PHYSICS 133
IN-CLASS OSCILLOSCOPE EXERCISE

These simple exercises are designed to familiarize you with some of the basic features of digital oscilloscopes. This is not a complete introduction to everything you will need to know this quarter, but should be a good start.

Nothing done here need be handed in.

Begin by turning on the scope and the function generator. Connect the output of the function generator directly into channel 1 of the scope. Using the settings on the generator, use it to generate a sine wave of approximately 1 kHz.

Trigger the scope on Ch 1 itself. Arrange the trigger level (indicated by the little arrow on the vertical scale) so that the scope triggers at 0 Volts (i.e. halfway between the peak and trough of the wave). For this trigger level, arrange the offset (indicated by the little arrow on the horizontal scale) so that the trigger occurs at t=0 (i.e. right in the middle of the scope trace).

Next adjust the properties of the wave so that it has a period of exactly 1 kHz. Now, change the trigger level so that the scope triggers at exactly half the wave amplitude rather than at V=0. When you do this, the time of the V=0 crossing of the wave should change. Use the cursors to measure this shift in time. Making use of the properties of the sine wave, explain this shift quantitatively. Check in with me or the TA to make sure you have a good understanding of this before moving on.

Place an open banana-to-BNC plug on CH2 of the scope (to get some pickup from CH1. Adjust the amplitude of the generated sine wave to 2V. Trigger the scope on CH1 but look only at CH2. Does what you see make sense?

Adjust the triggering to 'AC Line'. Can you explain the changes you see?

Return to the original triggering scheme (triggering on Channel 1). Figure out how to use the scope controls to acquire single pulse on demand. Do you see what you expect?

Make use of the scope controls to make the display show an average over 64 triggers.

Now, instead set the scope so that every trace is kept on the screen ('persists') indefinitely.