

Lesson 2. Recording Audio

Lesson Files Time Goals

Logic Pro X Files > Lessons > 02 Get Dancing

This lesson takes approximately 60 minutes to complete.

Choose digital audio settings

Record single and multitrack audio

Record additional takes

Record in Cycle mode

Rerecord sections by punching in (manually and automatically)

Adjust count-in, metronome, and other settings

Delete unused audio files

To build a song, you need to come up with the raw material you will later arrange and mix. You might start with an idea you have in your head, a part you rehearsed on an instrument, or a prerecorded sample or loop, or you may just start experimenting until inspiration strikes. To sustain and develop that initial inspiration, you need to master the techniques that Logic offers to record, create, and edit the audio and MIDI regions that constitute the building blocks of your project.

In this lesson, you will configure Logic for audio recording and study activities you will typically perform when working with live musicians: recording a single instrument, recording additional takes of the same instrument, cycle recording, multitrack recording, punching on the fly, and automatic punching.

Setting Up Digital Audio Recording

Before you record audio in Logic, you have to connect a sound source (such as a microphone, an electric guitar, or a synthesizer) to your Mac. You then choose the desired recording settings and adjust the recording level of your sound source to avoid distortion.

In the following exercises, you will set up Logic to prepare for a music recording.

► **Digital Recording, Sample Rate, and Bit Depth When audio is**

recorded in Logic Pro, sound pressure waves are turned into a digital audio file, as follows:

1. The microphone transforms sound pressure waves into an analog electrical signal.
2. The microphone preamp amplifies the analog electrical signal. A gain knob lets you set a proper recording level and avoid distortion.
3. The analog-to-digital (A/D) converter transforms the analog electrical signal into a digital data stream.
4. The audio interface sends the digital data stream from the converter to the computer.
5. Logic Pro saves the incoming data as an audio file displayed on the screen by a waveform representing the sound pressure waves.

To convert the analog signal into a digital data stream, the digital converters sample the analog signal at a very fast time interval, or *sample rate*. The sample rate identifies how many times per second the audio is digitally sampled. The *bit depth* identifies the number of data bits used to encode the value of each sample. The sample rate and bit depth settings determine the quality of a digital audio recording.

During recording, the only role for Logic is to save the digital data generated by the A/D converter to an audio file. Logic does not exert any influence over the quality of your recordings.

Note

Most audio interfaces include analog-to-digital converters, and many include microphone preamps. Also, most modern Mac computers include a built-in audio interface. Many Mac notebook computers and iMac computers even have internal microphones. Although those microphones are generally not intended to produce professional-quality recording, you can use the internal microphones to perform the exercises in this lesson in the absence of an external microphone.

By default, Logic records with a bit depth of 24 bits, which is fine for most uses. However, you may need to use different sample rates for different projects.

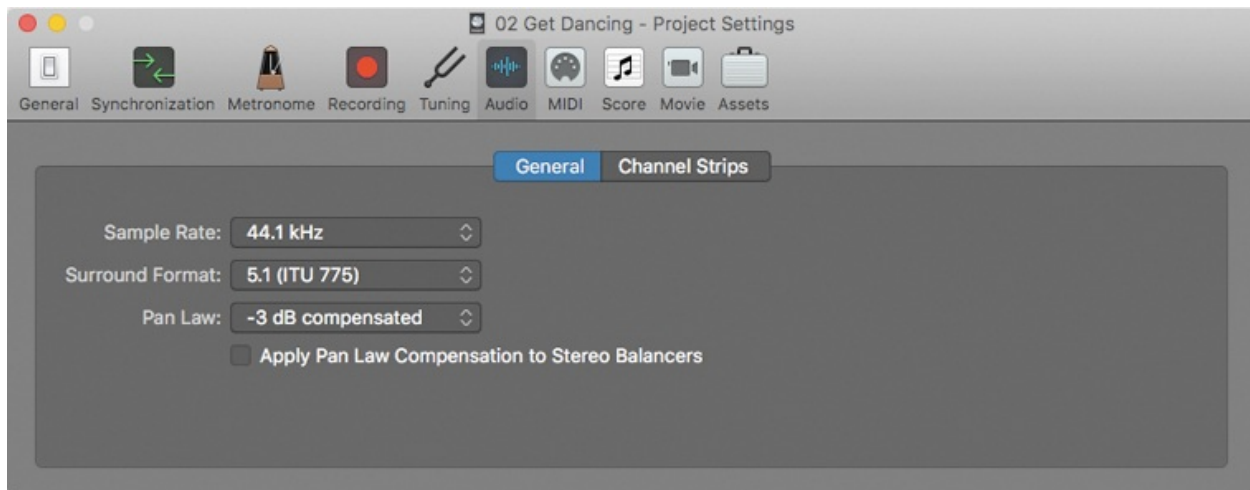
Setting the Sample Rate

By setting your project's sample rate before starting your first recording, you help to ensure that all the audio files used in that project will be recorded and played at the same sample rate. Playing an audio file at the wrong sample rate will result in the wrong pitch and tempo, much like playing an audiotape or vinyl record at the wrong transport speed.

Note

Be sure to read “Installing the Logic Lesson Files” in “Getting Started” before you continue.

- 1 Open Logic Pro X Files > Lessons > **02 Get Dancing**.
- 2 Choose File > Project Settings > Audio, and make sure the General tab is selected.



The Project Settings window opens, and you can see your Audio settings. By default, the sample rate is set to 44.1 kHz.

To determine which sample rate to choose, consider the sample rate of any prerecorded material you will use (such as samples) and the sample rate of the target delivery medium. Some producers who make intensive use of 44.1 kHz samples choose to work at that sample rate. Traditionally, music is recorded at 44.1 kHz (which is the sample rate of compact discs), whereas audio for video is recorded at 48 kHz (which is the sample rate used on DVDs).

Note that Apple Loops (such as those used on the six existing tracks in this project) always play at the pitch and tempo determined by the project's key and tempo settings, independent of the project sample rate.

Note

The Audio Engineering Society recommends a 48 kHz sample rate for most applications but recognizes the use of 44.1 kHz for compact disc and other consumer uses.

Let's keep the default 44.1 kHz sample rate.

3 Press Command-W to close the Project Settings window.

Note

In Logic, settings fall into two categories: Project settings, such as the sample rate, can be set individually for each project, so that each project can have unique project settings; Logic preferences are the same in all projects.

