

# Audacity Tips and Tricks for Podcasters

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## Common Challenges in Podcast Recording

### *Pops and Clicks*

Sometimes audio recordings contain pops or clicks caused by a too-hard “p”, “t”, or “k” sound, by just a little too much saliva as a word was said, or by the microphone just picking something up funny. For a truly professional podcast, we may want to get rid of any major instances of these.

#### **Solutions**

- Find Zero Crossings before deleting selection
- Click Removal
- Amplification

### *“Um,” “You Know,” Pauses, and Other Junk*

Let’s face it. We don’t always articulate the way we’d like, especially when we’re not using a script (the use of which is a great idea for many podcasts, but not always; for example, interviews). We may want to edit out words, phrases, useless verbal noises (e.g., “um”), pauses, or non-constant background sounds (e.g., the rustling of pages as a script page is turned or the noise of an item dropped on the floor). However, doing so can cause its own problems. If this is not done correctly, we can introduce pops and clicks.

#### **Solutions**

- Find Zero Crossings before deleting selection
- Amplification

### *Ambient Noise*

Unless they are recorded in a “dead room” (a soundproof room in a recording studio where the subject of the recording sits, surrounded by padding that seals him or her off from all outside sound), recordings intended for podcasts will contain background noise. Even when care is taken to eliminate voices, music, rustling of papers, and other easily noticed background noise, ambient noise will likely come from an air conditioner, a computer fan, or other source of constant, low-volume noise. No normal room is ever truly silent.

#### **Solutions**

- Noise Reduction

### *Differences in Sound from Changes in Location, Equipment, and/or Subject*

To compound the problem, each room (or even outdoor location) will likely sound a bit different from others due to differences in how sound reverberates in the space, and any change in recording equipment may cause sounds to be picked up differently, so podcasts recorded in multiple locations

and/or with multiple recorder types may exhibit some inconsistency in ambient sound, and also in volume. In addition, certain speakers talk louder than others, and this can lead to differences in recording volume when a podcast contains multiple participants.

### **Solutions**

- Normalization
- Amplification

### ***Multiple Recordings and/or Music Files to Interweave Together***

Maybe your podcast is a story, with multiple character voices connected by a narrator, and each actor recorded his or her part separately from the others. Maybe you are putting together interviews with multiple guests. Maybe you just want to use stingers or background music files, and you want to control the fading or volume of these in relation to other voices. You can often imagine complex uses of audio, and implementing what you imagine can be a challenge.

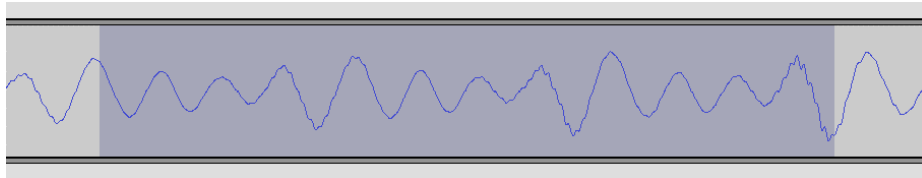
### **Solutions**

- Time Shift tool
- Fade In / Fade Out effects
- Envelope tool
- Splitting tracks
- Quick Mix
- Generating silence

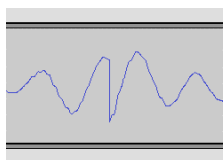
## **Solutions**

### ***Zero Crossings***

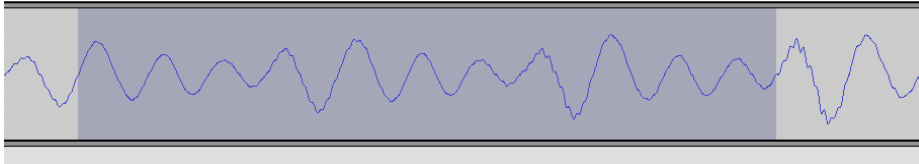
Sounds are made up of waves, and every sound file is represented in the computer as a waveform. When a portion of a sound is selected with the mouse, the beginning and end of the selection don't always (and in fact, usually won't) line up with a point where this wave crosses the horizontal midline dividing the crests and troughs. Thus, a selection (very zoomed in) might look like this:



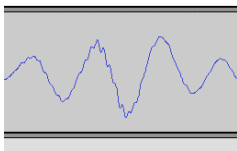
When the selection is deleted, the resulting waveform thus has an irregular drop from the crest on the left to the trough on the right (or vice versa), like this:



