Adobe® Audition® CS6

CLASSROOM IN A BOOK®

The official training workbook from Adobe Systems

Instructor Notes

Adobe® Audition® CS6 Classroom in a Book®

INSTRUCTOR NOTES

Getting Started

The *Adobe Audition CS6 Classroom in a Book* course presents students with tips, techniques, and solutions for using the Adobe Audition CS6 software.

The Instructor Notes are intended to complement the information in the *Adobe Audition CS6 Classroom in a Book*. The information is organized to follow the sequence of instruction in each lesson. These notes are not a play-by-play of each subsection of the book; rather, they point out specific areas where we feel you can expand on the lesson or introduce tangential subjects that may not be covered in the text.

The CS6 edition has been rewritten from the ground up compared to previous versions. Every lesson throughout the book contains new artwork, and all exercises were created specifically for this edition.

Course strategy

It's important to note that Audition is two programs in one: a digital audio editor and a multitrack recorder. Each has its own functionality and applications, although several elements overlap. As a result, the book is divided into roughly three parts: the basics (audio interface and the Audition workspace), digital audio editing, and multitrack recording.

If you're teaching a 15-session class, you can teach approximately one chapter of this book per class. The book contains 16 lessons, some of which may take a while to complete. If you are teaching a 10-session class, you may want to combine some of the lessons in a single class. For example:

- Lesson 1 covers interfacing Audition with computers and audio gear. If the classroom is already set up for recording and playing back audio, you can go directly into Lesson 2, which covers the Audition workspace.

- Lesson 3 covers basic digital audio editing concepts and techniques that are used in Lessons 4–7.

- Lesson 4 is by far the longest, because it covers all effects and signal processors included in Audition. These are important in both digital audio editing and multitrack recording; the lessons convey how these processors affect audio.

- Lessons 5, 6, and 7 cover Audio Restoration, Mastering, and Sound Design, respectively. These are medium-length lessons, and all describe applications related to digital audio editing. Different groups of students may have priorities that would require giving more weight to one chapter than another. For example, those involved in audio production might be most interested in mastering, whereas those doing audio for video may be most attracted to sound design.

- Lesson 8 deals with creating and recording files. It serves as a transitional lesson between the digital audio editing and multitrack recording sections, because it also introduces the concept of how to transfer files fluidly from one environment to the other. This ability is unique to Audition, and its importance should be emphasized.

- Lessons 9 and 10 cover two different aspects of multitrack recording—the Multitrack Editor and the Mixer. The Mixer chapter is the shorter of the two and can be discussed on its own or as a supplement to Lesson 9. The actual lessons tend to cover familiarity with the multitrack environment rather than creating actual music. Lesson 10 also touches on the use of hardware controllers, because Audition CS6 supports a variety of controller protocols.

- Lesson 11 describes editing clips in the multitrack environment, but also gives a practical example of creating a "DJ mix" of multiple songs. However, the principles involved are also useful for blending soundtrack sections within an audio-for-video project.

- Lesson 12 covers an extremely practical application for Audition—creating a composition from commercially available sound libraries. Whether for soundtracks, commercials, kiosks, or other projects, much music these days is created via these methods. There's also information on how to conform sound clips of varying lengths and pitches to a project's native pitch and tempo— an extremely useful new feature in Audition CS6.

- Lesson 13 is about recording in the Multitrack Editor; however, it also includes information on more advanced recording techniques, such as overdubbing, punching, and composite recording (where parts of multiple takes are combined to make a single, "perfect" take).

- Lesson 14 describes automation. This is a technique used in mixing, but in this book it is presented prior to the actual act of mixing so that automation can be included in a mix from the start.

- Lesson 15 takes a "deep" look at mixing, including some artistic considerations as well as technical ones. It starts off by using Audition to generate test tones for checking the acoustics in a mixing space and then proceeds to the multiple steps involved in building a mix—with a secondary emphasis on creating an efficient workflow. This lesson also covers the use of Clip Groups, another new feature in Audition CS6, as well as how to export a mixed project in multiple formats.

- Lesson 16 involves bringing a reference video into Audition and creating a soundtrack that matches audio to video (including how to create a rhythmic bed and match up hit points). It also covers Audition CS6's seemingly magical ability to synchronize ADR (dubbed) dialogue with the original dialogue.

Teaching Audition with Mac and Windows

Audition is available for both Mac OS X (Intel) and Windows computers. As a result, you'll need to decide which platform to use when teaching Audition (although assembling a collection of both Windows and Mac computers has merit; users can choose whichever platform feels most comfortable).

