

Editing Audio in Audacity – The Basics

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I recorded a short audio file and deliberately made several mistakes to illustrate how easy it is to edit them out with Audacity. Some of the “bad” sounds that need to be removed are:

1. Silence in several places in the wav file
2. Sibilants, or hissing sounds
3. “Ah” sounds
4. Sounds of rustling paper
5. Pops and clicks

Play the sound clip to hear these mistakes for yourself.

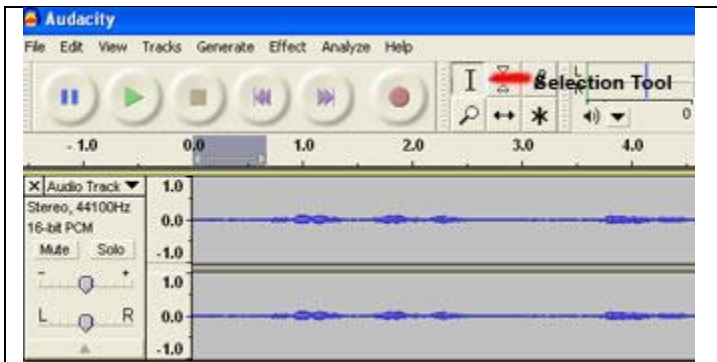


Figure 1: The Selection Tool

Step 1 – Delete silences

1. Look at the wav (uncompressed audio for PCs.) file. Note that there are several places in the audio track where all you see is a flat line. The flat areas indicate silence.
2. We will use the **Selection** tool to highlight the silent areas we want to remove. With the Selection tool selected, drag across the first area that has no sound. Be sure not to drag too far and select an area of the clip that contains sound. Use **Figure 2** as your guide.

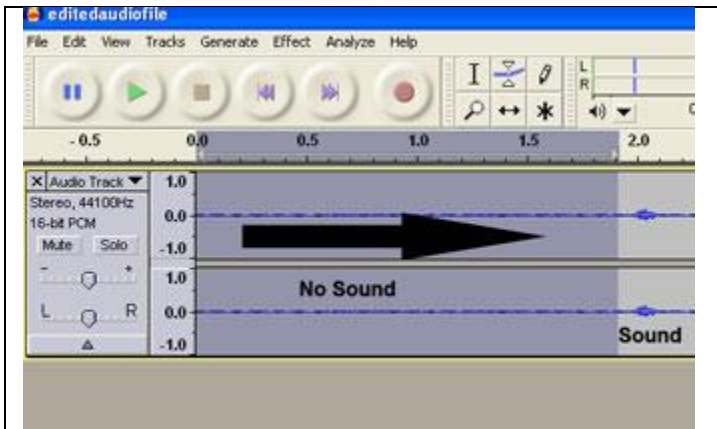


Figure 2: Selecting Area with no Sound

3. Press the **Delete** key on the keyboard to delete the piece of silence.

4. Select other areas of the clip you think have no sounds and listen carefully to them. You can play highlighted sections of the clip by pressing the space bar. Delete the sections of the file that contain nothing but silence. The areas I deleted were approximately between: 4.6 and 5.4 seconds, 6.6 and 7.1 seconds, and 39.3 and 40.2 seconds. Play the file again. Does it sound slightly better than before you removed the dead spots?

Step 2 - Removing a Popping Sound

Between the beginning of the recording and 1.0 seconds I mispronounced the word "at" so that it sounds roughly like "ATTT."

1. On the **View** menu select **Zoom In** so that you can select a small portion of the clip more accurately. Highlight the section between 0.0 and 0.9 seconds and press the space bar to listen to it. Figure 3 shows the piece of sound we have selected and the location of the popping t sound.

