

Apple Pro Training Series

# Final Cut Pro X Advanced Editing

Michael Wohl, Alexis Van Hurkman,  
and Mark Spencer

DVD-ROM with media and lesson files included



Level Two Certification

Apple Pro Training Series

# Final Cut Pro X Advanced Editing

Michael Wohl / Alexis Van Hurkman / Mark Spencer



Apple Pro Training Series: Final Cut Pro X Advanced Editing  
Michael Wohl, Alexis Van Hurkman, Mark Spencer  
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# Getting Started

Welcome to the official Level Two Apple Pro Training course for Final Cut Pro X.

This book is an in-depth journey into the advanced editing techniques and effects of Final Cut Pro X. It uses diverse footage ranging from the feature film *SuperGirl Rocks* to the music video *One Night in Jordan* (based on a live concert performance by internationally renowned artist Zade Dirani). It also explores creating promotional spots and show bumpers to demonstrate application features and practical techniques you'll use daily in your editing projects.

Whether you've been editing for years or are just beginning to work in film and video, this book will enhance your knowledge of Final Cut Pro X while it enhances your editing skills. So let's get started!

## The Methodology

This book takes a hands-on approach to using the software. It's divided into projects—based on footage on the accompanying DVD—that teach you advanced techniques as you work through the lessons. Every exercise is designed to get you editing and creating effects professionally in Final Cut Pro as quickly as possible.

Each lesson builds on previous lessons to guide you through the application's functions and capabilities. However, if you're already familiar with Final Cut Pro, you can go directly to a specific section and focus on that topic because every lesson is self-contained.

## Course Structure

This book is designed to improve your skills both as an editor and as a Final Cut Pro user. You'll begin by learning editing techniques designed to streamline your workflow and allow you to effectively perform complex editing tasks. Then you'll focus on sound editing and multicamera footage. Next, you'll explore the world of effects, covering such diverse topics as compositing, filters, keyframing, compound clips, titling, and speed changes. Finally, you'll finish your studies by learning a variety of techniques for color correcting clips, balancing scenes, and creating deliverables using Compressor.

The lessons are grouped into the following categories:

- ▶ Advanced Editing: Lessons 1–6
- ▶ Advanced Compositing and Effects: Lessons 7–9
- ▶ Finishing Techniques: Lessons 10–14

In addition to the exercises, some lessons include project tasks that provide an opportunity to practice what you've learned. Throughout the book, other valuable sections will guide you in evaluating your project before moving to the next editing stage.

## Downloading Final Cut Pro X

Final Cut Pro X is available as a download from the Mac App Store. Because installation can begin immediately after purchase, you should read the Apple best practices (<http://support.apple.com/kb/HT4722>) *prior* to installation to ensure the best performance of the application. The exercises in this book are based on Final Cut Pro version 10.0.3. If you have an earlier version of Final Cut Pro X, update your software or some exercises may not work as described.

## Using the DVD Book Files

The Apple Pro Training Series: Final Cut Pro X Advanced Editing DVDs (included with the printed book) contains the project files and media you'll use for each lesson. After you transfer the files to your hard drive, each lesson will instruct you in the use of the project and media files.

**NOTE** ► If you purchased this title as an eBook, you will find a URL to download the files on the “Where Are the Lesson Files” page located at the end of the eBook.

### Installing the Final Cut Pro X Lesson Files

On the DVDs, you'll find three files: APTS FCP X ADV Part 1.sparseimage, APTS FCP X ADV Part 2.sparseimage, and APTS FCP X ADV Part 3.sparseimage. These disk image files function like virtual disks. You will use their contents for the exercises in the book. Specific instructions in the lessons will explain which disk image to load.

- 1** Insert the Apple Pro Training Series: Final Cut Pro X Advanced Editing, Disc One DVD into your DVD drive.

Depending on which version of OS X you're using and the Finder preferences, you may not see the DVD on your desktop. If you don't see the DVD, take a quick look in a Finder window to see all the mounted volumes (such as hard disks or DVDs) that are available.

- 2** In the Dock, click the Finder icon.
- 3** In the Finder window, select the APTS FCP X ADV DVD listed in the left sidebar under Devices.
- 4** With the DVD selected, drag the three disk images from the DVD to your desktop to copy them.

Alternatively, you may drag the disk images to any locally connected storage device such as an external hard disk. Whichever destination you choose, Final Cut Pro must have access to the disk image files, and you must have read and write privileges. In addition, the storage device must have at least 23 GB of free space available.

- 5** After the disk image files are copied, eject the DVD.
- 6** Insert the second disc, Apple Pro Training Series: Final Cut Pro X Advanced Editing, Disc Two, into your DVD drive, and repeat steps 2 through 5.

Before you begin a section in this book, you must mount the corresponding disk image to give Final Cut Pro access to the necessary project and media files.

- 7 On your desktop (or the location you chose for the files), double-click an APTS FCP X ADV disk image file to mount the disk images.

A virtual disk labeled APTS FCP X ADV Part 1 (or Part 2 or Part 3) appears under Devices in the Finder window's sidebar.

**NOTE** ▶ Depending on which version of OS X you use and the Finder's preferences, you may not see the APTS FCP X disk on your Desktop.

Each lesson will identify the disk image and the files to use for that lesson's exercises. You should not alter the contents of the Final Cut Events or Final Cut Projects folders on a APTS FCP X ADV virtual disk.

## Using Final Cut Pro on a Portable

Some of the desktop Mac keystrokes identified in this book differ from the keystrokes used with a MacBook Pro. Specifically, you'll sometimes need to hold down the Function key (fn) when pressing the Left and Right Arrow keys to access the Home and End keys, respectively.

## About the Footage

Footage from eight diverse projects is used throughout this book—ranging from a feature film and a documentary to a concert video and various broadcast promos. Together, they represent a real-world sampling of the types of projects and media formats you'll likely encounter as a working video editor. Although the lesson exercises instruct you to edit the footage in a particular way, you can use any part of this footage to practice your own editing methods. Techniques you've learned using one set of clips in a lesson can be practiced using a different set of clips to create a new project.

**NOTE** ▶ Due to copyright restrictions, you cannot use this footage for any purpose outside this book or upload any version of the files in this book to YouTube or any other public or private video sharing site.

## System Requirements

Before using *Apple Pro Training Series: Final Cut Pro X Advanced Editing*, you should have a working knowledge of your Macintosh and its OS X operating system. Make sure that you know how to use the mouse; standard menus and commands; and how to open, save, and close files. If you need to review these techniques, see the printed or online documentation for your system.

To review the basic system requirements for Final Cut Pro X, refer to the technical specifications at [www.apple.com/finalcutpro/specs/](http://www.apple.com/finalcutpro/specs/).

## About the Apple Pro Training Series

*Apple Pro Training Series: Final Cut Pro X Advanced Editing* is both a self-paced learning tool and the official curriculum of the Apple Pro Training and Certification Program.

Developed by experts in the field and certified by Apple, the series is used by Apple Authorized Training Centers worldwide and offers complete training in all Apple Pro products. The lessons are designed to let you learn at your own pace. Each lesson concludes with review questions and answers summarizing what you learned, which can be used to help you prepare for the Apple Certification Exam.

For a complete list of Apple Pro Training Series books, see the page at the back of this book, or visit [www.peachpit.com/apts](http://www.peachpit.com/apts).

## Apple Pro Certification Program

The Apple Pro Training and Certification Programs are designed to keep you at the forefront of Apple digital media technology while giving you a competitive edge in today's ever-changing job market. Whether you're an editor, graphic designer, sound designer, special effects artist, student, or teacher, these training tools are meant to help you expand your skills.

Upon completing the course material in this book, you can earn Apple certification. Certification is offered in all pro applications, including Aperture, Final Cut Pro, Motion, and Logic Pro. Certification gives you official recognition of your knowledge of Apple professional applications while allowing you to market yourself to employers and clients as a skilled user of Apple products.

Apple offers three levels of certification: Apple Certified Associate, Apple Certified Pro—Level One, and Apple Certified Pro—Level Two. Certification exams do not require class

attendance. Students who prefer to learn on their own or who already have the necessary skill set in the chosen application may take an exam for a fee.

Apple Certified Associate status validates entry-level skills in a specific application. Unlike an Apple Certified Pro exam, you can take Associate exams online from the comfort of your own home or office. Apple Certified Associate status is appropriate for students, for someone who is preparing for a first job out of school or a college-level program, or for anyone interested in validating entry-level credentials. Instructions on how to take the exam are included later in this book. For details on what the exam covers, please visit <http://training.apple.com/certification/proapps>.

An Apple Certified Pro is a user who has reached the highest skill level in the use and operation of Apple Pro Applications as attested to by Apple. Students earn certification by passing the online certification exam administered only at Apple Authorized Training Centers (AATCs). Apple Certified Pro status is appropriate for industry professionals.

