How to do recording on your computer

with Audacity®

A Beginner's Guide

Richard Margetts

Third Edition

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With thanks to Audrey Joslin for suggestions on improvements.

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The following images are from Wikimedia Commons (http://commons.wikimedia.org) and are licensed under the Creative Commons licence: Sony ECM-MS907 microphone (Nicolas Esposito), mouse (Qurren), headphones, diagrams of the internals of dynamic and condenser microphones.

Audacity® is free, open source software for recording and editing sounds.

It is available on the Internet at:
http://audacity.sourceforge.net

This manual has been updated for Audacity version 2.0.

Contents

1

Choosing your equipment

In this chapter you will learn:

- two different ways of doing recording;
- different methods of connecting a microphone to the computer;
- how a microphone works and how to take care of it;
- about different accessories you might want to use;
- how to use more than one microphone.

1.1. Two different ways of doing recording

You will need to decide whether you want to:

1. record directly to the computer, or
2. record to another device first and then transfer to the computer later.

Method 1: Record directly to the computer

Here you connect the microphone to the computer and use audio recording software (such as Audacity). The audio files are saved on the computer's hard disk.

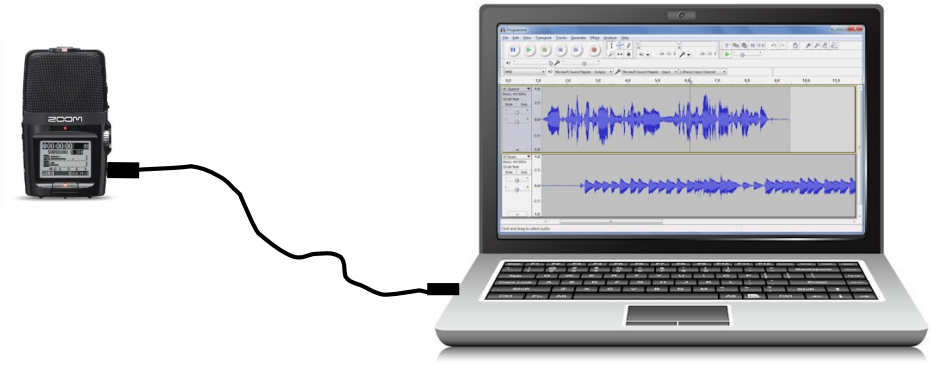
Method 2: Record to another device and then transfer to the computer later

For this method, you first do the recording on a portable device, such as a digital audio recorder.

Some digital recorders have good quality built-in microphones, such as the Zoom H2n. For other devices, you might want to connect an external microphone.

Zoom H2n
Handy Recorder

When you have done your recording, you connect the recording device to the computer in order to copy across the audio files for editing, usually via USB cable.



Alternatively, some devices (including the Zoom H2n) have removable SD memory cards you can take out and insert into your computer's card reader.

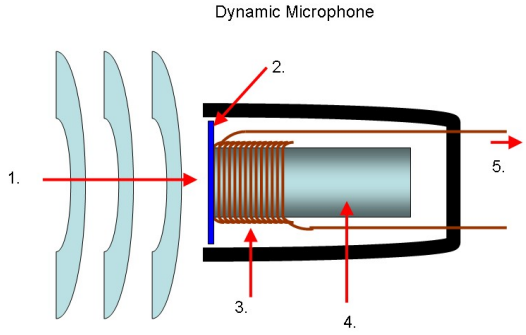
So what are the advantages of each method?

Advantages of Method 1 Recording directly to computer	Advantages of Method 2 Recording to a portable device first
You can see what you are recording and quickly identify when recording levels are wrong. It is easy to listen to parts of the recording immediately afterwards to verify all is ok. Viewing and manipulating what you see on a computer screen is easier than looking at a small LCD window with a few buttons. You can correct errors straight away.	Portable Discreet Quieter than a computer. No need to use an electric generator or car battery to power a laptop in areas where there is no mains electricity. With a supply of alkaline batteries you can record on location for as many hours as you like. Later, if you make a mistake when editing the audio on the computer, you might still have a backup on a memory card.

1.2. How a microphone works

The job of a microphone is to convert sound waves into electrical energy.

This is how a typical **dynamic microphone** works:



1. Sound waves enter the microphone and hit the diaphragm (a semi-flexible material).
2. The diaphragm vibrates.
3. As the diaphragm vibrates, it moves a wire coil backwards and forwards over a magnet.
4. Moving the coil over the magnet generates an alternating electric current (a process called electromagnetic induction).
5. The electric current is sent out of the microphone via the cable.

Note that this is the opposite way round to how a loudspeaker works.

For details of other types of microphone, such as condenser microphones, see *Appendix: Different types of microphone.*

1.3. Choosing a microphone

If you are going to do serious recording work, it is worth investing in a good microphone. In general, the more you spend on a microphone, the better the quality of the audio recording.

For good quality results, do not attempt to use a headset microphone like you might use for chatting with people on Skype. You'll find there is too much background noise.

Do not use cheap headset microphones for good quality recordings

For more details on the different types of microphone available, see *Appendix: Different types of microphone.*

1.4. How the microphone is connected to the computer

There are three typical ways of connecting the microphone to your computer, depending on the type of microphone you have:

i) Some microphones come with a 3.5mm plug. You connect the microphone directly to the computer's 3.5mm microphone input socket:

ii) Some microphones come with a USB connector[1]. You connect the microphone directly to one of your computer's USB ports. This type of microphone converts the signal from analogue to digital before it arrives in your computer.

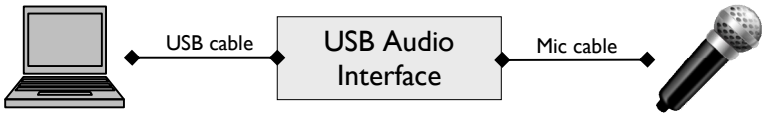
[1] Such as the Samson Q1U dynamic USB mic.

iii) Some microphones (typically the more professional ones) come with an XLR connector:

Shure SM58 professional microphone

XLR cable connectors

You should not connect these directly to the computer, but rather via a USB pre-amp/audio interface device[2] which is then connected to a USB port:



The USB audio interface boosts the signal from the microphone and converts it from analogue to digital before it enters the computer.

For example:

(a) Connect your microphone to a Shure X2u audio interface using an XLR microphone cable. Connect the audio interface to your computer using a USB cable.

Shure X2u

(b) Connect your microphone to a Cakewalk audio interface using an XLR microphone cable. Connect the audio interface to your computer using a USB cable.

Cakewalk UA25 EX

[2] Such as the Shure X2u XLR-to-USB signal adaptor, the Edirol UA5 USB audio interface, or the Cakewalk UA-25-EX.

1.5. Looking after your microphones

Ensure that you and all those who use your microphones know how to take good care of them.

DO:

- Avoid dust, dampness, high humidity and very high temperatures.
- Store carefully, and protect well from shocks when travelling.
- Remove batteries in storage.

DO NOT:

- Blow into a microphone. (The diaphragm is designed to be sensitive enough for sound waves, not wind!)
- Tap/hit a microphone.
- Drop a microphone.

1.6. Useful accessories

It might be useful to have the following accessories for your recording:

- **Mouse** – When you are editing sound files you will need to move the cursor around the screen accurately to cut, copy and paste at just the right points. For this, a mouse will give you better control than relying on your laptop's touchpad.

- **Headphones** – You will be able to better control the quality of the sound with headphones than if you simply listen through your computer's loud speakers. You'll be able to hear any background noise, hiss or distortion which you might otherwise miss.

- **Microphone stand** – You want to place the microphone at the right height and distance from the singer/speaker. You do not want to get noise from someone handling the microphone. There are different types of stand, ranging from short desktop stands to boom microphone stands that sit on the floor.

Beware: If you put the microphone stand on the same table as your computer, the microphone might pick up vibration unless you can dampen it in some way, e.g. with a shock mount, or by placing the legs of the stand on pieces of foam.

- **Microphone windscreen** – This will protect the microphone. It is especially useful outdoors to protect from wind and dust.

- **Pop filter screen** – This shields the microphone from fast movements of air, often caused when pronouncing plosives, like words beginning with the aspirated letter 'p'.

You'll need to test your microphone to see if a pop filter would be useful. Even if you cannot buy one locally, it is possible to make one with a piece of a woman's tights stretched over a bent coat-hanger wire.

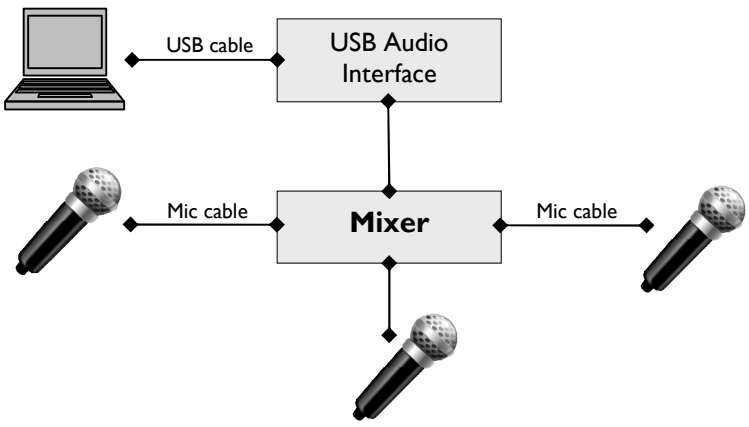
1.7. Using more than one microphone at a time

In some recording work, you might want to use more than one microphone at a time. Typical situations might include:

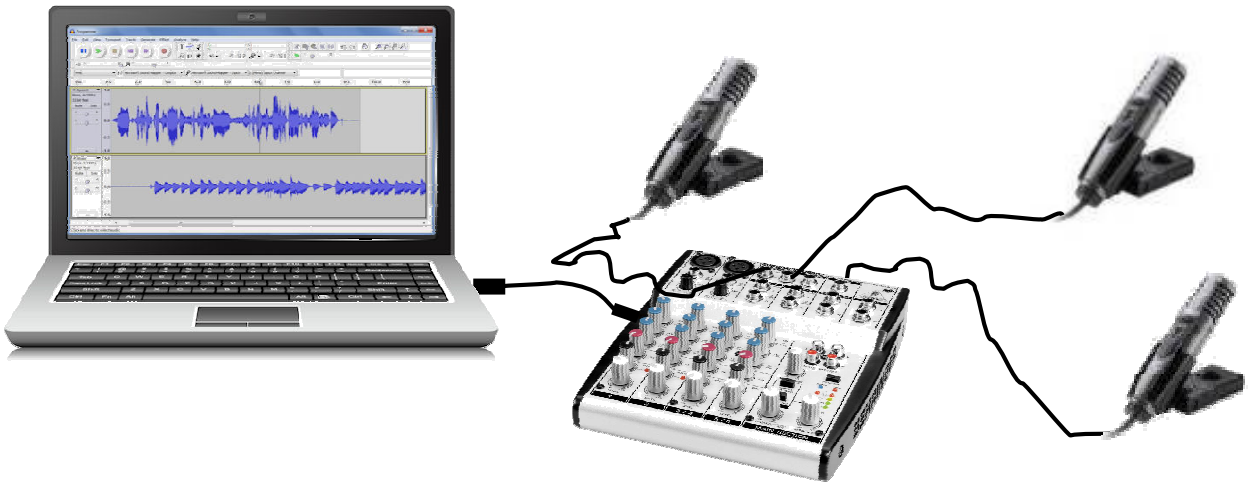
- When you are recording music and you want to place microphones for the lead singer, backing vocals, guitars, drums, etc.
- When you have an interview or discussion between two or more people and you want each of them to be in front of a microphone (rather than passing a single microphone from person to person).
- When you are recording a drama with several actors.

If you want to use several microphones you will need a **mixer**. This is a device that takes in inputs from several sources and provides a single output.

Some mixers today have a built-in **USB audio interface**, so you can plug the mixer directly into the USB port of your computer.[3] If the mixer does not have a built-in USB interface, you will need to connect one of these separately between the computer and mixer.



[3] For example, some of the Behringer XENYX series.



Note that this type of mixer does not send separate tracks to the computer. What it does do is allow you to set the right level on each microphone. The output from the mixer is then a single track recording with the sounds from all the microphones mixed together.

2

Installing the software

In this chapter you will learn:

- how to install the Audacity software on your computer;
- how to install the LAME file needed for exporting MP3 files.

2.1. The choice of software

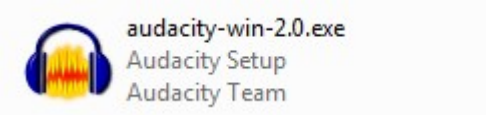
There are several audio recording software programs to choose from. In this training manual we will use Audacity. It is free, not complicated to learn, downloadable from the Internet and its user interface is available in several languages.

2.2. How to install Audacity

1. Download the latest Audacity installation program from the Audacity website:

   http://audacity.sourceforge.net/

   For version 2.0, the filename is **audacity-win-2.0.exe**. It is 19.8 MB in size.

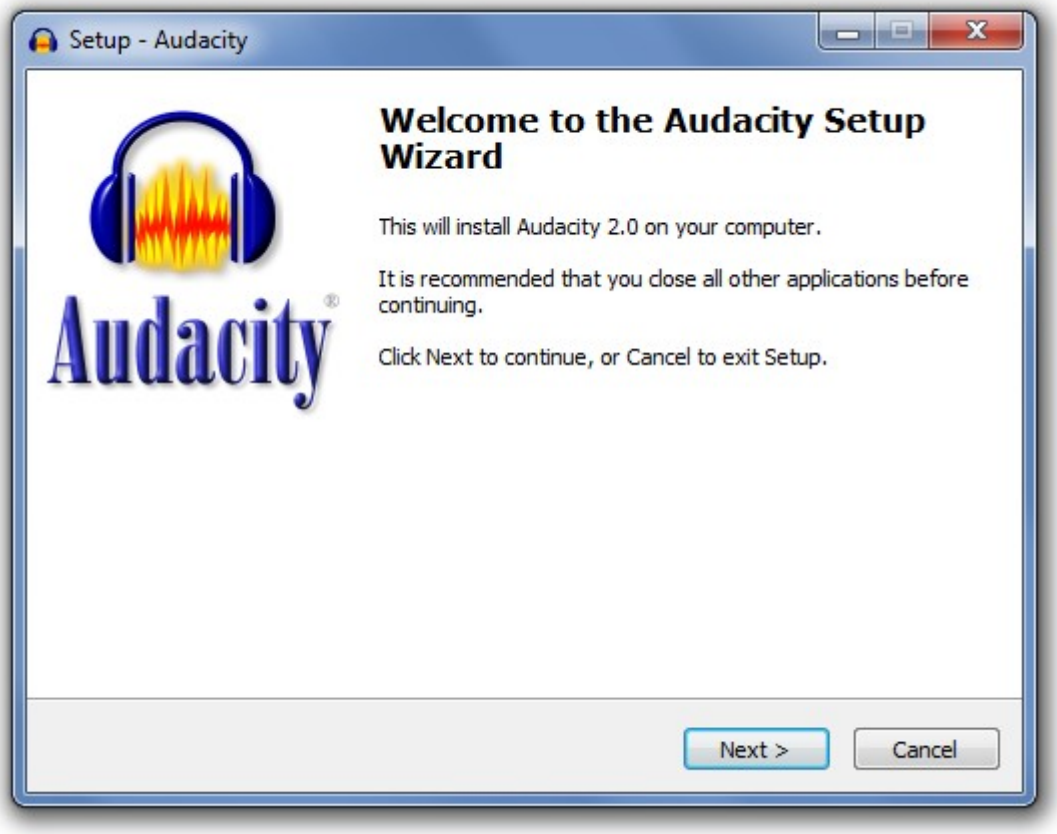
   

   It might be that a newer version than 2.0 is available. If so, download this newer version instead.

2. Double-click **audacity-win-2.0.exe** to start the installation.

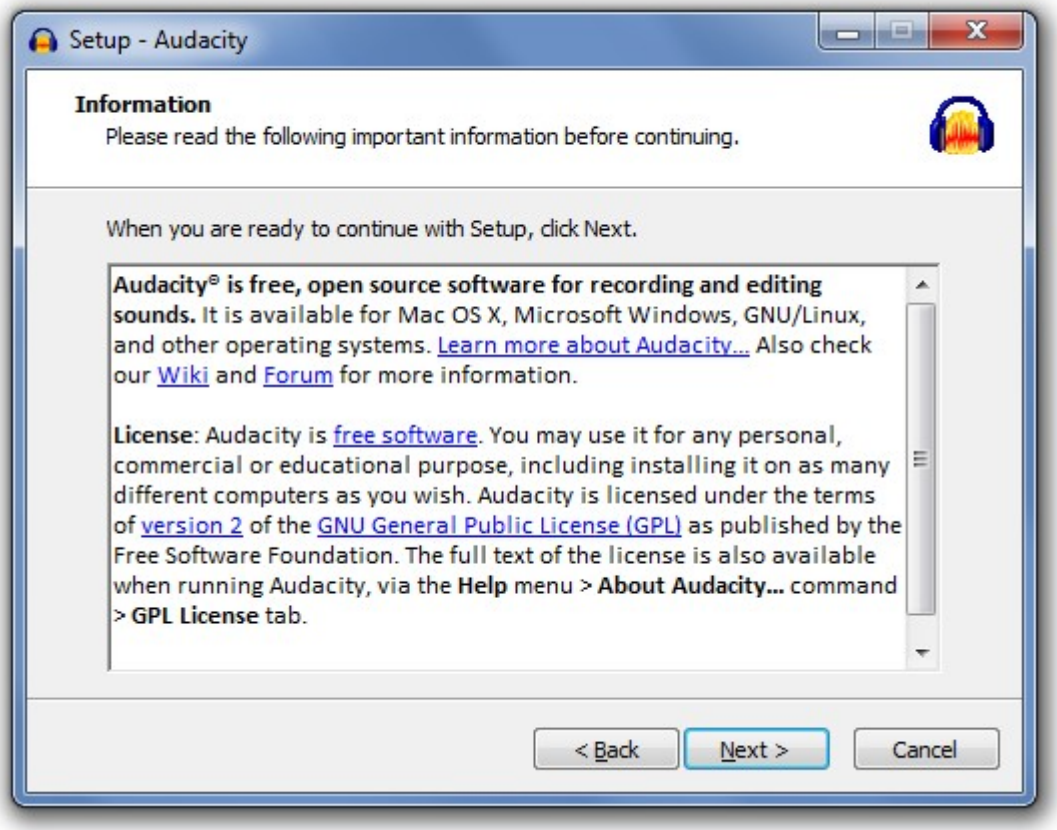
3. Select English as the language to use :

The Setup Wizard opens:



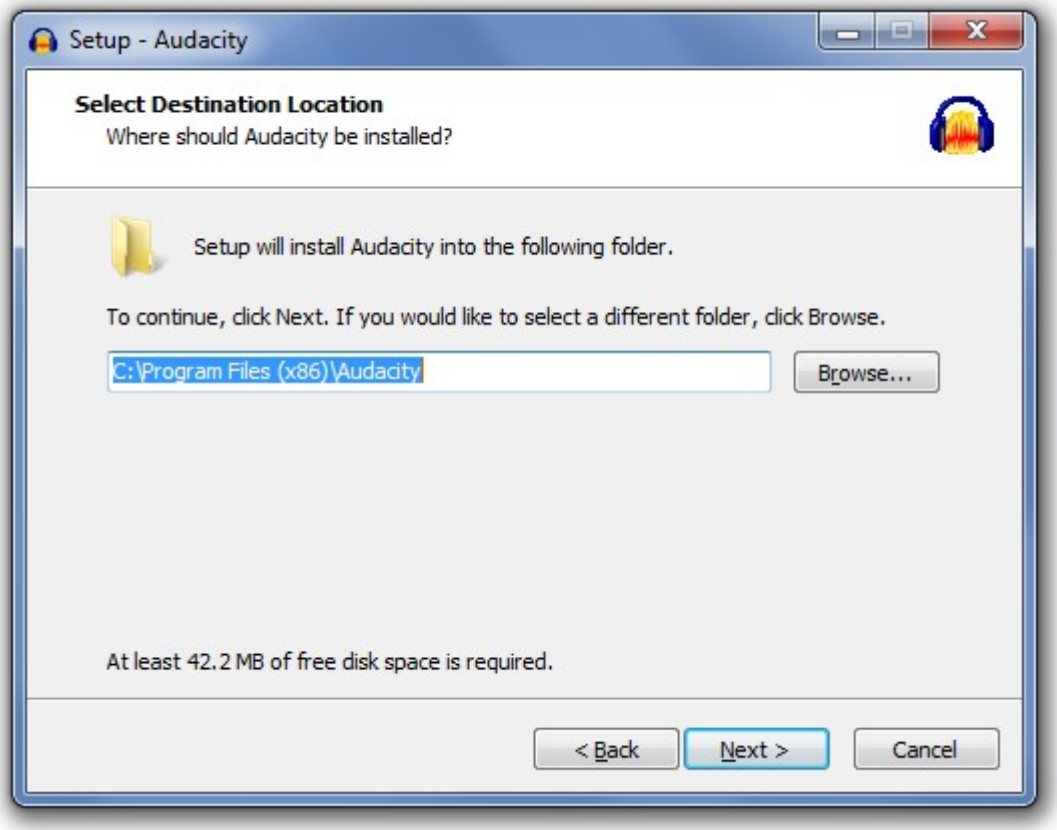
4. Click **Next** to continue.

A page of licence information will appear:



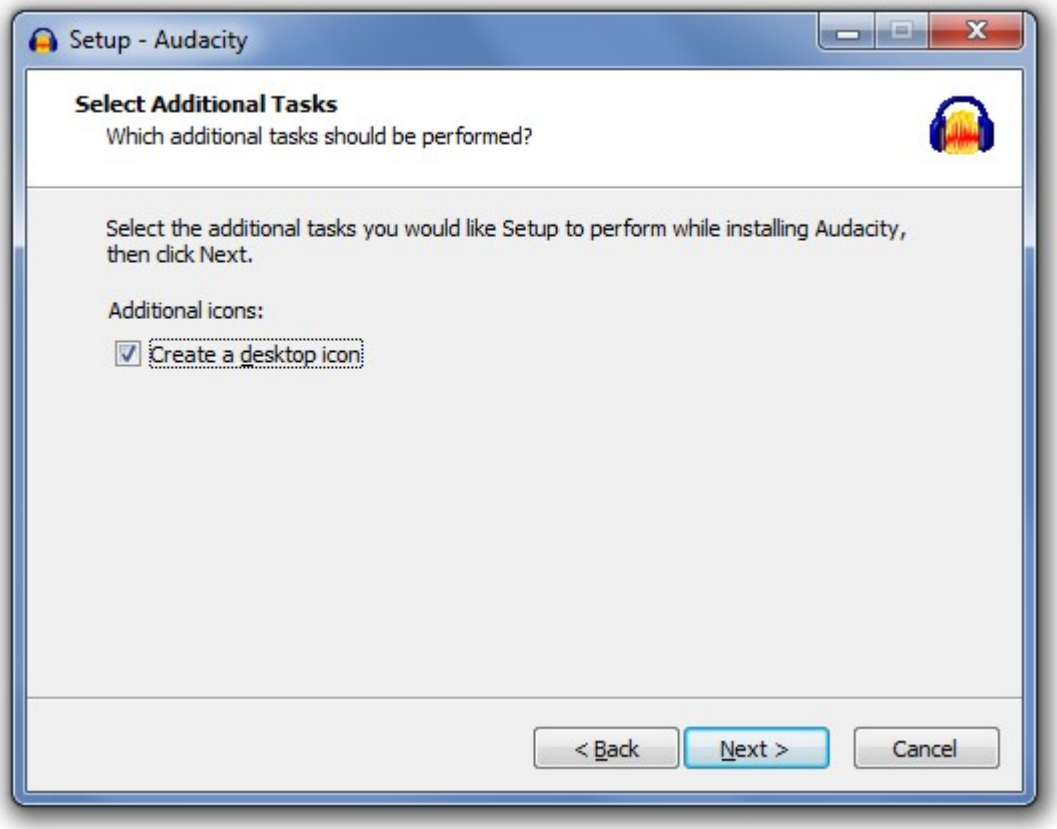
5. Click **Next** to continue.

   You will see the page **Select Destination Location**:



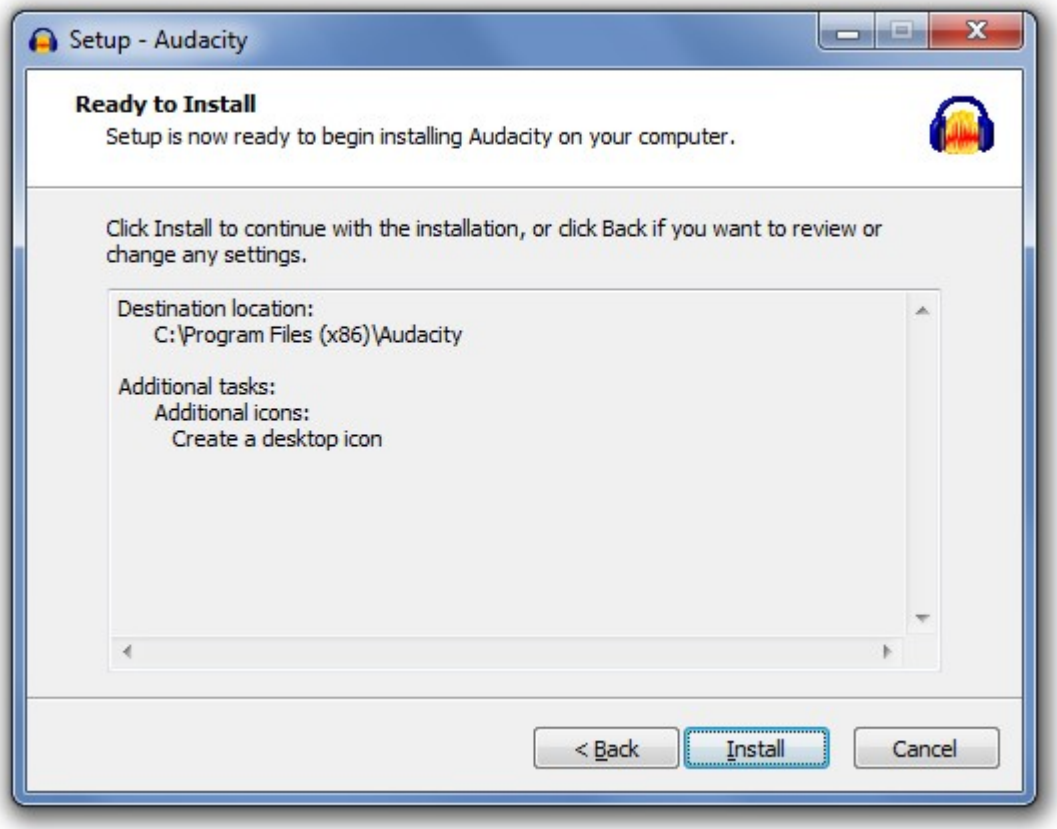
6. The suggested location in which to install Audacity is normally fine, so click **Next**.

You'll see the **Select Additional Tasks** page:

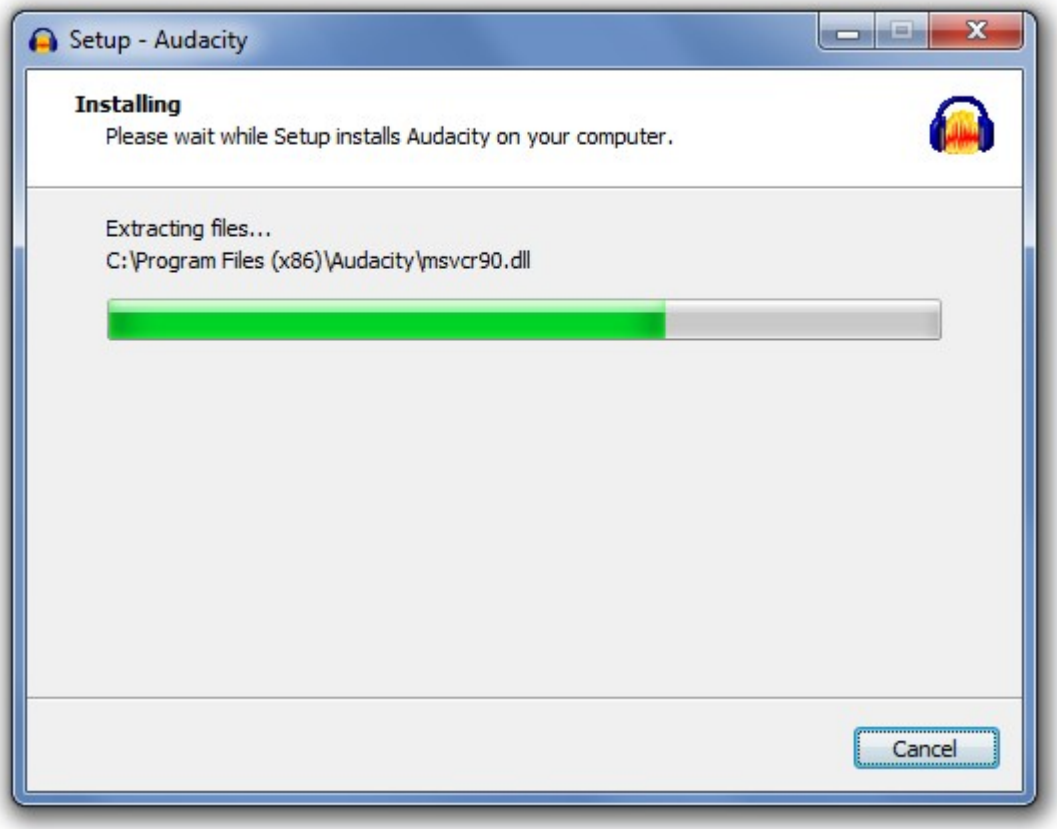


7. Click **Next** to continue.

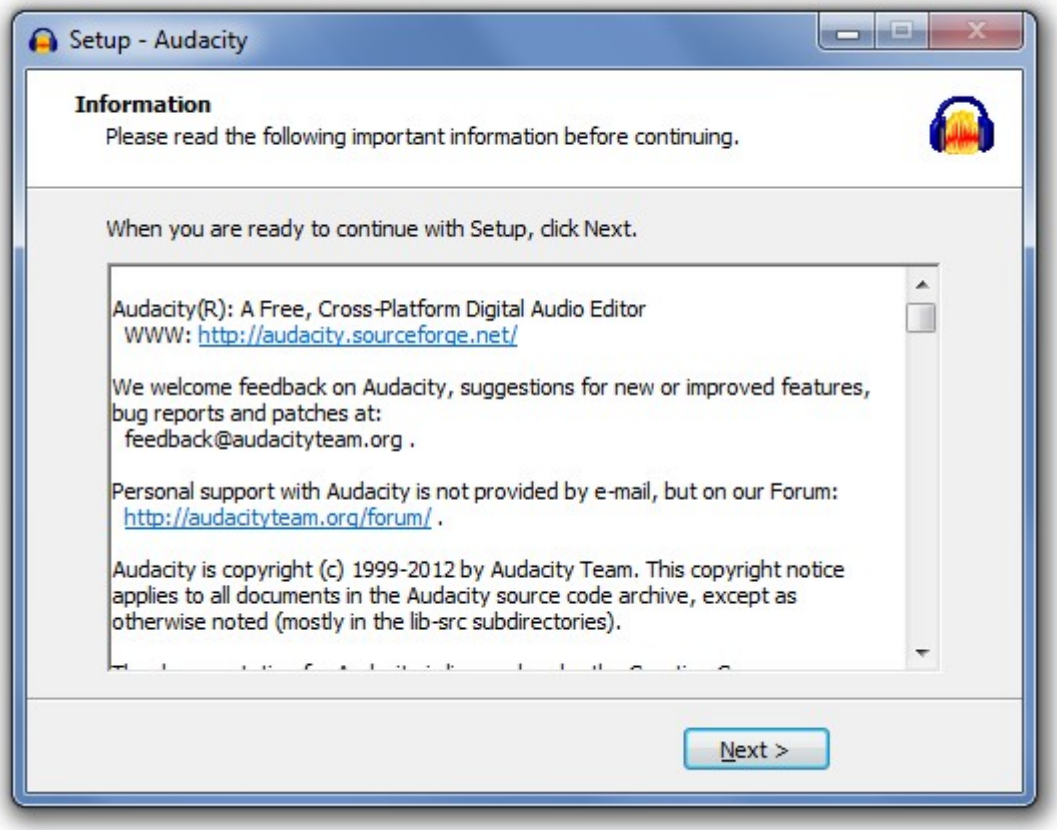
   You'll then see the **Ready to Install** page:



8. Click **Install** to begin the installation.

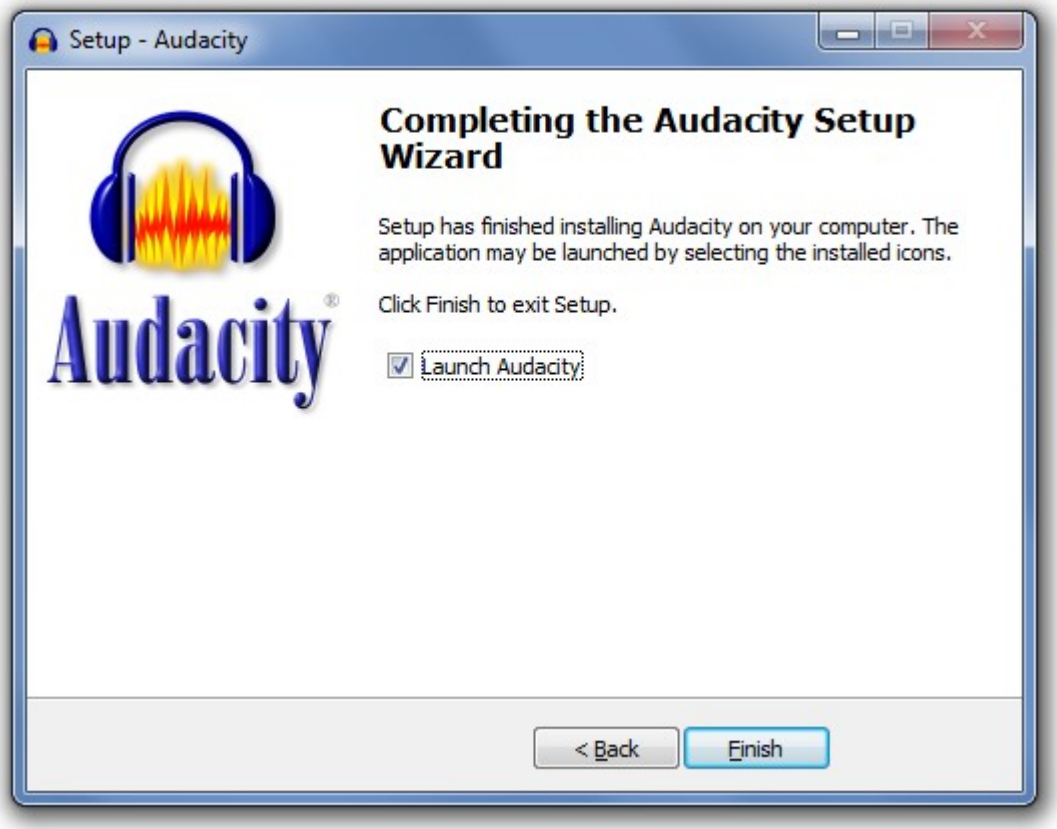


When the installation is complete, you will see a page of information:



9. Click **Next** to continue.

You will then see the final page of the Setup Wizard:



10. Click **Finish** to close the Setup Wizard and launch Audacity.

Audacity is now ready to use.