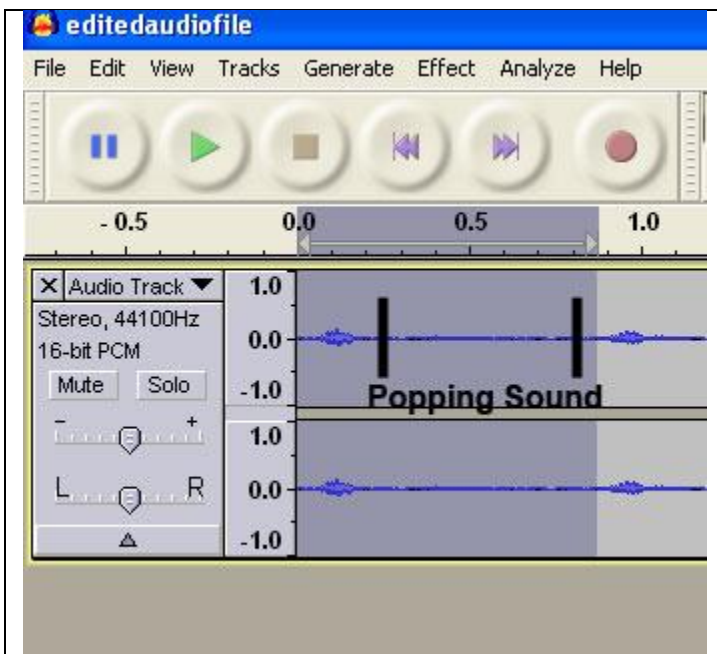


Figure 3 – Selecting Popping Sound

- From the **Effect** menu select **Noise Removal**. Click the **Get Noise Profile** button to let Audacity tool hear the noise you want to remove. Open the **Effect** menu again and select **Noise Removal**, and then click the **OK** button. Listen to the first part of you recording again. Oops! It removed the word “at,” not just the “TTTT” sound you wanted to delete, didn’t it. Let’s see if we can find a better way to remove this popping noise.
- On the **Edit** menu select **Undo**, or press **Ctrl + Z** to replace the section of the clip we just deleted.
- Highlight the section of the wav file that contains only the word “at” and listen to it. Figure 4 shows the portion of the file I highlighted.



Figure 4: Highlighting the Word You want to Replace

- We are going to re-record only the word “at.” Click the **Record** button, say “at,” and very quickly click the **Stop** button. The segment you just recorded will be on its own track, as shown in **Figure 5**. Click the **Mute** button for the first track and listen to the new clip. The first track is grayed out now.

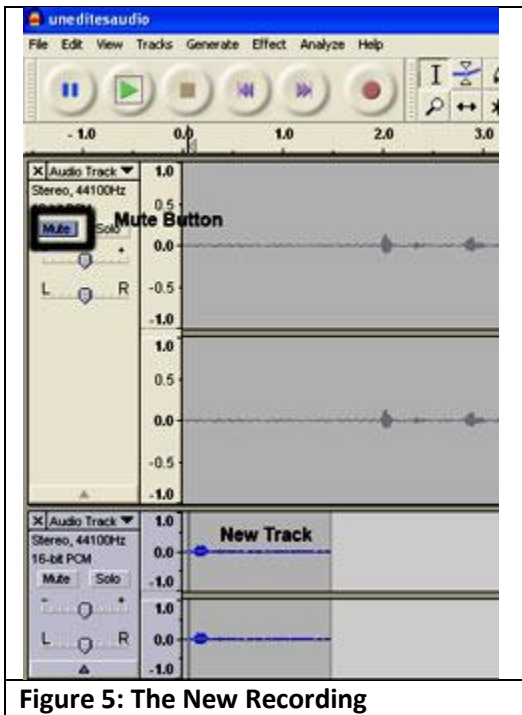


Figure 5: The New Recording

6. If you are satisfied with the way “at” sounds now click the **Mute** button again on the first track to make it active again. We need to merge the new track with the first track we recorded. Each track has a **Move Up** command, but if we use it to move the track it will just place it on a new track above the first one. The easiest solution is it to select the new track and copy it to the clipboard. Before you paste the new track into track one, select the word “at” on the first track and delete it. Then, place the cursor at the beginning of the first track and select **Edit > Paste** on the menu at the top of the page or type **Ctrl + V**. Listen to the first part of the recording again. You may need to select and delete a small part of the recording after the word you just pasted into it. Figure 6 shows the way your track looks after pasting the new sound segment into it. (Your file may not look exactly like mine depending on how much of the clip you deleted and re-recorded).

