



'Ocean Waves' by Konek Uehara

Wave Craft: Music Box Spectrogram

Iffy Books | 404 S. 20th St., PHL | iffybooks.net

Install Audacity

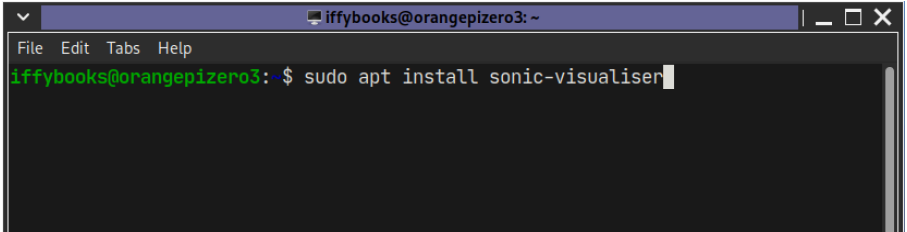
<https://www.audacityteam.org/download>

```
File Edit Tabs Help
iffybooks@orangeipzero3: ~
$ sudo apt update && sudo apt -y upgrade
```

```
File Edit Tabs Help
iffybooks@orangeipzero3: ~
$ sudo apt install audacity
```

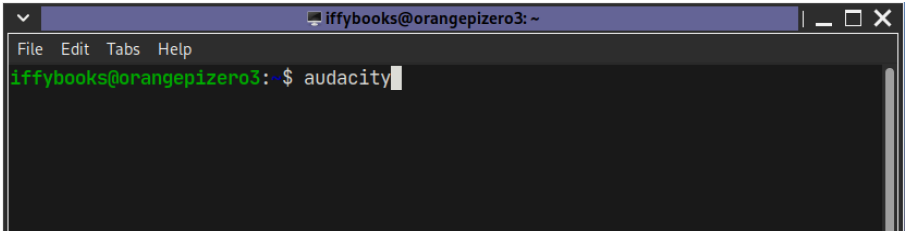
Install Sonic Visualiser

<https://www.sonicvisualiser.org>



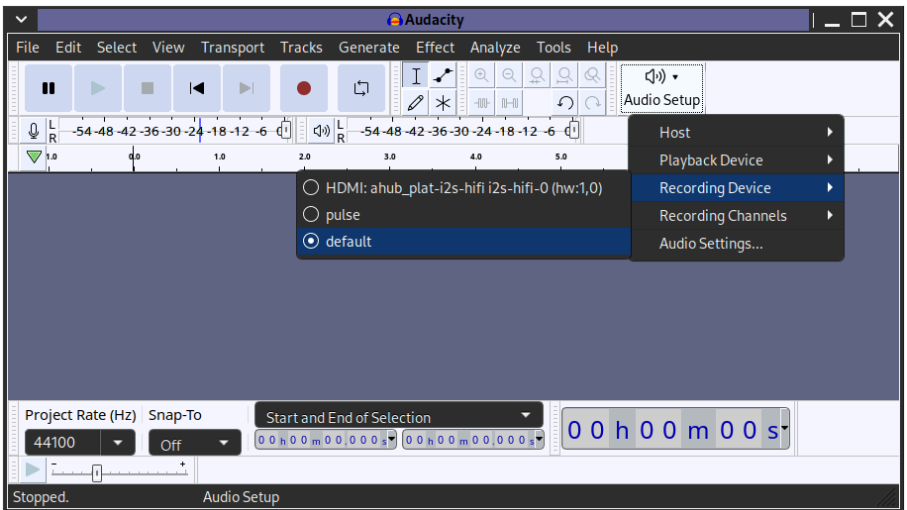
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iffybooks@orangezipero3: ~  
File Edit Tabs Help  
iffybooks@orangezipero3: $ sudo apt install sonic-visualiser
```

Make a recording with Audacity

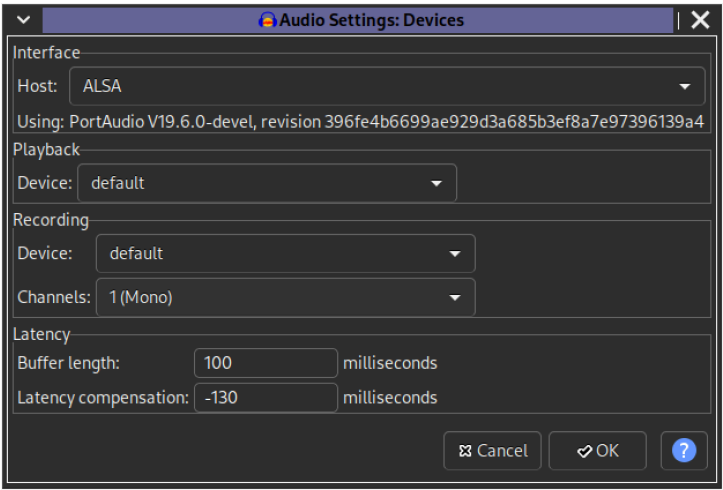


```
iffybooks@orangezipero3: ~  
File Edit Tabs Help  
iffybooks@orangezipero3: $ audacity
```


To check which audio hardware you're using, click **Audio Setup** and go to **Recording Device**. If you're using an external sound card and you see it on the list, select it. Otherwise leave **default** selected.