Choosing an Audio Interface

In most situations, Logic automatically detects an audio interface when you connect it to your Mac and asks if you want to use that interface. If you choose to use it, Logic selects that interface as both an input and output device in its audio preferences. Let's open the audio preferences and check that the correct audio interface is selected.

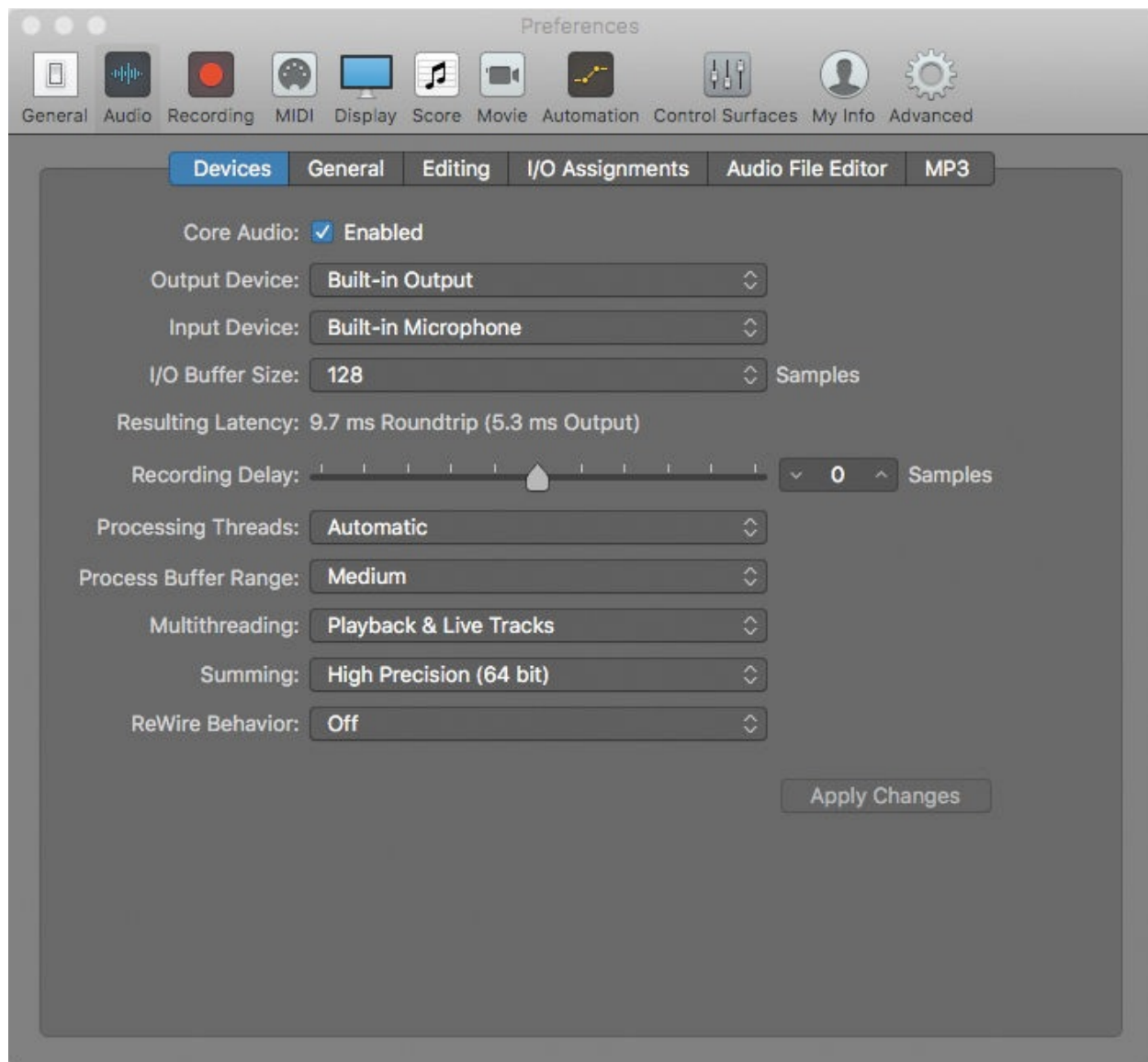
1 Choose Logic Pro X > Preferences > Audio.

The Audio preferences appear.

2 From the Output Device and Input Device menus, choose the desired audio interfaces.

► The Output Device is the device connected to your monitors or headphones.

► The Input Device is the device into which you plug your microphones or instruments.



Note

Using the same audio interface for both audio output and input is very common.

If you do not have an audio interface connected to your Mac, choose from the built-in output and input devices.

3 Press Command-W to close the Preferences window.

If you choose a new output or input device, Logic automatically reinitializes the Core Audio engine when you close the window.

More Info

Some options seldom need to be changed from the default settings. For more information on these, see “[Changing Recording Settings](#)” later in this lesson.

Recording a Single Track

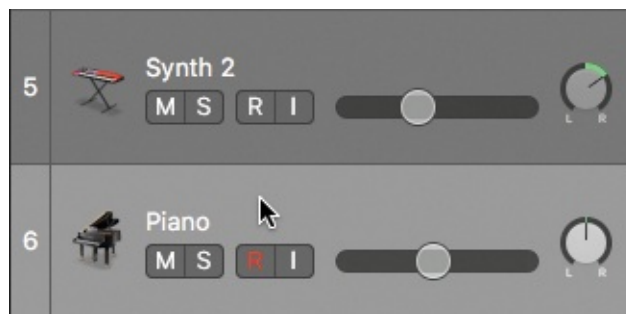
In this example, you will record a single instrument. The exercise describes recording an electric guitar plugged directly into an instrument input on your audio interface, but feel free to record your voice or any instrument you have.

Preparing a Track for Recording

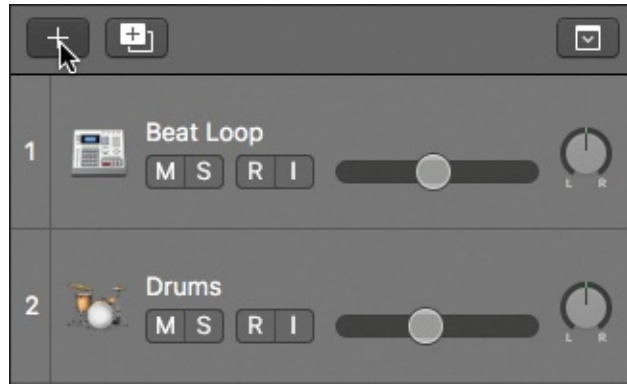
To record audio, you first have to create a new audio track, select the correct input (the input number on your audio interface where the guitar is plugged in), and enable that new track for recording.

