Oscilloscope Basics

**Principle (What the heck is this thing?)**

The purpose of an oscilloscope is very simple. It makes a plot (or usually repeated plots) of voltage (y axis) versus time (x axis). The scopes we are using can simultaneously plot the voltage from two inputs; these are referred to as Channel 1 and Channel 2. The figure above shows the key controls. The most important scope settings are:

- **Time Base** - This sets the horizontal scale (sec/division) of the plot. It is common to both channels.

- **Vertical Scale** - This is the scale of the vertical axis (Volts/division). It can be set separately for each channel.

- **Trigger Conditions** - The condition (or conditions) which start the plot. This usually involves one of the channels (or an external source) crossing some voltage level (You probably won’t have to do much with this).

**Initial Setup**

Luckily, these scopes come with a magic “autoset” button. In most cases, if you push this button, it will do a pretty good job at making all the settings. Then you just have to make fine adjustments. The scale values will display on the bottom of the screen.

If one of the channel traces does not appear, you can turn it on by hitting the appropriate “Channel Menu” button.

(over)
Measurements

Again, technology has come to the rescue. If you push the “Measure” button, you can simultaneously measure four values of your choosing. You control what is being measured by means of the general purpose buttons labeled “A” through “E” above. Push button “A” until “source” is highlighted, then you can set the source (i.e., Chan. 1 or Chan.2) for each of the four measurements by pushing buttons “B” through “E”. If you then push button “A” to highlight “type”, you can set what type of measurement you want to make. There are several things you can measure, but the most useful are frequency and amplitude. You can make all the necessary measurements for these labs by setting up your four measured values to be...

- Channel 1 amplitude
- Channel 1 frequency
- Channel 2 amplitude
- Channel 2 frequency

Note that for the scope to get a good measurement of frequency, you should adjust the time base until lots of full waves are on the screen at one time.