With very few (and extremely minor) exceptions, program operation and performance on both platforms is virtually identical. The main difference is if you want to teach how to use Audition with third-party plug-ins (signal processors), as described in Lesson 4. Plug-in formats are not compatible between the two platforms; even plug-ins identified as following the VST protocol have different versions for Mac and Windows. Although some plug-in copy protection methods allow installs on two different platforms, some don't.

The simplest, least expensive, and most reliable option is to use the collection of signal processors included with Audition, because they provide all significant functions (and then some) used for editing and recording. However, if you want your students to experiment with third-party plug-ins, in addition to purchasing third-party plug-ins for Mac and/or Windows, note that many legal, public domain plug-ins are available online; better yet, several software companies offer "starter" versions of their programs that have some limitations but are cost-free and fully functional.

Both Mac and Windows computers have built-in audio capabilities that are adequate for these lessons, especially if students are using headphones. External USB audio interfaces are an added expense but provide superior audio quality (FireWire audio interfaces are also available; however, fewer computers offer FireWire compared to USB). Most interfaces have drivers that are compatible with both Mac and Windows computers, and some have two headphone outputs if two students need to work with a single computer.

Audition's multiple identities

One of Audition's most important aspects is that no other audio program uses an identical "dual-personality" paradigm. Instead, programs tend to be split among digital audio editors and multitrack recorders. Although most multitrack recorders do allow for some degree of editing, for deep editing (noise reduction, de-clipping, analysis, averaging normalization, and the like), it has traditionally been necessary to switch to a different program. Similarly, although some digital audio editors allow for multiple tracks (usually to accommodate surround material), they do not have the same level of flexibility or sophistication as Audition.

However, be aware that some users will be interested in only one part of the program. For example, mastering engineers or those doing forensic analysis will be most interested in Lessons 1–8. Musicians will likely be most interested in Lessons 1, 2, and 9–15. Those doing sound design may use multitrack editing occasionally to build up very complex sounds, but most will follow the same path as mastering engineers.

In addition, another group of users will be most interested in the integration with Adobe Premiere Pro and/or Adobe After Effects. Just as there are "hooks" between the digital audio editing and multitrack editing sections of Audition, there are "hooks" that allow for efficient file transfers between Premiere Pro or After Effects and Audition. Because this book is dedicated to Audition, you'll need to refer to the documentation for Audition and Premiere Pro or After Effects for details on using these apps in tandem with Audition. However, note that those using Audition with video projects will find virtually all aspects of Audition useful because it includes dialogue cleanup and digital editing, ADR replacement, sweetening, multitrack recording for soundtracks, and audio mastering.

With all these options, you may want to determine the main interests of your class and emphasize the various sections accordingly. Nonetheless, it's important to make your class aware of everything Audition can do. For example, even nonmusicians can put together soundtracks by using the information presented in Lesson 12 on creating music from sound libraries.

Using Audition Help

Choosing Help > Audition Help or pressing F1 opens Adobe Community Help, which includes the entire collection of Audition Help files, as well as links to other online resources.

The "Getting Started" chapter discusses available resources in detail. Be sure to show students that Audition Help includes access to a variety of tutorials that can help with their understanding of the software and digital audio in general.

Using Adobe Online services

Students may inquire about privacy concerns related to Adobe's online services and resources. You can reassure them that no personal or configuration-related information is sent from their computer except that which they explicitly type in as part of the voluntary online registration process.

Managing student projects

One way to simplify file storage and retrieval in classroom situations is to ask students to create a folder on their hard disks, name it *[student's name]* **Lessons**, and then copy each project folder into the main Lessons folder. (Suggestions on the best way to do this are included in the "Getting Started" chapter.) This is also important because attempting to run lessons from the CD-ROM will generally not be successful: Audition needs to create temporary files based on the files used in the project and cannot write these to optical media.

Having students keep all their working files in their own Lessons folder makes it easy for you to clean up files when a class is over. It's a good idea to encourage them to save their work to their own media (USB stick, recordable CD-ROM, etc.) as well.

Lesson 1: Audio Interfacing

Audio interfacing allows Audition to accept real-world audio for recording and play back its internal files as audio for monitoring. Therefore, understanding the material in this lesson is essential for students to accomplish any meaningful results with the remaining lessons.