When adding tracks, the new tracks are inserted below the selected track. To create a new track at the bottom of the Tracks area, you first need to select the bottom track.

- 1 At the bottom of the track headers, click the Piano track header (track 6) to select it.

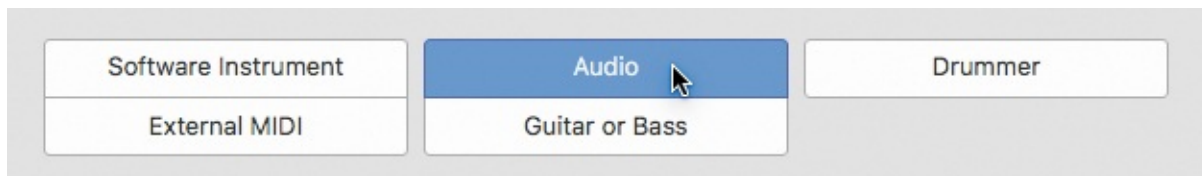


- 2 Above the track headers, click the Add Tracks button (+) (or press Command-Option-N).

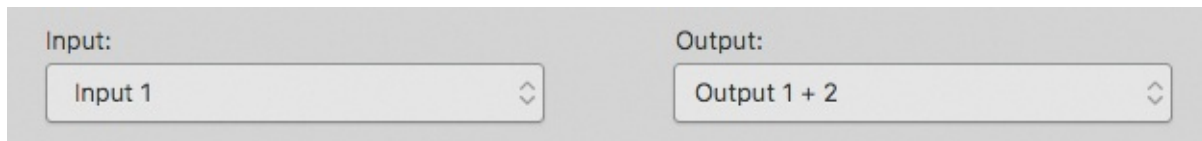


The New Tracks dialog appears.

3 Make sure the Audio track type is selected.



4 From the Input menu, choose the audio interface input number to which you've connected your instrument or microphone. If you are using your Mac computer's built-in audio interface or your notebook's microphone, choose Input 1.

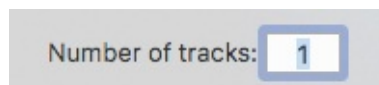


Note

Below the Input and Output menus, the input and output devices selected earlier in your Audio preferences are displayed. Should you need to change the input and/or output device, click one of the arrow buttons to the right of the device names to open the Audio preferences.

You can record-enable the track by selecting the Record Enable option below the Output menu; however, in some situations creating a record-enabled track may produce feedback. You will later take precautions to avoid feedback and then record-enable the track from the track header.

5 Ensure that “Number of tracks” is set to 1.



6 Click Create (or press Return).

A new audio track set to Input 1 is created. Logic automatically assigns the new track to the next available channel. Since six audio tracks were created when you dragged Apple Loops in [Lesson 1](#), the new track is assigned to the Audio 7 channel and is automatically named Audio 7. For clarity, let's rename it.

Tip

Logic automatically assigns the name of a track to the audio files recorded on that track, so naming a track before recording on it is always a good idea. If you don't name the track, Logic assigns the name of the project to the audio files. More descriptive names will help you identify files in the future.

7 In the Audio 7 track header, double-click the name, and type *Guitar*.



The new track has a generic audio waveform icon. Let's choose a more descriptive icon.

8 In the Guitar track header, Control-click the icon, and from the shortcut menu, choose the desired icon.

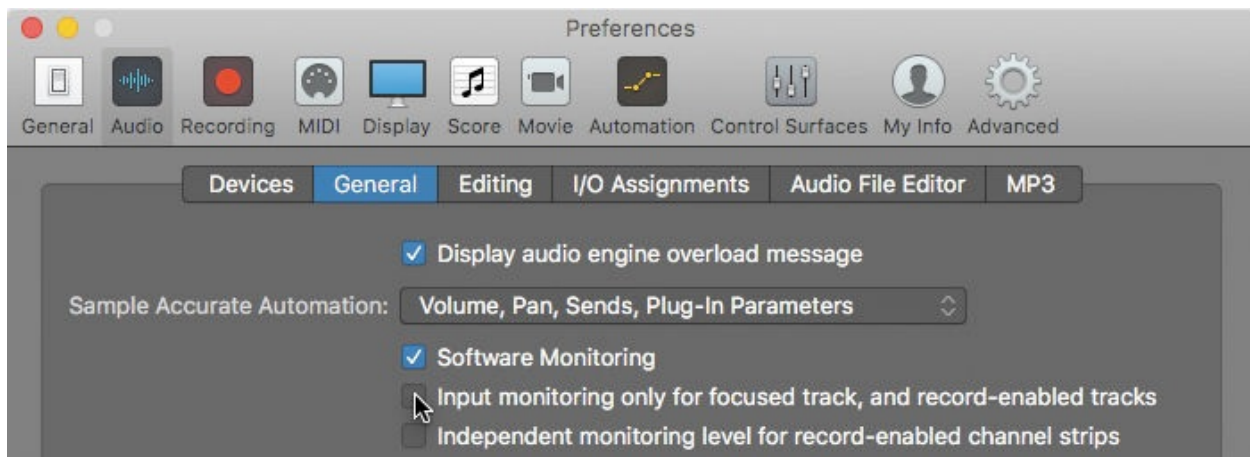


Note

To avoid feedback when recording with a microphone, monitor your recording using headphones and make sure your speakers are off.

You will now set up Logic so that record-enabling a track allows you to hear the source you're recording.

- 9 Choose Logic Pro X > Preferences > Audio, click the General button, and deselect “Input monitoring only for focused track, and record-enabled tracks.”



- 10 In the Guitar track header, click the R (Record Enable) button.



You can now hear your guitar and see its input level on the Guitar channel strip meter in the inspector.

Note

You may hear a small delay between the time you play a note and when you hear it. This delay is called *latency*. You will learn how to reduce latency at the end of this lesson, in the section “Choosing the I/O Buffer Size.”

Because your new audio track is record-enabled (the R button on the track header is red and blinking), the next recording will create an audio region on that track. You can monitor the audio routed to record-enabled tracks while Logic is

stopped, playing, or recording.

Note

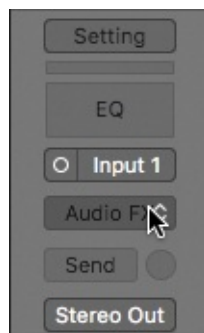
If you are already using a hardware mixer or your audio interface's software to monitor the audio signal routed to record-enabled tracks, turn off Software Monitoring in Logic's audio preferences. Otherwise, you will be monitoring the signal twice, resulting in a flangy or robotic sound.

