2.1.1

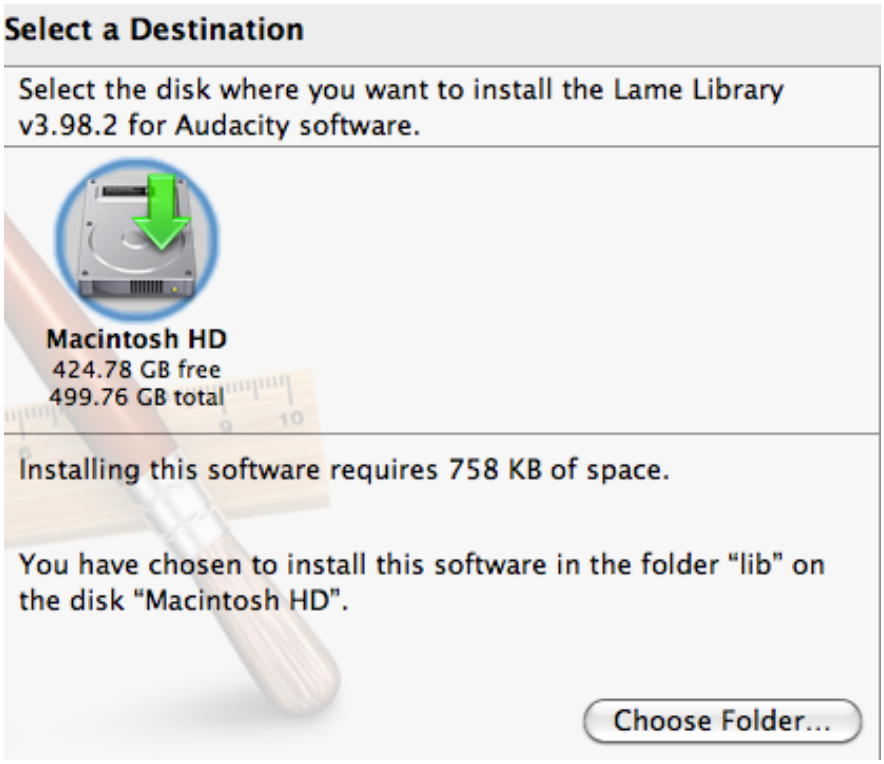
Tutorial

Part One -----Class1, 02/05/2015

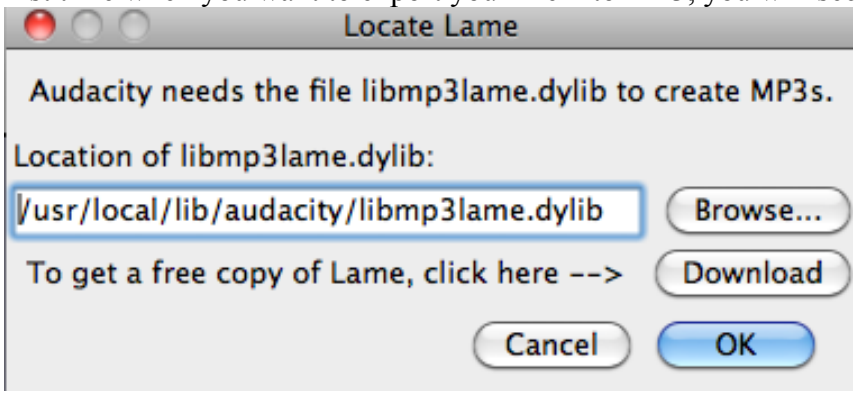
Download Audacity and LAME Encoder
Audacity is an open source cross-platform (It can be used in Windows, Macs, and Linux) audio editor. You can download at http://audacityteam.org/download/.

The newest version is 2.1.1 In order to export MP3 format files, you also need to download LAME MP3 encoder at
http://manual.audacityteam.org/o/man/faq_installation_and_plug_ins.html#lame

When you install the LAME MP3 encoder, you can see this image.