For those who prefer to learn in an instructor-led setting, training courses are taught by Apple Certified Trainers at AATCs worldwide. The courses use the Apple Pro Training Series books as their curriculum and balance concepts and lectures with hands-on labs and exercises. AATCs are carefully selected to meet Apple's highest standards in all areas, including facilities, instructors, course delivery, and infrastructure. The goal of the program is to offer Apple customers, from beginners to the most seasoned professionals, the highest-quality training experience.

For more information, please see the page at the back of this book, or to find an Authorized Training Center near you, visit [training.apple.com](http://training.apple.com).

## Resources

*Apple Pro Training Series: Final Cut Pro X Advanced Editing* is not intended as a comprehensive reference manual, nor does it replace the documentation created for the application. For comprehensive information about program features, refer to these resources:

- ▶ Final Cut Pro Help—Accessed through the Final Cut Pro Help menu, the Reference Guide contains a complete description of all features. You can also access Help at <http://help.apple.com/helplibrary/category/videoediting>.
- ▶ For a list of other resources, please visit the Apple website at [www.apple.com/finalcutpro/resources/](http://www.apple.com/finalcutpro/resources/).
- ▶ For details on the Apple Training and Certification programs, please visit <http://training.apple.com>.

# 4

## Time Goals

This lesson takes approximately 85 minutes to complete.

Read and use the Audio meters

Fix overmodulated audio clips

Adjust and animate audio levels

Perform subframe audio adjustments

Apply audio fades and select fade shapes

Create audio pans in stereo and surround

Animate audio pan effects

Manage audio channels for multichannel clips

Break apart audio channels for independent editing



## Lesson 4

# Working with Sound

It cannot be said often enough: Audio is more important than video. Audiences will tolerate shockingly poor quality video (see *Paranormal Activity*, *Cloverfield*, or *Blair Witch Project* for proof), but no one will sit through even three minutes on YouTube if the audio is hard to hear. You can always close your eyes, but closing your ears is far more difficult. And while the images carry the basic information of a scene, the sound invariably carries the emotional content. If seeing is believing, then hearing is feeling.

Fortunately, Final Cut Pro X contains an impressive number of ways to improve your video's sound. It has tools to set the audio levels to a uniform, accurate volume; multiple methods to create audio fades and four fade styles; intuitive controls for panning sound between speakers, in both stereo and surround sound environments; and much more.

**NOTE** ► *Apple Pro Training Series: Final Cut Pro X* by Diana Weynand (Peachpit Press) described the automatic audio enhancements you can apply to your clips to remove background noise, adjust levels, and remove silent audio channels. This lesson picks up where those lessons left off and delves into a more manual approach to improving your sound.

## Setting Sound Levels

One of the most basic and fundamental aspects of good audio is ensuring that the volume level is consistent across your project. If one scene is too loud and the next is too soft, it's very hard for viewers to stay engaged in your program. And if the overall level is too quiet or too loud, other problems arise such as increased background noise or distortion.

### Understanding Audio Meters

Final Cut Pro has highly accurate, easy-to-read Audio meters to monitor audio levels and ensure that they are correct and uniform. Tiny meters are always visible to the right of the current timecode in the center of the toolbar, but you can also display large meters with a single click.

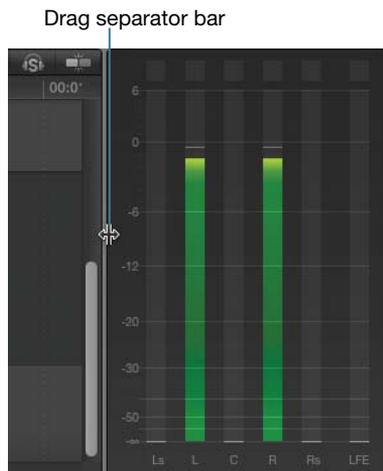
- 1 In the Project Library, double-click the *Sound editing* project inside the Lesson\_04 folder in the APTS FCP X ADV Part 1 disk.

The project opens into the Timeline.

- 2 Click the tiny Audio meters in the toolbar, or press Command-Shift-8 to display large Audio meters to the right of the Timeline.

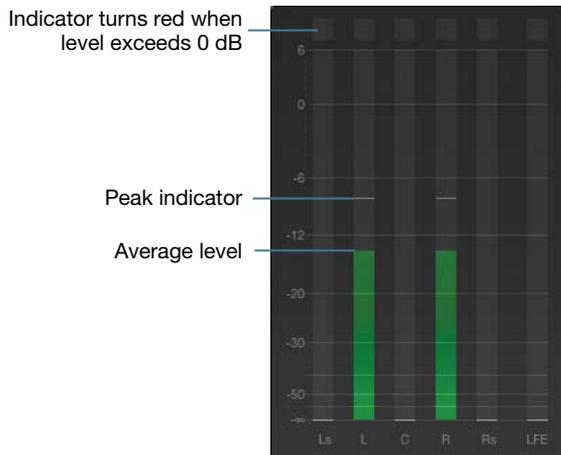


- 3 Drag the left edge of the meters to make them bigger or smaller and view more or less detail.



**NOTE ►** The meters show the number of channels in the current project. Surround projects show six meters (L, R, C, LS, RS, and LFE); stereo projects show two meters (L and R).

- 4 Play the first few clips of the project and watch the Audio meters.



The meters display the average and peak levels, and alert you if your audio ever hits 0 db.

You can determine the average level by watching the bouncing bars. This is not going to provide a precise value, but watching the meters can give you a good sense of the overall volume of the clip. In this project, the average level for the first clip is around -24 dB. The second clip averages at around -9 dB, and the third clip is even louder, and reaches 0 dB at about 27 seconds.

The peak level is indicated by the thin white line that lingers (for a second or two) as the clips play. That line shows the loudest level reached over the last section of playback and can be especially helpful if the audio has a very brief peak that's much louder than the average level (such as you'll hear in clip 2 around 15:00).

### ► How Loud Is Too Loud?

There is no hard and fast rule about what defines a proper audio level. Whatever level you choose, your viewer can always adjust the volume of the playback device to make the overall sound louder or quieter.

However, if your levels are low, she will have to turn the playback volume up very loud, which can expose background noise and lower the overall sound quality. On the other hand, if your levels are high, your listener will have to turn the volume down, which can make quiet passages nearly inaudible. Furthermore, when sounds are too loud in a high-level clip, the sound can distort, making an unpleasant grating sound and rendering the audio unintelligible, even if the volume is decreased.

High- and low-level audio problems may be exaggerated when your video is converted to play on other platforms. So, a project that sounds OK during editing can reveal problems when you upload the result to YouTube or burn the video to a Blu-ray disk. Also, lower-quality speakers (such as the built-in speaker on a cell phone or a consumer television) can magnify problems that aren't apparent when monitoring your project on studio-quality speakers or headphones.

Because of this, a general guideline is that you want your levels as loud as possible, as long as they *never* touch 0 dB (at which point they *overmodulate* and distortion occurs).

**NOTE** ► Never, never let the audio hit 0 dB!

Also, audio is *additive*, so if you play a sound effect, ambiance, and music along with your main dialogue, the volumes of each item are added together, pushing the final result ever closer to that dreaded 0 dB. Most audio mixers set the dialogue, interview, or narration to an average audio level of -12 dB, which allows plenty of room for adding sound effects, music, and other elements without risking overmodulating. This average audio level also provides a little *headroom* if you want to make a specific sound deliberately louder than the dialogue (such as a music swell or explosion).

To this last point, sound mixers working on theatrical films typically set the average dialogue levels even lower (-24 dB or -31 dB). The theater turns up their (high-quality) speakers so that dialogue plays at a comfortable level, and when those

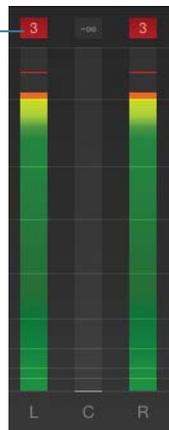
explosions occur, they can be so loud they knock your socks off—without ever touching 0 dB!

However, beware of using this trick if your target platforms are computers, handheld devices, or televisions without fancy sound systems. Those lower-quality speakers may not be able to reproduce so much *dynamic range* (variance between the loudest and quietest sounds), and your audio mixing artistry may come across as a muddy mess.

### Fixing Overmodulated Audio

The warning indicator turns red if your audio level reaches 0 dB. In this instance, you must turn down the audio below 0 dB or risk creating a distorted sound.

Excessive volume  
warning indicator



If you see this warning, do not ignore it!

**NOTE** ► If you don't see a number in the warning indicator, increase the width of the meters as described in the previous exercise.

