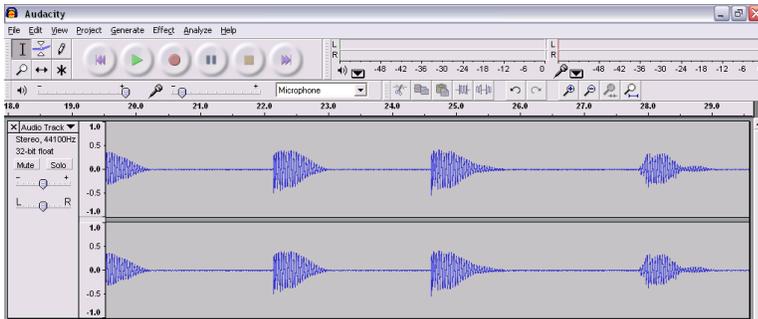


Earthquake!

Audacity



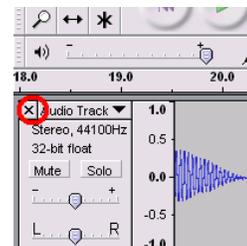
The SEP Vibration Detector, Seismometer Modelling Kit and Sound Source Locator are designed to be used with the freeware audio package *Audacity*, available from <http://audacity.sourceforge.net/>. The equipment plugs into the external microphone socket, usually colour-coded pink.

Recording

To record the output from one of these sensors, click the red record button (left). To stop recording, click the yellow stop button.

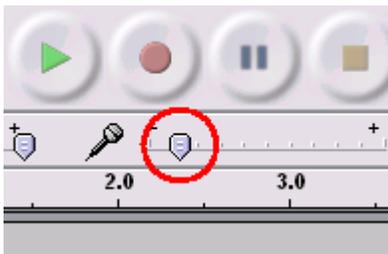


To delete a recording, click the x, as shown right.



Altering Sensitivity

The sensitivity of the recording system can be adjusted using the slider control next to the microphone icon (below). It goes without saying that this cannot be adjusted during an investigation without invalidating the results.

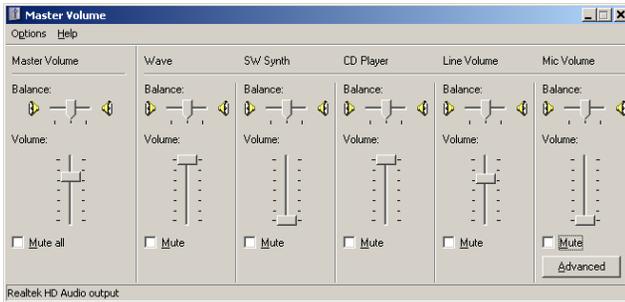


This may not be enough to stop the trace going off the scale. This may be because the microphone input to your computer's sound card may have been set to "boost".

To switch boost off, follow the steps below.

At the bottom right of your screen, just to the left of the clock, there should be a little loudspeaker icon like the one circled on the right. Double click this icon.





You should now be looking at something like the panel on the left. Exactly what you see will depend on your computer.

If you don't see the **Mic Volume** slider, go to **Options** and choose **Properties**. Something like the display on the right should appear. Make sure **Mic Volume** is selected. You may have to choose between showing recording and playback sliders. If so, choose **Recording**.

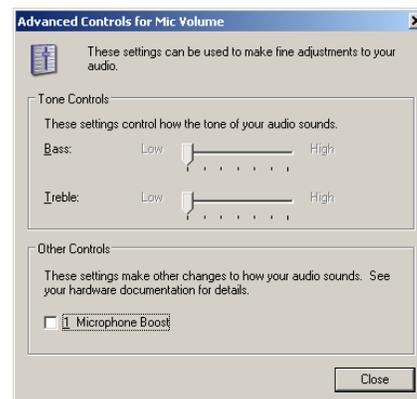
If the **Advanced** button is not displayed below the **Mic Volume** slider, go to **Options** and select **Advanced Controls**.

Click the **Advanced** button below the **Mic Volume** slider.



Make sure the **Microphone Boost** box is unchecked (right).

If the signal was originally too weak, do the opposite, i.e. follow the steps above and check the **Microphone Boost** box.

