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Refer to:	LIGO-E1200086-v2
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Common Mode Summing Node Test Procedure

Test Preparation

Enter Name, Date, and Board Serial Number. Indicate if the board has passed or failed the test.

Test Engineer:	Board Serial Number:	Date:	Pass:
JAX SANDERS	51203941	03/08/14	PASS

Required Test and Ancillary Equipment

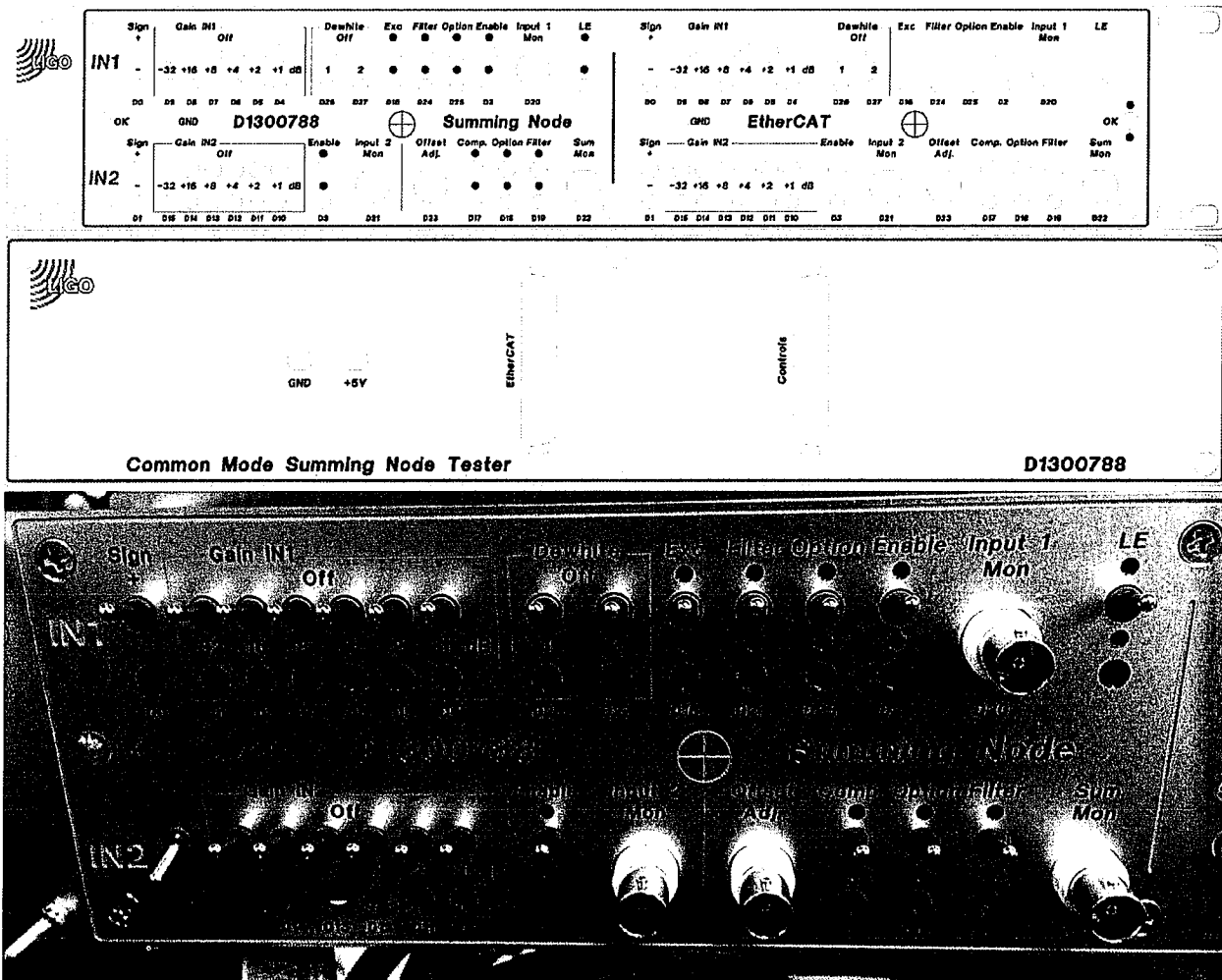
- 2 – Summing Node Board D1300788-v1 Tester
- 1 – Tektronix AFG 3101 Signal Generator or equivalent
- 1 – Tektronix TDS 210 Oscilloscope or equivalent
- 1 – Fluke Multimeter or equivalent
- 1 – HP 4395A Network analyzer (1Hz to 10MHz) or equivalent
- 1 – Stanford Research Systems Signal Analyzer Model SR785
- 1 – GPIB to Cat5 adapter
- 1 – Cat5 cable
- 1 – Laptop CPU using Windows operating system
- 1 – Folder containing Test File Scripts
- 2 – DC Power Supplies (Five Channels Required. Continuous Supply Voltages: +/- 24VDC, +/- 17VDC, and +5VDC)
- 1 – 17VDC Power Cable
- 1 – 24VDC Power Cable
- 1 – 5VDC Power Cable (Banana Plug to Banana Plug Cable and Jumper)
- 1 – custom cable adapting the DB9 Monitor port on the D0901781 front panel into three BNCs. (Refer to Common Mode Board: DAQ, Number D040180 Rev E, Sheet 17 of 17 for DB9 pinout detail)
- 3 – BNC Female to Female Adapters (Barrels)
- 1 – BNC Tee Connector
- 3 – BNC Female to Double Stacking Banana Plugs
- 1 – BNC Male to Mini Grabber Test Leads Cable
- 2 – 50 ohm BNC terminations
- 4 – BNC Male to BNC Male Cables