Goals for this lesson

It's likely that some students will already be familiar with audio interfacing; for others, the concept of specifying numerous parameters and making decisions regarding file formats before starting to do actual work may be daunting.

In this lesson, students will learn how to do the following:

• Configure a Macintosh computer's onboard audio for use with Audition

• Choose the appropriate sample rate for a project with recommendations of the different sample rates used for different types of projects

• Set up the onboard audio in Windows computers for use with Audition

• Set up Windows audio interfacing regardless of whether you're running XP (with Service Pack 3) or Windows 7 (Service Pack 1, 32-bit, or 64-bit)

• Configure Audition to work with the onboard audio that was set up for Macintosh or Windows computers

• Test the audio configurations to make sure all connections are correct

To simplify the learning process, this lesson emphasizes using a computer's onboard audio capabilities, because these are relatively consistent from one computer to another. However, the end of the lesson touches on using external audio interfaces, which are more flexible and provide superior sound compared to onboard audio. External audio interfaces are recommended for learning situations in which these types of interfaces are available, and students are sufficiently advanced to already have familiarity with drivers and the use of USB and FireWire connections. Note that it's not practical to include a lesson involving external interfaces due to the dizzying array of variations among models.

Because Audition CS6 works with both Mac and Windows XP and 7, this chapter covers what the two platforms *don't* have in common (drivers and user interface) and also what they *do* have in common (setting bit resolution and sample rate). In addition, there are several significant differences between Windows XP and 7. It's highly recommended that the learning environment use Windows 7, because XP is now 12 years old and approaching its end of life.

Windows users do not need to read the "Mac OS X Audio Setup" section, and Mac users to not need to read the section on Windows setup. *However, both groups of users need to read all other sections.*

This lesson also describes how to test the computer's audio connections; do not skip this, because it includes procedures that will be used in other lessons. This also verifies that audio can provide an input for Audition, and Audition can provide an audio output for monitoring.

At the end of this lesson, students will be prepared to proceed with the next lessons, which involve real-world applications that include recording and playback.

Lesson 2: The Audition Environment

Students who are already familiar with other Adobe Creative Suite programs are at an advantage, because customizing the workspace is a hallmark of all Creative Suite programs, and there are many similarities among programs. Those for whom Audition is their first CS program will take longer to acclimate.

Goals for this lesson

The overall objective of this lesson is to familiarize students with the way Audition allows for customizing workspaces. This is particularly important with Audition because of the many ways it can be used—for example, the type of workspace for doing mastering is very different from the workspace that would be optimum for multitrack recording or editing narration. Also, even when you're working within a single project, it may be necessary to adjust the workspace as the project evolves.

In this lesson, students will learn how to do the following:

• Create custom workspaces for particular workflows, which can then be optimized for specific types of projects

• Arrange panels and frames for optimum workflow while working within a project

• Use the Media Browser to find files, audition files before loading them using the Media Browser's Playback Preview function, and see a variety of file attributes at a glance

• Create shortcuts to frequently used folders

• Navigate to specific sections of a file in the Waveform Editor or a Session in the Multitrack Editor

• Use markers to create points that allow you to jump instantly to specific places in the Waveform Editor or a Session in the Multitrack Editor

• Use zooming to focus in on particular sections in the Waveform or Multitrack Editor

Panels and frames

Audition's use of templates is helpful as a point of departure for those new to the program. But while working with real-world projects, customizing the workspace is essential because not all needed elements can be visible at all times. As a result, the lesson starts off by emphasizing the significance of panels and frames, and how to rearrange them within a workspace.

It's important that students fully grasp workspace customization because future lessons will require resizing, adding, and removing panels to fulfill particular functions.

Navigation

Navigation is treated as three separate elements: navigation within the computer to open files and folders, navigation within a file to locate specific pieces of audio, and visual navigation (e.g., zooming in and out).

There's special emphasis on navigating with the Media Browser, which is new to Audition CS6. This Audition-specific Browser simplifies locating, loading, and even auditioning files. The Browser also provides multiple pieces of data about files, including attributes like duration, sample rate, file path, number of channels, and more. The Browser resembles the Windows Explorer and Mac Finder, so most students should feel comfortable with it.

Users of previous versions of Audition may fall into the habit of using menus or the drag-and-drop method instead of the Media Browser because those processes are familiar; encourage them to use the Media Browser as much as possible, because once learned, it speeds overall workflow considerably.