The audio waveforms in the Timeline also indicate when a clip is too loud. When a part of the waveform is louder than  $-6$  dB, it appears in yellow. If a part of the waveform is at 0 dB, it appears in red.



Fortunately, Final Cut Pro tells you how many decibels “over” 0 dB the peak is, making it very easy to fix the level. In **Shot\_03**, the audio peaked at +3 dB.

**TIP** ▶ When skimming is turned on, the excessive volume warning is dismissed as soon as you move your pointer. If you disable skimming (press S to turn skimming on and off), the indicator will stay active until you play the project again, enabling you to more easily see (and address) the offending audio level.

- 1 Select **Shot\_03**, and choose Modify > Volume > Down (–1 dB), or press Control-- (minus).
- 2 Repeat step 1 three times to lower the level by 3 dB.



- 3 Play the project again.

The waveform no longer turns red. However, leaving that audio at such a high level might still cause problems if you later add any sound effects, music, or other clips. So lowering it even further is wise.

Unfortunately, lowering the whole clip will make the rest of the shot *too* quiet. To fix this, you’ll need to utilize keyframes, as you’ll learn to do in the next section.

**NOTE** ▶ The figures in this lesson were captured with the “Show Reference waveforms” setting chosen. Reference waveforms factor out loudness and let you see the shape of the sound more clearly as it changes. (So, for example, the waveforms become smaller as the volume is decreased.) Choose this setting in the Editing pane of the Final Cut Pro Preferences window.

## Setting Levels in the Timeline

You have many ways to adjust a clip's audio level. In addition to choosing the Modify menu item, you can adjust levels in the Timeline or in the Audio Inspector, or by using the keyboard. Each of these methods is best used in certain circumstances. To fix the problem in **Shot\_03**, you will use the volume controls in the Timeline.

- 1 Click the Clip Appearance button, and set the clip appearance to the second icon from the left.



- 2 Drag the Clip Height slider to the middle to increase the clip heights.

**TIP** The Timeline doesn't update dynamically when you drag the slider, so for best results, drag and let go a few times to see the Timeline update until the clips are the size you desire.

- 3 Click outside the window to close the Clip Appearance window.

Making the audio portion of the clips larger makes it easier to see the waveforms and to make more precise adjustments to the volume control (the horizontal line across the audio waveform). In this case, you will return the volume to its default value, in preparation for lowering only the section that's too loud.

- 4 Position your pointer over the volume control for **Shot\_03**, and when the pointer changes to the Adjust pointer, drag the line up until the volume reads 0 dB.



This adjustment raises the overall level, but now the middle part of the clip is too loud.

- 5 Play the project and press I just as she says “Uh...” at 25:00, and press O just after she says, “I’m enjoying that” at around 28:15. The area you want to attenuate is now marked as a selection.



- 6 Position your pointer over the volume control within the selected area, and drag the line down to  $-7$  dB. You may need to zoom in on the Timeline to more easily select the line within the selected range.



The level is lowered only in the selected section.

- 7 Play the clip to hear how the overall level is now far more uniform.
- 8 Press Command-Shift-A to deselect all.



Deselecting allows you to more clearly see that *keyframes* were automatically added to limit the volume change to the selected range.

When two keyframes are set to different values, Final Cut Pro automatically interpolates the audio levels between the two values, thereby animating the audio level.

### Animating Audio Levels

To change audio levels over time, you can adjust the line between the keyframes, adjust specific keyframes, or add additional keyframes to make specific changes (such as removing a pop or cough, or adding an audio fade-in or fade-out). There is no limit to the number of keyframes you can add.

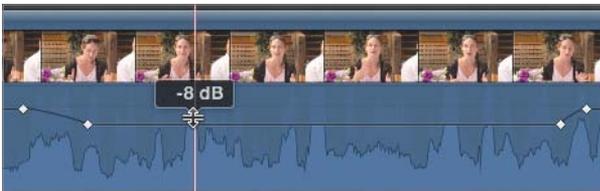
- 1 Drag the Timeline Zoom slider to the right to zoom in on the Timeline, or press Command-= (equal sign).
- 2 Position your pointer over the first keyframe, and then drag the keyframe to the left to create a slower fade effect.



**NOTE** ► You can drag a keyframe either vertically (to change its level), or horizontally (to change its location in time) but not both directions at the same time.

Changing the value of the first keyframe will affect the level of the clip prior to that keyframe, and changing the value of the last keyframe will affect the level of the clip from that point until the end of the clip.

- 3 Drag the line between the middle two keyframes down to  $-8$  dB.



Both keyframes surrounding the line are moved proportionally.

- 4 Option-click the line twice to add new keyframes as shown in the following figure.



- 5 Drag the line segment between the two new keyframes up to  $-5$  dB.



- 6 Play the clip to hear the results.

You may want to continue adding and adjusting keyframes to create an optimally smooth audio level.

### Making Subframe Audio Adjustments

Audio clips recorded at a sampling rate of 48 kHz contain 2,000 samples for each frame of 24 fps video. That means you could conceivably add 2,000 audio keyframes in every single frame of video! Higher audio sample rates could have even more keyframes. Although no one is likely to add thousands of keyframes to a single video frame, having that kind of precision means you can fix miniscule errors such as clicks, pops, and extra sibilance.

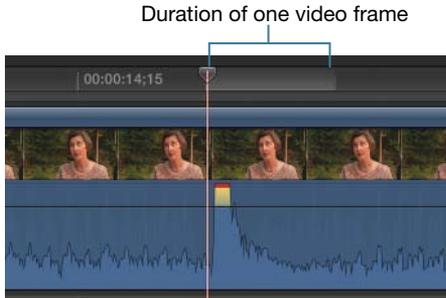
- 1 With no clips selected, click the Current Timecode field, and type *14:16*. Press Return.



- 2 Press Shift-/ (slash) to play around that timecode.

You will hear a pop sound right as the woman says “green tomato jam.”

- 3 Drag the Timeline Zoom slider all the way to the right to zoom all the way into the Timeline.



You can see the waveform that represents the offending sound, but if you try to remove it, you also risk removing some of the woman's voice. To avoid that, you should adjust only the specific samples containing the sound.

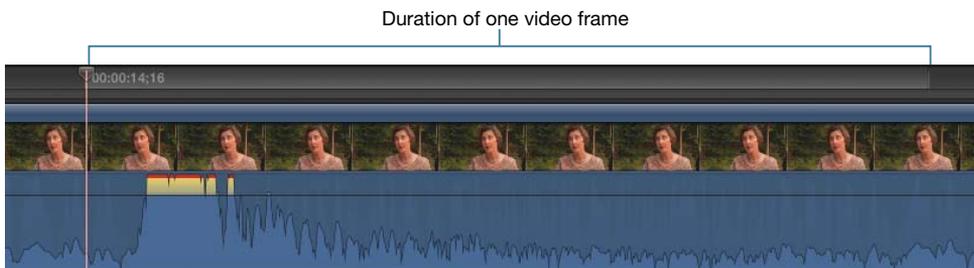
The light gray bar in the Timeline ruler indicates the duration of one frame. As you can see, audio keyframes can be edited with much greater precision than a single video frame; but in fact, you can zoom in much farther for even more precision.

- 4 Make sure that View > Zoom To Samples (the default) is chosen.

If Zoom To Samples was not active, you'll notice that the Timeline Zoom slider suddenly has a little more room to the right.



- 5 Drag the Timeline Zoom slider farther to the right. The gray bar in the ruler, which represents one frame, becomes larger as you zoom farther and farther into the Timeline.



At the farthest zoom point, each horizontal pixel on the screen represents an individual audio sample.

- 6 Option-click three times to add three keyframes around and on the unwanted noise.



- 7 Drag the middle keyframe all the way down to  $-96$  dB.



The two surrounding keyframes limit the adjustment to the area between them.

- 8 Press Shift-/ (slash) to play around the area again. The offending noise is removed, and the woman's voice appears unaffected.
- 9 Press Shift-Z to zoom the Timeline back out to show all clips.

### Setting Levels in the Inspector

You can also adjust audio levels for any selected clip in the Audio Inspector. One advantage to making changes here (as opposed to the Timeline) is that you can change clips that are in the Event Browser but not yet added to a project.

- 1 In the Event Library, open the *Lesson\_04* Event, and in the Event Browser, click **Shot\_06** to select it.



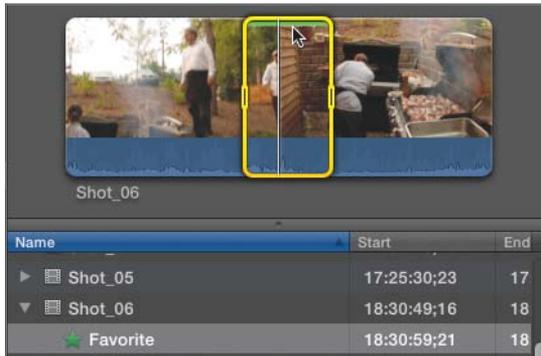
- 2 If the Inspector is not visible, press Command-4 to open it.