Monitoring Effects During Recording

When a guitar or bass is plugged directly into an audio interface's instrument preamp, the sound is clean and raw. To emulate the character a guitar amp can give to a guitar sound, you can use Amp Designer, a guitar amplifier modeling plug-in.

Note that you are still recording a dry guitar sound. The effect plug-in processes the dry audio signal in real time during the recording and playback. Recording a *dry signal* means that you can continue fine-tuning the effect plug-ins (or exchange them for other plug-ins) after the recording is completed.

- 1 In the inspector, click the Audio FX insert, and choose Amps and Pedals > Amp Designer.



Amp Designer opens. Here, you can dial in a sound or choose a preset.

- 2 In the Amp Designer window, click the settings pop-up menu and choose a setting that inspires you.



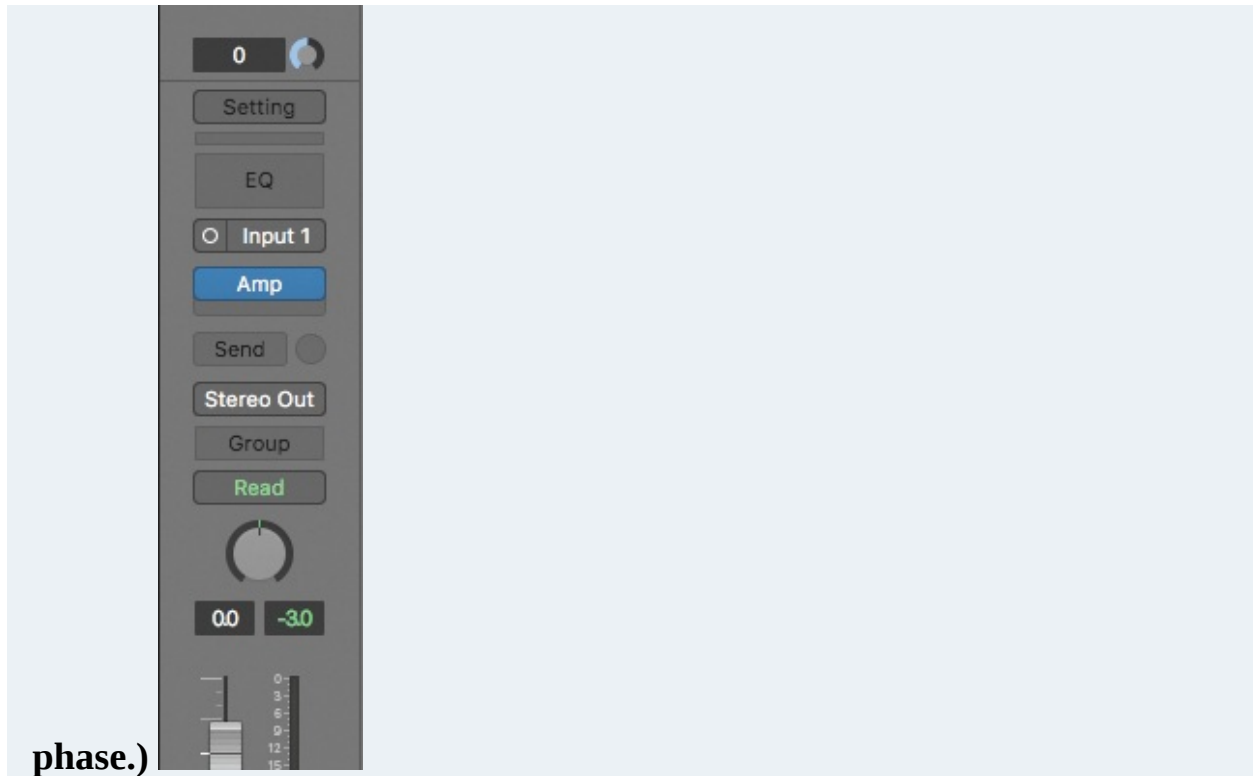
You can now hear your guitar processed through Amp Designer. It sounds like a guitar plugged into a guitar amp, and recorded by a microphone in front of the amp's speaker cabinet. Feel free to spend a few minutes exploring various settings and tweaking the amp's knobs until you're happy with your sound.

3 Press Command-W to close the Amp Designer window.

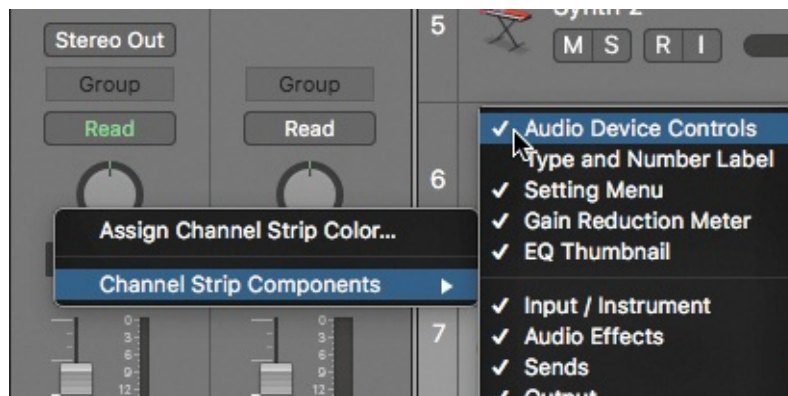
Adjusting the Recording Level

Before recording, make sure you can monitor the sound through Logic, and then adjust the source audio level to avoid overloading the converters. On the channel strip, look at the peak level meter, and make sure it always stays below 0 dBFS (decibels full scale, the unit used to measure levels in digital audio); a level above 0 dBFS would indicate that you are clipping the input of your converter. Keep in mind that you need to adjust the audio level before the converter input by using your microphone preamp gain knob. Allow some headroom, especially if you know that the artist might play or sing louder during the actual recording. Working with a low-level recording is better than clipping the input.

► **Control Your Microphone Preamp Gain Remotely Within Logic**
Compatible audio interfaces (such as a Mac computer's built-in audio device and some third-party interfaces) allow you to adjust the gain of your microphone preamp directly at the top of the audio track's channel strip in the inspector or in the Mixer. (Some interfaces also support other input settings, such as phantom power, hi-pass filter, and



If you cannot see the Gain knob at the top of the channel strip, Control-click the channel strip and choose Channel Strip Components > Audio Device Controls.



