ESSENTIAL AUDACITY

The purpose of this tutorial is to walk new users through the key elements of Audacity so that they can create and/or edit their own sound files. The destination of these sound files is up to the user: an audio player for a prop, or even a custom ring-tone for a cellular telephone.

Step 1: Installation

Use your web browser to navigate to the Audacity web page:

http://audacity.sourceforge.net

For the purposes of this tutorial we will be using the current stable release, version 1.2.4b, and assuming that the program is being run on a Windows computer (the author only knows Windows – note, though, that there are versions of Audacity for Mac and Linux). Download and run the installer for Audacity; once this step is completed you will have a shortcut in your Start menu.

Step 2: Basic Recording (Mic)

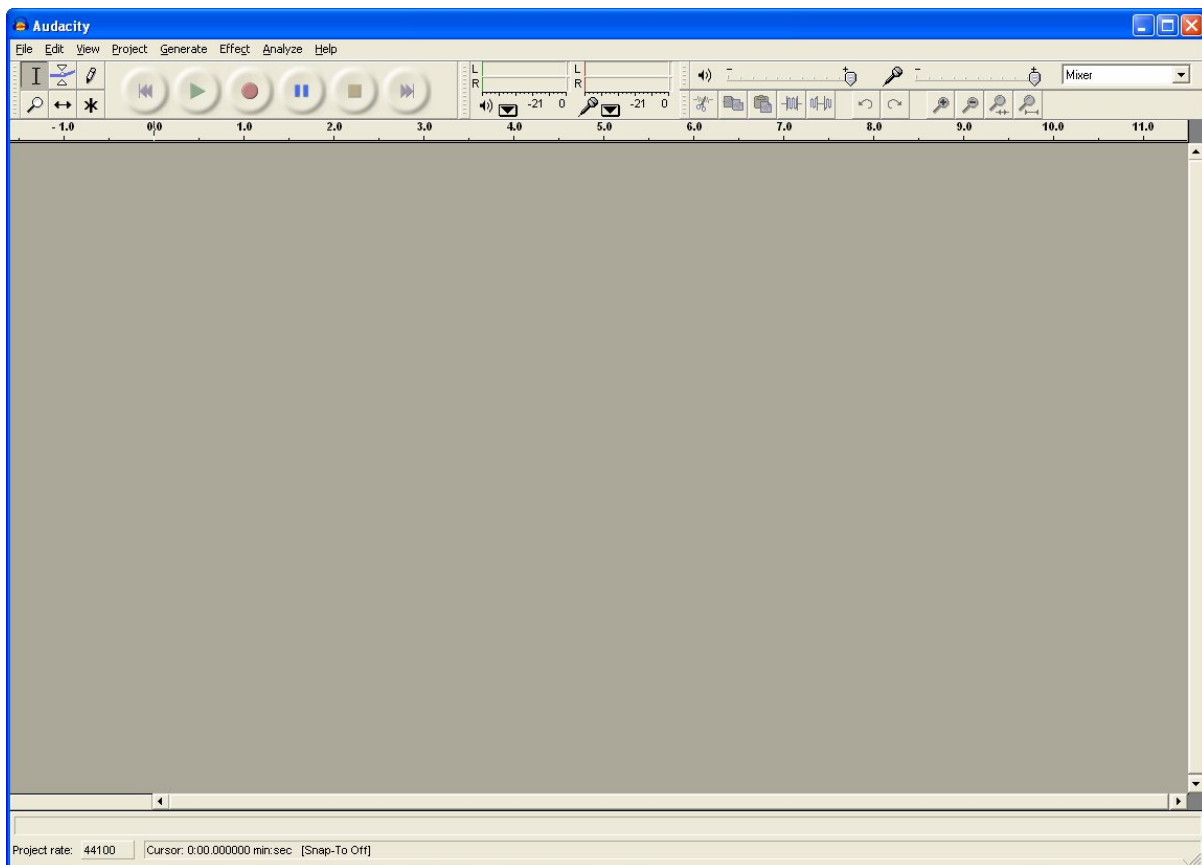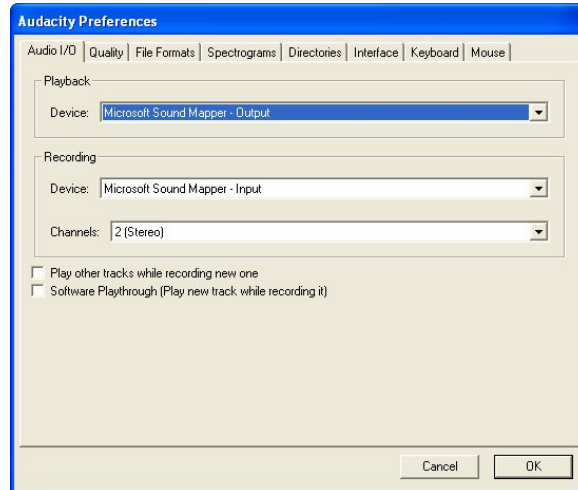When you start Audacity, the screen will look something like this:

Figure 1: Audacity Interface (Windows XP)

Click on **Edit > Preferences**, then select the Audio tab:

From this dialog you may select your sound card, though the default settings of "Microsoft Sound Mapper" are easiest to work with in the beginning. Make sure that the two checkboxes are unchecked.

Close the dialog and select **Mixer** as the recording source – you'll find this in a drop-down on the toolbar. Using the mixer allows us to record any sound(s) we can hear through our headphones (or speakers). This will enable us to pull ("rip") sounds from a CD or DVD player on our system as well.

Plug a PC-compatible microphone into your computer, click the red **Record** button on the toolbar and start talking. When you're done, click the yellow **Stop** button. If all went well you will have a new stereo track in your [unnamed] project.
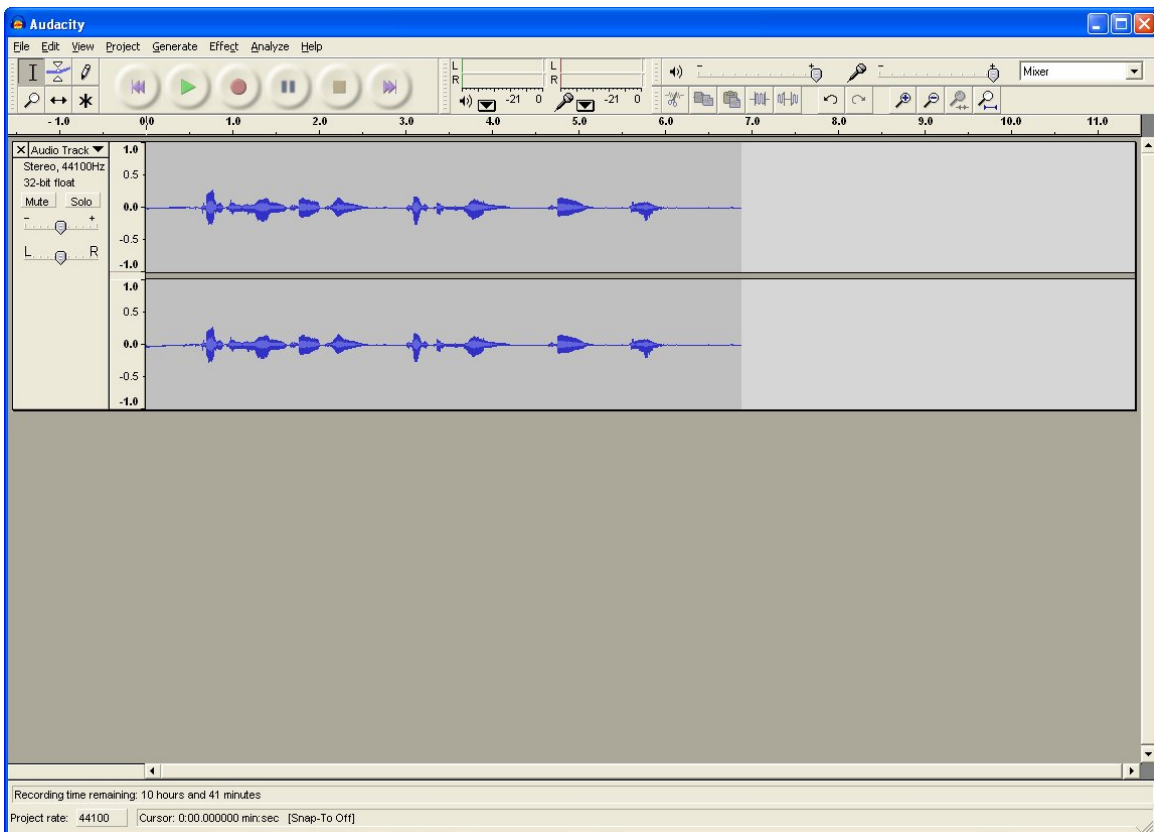
Since we don't need two channels, we can eliminate one side by selecting **Split Stereo Track** from the track header drop-down menu:
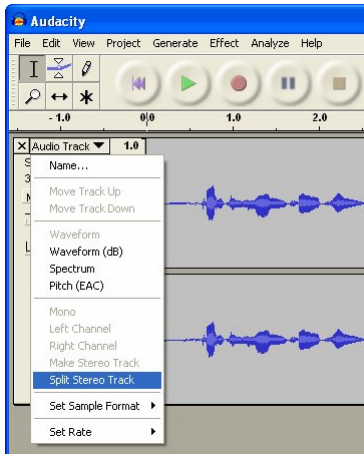

