# Working with Audio: Introduction to Sound Studio

Sound Studio is a Mac OS X application for working with digital audio. You can digitize your tape collection, do live recording, edit new and pre-existing digital audio, and save your audio file to be used in other audio applications.

Opening a CD Audio Track

1. Choose **File > Open**. Navigate to your audio CD.

2. Select the audio track you wish to open and click on **Open**. The file will be converted into an AIFF file that you can edit and save. All CD audio tracks will open up as 44.1 kHz, 16-bit, stereo files.
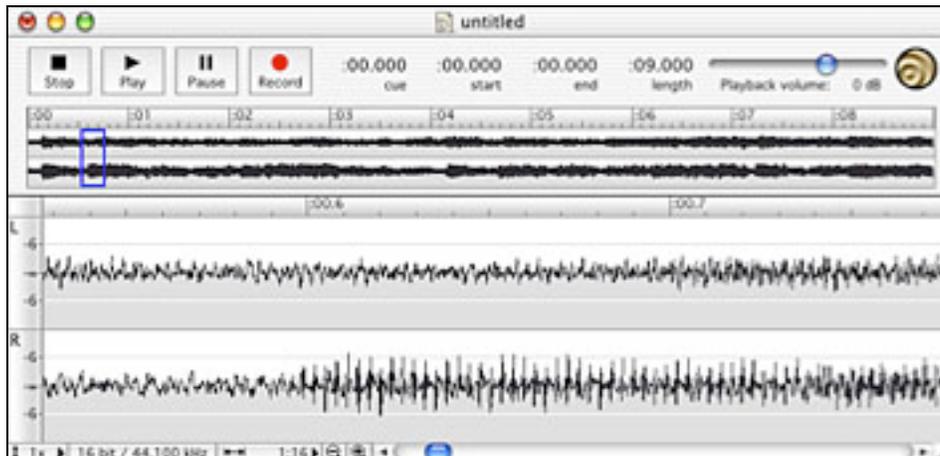
List of Keystrokes

Key	Effect
Space bar	Starts and stops playing sound
M	Inserts marker at cue point
P	Pauses and unpauses playback and recording
Command-period-Escape	Stops playback and recording

Input Levels Palette Window
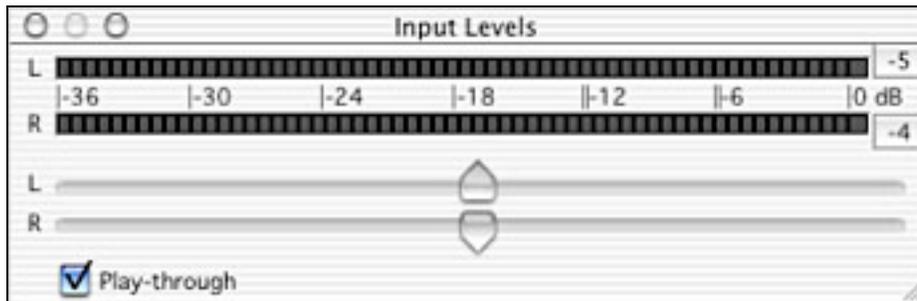
The Input Levels palette is a floating window that shows the current levels at the sound input, and lets you control the input gain [amplification]. You can show and hide the Input Levels palette by using the Window menu.

Making a File Fit Within a Specific Time

1. Choose **Filter > Pitch and Tempo**. The Pitch and Tempo dialog is displayed.

2. Enter the **Duration** the file should be. The duration is in the format – hours: minutes: seconds: milliseconds. The pitch of the audio will change with the duration. When you change the duration, the sample **Rate** and the **Pitch** controls will change.

3. After using the Pitch and Tempo option, use **Edit > Undo** to return the audio back to its original sample rate.

Saving your File with Compression

1. Choose **File > Save As**. The Sound Studio: Save dialog is displayed.

2. Choose **AIFF-C** from the **Format** option.

3. Click on **Save**. After specifying where to save the file, it will present a compression type dialog.

4. Choose **IMA 4:1** from **Compressor**. This is a lossy compression format, which results in files that are one-quarter the size of the uncompressed version.

Layering Two Sound Files on Top of Each Other

1. Open both sound files. For example, Sound file 1 and 2.

2. Choose **Edit > Select All** for file 1.

3. Choose **Edit > Copy**.

4. Bring the window for file 2 to the front by clicking in it. Click at the beginning of file 2, or alternatively click where you want file 1 to start.

5. Choose **Edit > Mix Paste** to mix the copied audio with the audio in file 2.

6. In the Mix Paste dialog box that appears, you can adjust the levels of both file 1, which is on the clipboard, and file 2, which is the existing audio. They should both be set to 0 dB in order to layer the sounds at the same levels.

7. Click **OK**, and the mixing operation should begin. This may take a few minutes if your file is long.

8. When it is done mixing, play back the audio to hear the results.

Computing How Many Bytes a Recording Will Take Up

To calculate the number of bytes that a recording will take up, given the duration of the recording, you can use a simple equation. First, you need to convert the time to seconds. To convert minutes to seconds, multiply by 60. To convert hours to seconds, multiply by 3600.

- 30 minutes = 30 * 60 = 1,800 seconds
- 2 hours = 2 * 3600 = 7,200 seconds

Once you have the number of seconds, you also need to know the sound quality settings of the file. This is the sample rate, sample size, and number of channels. The formula for computing the number of bytes given the time in seconds is:

- Bytes = Time * Sample Rate * Sample Size * Number of Channels

Where sample rate is in Hertz and sample size is in bytes instead of bits. This means that 8-bits equals 1 byte and 16-bits is 2 bytes. For 1 hour at 44.1 kHz, 16-bit, stereo sound, this is:

- Bytes = Time * Sample Rate * Sample Size * Number of Channels
- Bytes = 3,600 * 44,100 * 2 * 2

- Bytes = 637,040,000

Since the number of bytes is often such a large number, it is easier to express it in terms of kilobytes, megabytes or gigabytes. In the computer world, a kilobyte is 1024 bytes, instead of 1000 bytes. Also, a megabyte is 1024 kilobytes, and a gigabyte is 1024 megabytes. So to convert the number of bytes, divide by the appropriate factor:

- Kilobytes = Bytes / 1024
- Megabytes = Bytes / (1024 * 1024)
- Gigabytes = Bytes / (1024 * 1024 * 1024)

For the above example, the conversions are:

- Kilobytes = 637,040,000 / 1024 = 620,156.2 KB
- Megabytes = 637,040,000 / (1024 * 1024) = 605.62 MB
- Gigabytes = 637,040,000 / (1024 * 1024 * 1024) = 0.59 GB