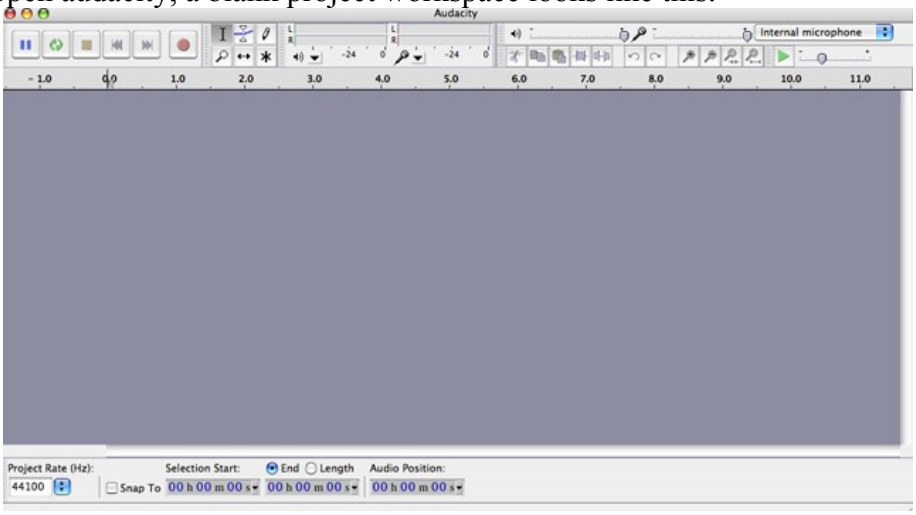
Click **Choose Folder** button and find a place you want to save it. After you download, at first time when you want to export your file into MP3, you will see



Don't click **OK**, instead, click **Browse** and find where you save your LAME MP3 encoder.

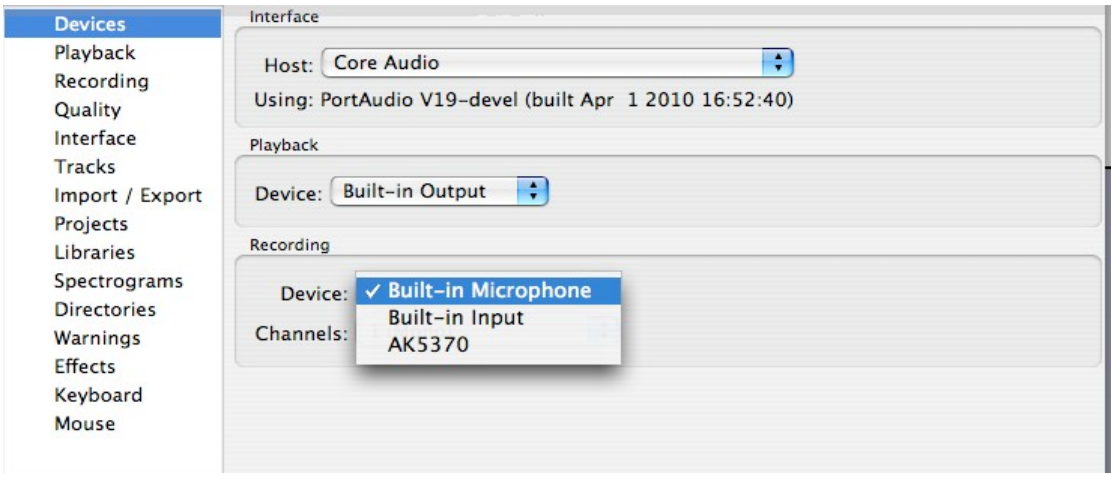
Interface

When you open audacity, a blank project workspace looks like this.



Setting up the Preferences in Audacity

Under the **Audacity** on the menu, click the **Preferences**; a dialog window will pop up.