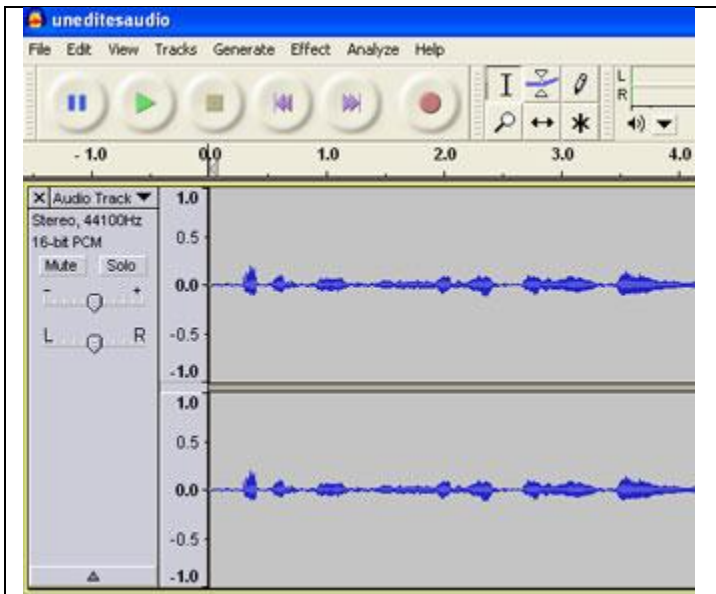
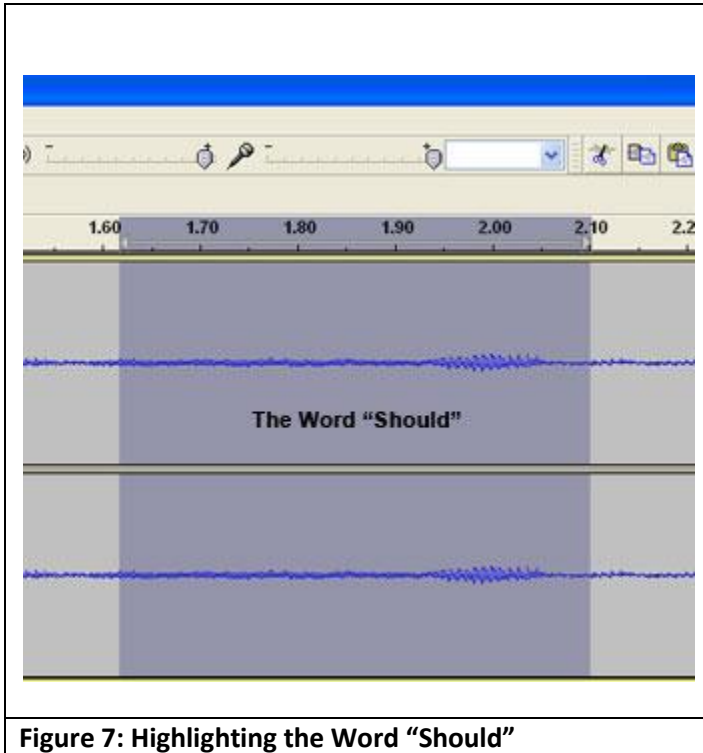


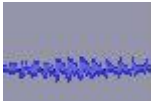
Figure 6: The Track after Merging New Track with It

Step 3: Removing the Sibilant Sound from a Word

1. Next, we will remove the hissing sound or sibilant I deliberately made when I recorded the word “should.” Press **Ctrl + 1** to zoom in and enlarge the wav file so you can more easily locate the word and highlight it. In my wav file the word is located between 1.62 and 2.10 seconds, as shown in **Figure 7**. The location will probably not be exactly the same in your sound file. Play just this word and note the “SHHHH” sound. This is what we need to remove.