The track header menu is accessed by clicking on the black triangle (▼) in the upper-right corner of the header. Once the stereo track is split, delete one track by clicking on the ✕ in the upper-left corner of the track header. For the remaining track, select Mono from the track header menu so that the audio will be available on both channels. Verify by moving the cursor to the beginning of the file (click on the track, or click the purple **Skip to Start** button) and clicking the green **Play** button.

To save the audio file, click on **File > Export as WAV**.

Step 3: Basic Editing

The first steps in editing a raw recording is clean-up and trim, and it's important to do it in that order. If Audacity is already running, remove any tracks by clicking the ✕ in the track header. Now select **Project > Import Audio** and load *Hello_Kiddies (raw).wav* file.

We'll start by *normalizing* the audio to a standard level. Select the entire track by clicking on a blank spot in the track header (or select **Edit > Select > All**, or press **Ctrl**+**A**). Now select **Effect > Normalize** and you'll get this dialog:
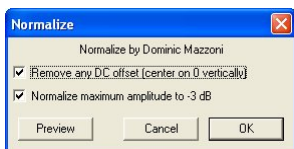

Leave both checkboxes selected and click **OK**. After a moment the audio will be processed and you'll notice that it "grows" a bit in volume. Normalizing will adjust the volume of a file such that the highest point is set a known level, in this case, -3 dB. By normalizing our audio files to the same level we can ensure consistent playback levels on a multi-file project (e.g., when using the AP-8 or uMP3 players).

When you play the track you'll probably notice a bit of hiss between phrases. We can use Audacity to eliminate this hiss and clean-up the track. Starting clean is the best way to ensure that we end clean for download into our player. As we start layering effects onto the audio any hiss will ultimately become muddy and reduce the overall quality of the sound.

