# Getting Started With *Audacity*

Audacity is free, open source software for recording and editing sounds. The completed sound file can contain multiple tracks. *Audacity* is used to create sound files for podcasting. This tutorial will explain the *Audacity* interface and how to use the tools and features of the program.

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Toolbars in the *Audacity* Window

The *Audacity* toolbar contains four toolbars: the **Mixer Toolbar**, the **Control Toolbar**, the **Edit Toolbar**, and the **Meter Toolbar**. In the picture below, the toolbars are docked; they can also be set to float separate from the window.

Control toolbar   Edit toolbar

Meter toolbar   Mixer toolbar
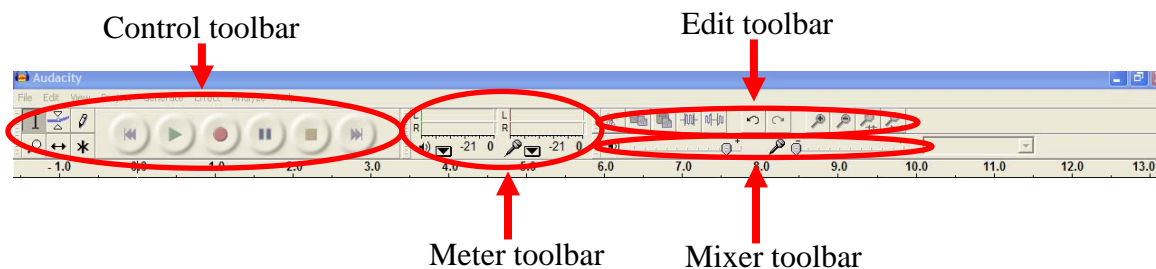
1. The **Control Toolbar** has tools for editing sound tracks and the recording buttons. The six editing tools are on the left.

a. Use the **Selection** tool to select the range of audio for editing or listening.

b. Use the **Envelope** tool to change the volume over time.

c. Use the **Draw** tool to modify individual samples.

d. Use the **Zoom** tool to zoom in or out of the audio tracks.

e. Use the **Time Shift** tool to slide tracks left or right to change playback times.

f. Use the **Multi** tool to access all the tools at once depending on the location of the mouse and keys selected.

The **recording buttons** are to the right of the editing tools.

a. Use the S**kip to Start** button to move the cursor to time 0. Press play to start the project at the beginning.

b. Use the **Play** button to play the audio from the position of the cursor. If part of the audio is selected, only that part will play.

c. Hold down the shift key and the **Play** button becomes the **Loop** button. Use the **Loop** button to play the selection over and over.

d. Press the **Record** button to begin recording at the project sample rate (in the lower left corner of the window) from the cursor position. Click the **Skip to Start** button to record from time 0.
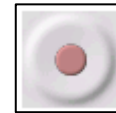
e. Use the **Pause** button to temporarily stop recording. Press the button a second time to resume recording.

f. Press the **Stop** button to stop recording or playing. This must be done before applying effects, saving, or exporting.

g. Use the **Skip to End** button to move the cursor to the end of the last track.

2. The **Mixer Toolbar** has tools for setting the volume level and selecting the input source for the audio.


   a. Use the slider bar on the left to control the output volume, the slider on the right to control the input slider, and the control on the right to select the input source.

   b. Changing the controls on this toolbar has no effect on the audio data of the project.

3. The **Edit Toolbar** has buttons that perform actions. Most of the buttons are shortcuts to menu actions.

   a. Use the **Cut** tool to remove a selected part of an audio track.

   b. Use the **Copy** and **Paste** tools to reproduce selected parts of an audio track.
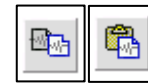
   c. Use the **Trim** button to trim away the audio outside of the selected part of a track.

   d. Use the **Silence** tool to silence the selected portion of the audio track.

   e. Use the **Undo** and **Redo** buttons to affect actions.

   f. Use the **Zoom in** and **Zoom out** tools to better manipulate the audio tracks in the timeline.

   g. Use the **Fit Selection in Window** button to fill the window with the selection. If the selected portion is smaller than the window, it expands to fill the window. If the selected portion is larger than the window, it contracts to fill the window.

   h. Use the **Fit Project in Window** button to zoom all of the audio so that it fits inside the window.

4. The **Meter Toolbar** is used to monitor the input and output audio levels to make sure that the audio is loud enough without distorting the sound. The green bars on the left are the output meter and the red bars on the right are the input meter.

Peak-hold line

Clipped audio indicators

Average audio level

Peak audio level
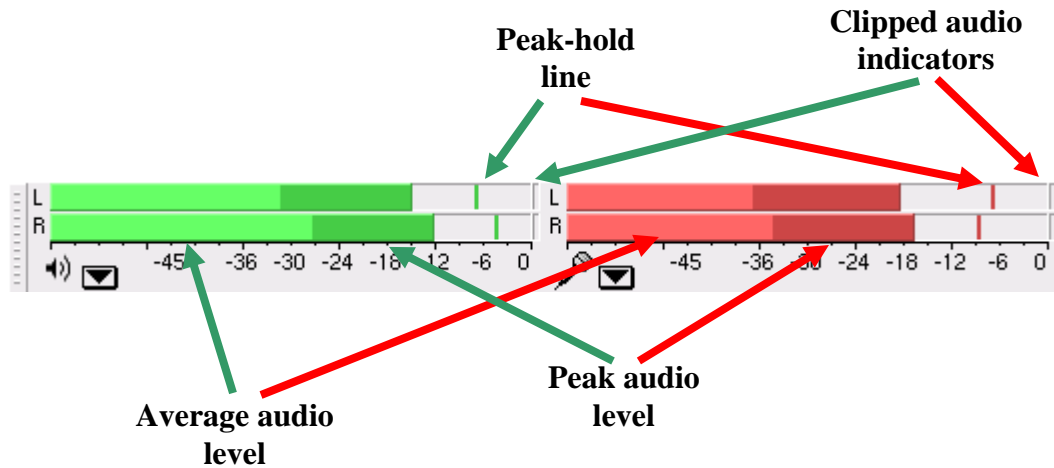
a. Audio is clipped (distorted) when the bars move to the right hand end of the meter. The left hand end is silence. The **Clipped audio indicators** light up if clipping is detected.