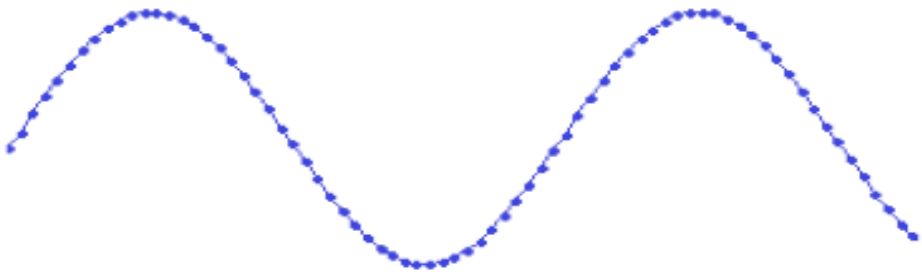


On the left side, it is a category of the setting. Click any item on the category; the setting for the item is listed on the right side.

1. Click the **Devices**, under **Recording** device, select **Built-in Microphone** when you want to use Microphone built in the computer, or select other **External Microphone** (LRC has AK5370 as an external microphone).
2. Click the **Quality,** on the "**Default Sample Rate**", make sure is "**44100 Hz**". On the "**Sample Format**" is **32-bit float**. If your computer is old, you can select "**16 bit**".
3. Click **Import /Export**, make sure to check **"Make a copy of uncompressed audio files before editing(safer)".** Uncheck **Normalize all tracks in project**.

Quality of Sound

All sounds we hear with our ears are pressured wave in air. Audio pressure waves, or waveforms, look something like this:



Each dot in the figure above represents on audio sample. The quality of digital audio is affected by two factors, sample rate and bit rate.

- Sample rate is the number of samples captured per second to make a waveform. It is measured in Hertz (Hz). More samples, better sound will be. An audio CD has 44.1kHz. This is also the default sample rate that Audacity uses. Capturing a sound at a particular frequency requires a sampling rate of at least twice that frequency. Human can't hear frequencies above 20,000 Hz, therefore a sample rate of 44,100 Hz is the absolute minimum necessary to reproduce sounds within the range of human hearing. 44, 100 Hz is chosen as the rate for audio CDs.

- Sample format is the number of computer bits used to represent each sample. Audacity default is 32. More bits, more memory space it will take on the computer. 16-bit can ensure a good quality sound. If you have a long audio file, it is better to change your default 32-bit into 16-bit from the track control panel.

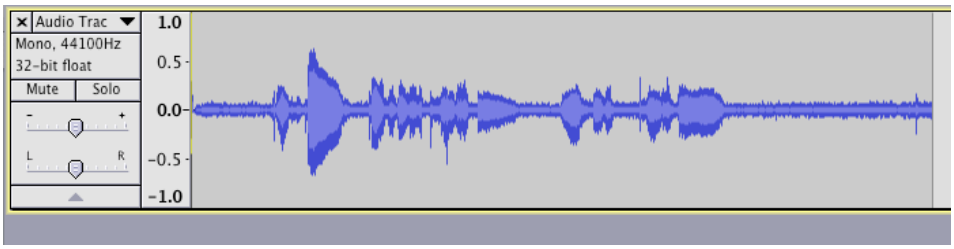
Bring Audio File into Audacity

1. Importing audio file

You can import an existing audio file from a CD or from other resources. Choose **File>Import Audio>Audio**. Then navigate to the file being imported. It will appear as a new track, displaying as the blue image, waveform,
although it also possible to display a spectrogram. Usually we use two types of tracks, mono track and stereo track. We can set up from **Preferences**. On the **Devices,** select **Mono** or **Stereo** from the drop down menu of **Channels**.