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IMPORTANT NOTES:

1. On the Summing Node Tester (D1300789-v1) front panel, all switches must be returned to default positions after each test and/or step, unless otherwise instructed.
2. The default position for most switches is UP
The switch default positions are shown in Picture 1 below.
3. “Left” and “Right” indicate the PCB as viewed from the front of the Summing Node chassis.



Picture 1
Front and Rear of Summing Node Tester

Tests Part 1.

1) Power Board Voltage (Low Noise Power Circuit Board Assembly D0901846)

Connect +/-17VDC and +/- 24VDC to the Common Mode Summing Node and +5VDC to the Summing Node Tester.

Turn ON Power Supplies.

On the Low Noise Power Circuit Board Assembly, **Connect** the positive multimeter test lead to the following test points and **Connect** the negative multimeter test lead to GRD.

Record the observed voltages in the data boxes below.

Turn Off Power Supplies.

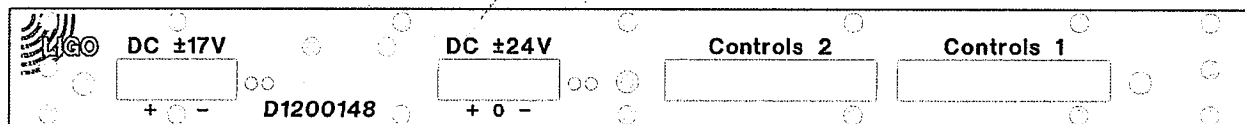
TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP10	TP11	TP12	TP13
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+17V	-17V	GND	GND	+5V	-15V	+24V	GND	-24V	GND	+15V	+VREF	-VREF

** Correct voltage indications are: TP14 ~3VDC and front panel OK light lit.

2) Power Supplies

Turn OFF Power Supplies.

Connect 50 pin Control cables 1 and 2 to corresponding Control Mode Servo Tester and Summing Node rear jacks.



**Picture 2
Rear of Common Mode Summing Node Board**

Turn ON Power Supplies

Check current draw from the ±17V power supply is between 0.3A and 0.6A.

On the front panel of Power Supplies, **Observe** and **Record** the amperage displayed.

