

CHAPTER 1



The Foundation of Digital Audio: The Sound Wave

Welcome to *Digital Audio Editing Fundamentals*! This book takes you through the foundation of digital audio, as well as manual and algorithmic data sample editing. I start with the lowest-level concepts—in this chapter it's the **sound wave**—and build upon each of these concepts in subsequent chapters until you have a comprehensive understanding of digital audio editing concepts, terminology, audio file formats, work flows, waveform editing, effects processing, and data footprint optimization.

I show you what these concepts, techniques, and terms look like using the most popular digital audio editing software package—open source Audacity 2.1.1, which just so happens to be free for commercial use.

For this reason, the first part of the chapter covers exactly how to download and install Audacity 2.1.1—just in case you don't currently own any digital audio editing software packages. After this, you learn about the foundational element of digital audio editing, which the industry professionals call a **waveform** or a **sample**. Once you put one together with other waveforms, your new media result comprises what's called **digital audio content**.

This book is all about the way your audio waveform samples are edited and processed. Each chapter builds on knowledge from the preceding chapters, until you understand the digital audio sample editing work process.

Downloading and Installing Audacity

You need to have digital audio editing software of one type or another, whether it is Avid ProTools, Cakewalk SONAR, or Propellerhead Reason. If you do not own any of these, you can use the free-for-commercial-use Audacity. Let's install Audacity and free audio encoders.

AudacityTeam.org: Get Your Audacity 2.1 Software

To download Audacity 2.1.1, which is the current stable version, go to www.audacityteam.org and click the **Download Audacity 2.1.1** link (see Figure 1-1), or alternately, click the **Download** tab, which is directly underneath the Audacity logo.

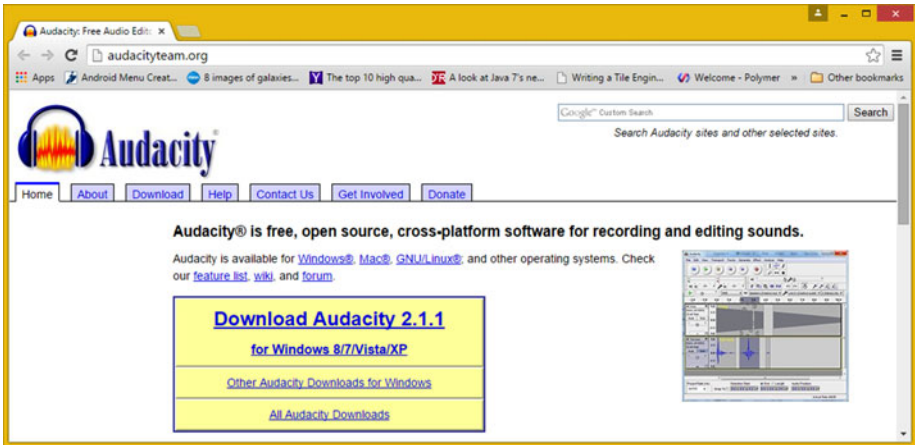


Figure 1-1. Go to the *audacityteam.org* site and click Download

Download the **audacity-win-2.1.1.exe** installer file if you are using Windows (otherwise, the Linux or Mac version) and then double-click it to start your installation process. Audacity for Windows is a 32-bit version; if you want to run 64-bit Audacity, use Linux.

Once the installation starts, select the language that you want to use for your audio editing (I chose English), and then click the **OK** button (see Figure 1-2).

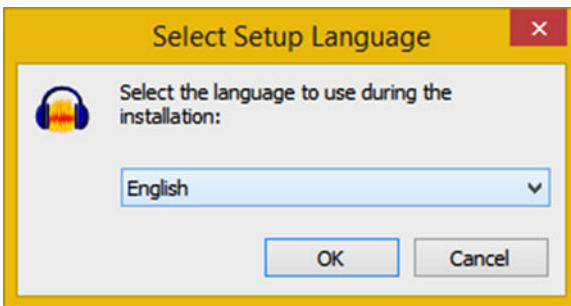


Figure 1-2. Select the language for the install

After you click the OK button, you see the **Welcome to the Audacity Setup Wizard** dialog. Click **Next** to continue.

Review the GNU license information (see the right screen in Figure 1-3) and then click the **Next** button.