2.3. How to install the LAME file for MP3 export

If you want to be able to export files in the MP3 format, you will need to install the LAME DLL file. For legal reasons, this file is not included in the standard installation of Audacity but must be downloaded and installed separately.[4]

Here's how to install the LAME DLL:

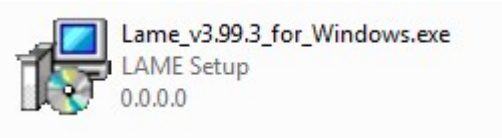
1. Download the latest LAME installation program from the Lame website:

   http://lame1.buanzo.com.ar

   Look for the file in the box under the sub-heading **'For FFMpeg/LAME on Windows'**.

   The filename to download will be called something like:

   Lame_v3.99.3_for_Windows.exe

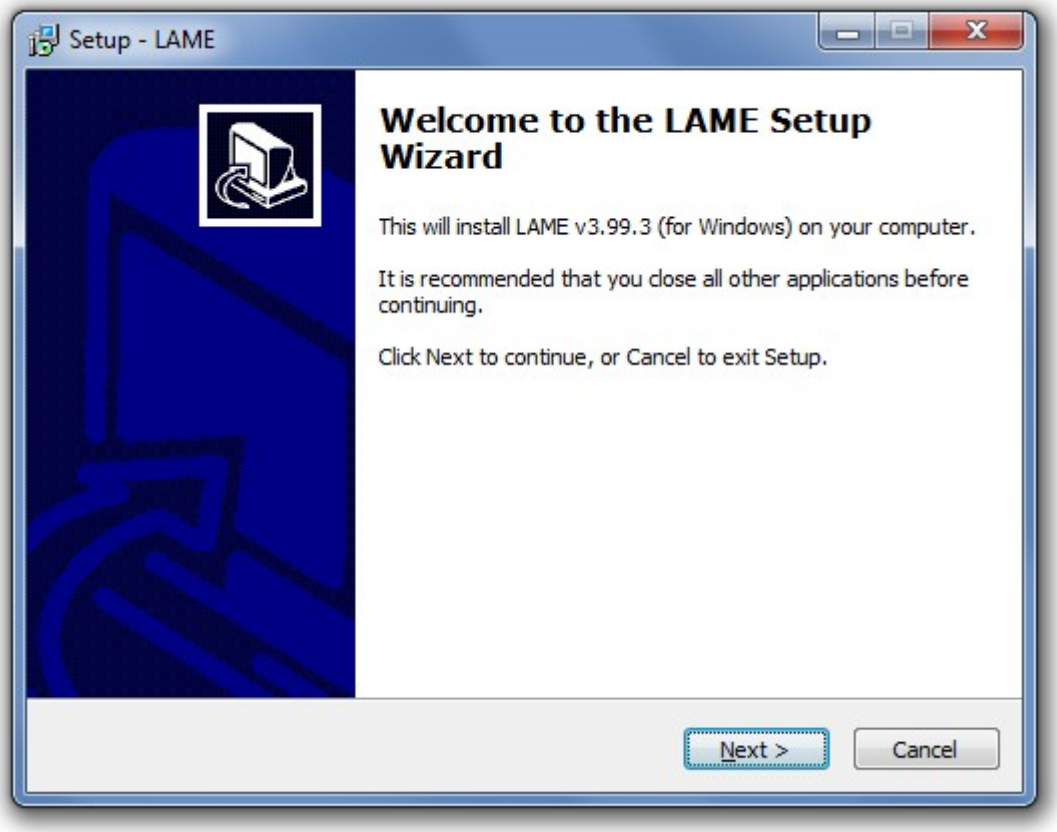
   

   It might be that a newer version than 3.99.3 is available. If so, download this newer version instead. This should be a quick download since the file is small (around 500 KB).

2. Double-click this downloaded .exe file to start the installation.

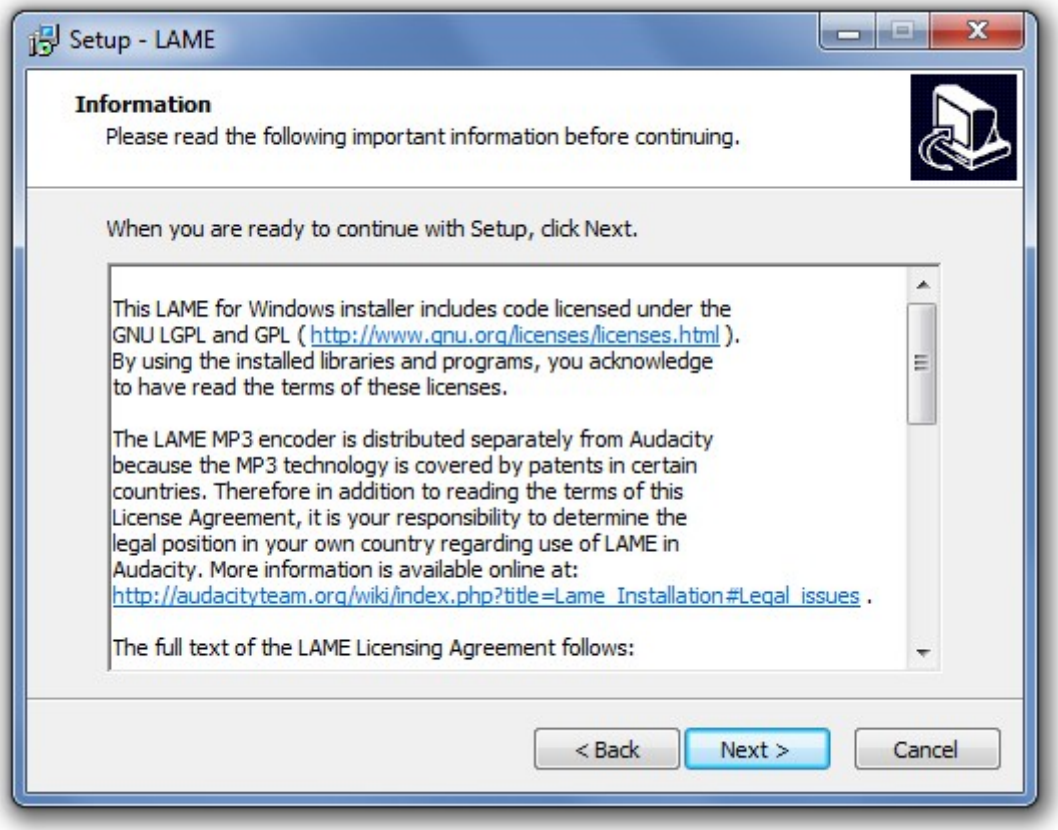
   The **LAME Setup Wizard** will begin.

[4] For more information regarding the legal considerations, see: http://wiki.audacityteam.org/index.php?title=Lame_Installation

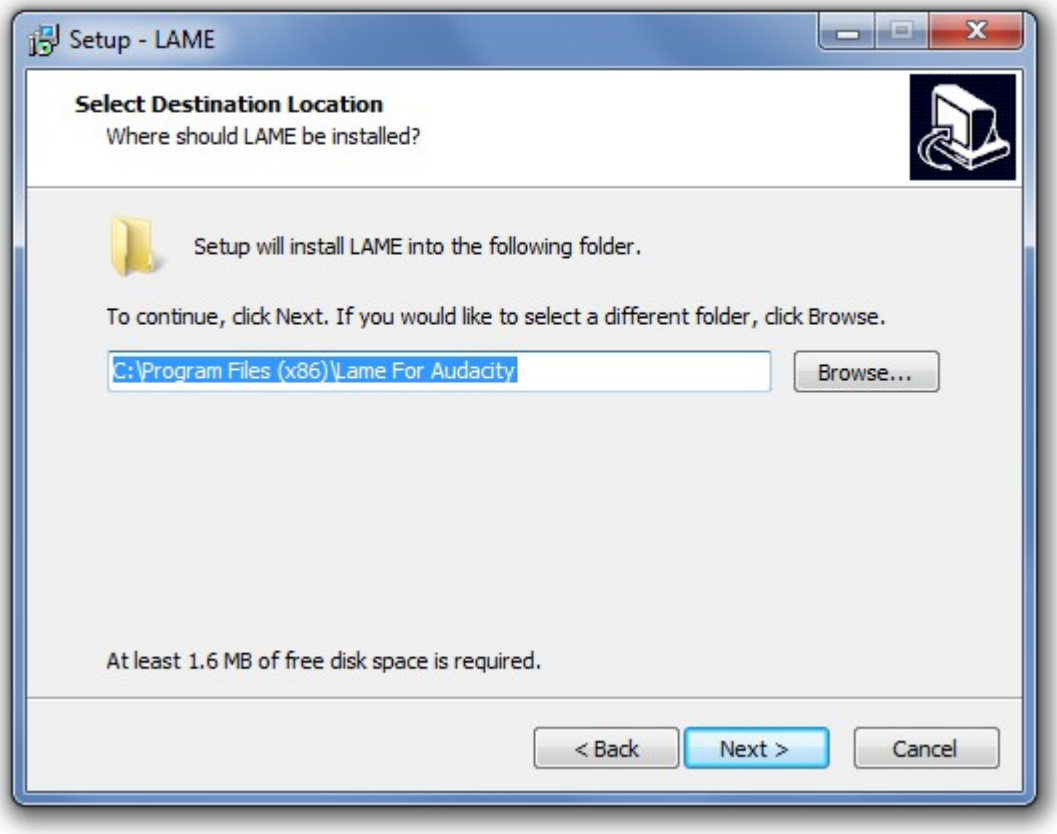


3. Click **Next** to continue.

   You will get the **Information** page which describes the licensing agreement.

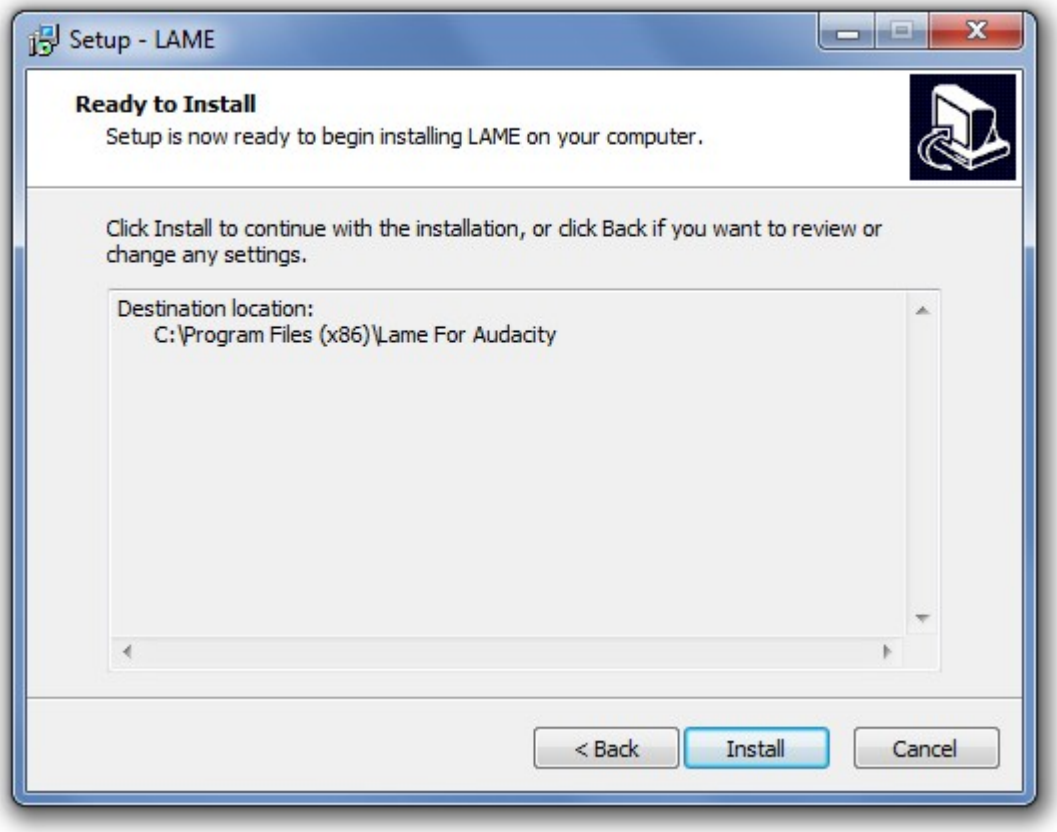


4. Click **Next** to continue.



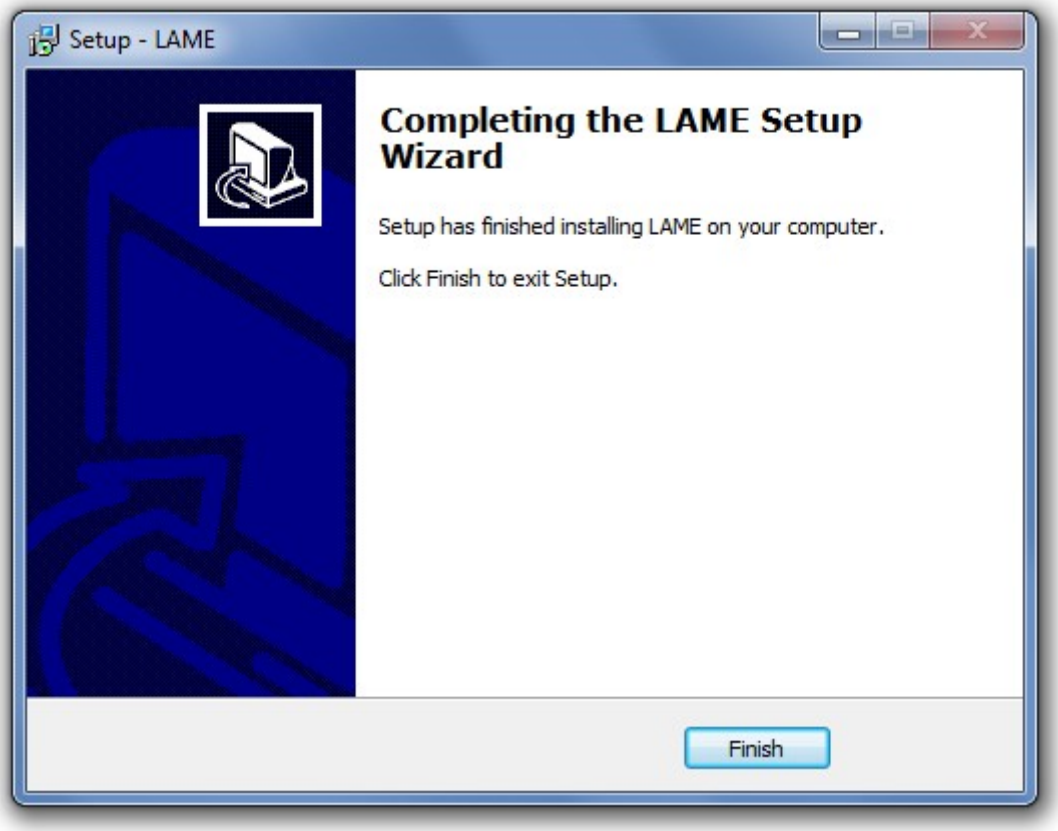
5. Accept the default destination folder and click **Next** to continue.

   You will get the **Ready to Install** page:



6. Click **Install** to begin the installation.

When the file has been installed you will get a confirmation page.



7. Click **Finish**.

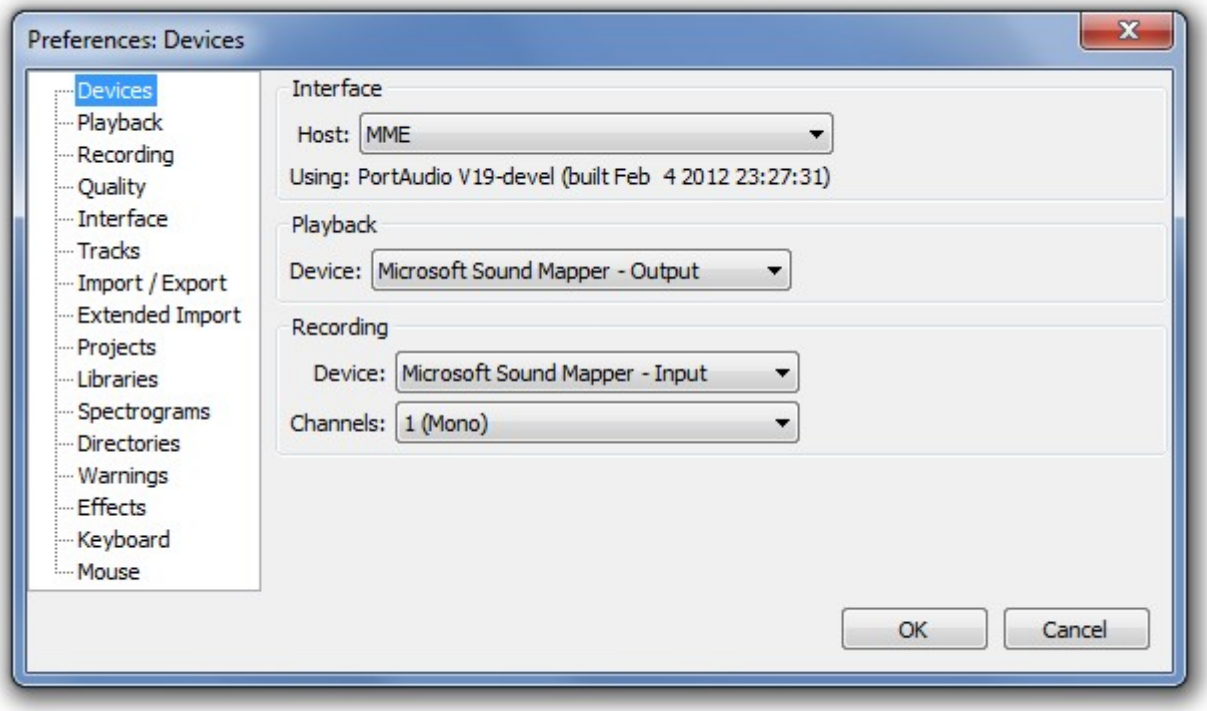
Now you will need to tell Audacity where to find the file you have installed.

To do this:

8. Launch the Audacity program.

9. On the menu at the top, click **Edit** ➢ **Preferences…** (or **Ctrl+P**).

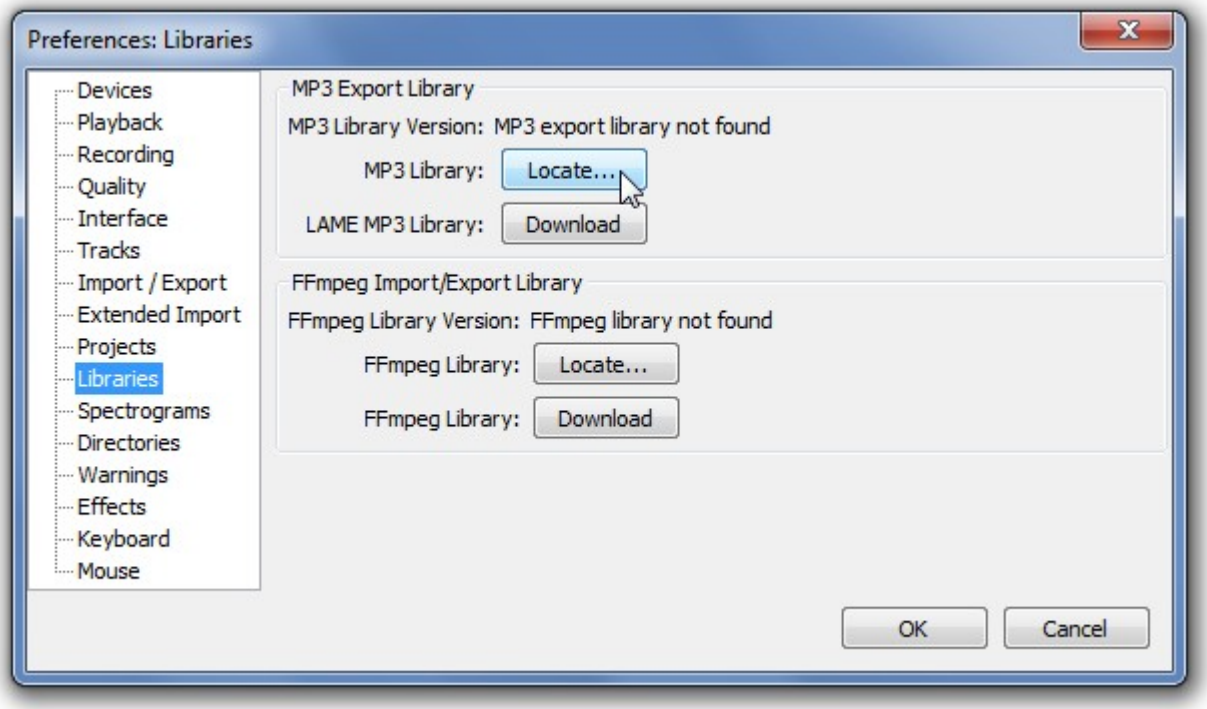
   You will get the Audacity Preferences dialog:



The Preferences dialog contains several pages of configuration settings.

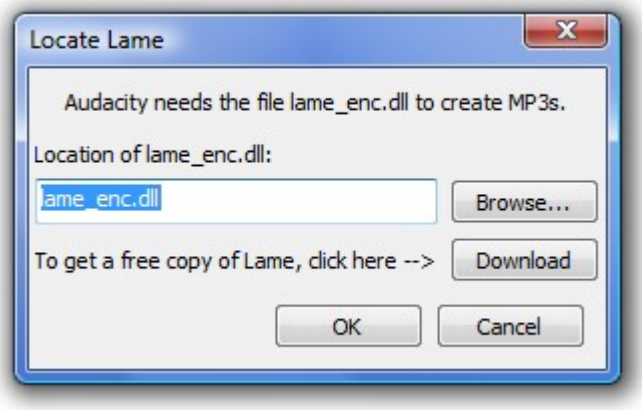
10. On the left, click **Libraries** (which is about half way down the list).

Notice that next to **MP3 Library Version**, it says 'MP3 export library not found'. We need to tell Audacity where to find the file we have just installed.



11. Click the **Locate…** button next to MP3 Library.

You will get the **Locate Lame** dialog:

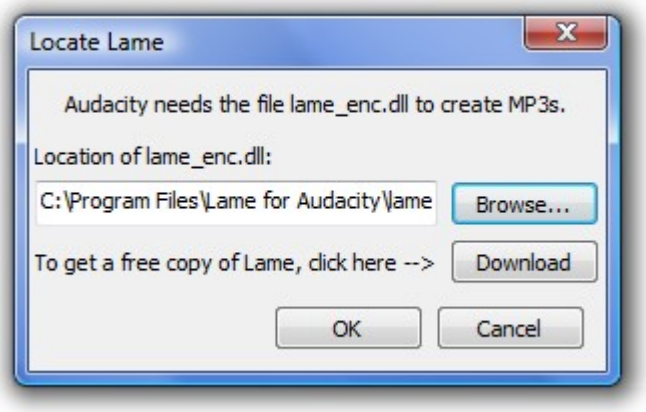


12. Click **Browse…** and navigate around your hard drive to find the place where you have just installed the LAME DLL.

    If you accepted the default installation location in the LAME Setup wizard, it is probably going to be at: **C:\Program Files\Lame for Audacity**

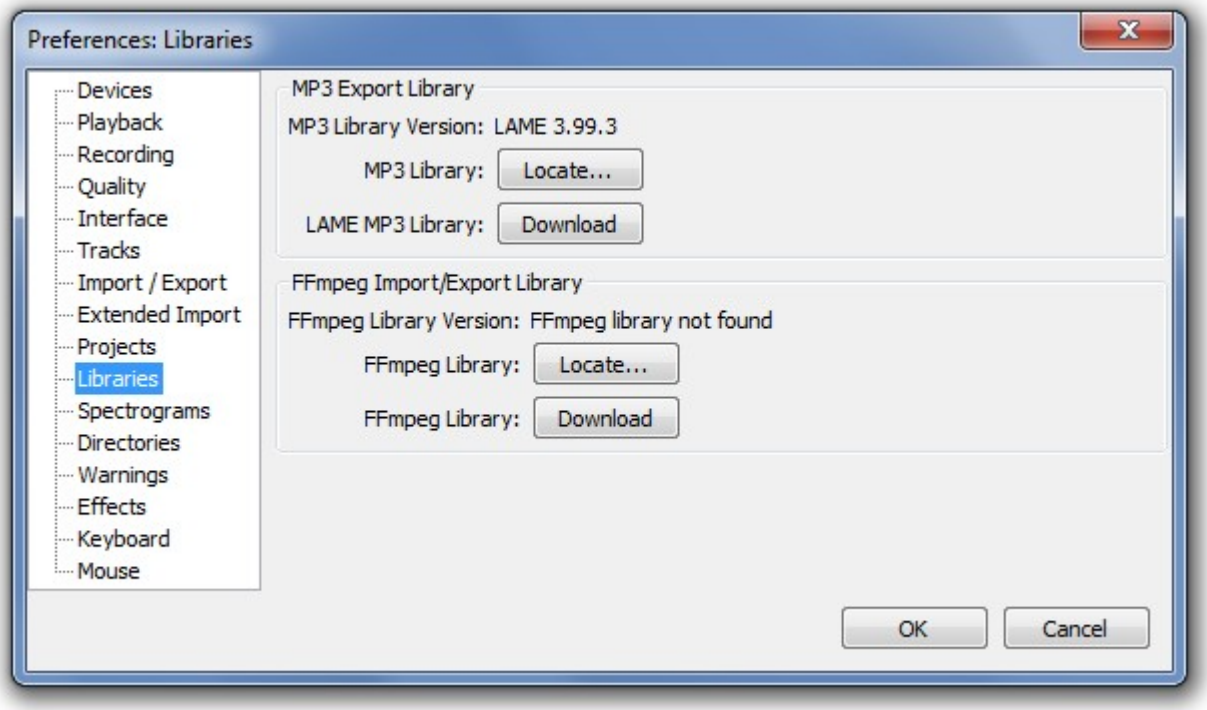
    To find this folder, click on the folders dropdown list at the top of the **Where is lame_enc.dll** dialog, click on **C Drive**, then find **Program Files**, then **Lame for Audacity**.)

13. Click **Open** when you have selected the **lame_enc.dll** file.



14. Click **OK**.

You should now be back to the **Preferences** dialog. If all is well you should see that next to **MP3 Library Version**, it indicates the LAME library version, e.g. something like 'LAME 3.99.3' (instead of saying 'MP3 export library not found' like before).



15. Click **OK**.

You have successfully installed the LAME DLL for MP3 exports.

3

Recording and playback

In this chapter you will learn:

- how to record audio onto your computer;
- what to do if you do not see any waveforms appearing;
- how to listen to what you have recorded;
- how to listen to parts of what you have recorded;
- how to delete an audio track;
- how to change the input volume of the recording.

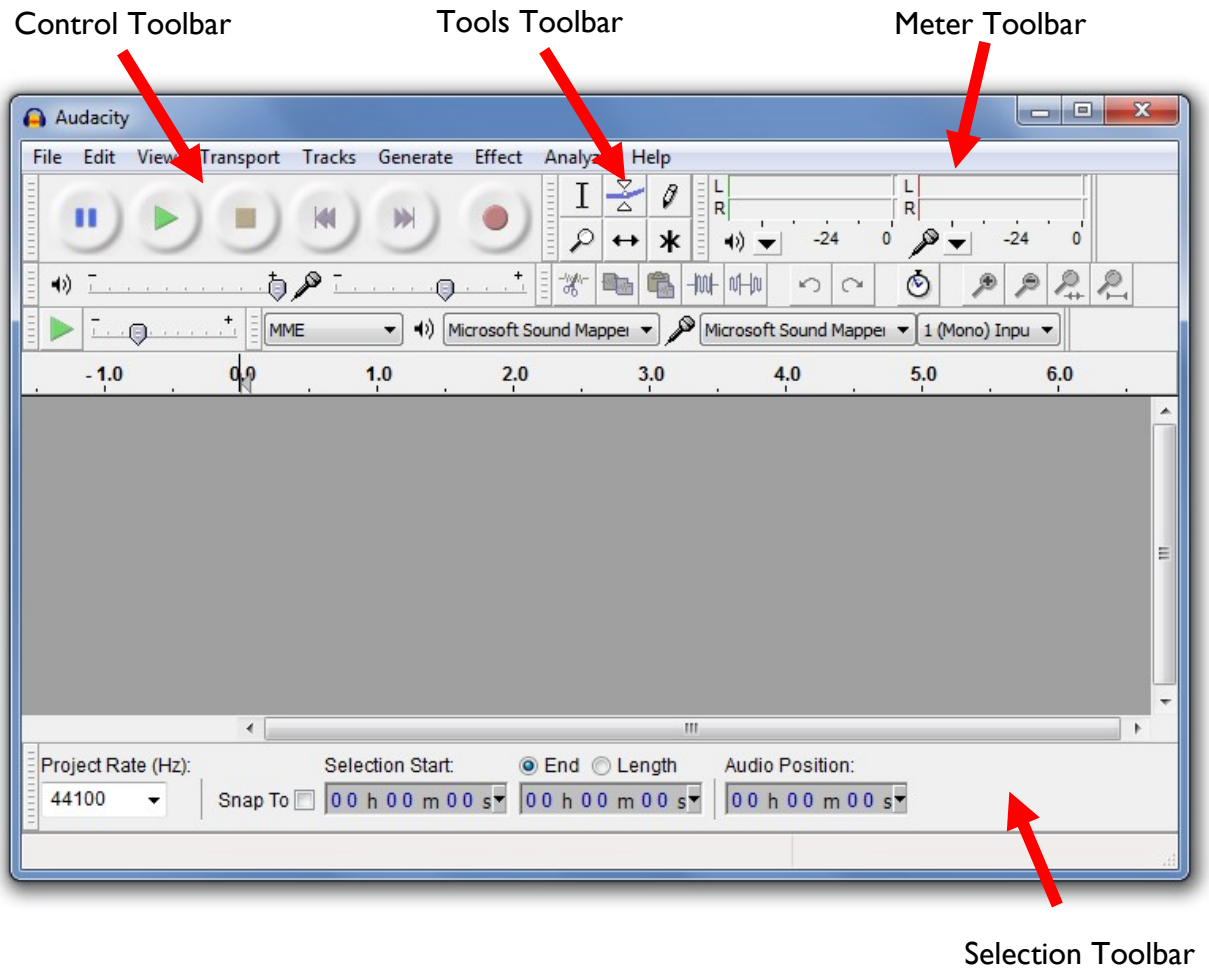
3.1. How to record audio onto your computer

1. Connect a microphone to your computer's microphone input socket or USB port (or set up your mixer equipment and audio interface).

