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EE2CI4 Lab 1

Introduction to Instrumentation Part 2

Equipment List: **Tektronix TDS210 Oscilloscope**
                          Hewlett Packard HP33120A function generator

1. Set the function generator to produce a sinusoid of arbitrary frequency and amplitude (e.g. 200 Hz 200 mV), and connect it to the scope input. Now set the trigger source of the scope to "line". (This is done by pressing the appropriate softkey until "line" appears in the corresponding square on the screen).

>   a) Why has the display gone unstable?
>   b) Disconnect the function generator from the scope and instead connect a scope probe to the Ch1 input. Let the alligator clip on the probe float. Touch the end of the probe with your finger. What is the waveform that appears on the screen? Why is it stationary on the display?
>   c) Why is the scope useful only for periodically repeating waveforms?

2. Reconnect function generator to the oscilloscope. Set function generator to produce a sinusoid waveform of 500 mHz frequency, 0 offset and 200 mV peak to peak amplitude. Set oscilloscope time base to 250 msec/div and trigger to auto mode. Set the coupling mode to DC. Is the display stable? Try measuring the peak to peak amplitude and period of the waveform as you did in Lab 1 part 1. Does the measure function work?. Use the cursor function of the oscilloscope (button under measure) to measure both peak to peak amplitude and signal period. Compare your answers to the function generator settings. Now turn off the cursors and measure the amplitude directly, using the vertical deflection of the trace. Also, measure the signal period by finding the time difference between two points on the trace that are separated by exactly one period of the waveform. Hint: use the volts/div and secs/div readings that appear on the bottom of the scope screen.

Repeat measurements for 200 mHz 100 mV peak to peak sinusoid waveform and compare.

3. Reset function generator to 500 mHz, 200 mV, 0 offset sine wave. Set oscilloscope time base to 250 msec/div and the coupling to DC. Try different modes of triggering and describe what each mode does. When using "single" you must use the run/stop button to

retrigger the oscilloscope. Hint: To see the effect move the trigger level around during each trigger mode. Measure the waveform using whatever means you think best. Experiment with different frequency settings. Why is it important to use DC coupling?

4. Set the function generator to produce a 1KHz 200 mV sine waveform. Modify the waveform to AM by using the blue shift button and the AM function button. Set the oscilloscope to 1 ms/div, normal trigger mode. Describe the waveform in your lab books. Set the oscilloscope to measure the peak to peak amplitudes of the minimum and maximum sine waves. Hint set trigger mode to single.

5. Practice using the various functions for both function generator and oscilloscope.