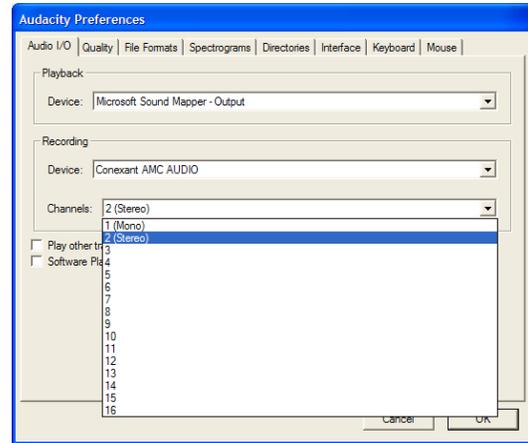


When experimenting with this equipment, there were times when we were working beyond the limits of Audacity. The only option was to change experimental practice to produce larger or smaller vibrations.

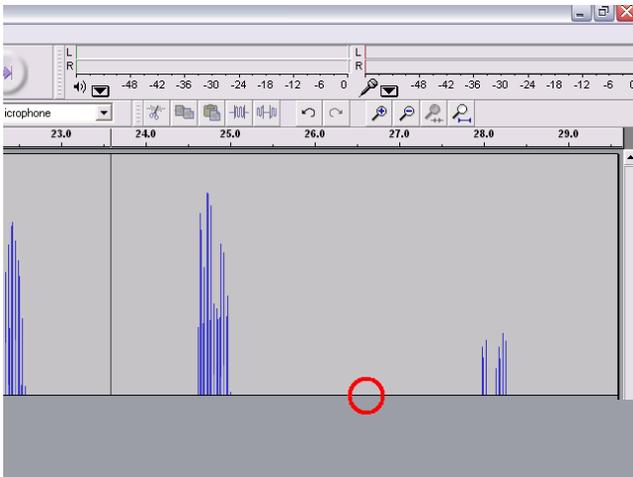
Stereo or Mono?

When using the Sound Source Locator apparatus, it was necessary to set Audacity to record in stereo. Whilst there was no problem using stereo for the other devices, the Audacity screen was less cluttered when mono was used. To change between the two, go to Audacity's **Edit** menu. Choose **Preferences...**

Make sure the **Audio I/O** tab is selected and change **Channels** to **2 (Stereo)** or **1 (Mono)** as appropriate.



Reading the Trace

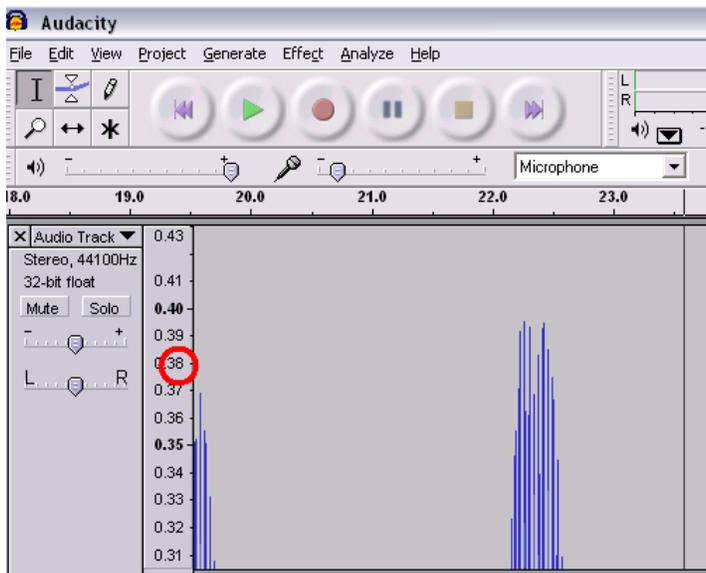


At the left hand side of the Audacity screen is a number scale for amplitude. There are two ways of getting a more accurate reading from this scale.

First off, move your mouse cursor to the bottom of the Audacity track - see the red circle in the picture on the left. Drag downwards. This makes the track take up more of the screen.

Secondly, you can zoom in on the trace.

Move the cursor on to the numbered scale at the side of the trace. Have it level approximately with the top of the trace that you want to zoom in on, as shown by the red circle in the diagram on the bottom left. Click to zoom.



For the activities we carried out, we found that zooming until the scale went up in steps of 0.01 was sufficient.

The trace can be moved to the left or right using the horizontal scroll bars.