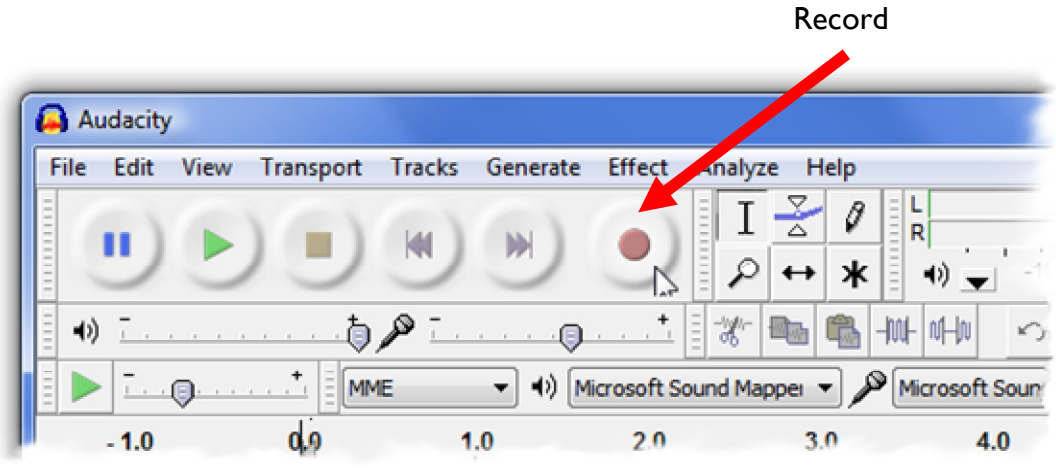
Turn on the microphone.

2. Double-click the Audacity icon on your computer's desktop to launch Audacity.

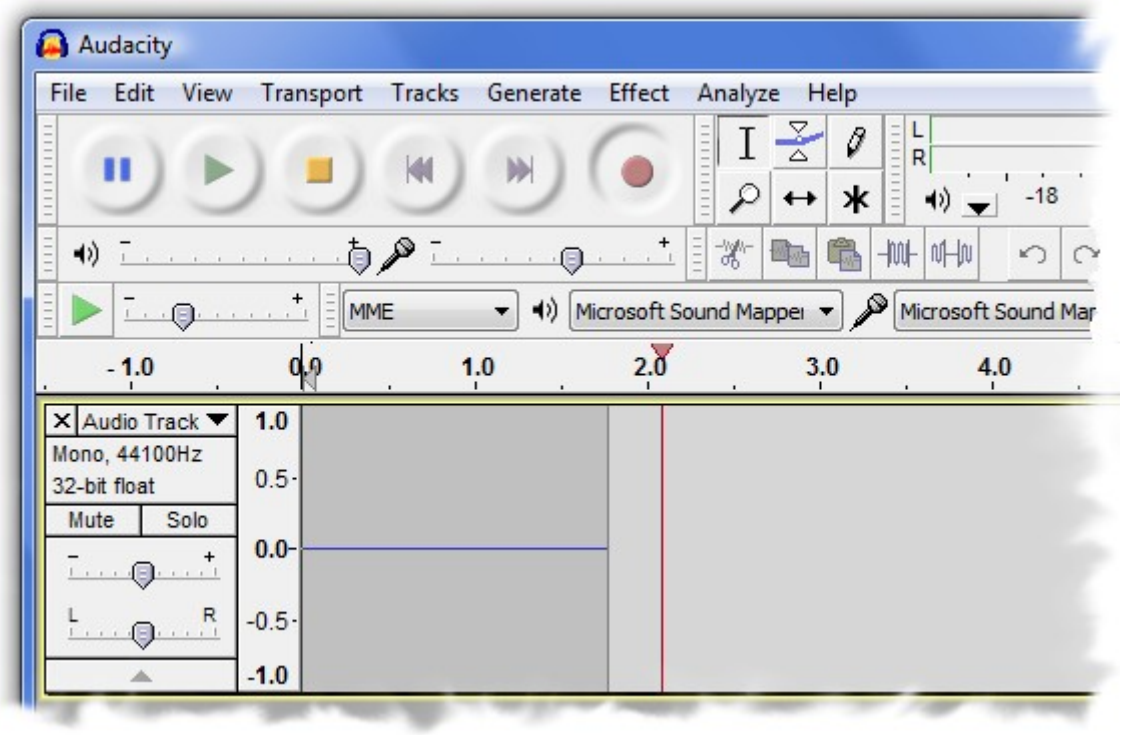
You'll get the Audacity main program window:



3. To start recording, click the **Record** button (the button with the red circle).

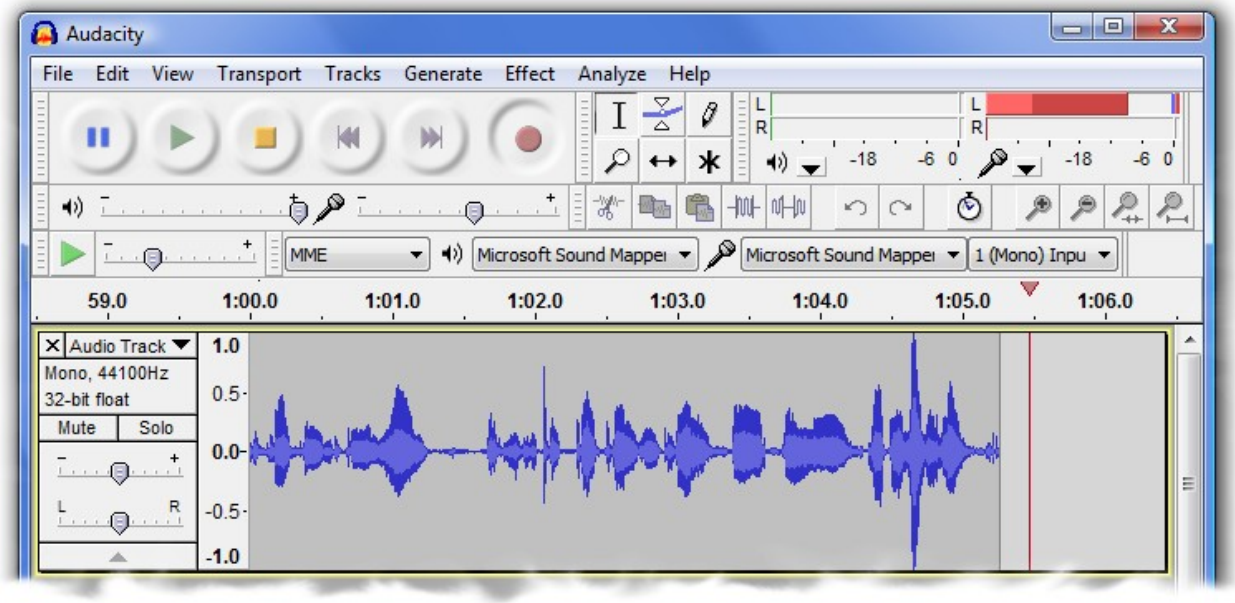


You should see an audio track appear on the screen.



4. Speak into the microphone.

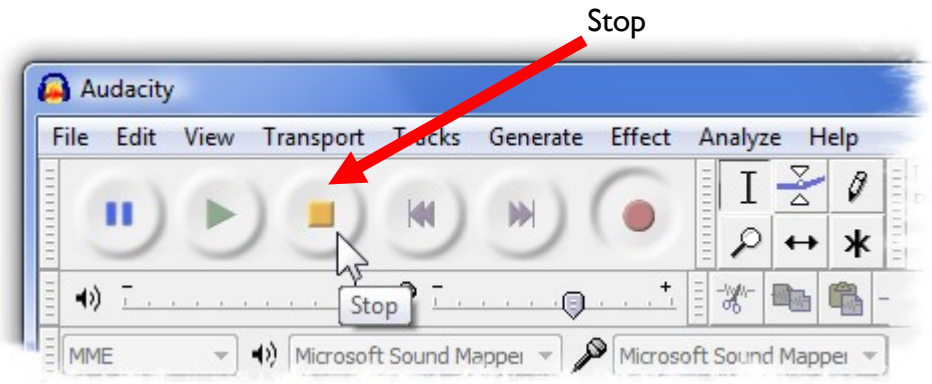
   When you speak, you should see waveforms on the track, like this:



   A vertical red line indicates the current position of the recording. You will see this line move from left to right, with a red triangle just above the track.

   You should also see a moving horizontal red bar on the meter toolbar.

5. To stop recording, click the **Stop** button (the button with the yellow square).



3.2. What to do if you do not see any waveforms appearing

If, despite having pressed the Record button, you don't see any waveforms in the track when you speak into the microphone, it means that Audacity is not recognising your microphone input.

To fix this, check the following:

1. Is the microphone **connected correctly**? If it is a microphone with a 3.5 mm plug, make sure that the microphone plug is firmly inserted into the computer's microphone socket (and not the headphones socket).

2. Is the microphone **turned on**? Some microphones have an on/off switch.

3. Is the microphone selected as the **current input device**? This is especially important to verify if you have connected a USB microphone.

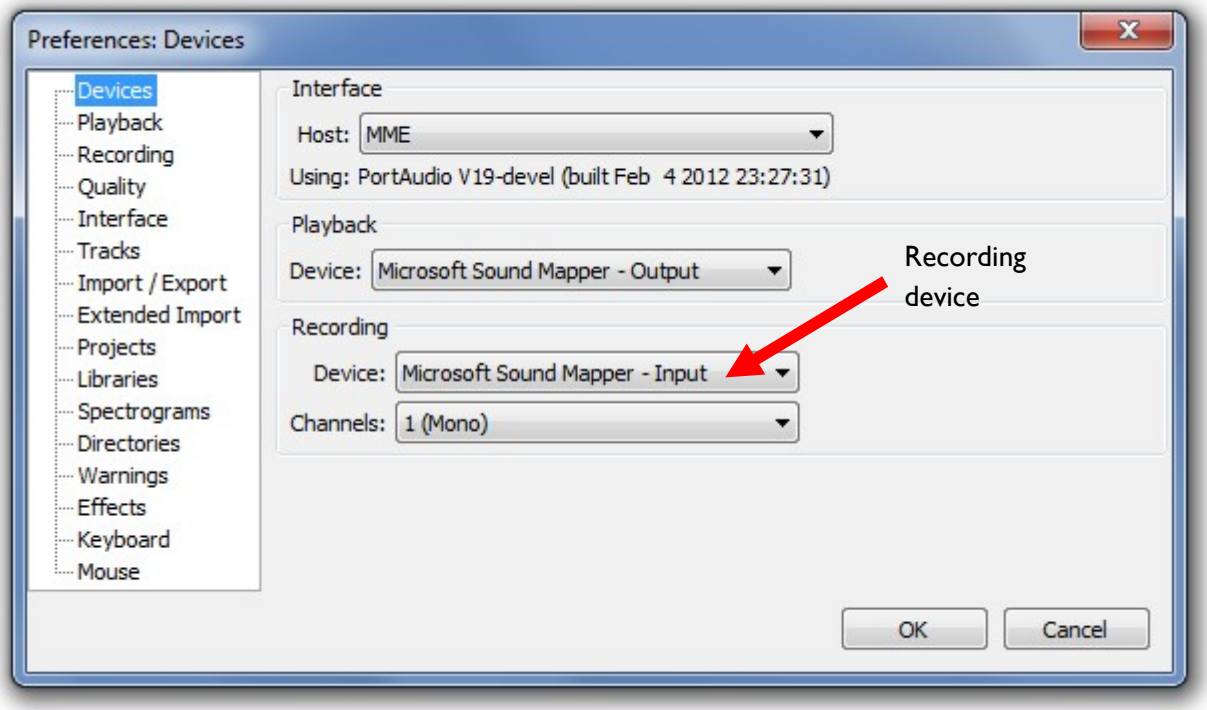
   You can find the current input device on the Audacity Device toolbar to the right of the microphone icon:

   Another place to check this is in the Preferences:

   i. On the menu select **Edit ➢ Preferences…** (or **Ctrl+P**)

   ii. Select **Devices** (top left) if it is not already selected.

   iii. Try changing the Recording Device, and click **OK**.



4. Is the audio **input level high enough**? Move the slider to the right if not.

5. Is the **correct microphone enabled** in the Sound configuration options in Windows **Control Panel**?

   These configuration options are outside of Audacity, and can be accessed via the Control Panel from the Windows Start menu, or by right clicking on the Speaker/Volume icon on the bottom right of the screen.

   If you are running Windows Vista or Windows 7:

   i. Access the audio configuration from the Windows Start menu:
      Start ➢ Control Panel ➢ Hardware and Sound ➢ Sound
      or by right clicking on the Speaker/Volume icon on the bottom right of the screen and selecting **Recording Devices**.

   ii. On the **Recording** tab, enable or disable the recording devices as required and verify their settings by right clicking and selecting **Properties...**

   If you are running Windows XP:

   i. Access the audio configuration from the Windows Start menu:
      Start ➢ Control Panel ➢ Sounds and Audio Devices.
      or by right clicking on the Speaker/Volume icon and selecting **Adjust Audio Properties**.

ii. Select the **Audio** tab, and ensure that the Default device for Sound Recording and its volume settings are as they should be.

For more details on these settings, please see sections B or C in the Appendix.

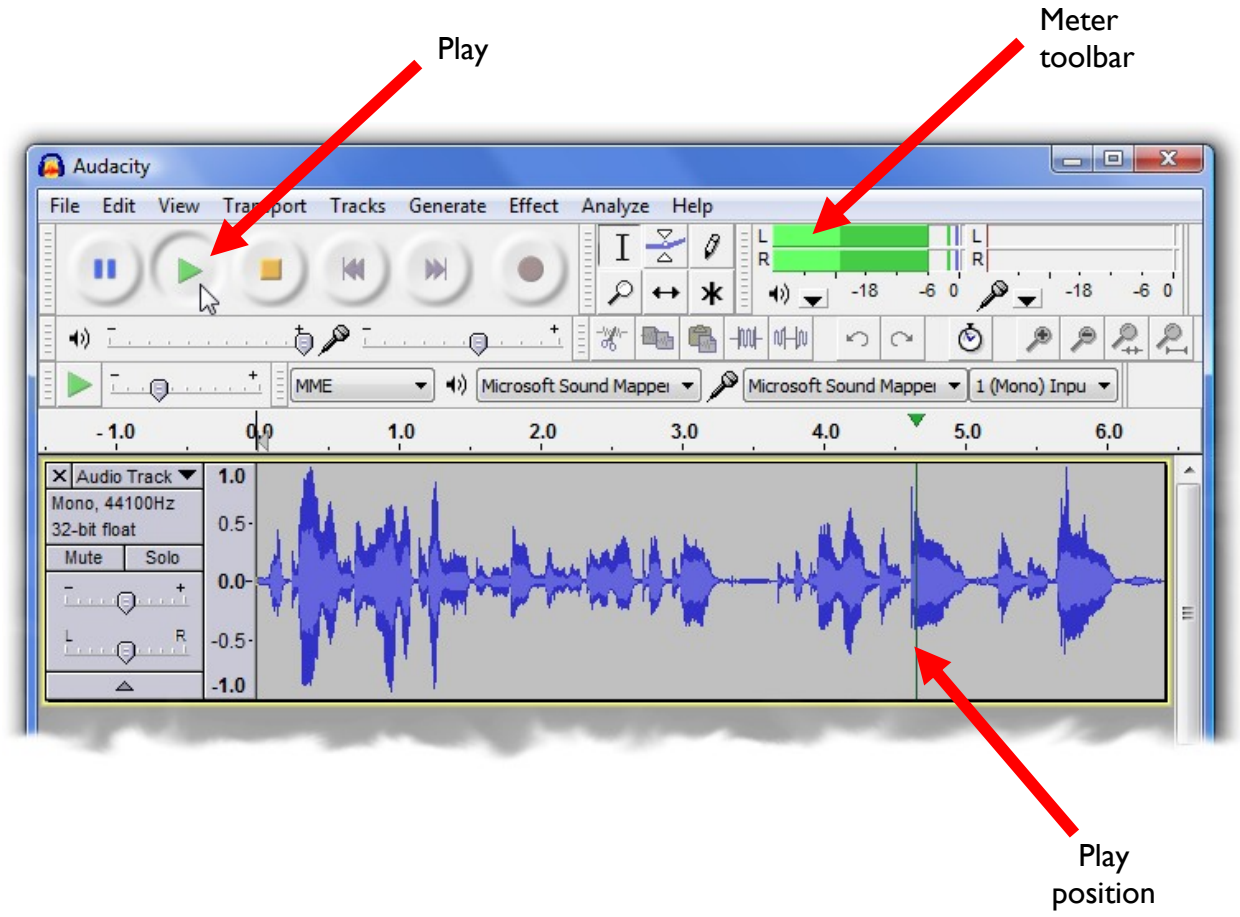
6. If the microphone has a **battery** inside, does it still have enough charge?

7. If the microphone is a condenser type and needs **phantom power**, is this being provided?

8. Is the **microphone working**? Try another microphone to see if it works any better. Or try changing the microphone cable.

3.3. How to listen to the recording

To listen to the recording, click the **Play** button (the button with the green triangle), or hit the **Space** bar.



A vertical line indicates the current position of the playback, i.e. the part of the track you are currently listening to. When you listen to a track, you will see that this line moves from left to right, with a green triangle just above the track.

Pause

During playback, you can pause by clicking on the **Pause** button (or by pressing **P** on the keyboard):

Pause

If the playback is paused, click on **Pause** (or press **P**) to continue listening to the track.

3.4. What to do if you do not hear any sound from the speakers

If you saw the green bars moving on Audacity's meter toolbar but didn't hear any sound coming from you computer speakers, check the following:

1. Has the **volume** been turned down on the computer?

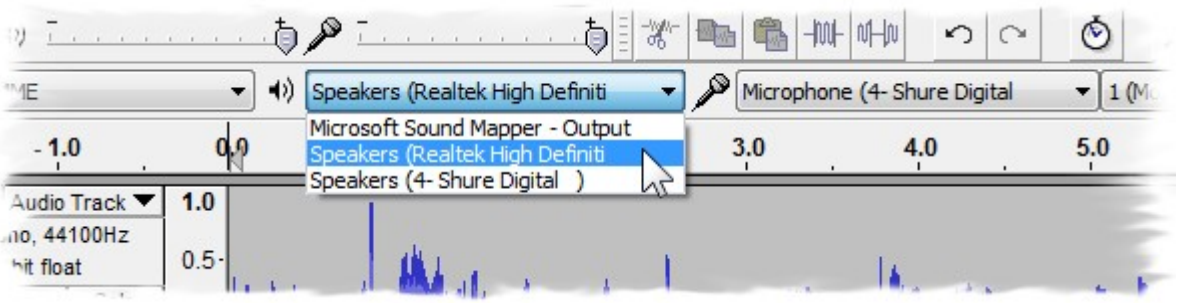
2. Has the computer sound been **muted**? (Check the speaker icon in the notification area at the bottom right of your screen).

3. If you have **external speakers** connected, are they connected correctly and turned on with the volume high enough?

4. Is the **audio output level high** enough? Move the slider to the right if not.

5. Are the computer speakers selected as the **current output device**? (This might have been changed if you have connected a USB audio interface.)

   You can find the current output device on the Audacity Device toolbar to the right of the speaker icon:

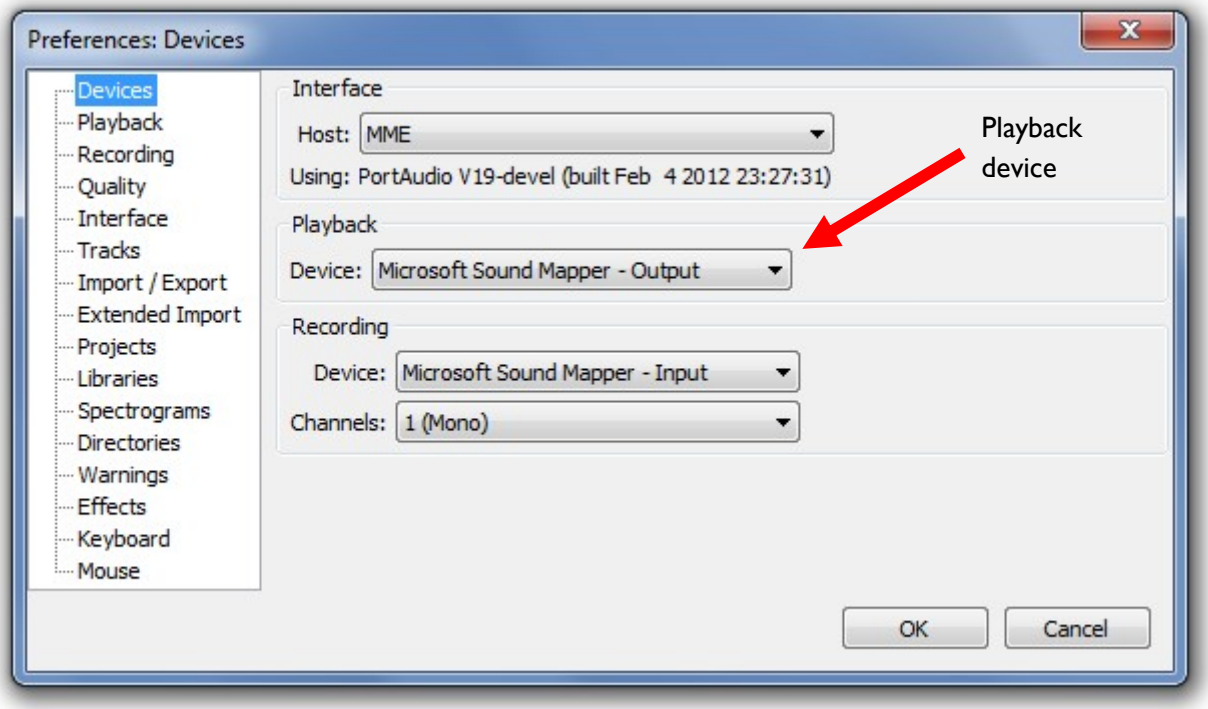


Another place to check this is in the Preferences:

i. On the menu, select **Edit ➢ Preferences…** (or **Ctrl+P**)

ii. Select **Devices** (top left) if it is not already selected.

iii. Try changing the Playback Device, and click **OK**.



6. Are the **correct speakers enabled** in the Sound configuration options in Windows **Control Panel**?

These configuration options are outside of Audacity, and can be accessed via the Control Panel from the Windows Start menu, or by right clicking on the Speaker/Volume icon on the bottom right of the screen.

If you are running Windows Vista or Windows 7:

i. Access the audio configuration from the Windows Start menu:
Start ➢ Control Panel ➢ Hardware and Sound ➢ Sound
or by right clicking on the Speaker/Volume icon on the bottom right of the screen and selecting **Playback Devices**.

ii. On the **Playback** tab, enable or disable the playback devices as required and verify their settings by right clicking and selecting **Properties**.

If you are running Windows XP:

i. Access the audio configuration from the Windows Start menu:
Start ➢ Control Panel ➢ Sounds and Audio Devices.
or by right clicking on the Speaker/Volume icon and selecting **Adjust Audio Properties**.

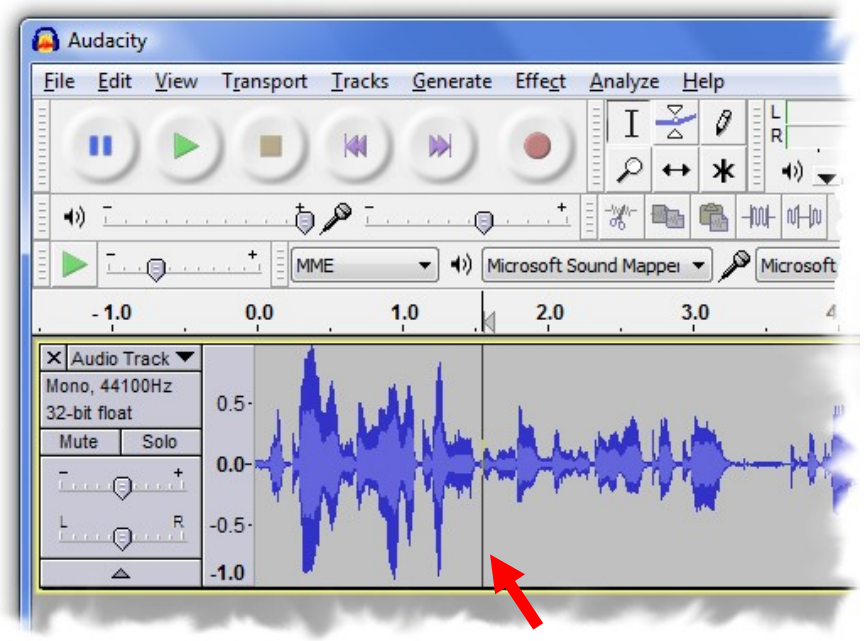
ii. Select the **Audio** tab, and ensure that the Default device for **Sound playback** and its volume settings are as they should be.

For more details on these settings, please see sections B or C in the Appendix.

3.5. How to listen to a part of the track

If you want to start listening to a track at a certain point, all you need to do is place the cursor where you want to begin the playback and then click **Play**.

The **cursor** is the black vertical line on the track that does not move during playback or recording. Some of the line is visible above the track on the timeline.

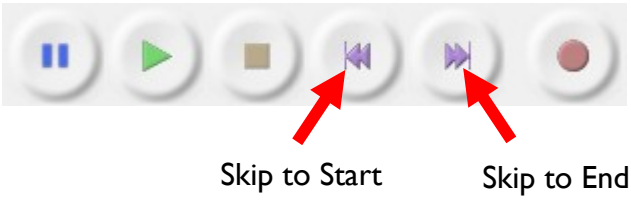


To place the cursor where you want to start playback:

- click in the track at the position you choose.

To move the cursor to the beginning of the track:

- click the button **Skip to Start**, or
- press the **Home** key on the keyboard.



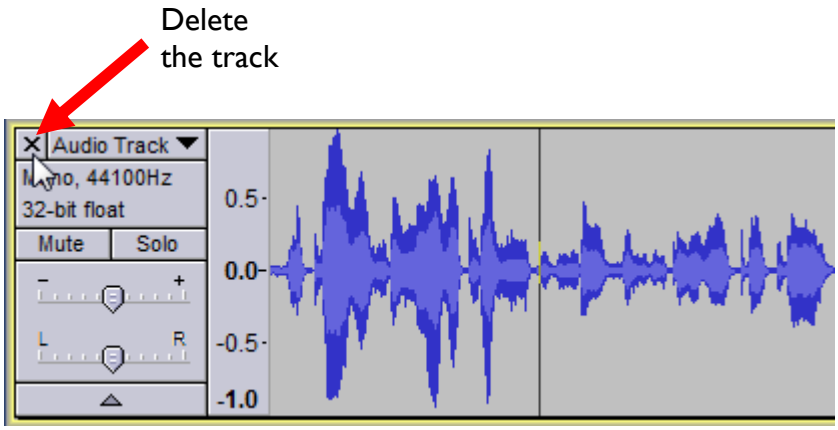
To move the cursor to the end of the track:

- click the button **Skip to End**, or
- press the **End** key on the keyboard.

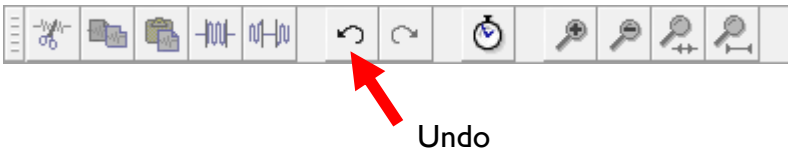
3.6. How to delete a track

Every time you click the **Record** button, a new track is created.

If you don't need a track anymore (e.g. if it was just a test), you can delete it. To do this, click the **X** button on the top left-hand corner of the track, as indicated in the image below:



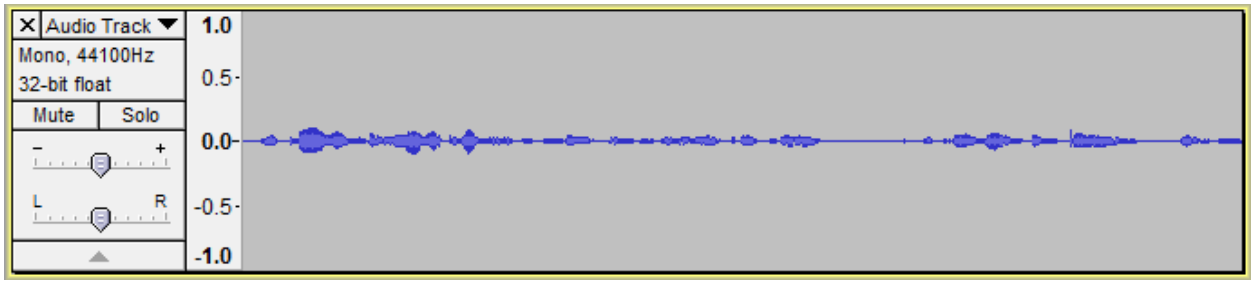
If you make a mistake and accidentally delete a track that you want to keep, you can restore the deleted track by clicking on the **Undo** button (or **Ctrl+Z**).



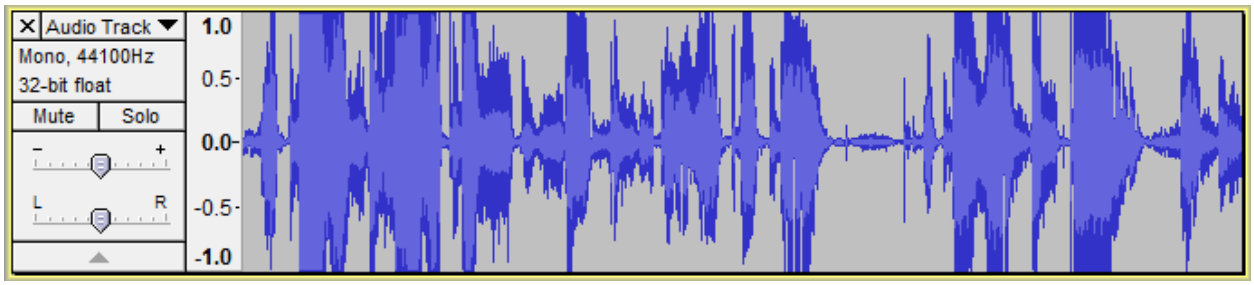
3.7. How to change the volume of the audio input

It is very important to ensure that the volume of the audio input is at the right level.

If the volume if the input is too low, the waveforms on the track will appear like in the image below. They are very weak:



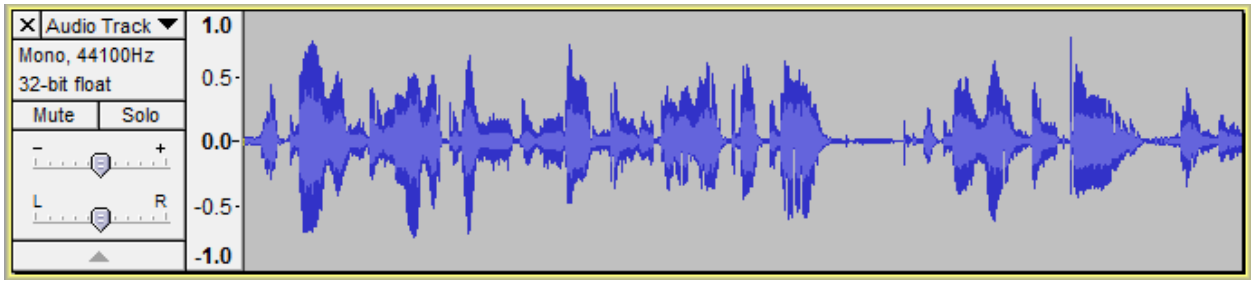
If the volume of the input is too high, the track will be saturated and the waveforms are clipped at the top and bottom of the track, like in the image below:



To see more clearly which waveforms have been clipped:

- On the menu, select **View ➢ Show Clipping**. The clipped waves will be shown in red.