Another essential Media Browser feature is the ability to create shortcuts to often-used files, which appear in the Media Browser along with other files. This is particularly handy if students need to break in the middle of lessons, because they can create shortcuts prior to quitting and then call up the designated files easily upon resuming.

Marker management is improved over previous versions of Audition. This lesson emphasizes using markers for navigation, but other lessons cover other aspects of using markers, like using markers to help extend or shorten musical selections (Lesson 3) and determining hit points for video (Lesson 16).

Students may already be used to keyboard shortcuts as a simple alternative to using the mouse. Audition and other Adobe products allow you to combine keys with mouse clicks to perform tasks quickly; in fact, professionals often keep one hand on the mouse within the Waveform Editor or Multitrack Editor and the other over the keyboard to choose zoom levels, trigger transport controls, switch tools, and the like. You may want to demonstrate how this method improves workflow.

Whenever possible, encourage students to learn the keyboard shortcuts for various functions. This can speed up workflow tremendously compared to using a mouse, clicking and pulling down menus, and making selections.

Lesson 3: Basic Editing

Lesson 3 covers fundamental editing skills that will serve the student throughout the course, but presents most of the material in ways that emphasize practical applications (extending or shortening music, creating loops, using fades to reduce artifacts, and the like).

Goals for this lesson

After completing this lesson, students should be comfortable doing basic manipulation of digital audio files. Students will learn how to do the following:

• Select a portion of a waveform for editing

• Cut, copy, paste, mix, and remove audio as needed to eliminate unwanted sounds

• Use multiple clipboards to assemble final audio from individual clips

• Extend and shorten pieces of music

• Add new sounds to an existing piece of music using Mix Paste

• Create loops with music files

• Fade audio regions to create smooth transitions and remove pops and clicks

The initial sections on opening files for editing, selecting regions for editing, and changing levels are straightforward. However, note the sidebar "About zero-crossings." Students may run into clicks from not cutting on zero-crossings in the various audio examples; however, these examples were designed to be relatively foolproof and it's entirely possible that students will not encounter clicks. As a result, it can be helpful for the instructor to cut some audio "incorrectly" to demonstrate how this can cause clicks, and how Audition's ways of adjusting selections inward or outward can modify cuts and region boundaries to coincide with zero-crossings.

Cutting, deleting, and pasting audio regions

Those used to the standard cut and paste functions in most programs may take a while to acclimate to the concept of cutting and pasting with multiple clipboards. The section that demonstrates this technique shows how to copy different sections of narration to different clipboards and then rearrange these sections to change the flow of the narration.

A more conventional application of cutting and pasting describes how to extend and shorten musical selections. Emphasize to students that this technique isn't used just to alter musical selections, but also to do techniques like cut "dead air" in narration or tighten up dialogue.

Being able to mix and paste simultaneously is another valuable technique, because it allows users to insert effects or other sounds "on top" of an existing file without having to use conventional mixing techniques.

Repeating part of a waveform to create a loop

Although the section that explains creating a loop is short, it's the first time that the concept of looping appears in the book. And although loops are used to advantage in later lessons, it could be helpful to explain to students that musical elements often repeat and that loops are the foundation of a variety of contemporary music—particularly dance, hip-hop, and even some elements of rock music.

In addition, as covered later in the book, Audition allows for "stretching" loop lengths. This is useful for audio-for-video applications, because musical events can stretch to hit specific visual cues that require audio emphasis.

Lesson 4: Signal Processing

The two main elements of working with digital audio involve editing the waveform (e.g., cutting, pasting, mixing, and the like) and using signal processing to alter some element of the waveform that involves pitch, frequency response, or amplitude. Signal processors are at the heart of Audition's Waveform Editor; they allow you to make substantial modifications to digital audio files.

Goals for this lesson

Because Audition has a rich roster of signal processors, and all of them are relevant to working with digital audio, this is the longest lesson. Although there are plenty of audio examples to demonstrate how these processors work, this lesson can also serve as a reference when you're using these effects in other lessons.

In this lesson, students will learn how to do the following:

- Use the Effects Rack to create chains of effects. Combining multiple effects allows for even more drastic sonic processing compared to using a single effect.

