ECE478 Lab 8 Report

The Noisy Channel, Eye Diagrams.

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Abstract:

The following lab explores signals and noise using TIMS Hardware. This culminates with the experimenter observing the eye diagram of an 8.333kHz signal sent through a tunable filter.

Experiment

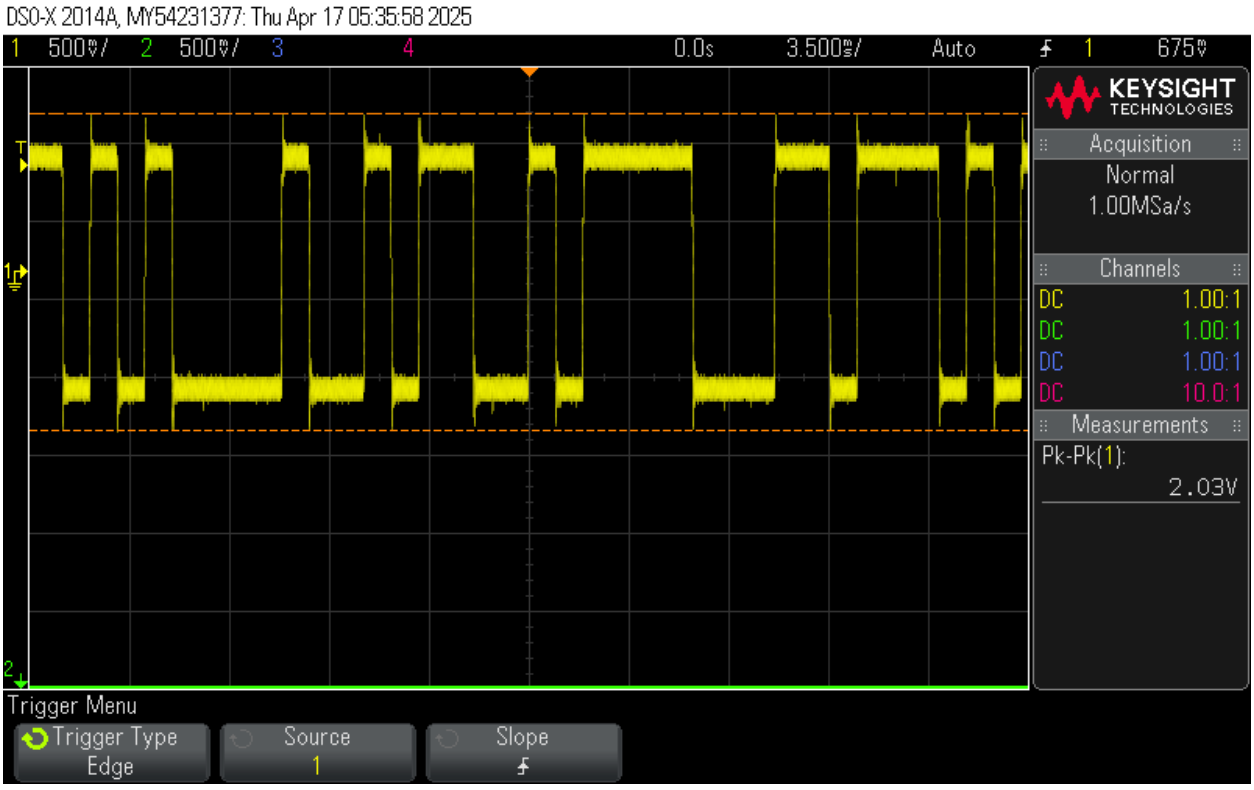

Figure 1: Encoded signal without noise.