What you are looking for is something like this:



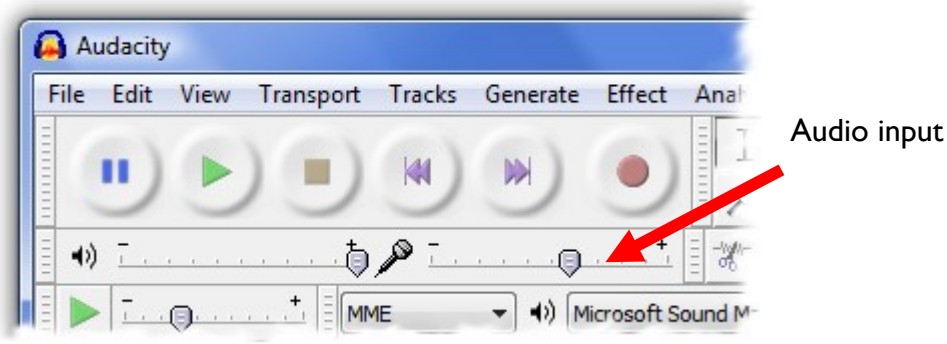
To **increase the volume** of the audio input:

i. speak louder, or

ii. move closer to the microphone, or

iii. move the Audio input slider to the right, or

iv. increase the levels on your mixer, pre-amp or audio interface (if you are using any of these).



To **lower the volume** of the audio input:

i. speak less loudly, or

ii. move further away from the microphone, or

iii. move the Audio input slider to the left.

iv. lower the levels on your mixer, pre-amp or audio interface (if you are using any of these).

4

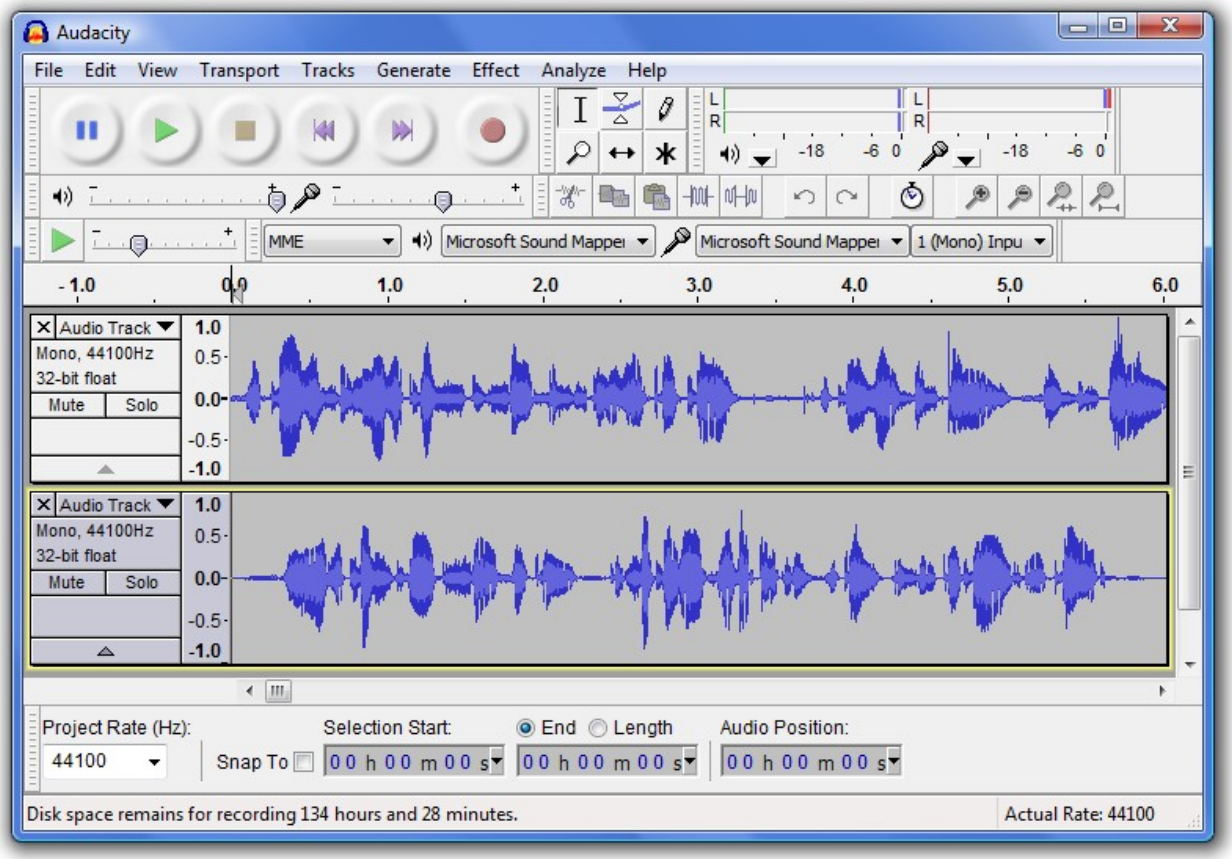
Handling multiple tracks

In this chapter you will learn:

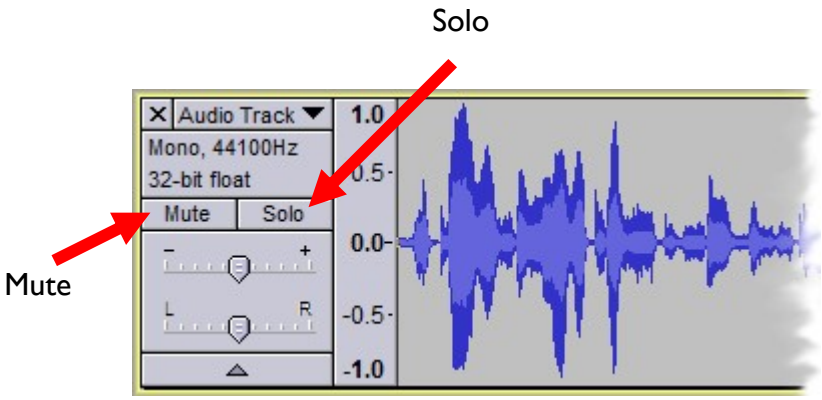
- how to listen to just one track rather than all the tracks at once;
- how to record one track after another;
- how to move the start of a track relative to another track;
- how to handle mono and stereo tracks.

4.1. How to listen to just one track rather than all the tracks at once

If you have recorded several tracks, like in the image below, you'll notice that when you click **Play**, all the tracks are played at the same time. There is a mix of sounds.



To choose to listen to just one track, use the **Mute** or **Solo** buttons on the panel to the left of the track:



Mute - turn off this track, mute it.

Solo - choose just this track to listen to and mute all the other tracks.

When a track is muted, the wave forms are greyed out:

4.2. How to record one track after another

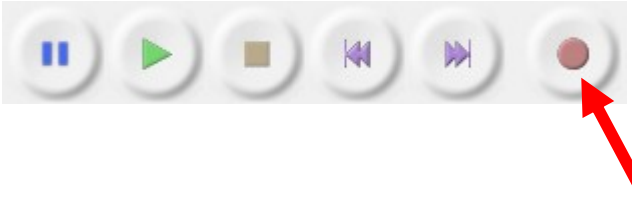
It is possible to avoid the situation where all the recorded tracks begin at the same time.

To do this, you can either:

- append the next recording to the end of the current track (i.e. not adding a new track), or
- align the track for the next recording so that it starts at the end of the current track.

To append the next recording to the end of the current track

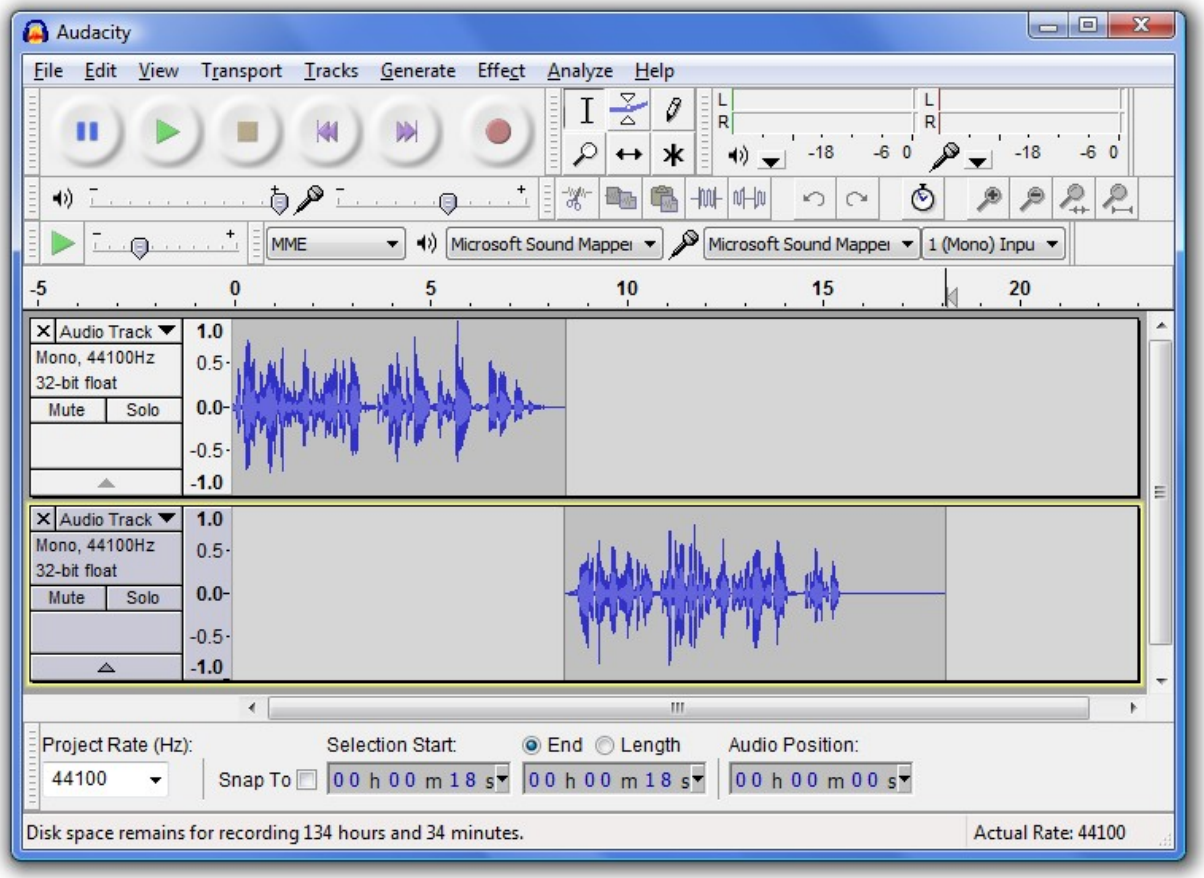
When you click the **Record** button to start the recording, hold down the **SHIFT** key at the same time. When you do this, Audacity will not create a new track, but rather append the new recording to the existing track.



Press the Record button while holding down the SHIFT key on the keyboard.

To align the track for the next recording so that it starts at the end of the current track

Before clicking the **Record** button, move the cursor to the end of the current track using the **Skip to End** button (or the **End** key). Now when you hit **Record**, the new track will begin under where you placed the cursor, as in the image below:

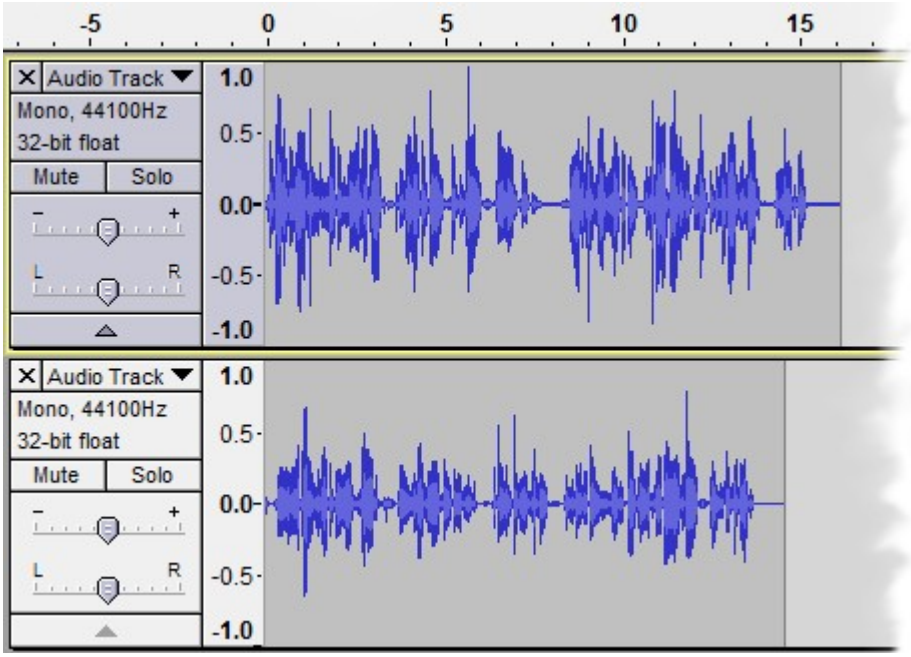


Here the second track starts after the end of the first track.

Note: Even if you record in this way, you will normally need to move the tracks a bit when you do the final editing.

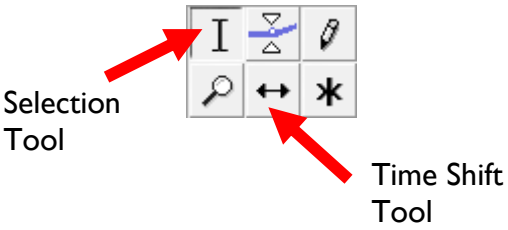
4.3. How to move the start of a track relative to another track

Consider the two tracks below:



If you want the second track to start after the first, there is a tool you can use to move it. It's called the **Time Shift Tool**.

Look at the six buttons on the Tools toolbar:



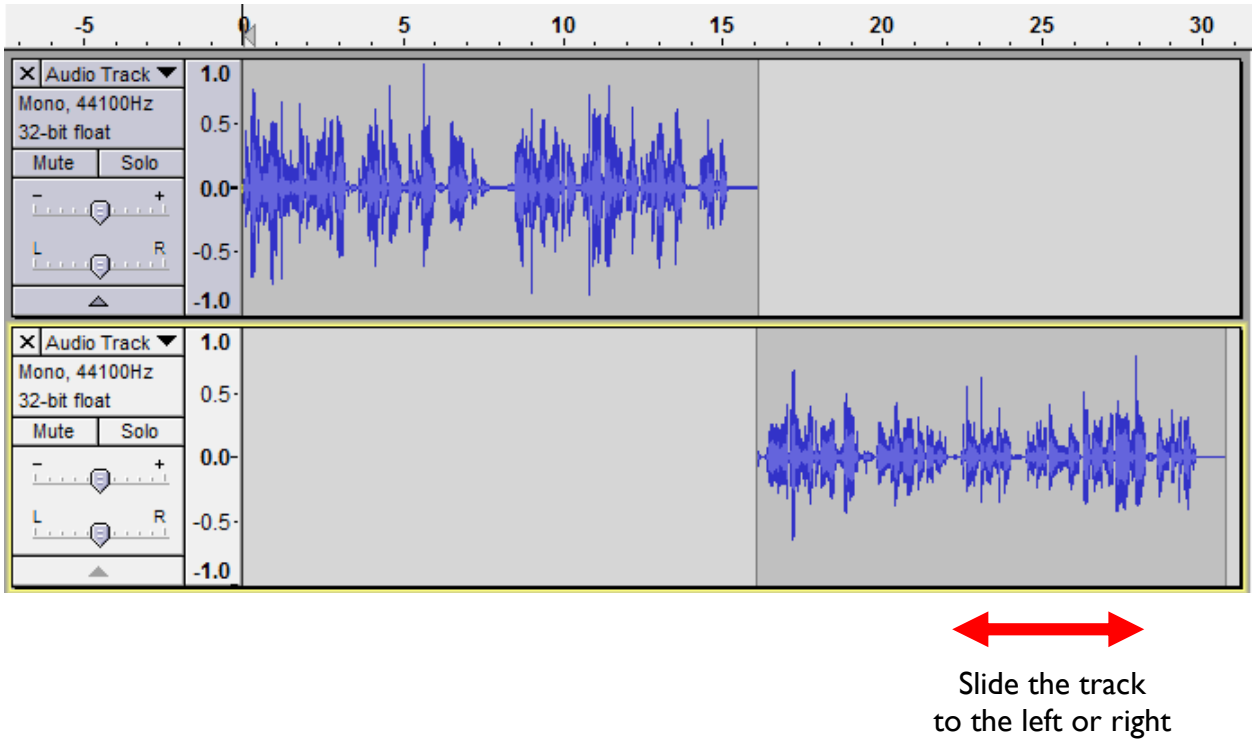
Only one of these tools can be selected at any time. By clicking on another tool button, you change the current tool. The tool you select will determine how the mouse cursor behaves when you click inside a track.

You'll notice that the **Selection Tool** is selected most of the time. The mouse cursor is like a capital 'I'.

To move the second track:

1. Click on the **Time Shift Tool**. The mouse cursor will change to a horizontal line with arrows on both left and right ends.

2. Move the mouse cursor into the second track and hold down the left mouse button. Keeping the button pressed, slide the track to the left or to the right as required.



Slide the track
to the left or right

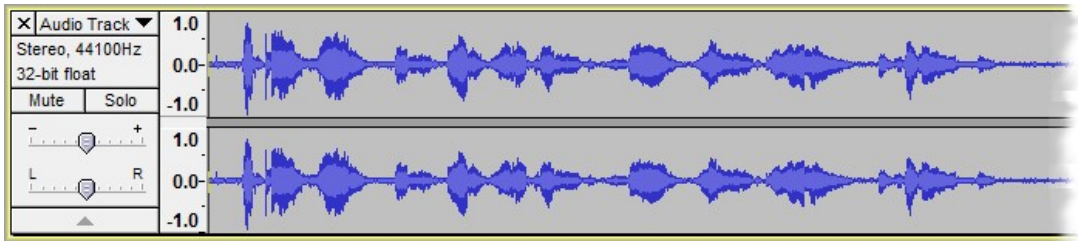
3. When you have found the right position for the track, release the mouse button.

4. Click **Play** to see how the two tracks sound when placed one after the other.

5. If all is well, change back to the **Selection Tool** (click on the Selection Tool button). The mouse cursor will go back to the capital 'I'.

4.4. Understanding mono and stereo tracks

When you record a track in Audacity, you might find that two sets of almost identical waveforms appear, one above the other. If this is the case, like in the image below, it means that you are recording in stereo rather than mono.

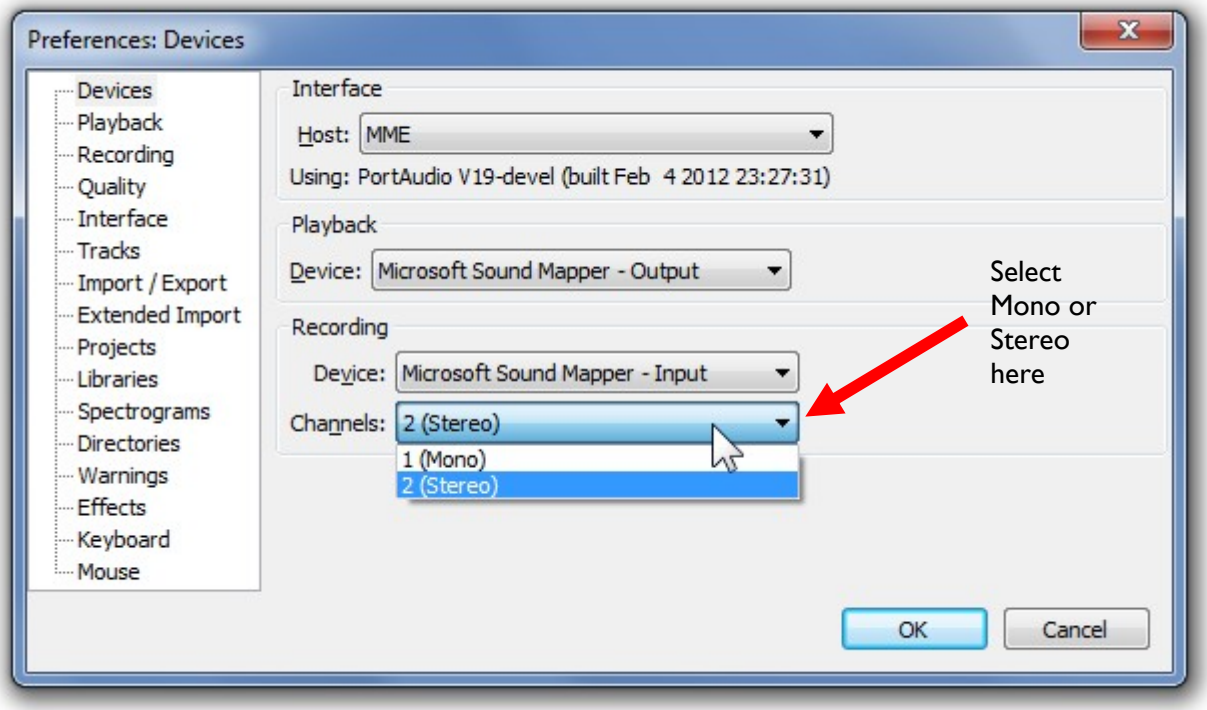


Most microphones do not record in stereo so you will not be getting any advantage from this. You will just find that your audio tracks take up twice as much memory – as well as more space on the Audacity editing screen.

And even if your microphone is a stereo microphone, you will need to decide whether you really need a stereo recording or whether a mono recording will be suitable for your purposes.

To switch the recording back to mono recording:

1. On the menu, select **Edit ➢ Preferences…** (or **Ctrl+P**)
2. Select **Devices** (top left) if it is not already selected.

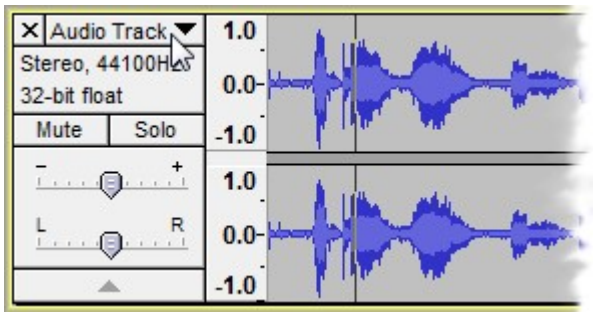


3. Change the number of Recording **Channels** from **2 (Stereo)** to **1 (Mono)**.
4. Click **OK**.

4.5. How to convert a stereo track into a mono track

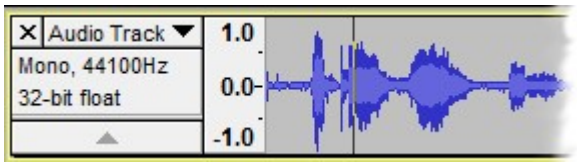
If you have a stereo track and you want to convert it into a mono track, do the following:

1. Click on the track to select it.



2. On Audacity's main menu, select **Tracks ➢ Stereo Track to Mono**.

   The stereo track will be converted into a single mono track.



5

Cutting and pasting

In this chapter you will learn:

- how to cut out portions from a track;
- how to examine the waveforms in more detail;
- how to insert something in the middle of a track;
- how to cut and paste at zero crossings.

5.1. How to cut out portions from a track

Sometimes you will want to cut out sections of sound from a track.

For example:

- When someone hesitates between words or phrases and you want to cut out the delay.
- When the pause between two actors or speakers is too long and you want to shorten it.
- When there's a short burst of noise while no one else is talking and you want to delete it – like a cough, a sigh, a dog bark or the sound of someone's lips.
- When someone makes an error and then corrects themselves, and you want to cut out the error.

All these things can be cut out of the track. But if there is a noise (like a baby crying) at the same time as when someone is speaking, you cannot cut the noise of the baby and leave the voice of the person. The baby's cry and the person's voice are mixed together. In such a case, you would need to re-record that section.

To cut out a section:

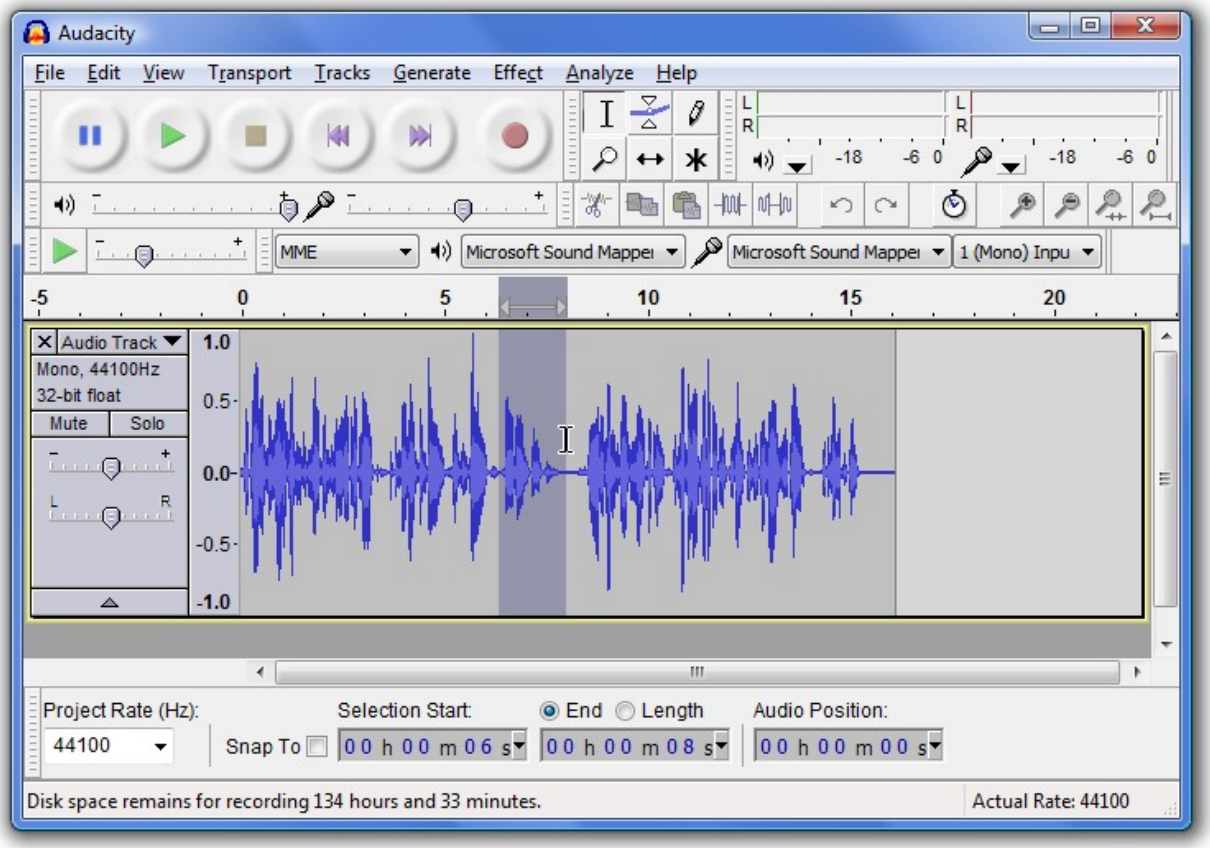
1. Select the portion you want to delete.

   To do this:

   a. Click in the track to position the cursor where you want the selection to begin. As you do this, keep holding down the left mouse button.

   b. Continue to keep the mouse button selected and drag the selection to the right.

   c. Release the mouse button when you have selected the portion you want to delete.



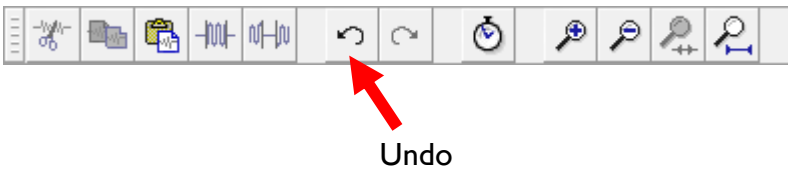
2. To listen to just the section you have selected, click the **Play** button.

3. When you are satisfied that you have selected the right section to cut, click on the **Cut** button (or the **Delete** key on the keyboard).

   You will see the selected section disappear.

4. After cutting the section, it's wise to listen again to that portion of the track to verify that you have cut at the right place.

   If you find that you have made a mistake, you can restore the deleted section. To do this, click on the **Undo** button (or **Ctrl+Z**).



A Word of Advice

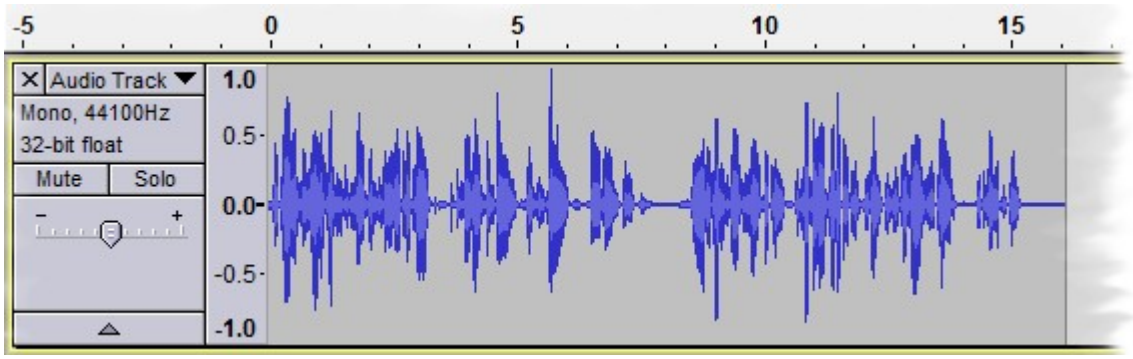
Every time you make an edit to a track (e.g. making a cut, adding a portion, or applying an effect), make sure you listen again to the affected portion of the track to ensure all is well. At that time, if there is a problem it is easy to correct it by clicking **Undo**.

It is more difficult to correct an error in editing if you have made many more changes afterwards.

5.2. How to examine the waveforms in more detail

In order to edit your tracks as accurately as possible, it is often useful to zoom in closer to examine the waveforms in more detail.

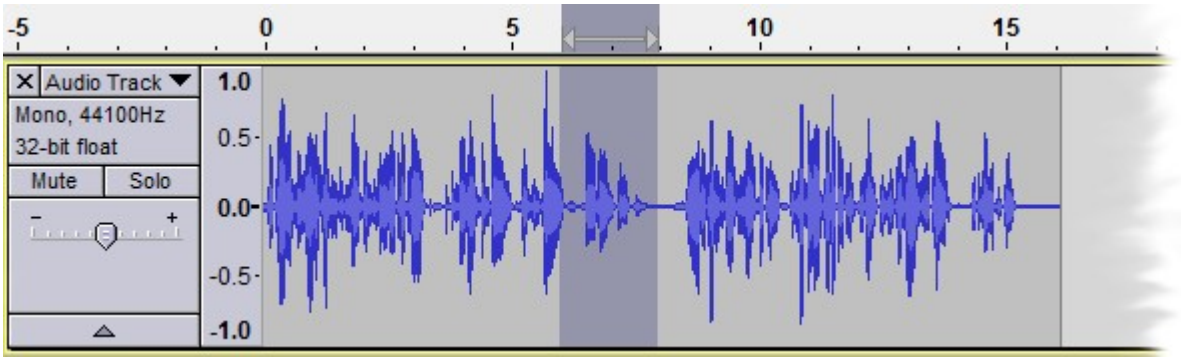
Consider the track below:



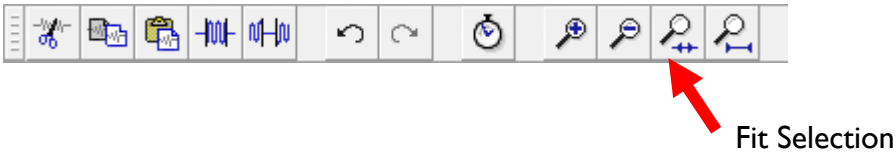
Looking at the numbers on the timeline at the top, you can see that the track is 16 seconds long. All of it is visible on the screen at the same time.

If we are interested in editing the sound in the 7th and 8th seconds of the track, we can zoom in to magnify this part.