This irregular drop is sometimes heard, when the sound is played, as a pop or click. This can also occur when an effect is applied to the selection, when the selection is cut and pasted, when the selection is replaced by silence, etc. Fortunately, there is an easy solution. *Whenever a piece of a waveform is selected, choose “Find Zero Crossings” from the Edit menu in Audacity before taking any action on the selection.* This will move the selection both right and left to the nearest point where the waveform crosses the zero line, like this:



Then, when the selection is deleted (for example), it looks like this (without the irregular drop seen above):



### ***Click Removal***

Audacity also provides a simple, first pass method to remove clicks and pops from audio files. Select “Click Removal” from the Effect menu in Audacity. Select the desired threshold and max spike width as described on the dialog box, and click the “Remove clicks” button. *The greater the sensitivity you select, the better the program will remove pops and clicks, but the greater the distortion of desired audio will be as well.* The “Preview” button on the Click and Pop Removal dialog box may help you to find an acceptable level of sensitivity for the particular file you are working with, but sometimes this is a matter of trial and error requiring multiple “Undo” operations. Since each file may require a slightly different setting for optimal results, if your project contains multiple files, make sure that you do this for only one track or file at a time.

### ***Noise Reduction***

Noise reduction works by reducing or eliminating sounds that match frequencies defined in a sample of what silence (or only constant ambient noise) sounds like in the particular file. Desirable sounds in these frequencies will also be reduced or eliminated, so *if noise reduction is overdone, the audio may sound tinny, robotic, or otherwise distorted* (kind of like talking into a fan). Also, noise reduction is primarily designed to remove constant sounds like an air conditioner or computer fan; it is far less effective for removing paper rustling, background voices, etc.

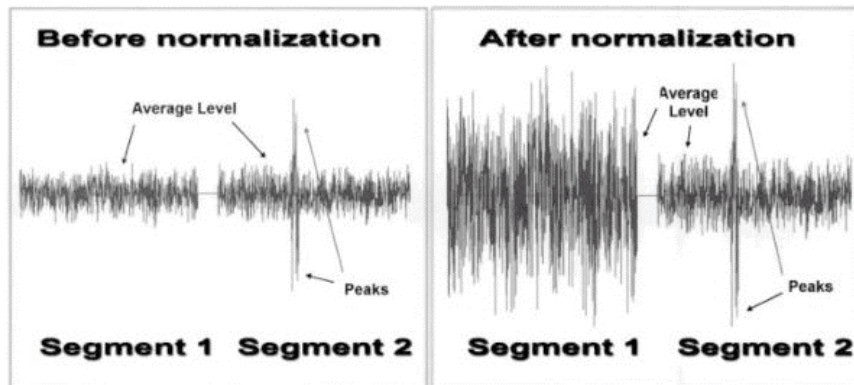
There are two steps to using noise reduction. First, select a few seconds of the file in which there is nothing but the ambient noise in the room (computer fans or whatever). Then, choose “Noise Removal” from the Effect menu in Audacity, and click the “Get Noise Profile” button on the dialog box. Next, select the files, or section of a file, to which you want to apply noise reduction, and find the zero crossings for the selection as described above. Finally, choose “Noise Removal” from the Effect menu in Audacity again, select how much noise reduction to apply with the slider on the dialog

box, and click the “Remove Noise” button. As with Click Removal, the “Preview” button on the dialog box may help you identify a proper level of noise reduction to use on the particular file, but sometimes this is a matter of trial and error. Perform noise reduction on only one track or file at a time.

## ***Normalization***

Normalization is a means to apply a consistent volume level across files. It ensures that the waveform of the normalized file is centered on the zero line, and that their maximum amplitude (volume) of the file is -3 dB. *It is useful to apply normalization to all of your tracks before beginning to mix your podcast.* To normalize a track, select the entire track and choose “Normalize” from the Effect menu in Audacity. Make sure both check boxes on the dialog box are checked, and click the “OK” button.

Another tool that is useful in normalization is dynamic range compression (see “Compressor” under the Effect menu in Audacity). This reduces the amount of volume difference between the loudest and quietest points in the selection, to prevent occurrences like this:



## ***Amplification***

The Amplify effect can be used to increase or reduce the volume of the selected track or section of a track. This can be used to achieve a more consistent volume level, to reduce overly emphasized sounds (e.g., “p”, “t”, “s”) that cause a spike in volume (sometimes helpful before normalization) or undesired sounds that can’t be completely removed, and obviously, to increase or reduce the volume of even a consistent recording to desired levels.