2. Now, highlight only the highest part of the sound wave you have selected and listen to it. This should be the word

“should” without the sibilant and it should look more or less like this : . This is the sound we want to keep.

Next, highlight the almost flat portion of the sound wave between “should” and the next word, which is “have” and listen to it. You should hear the sibilant, or hissing sound. Delete this tiny piece of sound and listen to the words “should” and “have.” You should hear “should have” without any sibilance. You could have used the noise removal effect to remove the sibilant, but then you would have had to delete the dead space left when you deleted the sibilant sound. You have noticed by now that sound editing in Audacity is not an exact science. It takes a lot of trial and error to become proficient at editing sound in Audacity. (My program of choice for editing sound is Adobe® Soundbooth® which is inexpensive and easy to learn. Simple editing tasks are much easier and quicker in Soundbooth, but once again, Audacity is a free program. If you will be doing a lot of podcasting you might want to consider buying Soundbooth®, which as of this writing only costs \$80 from Journeyed.com. (www.journeyed.com)). Highlight the word “formats” and remove the sibilance from it. If you remove too much sound press **Ctrl + Z** to undo your last action and repeat it. Finish this step by listening to the rest of the recording and removing any additional sibilant sounds.

Step 4: Removing Elongated “NNN” sound from “Information”

1. Play the recording until you hear the word “information.” I recorded an exaggerated “NNN” sound so you could practice removing these kinds of sounds. This sound is located approximately between 29.0 and 29.5 seconds on the audio track. Select this sound and listen to it a few times. It is shown in **Figure 8** below. Delete this sound, highlight the entire word “information” again, and listen to it again. If you don’t like the way the word sounds now, undo your operation and perform it again.



Figure 8: Locating the “NNN” Sound

Step 5: Removing the Knocking Sound

1. Our recording should sound better now, but we can still make it sound better. Press the **Home** key on the keyboard to move the cursor to the beginning of the wav file. Listen to the short recording again and see if you can detect the next error we need to repair. Select the portion of the sound wave that spans 17.00-17.17 seconds. You should hear the sound I made when I struck my desk with a rock. Again, you may have to adjust these setting slightly to highlight this sound.

2. This time let’s use the noise removal effect to remove this unpleasant sound. Select **Effect > Noise Removal** on the menu at the top of your screen. There is no need to change any of the default settings. Click the **Get Noise Profile** button, and then click the **OK** button. The dialog box will close. The noise should be removed now.

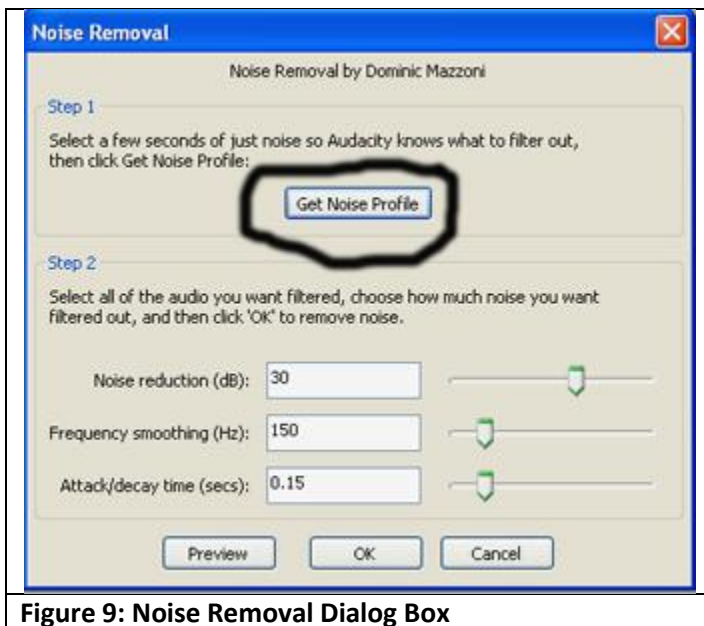


Figure 9: Noise Removal Dialog Box

3. Noise removal in Audacity is a two-step process. The section of the sound wave you selected should still be highlighted. Now, press the **Delete** key on the keyboard to remove the dead space where the knocking sound used to be. Highlight a few seconds of sound before and after where the knocking sound used to be. Listen to the area of the clip you highlighted. This section of your recording sounds better now, doesn't it? The vertical black line where the knocking sound used to be shows you that you deleted a sound in that location. It has no effect on the quality of your recording.

