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Differential Driver-Receiver  
Functional Test

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LIGO Science Collaboration

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# **1 FUNCTIONAL TEST OF THE DIFFERENTIAL DRIVER / RECIEVER BOARD**

Part Number D000253

This board consists of two sets of converters. The first takes a differential input and gives a single ended output. The second does the opposite, with a single ended input and a differential output. This procedure tests the converters by inputting a single ended input, letting the circuits convert it to differential and back, and observing the single ended output. This method was chosen to simplify the test setup.

## **1.1 Equipment needed**

- 1 oscilloscope
- 1 signal generator
- 1 test cable with differential Lemo connectors on each end
- 2 SMA (male) to BNC (female) adapters
- BNC cables and fittings as needed
- 1 Power supply

## **1.2 Supplying power to the board**

This board uses  $\pm 15\text{V}$  for power. The power supply can be connected at the four pin connector, if installed, or at J12 and J14. Do not supply power at the test points without first consulting the schematic, because the test point may not be an equivalent point. If connecting power to the four pins connector, connect +15V to pin 1, -15V to pin 4, and ground to pin 2 or 3. If connecting to J12 and J14, connect +15V to J12, with + volts on the pin closer to the edge of the board. The - 15V power is connected to J14, again with the positive voltage on the pin closer to the edge of the board.

Typical current on each voltage line is about 100 mA.

## **1.3 Signal Test**

As mentioned earlier, the circuits are tested in pairs to make it easier. The procedure will describe the connections for testing circuits 1 and 6. The same steps are used for testing the other circuits.

Set the signal generator for an output in the kHz range (10 kHz works well), with an amplitude of 100-200 mV (or power level of  $-20$  dB). Note: The signal parameters given are those used for conducting the test in February 2001. They are known to work, but are not to be considered required ranges.

Connect the signal generator output to the single ended input of circuit 1 (the gold SMA connector) and to channel 1 of the oscilloscope. Connect the differential output #1 (Lemo connector) to the differential input on circuit 6. Connect the single ended output on #6 to channel 2 of the oscilloscope.

Compare the signals on the oscilloscope. They should be the same amplitude and frequency, but will differ in phase by 180 degrees.

Repeat the test until all circuits have been tested.