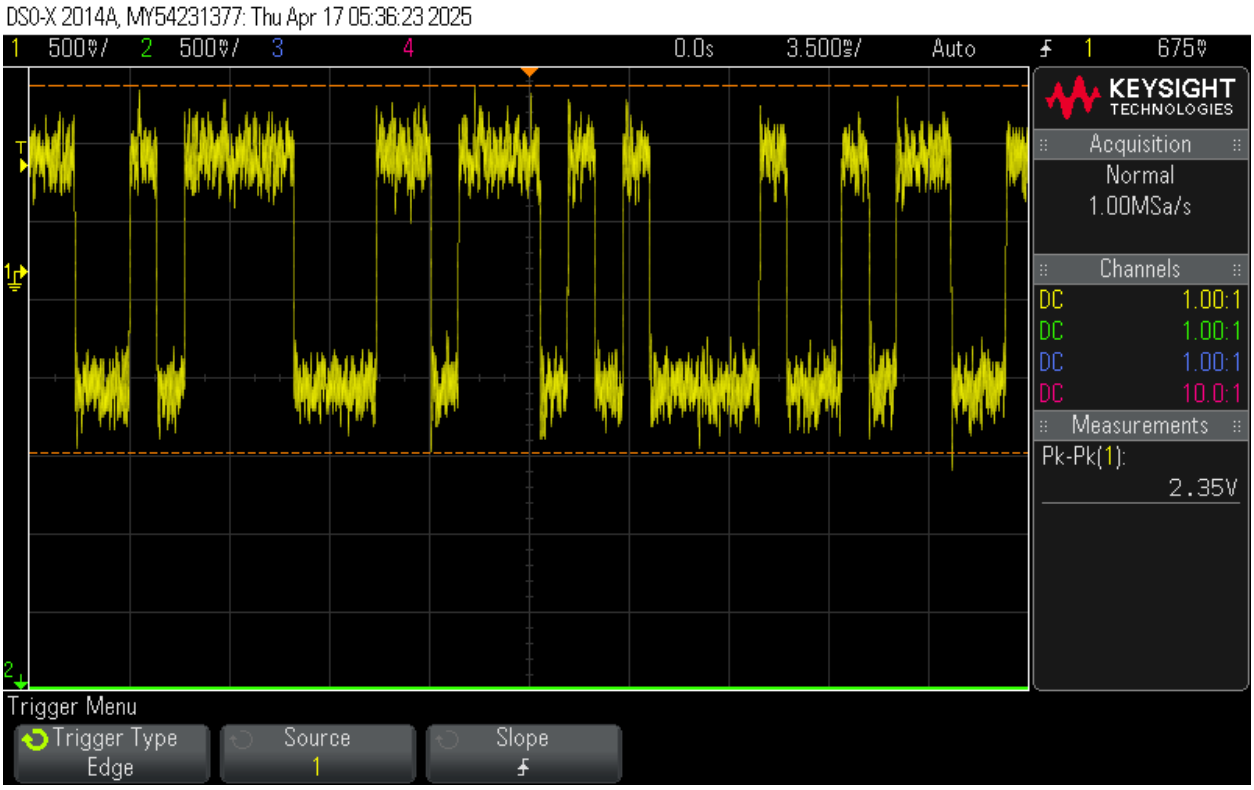

Figure 2: Encoded signal with noise.