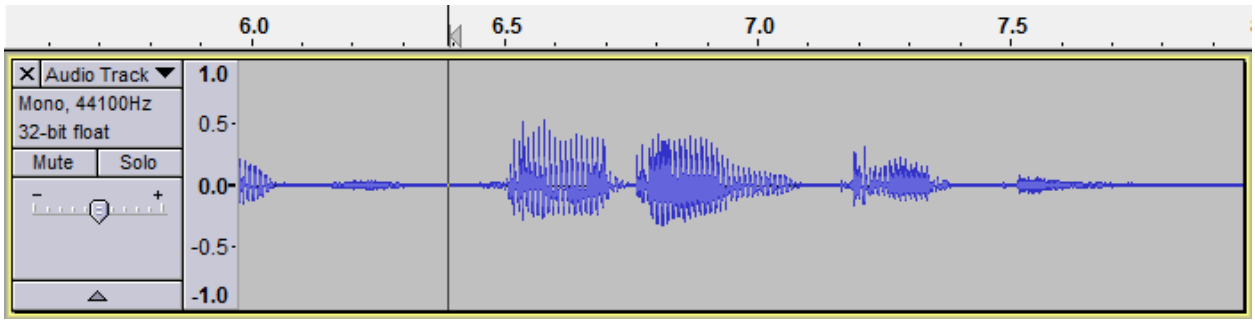
To do this, select the section to magnify:



Next, click the button **Fit Selection**:

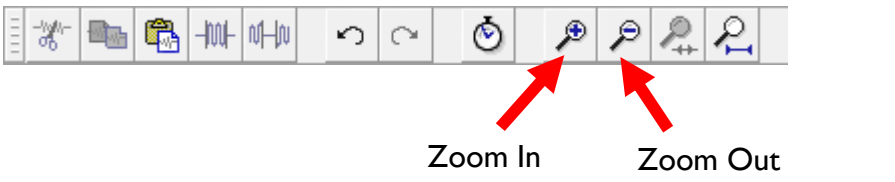


The result will be something like in the following image:

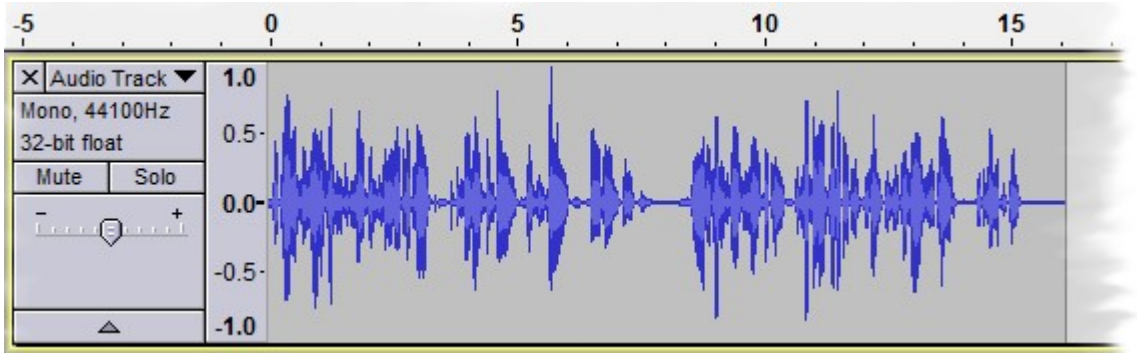


You can see the wave forms in more detail and can therefore make your edits with more accuracy seeing more precisely where to cut, copy, paste, etc.

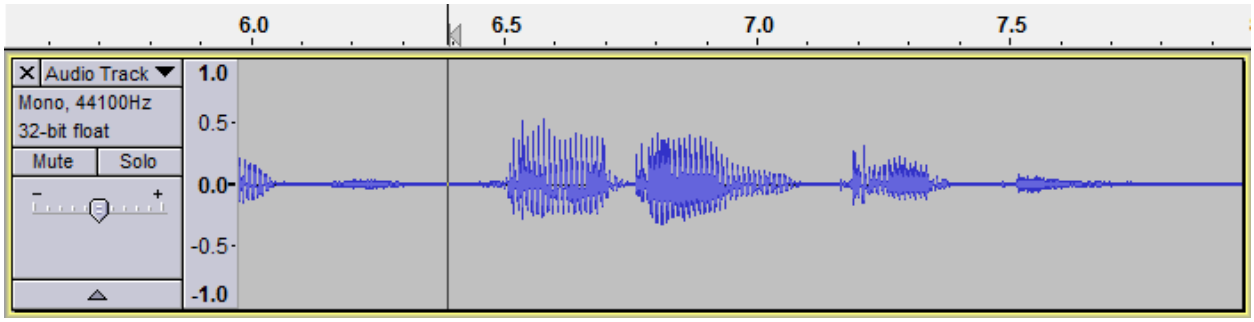
You can also use the **Zoom In** and **Zoom Out** buttons to examine a track in more or less detail.



When you view the track in less detail, you see more of the track on the screen at once (several seconds or minutes):



When you view the track in more detail, you see less of the track on the screen at once (a few seconds or milliseconds):



Zooming in allows you to select more precisely the sections of the track to edit or cut.

Note

When you use the **Zoom In** and **Zoom Out** buttons, you are not changing or modifying the audio track. The track stays the same. In zooming in and out, all you are doing is changing your view of the waveforms on the computer screen.

So don't worry when you use it. Zoom in or out as much as you need to so you can cut as accurately as possible.

5.3. How to insert something in the middle of a track

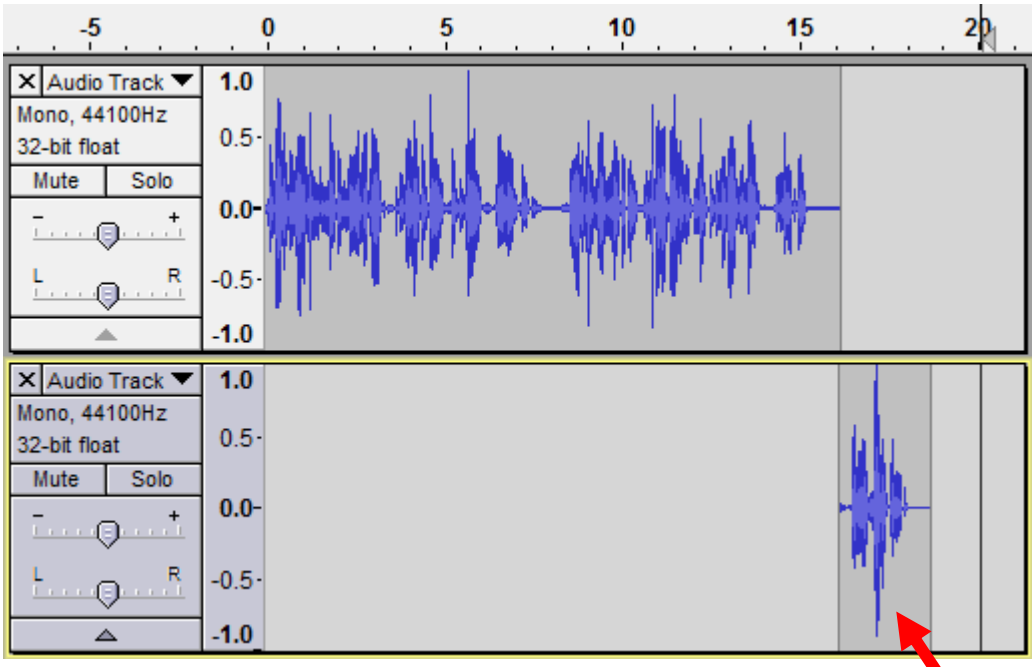
Sometimes you will want to insert something in the middle of an existing track.

For example:

- an additional phrase that you forgot to add when doing the initial recording;
- a sound effect;
- a short piece of music between narrators.

To do this:

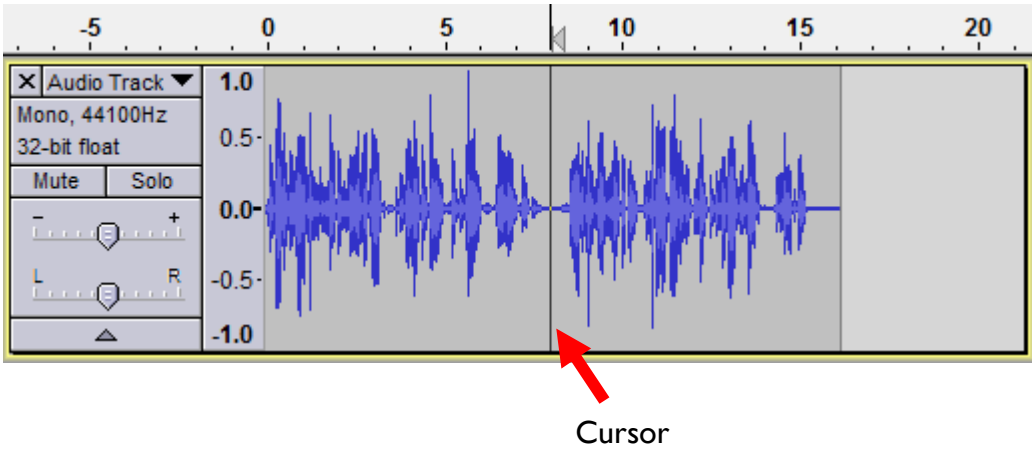
1. Record the part you want to insert in a new track.



2. Select the portion that you want to insert.

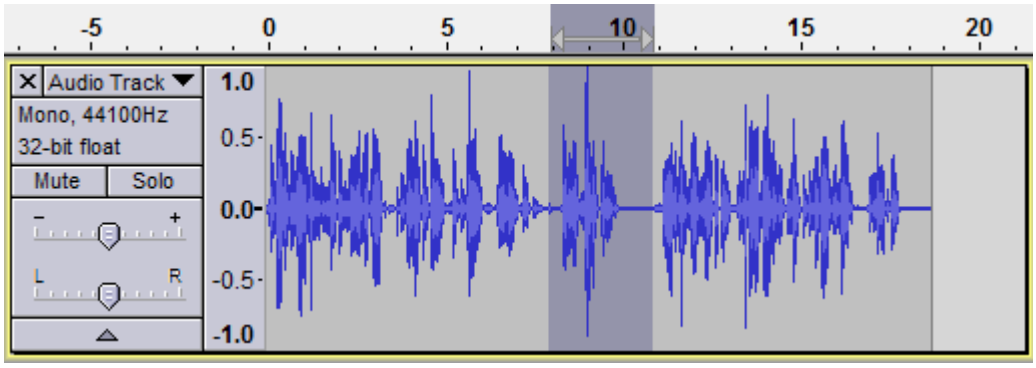
3. Click **Copy** to copy the portion to the clipboard.

4. In the main track, position the cursor at the place you want to insert the copied portion.



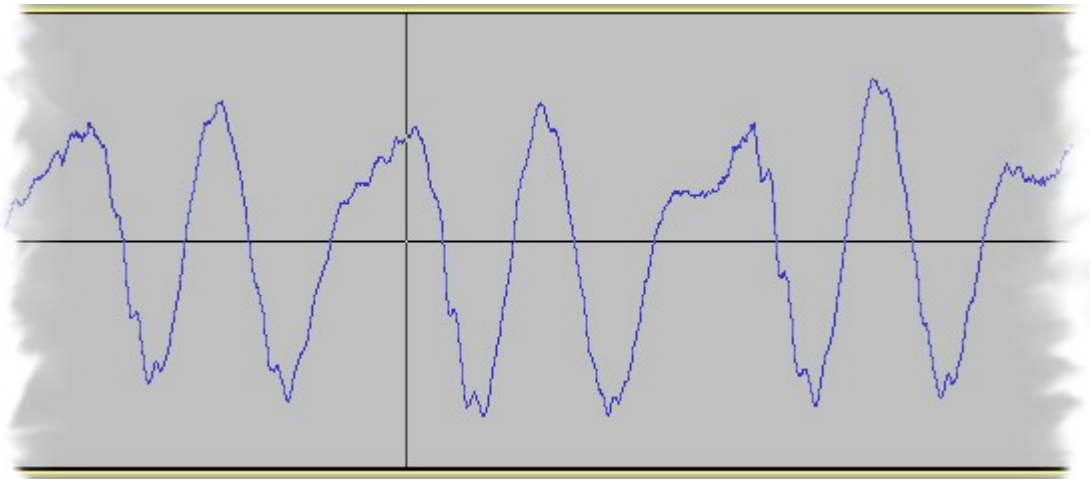
5. Click **Paste**.

The portion will be inserted into the main track.

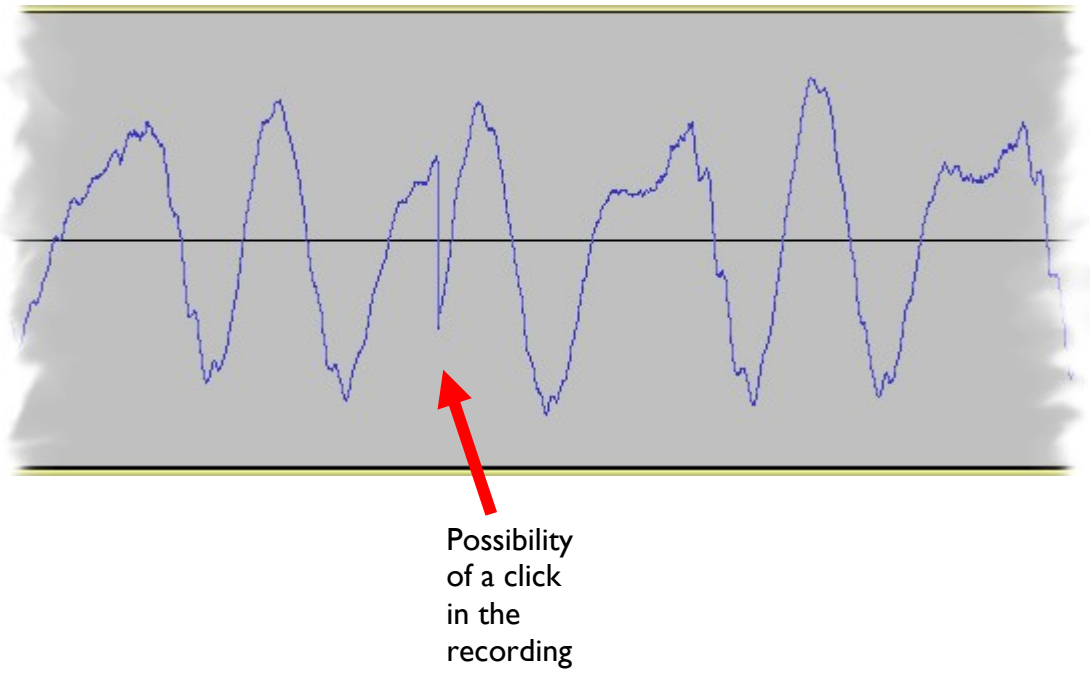


5.4. How to cut and paste at zero crossings

If you are cutting and pasting at a point in the track where there are a lot of sound waves, you run the risk of cutting a wave in half. For example, look at where the cursor is placed in the track below:



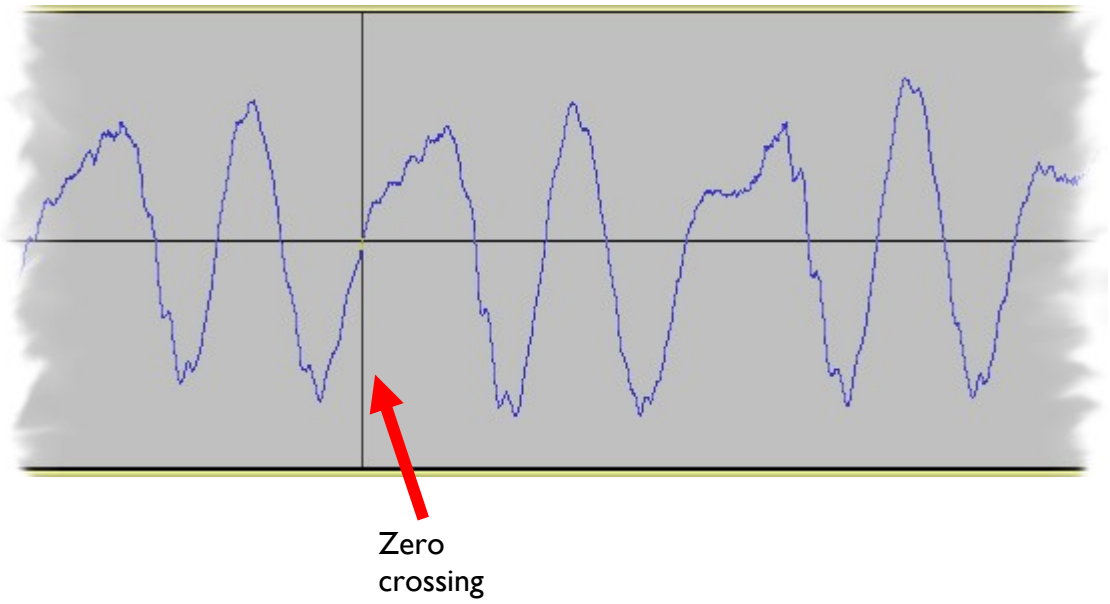
If we cut the track at this point and connect it to a track where the waveform begins at a different point, we could introduce a 'click' into the recording, such as in the example below:



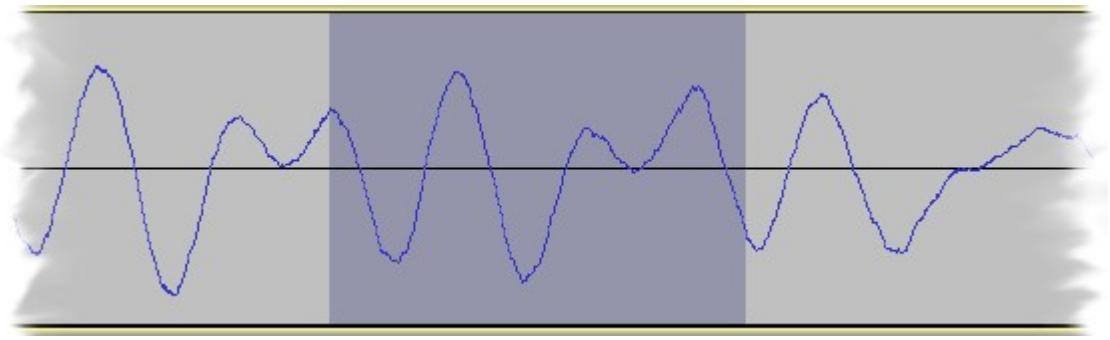
To avoid this, before you make a cut, you can tell Audacity to find the nearest **zero crossing point**, i.e. where the waveform cross the zero-amplitude line.

To do this, press the **Z** key on the keyboard (or click **Edit** ➢ **Find Zero Crossings**)

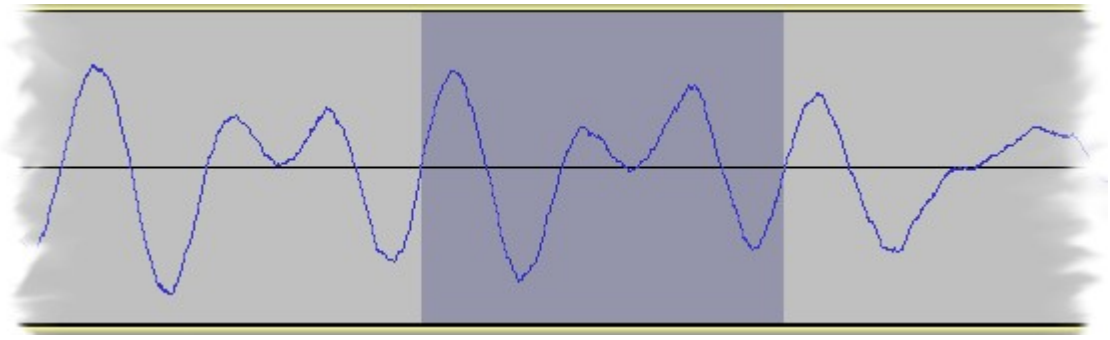
You'll see the cursor move to the point where the waveform crosses the zero-line. This is a safe place to cut the waveform.



Here's another example. See where the selection is made in the waveforms below:



After pressing **Z** to find the zero crossings, notice that the selected section has moved so as to contain complete waveforms and to start and finish at zero crossing points.



6

Changing the volume

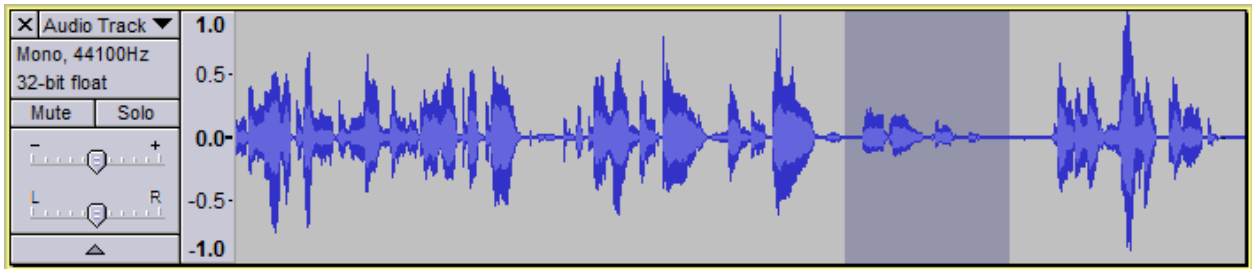
In this chapter you will learn:

- how to increase or lower the volume of part of a track;
- how to amplify several sections of the track by the same amount;
- how to increase the volume of the whole track.

6.1. How to increase or lower the volume of part of a track

If you notice that the volume is too low or too high in part of the track, you can modify it in Audacity.

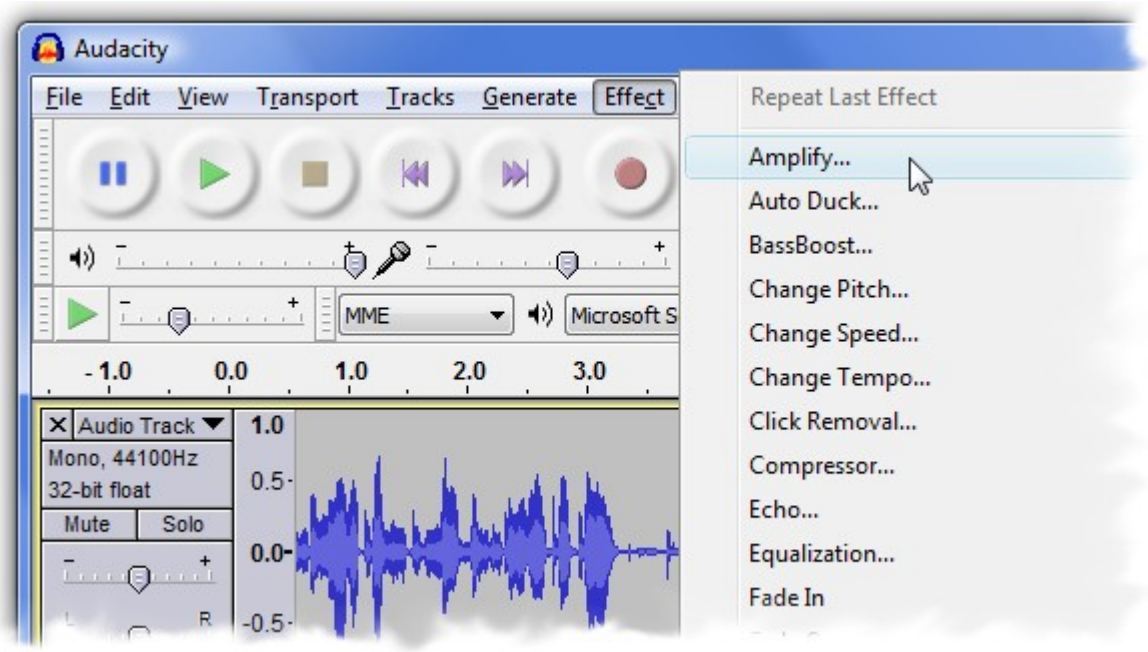
For example, in the track below, the volume of the selected section is too low:



To increase it:

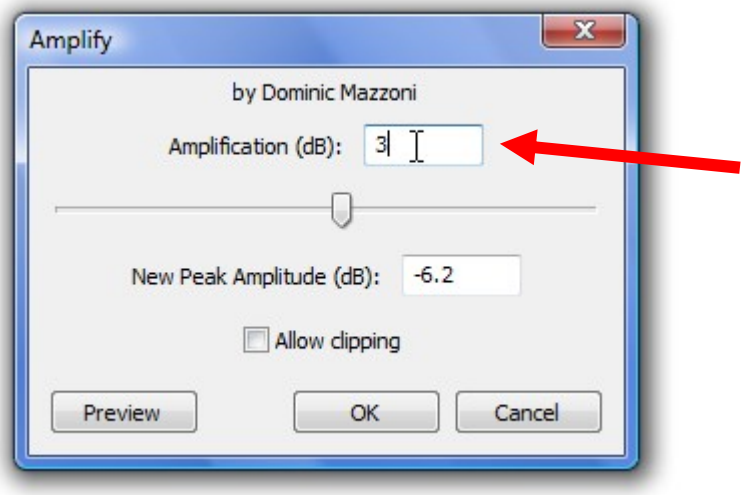
1. Select the part of the track you want to modify (like we have already done in the image above).

2. On the menu, click **Effect ➢ Amplify…**



You will see a new window, titled **Amplify**, in which you can specify the amount of amplification you need.

3. Choose the level of amplification you require. Do this by entering a number into the first edit box, **Amplification (dB)**:



Enter the amount of amplification you want here.

The number you see by default is the maximum possible if you do not want the waves of the track to be clipped at the top and bottom. Normally you will be looking for an amount of amplification that is less than this.

So what number should you choose?

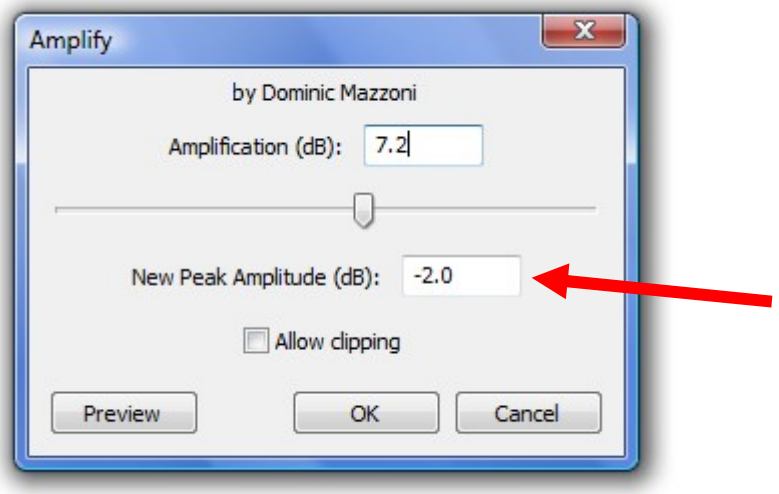
To **increase** the volume, use a **positive** number:

- 1 = a very small amount of amplification (increase the volume very slightly)
- 2 = a small amount of amplification (increase the volume slightly)
- 3 = a medium amount of amplification (increase the volume)
- 4 = … etc.

To **decrease** the volume, use a **negative** number:

- -1 = decrease the volume very slightly
- -2 = decrease the volume slightly
- -3 = decrease the volume by a medium amount
- -4 = … etc.

You'll notice that when you change the amount of amplification, the **New Peak Amplitude** will change. This refers to the volume of the loudest waveform in your selection. We recommend that you do not let the New Peak Amplitude get any closer to 0 than **-2 dB**. For example, a New Peak Amplitude of -5, -3, or -2 is OK, but anything between -2 and 0 might lead to distortion of sound when other effects or music are added.

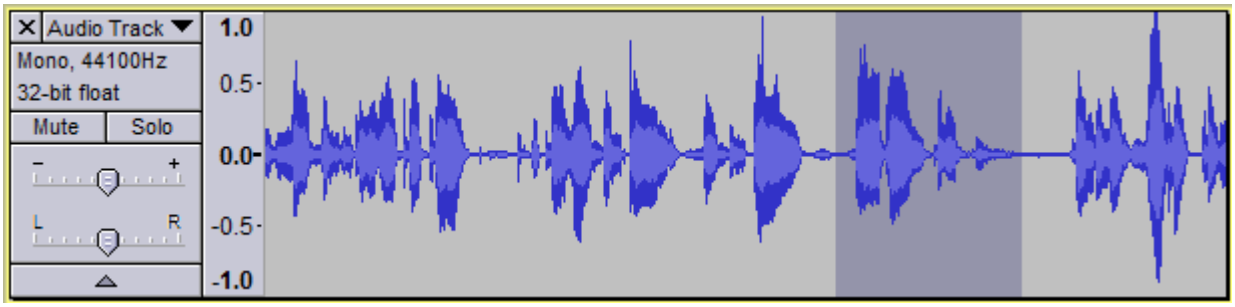


As you become more experienced with editing recordings in Audacity, you will find that you can predict the amount of amplification you need. For example, you'll see a wave form and say to yourself, "That needs an amplification of 3", or "That needs its volume lowered: probably a minus 4".

(An alternative would be to move the slider left to decrease the amount of amplification or right to increase it, but since you have less control that way, we recommend you type in a number directly.)

4. Click **OK**.

You'll see that the selected portion of the track has been amplified.



5. Before doing anything else, listen to the amplified section of the track to verify that it has been set to the right level and that there is no distortion.

   If you find that you have made a mistake, you can undo the amplification effect by clicking on the **Undo** button (or **Ctrl+Z**).

Undo

6.2. How to amplify several sections of the track by the same amount

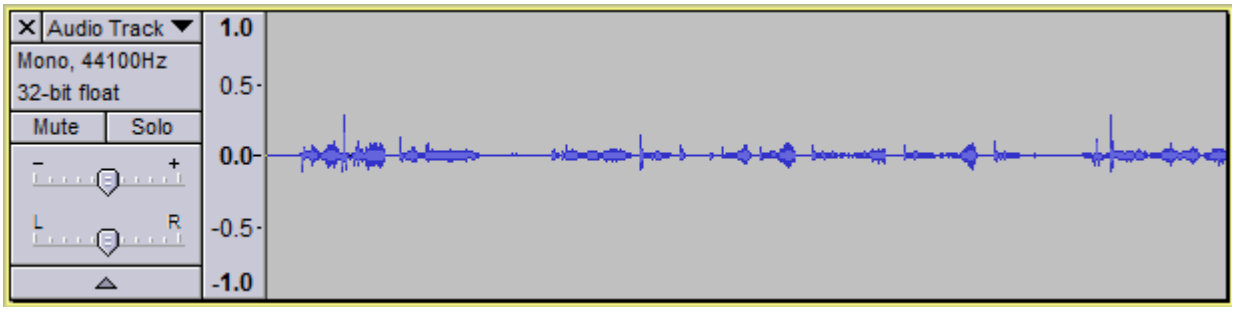
You might find that as you look along the track, you want to amplify several different sections by a similar amount of amplification. If this is the case, it can become tedious to keep going back to the Amplify dialog and specifying the same level of amplification.

In such cases, a useful key command to remember is **Ctrl+R** (Repeat effect).

After you've applied the effect on one section, you can go along the track selecting similar sections and pressing **Ctrl+R** to apply the same amplification effect.

6.3. How to increase the volume of the whole track

If you have a recording with a low volume, it is possible to use the Amplify effect to increase the volume of the whole track.



Although this is possible, be aware that you might not be completely happy with the result, especially if the original volume was very low.

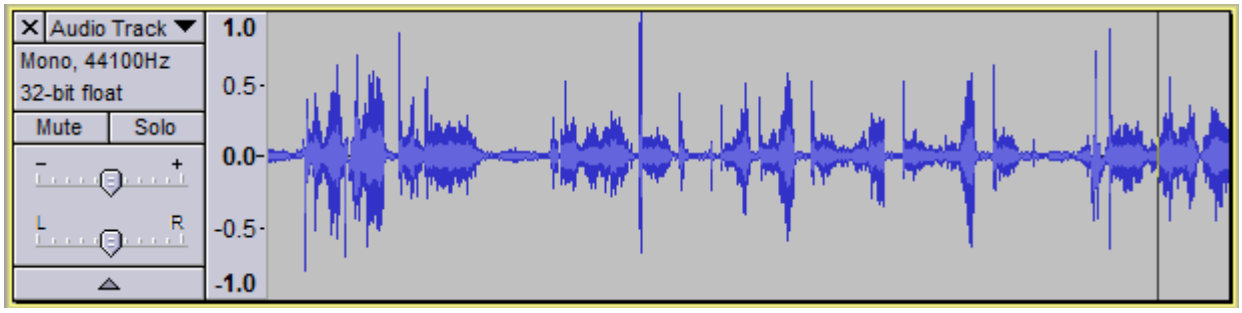
To try it:

1. Select all the track.

   You can do this:

   - by clicking **Edit** ➢ **Select** ➢ **All** on the menu, or
   - by clicking **Ctrl+A**.

2. On the menu, click **Effect** ➢ **Amplify…**
3. Set the **New Peak Amplitude** to be **-2 dB** (recommended maximum amplitude).
4. Click **OK**.
5. Listen to the resulting track.



Everything is amplified - including any background noise.

A Word of Advice

When you amplify a recording that is very weak in its original volume, you will also amplify the background noise. As a result, the quality of your final recording will not be as good as if you had made the recording with the right volume level from the start.