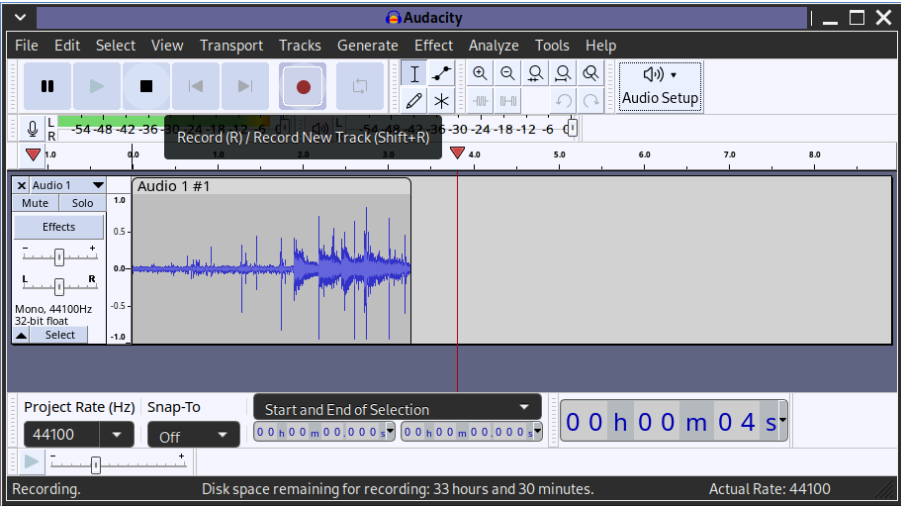


Click **Audio Setup** and go to **Audio Settings**. In the dropdown menu next to **Channels**, select **1 (Mono)**. Click **OK**.

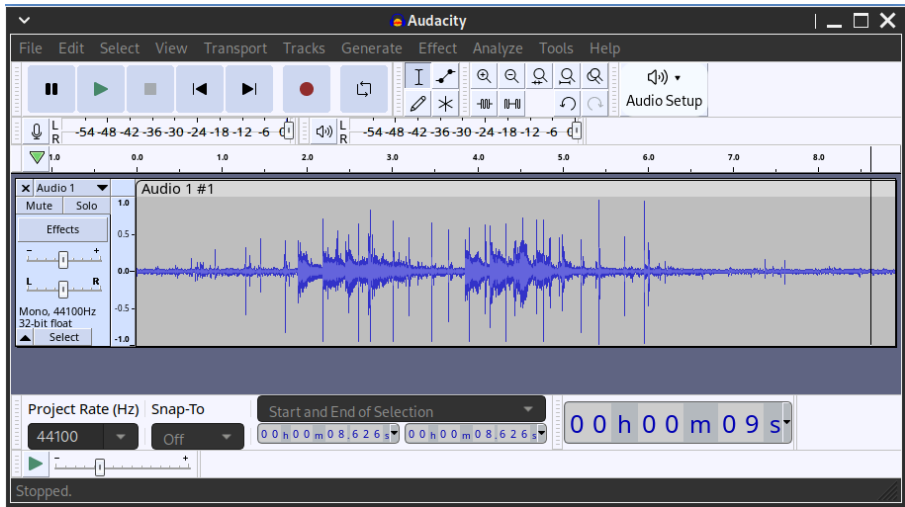


Point your microphone at your music box and load the paper strip into place.