To increase or reduce volume, select the desired track or section of track, find the zero crossings for the selection, and then choose “Amplify” from the Effects menu in Audacity. Type in the decibels by which you want to increase (positive number) or decrease (negative number) the volume of the selection. This is the amount by which, not to which, the selection volume will be adjusted. Three decibel increments is a good starting point for experimentation. Make sure that the “Allow Clipping” check box is NOT checked. This prevents the selection from being amplified so high that the top of any piece of the waveform is chopped off, which would lead to high distortion. Then click the “OK” button.

Amplification amplifies all the sound in the selection, including background noise, and can lead to some distortion. Also, when reducing volume, bear in mind that amplification cannot undo the

distorting effects of clipping that happened at the time of recording due to incorrect microphone gain, so make sure that microphone gain is not set too high. As with all of these effects, use amplification judiciously and use the Preview button on the dialog box plus a healthy dose of trial and error to find the optimum level of amplification.

### ***Time Shift Tool***

The Time Shift tool allows you to drag the contents of a track to any point in time on the project timeline. This tool is found in the tool palette to the left of the playback controls, and looks like this:



Click on the Time Shift tool, then click and drag the desired track to the proper location on the timeline.

### ***Fade In / Fade Out***

You may want to fade in or out certain tracks in your podcast, particularly if you are using stingers or music. To do this, select the length of the track over which you want the fading in or out to occur. Find the zero crossings. Then, select either “Fade In” or “Fade Out” from the Effects menu in Audacity. This will fade the volume of the selection to or from complete silence. To fade a track to or from a lower volume, use the Envelope tool.

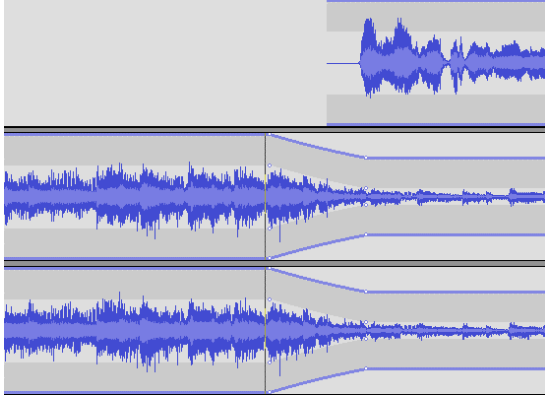
### ***Envelope Tool***

The Envelope tool is used to increase or decrease the volume of a track gradually (unlike the Amplify effect) and without going to or from zero volume (unlike Fade In and Fade Out). One example of where the Envelope tool might be used is to have music playing and then to fade that music to a lower volume over a second or two as a speaker begins to speak, keep the volume lower but still audible while the speaker is speaking, and then gradually bring the volume of the music back to its original level as the speaker is ending.

The Envelope tool is found in the tool palette to the left of the playback controls, and looks like this:



After clicking the Envelope tool, click the desired track at the point where you want the volume change to begin. This will be a small handle on the top and bottom edges of the track at this point. Hold the mouse button down and drag up or down while over one of these handles to increase or reduce the volume of the track (indicated by the amplitude, or height, of the waveform). Adding multiple such points on the track allows for complex shaping of the volume. For example fading from full volume to a lower volume then back to full volume again requires four such points or handles. This picture shows two of those handles, used to face the volume of some music down as a speaker begins to talk.