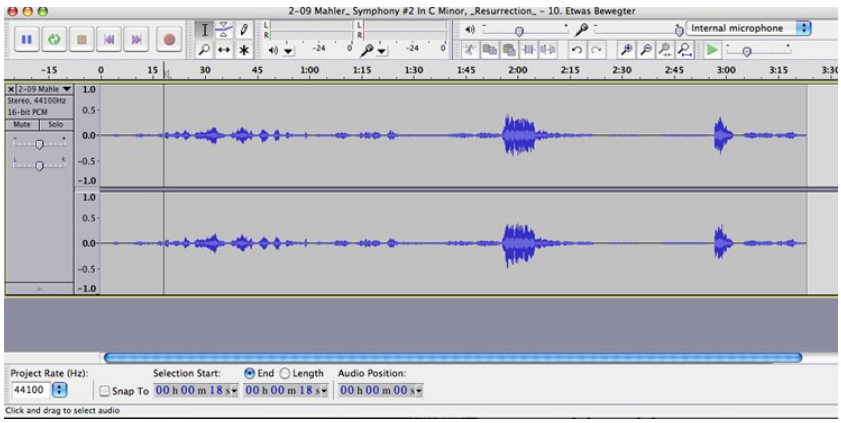
- Audacity Mono Track

In Audacity, most voice recording will be done as a mono or single channel sound track. The blue image on the
Audacity tracks below is the waveform, displaying of the mono track.



- Audacity Stereo Tracks

A stereo track is a group of two audio tracks that are grouped together. Stereo Tracks include both a right and left
channel as illustrated below. The top waveform is the left channel and the bottom form is the right channel.



Two alternative ways to import an audio file:
By going to Tracks, picking "New Track" and specifying whether you want an audio, stereo or label track. Also you can simply drag your file into the Audacity window.

Toolbars

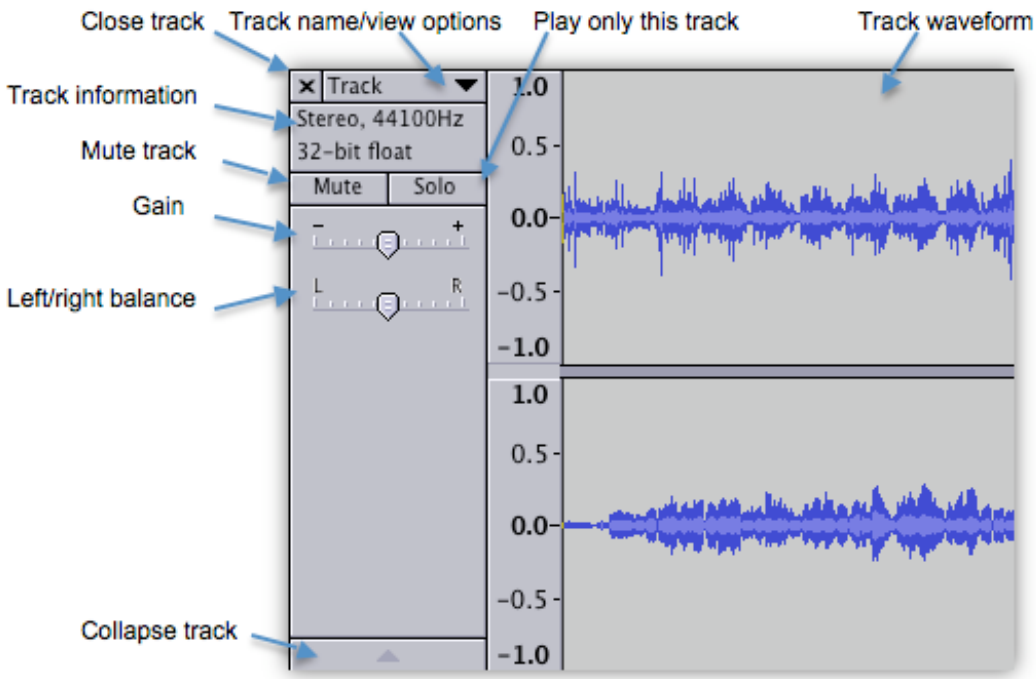
1. Play Back with Control Toolbar

The buttons on the play back control bar are represented by the traditional buttons on the toolbar. From

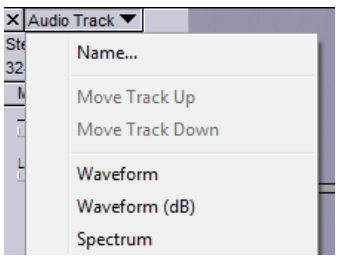
left to right, they are Pause, Play, Stop, Skip to Beginning, Skip to End, and Record.