b. For stereo sound, the top bar shows the left channel and the bottom bar shows the right channel.

c. The **Average audio level** is the brighter part of the bars and the **Peak audio level** is the darker part.

d. The **Peak-hold line** shows the maximum audio level achieved in the last 3 seconds. This line fluctuates with increases and decreases of volume.

Lower the volume of the input source when clipping is detected during recording. If the output level indicates clipping, then make the tracks quieter using the track **gain control**.

**Use the track gain control to change the output volume**
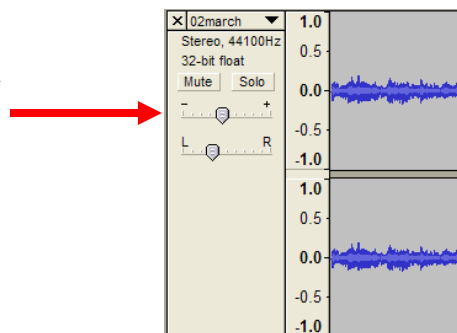
Important Menu Features in the *Audacity* Window

In addition to the common **File**, **Edit**, **View**, and **Help** menus, *Audacity* also has **Project**, **Generate**, and **Analyze** menus.
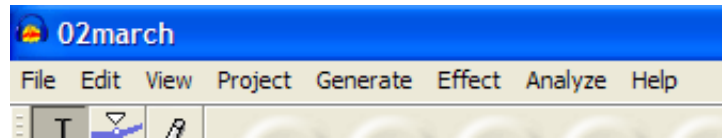

1. Use the **Help** menu to find more information about *Audacity* topics and features. It covers topics beyond the scope of this tutorial.

2. Use the **File** menu to save or open projects, or to export an audio file.

   a. In *Audacity*, the edited audio files constitute a project. Saving the project saves it as an *Audacity* file in a project folder. The file extension is .**aup**. A project data folder is also created. A project can only be opened in *Audacity.* This is useful for further editing.

   b. To create an audio file for listening with an audio player or to use it with another program, use the export feature. **Export As WAV** creates an uncompressed file.

   c. Use **Export As MP3** to create a compressed file. Compressed files take up less disk space and upload to the Web more quickly, but lose some audio quality.
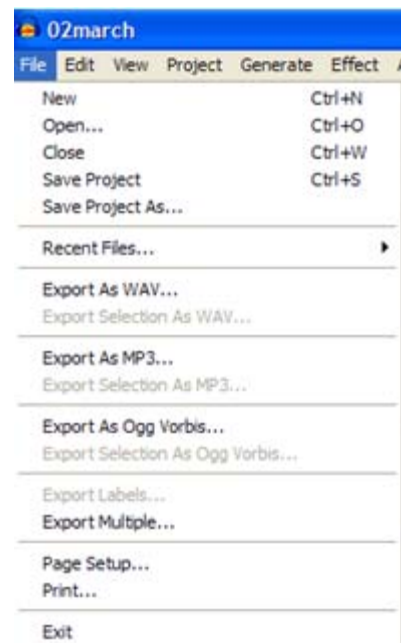
3. Use the **Edit** menu to access **Preferences**. Changing **Preferences** will customize the *Audacity* experience. The **Preferences** window has eight tabs. Some of the possible customizations are below.
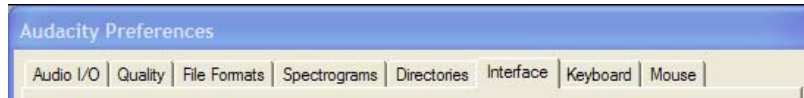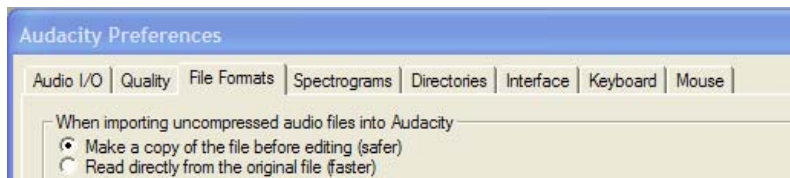

a. **Audio I/O tab**
- **Play other tracks while recording new one** – Check this box to hear existing tracks while recording new ones. Use this option to record harmonies or add a voiceover.
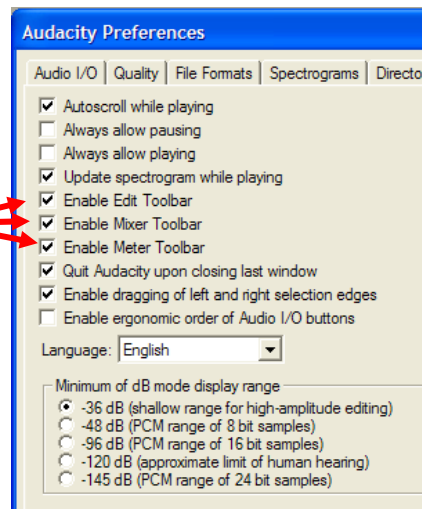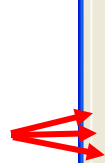
b. **File Formats tab**
- **Make a copy of the file before editing** – It will take longer to import an audio file, but it will save a copy of any audio used in a project.