- Apply effects to audio, so that the results of the effect become a permanent, "embedded" part of the audio file

- Adjust parameters in various effects to process audio in specific ways

- Alter dynamics, frequency response, ambience, and other audio attributes

- Simulate guitar amp and effects setups with Guitar Suite effects

- Load third-party, plug-in effects with Mac or Windows computers

- Apply single effects rapidly without the Effects Rack by using the Effects menu

- Create favorite presets that can be applied immediately to audio simply by selecting them

Bypassing effects

Audition allows you to bypass individual effects, groups of effects, or all effects. This is invaluable as students learn about the various effects, because it simplifies the process of comparing a nonprocessed file with the results of processing. Encourage students to bypass effects periodically as a "reality check" as well as to compare the levels of a file with and without processing.

Gain staging

When you're placing multiple effects in Effects Rack inserts, it becomes important to maintain uniform signal levels from the Effects Rack's input to its output. Otherwise, distortion can result. Those who are new to signal processing can mistake this distortion as intentional and judge the resulting sound to be unpleasant rather than hearing the processing as intended.

This is particularly true with distortion effects and the Guitar Suite, which both incorporate intentional distortion. Feeding too much level into these will create distortion, but not the desirable distortion created by the effects. Make sure students know how to view the Effects Rack meters, adjust the related input and output level controls, and avoid distortion as indicated by the metering.

About the lessons for individual effects

It would be difficult to cover this entire lesson in one sitting, given the large number of effects. But another consideration is that the lesson for each effect covers only one possible application; an entire chapter could be written for each effect.

Calling up various presets, experimenting with effects settings, and exploring an effect's potential is desirable but time-consuming. Also, some people will be more interested in certain effects but not others. For example, a guitar player might obviously be fascinated by the Guitar Suite, whereas someone who's into sound design might gravitate toward the modulation effects.

Therefore, consider allotting some "free time" for students to experiment further with the various effects, and suggest they try loading other files from the CD-ROM for processing, not just the one(s) recommended for a particular lesson.

The effects are an important part of Audition; some programs provide a decent assortment of oft-used effects, but going beyond that requires buying third-party plug-ins. For example, Audition includes restoration and noise reduction tools, which are rarely (if ever) found in multitrack recording programs.

In addition, although this is mentioned in the text, emphasize that Audition's Mastering effects suite is included as a convenient way to do quick mastering of audio files. However, serious mastering would almost always use an *à la carte* collection of various effects (EQ, dynamics, noise reduction, etc.) chosen and optimized for the task at hand.

Lesson 5: Audio Restoration

Audio restoration has multiple applications, including restoring old vinyl records, cleaning up dialogue recorded on location, removing occasional crackles from bad connections, forensics, modifying audio in novel ways, and even sound design.

Although audio restoration is traditionally considered solely the domain of digital audio editing, the only reason is that few Digital Audio Workstations (DAWs) include any kind of noise reduction tools. Audio restoration is also useful with multitrack files for removing mic preamp hiss, reducing finger squeaks from guitar parts, and performing other utilitarian tasks. In this context, Audition's ability to transfer files seamlessly from the Waveform Editor to the Multitrack Editor is invaluable, so emphasize to the class that audio restoration skills apply to a large number of applications.

This chapter also introduces the Spectral Frequency Display, which although uncommon, allows for a variety of editing techniques that are not possible in the standard Waveform Editor.

Goals for this lesson

This lesson contains audio examples with obvious problems and then uses audio restoration to fix these problems.

In this lesson, students will learn how to do the following:

- Remove hiss, like tape hiss or preamp noise

- Reduce the level of clicks and pops automatically

- Minimize or even remove constant background noises, like hum, air conditioning, ventilation system noise, and similar sounds

- Remove undesired artifacts, like someone coughing in the middle of a live recording

- Do highly effective manual click and pop removal

- Use restoration as more of a sound design application (in this case, completely modifying a drum loop)

Removing hiss, clicks, and noise

The "Removing hiss, clicks, and noise" section is handled similarly to the process of exploring processors in Lesson 4: After loading files, applying effects to the files creates the desired results.

Removing artifacts

The "Removing artifacts" section uses an entirely different Audition feature, the Spectral Frequency Display. Whereas the standard display shows amplitude and time, this feature includes frequency as well. For example, you can look at this display and "see" something like a bass, or a high-frequency triangle. High-frequency hiss appears as a light, purple cloud. By selecting particular frequency ranges over particular periods of time, you can attenuate and sometimes even remove specific artifacts or sounds while leaving the remainder of the file intact.

Even those familiar with digital audio editing may find this display confusing unless they have prior experience. It takes practice to correlate what's happening visually with what's being heard, but the audio examples use sounds that are intended to create a fairly obvious visual correlation.