Power supply	Current (A)	Nominal (A)
+24V	0.02	0.02
-24V	0.02	0.02
+17V	0.57	.45
-17V	0.69	.45

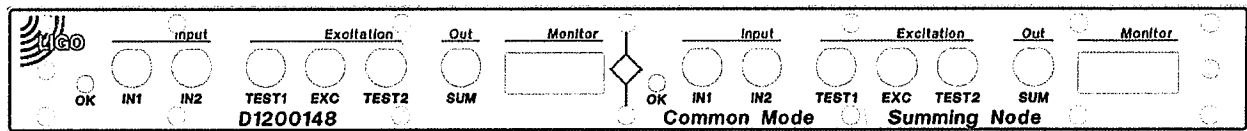
3) Oscillations

Set oscilloscope coupling to **AC Coupling**.

Connect oscilloscope probe to the following outputs. Ensure no oscillating waveforms are observed.

Use P2 pins 1+2 for I1MON P+N, pins 3+4 for I2MON P+N, pins 4+6 for SMON P+N.
Connect controls output to tester.

Place checkmark in corresponding box below each output.



Picture 3
Front of Common Mode Summing Node Board

Right Front Panel Outputs:

Outputs	SUM Out	Test 1	Test 2
Check Box	✓	✓	✓
Outputs	I1MON	I2MON	SMON
Check Box	✓	✓	✓

Right Rear Panel Outputs:

Outputs	D20 Input 1 Mon	D21 Input 2 Mon	D22 Sum Mon
Check Box	✓	✓	✓

Left Front Panel Outputs:

Outputs	SUM Out	Test 1	Test 2
Check Box	✓	✓	✓
Outputs	I1MON	I2MON	SMON
Check Box	✓	✓	✓

Left Rear Panel Outputs:

Outputs	D20 Input 1 Mon	D21 Input 2 Mon	D22 Sum Mon
Check Box			

4) Check DC Bias

Check DC Bias at the outputs and monitors. Pass if around 0 VDC

~~Right~~ *Left*

Input Mon 1 (D20)	0	VDC	Pass/Fail
Input Mon 2 (D21)	-5 mV	VDC	Pass/Fail
Sum Mon (D22)	10 mV	VDC	Pass/Fail
Sum OUT	70 mV	VDC	Pass/Fail
I1MON (P2)	55 mV	VDC	Pass/Fail
I2MON (P2)	75 mV	VDC	Pass/Fail
SMON (P2)	16 mV	VDC	Pass/Fail

~~Left~~ *Right*

Input Mon 1 (D20)	6 mV	VDC	Pass/Fail
Input Mon 2 (D21)	-11 mV	VDC	Pass/Fail
Sum Mon (D22)	23 mV	VDC	Pass/Fail
Sum OUT	23 mV	VDC	Pass/Fail
I1MON (P2)	50 mV	VDC	Pass/Fail

I2MON (P2)	26 mVDC	Pass/Fail
SMON (P2)	55 VDC	Pass/Fail

5) Signal Gain

Gain slider IN1:

Connect Input 1 Mon (or Test 1) to the oscilloscope.

Connect Function Generator Output to Common Mode Summing node IN1 jack.

Set Function Generator to frequency 10Hz, Sine wave, and an Amplitude of 1 Vpp.

Inject a 10Hz / 1Vpp Sine wave signal.

Measure the voltage at 0dB (all switches in default position) and Record.

Individually, Toggle each switch down (GND) and Record observed voltage. After each voltage observation, Return the switch to default position.

Continue to Toggle each switch, Record the observed voltage and Return each switch to default position.

** Tolerance is + / - 1.059 V (+/-0.5dB).

Right:

Binary input (Switch Setting)	Measured Vpp	Nominal Vpp
—(0dB)	0.992 1.0	1
D4 (1dB)	1.09	1.12
D5 (2dB)	1.28	1.26
D6 (4dB)	1.60	1.59
D7 (8dB)	2.52	2.51
D8 (16dB)	6.28	6.31
D7 & D8 (24dB)	14.6 15.0	15.9
D9 (-32dB)	0.027	0.025
D9 & D7 (-24dB)	0.080 0.08	0.063
D9 & D8 (-16dB)	0.170 0.17	0.159