Removing noise requires two steps: Start by drag-selecting about a 0.05 second section of the hiss – the area between "nightmare" and the laugh works well. The selection (dark area) should look something like this:
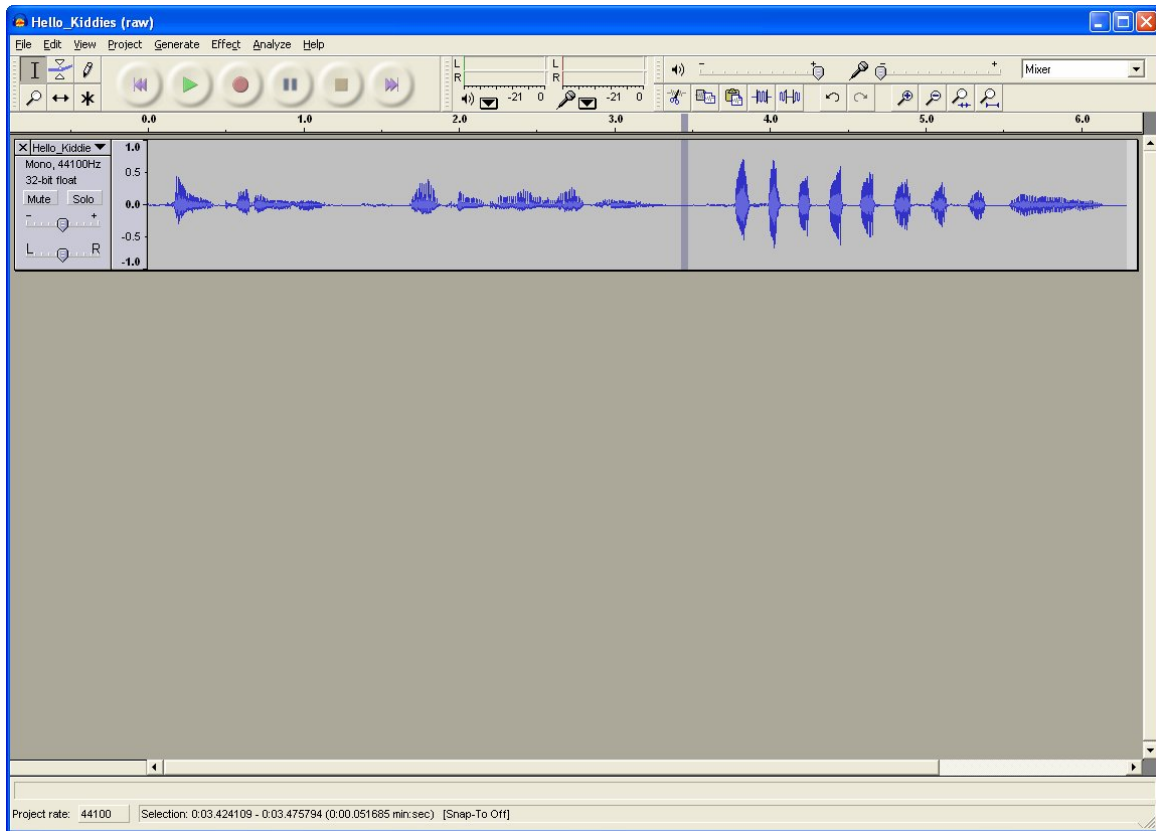
Now click on **Effect > Noise** Removal and click on the **Get Noise Profile** button.
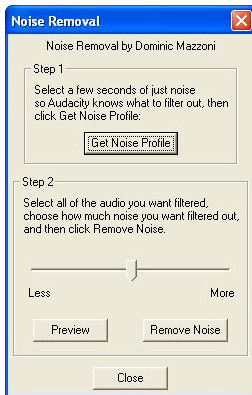
This step analyzes the audio in the selection so that it can be removed in the next step. Select the entire track and open the **Noise Removal** dialog again. Move the level slider to "Less" and click **Remove Noise**. After a bit of processing you'll see that the "silent" areas of the track are [very nearly] silent.

The term *"less is more"* is particularly appropriate for noise reduction; applying too much will cause sound degradation (called aliasing) – the sound will become hollow and tinny. This can be used for an effect; if, for example, you wanted audio to sound like it was coming through a bad phone or radio connection, try moving the level slider to "More."