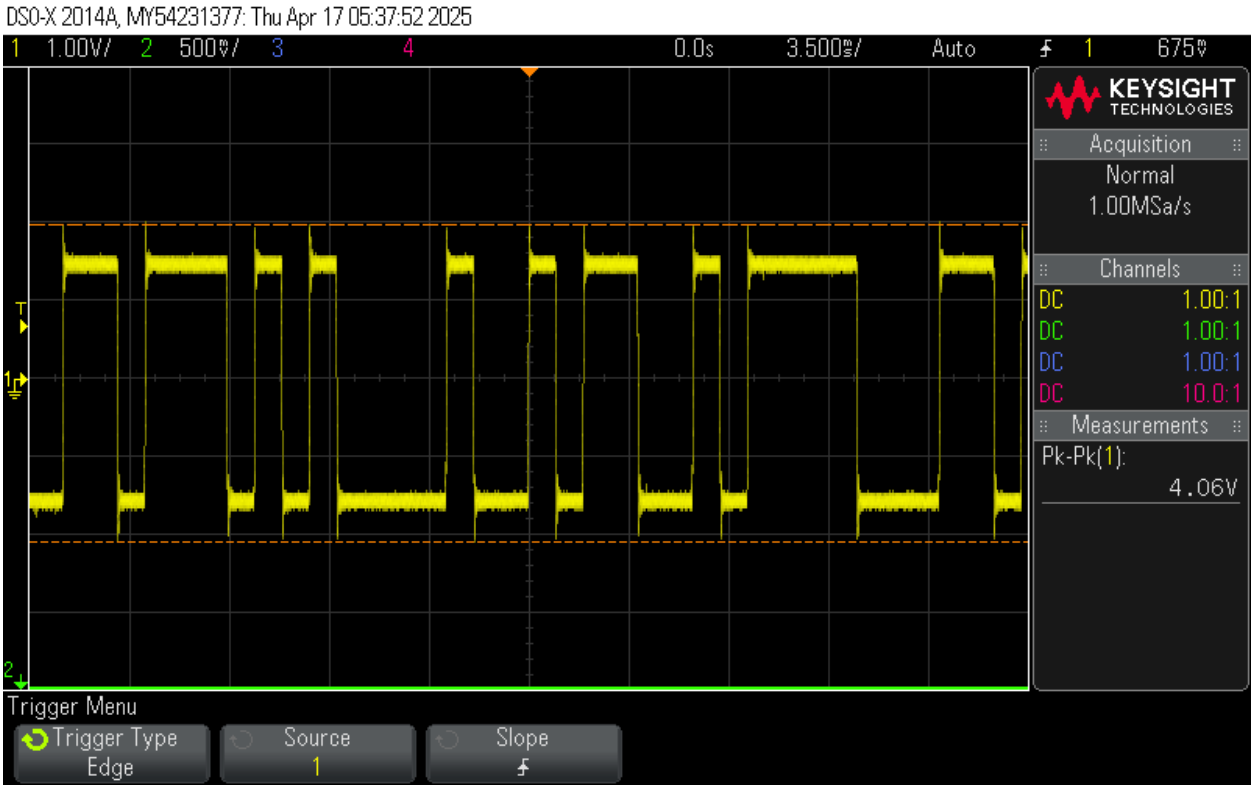

Figure 3: Noise-free encoded signal at 4-V_{peak}

BER measurement taken of 50.

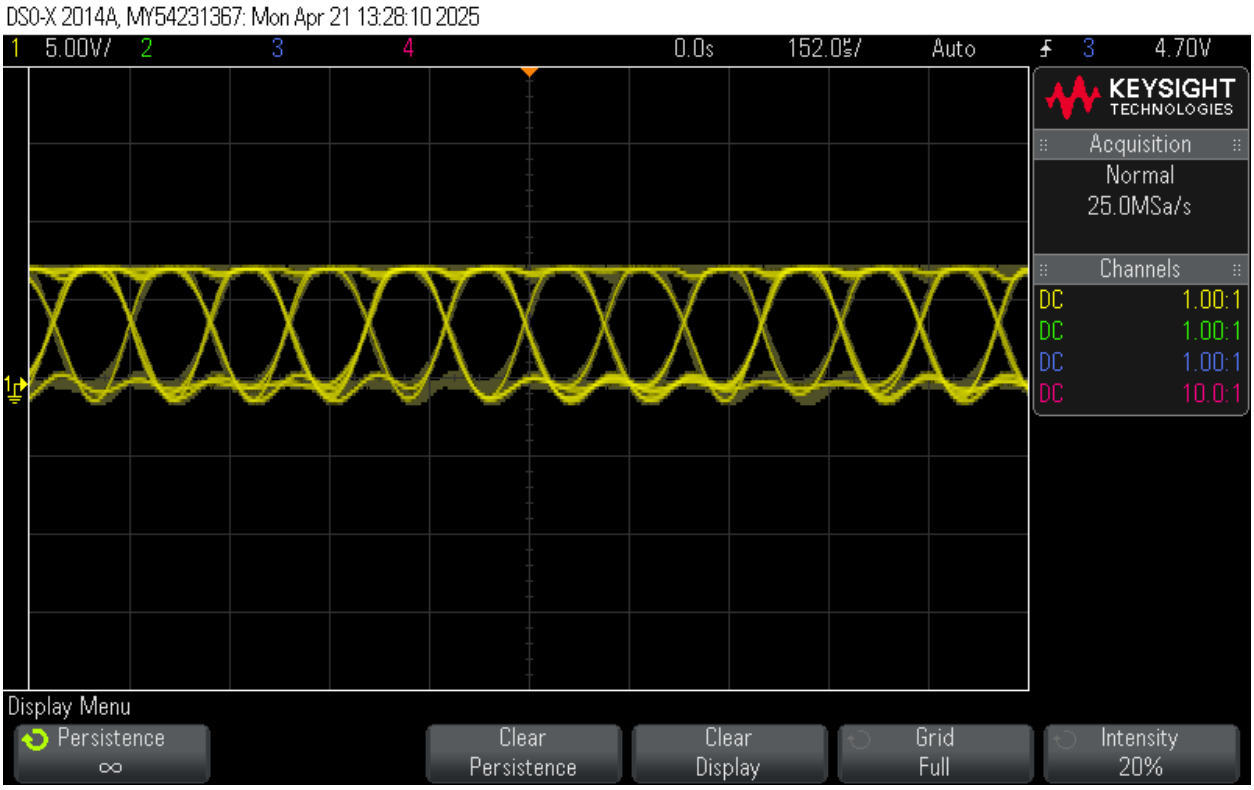

Figure 4: Eye Diagram of 8.333kHz sequence, with fully-open LPF

Figure 5: Eye Diagram of 8.333kHz sequence, with half-open LPF

As we can see, the eye diagram is cleanest, or most open, when the LPF is also fully open, which tracks as the signal can fully pass through, and have more signal strength relative to the noise of the channel, which means we are maximizing SNR.