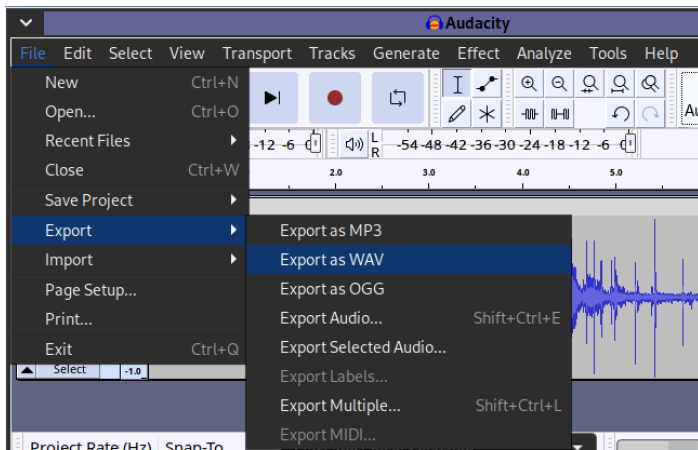
In Audacity, click the red **Record** button () or press **R** to start recording. Turn the music box crank and you'll see the sound visualized as a waveform onscreen.



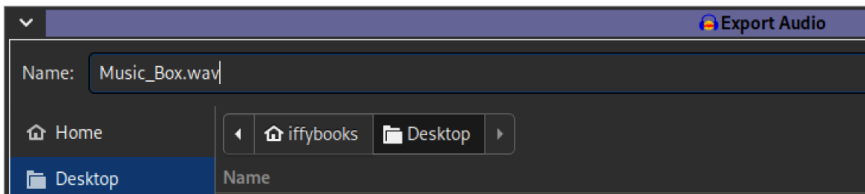
Click the **stop** button () to stop recording.



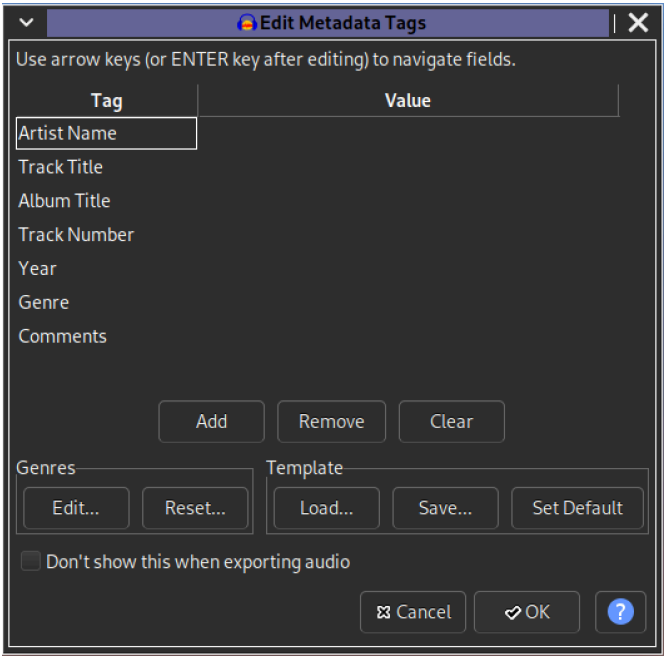
In the menu bar, go to **File > Export > Export as WAV**.



Enter a name for your audio file, such as **Music_Box.wav**. Then click **Save**.

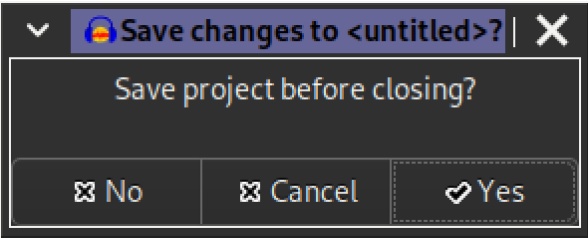


Next you'll see a window titled **Edit Metadata Tags**. Leave everything blank and click **OK**.



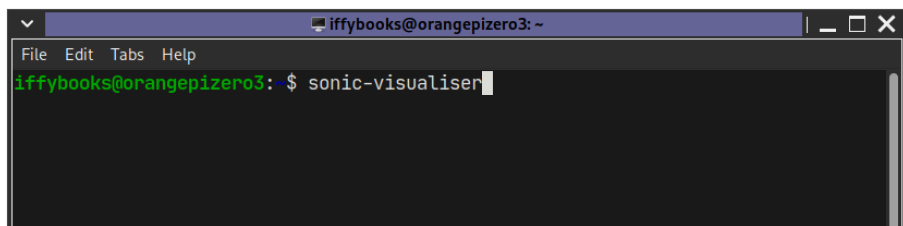
Now that you've created a WAV file, you can quit Audacity. Select **File > Quit** in the menu bar or press **ctrl+Q**.