- 3 In the Inspector, click the Audio button to open the Audio Inspector.

Dragging the Volume slider in the Audio Inspector has the same effect as adjusting the volume control in a waveform in the Timeline. For clips already placed in a project, both controls affect the same data.

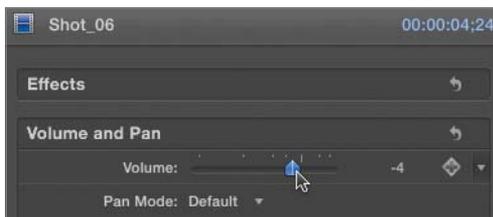
- 4 In the Event Browser, click the green Favorite bar for **Shot\_06** to select it.



- 5 Press E to append the clip to the end of the project.
- 6 In the Timeline, click **Shot\_06**. The Inspector updates to show the audio level for the current playhead position of the selected clip.



- 7 In the Inspector, drag the Volume slider down by 4 dB.



The volume control in the Timeline moves down by 4 dB.

- 8 Drag the volume control down to -5 dB. The Volume slider in the Inspector also updates.



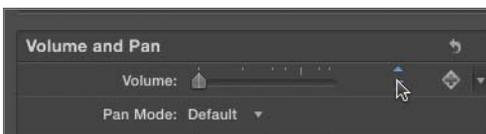
You can also use the Inspector to change the level of multiple clips simultaneously.

- 9 In the Timeline, Shift-click **Shot\_05** to add it to the selection.



Now, both **Shot\_05** and **Shot\_06** are selected. The Audio Inspector no longer shows an indicator for the volume (since more than one clip can have more than one value) but you can still modify the clips' volume by a relative amount.

- 10 Position your pointer over the dashes to the right of the Volume slider and drag up or down to change the two clips' levels simultaneously.



**TIP** To see the resulting level for one of the selected clips, deselect both clips, and then select the one clip you want to observe.

### Animating Levels in the Inspector

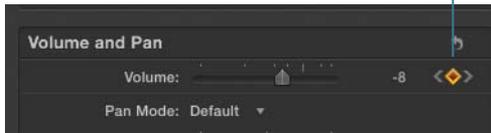
You can also add, modify, and navigate between audio keyframes within the Inspector.

- 1 In the Timeline, select **Shot\_03**.

The Inspector updates to show the values for the selected clip at the current frame (either under the playhead or the skimmer, if enabled).

- 2 In the Timeline, drag the playhead and watch the Volume slider in the Inspector move as the existing keyframes affect the clip's volume.

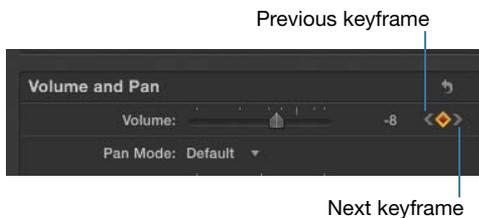
Button turns orange when playhead/skimmer is over a keyframe



Keyframes are represented in the Inspector by the diamond-shaped Keyframe button to the right of the Volume slider. When the playhead is parked on a keyframe, the button turns orange.

**NOTE ►** The Keyframe button also turns orange (with a plus sign in the middle) when you position your pointer over a parameter—even if you're on a frame that doesn't yet have a keyframe assigned. This is the Add Keyframe button. It alerts you that if you click and make a change to the slider, a new keyframe will automatically be added. However, the Add Keyframe button looks very similar to the Keyframe button (especially on a high resolution screen), so it's easy to get confused. To be sure whether or not you're currently parked on a keyframe, move the pointer away from the Volume parameter.

You can navigate directly to keyframes by clicking the arrows on either side of the Keyframe button.



- 3 Click the left arrow to jump to the first keyframe to the left of the current playhead position. Click the right arrow to jump to the first keyframe to the right of the current playhead position.

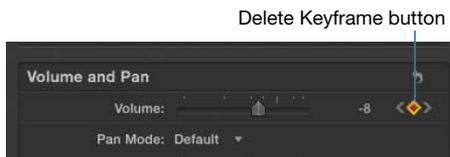
If no more keyframes exist either before or after the current playhead position, the appropriate arrow is dimmed.

**NOTE** ► Once a first keyframe is added to a clip, any changes you make to the Volume slider will automatically add a new keyframe at the current playhead position.

### Deleting Keyframes

Keyframes can be deleted in the Inspector. To do so, the playhead must be positioned directly on that specific keyframe.

With the playhead parked on the keyframe, click the orange Delete Keyframe button.



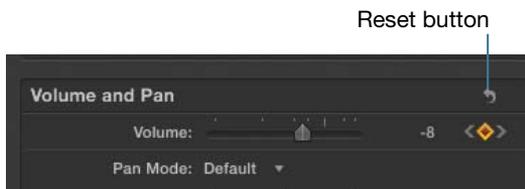
The keyframe is removed. Final Cut Pro automatically recalibrates to interpolate the audio based on the remaining keyframes.

**NOTE** ► The X in the Keyframe button doesn't appear until you roll your mouse over it.

### Resetting Audio Levels

The Inspector also contains an essential control: the Reset button. Clicking this button allows you to remove any keyframes or audio volume adjustments made to the selected clip, and restore the clip to its default volume.

- 1 In the Timeline, select **Shot\_03**.
- 2 In the Inspector, click the Reset button for the Volume and Pan section.



The volume (and pan) settings are restored to the default, removing any keyframes.

### Setting Levels Using Keyboard Shortcuts

You have one more way to change audio levels: Select a clip (or portion of a clip) and press a keyboard shortcut to boost (raise) or *attenuate* (lower) the level by 1 dB.

These keyboard shortcuts are especially useful because they allow you to change the levels of a clip *while the video is playing back*, which means you can hear the changes dynamically, creating a more organic workflow.

- 1 In the Timeline, select **Shot\_01**.
- 2 Play the project.
- 3 While the first clip is playing, press Control-= (equal sign) several times.

Each time you press the keyboard command, the volume for the clip is boosted by 1 dB.

- 4 Press Control-- (minus sign) to lower the level by 1 dB.

### Nudging Keyframes

When you have created audio keyframes, you can select an individual keyframe directly and move it up and down 1 dB at a time from the keyboard.

- 1 In the Timeline, Option-click the volume control for **Shot\_01** to add a keyframe.



- 2 Click the keyframe to select it. The keyframe turns orange.



- 3 Press Option-Up Arrow to increase or Option-Down Arrow to decrease the level of the selected keyframe.



**TIP** You can also delete a selected keyframe in the Timeline by pressing the Delete key.

- 4 To deselect the keyframe, press Command-Shift-A or click anywhere outside the keyframe.

## Creating Audio Fades

Nearly every audio clip should ideally have a small fade-in and fade-out applied to it. Tiny shifts in background sound levels can create subtle, but distracting clicks and knocks that can interfere with an otherwise flawless soundtrack.

Every audio clip in Final Cut Pro can easily be faded in and out without applying an effect, adding multiple keyframes, or performing any other elaborate manipulation. You can fade audio clips with a single gesture.

- 1 In the Timeline, position your pointer anywhere over **Shot\_02**. Fade handles appear at the left and right edges of the waveform area.



- 2 Drag the fade-in handle to the right to apply a fade-in effect to the clip.



**TIP** Be careful not to drag the edge of the video area and perform a ripple trim instead of creating a fade effect. You can tell which effect you will get by the pointer that appears before you begin to drag.

- 3 Position your pointer over the right edge of the clip, and drag the fade-out handle to the left. The farther you drag, the longer (slower) the fade effect.



Fade effects are applied in addition to any adjustments made to the audio level parameter. The fade will always begin (or end) at complete silence, and fade up to the maximum level set by the level parameter.

### Crossfading Between Audio Clips

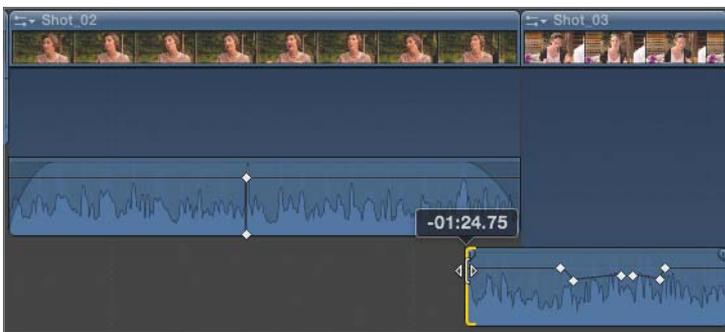
Using fades, you can easily create a crossfade effect between two audio clips, as long as the clips overlap in the Timeline. For audio/video clips, you will first need to expand the audio to make the clips overlap; for connected audio clips, you can simply drag them into an overlapping position.