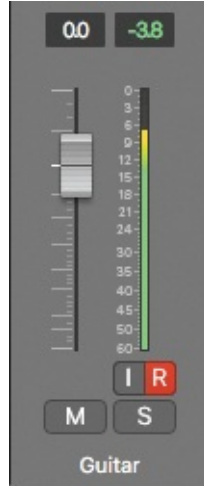
If the Gain knob is dimmed, it means that the feature is not supported by your audio interface.

Let's adjust the recording and monitoring levels, tune the guitar, and find a cool acoustic guitar sound.

- 1 Play the loudest part of the performance you are about to record, and as you watch the peak level meter on the channel strip, adjust the level on the instrument preamp.

- 2 If the peak level meter turns yellow, lower the gain on the preamp, and click the peak level meter to reset it.

Make sure the peak sits comfortably below 0 dBFS: the wider the dynamic range of the source, the more headroom it needs to avoid clipping.

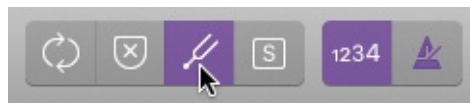


When your signal peaks below -2.0 dBFS, the peak level meter value is green. When it peaks between -2.0 and 0 dBFS, the peak level meter value is yellow to indicate that you are within 2 dB of clipping (that is, you have less than 2 dB of headroom).

Tuning the Instrument

Making sure an instrument is in tune before recording is always a good idea. The control bar's Tuner button gives you quick access to the Tuner plug-in.

- 1 In the control bar, click the Tuner button.



The Tuner opens.

Note

The Tuner is available in the control bar only when an audio track is selected and an input is selected in the input slot of the corresponding channel strip. You can also insert the Tuner as a plug-in on a channel strip: click an Audio FX slot, and choose **Metering > Tuner**.

- 2 One by one, tune the guitar strings, trying to get each string as close as

possible to a 0 cents deviation of the target pitch.



3 Close the Tuner window.

Checking the Balance

Now that the guitar is tuned, you can practice the performance and make sure that you can hear yourself and the other instruments comfortably.

1 Press the Spacebar to start playback, and play along with the song. If the guitar is now too loud or too soft in comparison to the other tracks, in the inspector drag the volume fader on the Guitar channel strip to adjust the monitoring level, or drag the volume slider in the Guitar track header.

The track header's volume slider and the channel strip's volume fader adjust the monitoring and playback level, but they do not alter the recording level.

2 Press the Spacebar to stop playback.

Recording Audio

You have set the desired sample rate, adjusted the recording and monitoring

levels, inserted a plug-in to emulate the sound of a guitar amp, and tuned the instrument. You are now ready to start recording.

Let's record a guitar part from bar 13 to bar 17.

- 1 In the lower half of the ruler, click at bar 13.



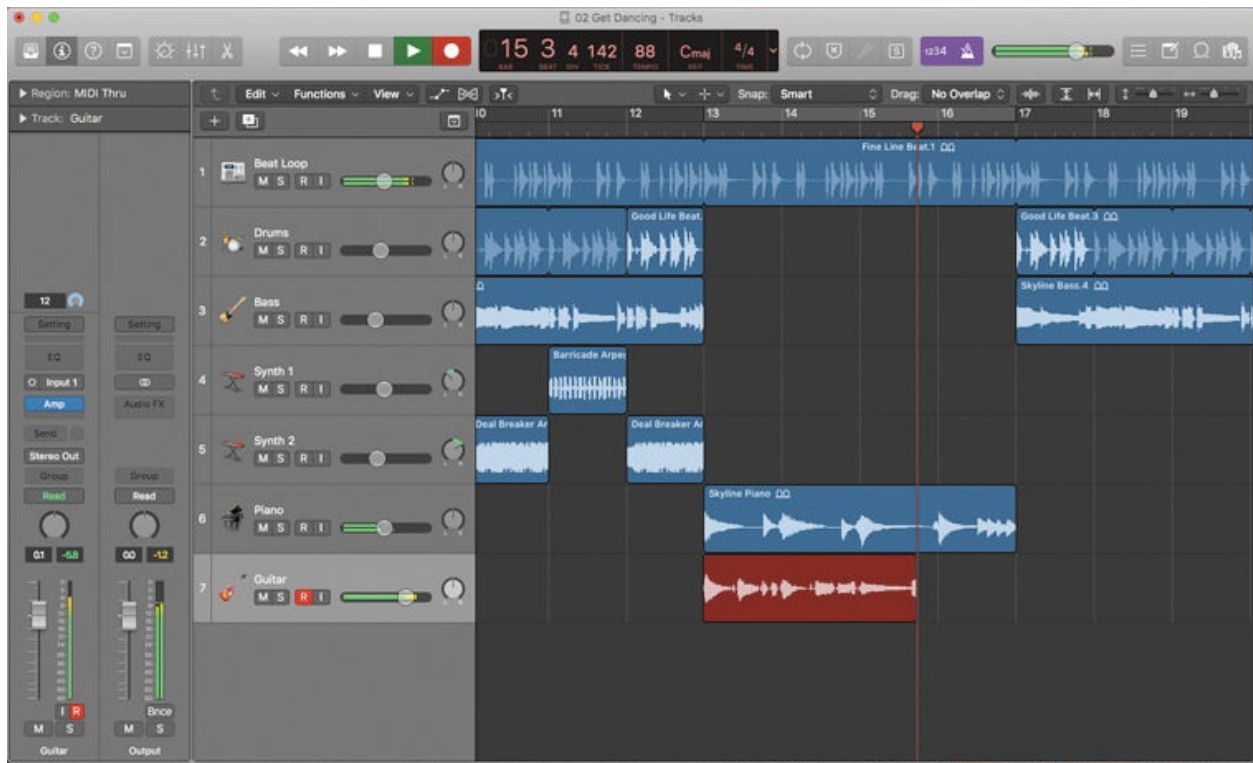
The playhead is positioned at bar 13. In the control bar's LCD display, make sure the playhead position is exactly bar 13, beat 1, div 1, tick 1. If you need to adjust the position of the playhead, drag it left or right.



- 2 In the control bar, click the Record button (or press R).



The playhead and the LCD display in the control bar both turn red to indicate that Logic is recording. The playhead jumps one bar earlier and gives you a four-beat count-in with an audible metronome click before the recording starts. A new red region is created behind the playhead on the record-enabled track, and you can see the recording's waveform drawn in as you play or sing.



Note

By default, the metronome automatically turns on during recording, and you get a four-beat count-in (in the control bar, the Count-in and Metronome buttons are enabled). You will learn how to alter both the metronome and the count-in settings later in this lesson.