Step 6: Removing More Knocking, Clicking, and Paper Rustling Sounds

1. Between approximately 17.50 and 18.25 seconds there are sounds of knocking and paper rustling and clicks. Try to locate and remove these sounds by yourself, either by selecting and deleting them or by using **Effect > Noise Removal**.

2. The same kinds of extraneous sounds can be heard between 17.95 and 19.90 seconds. Use one of these techniques to remove these sounds. Be careful not to delete any spoken speech you hear in this area of the recording. One clue to help you locate sounds you want to remove is that these sounds are often represented in the sound wave as vertical lines, which look like this: |. You may have to highlight one tenth of a second or less of sound to isolate and remove these noises.

3. Between 18.75 and 18.90 seconds you can hear clicking sounds. **Figure 10** shows what this small section of the wav file looks like. Notice that each click is shown as a vertical line. This time let's use Audacity's click removal tool to remove these sounds. Highlight this section of the sound wave and select **Effect > Click Removal** on the menu at the top of the screen. The dialog box allows you to change the threshold and max spike width settings, but let's accept the defaults for this exercise. Click the **OK** button and listen to your result. You can still hear the clicking sound, can't you? Adjust the settings in the dialog box. Go all the way down to zero for threshold and up to forty for the max spike and listen to the result. You can still hear the click can't you? This is probably because Audacity does not recognize these sounds as clicks. With these sounds still highlighted press the **Delete** key to remove them. Once again, we are working with a free program.