A window will pop up asking if you want to save your project file. Click **No**.

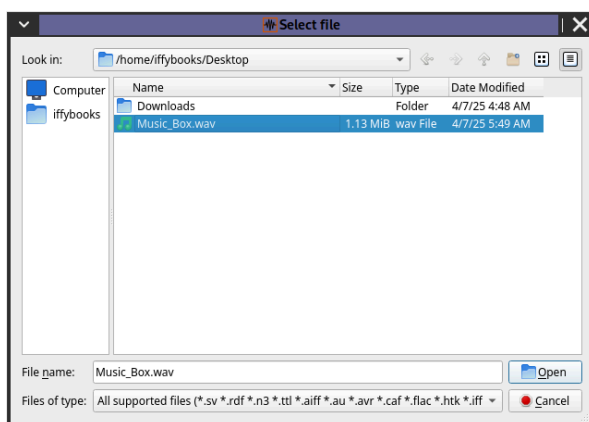
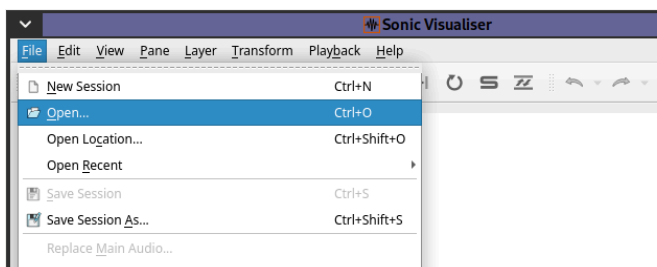


Create a spectrogram in Sonic Visualiser

Open the Sonic Visualiser application. On Linux, open a terminal window, type **sonic-visualiser**, and press **enter**.



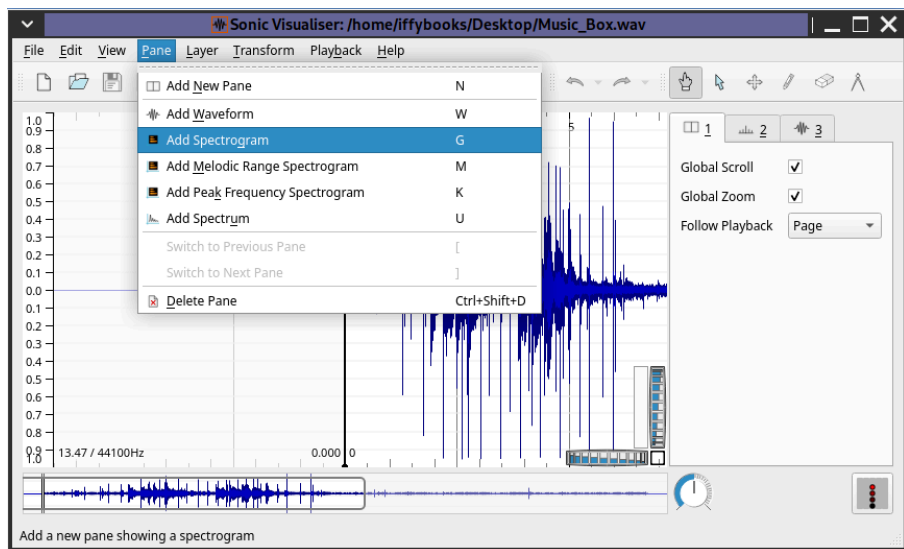
In Sonic Visualiser, go to **File > Open...** and select the WAV file you just created.