If you look closely at the file you may see a little noise left in front of "Welcome" in the second phase (this is breath noise). We can silence a portion of the audio by selecting it (click at beginning then left-drag with mouse to select area) and then clicking the **Silence Selection** button on the toolbar.

The last thing to do is select any unwanted material (at ends, between phrases, etc.) and remove it by pressing the **Delete** key, or clicking on the **Cut** button on the toolbar.

Once you're satisfied with the clean-up and trim you can save it (**File > Export as WAV**) to a new file.

Step 4: Effects

The "*Hello kiddies*…" file is now cleaned and trim, but not particularly spooky; certainly not likely to send chills up anyone's spine. Let's fix that. Click on an empty spot in the track header to select the entire clip, then click on **Effect > Change Pitch** and move the **Percent Change** slider to -25. Click on **OK** and play the file again – notice that now it sounds more like *Tiny* from "*House of 1000 Corpses*."
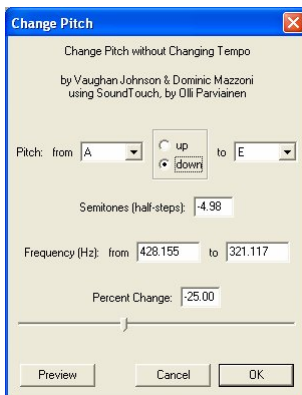
If the effect is too much, you can easily undo it by clicking on **Edit > Undo**, or pressing **Ctrl+Z** on the keyboard. The undo buffer is actually several changes deep letting you go back to a previous point without having to reload the source file.

Okay, it's certainly a little more interesting, but it would have a little more "life" if the sound was thicker. Unless were in a sound booth or a big open field, our voice gets reflected back to us – this is why we sound wonderful in the shower; we're hearing multiple versions of our voice that are just a fraction of a second out of phase. With Audacity we can quickly do an effect called "doubling" that is used by singers to give their voice more *oomph*.

Click on a blank spot on the track header to select the whole clip (**Ctrl+A**), then click on **Edit > Duplicate**. Now we have two matching tracks, and no apparent difference. To get the doubling effect, select the **Time Shift Tool**


and then click and drag the second track just a hair to the right. Now play the project. The depth of the effect will depend on the movement of the second track. The advantage to using this method over one of the menu-based effects is that we can experiment easily without damaging the original file. We could even add a third track and change the pitch of two for a chorus effect. This is a very simple technique for adding a lot of body to what started as a simple mono recording.

When you're happy with the doubling effect, return to the normal I-bar cursor, click on the track header of the top track, then shift-click the track header of the second track; both should now be selected. Click on **Project > Quick Mix** and the two tracks will be merged into one with the doubling effect applied.