c. **Interface tab**
- **Enable or disable the floating toolbars** – If the toolbars are disabled, they can not be turned on from the **View** menu. Enabling them make them appear in the **View** menu.
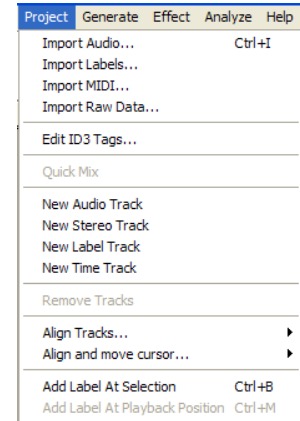

4. Use the **View** menu to float any or all of the four toolbars: **Control, Edit, Mixer, Meter**.

5. Use the **Project** menu to import audio files or to open a new track. Do this to add a sound track to an existing project.

    Audacity projects cannot be imported. Open projects from the **File** menu.

6. Use the **Generate** menu to insert silence in a track. Select the portion of the track to be replaced by silence and then select **Silence** from the **Generate** menu. This is the same as using the **Silence** button in the **Edit** toolbar.

7. Use the **Effect** menu to change the selected audio in a number of ways. Most effects have a **Preview** button that plays up to three seconds of audio.

    The effects are created by plug-ins. It is possible for certain plug-ins to crash the program. Save the project before using a plug-in effect to avoid losing it.

   Some effects that might be useful are:
    - **Repeat Last Effect** – This is a quick way to apply the last effect multiple times.
    - **Amplify** – Changes the volume of a selected portion of the audio track.
    - **Change Pitch** – This will change the pitch of the selected audio without changing the tempo. It works well with recordings of singing or musical instruments without background noise.
    - **Change Tempo** – Changes the tempo (speed) of the audio without changing the pitch. The length of the selection will change.
    - **Fade In** – Fades the selection in linearly.
    - **Fade Out** – Fades the selection out linearly.
    - **Repeat** – Repeats the selected audio a certain number of times. This is easier to use than to copy and paste a selected portion of the audio track.

    The **Help** menu describes more effects plug-ins.

8. The **Analyze** menu is beyond the scope of this tutorial. See the **Help** menu for information.

Understanding an Audio Track

The audio track appears as a set of controls on the left side, a vertical ruler, and a waveform to the right.
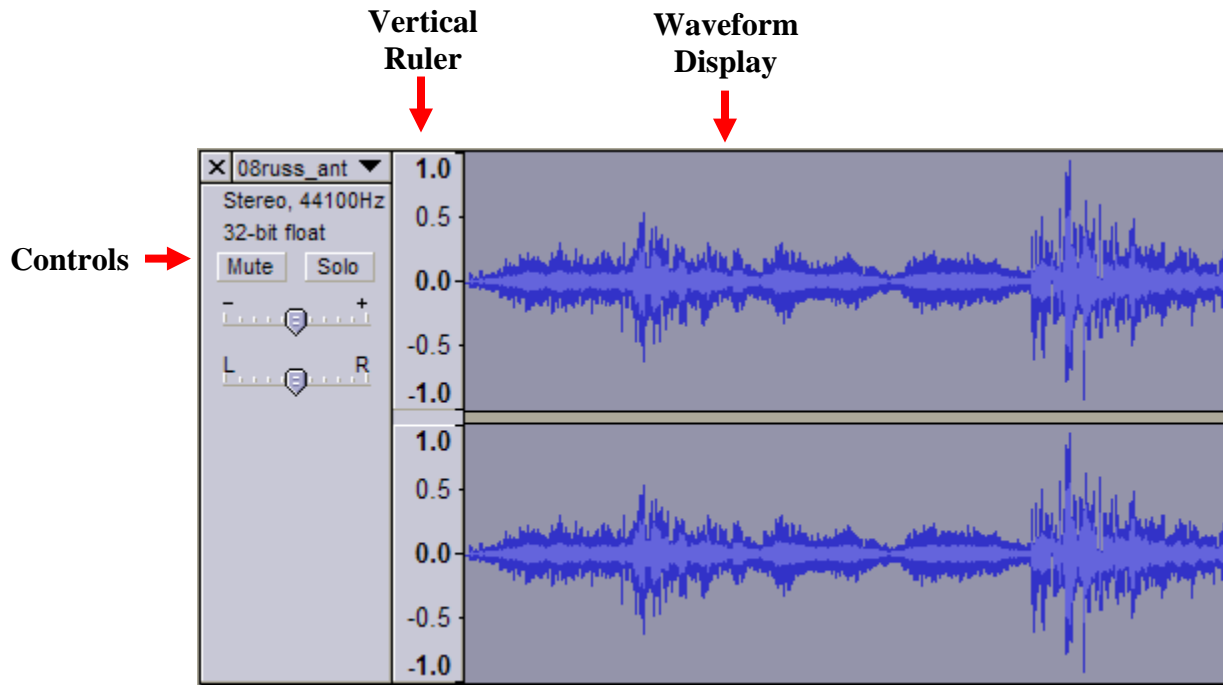

If the track is a stereo track, two waveform displays appear. The top one is the **left channel** and the bottom one is the **right channel**. Edits to a stereo track affect both channels. If the two channels need to be edited separately, they can be split using the track pop-down menu.