D9 & D8 & D7 (-8dB)	0.408 *	0.398
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Left:

Binary input (Switch Setting)	Measured Vpp	Nominal Vpp
—(0dB)	1.04	1
D4 (1dB)	1.16	1.12
D5 (2dB)	1.26	1.26
D6 (4dB)	1.60	1.59
D7 (8dB)	2.52	2.51
D8 (16dB)	6.32	6.31
D7 & D8 (24dB)	14.5*	15.9
D9 (-32dB)	0.027	0.025
D9 & D7 (-24dB)	0.080 3	0.063
D9 & D8 (-16dB)	0.170 3	0.159
D9 & D8 & D7 (-8dB)	0.404 3	0.398

Gain slider IN2:

Connect Input 2 Mon to an oscilloscope.

Set Function Generator to frequency 100Hz, Sine wave and an Amplitude of 1 Vpp.

Connect Function Generator Output to Common Mode Summing Node IN2 jack.

Inject a 100Hz / 1Vpp Sine wave signal into IN2.

Measure the voltage at 0dB (all switches in default position) and Record.

Toggle each switch individually Down (GND) and Record observed voltage. Return the switch to default position.

Continue to Toggle each switch, Record the observed voltage and Return each switch to default position.

** Tolerance is +/- 1.059 V (+/-0.5dB).

Unless specified, measured my breakout - this is fine!

Right:

Binary Input (slider gain)	Measured Vpp	Nominal Vpp
— (0dB)	0.624	1
D10 (1dB)	0.709	1.12
D11 (2dB)	1.23 0.784	1.26
D12 (4dB)	0.992	1.59
D13 (8dB)	1.60	2.51
D14 (16dB)	4.04	6.31
D13 & D14 (24dB)	15.0*	15.9
D15 (-32dB)	0.021	0.025
D15 & D13 (-24dB)	0.080*	0.063
D15 & D14 (-16dB)	0.174*	0.159
D15 & D14 & D13 (-8dB)	0.412*	0.398

Left:

Binary Input (slider gain)	Measured Vpp	Nominal Vpp
— (0dB)	0.632	1
D10 (1dB)	0.704	1.12
D11 (2dB)	0.784	1.26
D12 (4dB)	0.992	1.59
D13 (8dB)	1.62	2.51
D14 (16dB)	4.02	6.31
D13 & D14 (24dB)	14.8 14.8*	15.9
D15 (-32dB)	0.021	0.025
D15 & D13 (-24dB)	0.080*	0.063
D15 & D14 (-16dB)	0.177*	0.159
D15 & D14 & D13 (-8dB)	0.412*	0.398

Ⓢ measured w/ tester

6) Crossbar switches

Inject a 100Hz/1Vpp Sine wave to IN1. Individually, Toggle each Crossbar switches Down. Using an oscilloscope, Record the voltage states at each SUM Out. Voltage states are either ON or OFF.

Binary input	SUM Out Right	Nominal	SUM Out Left	Nominal
Switches in Default Positions	on	On	off on	Off
D2 (input 1 disabled)	off	Off	off	Off
D3 (input 2 enabled)	off	off	off	On

Inject a 100Hz/1Vpp Sine wave to IN2. Record the voltage states at each SUM Out 2 while toggling the switches Down. Voltages states are either ON or OFF.

Binary input	SUM Out Right	Nominal	SUM Out Left	Nominal
Switches in Default Positions	off	Off	off	Off
D2 (input 1 disabled)	off	Off	off	Off
D3 (input 2 enabled)	on	On	on	On

7) Excitation:

Inject a 100Hz/10Vpp Sine wave to IN1. Measure and Record the voltage at TEST1 and TEST2. ** Tolerance is +/-0.5dB.

Right:

Binary input	TEST1	Nominal Vpp	TEST2	Nominal Vpp
Switches in Default		1.00	~	-1.00

Left:

Binary input	TEST1	Nominal Vpp	TEST2	Nominal Vpp
Switches in Default		1.00	-	-1.00

Inject a 100Hz/10Vpp Sine wave to EXC. Measure and Record the voltage at TEST2 and Sum OUT while toggling the switches Down. ** Tolerance is +/-0.5dB.

