Unit Level Test Plan: Trigger Level Circuit
From: Team 4
To: Professor Yoder
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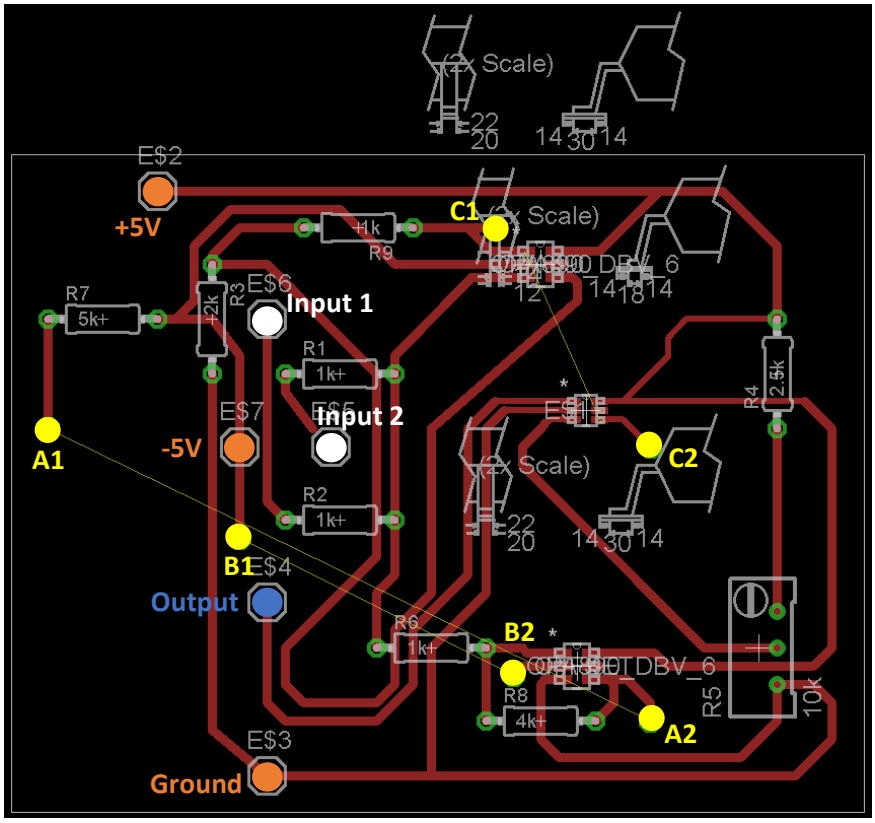
The Trigger Level Circuit is responsible for sending an interrupt to the microcontroller on the LaunchPad when the output of the circuit switches from low to high (or 0V to 5V).The input voltage into the circuit should not exceed the range of -1.5V to 1.5V. The output voltage of the circuit should not exceed the range of 0V to 5V and should be logically shaped (like a square wave). The output signal should not generate a current outside the range of -30mA to 30mA for the current limits of the microcontroller.

The equipment needed to properly test this circuit is a DMM, a function generator with 2 channels, an oscilloscope with 3 channels, and a DC power supply that can output both -5V and 5V at the same time.

See the figure on the next page for the locations of all the referenced node names.

Set both channels of the function generator to an output load of 'high Z'. Set Channel 1 to a frequency of 1 kHz and an amplitude of 2V-ptp. Set Channel 2 to a frequency of 2 kHz and an amplitude of 2.2V-ptp. Set the DC power supply to provide DC voltage of -5V and 5V. Connect node A1 to node A2. Connect node B1 to node B2. Connect node C1 to node C2. Connect the 5V output on the DC power supply to the +5V node. Connect the -5V output on the DC supply to the -5V node. Connect the Ground node to the blue rail on the breadboard and connect all ground references to that blue rail as well. Connect Channel 1 of the function generator to the Input 1 node and connect Channel 2 of the function generator to the Input 2 node. Also connect Channel 1 of the oscilloscope to the Input 1 node, connect Channel 2 of the oscilloscope the Input 2 node, and connect Channel 3 of the oscilloscope to the Output node. Turn the potentiometer to the middle position.

Turn on the DC power supplies and the function generator channels. There should be a logical output signal with its highest value at 5V and its lowest value at 0V on (oscilloscope Channel 3). The pulse width for the high pulse should be equal to the pulse width of the low pulse (oscilloscope Channel 3). Turning the potentiometer all the way to one direction should output a constant 0V and turning the potentiometer all the way in the other direction should output a constant 5V (oscilloscope Channel 3). The input signals should be able to have any value from -1.5V to 1.5V (oscilloscope Channel 1 and Channel 2) and the output of the circuit will not exceed the range of 0V to 5V (oscilloscope Channel 3). Disconnect oscilloscope Channel 3 from the Output node and connect the DMM to the Output node and ground. The current measured by the DMM should not exceed the range of -30mA to 30mA.


E$2
+5V
C1
R9
1k
R7
5k+
R3
2k
E$6
Input 1
R1
1k+
E$7
-5V
Input 2
A1
R2
1k+
B1
E$4
Output
R6
1k+
B2
R8
4k+
A2
E$3
Ground
C2
R4
2.5k
R5
10k
(2x Scale)
DBV_6