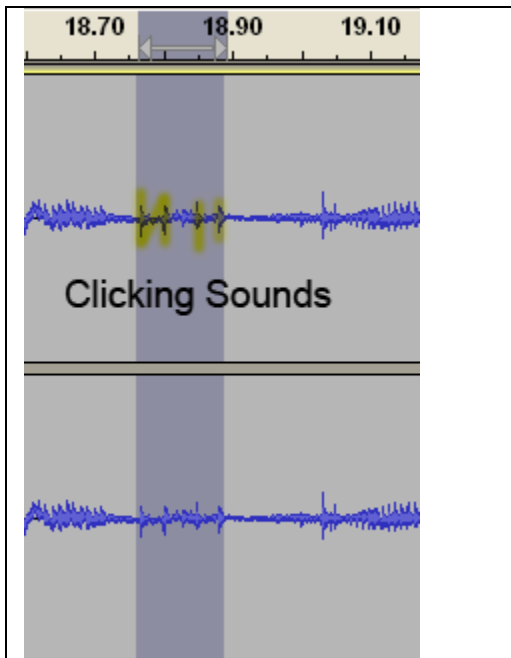


Figure 10: Removing Clicking Sounds

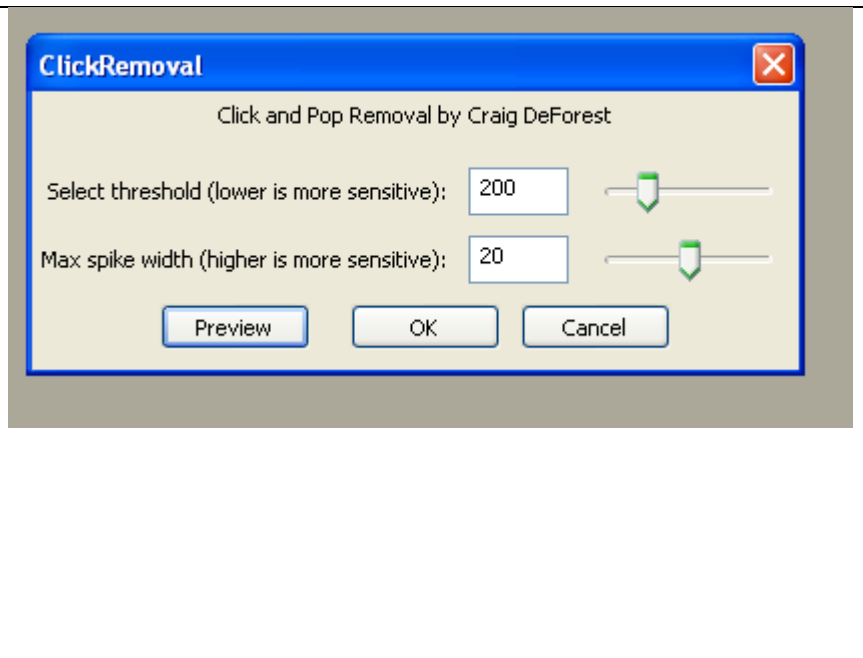


Figure 11: Using Click Removal Effect

Step 7: Removing Rest of Extraneous Sounds

By this point in our exercise you should have had enough experience in identifying and selecting and removing unwanted noises from our file to locate and clean up the rest of the sounds we need to delete from our recording, so I will let you work through the rest of the file on your own. Have fun, and remember we are not professional sound engineers. After you have edited the rest of the file listen to it from beginning to end. Be sure to remove all silences that last longer than normal pauses between words and sentences. If you remove parts of words I recorded, or if you cannot remove all the extraneous noises, don't worry; we are just practicing. It takes many hours of practice to become proficient at editing sound in Audacity. Also, sometimes it is impossible to remove noises without removing recorded speech. It is always a good idea to write out a script of your recording and read it aloud several times before recording it. This will always result in a much better recording. I write a script for each podcast I produce and rehearse it thoroughly before recording it. In a later tutorial I will show you how much easier it is to edit this file with Adobe® Soundbooth®.

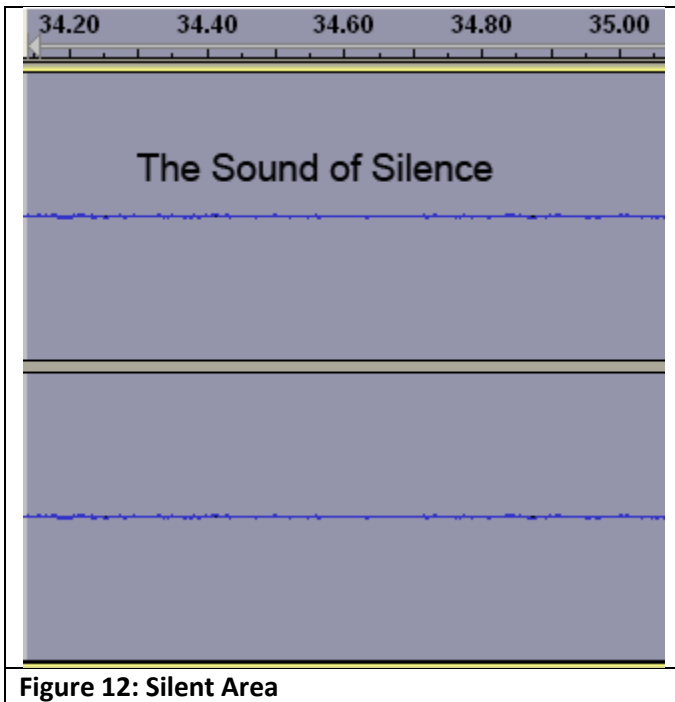


Figure 12: Silent Area

Step 8: Amplifying Our Recording

Our recording should sound pretty good by this time, but the volume is much too low. There are two ways we can increase the volume. We can amplify it or we can normalize the recording. Amplify just means to increase the sound's volume. Wikipedia defines normalization as, "the process of increasing (or decreasing) the amplitude of an entire audio signal so that the resulting peak amplitude matches a desired target. Typically, normalization increases the amplitude of the audio waveform to the maximum level that does not introduce any new distortion other than that of requantization." (Retrieved from English Wikipedia, July 3, 2009). We will use both methods to increase the volume of our recording and you can choose the one that sounds best to you.