- 3 After you've recorded a few bars, in the control bar, click the Stop button (or press the Spacebar).



The new recording, Guitar#01, appears as a blue-shaded audio region. To the name of the track, Logic appends the number of the recording. Note that this new region is selected, which makes listening to it easy using the

“Play from Selection” key command.

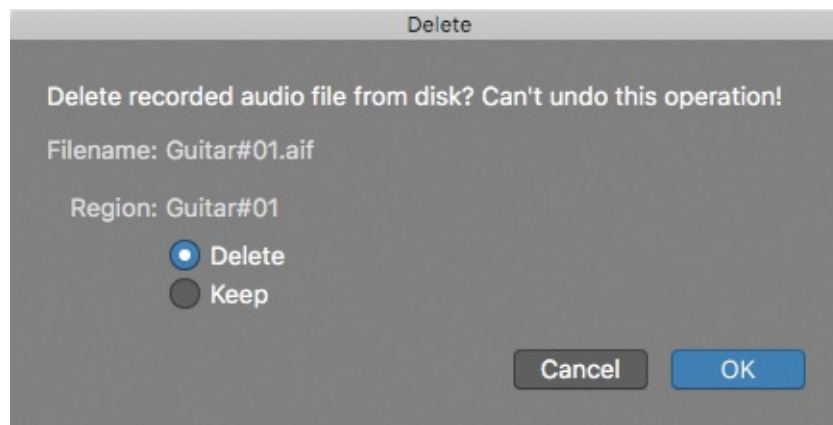
4 Press Shift-Spacebar.

The playhead jumps to the beginning of the selected region and playback starts.

5 Stop playback.

If you are not happy with your new recording, you can delete it and start over.

6 Press Delete.



A Delete alert appears with two choices:

- **Delete**—The audio region is removed from the Tracks area, and the audio file is removed from the Project Audio Browser. In the Finder, the audio file is moved from inside the project package to the Trash.
- **Keep**—The audio region is removed from the Tracks area. The audio file stays in the Project Audio Browser and is still present inside the project package, allowing you to later drag it back to the workspace if necessary.

Note

To find the audio files inside a project package, Control-click the project package in the Finder, choose Show Package Contents, and then navigate to Media > Audio Files.

This alert appears only when you try to delete a recording made since you most recently opened the project. When deleting an audio region that was previously recorded, the behavior corresponding to the Keep option is automatically applied and an alert does not appear.

Tip

Despite what the alert says, if you chose Delete and clicked OK by mistake, you could still choose Edit > Undo (or press Command-Z) to undo the operation (as long as you didn't empty the Trash).

You will keep your recording so you can experiment with recording additional takes in the next exercise.

7 In the Delete pop-up window, click Cancel.

Recording Additional Takes

When recording a live performance, musicians can make mistakes. Rather than deleting the previous recording and repeatedly recording until you get a flawless performance, you can record several takes (repeat performances of the same musical part) and later choose the best take, or even combine the best parts of each take to create a *comp* (composite take).

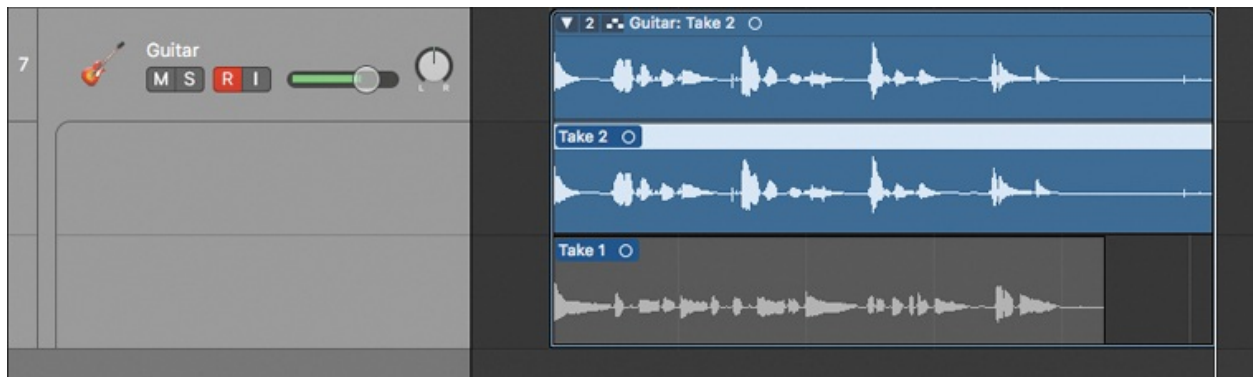
To preserve multiple takes in Logic, you can record new performances over previous ones. By default, all the takes (including the original recording) will be placed into a take folder (you can change that behavior under Record > Overlapping Audio Recordings).

- 1 Make sure the Guitar track is still record-enabled.
- 2 Position the playhead on bar 13.
- 3 In the control bar, click the Record button (or press R) to record a second take slightly longer than the first.



The new recording (in red) appears to be recorded over the previous blue audio region.

- 4 Stop the recording.



Both the original recording (Take 1) and the new recording (Take 2) have been saved into a take folder. The take folder is on the Guitar track. It is currently open, so the two takes you recorded are displayed on subtracks below.

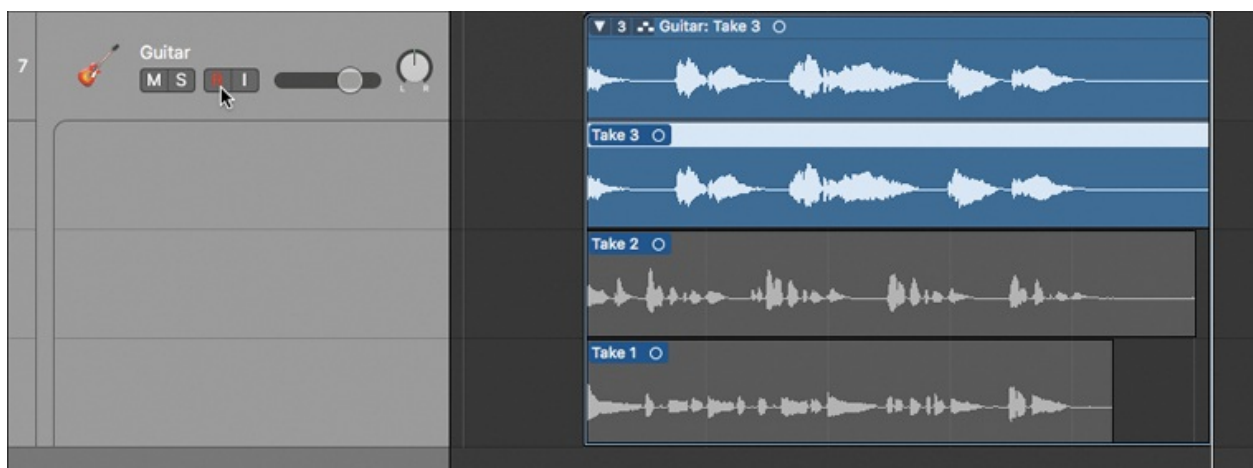
The take folder is named Guitar: Take 2, the name of the track appended with the name of the take it's playing. By default, the take folder plays the most recent take you recorded, Take 2, in this case. The previous take, Take 1, is dimmed and muted.

