Lab 6 Solution

The test waveform used for Lab 6 was a square wave with a period of 32 microseconds. Unfortunately, none of the descrambler solutions, including the instructor's, regenerated this waveform.

The problem was with the test waveforms. The rising edge of the clock in these waveforms was at the same time as changes in the input data. This violated the setup time requirements and led to the unexpected simulation results.

New test vectors were generated with the clock inverted so that the rising edge is a half clock period after the data transitions. An extra clock edge was also added at the start of the data to reset the descrambler.

The new test waveforms produce the expected simulation results and are shown below for the short and long scrambler polynomials.

The schematic below shows one solution. It registers the inputs It is good practice to register all inputs (to avoid metastability problems) and outputs (to avoid glitches).