Right:

Binary input	TEST2	Nominal Vpp	SUM Out	Nominal Vpp
Default	off	Off	off	Off
D16 (exc enable)	1.00	1.00	1.00	1.00
D16 & D26 (DW1)	0.1	0.10	0.1	0.10
D16 & D27 (DW2)	0.1	0.10	0.1	0.10
D16 & D26, 27 (DW1, 2)	0.01	0.01	0.01	0.01

Left:

Binary input	TEST2	Nominal Vpp	SUM Out	Nominal Vpp
Default	off	Off	off	Off
D16 (exc enable)	1.00	1.00	1.00	1.00
D16 & D26 (DW1)	0.1	0.10	0.1	0.10
D16 & D27 (DW2)	0.1	0.10	0.1	0.10
D16 & D26, 27 (DW1, 2)	0.01	0.01	0.01	0.01

8) Filter/Option

Inject a 100Hz/1Vpp Sine wave to IN1. Measure and Record the voltage at SUM Out while toggling the switches Down. ** Tolerance is +/-0.5dB.

Right:

Binary input	SUM Out	Nominal Vpp
—	4.0	1.00
D17 (SUM comp. enable)	1.0	1.00
D18 (SUM filter enable)	1.0	1.00
D19 (SUM option enable)	0	0.00
D24 (IN1 filter enable)	1	1.00
D25 (IN1 option enable)	0	0.00

Left:

Binary input	SUM Out	Nominal Vpp
—	1.0	1.00
D17 (SUM comp. enable)	1.0	1.00
D18 (SUM filter enable)	1.0	1.00
D19 (SUM option enable)	0	0.00
D24 (IN1 filter enable)	1.00	1.00
D25 (IN1 option enable)	0	0.00

Note: D18/D19 are mislabeled on tester.

9) EPICS Readbacks

Inject a 100Hz/1Vpp Sine wave to IN1 or IN2 and Record the observed voltage.

Right:

EPICS readback	1Hz	Nominal Vpp	100Hz	Nominal Vpp
D20 (input mon 1)	-0.5V	-1.00	0.083	0.080
D21 (input mon 2)	-0.5V	-1.00	0.082	0.080
D22 (sum mon)	-0.5V	-1.00	0.082	0.080

Left:

EPICS readback	1Hz	Nominal Vpp	100Hz	Nominal Vpp
D20 (input mon 1)	-0.5	-1.00	0.084	0.080
D21 (input mon 2)	-0.5	-1.00	0.083	0.080
D22 (sum mon)	-0.5	-1.00	0.084	0.080

Tests Part 2: SR785 Signal Analyzer Tests

Important Notes: 1. Ensure all Summing Node Tester switches are in the default position. 2. Closely Read and follow all On-Screen prompts.

On a Windows operating system laptop, Create and Save a file called TEST_DATA to C: drive. The path is C:\Test_DATA\.

Save Test Scripts in TEST_DATA.

Connect an SR785 Signal Analyzer to the laptop with a GPIB to Cat5 adapter.

From the DOS CMD window, Type cd., Enter, Type cd., Enter and Type cd SummingNode_TEST_DATA.

Type and Run 'setgpib.bat' and Enter the adapter's IP address (which should be labeled on the adapter).

Reset the SR785's settings with 'resetSR785.bat'. If the SR785 resets when the script is run, the SR785 is properly connected to the PC.

10) Power Board Noise (SR785PowerBoardNoise.bat)

One pair of probes (MiniGrabbers) are required to check the noise levels at 140Hz on the low noise power board.

In the DOS CMD window, Type SR785PowerBoardNoise.

Read and Follow the On-Screen prompts for proper test equipment configuration and procedure.

Record the collected On-Screen data in the boxes below.