7

Saving and exporting

In this chapter you will learn:

- the difference between saving and exporting;
- how to save your Audacity project;
- how to look after your Audacity project files;
- how to export your audio as a WAV or MP3 file;
- how to change the size of the exported MP3 files.

7.1. Saving or exporting your audio project

There are two ways of saving your audio work:

- One way is called **Save.**
- The other way is called **Export.**

What is the difference?

- **Save:**

  When you **save** your project (using **File ➢ Save Project**), you are saving the details of all the individual tracks and their Audacity settings. You will be able to open the project again in Audacity and continue with editing, exactly as you were doing. Nothing will be lost. But note that a saved project can be opened again only with the Audacity program – and not with a media player.

  Please see sections 7.2 and 7.3 for more details on this.

- **Export:**

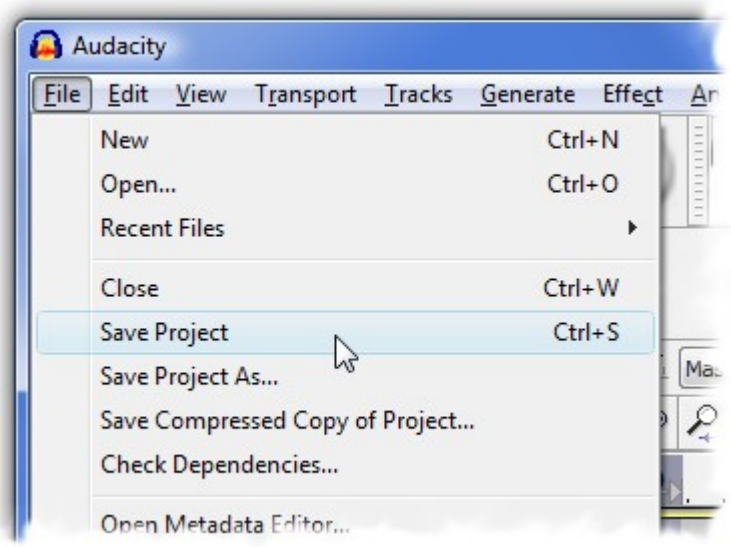
  When you **export** your project (**File ➢ Export…**), you are asking Audacity to mix together the tracks you have into a single track, and to write out the result as an audio file (e.g. WAV or MP3) which can be played by a media player. This merged track can also be imported into Audacity if you need to use it in another audio project.

  Please see sections 7.4 and 7.5 for more details on this.

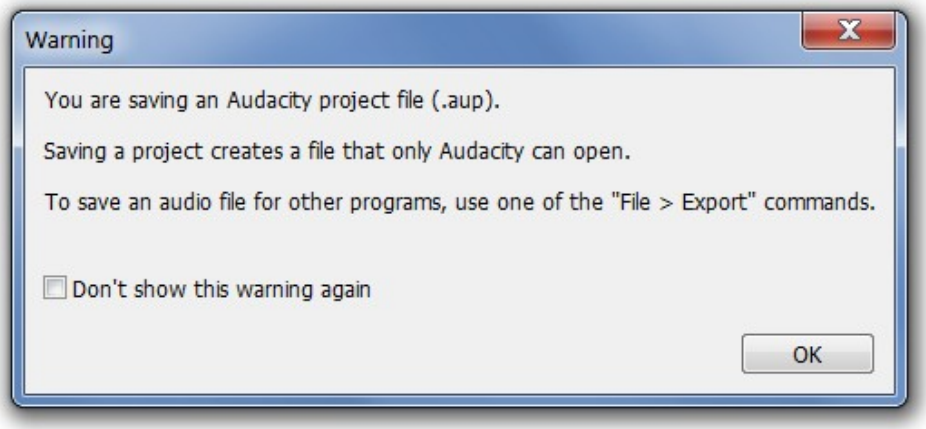
7.2. How to save your project

To save your project, keeping the multiple tracks, so that you can come back and edit it at a later date:

1. On the menu, click **File ➢ Save Project**



2. The first time you try to do this, Audacity will remind you of the difference between saving projects and exporting them (as we saw in the previous section).



   If you do not want to see this message again, select the checkbox **Don't show this warning again**.

   Click **OK** to continue.

3. Navigate to the folder in which you want to place the file. (Don't forget this location, so you know where to find it afterwards!)

4. Enter a name for the project. (The default file extension is '.aup'.)

5. Click **Save**.

Your project will be saved.

If you want to open this project in the future:

1. On the menu, click **File ➢ Open…**
2. Select the project filename to open.
3. Click **Open**.

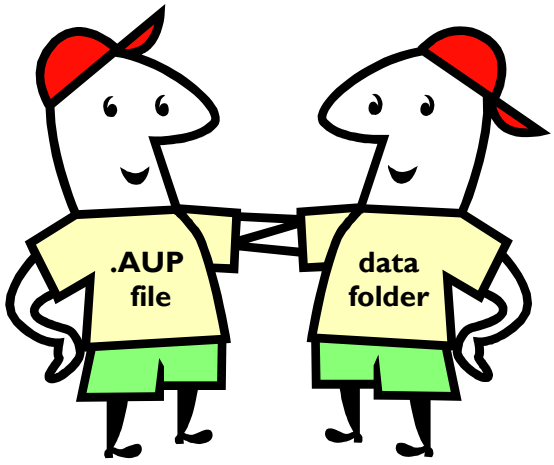
7.3. How to look after your Audacity project files

When you save your Audacity project using **File ➢ Save Project**, you will find that it is saved in two parts:

- an **.aup file** (such as MyRecording3.aup), and
- an associated **data folder** (such as MyRecording3_data)

An .aup file is an Audacity project file. This is a file containing details of the Audacity project you are editing. It allows you to save all the tracks you are working on so you can come back and edit them at another time. The _data folder contains details of the different tracks and the edits you have made. These files are only for use in Audacity and cannot be used by other programs like Windows Media Player or iTunes.

The .aup file and its data folder do not like being separated, especially if you want to be able to open the project again. So if you move the .aup file, don't forget to move its brother, the associated data folder.



We're brothers! Please don't separate us!

7.4. How to export your audio as a WAV or MP3 file

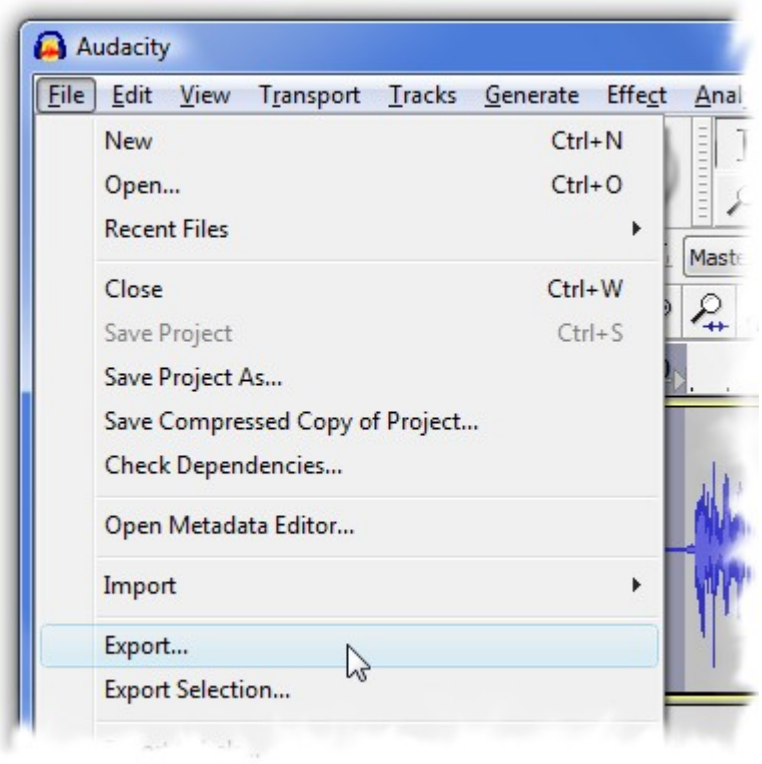
When you are satisfied with your recording and you want to get it into a form you can distribute to others, you need to export it as an audio file.

There are several forms of audio file. Two of the most popular are WAV and MP3.

WAV	Audio format for Microsoft Windows – uncompressed. Recommended for music. No loss in quality. It is a good idea to keep a copy of your recording in WAV form for archive purposes, even if you will distribute it as an MP3.
MP3	Compressed audio format. MP3 files are a lot smaller than WAV files. Their size and quality will depend on the level of compression you choose. They are used in portable MP3 players like iPods, mobile phones, MP3 CDs and audio downloads on the Internet.

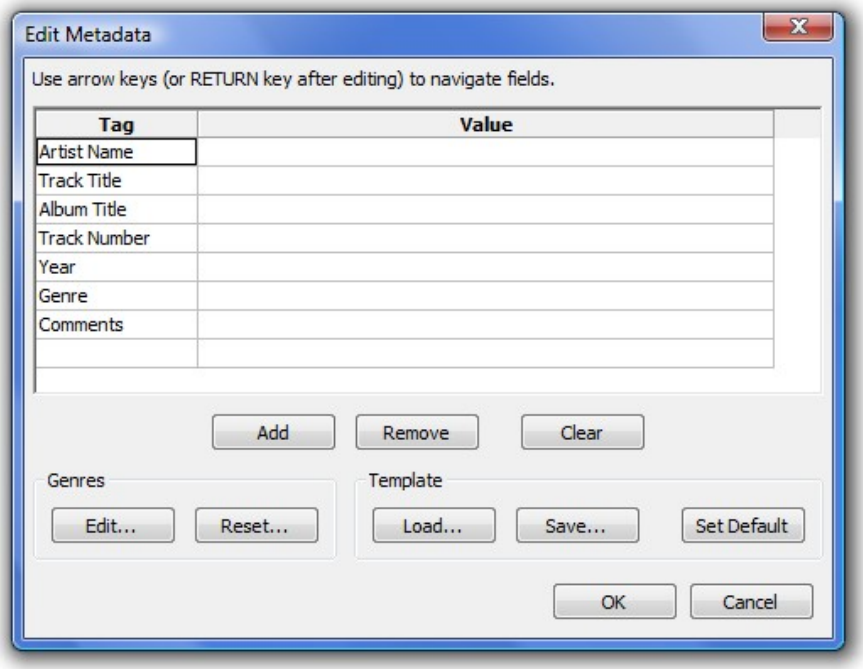
To export the recording as an audio file:

1. On the menu, click **File ➢ Export…**

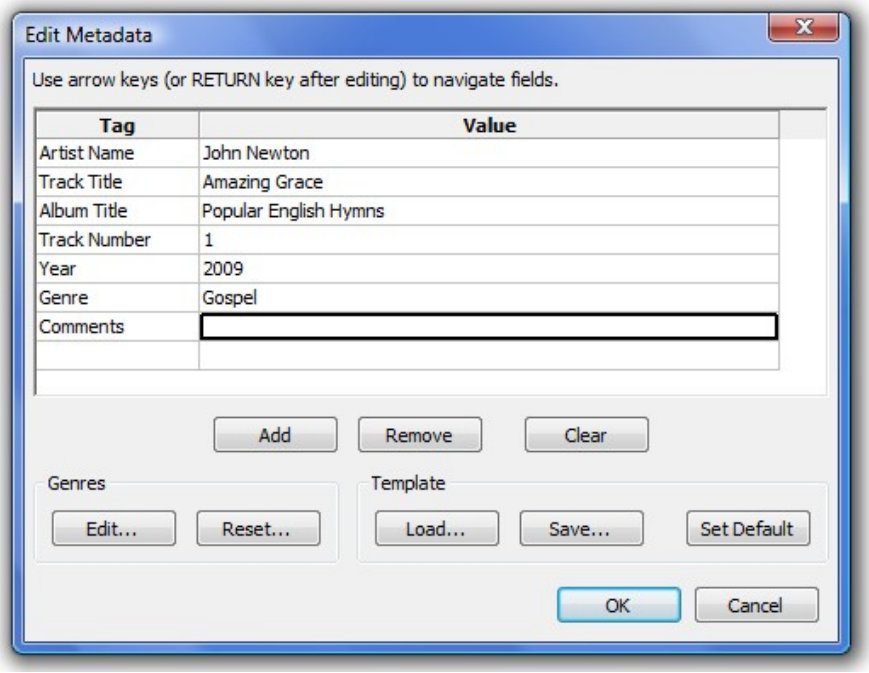


The **Edit Metadata** window will appear. This allows you to provide some information about the content of the audio file to be stored within the WAV or MP3 file itself. This information (title, author, album name, etc.) is known as *metadata*.

If you are only exporting the file for testing purposes you do not need to provide any of this, but if you are exporting the file for distribution it is good practice to include such information so that other users can see the details of your file when they have it loaded in an MP3 or media player.

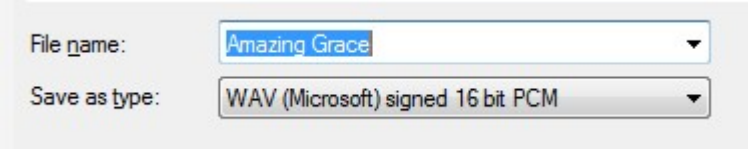


2. Enter metadata in the **Value** column if required. Then click **OK**.



3. In the **Export File** dialog, navigate to the folder in which you want to place the file. (Don't forget this location, so you know where to find the file afterwards.)

4. Enter a **File name** for the file.



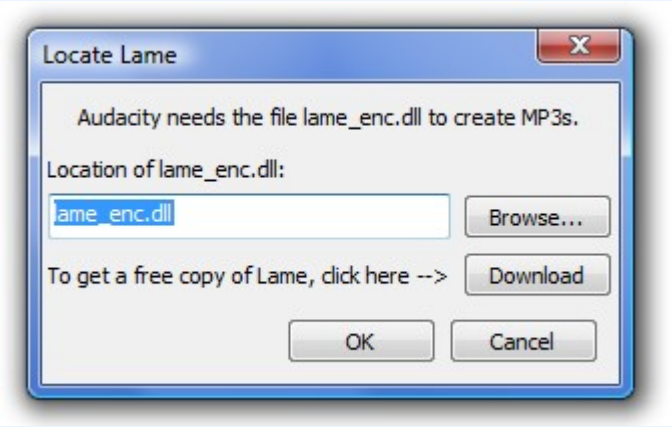
5. Choose the file type in the dropdown list **Save as type**. Here you can choose WAV or MP3.
   - For WAV, select: **WAV (Microsoft) signed 16bit PCM**.
   - For MP3, select: **MP3 Files**.

6. Click **Save** to export the file.

The file will be exported. You will find it saved on your hard disk.

Exporting as MP3 – LAME DLL

When exporting as an MP3 file, you might get a message like the one below:



If you do, it means that you have not installed the LAME system file that Audacity needs to do the compression for creating MP3 files.

To install it, follow the instructions in section 2.3 of this manual, titled **How to install the LAME file for MP3 export**.

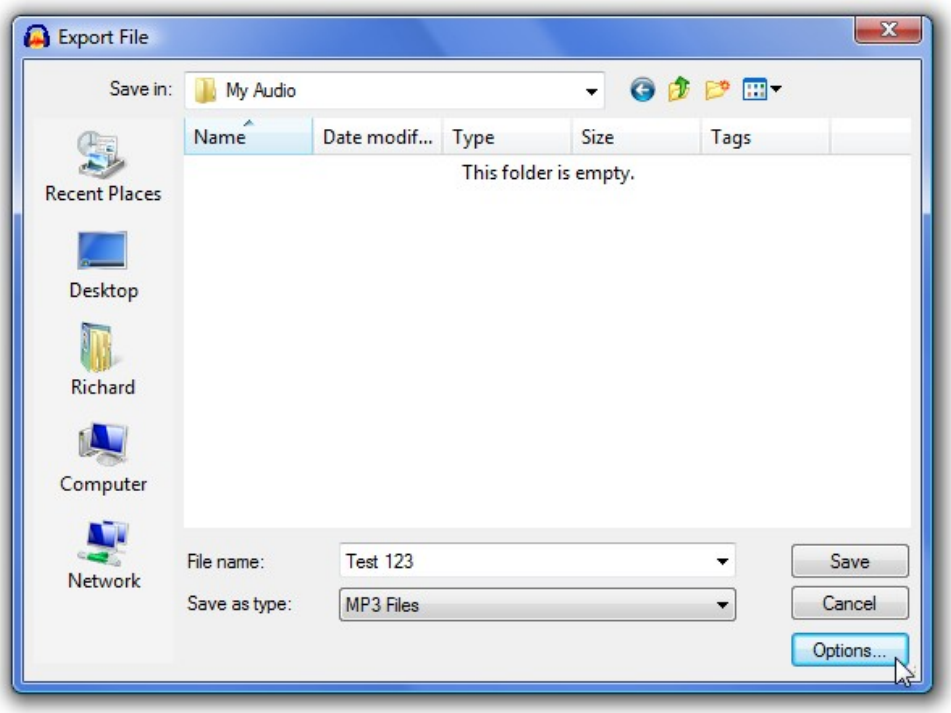
7.5. How to change the size of the exported MP3 files

MP3 files are compressed audio files. You can choose the amount of compression to apply, and hence make the exported MP3 files smaller or larger.

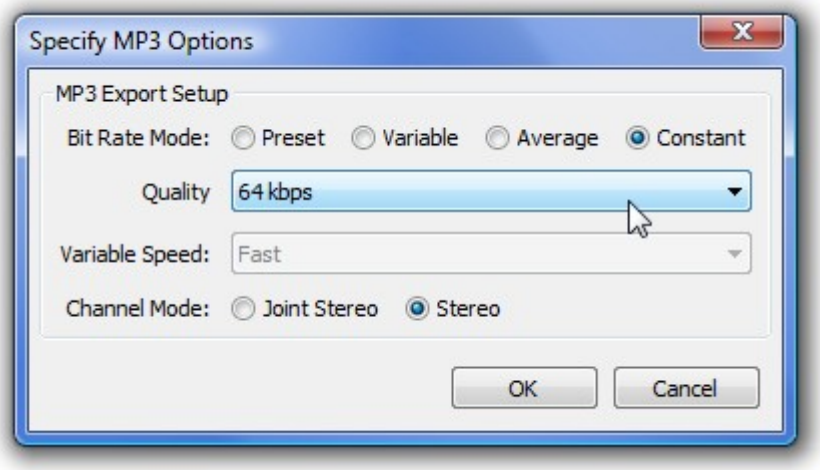
To specify the amount of MP3 compression:

1. Follow steps 1 to 3 above.

2. Choose **MP3 Files** as the file type in the dropdown list **Save as type**.



3. Click **Options…**.



In this Options dialog, you can specify the quality of the exported MP3 file.

4. The key field to change is labelled **Quality**. It specifies the bit rate for the encoding (kbps = kilobits per second).
    - A higher bit rate will mean a larger file size and better quality.
    - A lower bit rate will mean a smaller file size and lower quality.

    For good quality music, you could choose a bit rate of 128 kbps or more.
    For speech content (audiobooks, teaching, narration, etc.), 64 kbps would usually be fine.

5. Click **OK** after making your changes and continue the export as before.

6. Experiment with different bit rates to see what difference it makes to the size and quality of the resulting MP3 file.

A Word of Advice

If you choose a very low bit rate (i.e. high compression), you might be **sacrificing quality**. Listen to the exported file with headphones to hear how it sounds.

In general, you will find you need a higher bit rate for **music** than for **speech-only** audio files (speeches, interviews, reading).

If you are making MP3 files for uploading to **mobile phones** or **digital audio players**, be aware that the larger you make your files, the fewer you will be able to fit on the internal memory card of these devices.

If you are offering MP3 files for **download** over the internet, you might want to provide them at two different qualities (low and high) to allow for those with low bandwidth connections. People with slow connections might prefer the smaller files, even if the quality is lower.

8

Editing and mixing

In this chapter you will learn:

- how to import an audio file into a project;
- how to fade in or out a piece of music;
- how to add background music.

8.1. How to import an audio file into a project

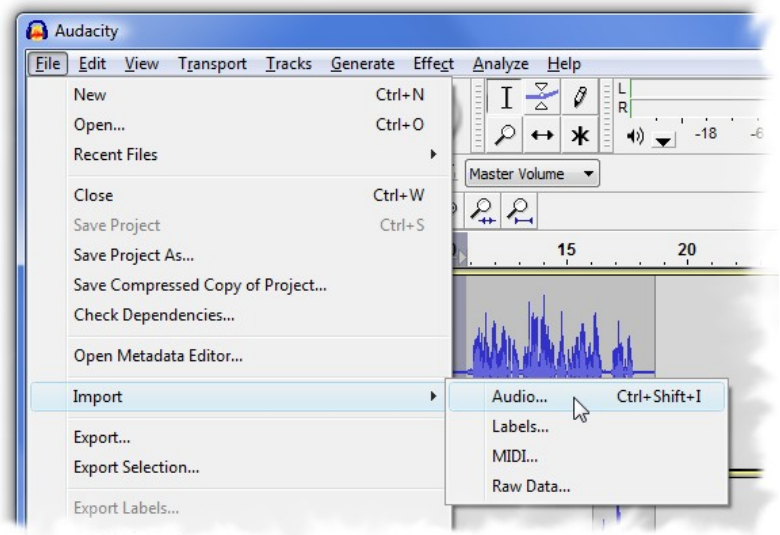
You can import an existing audio file into your project. Audacity can import MP3 and WAV files.

For example:

- You have a song that you have already recorded elsewhere and you want to insert it into your current project.
- You have an audio file of instrumental music that you want to put in the background of your current project.

To import such a file:

1. On the menu, click **File ➢ Import ➢ Audio…**



2. In the window **Select one or more audio files**, select the file you want to import.

3. Click **Open**.

   The file will be imported as new tracks in the project.

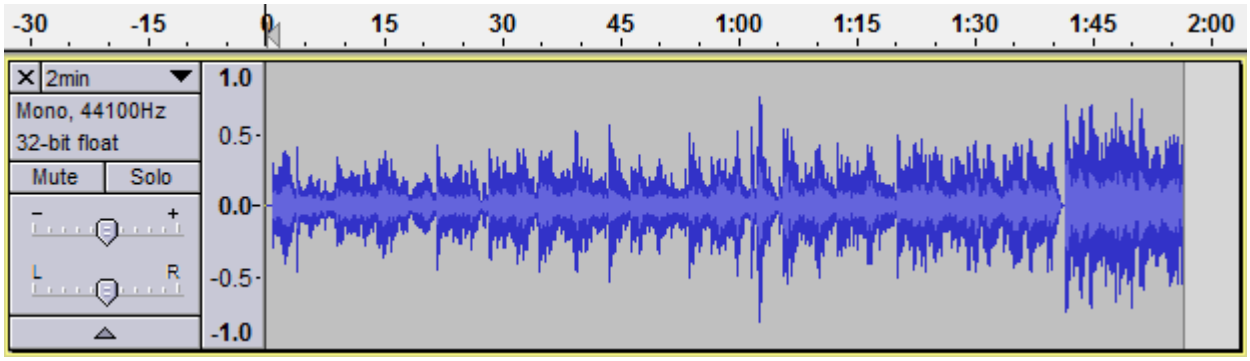
4. Modify the new track as required. For example, you could:
   - cut, copy or paste portions of the track;
   - change the position of a track relative to the others using the **Time Shift Tool**.

8.2. How to fade in or out a piece of music

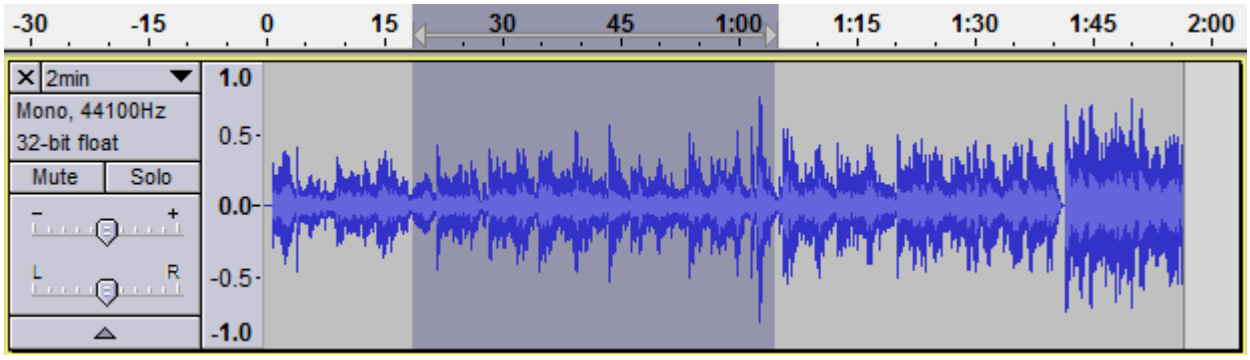
If you have a piece of music and you don't want to use all of it in your project, you will need to cut it at the beginning and/or the end. For example, if the length of a song is 4 minutes but you only need 2 minutes of it, you'll need to trim it.

Our ears do not like abrupt changes, so here's how you can select a portion of music and fade the music in and out…

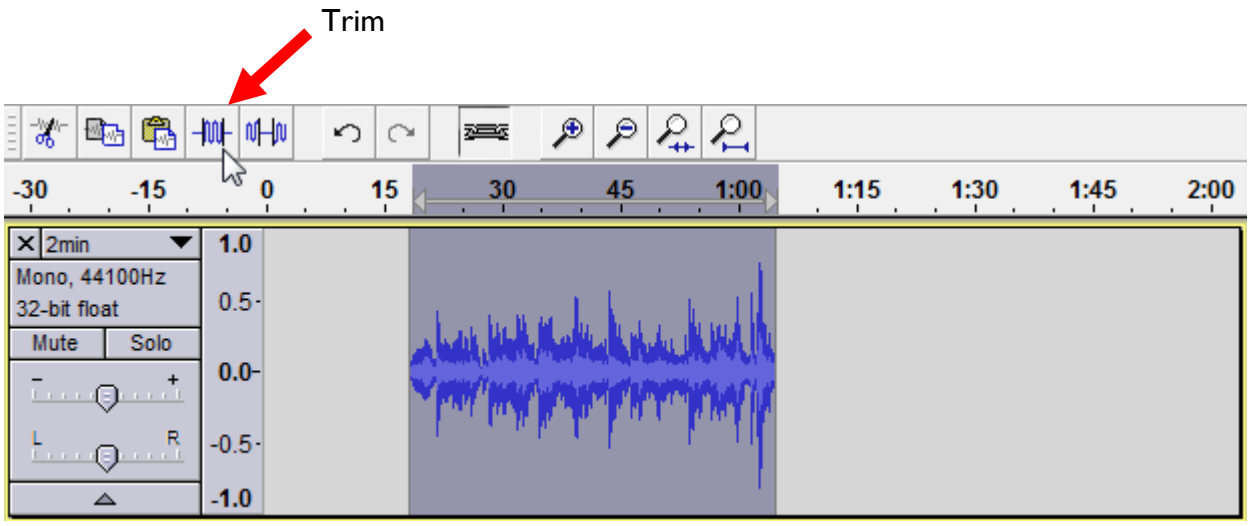
1. Import the music file into Audacity (**File ➢ Import ➢ Audio…**)



2. Select the part you want to keep.



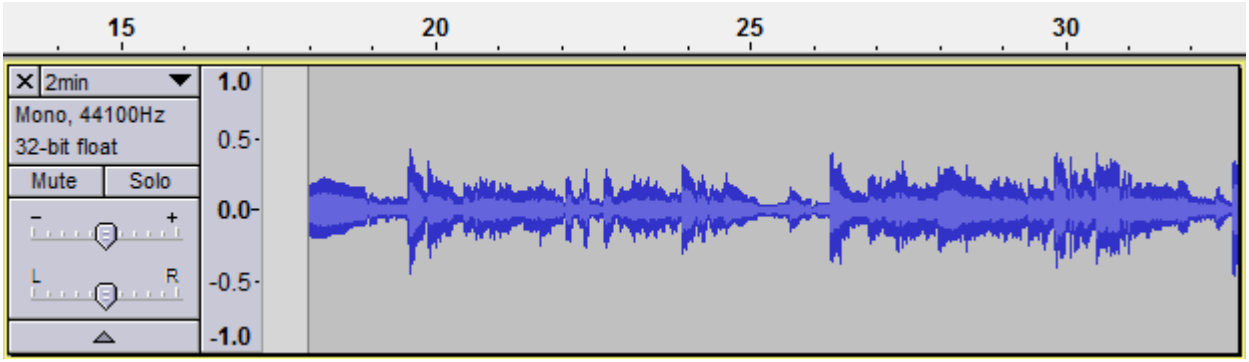
3. Click the button **Trim** (or **Ctrl+T**).



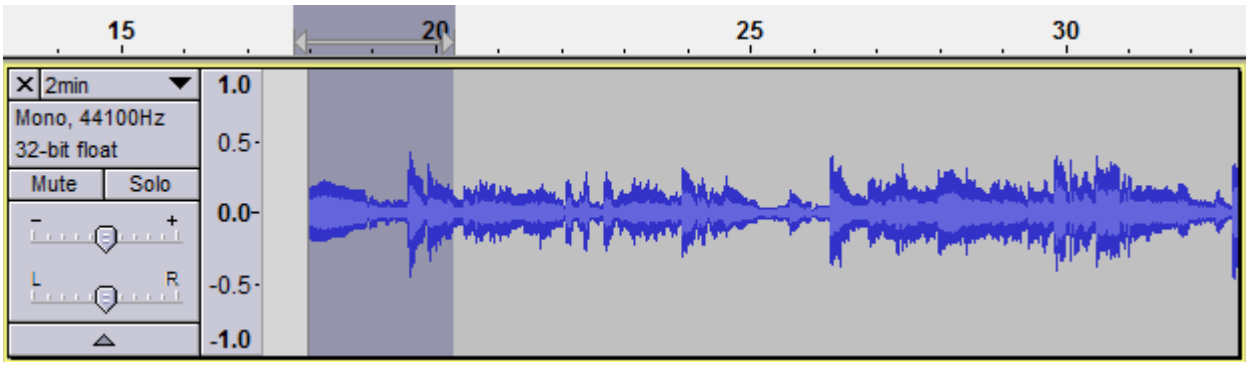
With the piece of music we have left, we want to fade it in at the start and fade it out at the end, so that our ears will not have to cope with any sharp changes in sound.

To Fade In

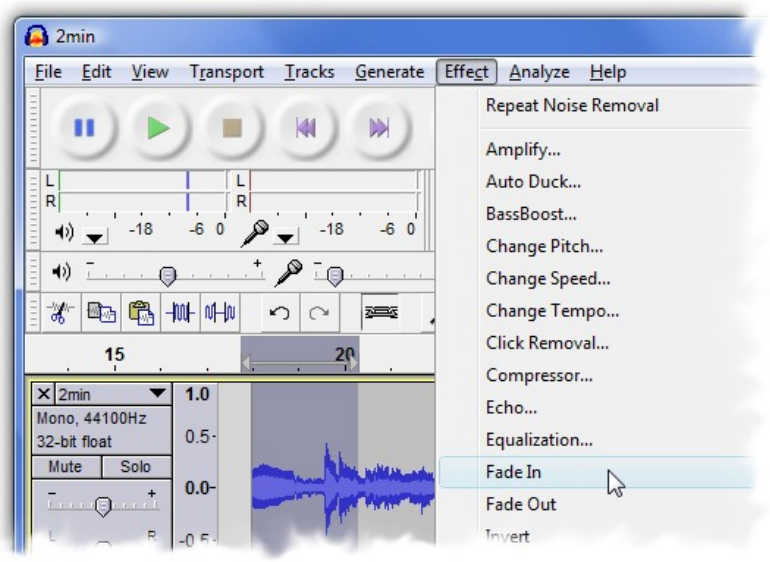
4. Use the **Zoom In** button to magnify the section of the track where the music starts.



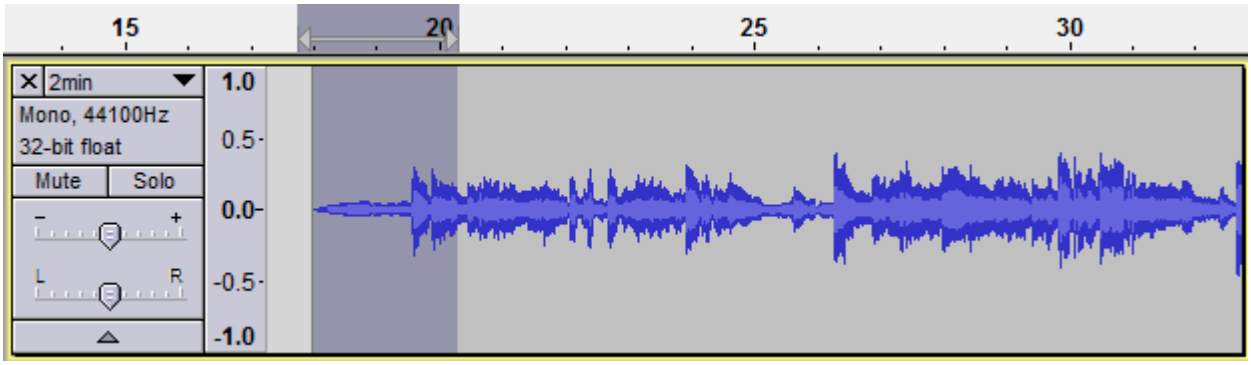
5. Select a few seconds at the start of the music (5-10 seconds).



