

the speed of sound

Academic Physics
2008-9

Name:
DATE:

Purpose:

To measure the speed of sound at room temperature.

Theory:

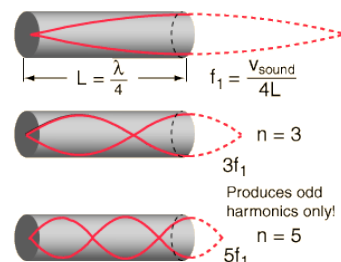
The length of the air column must be increased by four tenths of the diameter of the tube to correct for the small amount of air just outside the top of the tube that vibrates with the air column in the tube.

$$v_{\text{sound in air}} \approx 331.4 + 0.6T_C \text{ m/s}$$

The velocity of a wave is equal to the product of its frequency and wavelength

$$v = f \lambda$$

In a closed tube, only odd harmonics are possible. The first standing wave has the basic properties of a single node and antinode pair.



Calculations:

Trial	Frequency (Hz)	Length of air column (cm)	Corrected Length (m)	Wavelength (m)	Speed (m/s)
1					
2					
3					
4					
				avg	
Find the percentage of error for the speed of sound				actual	%

Conclusion (error analysis):