1. Amplifying the Recording – Press the **Home** key to move to the beginning of the recording and select **Edit > Select All** on the menu or type **Ctrl + A**. On the menu at the top of the screen select **Effect > Amplify**. The Amplify dialog box should open. Audacity has set the decibels of amplification to the reading it thinks is appropriate. Let's not change this setting. The New Peak Amplitude setting is 0.0 by default. Let's not change it at this time. There is no need to click the **Allow Clipping** button. Click the **Preview** button to listen to a segment of the amplified file. Does it sound loud enough to you? Now, click **OK** and listen to the entire amplified file. It sounds a lot better doesn't it? **Figure 13** shows the Amplify dialog box.

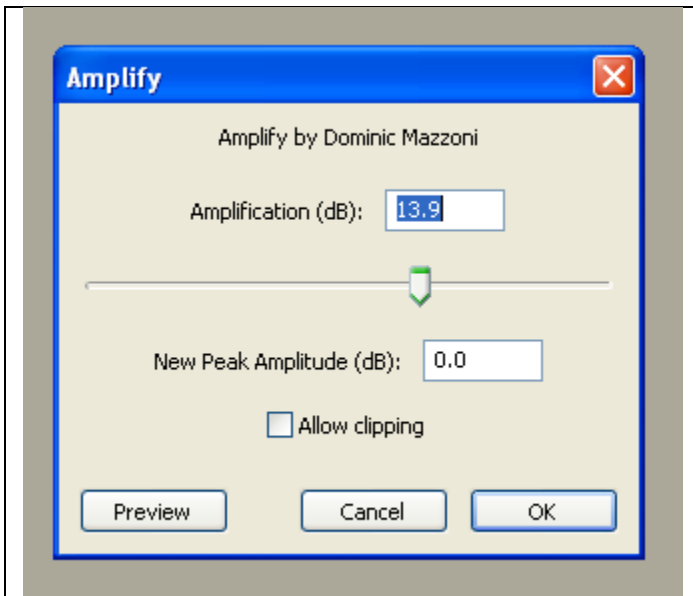


Figure 13: Amplifying the Recording

2. Normalizing the Recording

Select **Edit > Undo** on the menu at the top of the screen to return the audio file to its unamplified state. This time we are going to use the normalize effect to boost the sound level. Select the wav file again if you have deselected it. This time select **Effect > Normalize**. Preview a segment of the normalized file if you want to. The file will be normalized to -0.10.0 decibels. Let's accept that setting for now. Click **OK**. Listen to your file again. The normalized recording is not as loud as the amplified file is it? Which sounds better to you, the normalized file or the amplified file? If you like the sound of the amplified file better, undo the normalization, select the file again, and amplify it. The table below shows the unchanged file, the amplified version, and the normalized version. How do you think you can tell the amplified file is louder just by looking at the sound wave? Our audio recording is not perfect, but I think you will agree that it sounds much better than it did before we edited it. The last step is to export the wav file as a compressed MP3 file that we can use as podcast. Follow **Step 9** below to finish our audio recording and editing project.

