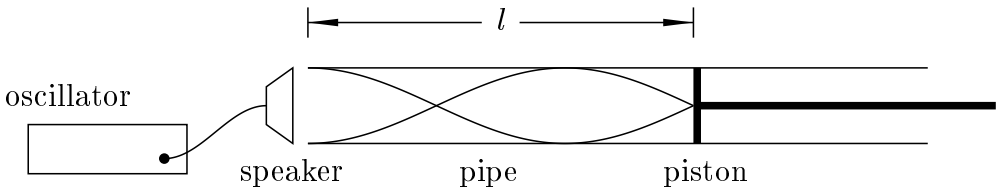
Physics 123 section 2 Identification number_____
Lab #5
Standing Waves in a Pipe

In this lab, you will produce standing waves in a pipe. This is done by placing a speaker at an open end of the pipe and driving the speaker with an oscillator as shown below:




A piston is inserted into the other end of the pipe. At certain positions of the piston, the speaker will cause the pipe to resonate, thus producing standing waves.

Set the frequency $f$ of the oscillator at approximately 700 Hz. Read the frequency shown on the counter and record it below. Starting with the piston at the end of the pipe, push it in slowly. You will notice that at certain positions, the sound of the speaker is enhanced. This is caused by standing waves in the pipe. Use the sound meter to accurately determine the position of the piston where the enhanced sound is loudest. Measure the distance $l$ between the piston and the open end of the pipe at all positions of the piston for which this occurs and record it below. You ought to find 5 of them.

For each standing wave, the piston is at a position of a displacement node. From the data, you can thus obtain the distance between nodes and consequently the wavelength $\lambda$. Using the wavelength and frequency, calculate the velocity of sound to the nearest m/s (three significant figures). Record these results below.

$f =$ _____

$l =$ _____ _____ _____ _____ _____

$\lambda =$ _____

$v = f\lambda =$ _____