1. The track **Control Panel** has several functions.
   a. Click the panel outside of the buttons to select the entire track.

   b. Shift-click the panel outside of the buttons to add or remove a track from the selection. Also shift-click and drag to reorder the tracks.

   c. Use the "**X**" in the upper left corner of the panel to delete a track.

   d. Use the **Mute** button to prevent the track from playing. Use the **Solo** button to play only the one track. Muting and soloing affects only playback in *Audacity*; it doesn't affect mixing or exporting.
   e. The top sliding bar is the **gain control**. Use it to adjust the volume of the track. It selects multiples of 3 decibels, but by holding the shift key, any level can be selected. Setting it too high could result in clipping.
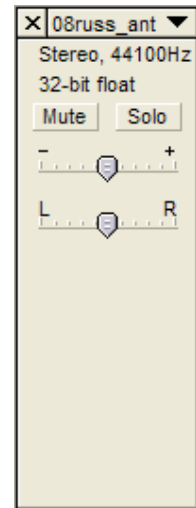
f. The bottom sliding bar is the **pan control** for changing the balance between the left and right speakers.

g. Click the title bar to see the **track pop-down** menu to change the track name or to split a stereo track. Also use it to change the order of the tracks.

Title bar

Track pop-down menu
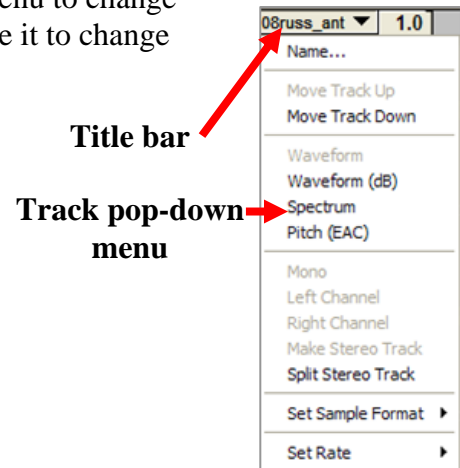
2. The **Vertical Ruler** is a guide to the volume levels in the waveforms. A level of 1.0 or -1.0 is the maximum supported by the audio file. Audio outside these levels will be clipped, sounding distorted. Clicking the ruler will zoom in vertically. Shift-clicking will zoom out vertically.

Normal view…   **Zooming…**   **Zooming…**
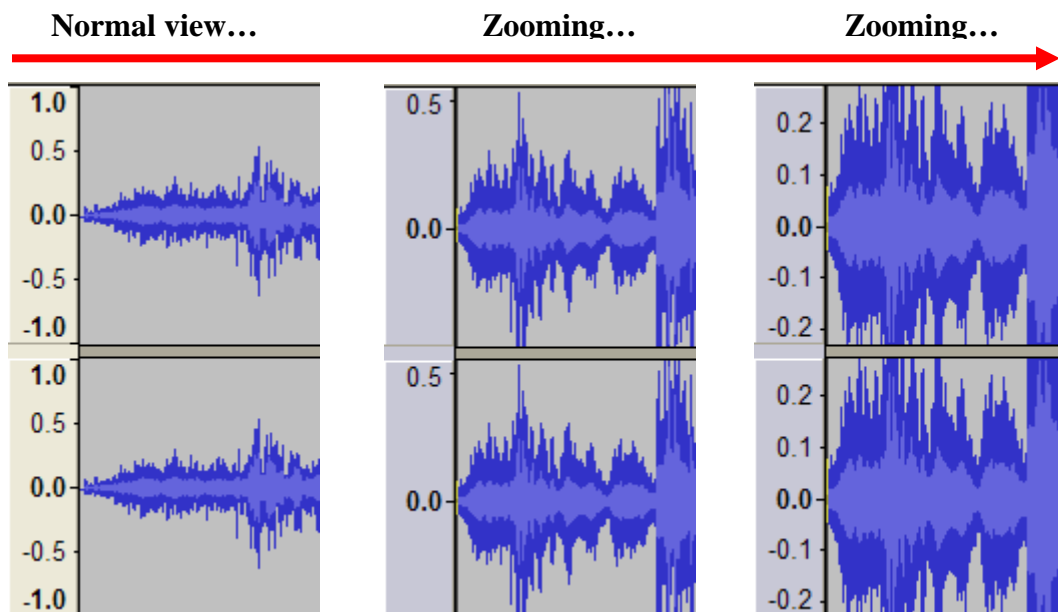
The location of the mouse on the ruler when it is clicked determines which part of the ruler is in the zoomed view. In the examples above, the mouse was held on zero and clicked.

## Starting a Project – Recording and Importing

This section will describe and explain the steps involved in creating a typical audio file. The steps in this project include:

- Recording narration
- Importing music
- Importing background sounds
- Editing the tracks
- Saving the project
- Exporting the file

To actually follow the steps, you will need three resources: a primary source document for the narration in step 1, a music file for step 2, and a background sound file for step 3.