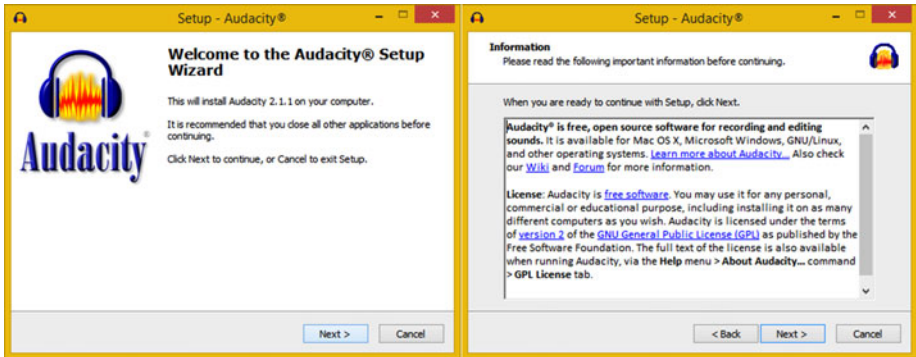


Figure 1-3. Click *Next* to read GNU licensing information

I recommend that you use the destination location default specified by the installer—`C:\Program Files (x86)\Audacity`—since that is where the third-party products compatible with Audacity will look for the software on your computer system. Click **Next**. Select **Create a desktop icon** and **Reset Preferences**, and then click **Next** to continue (see Figure 1-4). Then select your icon and your preference options.

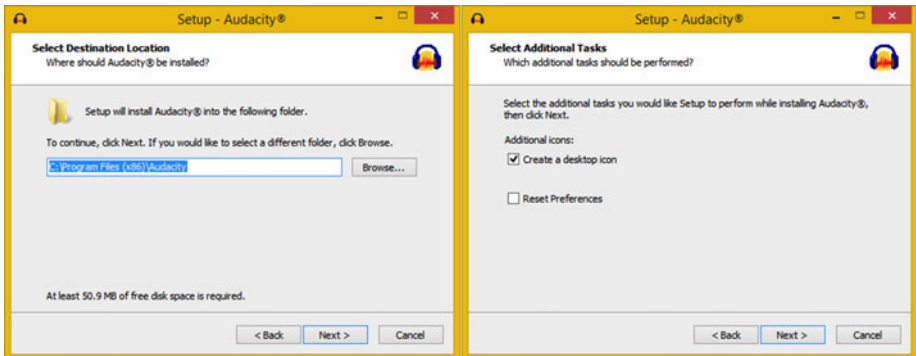


Figure 1-4. Accept default installation options, and click *Next*

Once you have specified your setup configurations, click the **Install** button (seen in the left screen in Figure 1-5). Audacity proceeds to install the software, displaying a green progress bar (shown in the right screen in Figure 1-5).

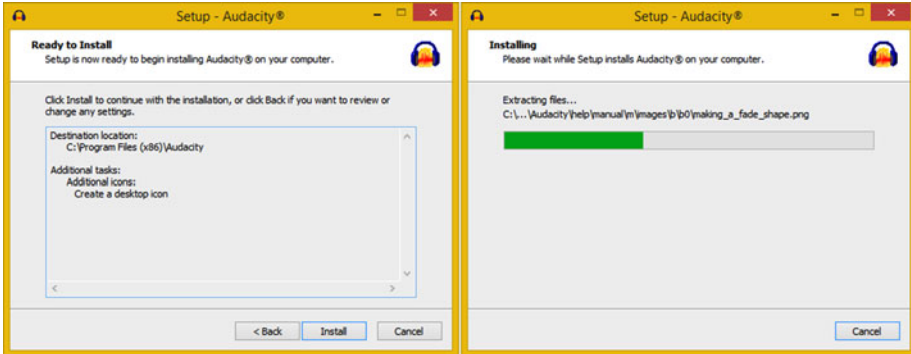


Figure 1-5. Click the **Install** button to begin the installation

After the installation process is complete, you get another **Information** dialog (see the left screen in Figure 1-6). Click the **Next** button and select the **Launch Audacity** check box. To finish the installation and launch Audacity, click the **Finish** button.