**NOTE** ▶ Applying a transition effect to adjacent video clips in the primary storyline automatically crossfades the audio in those two clips, but this exercise shows how to create an audio crossfade without using a video transition effect.

- 1 Double-click the audio waveforms for **Shot\_02** and **Shot\_03**. The audio is expanded, allowing you to manipulate it separately from the video.



- 2 Drag the Audio start point of **Shot\_03** to the left until it overlaps the fade at the end of **Shot\_02**.



- 3 Drag the fade handle on the left edge of the **Shot\_03** audio to add a fade that matches the duration of the clips' overlap. The first clip fades out as the second fades in creating a crossfade effect.



- 4 Select the two clips, and choose **Clip > Collapse Audio/Video**, or press **Control-S**. The clips are collapsed, but the crossfade between the two shots remains.



**TIP** You can also collapse clips by double-clicking the audio waveform section or the gap between the audio and video.

Crossfading adjacent connected clips is even easier.

- 5 Select the edit between the two connected audio clips under **Shot\_04**.



- 6 Press Command-T. The two clips are converted into a new storyline, and a crossfade effect is placed between the two items.



**NOTE** ► Connected clips can use transition effects only if they are embedded in a storyline, but Final Cut Pro takes care of that by automatically creating the storyline for you.

You can change the duration of the crossfade effect by dragging either edge of the gray transition icon.

- 7 Drag the left edge of the transition to the left to lengthen the duration of the overlap.

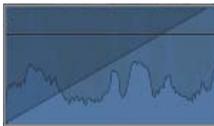


**TIP** You could also select the transition effect, press Control-D, and type a new duration.

### Setting a Fade Shape

Final Cut Pro includes four fade shapes that perform different types of fade effects. It's up to you to decide which shape to use in any situation. There are no absolute rules because every clip will need a unique fade shape and length, but you can use the following descriptions to help you choose:

- ▶ *Linear*: Best for fades to or from silence on a clip with a relatively even waveform (such as a roomtone or ambiance track). Should not be used for crossfades, as a volume dip may be heard at the middle of the fade.



- ▶ *S-curve*: The default shape for crossfades. It is an all-purpose shape that creates an ease-in at the beginning and an ease-out effect at the end of the fade.



- ▶ **+3 dB:** The default shape for single fades. It is also known as a *fast-fade*, or when used as a crossfade, an *equal power* fade. This shape is ideal for crossfading between two clips of constant volume (such as roomtone, ambiences, and some music). The slight boost in the middle of the fade compensates for audio's naturally nonlinear response curve and creates a transition that is heard as a constant level across the edit.

When used for a fade-in, it creates what sounds like a uniform volume increase over the course of the fade. When used for a fade-out, the result is a seeming acceleration of the attenuation. This shape works well on dialogue or other clips when there's only room for a very short fade.

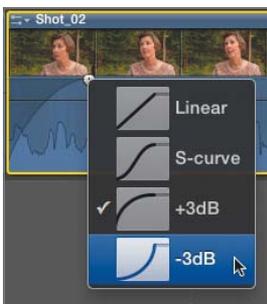


- ▶ **-3 dB:** Also known as a *slow-fade*. For a fade-in, it creates a slower, more gradual volume increase. It's often used for fading in clips with noticeable background noise or when there's room for a longer fade.

For a fade-out, the attenuation is accelerated at first, followed by a more gradual decrease in volume. When used on a longer fade, the slow-fade works well to make sounds disappear more subtly or organically.



- 1 Position your pointer over **Shot\_02**. The fade handles appear.
- 2 Control-click (or right-click) the Fade In handle to open the Fade Shape pop-up menu.



- 3 Choose  $-3$  dB.



- 4 Play the project to hear the fade-in.
- 5 Set the fade shape to  $+3$  dB, and play the project again. The difference is subtle but audible.

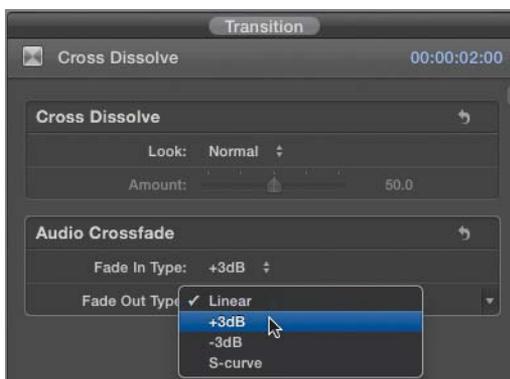
**NOTE** ▶ You may need to listen with headphones to hear the subtle difference (especially in a classroom environment).

You can also set the fade shape for crossfade effects.

- 6 Select the crossfade effect between the two connected clips.



- 7 If the Inspector is not visible, press Command-4 to open it.
- 8 In the Audio Crossfade section of the Inspector, set both the Fade In Type and the Fade Out Type to  $+3$  dB. The crossfade is now set as an equal power crossfade.



**NOTE ►** There's no reason you can't mix and match the fade types based on the specific clips you're fading.

- 9 Play the project and listen to the fade.
- 10 Experiment with the other fade types and try to hear the difference between them.

## Panning Audio

One of the best ways to add dimension to your sound design is to take advantage of the fact that most audiences will be hearing your movie through multiple speakers. Surround sound enables you to spread the audio across several speakers that surround your audience; but even *stereo* projects enable you to choose the locations of sounds. You'd be very surprised to know how many editors simply leave all their audio mixed to the center, or worse, they leave it in the sometimes haphazard arrangement determined by the original sound recording.

Exercise restraint and subtlety when *panning* clips. In the real world, sound reflections and reverberations cause most sounds to come from a relatively neutral point of origin. If too much of your sound comes exclusively from a single speaker, the unnatural result might pull your viewer out of the story instead of drawing him in.

Still, appropriate panning is a great tool in your sound design arsenal, and Final Cut Pro X makes it easy to craft rich sound environments in both stereo and surround sound.

### Choosing a Panning Environment

By default, all clips are imported with the audio placement information that was provided by the camera or audio recording device. Final Cut Pro examines such metadata and applies appropriate settings to your clips.

Although some devices record in full surround sound, they are extremely rare. Even stereo recording is not the norm, at least not on professional productions.

**NOTE ►** Many consumer-level camcorders will record stereo or surround audio using multiple microphones; but because the mics are mounted so close together on the top of the camera, they typically record nearly identical content on all channels.

Nearly every professional camera records (at least) two channels of audio, but those channels are typically used to record two different signals, such as the signals from two separate lavalier microphones, or a built-in camera mic and an attached shotgun microphone controlled by a boom operator.

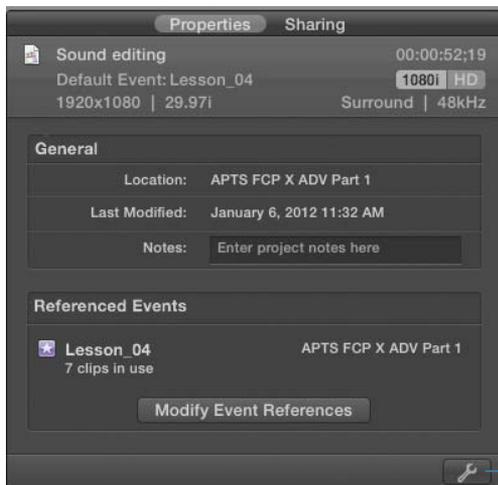
New projects in Final Cut Pro default to surround sound, and allow you to move sounds to any of five channels (though you can also just use the left and right stereo channels and ignore the others).

**NOTE ►** Technically, six channels are included in a five-channel surround mix: In addition to the left, center, right, left surround and right surround channels, an additional channel is dedicated to low-frequency effects (LFE) such as explosions, rumbling trains, and Barry White vocals.

If you do want to mix in surround sound, you must have a surround-monitoring environment in your editing suite, which requires third-party hardware connected via PCIe, FireWire, USB, or HDMI.