2. Track Control Panel

The track control Panel appears directly to the left of every track.



Delete Button: To delete the track, click on the **"X"** in the upper left corner.
Title Button: The title of the track appears just to the right of the "X". Clicking on the drop-down menu on the **Title** bar, you will allow to rearrange tracks and change various track options.



The options include naming the track, ranging tracks, changing the display, splitting stereo track, and setting sample format and rate, etc. When you change the options, they will display on the control panel. For example, you change the name of the track, the name will show on the title bar. If you split the stereo track into mono track, you won't see the **Gain** and **Left/Right** pan.
Mute Button: The Mute Button turns off the sound playback from a track.
Solo Button: It causes only the sound from a track to be heard, and other active tracks cannot be heard while this button is selected.
Gain Control: It affects the volume of the track. You can move it left to decrease the volume of the track or to the right to increase it. The default is 0 dB.
Left/Right Panning Slide: It affects the balance between the left and right speakers.

The Vertical Ruler is a guide to the level you see in the waveforms. A level of 1.0--- -1.0 is the maximum supported by the audio-file. Any waveform that goes above 1.0 or below -1.0 will be clipped and will result in distortion.

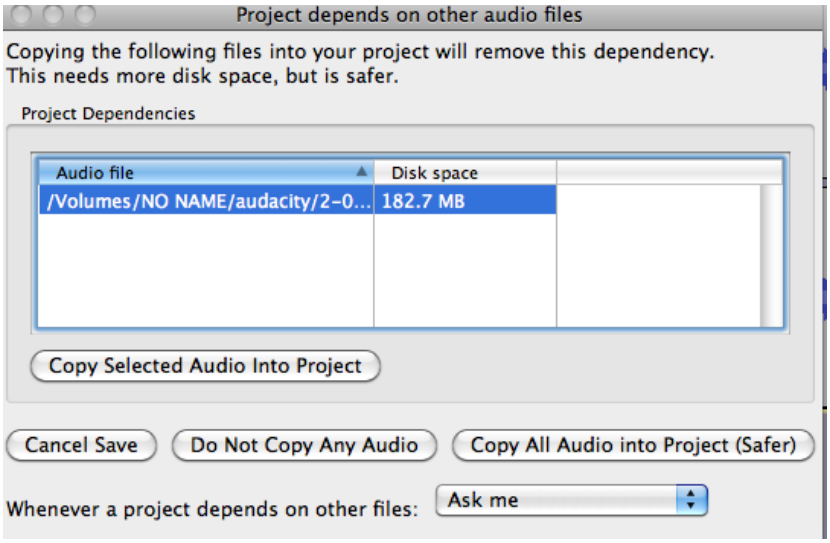
When you click and held the mouse over the vertical ruler, the waveform turns magnifying vertically. When you press the **Shift** key, click and hold the mouse over the vertical ruler, the waveform turns de-magnifying vertically and zoom back out.

The track information includes the channel of the track (in this case it is Stereo), the sample rate (in this case it 44100Hz) and 32-bit float.

Saving your Audacity session

Saving your Audacity session will preserve all of these tracks for continuing to work. It is important to save your Audacity editing work regularly. When you first save your project, to make sure the project document saved as ".aup" is placed in the folder your created.

1. Click **File>Save Project As**. A window will open



If you click on "**Copy Selected Audio Into Project**." Your audio edit document with the extension ".aup" and a copy of all of the sound files will be saved into a folder(_data). This is a good way to make sure that everything is kept in your project folder.

If you click on "Do not copy any Audio", only the Audacity Edit document (the ".aup" doc) will be saved in your Project Folder. You can't play this file on another computer even you move the ".aup" and "-date" to this computer.

