4.2.3: Procedure

1. Mount the microphones on the stands at a comfortable height, placing them relatively close to each other. Connect a short cable to the first microphone and a long cable to the second. Connect the microphones to the pre-amps (if available). Connect the pre-amp output for microphone one (short cable) to channel one of the oscilloscope, and similarly, connect the pre-amp output for microphone two (long cable) to channel two of the oscilloscope.

2. Depress the oscilloscope's "Quick Menu" button and use the following settings: Input Coupling=AC, Input Impedance=1M, Bandwidth=20MHz. Set the Trigger Source to Channel One.

3. Adjust the oscilloscope time base (Horizontal Scale) to approximately 1 millisecond per division and the amplitude (Vertical Scale) to 5 mV per division if no pre-amps, and 100 mV otherwise. Position the Trigger Start Position toward the left edge of the display (this is the little orange triangle at the top of the grid; move it using the Horizontal Position knob).

4. Position the transient generator close to the microphones and equally distant from them. Generate a transient while observing the oscilloscope display. Adjust the vertical sensitivity scale so that the waveform peaks are seen clearly.

5. Using the sample capture/freeze ability of the oscilloscope (the "single shot" button on the extreme right side) adjust the Trigger Level control so that a transient triggers the oscilloscope. This will create a "freeze frame" of the transient events recorded by the microphones. This may take some trial and error. (Generate a transient and decrease the Trigger Level until the transient is captured. If the level is set too low, false triggers will occur on random sounds.)

6. With the oscilloscope set properly, generate a transient and examine the waveforms on the oscilloscope.

7. Adjust the Vertical Position of the two waveforms so that the starting points are visible clearly. Record the time delay between channel one and channel two in Table 1. If the delay is considerably less than one millisecond, leave the velocity column blank. If not, make sure that the transient device is located equal distances from the microphones and try again.

8. Move the second microphone to a new position at least a few meters away from the first microphone.

9. Measure the distance between the two microphones and record in the first column of Table 1.

10. Set the Horizontal Scale to 2 milliseconds per division.

11. Generate a transient very close and somewhat to the side of the first microphone. Examine the waveforms on the oscilloscope. If the second channel transient is beyond the right edge of the display, increase the Horizontal Scale and try again. The Vertical Scale (or pre-amp gain) for the second microphone may need to be increased in order to see the transient waveform.

12. Measure the time delay between the two channels and record in Table 1. Based on this time and the separation recorded in column one, compute the velocity of sound and record in Table 1.

13. Repeat steps 8 through 12 for two other microphone separations. One of them should be at least 6 meters.