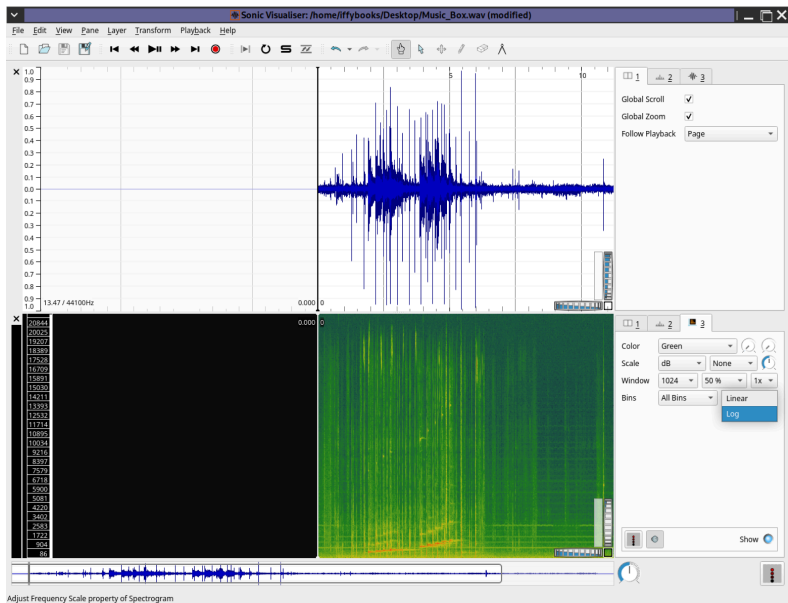
You'll see a waveform representation of your audio, similar to what you saw in Audacity. A waveform can show you roughly how loud the sound is across an audio file, but it doesn't tell you much about pitch.



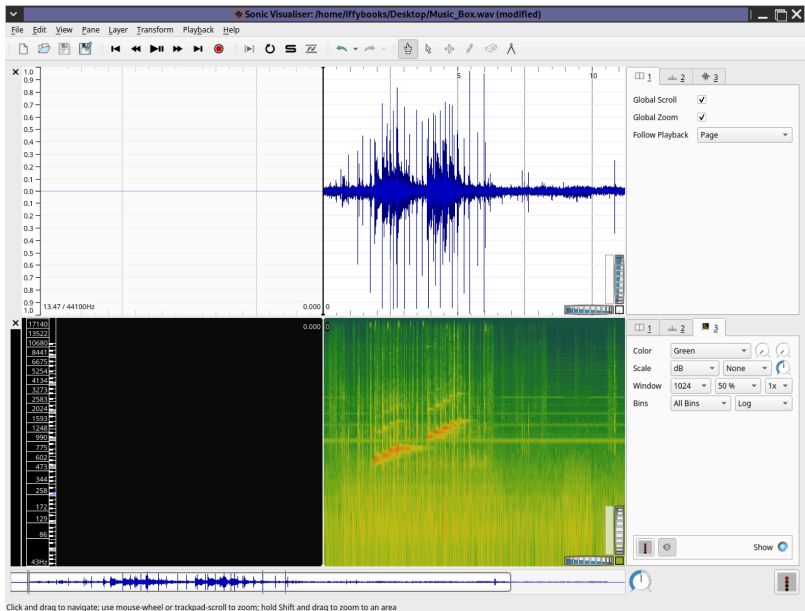
To add a spectrogram representation of your audio, select **Pane > Add Spectrogram** in the menu bar or press **G**.



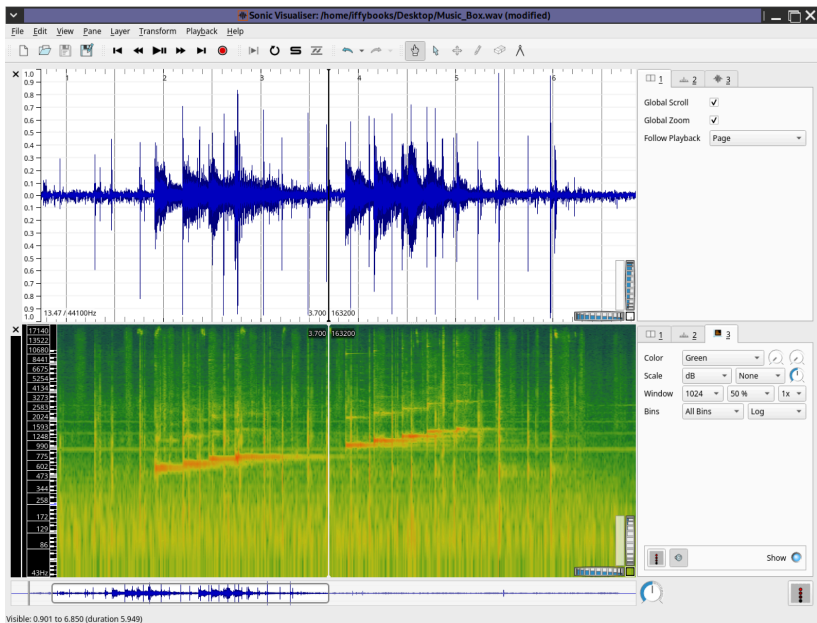
To make the spectrogram easier to interpret, click the second dropdown menu next to **Bins** and select **Log**.