Saving

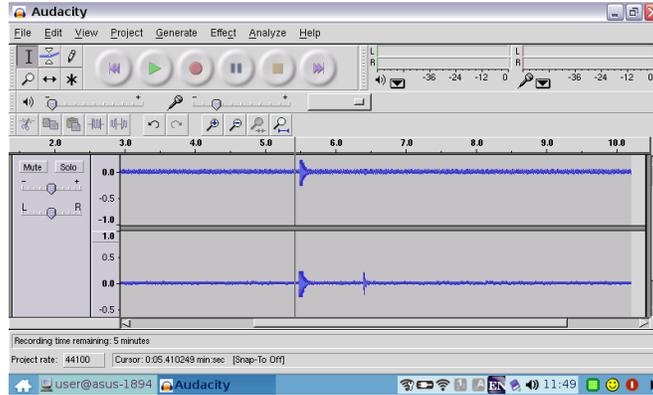
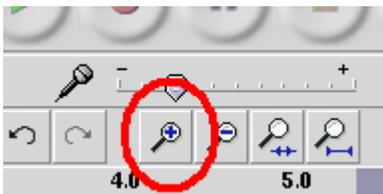
Note that files can be saved for later analysis by exporting them as .wav files.

Audacity and the Sound Source Locator

The Sound Source Locator is described on a separate sheet. It uses two mono microphones, connected via an adapter to a stereo jack. The idea is that each microphone records onto a separate stereo channel. The locator is connected to a computer running Audacity. A sharp sound is made. Unless the sound source is equidistant from each microphone, there will be a time delay between the recorded pulse on each track and the sounds will have different amplitudes.

A typical recording is shown on the right.

Drag across one of the traces as shown on the right. This will select the same interval on both channels. Zoom in on the selection using the zoom button:

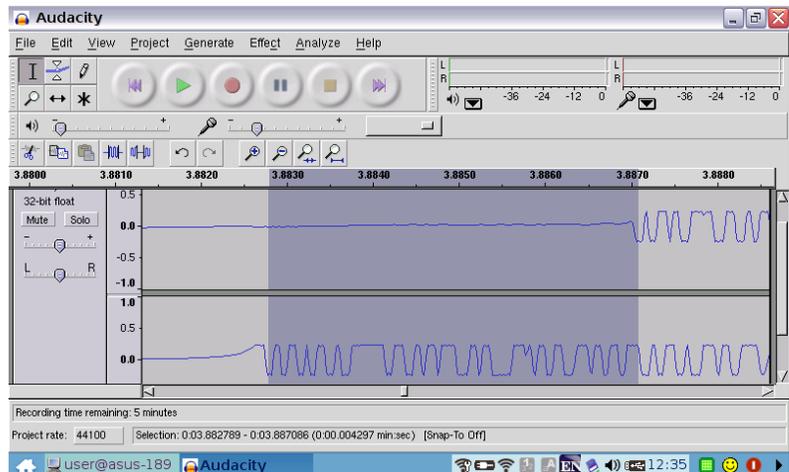
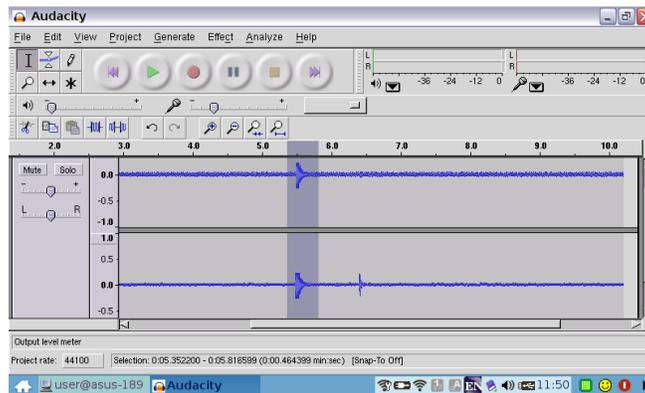
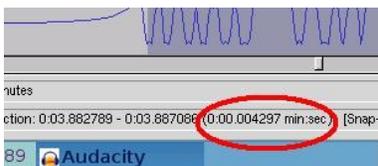


Note that the second pulse on the lower track was caused by a sound not related to the experiment.

Keep selecting and zooming until you can clearly see the time difference between the two pulses.

Now drag from a point on one pulse to exactly the same point on the other, as shown on the right.

The time difference between the two pulses is then shown at the bottom of the screen:



Some versions of Audacity don't have this feature. The time can always be found from the scale above the trace.