** Test values must be less than the values indicated in the table below.

TP11	< [nV/√Hz]	TP12	< [nV/√Hz]	TP13	< [nV/√Hz]	TP6	< [nV/√Hz]
12	30	10	20	12	30	18	30

Note: TP11, TP12, TP13, TP6 indicate the noise performance of P15V, VREF, NREF, and N15V respectively, which are the voltages we are regulating.

11) Monitor Channel Filtering (SR785MonitorTFs.bat)

In the DOS CMD window, Type SR785MonitorTFs

Read and Follow the On-Screen prompts for proper test equipment configuration and procedure.

Measure test transfer functions at 100Hz to 1Hz on IN1 to the indicated monitor channels on the tester and Record the data in the table below.

** Tolerances for Lowpass filtering are +/-1dB and +/-5deg from nominal.

Right:

Boost #	@1Hz	Nominal	@10Hz	Nominal	@100Hz	Nominal
Input Mon 1 (D20)	-0.45dB 173.1 deg	-0.1dB 173deg	-4.48dB 128.5 deg	-4.1dB 129deg	-22.4dB 94.4 deg	-22dB 95deg
Sum Mon (D22)	-0.53dB 173 deg	-0.1dB 173deg	-4.6dB 128.3 deg	-4.1dB 129deg	-22.5dB 94.7 deg	-22dB 95deg

Left:

Boost #	@1Hz	Nominal	@10Hz	Nominal	@100Hz	Nominal
Input Mon 1 (D20)	-0.45 173.1 deg	-0.1dB 173deg	-4.5dB 128.4 deg	-4.1dB 129deg	-22.4dB 94.5 deg	-22dB 95deg
Sum Mon (D22)	-0.5dB 173.1 deg	-0.1dB 173deg	-4.6dB 128.4 deg	-4.1dB 129deg	-22.5dB 94.7 deg	-22dB 95deg

Measure test transfer functions at 100Hz to 1Hz on IN2 to the indicated monitor channels on the tester and Record the data in the table below.

Toggle D2 down (off), and Toggle D3 down (on).

** Tolerances for Lowpass filtering are +/-1dB and +/-5deg from nominal.

Right:

Boost #	@1Hz	Nominal	@10Hz	Nominal	@100Hz	Nominal
Input Mon 2 (D21)	-3.1dB 173.1 deg	-0.1dB 173deg	-4.4dB 128.4 deg	-4.1dB 129deg	-22.2dB 94.5 deg	-22dB 95deg
Sum Mon (D22)	-3.9dB 173 deg	-0.1dB 173deg	-4.6dB 128.3 deg	-4.1dB 129deg	-22.4dB 94.7 deg	-22dB 95deg

Left:

Boost #	@1Hz	Nominal	@10Hz	Nominal	@100Hz	Nominal
Input Mon 2 (D21)	-0.31dB 173 deg	-0.1dB 173deg	-4.4dB 128.4 deg	-4.1dB 129deg	-22.3dB 94.5 deg	-22dB 95deg
Sum Mon (D22)	-0.38dB 173 deg	-0.1dB 173deg	-4.5dB 128.4 deg	-4.1dB 129deg	-22.4dB 94.7 deg	-22dB 95deg

Return all summing node tester switches to the default position.

12) Adjustment Channel Filtering (SR785AdjustmentTFs.bat) **NOT Applicable, unless input is connected.

Type SR785AdjustmentTFs

Test the transfer functions at 10kHz to 1Hz on the indicated adjustment channels on the tester to Sum Out. Verify filtering of at least -60dB at 100Hz and **Record** level below in the box below.

Right:

Default	
---------	--

Left:

Default	
---------	--

13) Distortion (SR785DistortionMeasurement.bat)

Type SR785DistortionMeasurement.

Inject a 1kHz/Vrms sine wave into IN1. Use a spectrum analyzer to measure the harmonic components at Sum Out. One the SR785, **press** Marker to display the THD level. **Repeat** the measurement for IN2 (Toggle D2, D3 down). **Record** the measurements in the boxes below.

Return toggle switches to default position.