Two tracks selected:
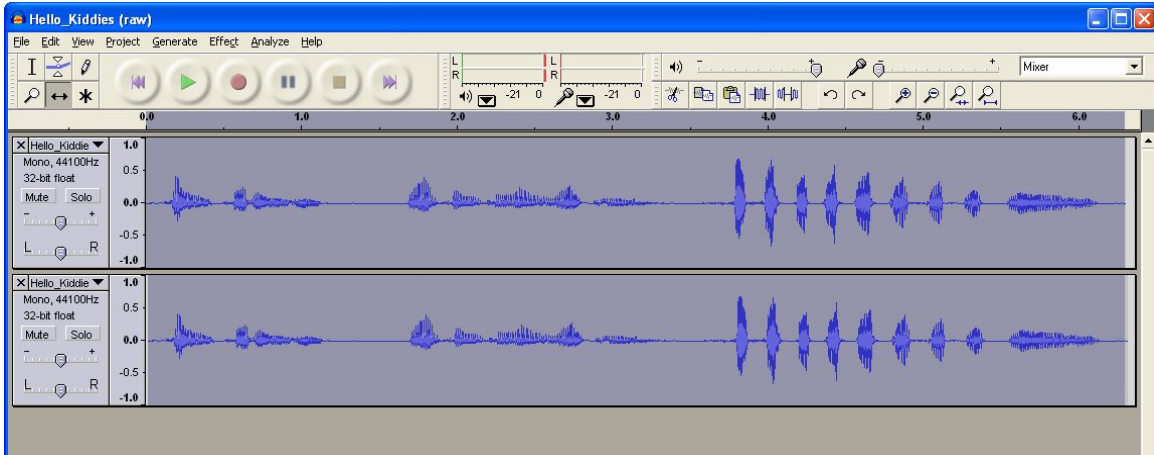

After applying **Project > Quick Mix:**
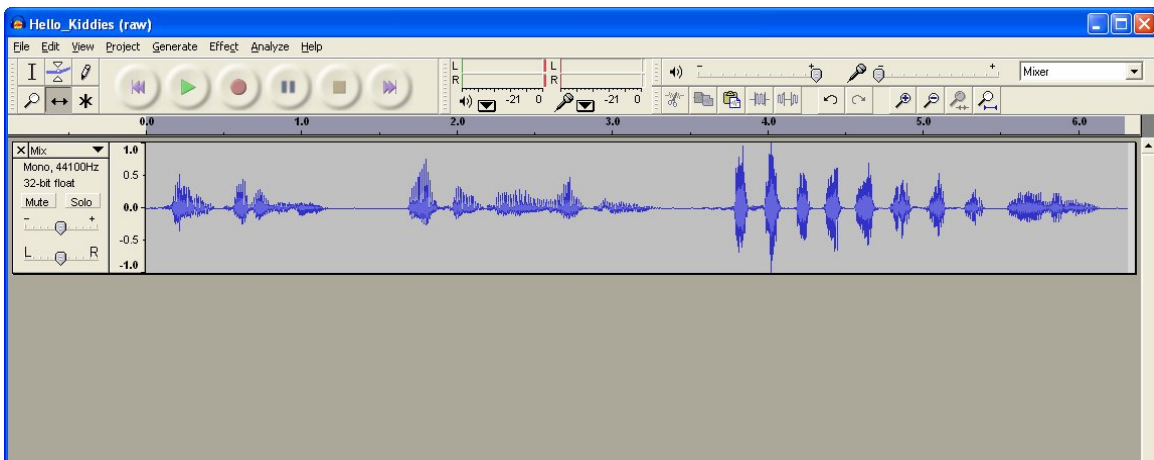
Note that the two tracks were added together and will require re-normalizing – we'll do this as the final step before downloading to a sound device.

Finally, let's add a bit of echo to the evil laugh. Start by adding some empty space at the end of the clip. Move the cursor to the end, and then click **Generate > Silence**. Enter 3 in the duration field then click the **Generate Silence** button.
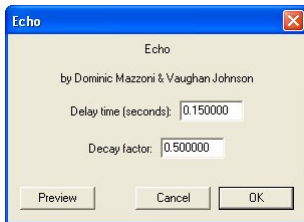

Now make a selection from before the laugh to the end of the clip (silence).

Laugh and silence selected:
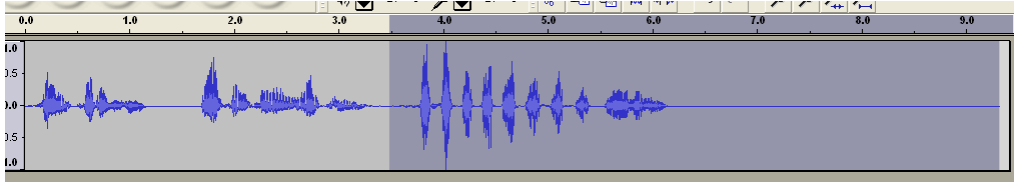
Now click on **Effect > Echo**, and then enter 0.15 for Delay, and 0.5 for Decay. These values work well on this file – other sounds will require experimentation.


The *Delay* factor determines the apparent distance to the reflecting element, and the *Decay* factor determines the strength of the apparent reflection. Remember that you can quickly undo the echo with **Ctrl+Z** and then experiment with new values.