6. On the menu, click **Effect ➢ Fade In**.



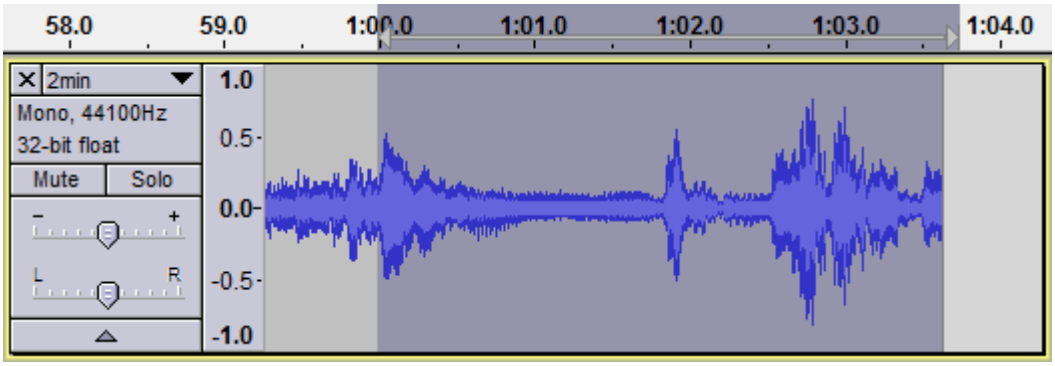
You will see the effect of your actions. The music should start softly and the volume will gradually increase over a few seconds.



To Fade Out

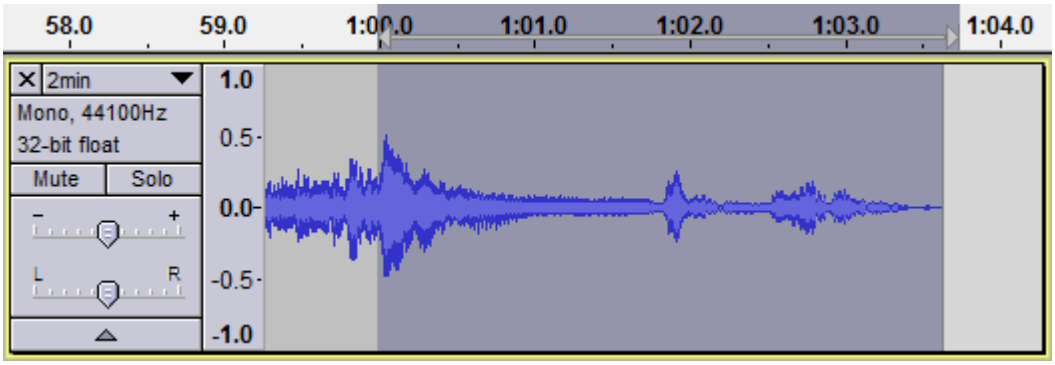
7. Go to the part of the track where the music is ending.

8. Select a few seconds at the end of the music (5-10 seconds).



9. On the menu, click **Effect ➢ Fade Out**.

   You will see the effect of your actions. The music should begin to fade out gradually over a few seconds.



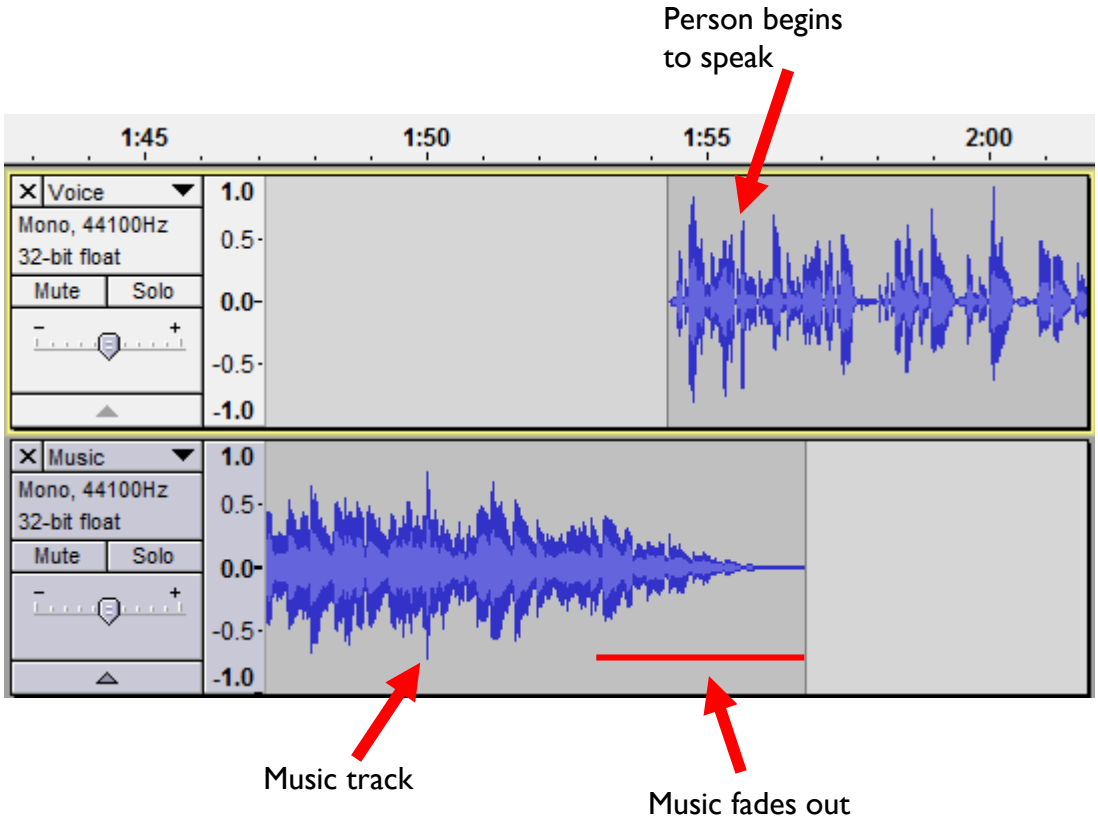
8.3. How to add background music

With the tools and techniques we have learned already, we can add background music to a recording:

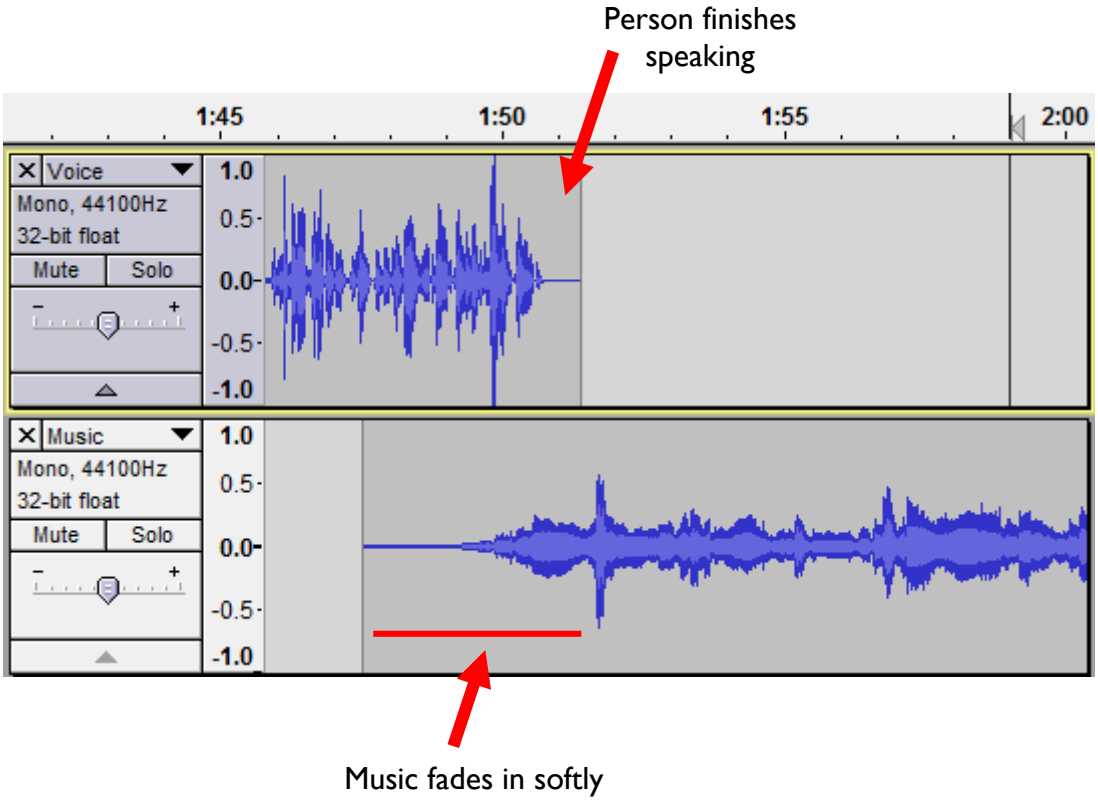
- ***Import an audio file*** – to import a piece of music (.WAV ou .MP3) that you have already recorded, or that someone else has recorded and you have the right to use.
- ***Time Shift Tool*** – to change the position of a track relative to another.
- ***Cut, copy and paste*** – to choose the section of the track you need and place it where you want it.
- ***Amplify*** – to change the volume of the music, e.g.:
  - lower the volume when someone is speaking,
  - increase the volume when they have finished speaking.
- ***Fade In, Fade Out*** – to increase or lower the volume gradually so as not to give a shock to the ear.

Here are some possible scenarios:

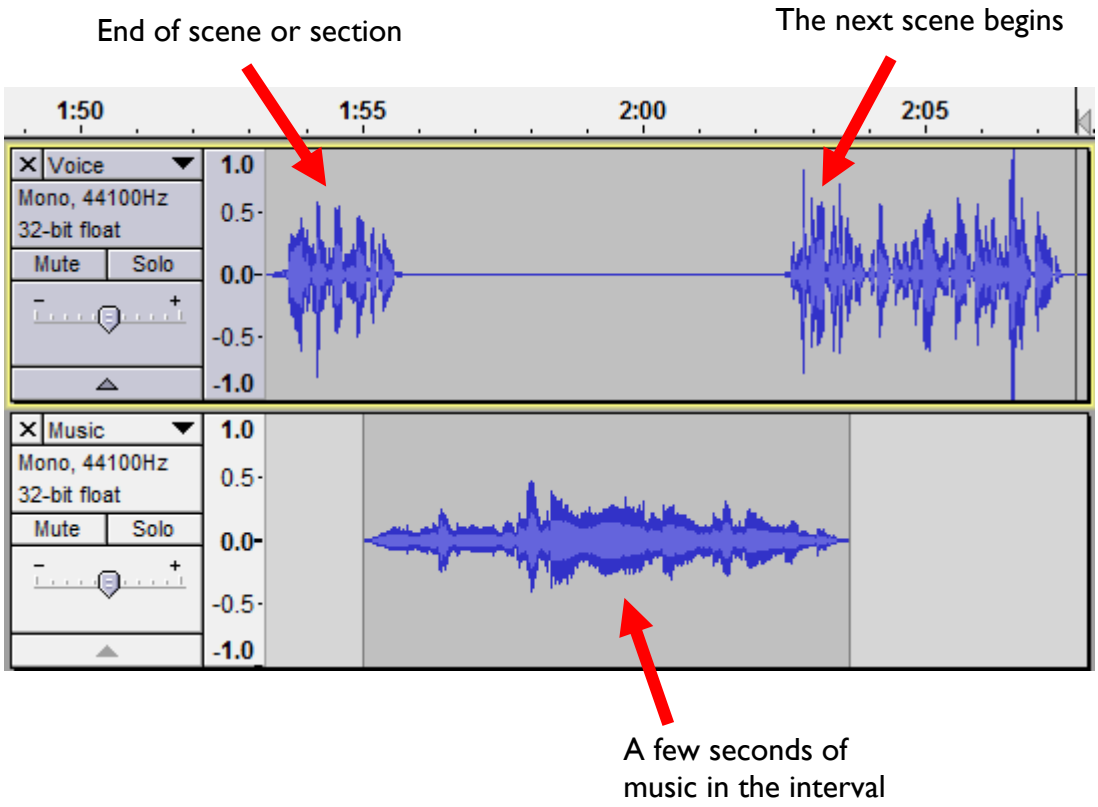
i. ***We start with music. After a while the music fades out and someone begins to speak as the music continues to fade out.***



ii. ***Someone is speaking. Just before they finish the music begins to fade in, with the volume increasing gradually.***



iii. ***A few seconds of music are inserted between two parts of a narration or speech, or between scenes or sections.***

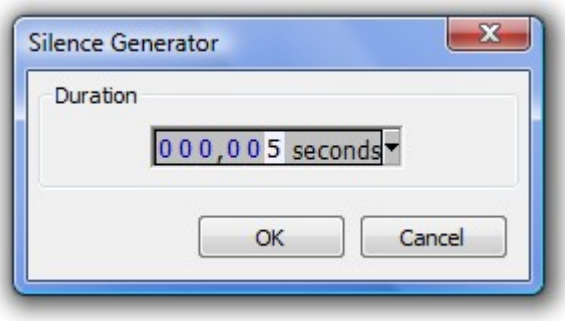


How to insert a few seconds of silence in the middle of a track

If you look at the first track in the image above, you will notice that we have inserted a few seconds of silence between the two scenes or sections.

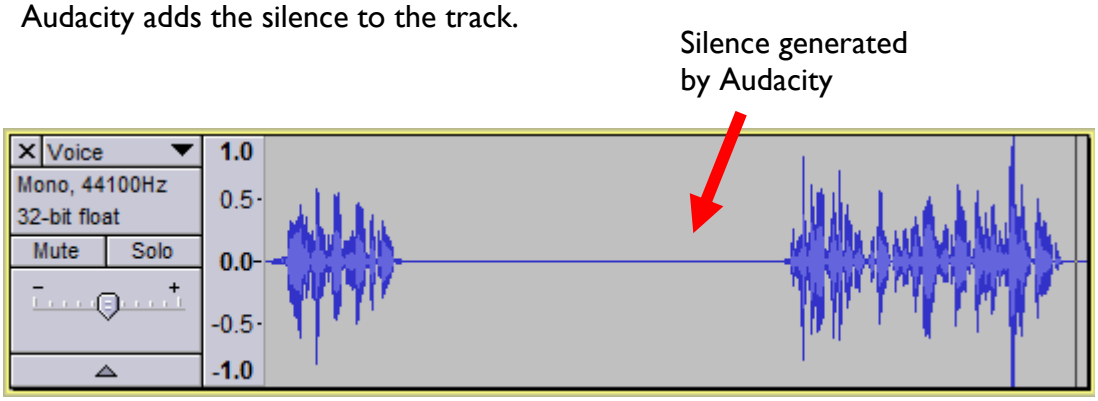
To do this:

1. Position the cursor in the track where you want to insert the silence.
2. On the menu, click **Generate ➢ Silence…**



3. Specify the number of seconds of silence to insert.
4. Click **OK**.

Audacity adds the silence to the track.



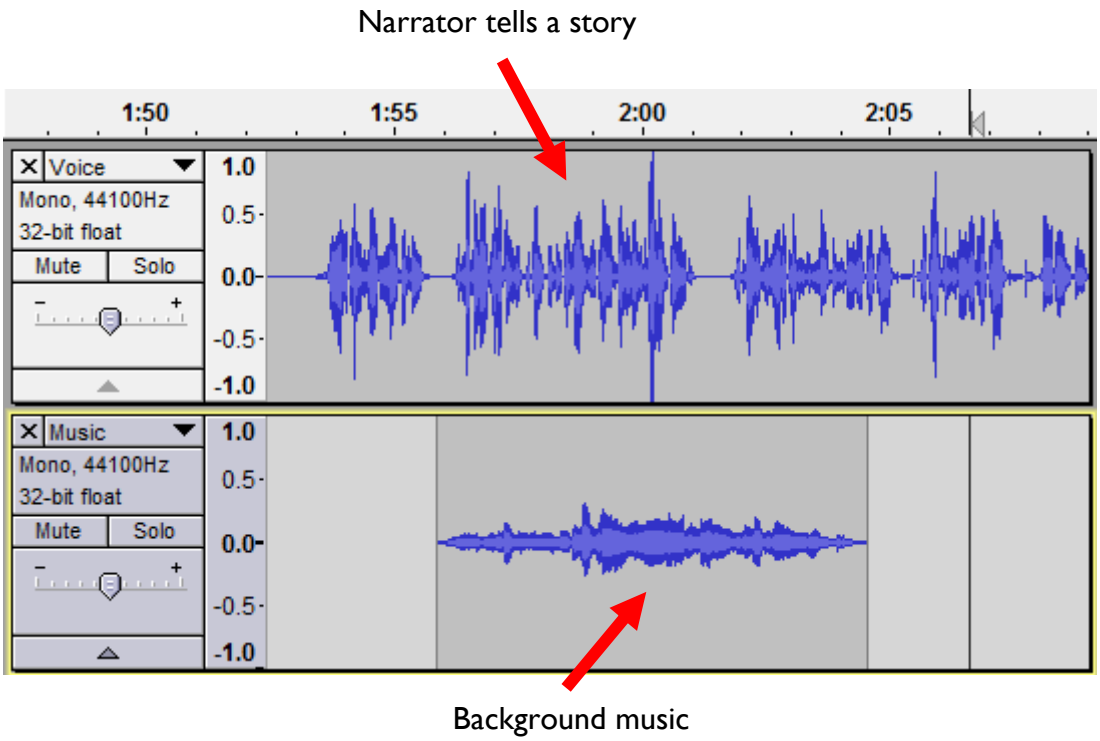
How to split a track

Another way of doing this would be to split the track and move the two halves apart.

To do this:

1. Position the cursor at the place where you want to split the track.
2. On the menu, click **Edit ➢ Clip Boundaries ➢ Split** (or **Ctrl+I**)
3. Use the **Time Shift Tool** to move the split sections apart.
4. If you want to join the sections together again after moving them apart, on the menu click **Edit ➢ Clip Boundaries ➢ Join** (or **Ctrl+J**).

iv. *At the same time as someone is speaking, we add some background music for some of the time.*

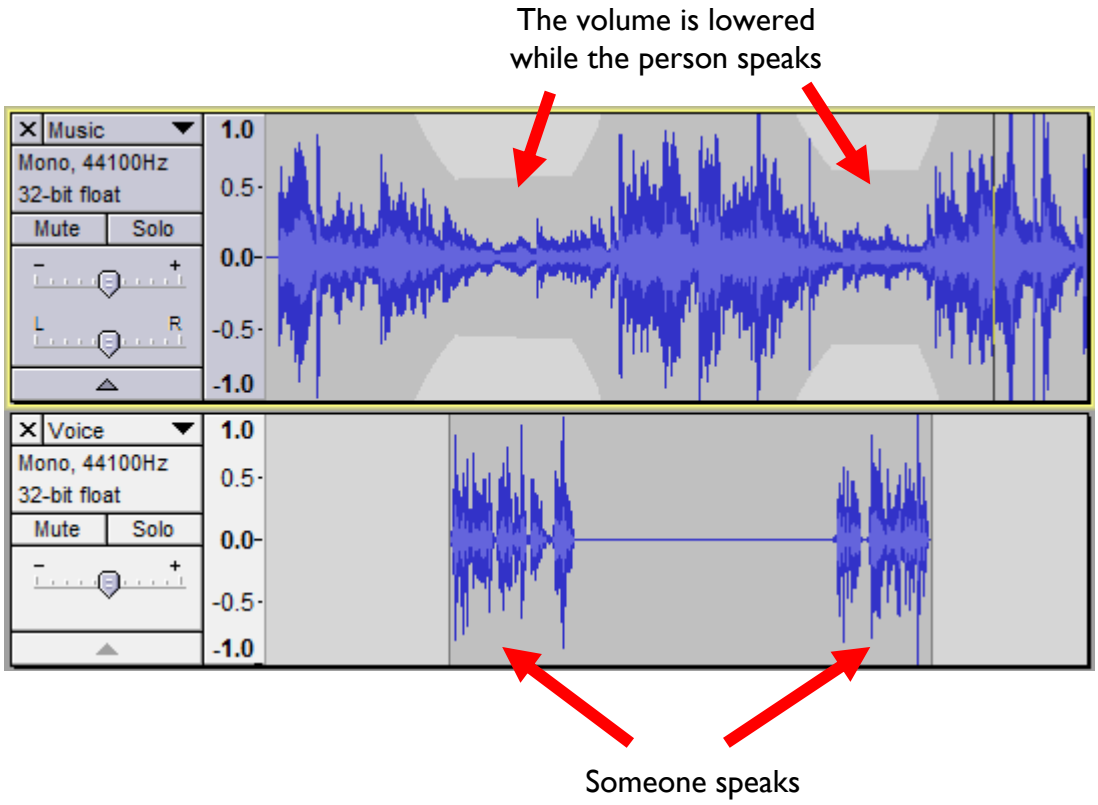


You'll need to take care with the volume of the background music. Don't make it so loud that it drowns out the voice of the person speaking.

Also, take care to use the appropriate style of music for the occasion so that it is helpful rather than distracting.

> **A Word of Advice**
>
> If you want to add background music when someone is speaking, it is usually best to choose a piece of instrumental music (without words). Otherwise, your listeners will be trying to listen to two sets of words at the same time (narrator and song) which could be distracting.

v. ***The music is the main track and from time to time we lower the volume of the music so someone can speak. This is what radio DJs do.***



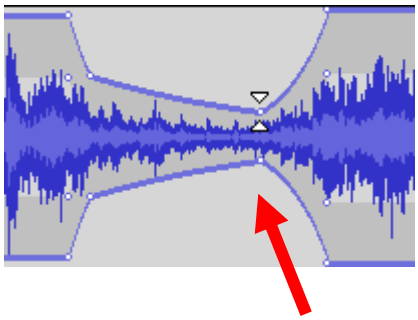
To increase and decrease the volume at the right moments – and to do it gradually, not abruptly – there is a tool to help. It is called the **Envelope Tool**.

Envelope Tool

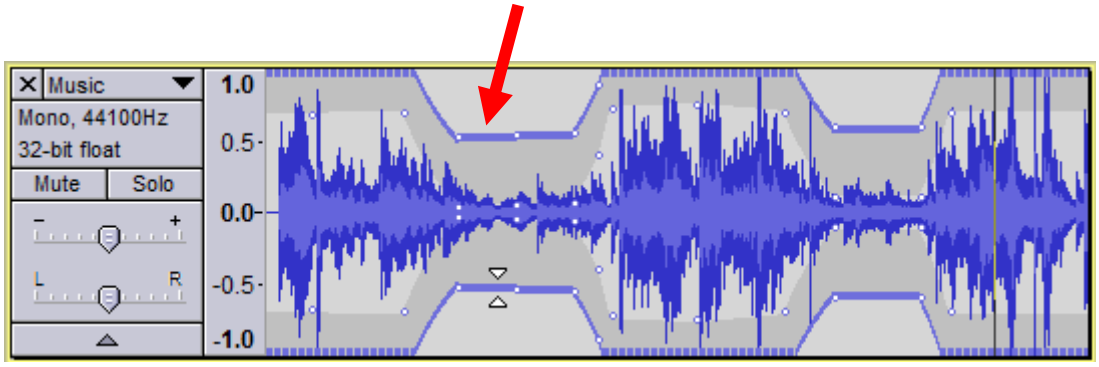
To use the Envelope Tool:

1. Click on the **Envelope Tool** button. The mouse cursor changes to become two triangles.

2. With the tool, click in the track and drag the wave forms up or down to modify the volume. You need to do this at several places.



Click in the track and drag up or down
to change the volume



3. If everything is OK, close the Envelope Tool by selecting the **Selection Tool**. The mouse cursor goes back to the capital 'I'.

9

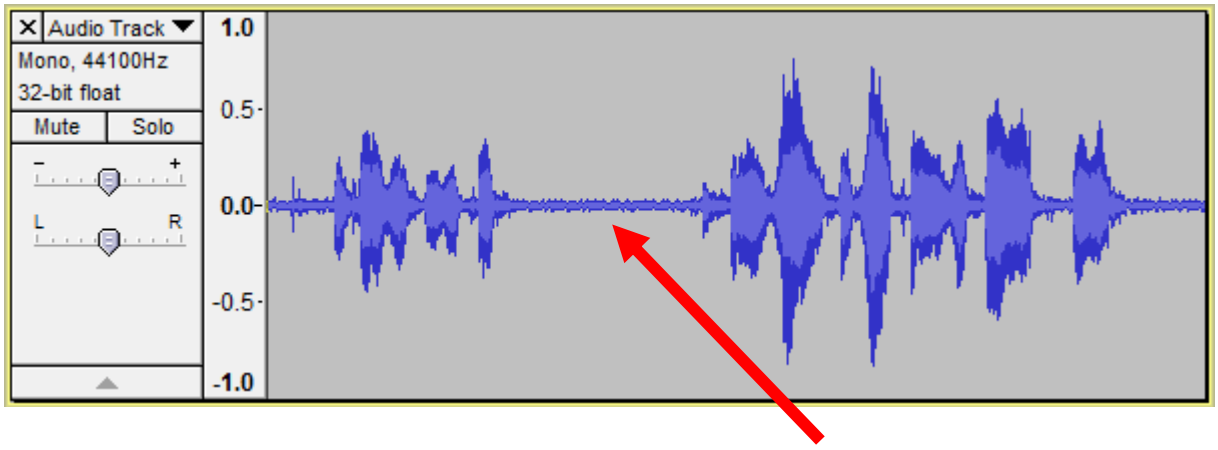
Advanced effects

In this chapter you will learn:

- how to reduce background noise;
- how to change a person's voice.

9.1. How to reduce background noise

Sometimes you'll find a constant background noise in your recording. Here we are not talking about something with a short duration like a car horn or a dog barking but rather a sound that continues with the same volume for most or all of the recording.



Examples of background noise include:

- computer noise (fan or hard disk);
- a cassette player motor;
- a microphone (especially low quality microphones);
- a fridge or freezer;
- an electric generator;
- air conditioning.

All these noises repeat themselves regularly in the background and hardly change. If we can help Audacity to learn to recognise them, it can try to remove them.

There are two steps to this **Noise Removal** process:

Step 1: Select some noise and get the noise profile.

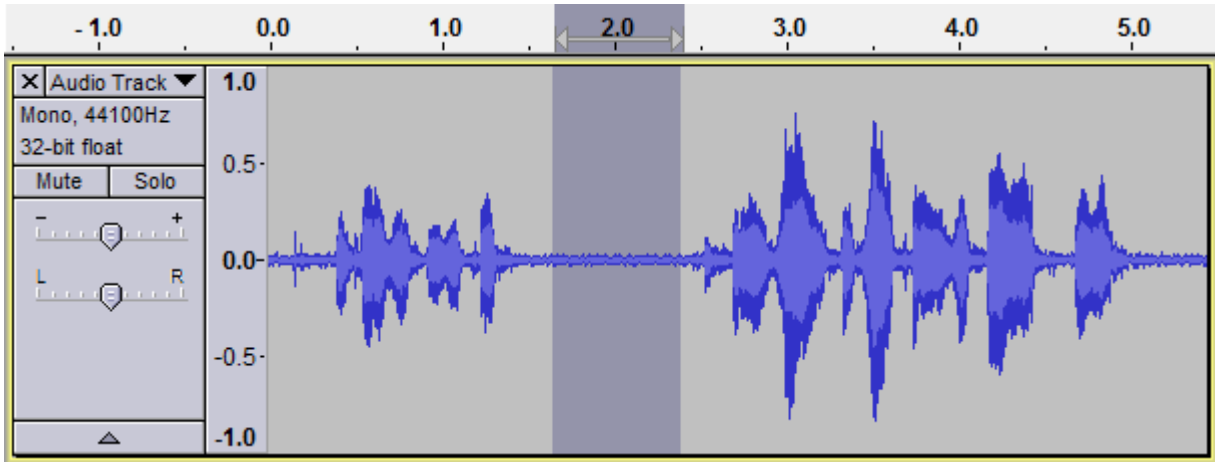
Step 2: Remove noise from a selected part of the track.

Step 1

To get the noise profile:

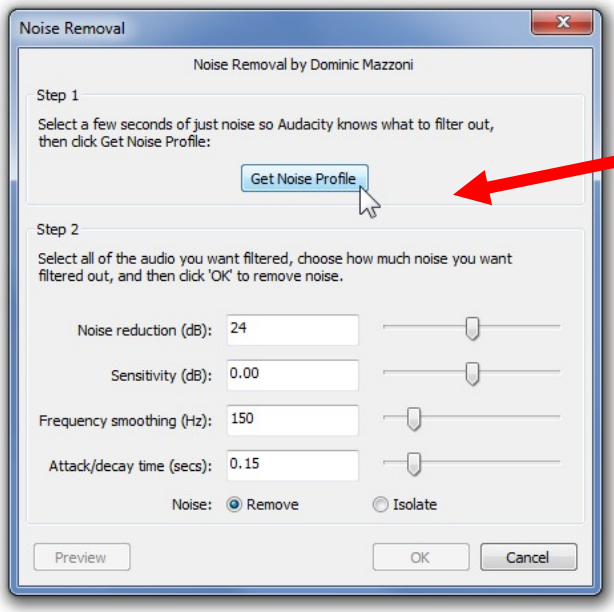
1. Look for a section of the audio track in which there is nothing but background noise for a few seconds and nothing else. (Use **Zoom In** if necessary.)

2. Select a few seconds of noise.



3. On the menu, click **Effect ➢ Noise Removal…**

   You will get the **Noise Removal** dialog.

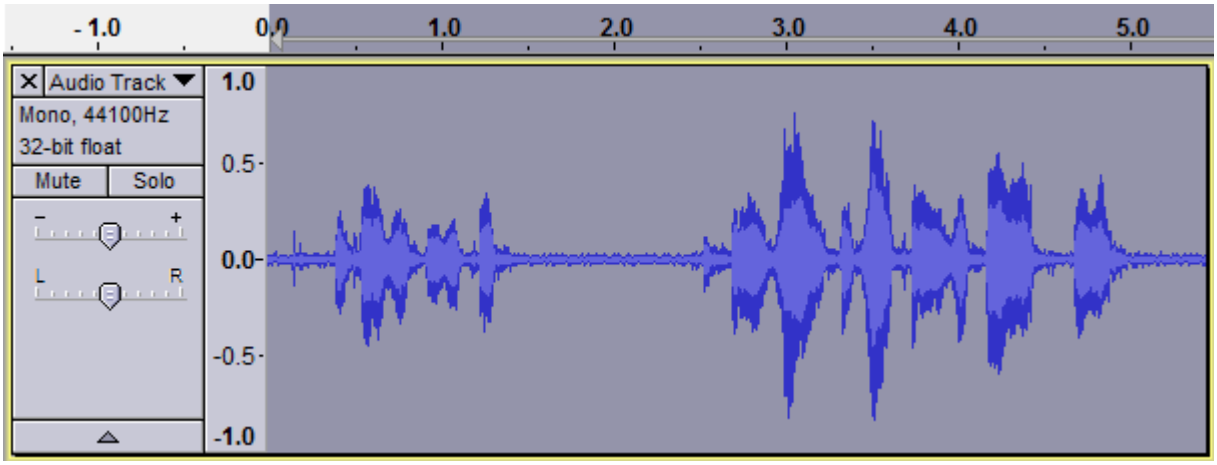


Click here to get the noise profile

4. Click the **Get Noise Profile** button.

Step 2
To remove the noise from all or part of the track:

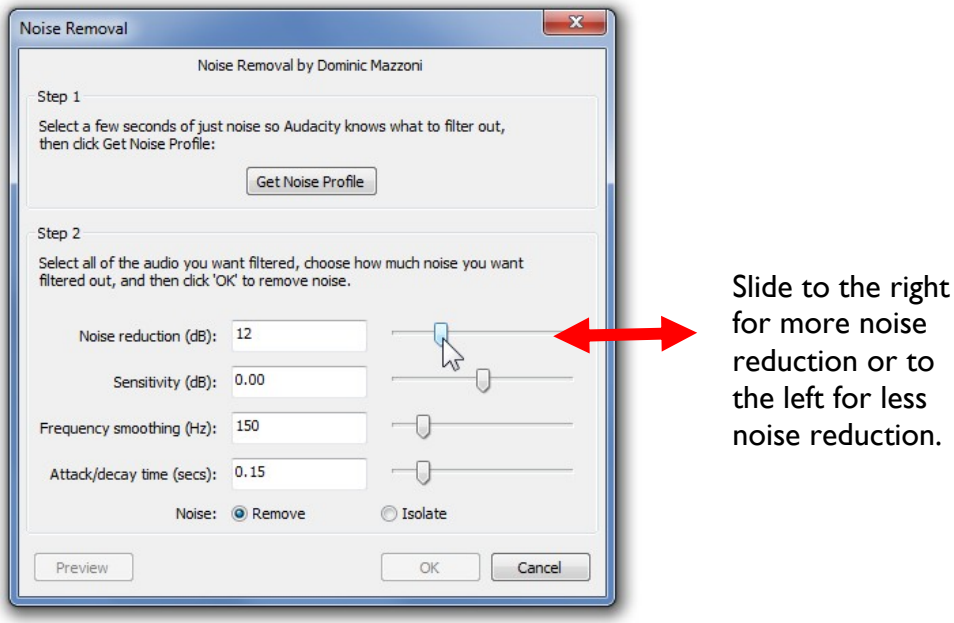
5. Select the part of the track from which you want to remove the noise. (This is a different selection from the one you chose in Step 1 and includes parts where people are speaking.) If you want to select the whole track, you can do this with **Ctrl+A**.