Note

If the recent take you recorded is shorter than a take you recorded earlier, the take folder is named Guitar: Comp A, and plays a comp made of the recent take and the end of the previous take.

5 Record a third take.

6 In the Guitar track header, click the R (Record Enable) button to disable it.



The track is disarmed, and you can no longer hear the sound coming from Input 1 on your audio interface.

The take folder now contains three takes. It plays back the most recent one, Take 3, while the two previous ones, Take 1 and Take 2, are muted.

More Info

You will examine take folders in more detail and learn to comp takes in [Lesson 3](#).

- 7 At the top left of the Guitar take folder, click the disclosure triangle to close the folder.



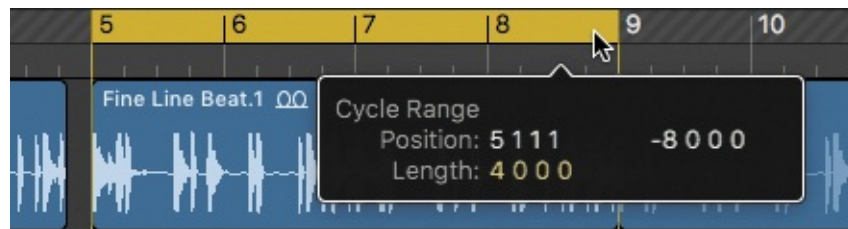
Tip

You can also double-click a take folder to open or close it.

Recording Takes in Cycle Mode

Recording multiple takes in a single operation can be very useful when you are both the engineer and the musician because switching from playing your instrument to operating Logic between each take isn't always practical (and it can destroy your creative vibe). Recording in Cycle mode allows you to repeatedly record a single section, thereby creating a new take for each pass of the cycle. When you stop recording, all the takes are saved inside a take folder.

- 1 In the upper half of the ruler, drag a cycle area from bar 5 to bar 9.



Tip

You don't have to position the playhead when recording in Cycle mode; recording automatically starts at the beginning of the cycle, after the count-in.

2 Make sure the Guitar track is selected, and click Record (or press R).

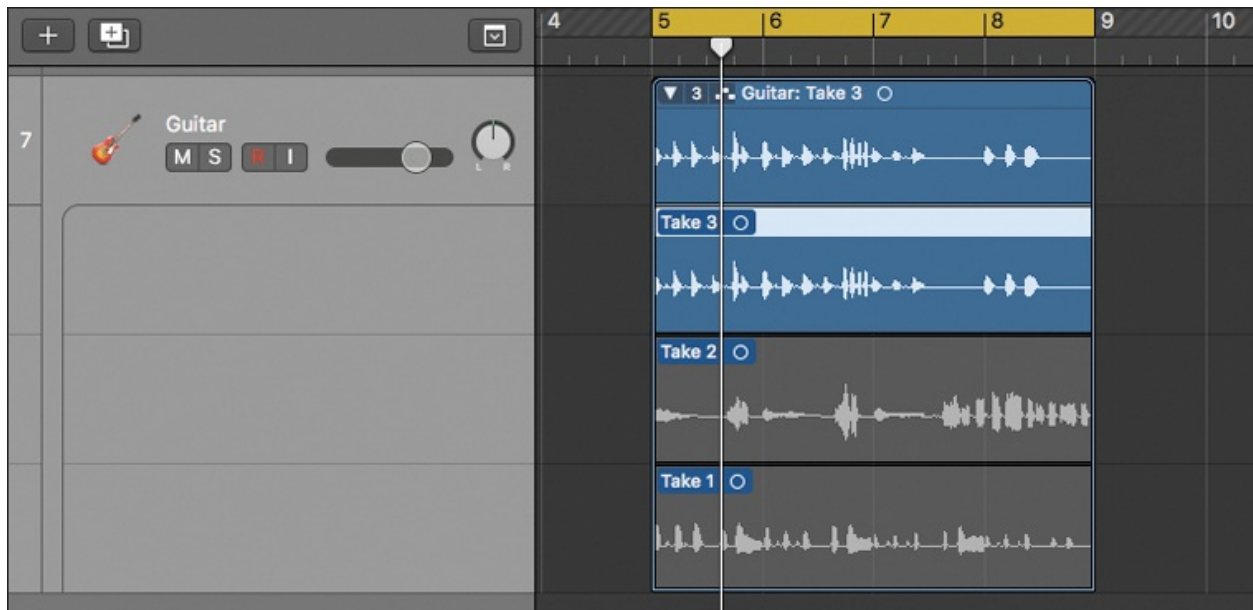
The Guitar track is automatically record-enabled. The playhead jumps a bar ahead of the cycle for a one-measure count-in, and starts recording the first take. When it reaches bar 9, the end of the cycle area, it jumps back to bar 5 and starts recording a new take.

Note

If no track is record-enabled, Logic automatically record-enables the selected track during recording.

Logic keeps looping the cycle area, recording new takes until you stop recording. Record two or three takes.

3 Click Stop (or press the Spacebar).



All the takes recorded in Cycle mode are packed into a take folder. The Guitar track is automatically disabled for recording.

Note

When you stop recording, if the recent take is shorter than a bar, Logic automatically discards it. To keep the last take of a cycle recording, make sure you stop the recording more than one bar after the beginning of the cycle area.

4 At the top left of the take folder, click the disclosure triangle.

The take folder closes.

5 In the ruler, click the cycle area (or press C) to turn it off.

Recording Multiple Tracks

You can use the same single-track techniques you've learned to record multiple tracks simultaneously. Doing so allows you to record several instruments at once, placing each instrument on a separate track, so that you can later adjust their volumes and stereo positions or process them individually.