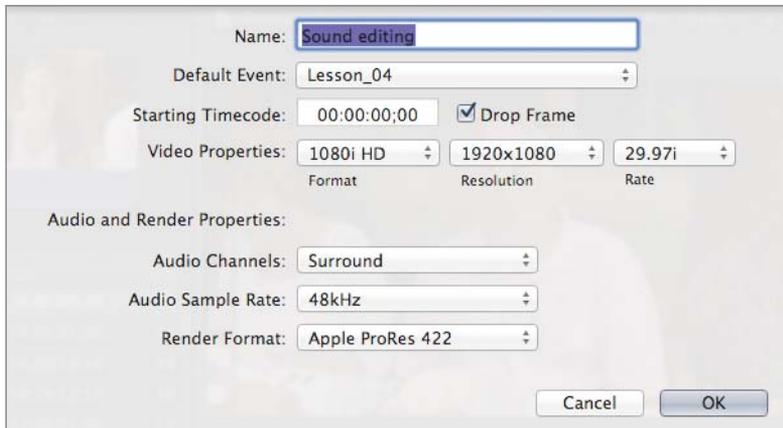
Fortunately, all Macs can monitor in stereo. If you want to mix your audio only for a stereo sound environment, you can change the project from surround to stereo.

- 1 Activate the project by clicking anywhere in the Timeline pane (or by selecting the *Lesson\_04* project in the Project Library). Choose File > Project Properties, or press Command-J. The Project Library opens (if the Timeline was showing) and the Inspector displays the Project Properties pane.



Modify Project Properties button

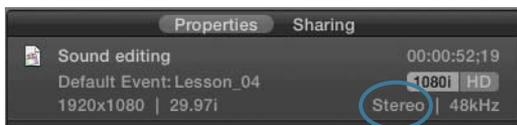
- 2 In the lower-right corner of the Inspector, click the Modify Project Properties button.



- 3 In the Audio and Render Properties section, set Audio Channels to Stereo, and click OK.



**TIP** You can tell at a glance whether a project is stereo or surround in two places: in the summary at the top of the Project Properties pane, and by noting how many meters appear in the Audio Meters section (stereo projects have two meters, surround projects have six meters).



**NOTE** ► It is possible to have a mono project if imported from iMovie. Such projects can be converted to stereo (or surround) by following the same steps just described

### Using Stereo Panning

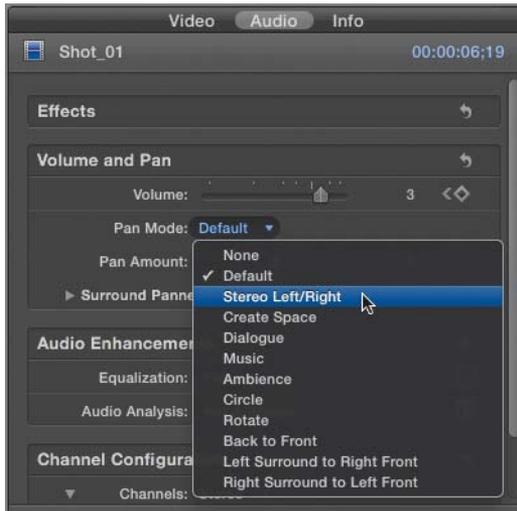
In the Audio pane of the Inspector, you can assign which speakers will emit the sound of a clip. Panning between the left and right speakers can be done quickly and easily, and is very intuitive.

**NOTE** ► Although editing a stereo clip into a surround project or a surround clip into a stereo project is possible, the final output will be based on the settings in the project. As a result, a surround clip edited into a stereo project will play out of only the left and right channels regardless of the panning you applied to the clip.

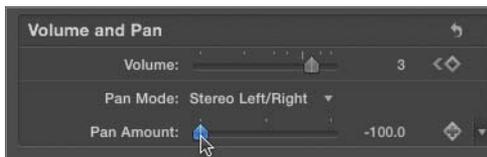
- 1 In the Project Library, double-click the *Sound editing* project in the Lesson\_04 folder to open the Timeline.



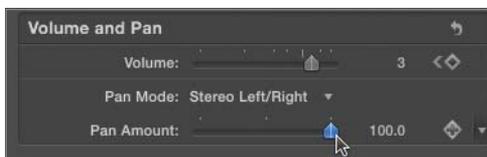
- 2 In the Timeline, select **Shot\_01**, and in the Inspector, click the Audio button to open the Audio Inspector.
- 3 In the Volume and Pan settings, set Pan Mode to Stereo Left/Right.



- 4 Drag the Pan Amount slider all the way to the left.



- 5 Play the project and note that the sound from the first clip is heard only in the left speaker.
- 6 In the Inspector, drag the Pan Amount slider all the way to the right and play the project again. Now the audio for the first clip comes out of the right speaker.



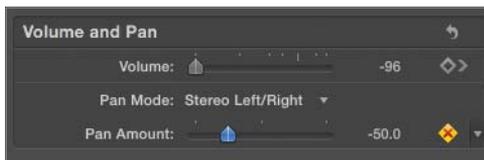
## Animating Pan Effects

You can use keyframes to change pan settings while a sound plays, which can be very effective to create naturalistic sounds for moving objects within a scene.

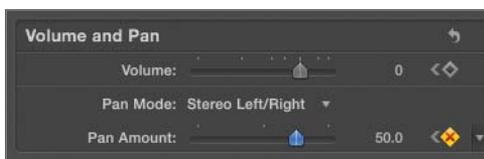
- 1 Move the playhead to the very beginning of **Shot\_02**.



- 2 In the Inspector, set Pan Mode to Stereo Left/Right, and then drag the Pan Amount slider about halfway toward the left (to about  $-50$ ), and click the Keyframe button to add a keyframe.



- 3 In the Timeline, move the playhead to 20:00.
- 4 In the Inspector, drag the Pan Amount slider halfway to the right (to around  $+50$ ). A keyframe is automatically added because you've changed the value on a new frame in time.

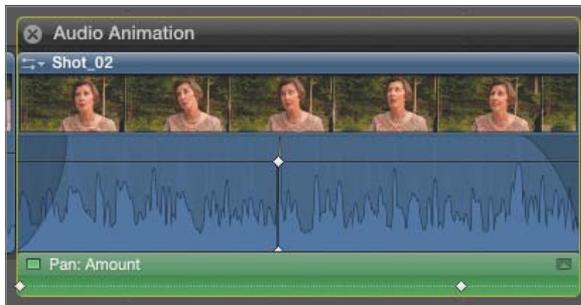


- 5 Play the project and listen to the subtle audio shift from left to right.

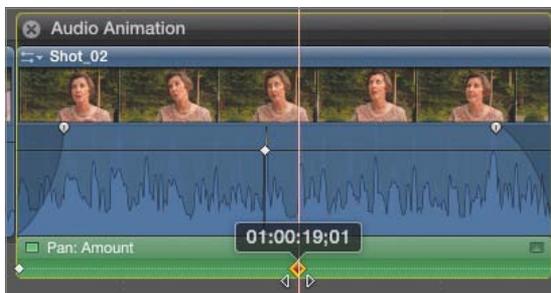
## Panning in the Timeline

You can also view and modify audio pan settings in the Timeline.

- 1 Select the clip in the Timeline, and choose **Clip > Show Audio Animation**, or press **Control-A**. The Audio Animation Editor appears below the clip in the Timeline. White diamonds represent the keyframes so you can see when they occur. White diamonds represent the keyframes so you can see when they occur.



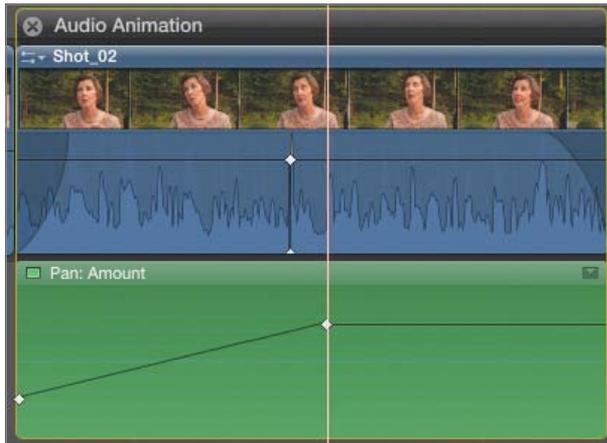
- 2 Drag the second keyframe to the left (to approximately 1:00:19:00), and play the project. Moving the keyframe to the left makes the panning animation happen more quickly.



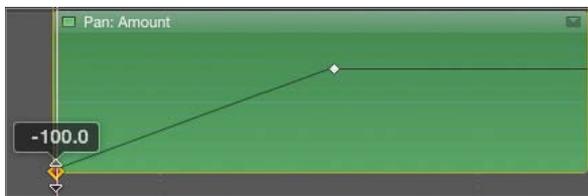
**NOTE** ▶ A numerical field shows the timecode for the individual clip, not the project timecode.

You can also change the pan value directly in the Timeline.

- 3 Double-click the keyframe area, or click the disclosure button in the upper-right corner of the Audio Animation Editor. The Pan graph expands showing the keyframes' relative values in addition to their positions in time.

