

Midpoint Writeup

This setup has 3 input conditioners, 1 shift register and 3 inputs. The 3 inputs are Button 0, Switch 0 and Switch 1.

When Button 0 is released, the shift register will do a parallel load once the input is conditioned. It will parallel load 10100101_2

Switch 0 will be read as the serial input after being conditioned by an input conditioner.

When Switch 1 is initially turned on and its input conditioned, the serial input will be loaded.

Testing a Parallel Load:

You can start by pressing Button 0, which should have no effect until you release it. When Button 0 is released, then the negative edge should be raised, which is connected to ParallelLoad. When ParallelLoad is raised, the shift register should reset its output to 10100101_2 ($A5_{16}$). Since you can only see the lowest 4 bits through the 4 LEDs, you should see 0101 [where 1 is a lit LED]. At any point, pressing and releasing Button 0 should reset the LEDs to 0101.

Testing Serial Load:

Switch 0 controls the output of the conditioned data, which is the “clean” version of the inputted data. The conditioned data takes the “noisy” raw inputted data and waits 3 clock cycles for it to stabilize. Once the raw input has stabilized, the conditioned data changes to reflect the raw input signal. This is sent to the shift register as the Serial Input so just pressing Switch 0 will not change the register’s output until the peripheral clock edge is raised. Engaging Switch 1 should send the output of Switch 0 as the SerialIn.