You first create the desired number of tracks, making sure that each track is assigned to a different input number that corresponds to the input number on your audio interface where the microphone is plugged in.

Note

Logic does not let you record-enable multiple tracks set to the same input number, because you would record the same input on different tracks and end up with redundant audio files.

In the following exercise, you will record two mono tracks at the same time, which you can do using the built-in Mac audio interface. To record more than two tracks at once, you need an audio interface with more than two inputs. The exercise describes recording an acoustic guitar on Input 1 and a vocal microphone on Input 2.

Note

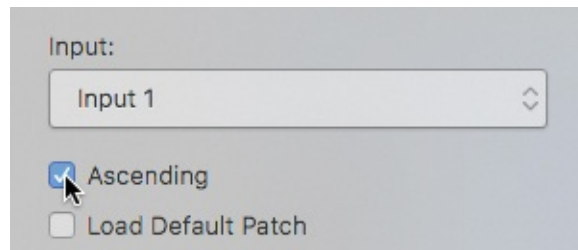
To avoid the sound of the guitar bleeding into the vocal microphone or the sound of the vocals bleeding into the guitar microphone, the guitar player and the singer should be located in different rooms.

- 1 At the bottom of the Tracks area, click the Guitar track header to ensure that the tracks you are about to create will be added below the Guitar track.
- 2 Above the track headers, click the Add Tracks button (+) (or press Command-Option-N) to open the New Tracks dialog.



3 At the top of the New Tracks dialog, make sure the Audio track type is selected.

4 Below the Input menu, select the Ascending checkbox.

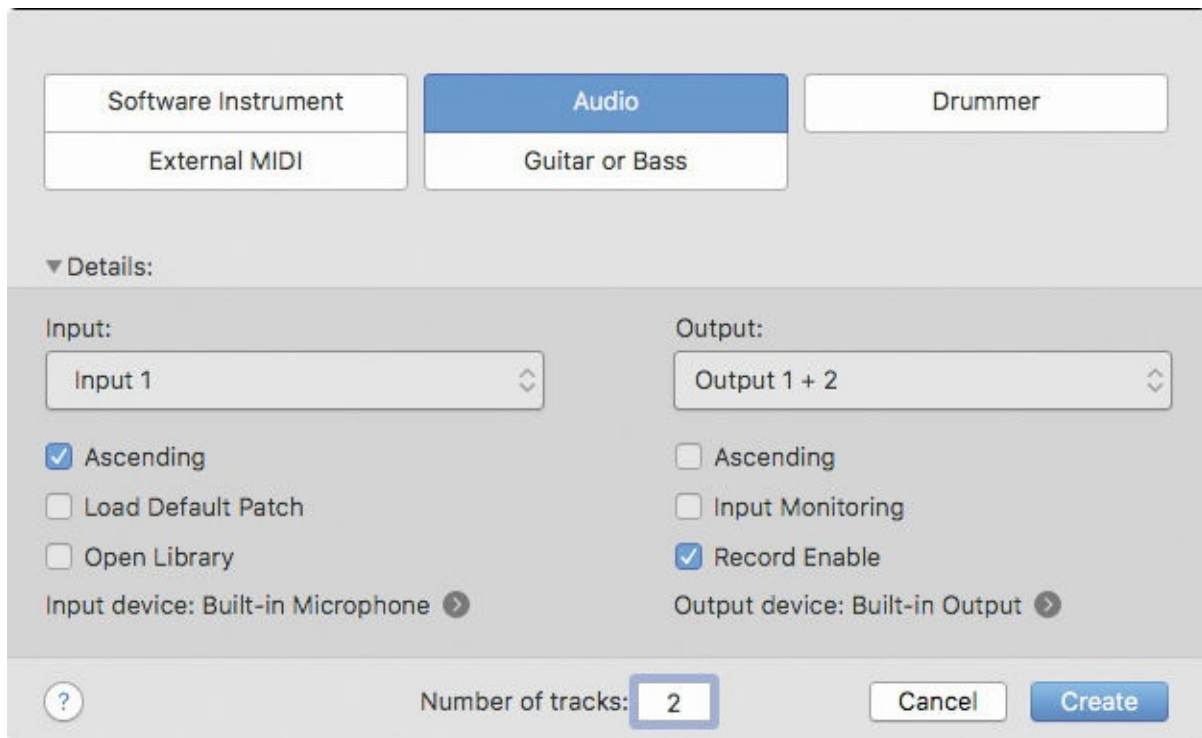


When creating multiple tracks, selecting Ascending automatically sets the inputs (or outputs) to ascending settings. In this case, you will create two tracks, so the first will be assigned to Input 1 and the second to Input 2.

Make sure that you took precautions to avoid feedback, as explained at the beginning of this lesson; this time you will create record-enabled tracks.

5 Below the Output menu, select Record Enable.

6 At the bottom of the New Tracks dialog, set “Number of tracks” to 2.

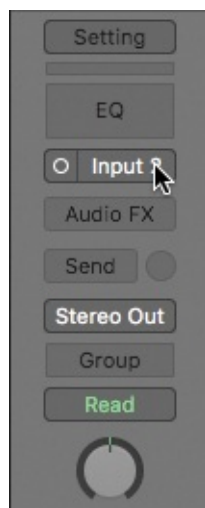


7 Click Create (or press Return).

Two new tracks are added at the bottom of the Tracks area and automatically assigned to the next available audio channels (Audio 8 and Audio 9). Their inputs are set to Input 1 and Input 2, and both are record-enabled.

Tip

If you need to reassign a track's input, click the Input slot on the track's channel strip and choose the new input.



Note

The number of inputs available in the Input menu depends on the audio interface selected as an input device in the Logic Audio preferences.

8 Rename the tracks *Acoustic Gtr* and *Vocals*.

9 In the control bar, click the Go to Beginning button (or press Return).

10 Start recording.



The multitrack recording starts, and after a one-measure count-in, you see the red playhead appear to the left of the workspace, creating two red regions, one on each record-enabled track.

11 After a few bars, stop recording.

You now have a new blue-shaded audio region on each track.

12 In the Acoustic Gtr and Vocals track headers, click the R (Record Enable) buttons to disable recording for both tracks.

You can use the same procedure to simultaneously record as many tracks as needed. If the tracks already exist in the Tracks area, make sure you assign them the correct inputs, record-enable them, and start recording.

Note

You can record multiple takes on multiple tracks the same way you previously recorded to a single track: either return the playhead to the beginning of the first take and record a new take, or record multiple takes in Cycle mode.