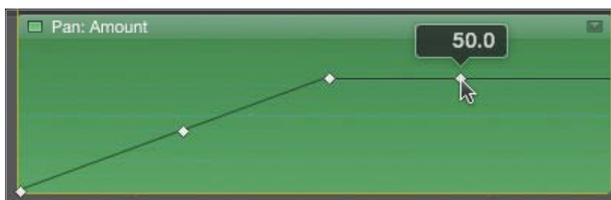


- 4 Drag the first keyframe all the way to the bottom of the graph.



This sets the audio in the clip to begin exclusively in the left speaker. Dragging toward the top of the graph would pan it to the right speaker.

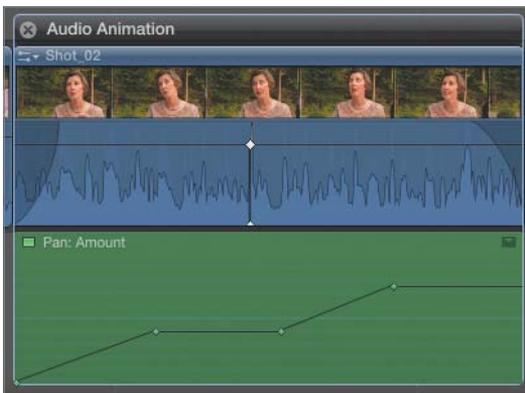
- 5 Option-click the black line in the Pan animation graph twice to add two new keyframes.



- 6 Drag the third keyframe down to create a plateau in the middle of the graph. This stops the panning action for the duration between the two keyframes.



- 7 Play the project to hear the results of your work.
- 8 Click the close button.



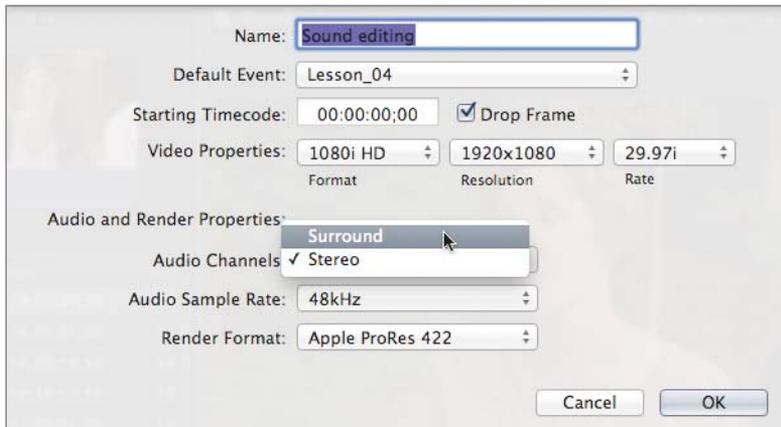
The Audio Animation Editor closes, but the keyframes and settings you modified remain applied to the clip.

### Performing Surround Panning

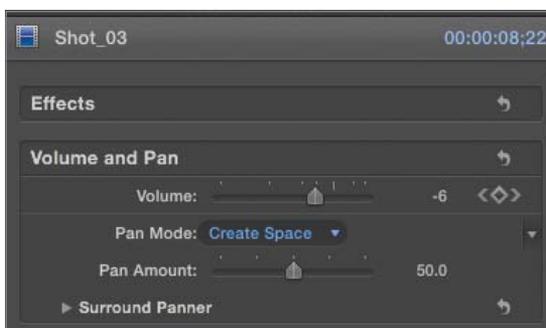
Just as you can set stereo panning, you can make similar changes to clip audio in a surround project. To hear the surround panning, you must set your project's audio channels to surround.

**TIP** If you do not have a surround-monitoring system attached to your editing system, you will not be able to hear the results of the adjustments in this lesson. Although you can perform the steps, Final Cut Pro will down mix to stereo outputs.

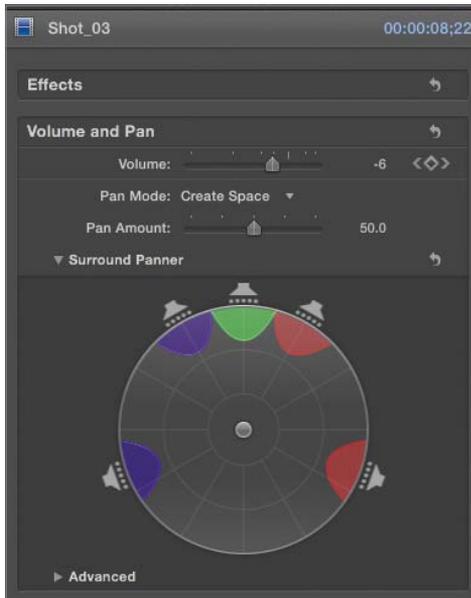
- 1 Press Command-J to open Project Properties.
- 2 In the lower-right corner of the Inspector, click the Modify Project Properties button.



- 3 In the Audio and Render Properties section, set Audio Channels to Surround, and click OK.
- 4 Double-click the project to reopen it, and select **Shot\_03**.
- 5 In the Inspector, click the Audio button to open the Audio Inspector.



- Set Pan Mode to Create Space, and then click the disclosure triangle to reveal the Surround Panner, if necessary. The Surround Panner graphically represents the five surround speakers (left, center, right, left surround, and right surround).



- Drag the center handle around the Surround Panner.



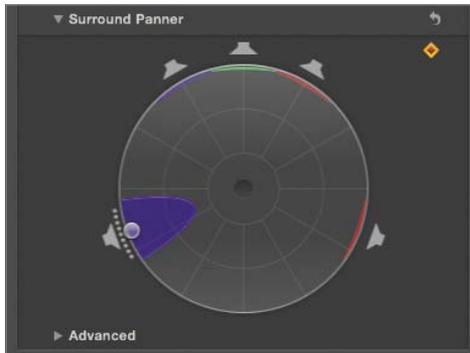
As you drag toward each of the speakers, the colored shapes expand and contract to represent how much sound will emit from that speaker. (The bigger the shape, the more sound will come out.)

- Play the project and experiment with different positions to hear the result.

## Keyframing Surround Sound

You can animate surround panning using one of two methods: by keyframing the Surround Panner itself, or by choosing one of the preset panning modes and keyframing the Pan Amount slider.

- 1 Position the Timeline playhead to the first frame of **Shot\_03**, and then drag the Surround Panner handle to the left-rear speaker (at around 8 o'clock).



- 2 Click the Keyframe button.
- 3 Move the Timeline playhead forward by two seconds (to 25:18), and drag the Surround Panner handle to the right-front speaker (at around 1 o'clock). A second keyframe is automatically assigned.



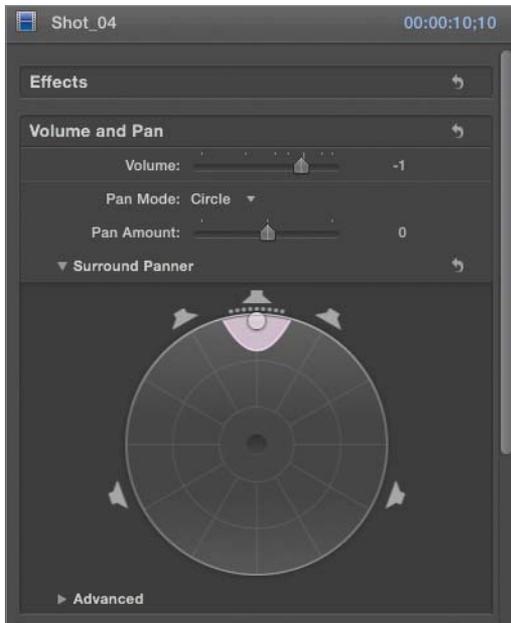
- 4 Play the project across **Shot\_03**. The audio moves from the left-rear speaker to the right-front speaker over the course of the clip.

You can add as many keyframes as you like to create complex animations of your sound in the surround audio space.

### Using Preset Pan Methods

You can also employ one of the preset panning settings and keyframe the Pan Amount slider.

- 1 Select **Shot\_04** and position the playhead at the first frame of that clip.
- 2 In the Inspector, set Pan Mode to Circle, which allows you to animate your sound to move in a circle around the listener, utilizing all five speakers.



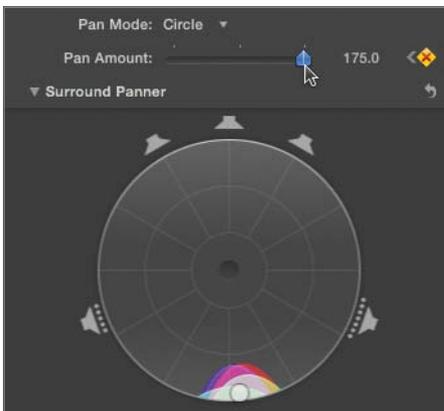
- 3 Drag the Pan Amount slider from left to right and observe the movement that occurs in the Surround Panner.

