

To: Prof. Andy Olson  
 From: Sam Harkness  
 Regarding: EELE445 Lab 5 Report  
 Date: 6 Mar 2014

1. Set the oscilloscope for a sample rate of 100 Ks/sec, 20MHz BW, 10,000 points, and 1mV/div. Disconnect the probe from the scope.

	Oscilloscope	MATLAB
DC	995 $mV$	-9.899e-05 $V$
Pk-Pk	5.5 $mV$	.00042 $V_{p-p}$
$\sigma$	550 $mV$	5.6886e-05 $V_{rms}$

- $\Delta V$  is 20  $\mu V$ , which corresponds to a maximum range of 10.24  $mV$ . The extra 2.24  $mV$  above the range displayed by the scope is still included, but not displayed.
2. Set the oscilloscope for a sample rate of 100 Ks/sec, 20MHz BW, 10,000 points, and 200mV/div. Disconnect the probe from the scope.
    - $\Delta V$  is 4  $mV$ , which corresponds to a maximum range of 2.048  $V$ . The extra 448  $mV$  above the range displayed by the scope is still included, but not displayed.
  3. Using the same settings from 2, connect a signal generator and apply a 1 KHz sine wave of 1  $V_{p-p}$ .
    - $\Delta V$  is 4  $mV$ , which corresponds to a maximum range of 2.048  $V$ . The extra 448  $mV$  above the range displayed by the scope is still included, but not displayed.
    - The dynamic range of the scope is approximately 48.7  $dB$ .
  4. Set the oscilloscope for a sample rate of 100 Ks/sec, 10,000 points, and 200mV/div. Now connect a signal generator and apply a 1 KHz sine wave of 2  $V_{p-p}$ .
    - $\Delta V$  is 4  $mV$ , which corresponds to a maximum range of 2.048  $V$ . The extra 448  $mV$  above the range displayed by the scope is still included, but not displayed.
  5. Change the input waveform to a 100 Hz triangle waveform 4  $V_{p-p}$ .
    - $\Delta V$  is 4  $mV$ , which corresponds to a maximum range of 2.048  $V$ . The extra 448  $mV$  above the range displayed by the scope is still included, but not displayed.
    - The triangle wave is clipped beyond  $\pm 1 V$ .