6. On the menu, click **Effect** ➢ **Noise Removal…**

   You'll get the **Noise Removal dialog** again.

7. Choose the amount of noise to filter out by moving the **Noise Reduction** slider left or right.



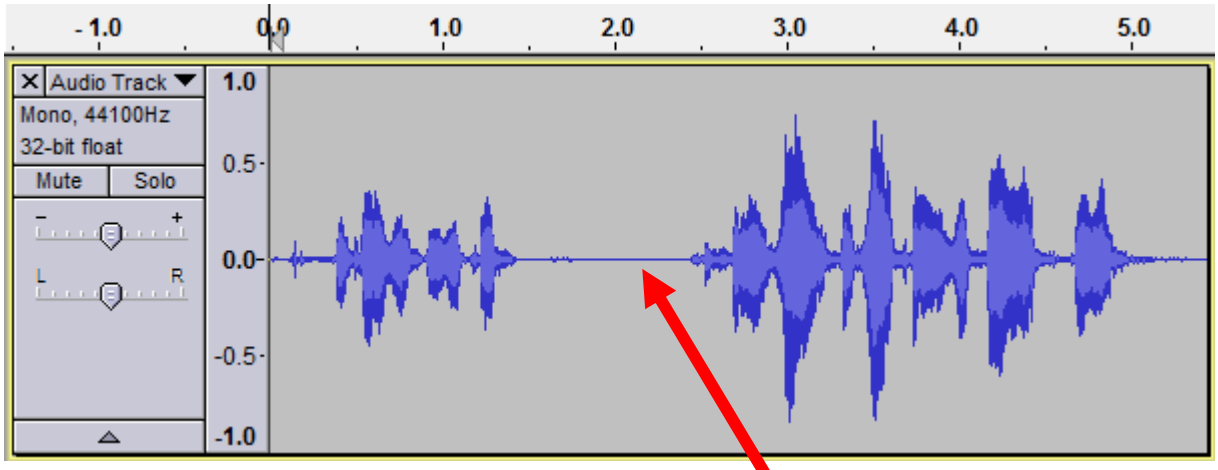
Slide to the right for more noise reduction or to the left for less noise reduction.

8. Before clicking OK to start removing the noise, you can listen to a preview of how the audio will sound by clicking the **Preview** button.

    - If you try to remove too much noise, you will hear a distortion in the sound.
    - It is better to remove less noise than too much noise. If you try to remove too much you could ruin your recording.

9. Click **OK** to start removing the noise from the section of track you have selected.

    If the section is several minutes long, the noise removal process could take some time.



The noise has been removed

10. Listen to the track again with headphones if possible. The reason for using headphones is that you will be able to hear more clearly whether there is any distortion.

    If you are not satisfied with the quality, it is the moment to click **Undo** (or **Ctrl+Z**) to start again.

Some Advice about Noise Removal

It is easy to ruin your recording with Noise Removal if you don't pay attention.

So:

- Make sure you have taken **backups** of your audio files before saving a project with noise removal.
- After applying Noise Removal to a track, **listen to it carefully with headphones** until you are satisfied, before continuing with other edits.

Remember that:

"Prevention is better than cure!"

You are better off if you can record the initial audio without background noise.

So:

- Use a good quality microphone.
- Use good quality cables.
- Keep the microphone well away from the computer, tape recorder, etc.
- Turn off fans, air conditioning, clocks or lights if they are making a noise.
- If you are using an electric generator, move it as far away as possible, or use a 12V battery instead.
- Insulate the recording room/studio from outside noises.

9.2. How to change a person's voice

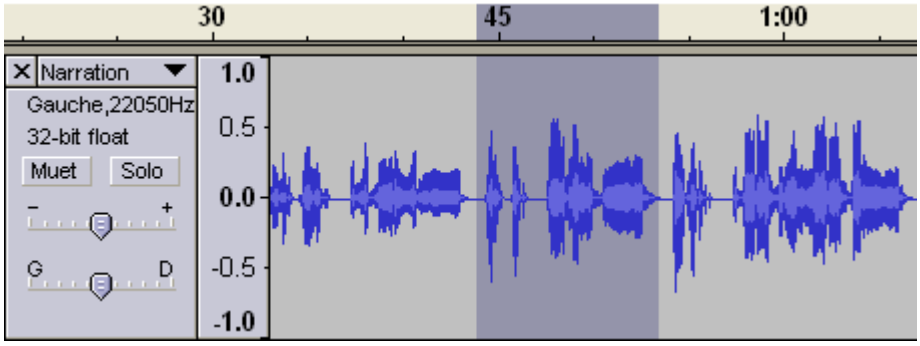
It is possible to change the pitch of someone's voice in a recording, for example:

- to make it deeper, or
- to make it more high pitched.

This could be useful if you wanted a single actor to play two roles in a drama (but is probably not the best way of disguising someone's voice).

Here's how you do it:

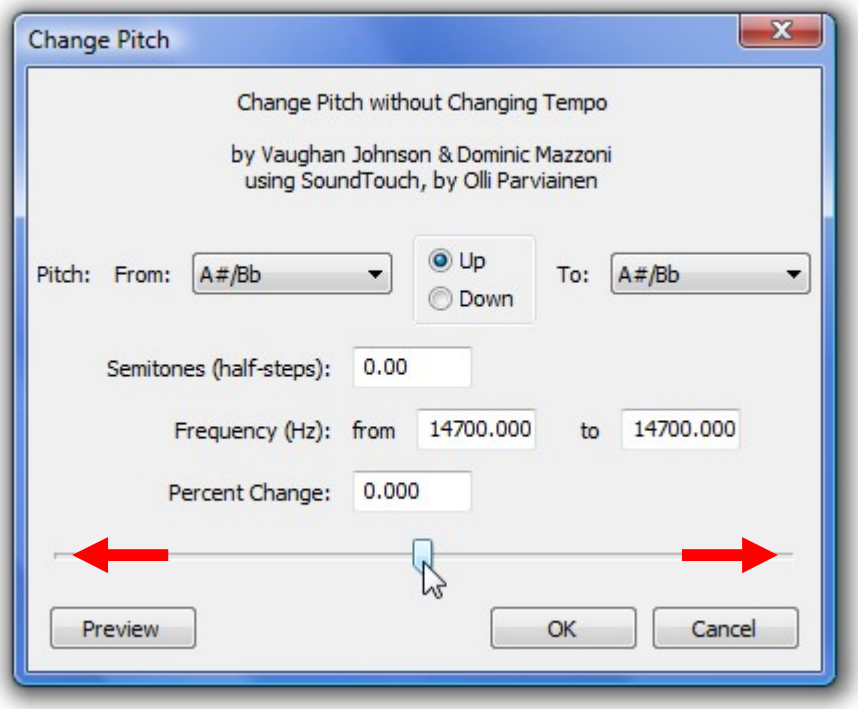
1. Select the section of the track for which you want to change the pitch.



2. On the menu, click **Effect** ➢ **Change Pitch…**

   You'll see the **Change Pitch** dialog.

Slide to the left to make the voice deeper



Slide to the right to make the voice more high pitched

3. Drag the slider to the left or right to choose the percentage change in pitch:
    - A negative change: to lower the pitch.
    - A positive change: to increase the pitch.

4. Before closing the window, you can listen to the effect of the change on a sample by clicking the **Preview** button.

5. When you are satisfied, click **OK**.

    Audacity will apply the effect to the selected portion of the track.

6. Listen to the portion of the track you have modified (with headphones if possible). If you are not satisfied, it is the moment to click **Undo** (or **Ctrl+Z**).

10

Advanced tasks

In this chapter you will learn:

- how to cut an audio file into several sections.

10.1. How to cut an audio file into several sections

There might be occasions when you want to take an existing audio file and cut it up into a series of smaller audio files, for example:

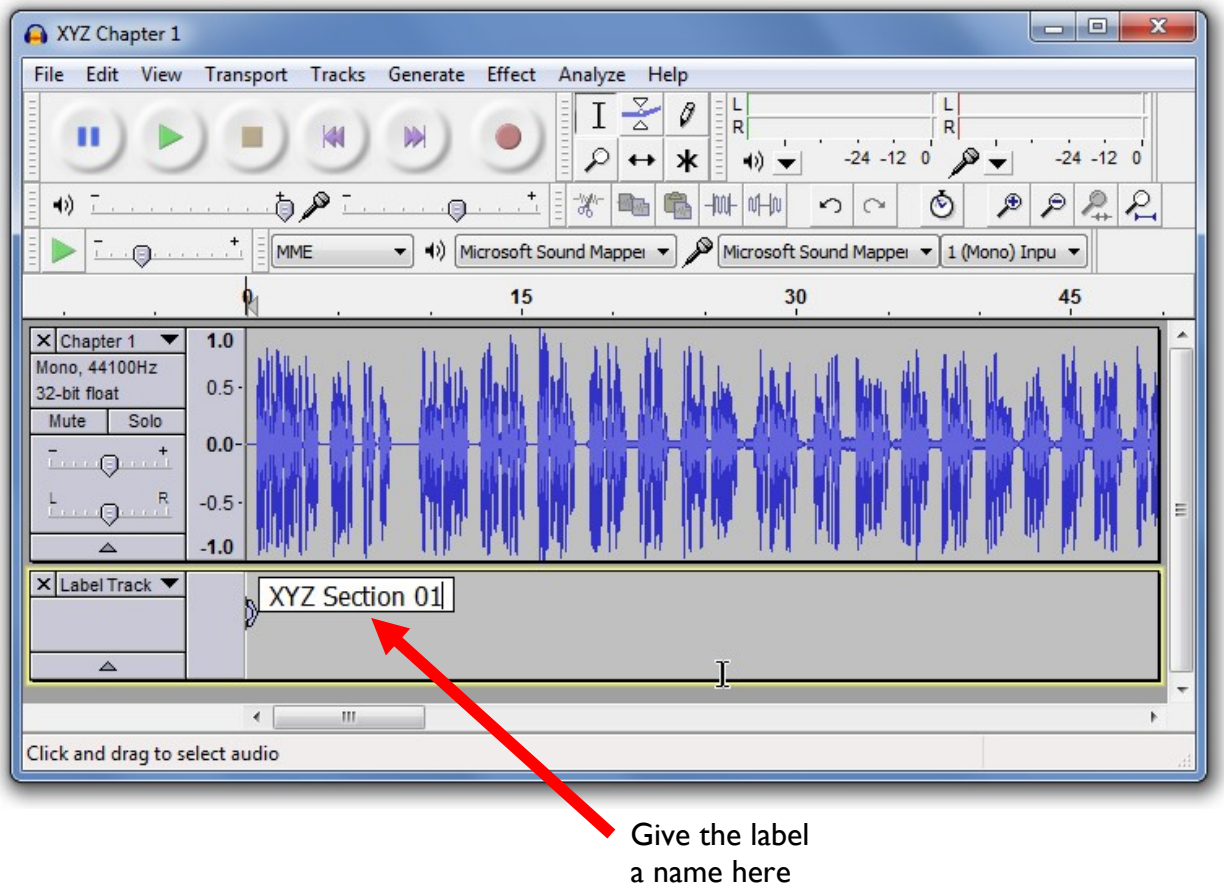
- If you have a single audio file containing several songs and you want to split it up so that each song is in a separate file.
- If you have an audio file of the reading of a book, and you want to split it up into smaller sections.

To do this:

1. Open the audio file you want to cut into sections, using **File** ➢ **Open**…
2. Apply any effects/changes you need to make to the whole track, e.g.
   - if you need to make any volume changes (**Effect** ➢ **Amplify…**);
   - if you need to change a stereo track to mono (**Tracks** ➢ **Stereo Track to Mono**).
3. **Zoom In** - so you can see better where to make the cuts in the track.
4. Place a label at the start of the track:

   To do this:
   - Move the cursor to the start of the track (**Home**).
   - Press **Ctrl+B** (or select **Tracks** ➢ **Add Label At Selection**) to place a label at the cursor. When you do this, you'll see a label track appear under the audio track.

- Give a name to the label (e.g. 'XYZ Section 01') by typing into the box next to the label marker. Choose the label name carefully since this will be the filename given to the first of the cut-up files.



5. Listen to the track to find the next place to make a cut.

6. When you have found the next place to make a cut, place a label there.

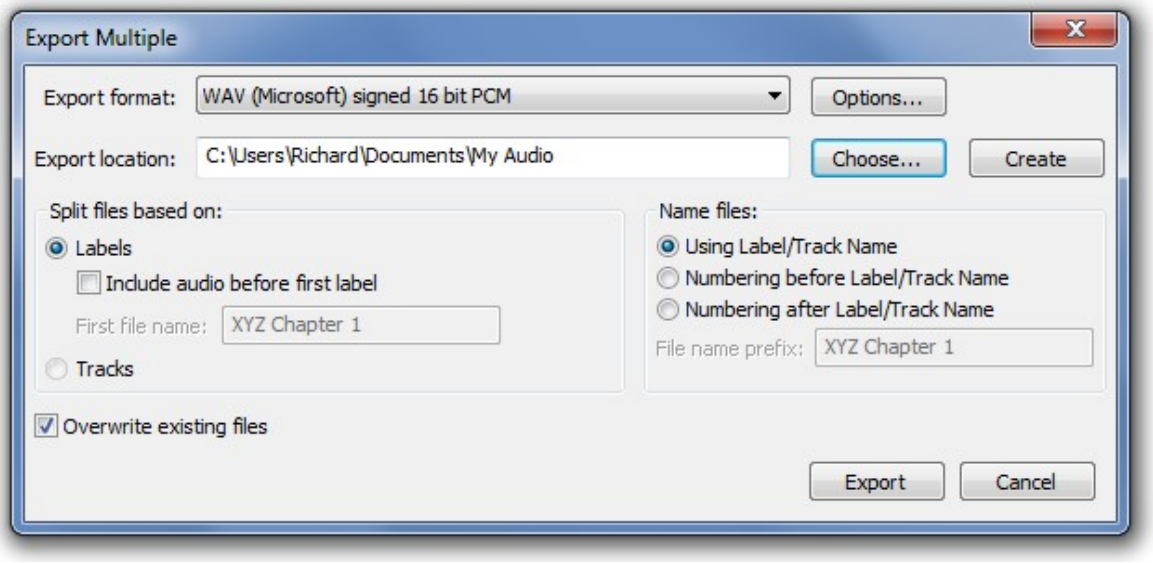
   To do this:
   - Move the cursor to where you want to cut the track.
   - Press **Z** (to find a zero crossing)
   - Press **Ctrl+B** (or click **Tracks ➢ Add Label At Selection**) to place a label at the cursor.
   - Give a name to the label (e.g. 'XYZ Section 02', 'XYZ Section 03', or 'XYZ Section 04', etc.). Choose the label name carefully since this will be the filename given to the next of the cut-up files.

7. Repeat steps 5-6 until you have placed labels at all the places where you want to make a cut. (Note that you do not need to place a label at the end of the track.)

8. If you need to make corrections or remove labels, you can use:

   Tracks ➢ Edit Labels

9. When all is ready, click **File ➢ Export Multiple…**



In the **Export Multiple** dialog box, choose the following options:

Export format:	*Select either:* WAV (Microsoft) signed 16 bit PCM *or:* MP3 Files
Export location:	*Select the folder in which you want to place the files.*
Split files based on:	Labels
Name files:	Using Label/Track Name

If you are exporting as MP3 files, you can specify the quality (i.e. how much compression), by clicking on the **Options…** button at the top of the dialog.

10. Click **Export**.

11. The **Edit Metadata** window will appear several times, once for each individual file.

    For each, enter any information about the file and click **OK**.

    The metadata provides information about the content of an audio file (title, author, album name, etc.) and is stored within the WAV or MP3 file itself. If you are only exporting the files for testing purposes or if the files are only for use in editing locally, you do not need to provide any of this. You can simply ignore the window and press **OK**. But if you are exporting the files for distribution it is good practice to include such information so that other users can see the details of your file when they have it loaded in an MP3 or media player.

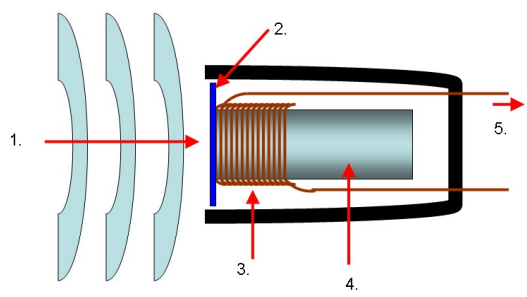
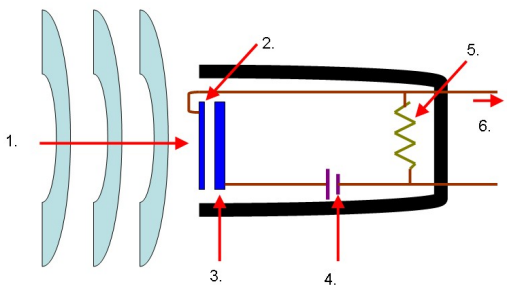
12. Audacity will export all of the individual files. Go to the folder using Windows Explorer and verify that the files are there and have been created correctly.

A

Appendix

A. Different types of microphone

There are two major types of professional microphone: dynamic and condenser.

Dynamic Microphone	Condenser Microphone *(capacitor or electrostatic microphone)*
	
Standard general purpose microphone	More specialised microphones, better suited for an indoor studio situation.
How it works: Sound waves hit the diaphragm, causing it to vibrate and move a wire coil backwards and forwards over a magnet. The alternating electric current generated (by electromagnetic induction) is sent out of the microphone. This is the opposite way round to how a loudspeaker works.	**How it works:** Inside are two plates with a voltage between them. Sound waves cause the front plate (the diaphragm) to vibrate, moving it closer or nearer to the other plate (the back plate). As this happens, the capacitance increases or decreases. The resulting electric current is recorded.
Dynamic Microphone 	Condenser Microphone 

Dynamic Microphone	Condenser Microphone *(capacitor or electrostatic microphone)*
Does not require power or an internal battery. **Features** Robust and rugged Can cope well with high volume sounds **What can it be used for?** Well suited for general purpose use, recording, live performances, public speaking events, karaoke, etc.	Needs a power source: a battery inside the microphone or 'phantom power' from a mixer or pre-amp. **Features** More fragile More expensive More accurate Wider frequency range: can pick up higher frequencies and quieter sounds. High volume sounds can cause distortion. **What can it be used for?** Well-suited for studio recording use, but not for live performances where they could receive harsh treatment and risk being dropped.

Professional dynamic microphones include the Shure SM58 and the Sennheiser e835. Professional condenser microphones include the Rode NT1, Rode M3 and the Shure SM81. But please note that to use these microphones you will need a USB Audio Interface since they will not work well if you try to plug them directly into the Mic socket of the computer.

Electret Condenser microphones

Another popular type of microphone is the Electret Condenser microphone. This is a form of a condenser microphone, which is manufactured with a permanent static electric charge, rather than needing to be powered.

They are used, for example, in:

- Mobile phones
- Lapel mics (lavalier microphone)
- Built into laptops
- Headsets
- Digital sound recorders

Although the quality of these microphones is improving, it does not always match that of the more established dynamic or condenser microphones. A lot of electret microphones are mass-produced cheaply and noise levels tend to be higher.

If you want to do good quality recording we would recommend you do <u>not</u> use a cheap headset.

B. Control Panel settings in Windows Vista and Windows 7

(Note: If your computer is running Windows Vista or Windows 7, follow the instructions in this section, otherwise if you have a Windows XP computer, please see section C.)

When configuring your microphone and speakers for use with Audacity, you might need to adjust your Windows Control Panel settings to tell Windows which microphone (recording device) and speakers (playback device) you want to use. You will likely need to do this if you are using a USB microphone, e.g. to tell Windows to disable the built-in microphone for recording, but to use the built-in speakers for playback.

Where to find the Control Panel settings:

There are two ways of getting at the audio configuration settings. Either:

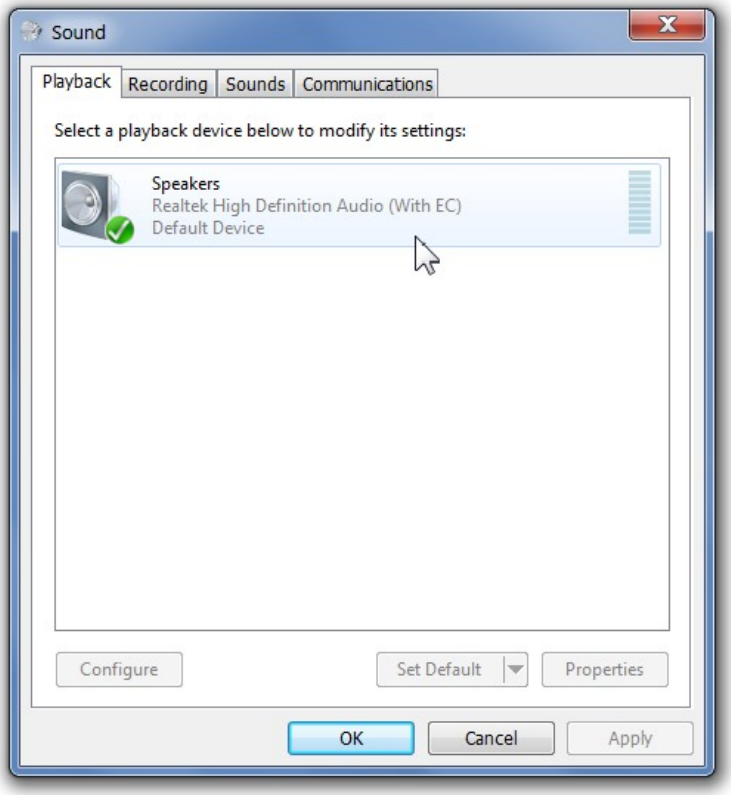
- From the Windows Start menu:

  Start ➢ Control Panel ➢ Hardware and Sound ➢ Sound, or

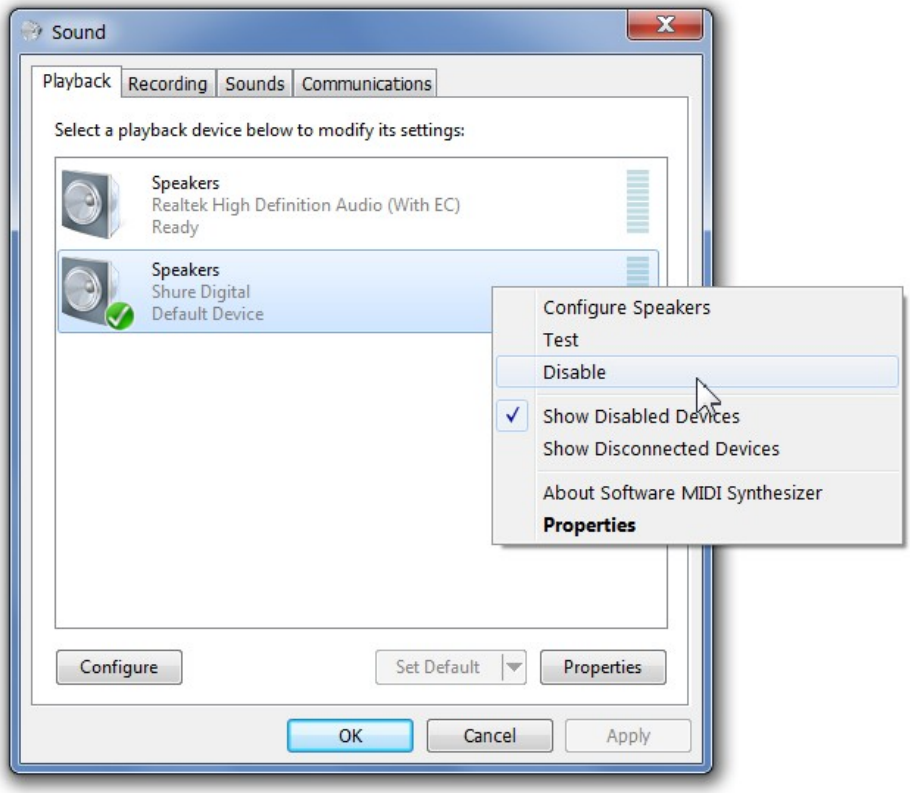
- By right-clicking on the Speaker/Volume icon in the bottom right of the screen and selecting either **Recording Devices** or **Playback Devices**.

To specify the default playback device:

If the Playback tab looks like the one below with only one playback source listed, this is the one that will be used. You do not need to do anything.



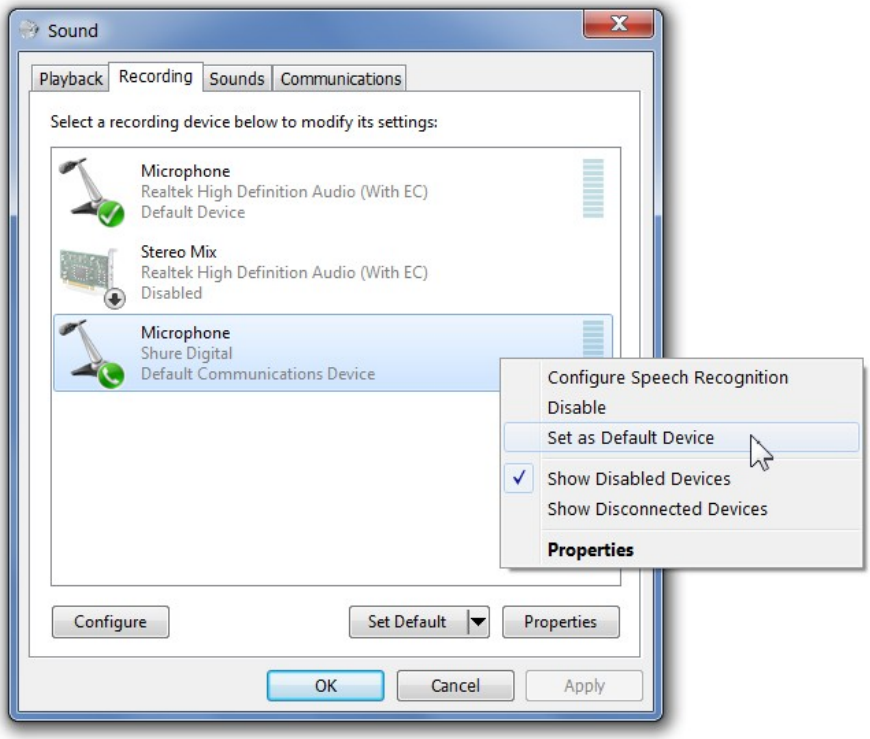
If the Playback tab looks like the one below with more than one playback source listed, use the right mouse button to select or disable the different speakers as appropriate.



To specify the default recording device:

On the **Recording** tab, enable or disable the recording devices as required. Verify their settings by right clicking and selecting **Properties**.

For example, in the screen below, our built in microphone is called 'Realtek High Definition Audio' and the USB microphone we have attached is called 'Shure Digital'. In this case, we want to make the Shure Digital microphone the default device and we want to disable the built-in one.



The names of the recording devices on your machine will depend on the type of computer and microphones you have, so you might need to use some trial and error to enable/disable the various recording devices in order to find the one you want.

C. Control Panel settings in Windows XP

(Note: If your computer is running Windows XP, follow the instructions in this section, otherwise if you have a Windows Vista or Windows 7 computer, please see the previous section.)

When configuring your microphone and speakers for use with Audacity, you might need to adjust your Windows XP Control Panel settings to tell Windows which microphone (recording device) and speakers (playback device) you want to use. You will likely need to do this if you are using a USB microphone, e.g. to tell Windows to disable the built-in microphone for recording, but to use the built-in speakers for playback.

Where to find the Control Panel settings:

There are two ways of getting at the audio configuration settings. Either:

- from the Windows Start menu:

  Start ➢ Control Panel ➢ Sounds and Audio Devices,

or

- by right-clicking on the Speaker/Volume icon in the bottom right of the screen and selecting **Adjust Audio Properties**.

To specify default playback and recording devices:

In the **Sounds and Audio Devices Properties** dialog box, select the **Audio** tab and select the default devices for playback and recording.

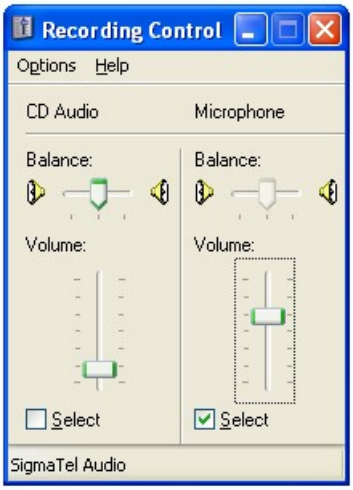
Select the speakers you want to use here

Select the microphone you want to use here

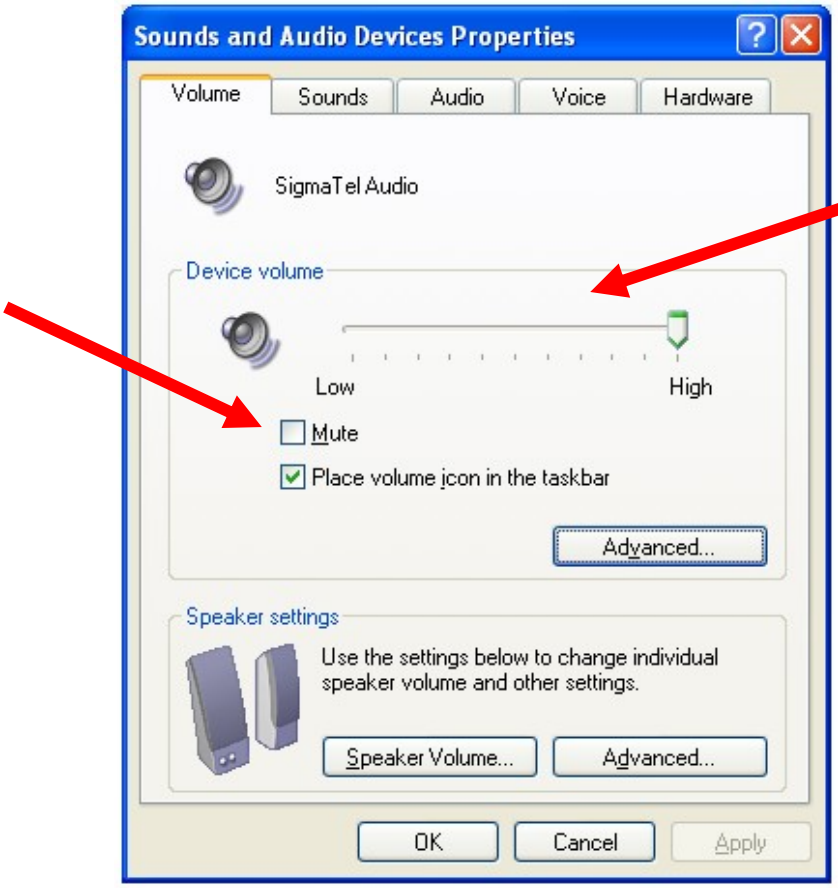
You might need to select **Use only default devices**

You might need to select **Use only default devices** to ensure that only those you have selected as defaults are enabled for use in playback and recording.

Click on the **Volume…** button under the playback device name and the recording device name, to ensure the devices have been selected and that the volume is not too low.



Back in the **Sounds and Audio Devices Properties** dialog box, click on the **Volume** tab to ensure that the playback device volume is set high enough and that the sound is not muted.



Ensure that **Mute** is <u>not</u> selected

Ensure that the volume is set high enough

Index