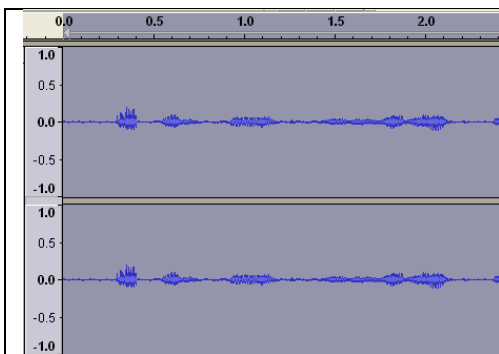


Figure 14: Unamplified File

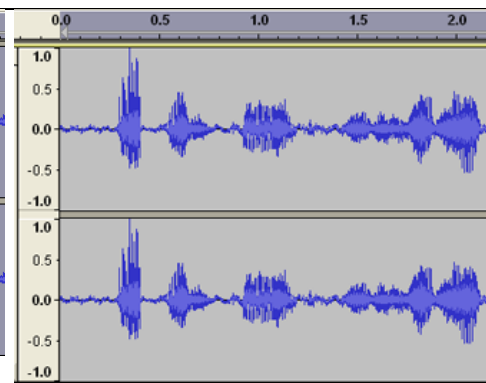


Figure 17: Amplified File

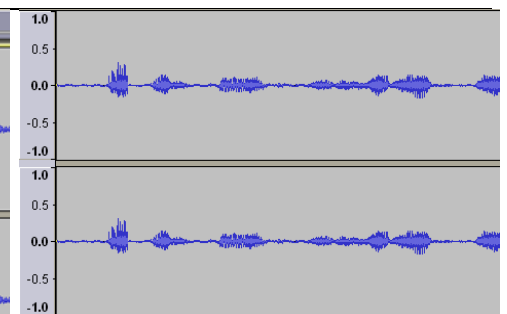


Figure 16: Normalized File

Step 9: Exporting Wav File in MP3 Format

Our uncompressed wav file is 4.90 MB even though the recording is only about 29 seconds long. It is much too large to upload to the Web as a podcast. We are going to export it in MP3 format and compress it to a small fraction of its current size.

1. On the menu at the top of the screen select **File > Export**. Locate the folder you wish to save the file in and rename it if you wish. Be sure to select **MP3 Files** as the file type. Click the **Save** button. Open the folder on your computer where you saved the file and check the file size. My MP3 file is only 460 KB, and it sounds almost as good as the original file.

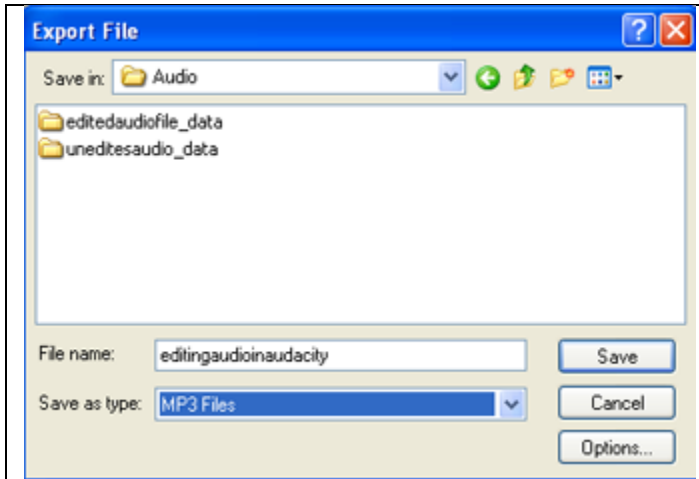


Figure 18: Export as MP3

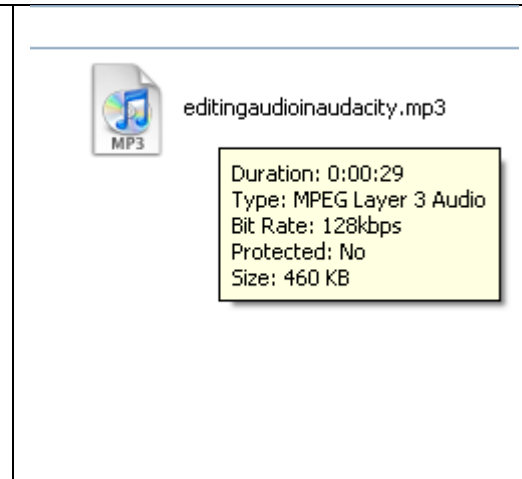


Figure 19: MP3 File

Congratulations and pat yourself on the back!! You now understand the basics of editing audio in Audacity. This tutorial and the audio files will be posted on the Digital Audio website which is located at: <http://irt.austincc.edu/audio/> . Check this website periodically for updates. Tutorials on advanced audio editing in Audacity, audio editing in Adobe® Soundbooth®, and Apple’s Garageband are planned for the future.