If we're going to use a mono device like the Cowlacious ISD Recorder/Player or the Parallax AP-8, the file is about ready; simply select the entire clip, normalize it, save it to a file (for later use) and then "play" it into the device (see manufacturers' instructions for loading audio).

But what if we want to take a mono track and make it stereo? – for a player like the uMP3 from Rogue Robotics. Select the entire clip and then click on **Edit > Duplicate**. In the track header of the top track select **Left Channel**; in the track header of the bottom track select **Right Channel**.

Before we combine the separate track into a single stereo file, let's make some edits – start by selecting the "welcome to my nightmare" section in the top track, then click **Silence Selection**. Now do the same thing on the bottom track for the "Hello kiddies" section. Here's what the edits look like:
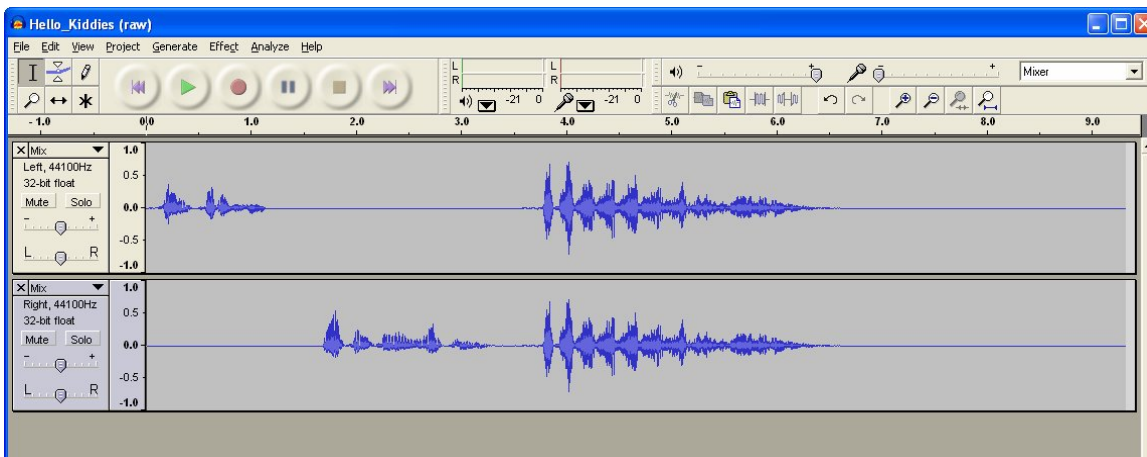
To complete the process, select **Make Stereo Track** from the track header of the top track. Now the clip can be exported and will play in stereo.

Exporting MP3

To use the Rogue Robotics uMP3 player in a prop we must export our clip in the MP3 format. This is not built into Audacity, but can be added.   Open the Preferences dialog, select the File **Format** tab, and then click on the **Find Library** button in the *MP3 Export Setup* section.   Move past the dialog that explains the requirement for an external MP3 library, and then locate the *lame_enc.dll* file on your system (downloaded before this step). Click **OK** to exit **Preferences** and then use **File > Export as MP3**.

Got Sound FX?

Want to pull audio from a sound FX CD or DVD? Here's how: use your system media player to play the CD/DVD and use the Pause button to stop just before the sound you want to capture. Now click on the **Record** button in Audacity.   Go back to the media player and press **Play** (release Pause).   Since we're recording through the system Mixer, Audacity will grab the audio and record it.   Stop and save the audio to a file (if desired) as explained above.

Useful Audacity Links

- http://audacity.sourceforge.net/manual-1.2/index.html

- http://audacity.sourceforge.net/manual-1.2/tutorials.html

- http://www.daniel.uklinux.net/tutorial/

- http://www.transom.org/tools/editing_mixing/200404.audacity.html

- http://www.shellworld.net/~davidsky/nyquist.htm

- http://www.shellworld.net/~davidsky/plug-ins.htm