1. Recording narration with a **built-in microphone**:
   a. Open *Audacity*. A new project will open.

   b. Click the **Record** button and begin reading the primary source document. The sound wave appears as the narrative is read. Click the **Stop** button when the narration is finished.

   Record   **Stop**

   c. Play the narration back. Delete and rerecord if desired.

   d. Use the **Track Pop-down** menu to change the name of the track.

   Track Pop-down Menu
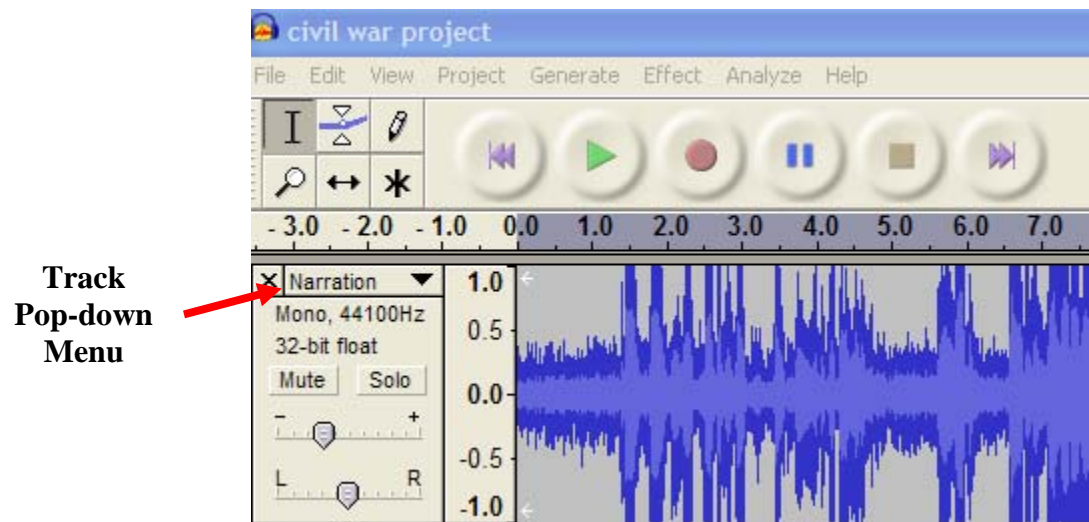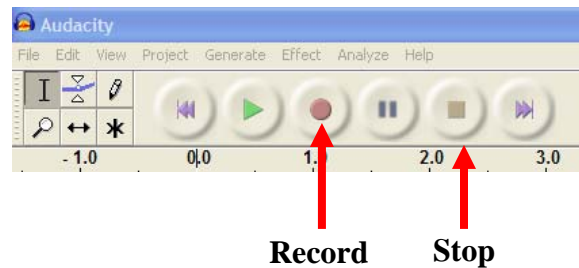
Recording narration with an **external microphone**:
   a. Plug the external microphone into the microphone port.

   b. If the **Audio System Event** window appears, select **Microphone** and click **OK**.
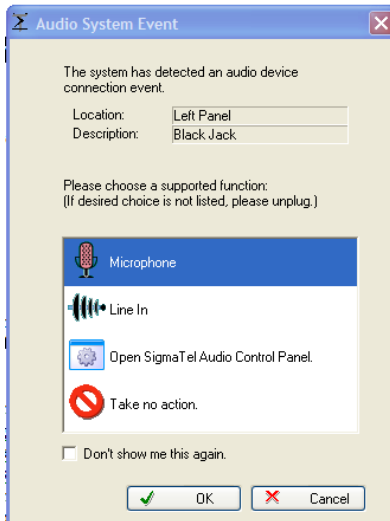
   c. Open *Audacity* and record the narration.

   d. Play the narration back. Delete and rerecord if desired.

   e. Use the **Track Pop-down** menu to change the name of the track.

2. Importing the music file:
    a. From the **Project** menu, select **Import Audio.**

        Note: Do not go to **File** and select **Open**. Doing so will open a second project and the two tracks will not appear together.

    b. Navigate to the music file and open it. The waveform appears in the project window. If the music was recorded in stereo, there will be two waveforms: one for the left channel, and one for the right channel. The project should look like this:
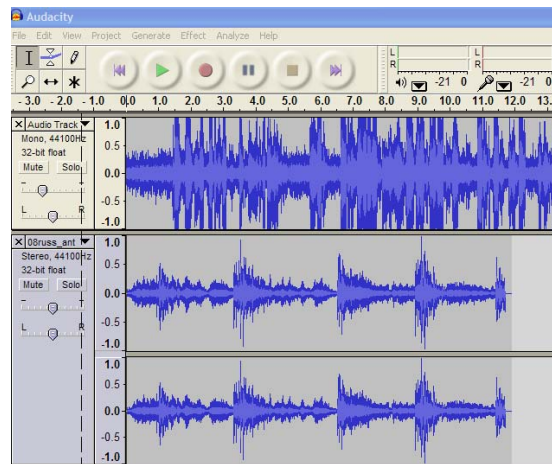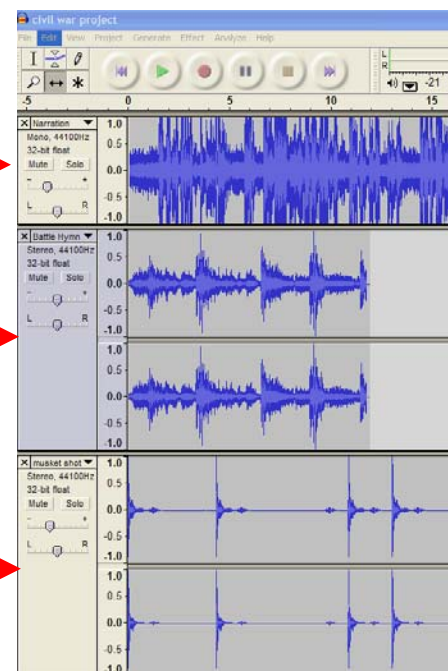