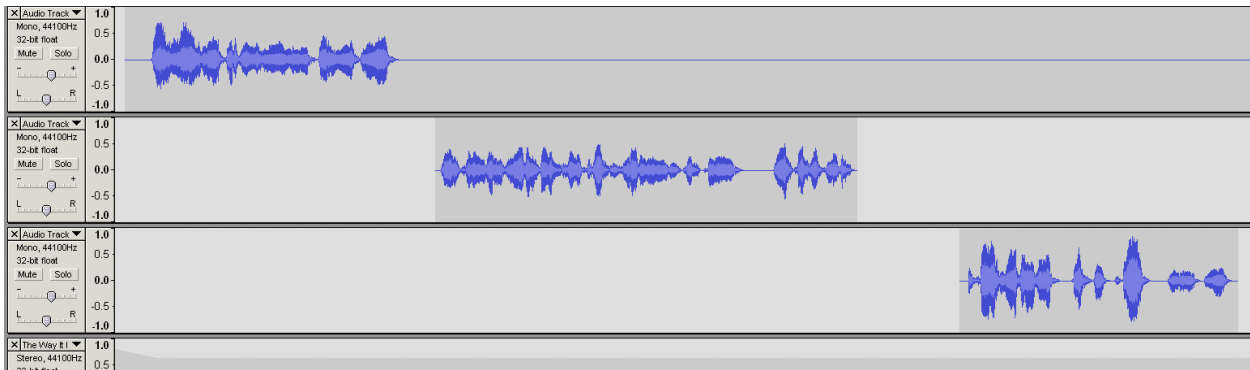


## ***Splitting Tracks***

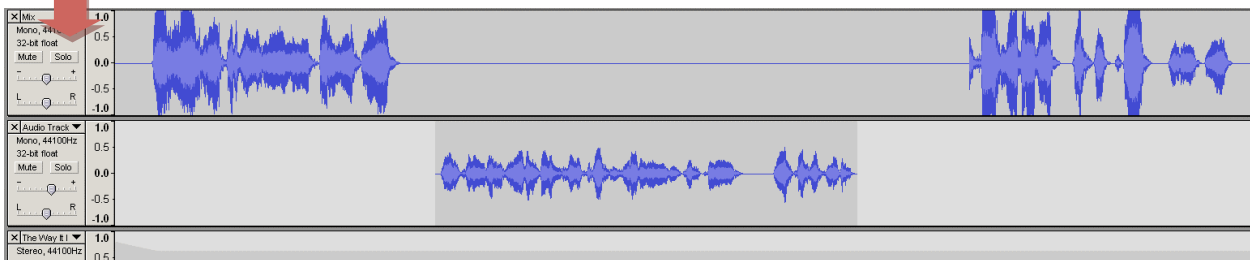
Sometimes you may want to take what is on one track and split it into multiple tracks, to allow the pieces to be moved independently on the timeline with the Time Shift tool. One example might be a recording of a story using multiple voices, where each actor recorded his or her parts separate from the others, and these parts are imported as one track but must be broken up and interwoven with the parts of other actors. To split a track, select the section of the track that you want to split out and find the zero crossings. Then choose “Split” from the Edit menu. The selected section of track will be moved to a new track, and replaced by silence in the original track.

## ***Quick Mix***

Quick Mix is the opposite of splitting a track. It allows you to combine the contents of multiple tracks into one track. For example, this picture shows three tracks:



And this picture shows the first and third tracks combined using QuickMix:



Notice that the position of each track on the timeline is maintained in the combined track. If necessary, silence is generated between the clips on the combined track.

It is possible to combine tracks that overlap each other on the timeline, *but once this is done, the overlapping sections will NOT be able to be separated, as they will become part of a combined waveform.* Do this only with extreme caution.

Quick Mix is a great way to keep the number of tracks you are working with manageable by combining tracks once the need for them to be separate is done. To use Quick Mix, select the desired tracks by clicking on the track information area to the left of each track (indicated by the red arrow above). Hold down the Shift key while selecting the second and subsequent tracks. Then choose “Quick Mix” from the Project menu.

### ***Generating Silence***

One way to move sections of audio on a track further apart is by splitting the track into two, and then using the Time Shift tool. Another is to generate silence to lengthen the space between the two sections. To do this, put the cursor on the timeline at the point where you want the silence to go, then choose “Silence” from the Generate menu in Audacity. Type in the length of the silence you want to generate, and click the “Generate Silence” button.

### **Proactively Addressing Challenges**

Because most of the above effects, such as amplification and noise reduction, have both limits on what they can achieve and possible undesirable side effects, it is important to proactively address challenges you can anticipate. For example, use a pop filter or windscreen between your mouth and the microphone to reduce the incidence of pops and clicks. Pop filters are inexpensive, but if needed, a pop filter can even be constructed from a bent hanger and a piece of nylon stockings.

Make sure that gains on microphones, and distances between microphones and the recording subject, are set properly so as to minimize the need for amplification. As much as possible, eliminate undesirable background noise, especially noise such as other voices, paper rustling, etc., from the recording environment. Use a script when possible to avoid undesired pauses, “ums,” etc. Completely finish reading from one page of the script before turning the page and beginning to read again. This makes the rustling of the pages much easier to edit out than if pages are rustling while you are still talking.