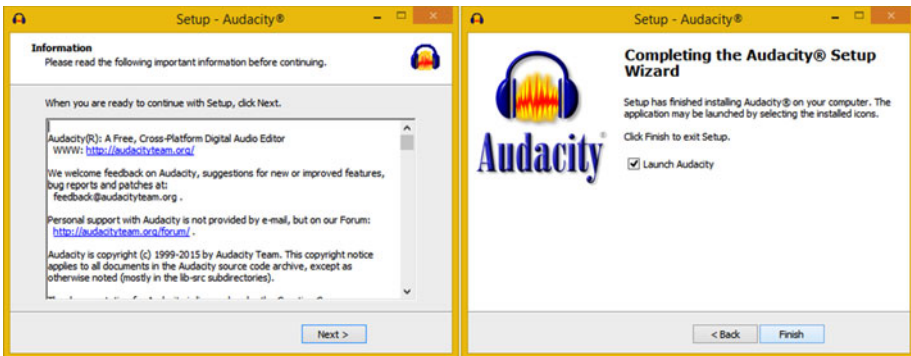


Figure 1-6. After your install completes, click **Next** and **Finish**

Be sure to create a shortcut icon for your Quick Launch taskbar in your operating system (OS), so that you can launch Audacity with just a single mouse-click.

Audio File Formats: Installing FFMPEG and LAME

If you click the **Download** tab on the Audacity homepage (see Figure 1-7), you'll see a **Plug-Ins and Libraries** link on the left, where you'll find additional plug-ins and sound libraries.

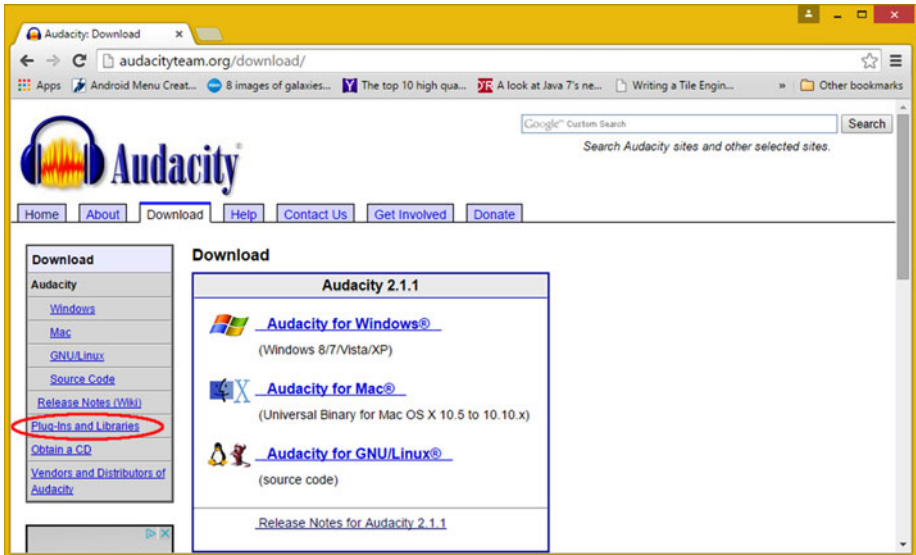


Figure 1-7. Click the Download tab to find Plug-Ins and Libraries

You also need to get the **LAME** and **FFMPEG** libraries, which are located on the lame.buanzo.org web site (see Figure 1-8). Click the link for Windows or for Mac, depending on what OS you are using. Linux users have libraries for LAME and FFMPEG already installed, as part of the Linux OS.

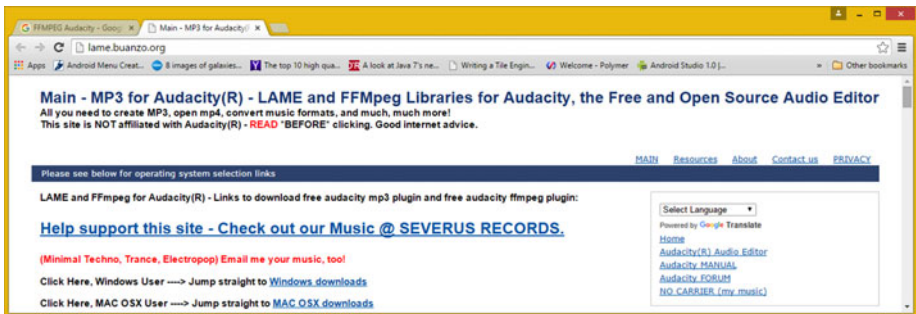


Figure 1-8. Click the operating system link for Windows or Mac

Since I am on Windows 8.1, I found the LAME 3.99.3 for Windows EXE file, downloaded it, and installed it onto my computer, where Audacity will find it each time it starts up.

I also downloaded and installed the FFMPEG 2.2.2 EXE file so that I will be able to import or export MPEG and other formats (see Figure 1-9).