2. In the save navigation window, enter the name for your project such as "YourNmeProjeTittle" and click OK. The step automatically creates one documents and one folder:

   (a) "YourNameProjectTitle. aup", This is the document of your audacity that contains all editing/changes you make.
   (b) "YourNameProjectTitle_date", This folder will be created if you select "Copy Selected Audio Into Project."

3. When you save an Audacity project, you save in the Audacity Project Format (.aup) file. The file can't be used in an MP3 player. To keep the Audacity Project appropriated, you should be pay attention for these

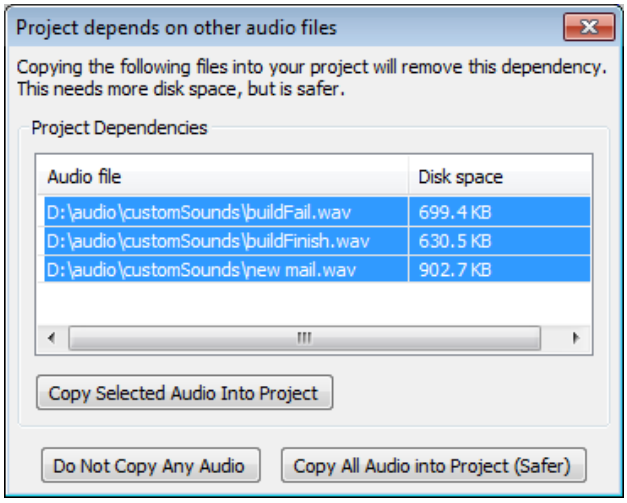
   - Never rename the .aup file or the _data folder. If you want to rename your project, use the **File>Save Project As…**
   - Always keep the .aup file and the _data folder together in the same folder.

   - If you import an audio file with the "**Read uncompressed file**

directly from the original (faster)" option on the Import/Export Preferences, never move, rename or delete the original imported file unless you first copy it the Audacity project.

Dependencies

Uncompressed WAV and AIFF files that are imported into a project with "**Read uncompressed audio files directly from the original (faster)**" option in **Import/Export** Preferences are not copied into the project. Instead, Audacity keeps a reference to these files, and the project is dependent on them. When you save an Audacity project, Audacity will tell you about these dependencies and give you the option of "**Copying all of the audio data into your Audacity project**". You also can click on **File> Check Dependencies…** to see if your project depends on any external files. If you have, the dependencies dialog lists these dependencies and allows you to optionally remove them.



Select the audio you want to save into your _data folder, click **Copy Selected Audio into Project.**

If you selected "**Make a copy of uncompressed audio file before editing (faster)"** in Import /Export Preferences, your project will never have dependencies, but more disk space may be used to store the project. And importing WAV or AIFF file will be slower.

Undo

Audacity does support the "Undo" feature for a few prior steps so if you change your mind or make a mistake while editing, you can reverse your steps to return to the prior stage. However audacity doesn't support the "Undo" feature to reverse many prior steps.

Audio File Formats

There are different types of Audio files. The most popular are Wave files and MP3. The format is usually identified by the file extension, such as ".wav" and

".mp3". The brief information about the common audio file
types is below.
wav: a standard audio file format used in Windows PCs. WAV is Commonly used for storing uncompressed
CD-quality sound files, which means that they can be large size.
aiff: a standard audio file format used by Apple. It is like a wav file for the Mac.
mp3: the most popular format for downloading and storing music. By eliminating portions of the audio file that
are essentially inaudible, mp3 files are compressed to about one-tenth the size of an equivalent uncompressed file while maintaining good audio quality.
au: the standard audio file format used by Sun, Unix and Java.
Ogg Vorbis: another compressed audio format that is an alternative to MP3 compression.
wma: the popular Windows Media Audio format owned by Microsoft Company.
BWF: is a standard audio format created by the European Broadcasting Union as a successor to WAV.
SDII: Sound Designer II, sometimes seen abbreviated as SD2, is a monophonic/stereophonic audio file format. It is the successor to the original monophonic Sound Designer I audio file format.