	IN1 Left	IN1 Right	SUM Out	IN2 Left	IN2 Right	SUM Out
Total Harmonic Distortion (THD)	-87dB	-87dB	<-70dB	-87dB	-87dB	<-70dB

14) Noise Spectra (SR785NoiseMeasurements.bat)

Type resetSR785 and Allow the SR785 to reset. Type SR785NoiseMeasurements

Terminate IN1 and IN2 using 50 Ohm terminations. Measure the noise density at each SUM Out. Record the values at 100Hz, 1kHz, and 10kHz in the table below.

Frequency	SUM Out Left	< [nV/√Hz]	SUM Out Right	< [nV/√Hz]
100Hz	28	40	36	40
1kHz	30	30	28	30
10kHz	27	30	30	30

15) Basic Transfer Functions (SR785BasicTFs.bat)

Type SR785BasicTFs

Sweep the frequency from 100kHz down to 1Hz with 100mV source amplitude and Measure the transfer function from IN1 to SUM Out, and from IN2 to SUM Out for each side. Record the values at 10Hz, 100Hz, 1kHz, and 10kHz in the table below.

** Tolerances must be within 1dB and 5deg of nominal.

Right:

SUM Out/IN1	dB	Nom	deg	Nom
1Hz	-0.45	0.0dB	180	180deg
10Hz	-0.46	0.0dB	180	180deg
100Hz	-0.48	0.0dB	180	180deg
1kHz	-0.42	0.0dB	180	180deg
10kHz	-0.42	0.0dB	179	175deg

Toggle D2, D3 down

Ensure Sign "-" for IN2 (swapped sign relative to IN1)

SUM Out/IN2	dB	Nom	deg	Nom
1Hz	-0.32	0.0dB	-180	180deg
10Hz	-0.32	0.0dB	-180	180deg
100Hz	-0.37	0.0dB	-180	180deg
1kHz	-0.29	0.0dB	-180	180deg
10kHz	-0.28	0.0dB	-180	175deg

Return toggles switches to default positions

Left:

SUM Out/IN1	dB	Nom	deg	Nom
1Hz	-0.45	0.0dB	-180	180deg
10Hz	-0.46	0.0dB	-180	180deg
100Hz	-0.48	0.0dB	-180	180deg
1kHz	-0.42	0.0dB	-180	180deg
10kHz	-0.42	0.0dB	-180	175deg

Toggle D2, D3 down

Ensure Sign "-" for IN2 (swapped sign relative to IN1)

SUM Out/IN2	dB	Nom	deg	Nom
1Hz	-0.32	0.0dB	-180	180deg
10Hz	-0.32	0.0dB	-180	180deg
100Hz	-0.34	0.0dB	-180	180deg
1kHz	-0.28	0.0dB	-180	180deg
10kHz	-0.28	0.0dB	-180	175deg

Return toggles switches to default positions.

16) Transfer Functions of Boost Gain Stages (SR785BoostGainTFs.bat)

Type SR785BoostGainTFs

Note: 1. Switch D9 must be **Down** (low) for **all** measurements.
 2. All other switches are in default unless prompted otherwise

** Tolerances must be within 1dB and 5deg of nominal.

Right:

Boost #	@10Hz	Nom	@100Hz	Nom	@1kHz	Nom
Common Comp. (D17)	-32.4dB 179.9 deg	-32dB 180deg	-32.5dB 179.8 deg	-32dB 180deg	-32.3dB 179 deg	-32dB 180deg

Left:

Boost #	@10Hz	Nom	@100Hz	Nom	@1kHz	Nom
Common Comp. (D17)	-32.3 dB 179.8 deg	-32dB 180deg	-32.3 dB 180 deg	-32dB 180deg	-32.3 dB 179 deg	-32dB 180deg

17) Transfer Functions of DAQ Channels (SR785DAQTFs.bat)

Type SR785DAQTFs

Measure the transfer function from SR785 CH1 A to Monitor jack (DAQ channels). Sweep the frequency from 10kHz down to 1Hz at 1mV source amplitude. Record the values at 1Hz and 10kHz in the table below.