3. Importing background sounds:
    a. From the **Project** menu, select **Import Audio**.

    b. Navigate to the **Background Sounds** file and open it. The waveform for the background sounds appears.

    c. Rename the tracks. Now there are three tracks.
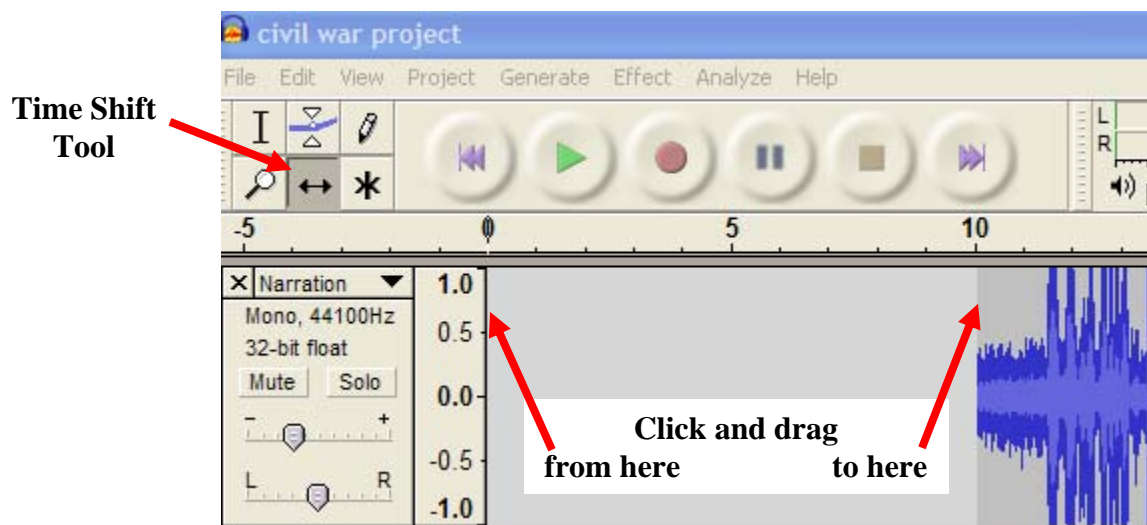
Narration Track →

Music Track →

Background Sounds →

Editing the Tracks

This project will begin with music at a normal volume. It will slowly fade to a lower volume. Narration will then begin and continue to the end. Musket fire will occur in the background. As the narration ends, the music fades in to a normal volume before fading out at the end.

1. Narration begins 10 seconds after the music.
   a. Use the **Time Shift** tool. Place it on the 0 mark on the timeline adjacent to the **Control** panel. The tool is a double-headed arrow.

   b. Click and drag the waveform to the right. Stop when the 10 second mark is reached.

   c. Playing the project at this point will have it begin with music and background sounds, followed by narration at 10 seconds.

   Use the **Solo** and/or **Mute** buttons to play individual tracks. Use the **Skip to Start** button to begin at the beginning of the project.

2. Edit the music so it will play from beginning to the end. It will start loud and fade in volume for the narration. When the narration is finished, the music will resume playing loudly for a few seconds and gradually fade to silence.

   a. First, repeat the music track. Select the music track by clicking the **Control** panel. This selects the entire track of music.

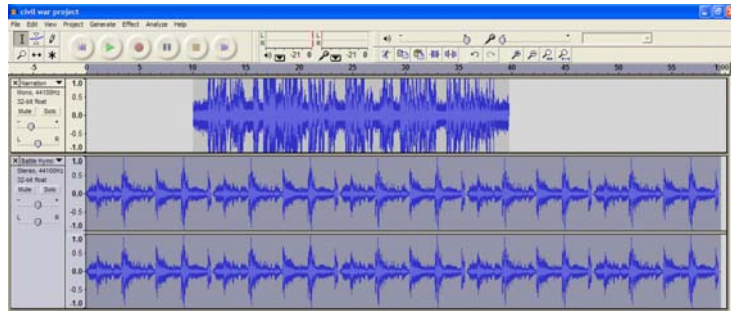b. Go to the **Effect** menu and select **Repeat**.