Using Pan Mode allows you to animate the Pan Amount slider to create surround sound animations based on a preset type of effect (which is arguably simpler than animating the entire Surround Panner).

- 4 Drag the Pan Amount slider all the way to the left to set the sound to come out of the rear speakers only.



- 5 Click the Keyframe button for the Pan Amount slider.
- 6 Move the Timeline playhead forward by five seconds (to approximately 35:00).
- 7 Drag the Pan Amount slider to the right.



A keyframe is automatically added, and the sound is animated to move around the room in a circle.

- 8 Play across **Shot\_04** to hear the results.

Alternatively, rather than creating a circle effect, you could select one of the other pan modes.

- 9 Set Pan Mode to Back to Front.

**NOTE** ► Changing the pan mode automatically erases any keyframes assigned to the Pan Amount slider.

- 10 Move the Timeline playhead to the beginning of **Shot\_04** and repeat steps 5 through 9 as you observe the difference in the movement of the sound.

## Managing Audio Channels

Most clips include multiple audio channels. This could be two discrete mono tracks recorded in the camera, a stereo track in which the left and right channels are intended to pan in a specific way, or a multitrack clip with many audio channels that actively need to be managed. One common example of this is footage in which audio was recorded on a device separate from the video and the two signals were joined inside Final Cut Pro using the Synchronize Clips function as described in Appendix A.

Regardless of the number of tracks, you can manage which audio channels are *active* and which are ignored when you play a particular clip.

**NOTE** ► You can change the active channels at any point in the editing process—either in the Event Browser before the clip is used, or after an instance of a clip has been added to a project.

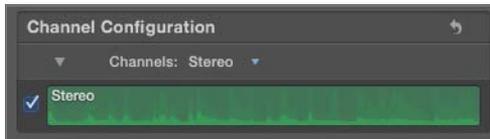
Furthermore, active channels can be displayed in the Timeline collapsed into a single bar combined with the video, expanded into a separate audio-only bar, or broken apart so that each individual channel can be seen and modified independently.

### Enabling and Disabling Channels

You manage audio channels in the Audio Inspector for the selected clip. There, you can skim the individual channels to identify the contents of each channel. You can also enable or disable individual channels, and select the audio format (stereo, surround, and so on). This latter setting instructs Final Cut Pro how to pan the individual channels by default.

- 1 In the Timeline, select **Shot\_05**.

- In the Audio Inspector, scroll down to view the Channel Configuration section. This clip contains two audio channels, marked as stereo. Because they are a stereo pair, they are represented by a single bar.

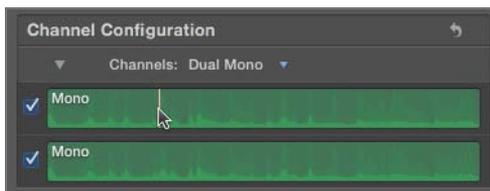


- From the Channels pop-up menu, choose Dual Mono. The two individual items are broken out into two individual channels.



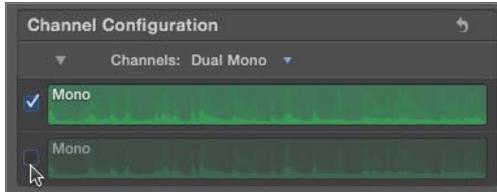
**NOTE** ► The contents of the Channels pop-up menu changes dynamically based on the number and type of channels in the currently selected clip. Clips with an even number of channels can display as stereo pairs or individual mono channels. Clips with six channels can also be marked as 5.1 surround channels. Always check the pop-up menu to see the options available for the current clip.

- Skim the two individual tracks to hear the difference between them.



The first channel contains clear, sharp audio; the second sounds inferior. That's because channel 1 was recorded with a boom mic pointed directly at the subject's mouth, and channel 2 was recorded using the built-in camera mic, which was much farther away.

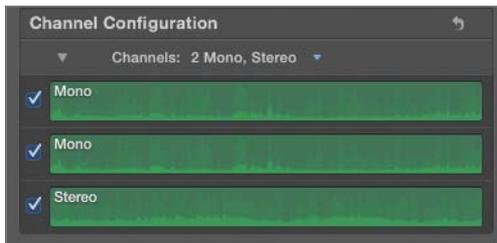
- 5 Deselect the checkbox to the left of the second channel to disable it. Now, the clip in the Timeline will play only the higher-quality channel 1 audio.



### Breaking Apart Audio Clips

When you have more than one audio channel, you can expose each of the components as separate bars in the Timeline. This allows you to independently keyframe the volume, pan, and effects settings for each channel.

- 1 In the Timeline, select **Shot\_06**, and in the Audio Inspector, scroll to see the Channel Configuration section.



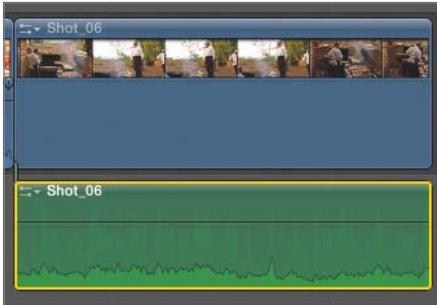
This clip contains four audio channels: two mono channels and a stereo pair. Yet, in the Timeline, the audio is represented by a single bar connected to the video.

**TIP** You can reconfigure these four tracks as four mono channels, two stereo pairs, L, R, C, S, or other configurations by choosing from the Channels pop-up menu.



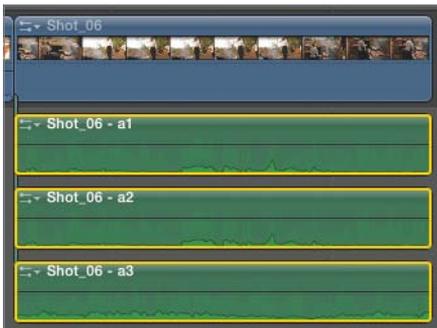
This bar can be *expanded*, as described earlier in the lesson, or it can be detached to be treated as a separate entity from the video.

- 2 With audio selected, choose Clip > Detach Audio, or press Control-Shift-S. The audio is detached from the video and appears as a connected clip, synchronized to the first frame of the video.



However, the four individual audio channels are still combined and treated as a single entity in the Timeline. This is helpful when adjusting the audio as a single unit, but if you want to change individual channels you need to go one step further.

- 3 Choose Clip > Break Apart Clip Items, or press Command-Shift-G. Each channel is broken into its own bar and can be adjusted individually.



## Lesson Review

1. What three things do Audio meters show?
2. Should dialogue levels be set to: A) 0 db, B) -12 db, C) -31 db, or D) none of these options?
3. Should you change audio levels in the Timeline or the Inspector?
4. What is the finest resolution that audio can be adjusted to?
5. Which kinds of clips can have an audio fade effect applied?
6. How many fade shapes are there and what are they called?
7. Can you crossfade between two connected clips?
8. How many speakers can you use for audio panning?
9. True or false: Panning can be animated in stereo but not in surround.
10. How do you display individual audio channels of a multichannel clip in the Timeline?

### Answers

1. Average audio levels, peak audio levels, and overmodulation
2. B or C are both acceptable answers. Never set audio to 0 db.
3. You can set audio levels in either the Timeline or the Inspector.
4. Audio can be adjusted to the individual sample level.
5. All clips that contain audio can be faded.
6. There are four audio fade shapes: Linear, S-curve, +3 dB, and -3 dB.
7. Yes, although they will automatically be converted into a storyline.
8. Two speakers in stereo and five speakers in surround. (Surround mixes also include a low-frequency channel that is not affected during panning.)
9. False. You can animate panning settings in both stereo and surround mixes.
10. Select the clip, and choose Clip > Break Apart Clip Items.

## Keyboard Shortcuts

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<b>Control-A</b>	Open Audio Animation Editor
<b>Command-J</b>	Open Project Properties
<b>S</b>	Toggle skimming on and off
<b>Control-S</b>	Expand/collapse Audio/Video
<b>Control-Shift-S</b>	Detach audio from video and display as a connected clip
<b>Control-Z</b>	Zoom to Samples
<b>Shift-Z</b>	Zoom to fit
<b>Option-Down Arrow</b>	Reduce level of the selected keyframe
<b>Option-Up Arrow</b>	Increase level of the selected keyframe
<b>Option-' (apostrophe)</b>	Navigate to next keyframe
<b>Option-; (semicolon)</b>	Navigate to previous keyframe
<b>Command-= (equal sign)</b>	Zoom in on Timeline
<b>Control+= (equal sign)</b>	Increase volume level by 1 dB
<b>Control-- (minus sign)</b>	Decrease volume level by 1 dB
<b>Command-4</b>	Open Inspector
<b>Command-Shift-8</b>	Display large Audio meters

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