** Tolerances must be within 1dB and 5deg of nominal.

Note: If you only have one PCB, you will need a breakout board to attach to P2 (see D1200151 for pin breakdown). If you have two PCBs, attach right front panel P2, P3 to left front panel P4, P2.

Right:

Frequency	1Hz	Nominal	10kHz	Nominal
I1MON	5.6 dB, 11 deg	5dB, 0deg	45.6 dB, -2.2 deg	46dB, 0deg
I2MON	5.7 dB, 11 deg	5dB, 0deg	45.8 dB, -2.2 deg	46dB, 0deg
SMON w/ IN1		5dB, -170deg		46dB, -180deg
SMON w/ IN2		5dB, -170deg		46dB, -180deg

← sign flip not activated in data

Left:

Frequency	1Hz	Nominal	10kHz	Nominal
I1MON	5.6 dB, 11 deg	5dB, 0deg	45.6 dB, -2.1 deg	46dB, 0deg
I2MON	5.7 dB, 11 deg	5dB, 0deg	45.8 dB, -2.3 deg	46dB, 0deg
SMON w/ IN1	5.5 dB, 11 deg	5dB, -170deg	45.6 dB, -2.6 deg	46dB, -180deg
SMON w/ IN2	5.6 dB, 11 deg	5dB, -170deg	45.8 dB, -2.8 deg	46dB, -180deg

18) Transfer Functions Filters (SR78FilterTF.bat)

Type SR785FilterTF

Measure the transfer function from EXC to SUM Out with the dewhitening filters enabled from 7mHz to 1kHz with a source amplitude of 1V.

Confirm pole/zero at 1Hz/10Hz.

Right:

Check box

Left:

Check box

Measure the transfer function from IN1 to SUM Out with each filter on (D24, D18) from 1Hz to 100kHz with a source amplitude of 1V. Ensure unity gain.

Right:

	Measured (dB)	Nominal (dB)	
IN1 Filter (D24)	$\sim -40\text{m dB}$	0 dB	Pass /Fail
Sum Filter (D18)	$\sim -400\text{m dB}$	0 dB	Pass /Fail

Left:

	Measured (dB)	Nominal (dB)	
IN1 Filter (D24)	$\sim -400\text{m dB}$	0 dB	Pass /Fail
Sum Filter (D18)	$\sim -400\text{m dB}$	0 dB	Pass /Fail

Tests Part 3: 4395A Network/Spectrum Analyzer

Connect the 4395A in a similar fashion to the SR785, with a GPIB to Cat5 adapter.

19) High Frequency Transfer Function (AG4395AHighFreqTF.bat)

Type AG4395AHighFreqTF

Use a network analyzer to measure the transfer function from IN1/2 to Sum Out. Sweep the frequency from 10MHz down to 10kHz with -20dBm source. To remove cable delays first measure the transfer function against a BNC barrel and use as a reference. Record the displayed values at 100kHz, 300kHz and 1MHz in the table below. Nominal values are given.

** Tolerances are within 1dB and 5deg of nominal.

Right:

Frequency	SUM Out/IN1 [dB]	Nominal	SUM Out/IN1 [deg]	Nominal
100kHz	-5.2	0dB	174.8	170deg
300kHz	-5.0	0dB	166.5	150deg
1MHz	-5.3	2dB	131.7	75deg

Frequency	SUM Out/IN2 [dB]	Nominal	SUM Out/IN2 [deg]	Nominal
100kHz	-4.7	0dB	175.9	170deg
300kHz	-4.8	0dB	168.3	150deg
1MHz	-5	2dB	142.4	75deg

Left:

Frequency	SUM Out/IN1 [dB]	Nominal	SUM Out/IN1 [deg]	Nominal
100kHz	-4.8	0dB	174.8	170deg
300kHz	-4.9	0dB	164.9	150deg
1MHz	-5.3	2dB	130.9	75deg

Frequency	SUM Out/IN2 [dB]	Nominal	SUM Out/IN2 [deg]	Nominal
100kHz	-4.7	0dB	175.8	170deg

300kHz	-4.7	0dB	108.2	150deg
1MHz	-5.0	2dB	142.0	75deg