c. In the **Repeat** window use the selection length along with the timeline to estimate the number of times to repeat.
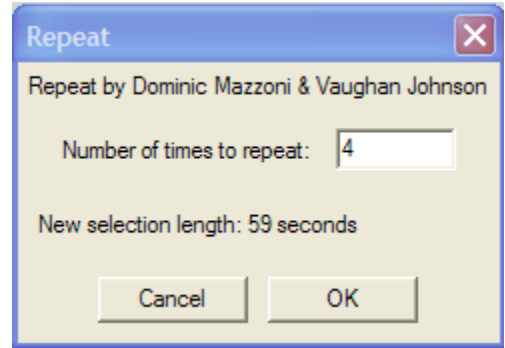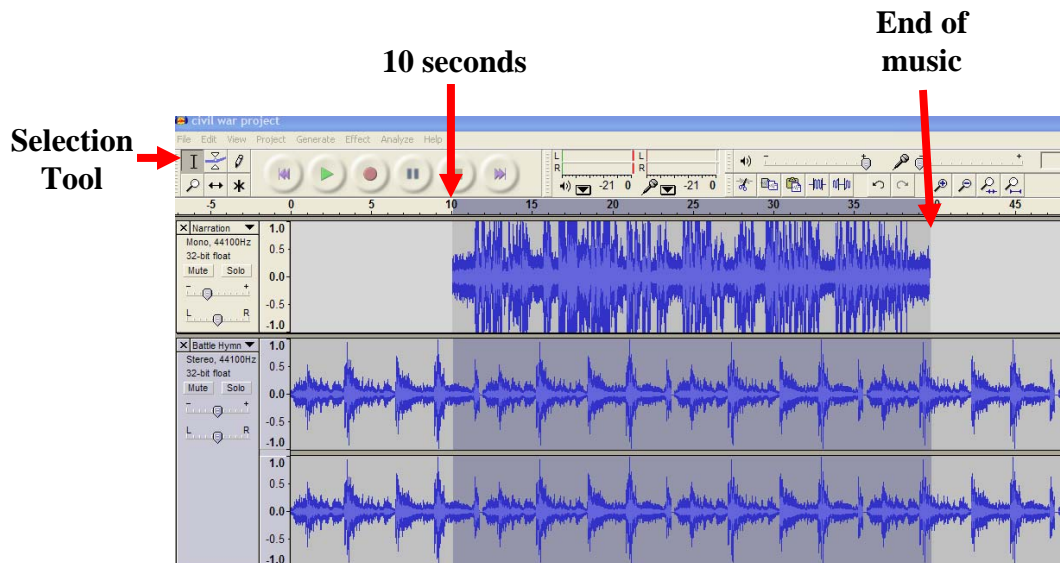
   The number of repetitions should have the music playing 10 seconds after the narration.

d. Click **OK**.

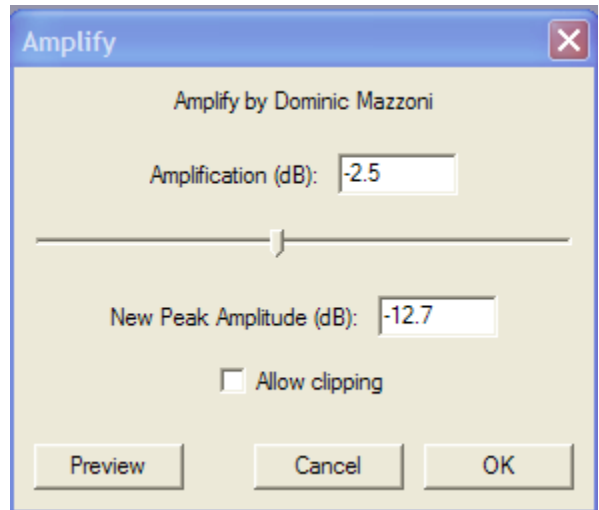   The narration and music tracks should look like this:

e. Next the volume of the music under the narration needs to be lowered. Use the **Selection** tool and click and drag the music track starting at 10 seconds and ending with the end of the music.
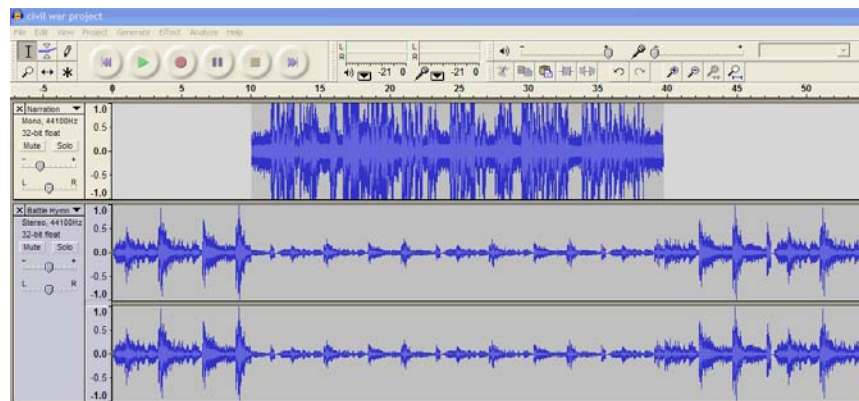
f. From the **Effect** menu, select **Amplify**.

g. Begin by lowering the decibel level by -2.5. The waveform in the selected area will change amplitude.

h. Play the music and narration tracks for a sound check. (Mute the background sounds.) If the music needs additional adjustment to lower the volume, select it again and use the **Repeat Amplify** effect until satisfied.

The narration and music tracks now look like this:

Next the music needs to fade from the beginning to the 10 second mark and become louder after the narration to the end.

i. Use the **Selection** tool to select the music from 0 to 10 seconds on the timeline.

j. From the **Effect** menu select **Fade Out**. The music waveform at the beginning of the track will gradually decrease in size.

k. Select a few seconds of music immediately after the narration. From the **Effect** menu, select **Fade In**.

l. Finally, select the last few seconds of music and do another **Fade Out**.