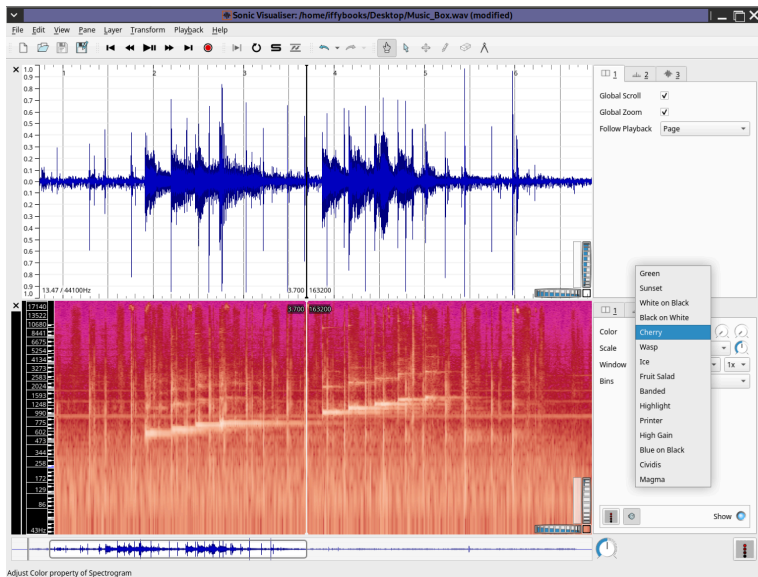
Note the difference between the spectrogram above (linear scale) and the one below (log scale).



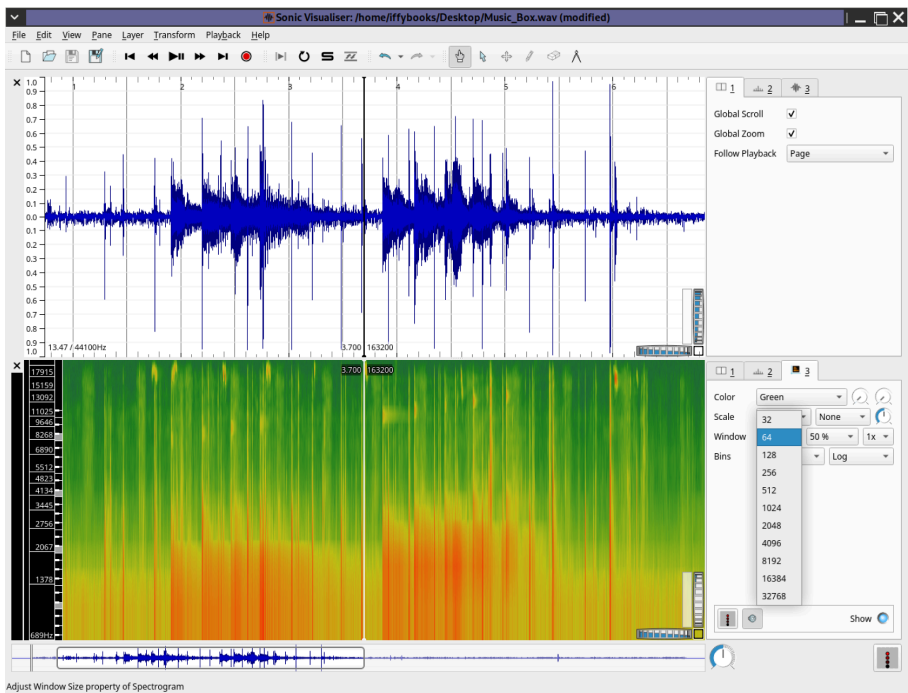
Scroll with your mouse to zoom in and out. **Click and drag** on the visualization to move around the file.



In the **Color** dropdown menu, choose a different option and see how it changes the spectrogram. Is the visualization easier or harder to understand?



In the first **Window** dropdown menu, select a small value such as 64. Note that pitch values are harder to distinguish than before, while rhythmic information is clearer.



Try experimenting with different window values while zooming in and out. Note the frequency scale in Hertz (Hz) on the left side. When using higher window values, you'll be able to pinpoint the exact pitch at a specific moment.