Now the narration and music tracks look like this:

Fade out   **Fade in**   **Fade out**
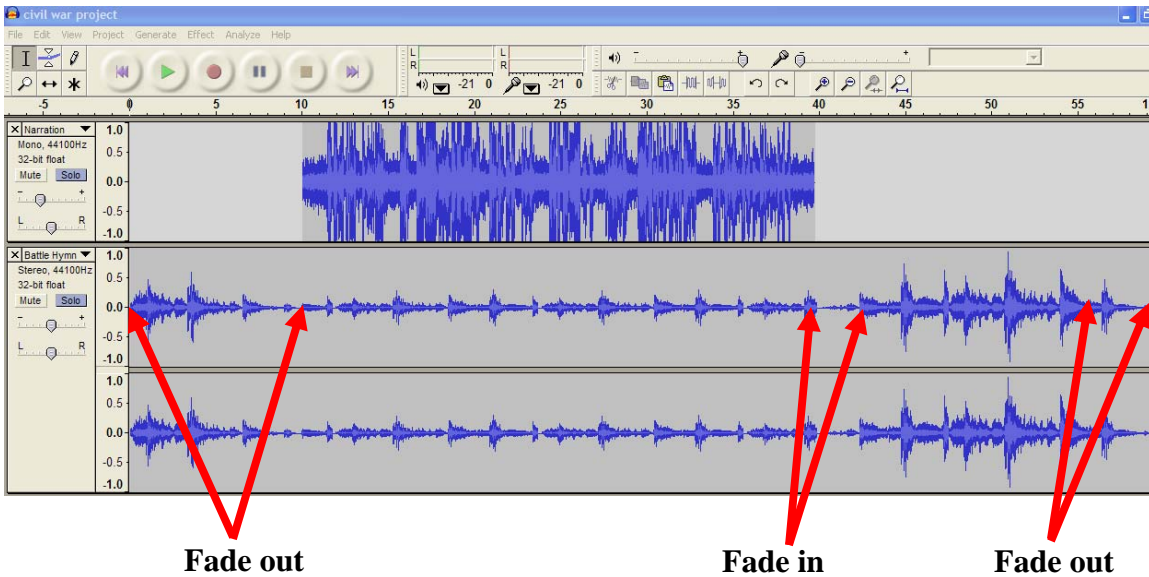
Editing of the music track is complete.

3. Edit the background sounds to occur during the narration.

   a. First, select the **Background Sounds** track.

   b. Use the **Repeat** effect to extend the sounds to cover the narration.

   c. Use the **Time Shift** tool to change the start of the background sounds track from 0 seconds to 10 seconds.

   d. Use the **Selection** tool and the **Cut** tool to delete any part of the background sounds track that extends beyond the narration.
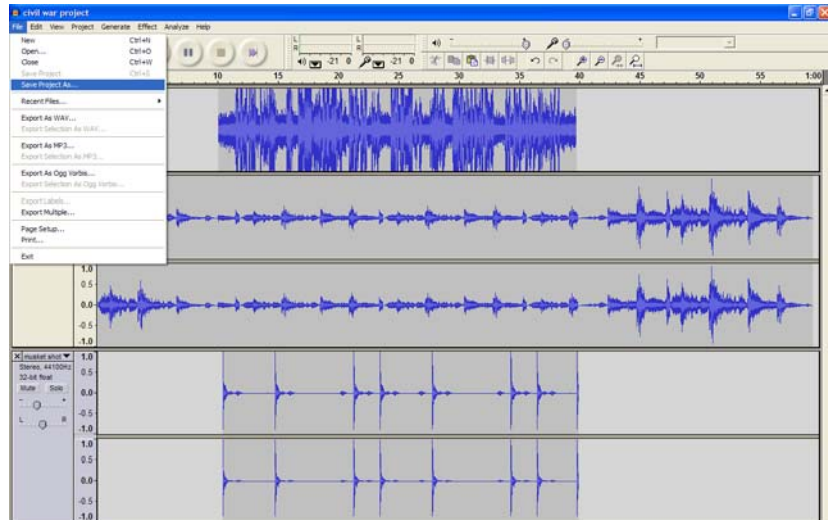
The tracks look like this:
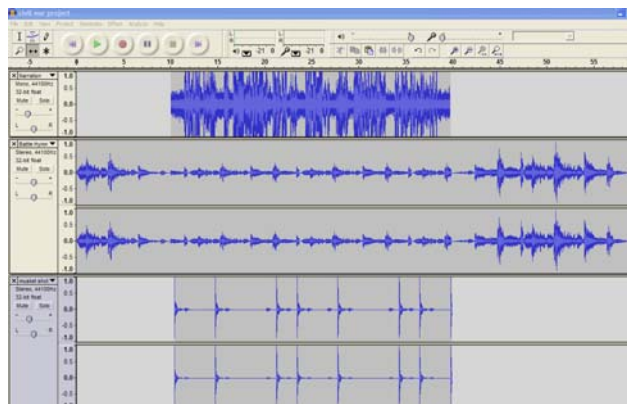
Saving the Project

Soon after starting a new project, it should be saved as a project and saved frequently throughout the creation of the project. Project files (extension .AUP) can always be opened in *Audacity* and further modified.

Select **Save Project As…** from the **File** menu for the intial save.

Thereafter, use **Save Project** (or Control-S) to save changes to the project.

Exporting the File

Exporting the file will mix the separate tracks and put them in an audio format compatible with most players.