At first, some attempts at editing may seem more "hit or miss" to students. Emphasize the use of the Undo command, and also refer to the Appendix for information on the History panel, which can undo multiple steps.

Creative removal

The final lesson based around the Spectral Frequency Display doesn't solve a problem, but instead does creative sound design by removing four individual drum hits from a drum loop. This example was chosen because it's well suited to Spectral Frequency Display editing, and students will likely have a successful experience. However, stress that the Spectral Frequency Display, although possibly difficult to master, is an extremely effective way to edit audio with specificity.

It takes experience to recognize what's an artifact and what's part of the sound, and also whether to choose the Spot Healing Brush tool and drag across the sound or choose the Lasso tool and either cut or reduce the artifact level. However, with sufficient practice, this type of restoration is extremely effective. In fact, it's worth encouraging students to explore this type of editing—even if they have no specific goal in mind—just to hear the results of trying different edits.

Lesson 6: Mastering

Mastering, which adds the final polish to a mix and prepares it for duplication, is a complex art that requires a significant skill set, great ears, and experience. Emphasize to your students that this lesson conveys the essence of mastering and the types of tools that are used, but cannot possibly convey the kind of experience required to do professional-level mastering.

However, if you define mastering as "making a raw mix sound better than it did originally," there's no reason students shouldn't try their hand at mastering. If they continue to pursue mastering, eventually they'll develop the skills required to produce good masters.

Goals for this lesson

This lesson breaks the procedure of mastering into several specific steps and applies them sequentially to an audio example to show how mastering can incrementally improve the audio's sound quality.

In this lesson, students will learn how to do the following:

• Use effects to improve the sound of a mixed, stereo piece of music

• Apply EQ to reduce "mud," emphasize the kick drum, and make cymbals more articulated

• Apply dynamics to give music more apparent levels, which can also help overcome background noise in cars and other environments

• Create ambience for music that has a "dry," sterile sound

• Alter stereo imaging to create a wider stereo effect

• Make small edits to emphasize particular parts of a piece of music

Equalization

Equalization is one of the most important tools involved in mastering and requires critical listening. If students are using headphones instead of speakers, explain that headphones can deliver an unrealistic sound compared to speakers, and that ideally, a mastered track should be listened to over a variety of speakers and headphones to determine an "average" evaluation. The object of equalization is to have the music sound good over *all* playback systems rather than being optimized for one system and running the risk of not sounding good on other systems.

Dynamics, ambience, and stereo imaging

The sections that discuss dynamics, ambience, and stereo imaging apply additional processes to the track to be mastered and polish the sound further. The same considerations given previously regarding listening with headphones and speakers apply here as well.

"Pushing" the drum hits (waveform editing)

Although not necessarily common, some mastering engineers go beyond adding processing and edit the actual waveform. The pushing the drum hits example is very basic but gets the point across that it's possible to add emphasis to particular parts of a track without using traditional signal processors.

Testing the final result

Although not suggested in the book, it may be worth the time for students to jump temporarily to the end of Lesson 15 and learn how to burn a CD of what they mastered. They can then play this over a variety of systems, like the stereo system in a car, boom box, hi-fi setup, and so on to hear how the sound of a mastered recording changes when played over various systems.

Lesson 7: Sound Design

Lesson 7 is intended to be a "fun" lesson that shows the versatility of digital audio editing. Students start off with files of common, everyday sounds—water running in a sink and the sound of a wall fan—and transform them into sound effects suitable for use in videos or movies. This lesson also demonstrates that Audition's processing options can be taken to extremes, yet still produce useful results.

Goals for this lesson

This lesson encourages the creative use of effects to transform, not just process, two audio examples.

In this lesson, students will learn how to do the following:

- Apply extreme processing to everyday sounds
- Create special effects
- Change the apparent environments in which sounds occur
- Use pitch shifting and filtering to alter sounds
- Use the Doppler Effect to add motion

Creating rain sounds

Suggest that the students vary different sliders on the graphic EQ effect and observe the effect this has on the sound. It's possible to change the intensity and location of the "virtual rain" with this processor, as well as create a sound that's more like a babbling brook, as demonstrated in the subsequent example ("Creating a babbling brook").

Creating an alien choir

After the student has obtained the alien choir sound, recommend leaving all the processing exactly as is but loading different files from the CD-ROM. The results will be unpredictable but will demonstrate the extent to which processors can warp a sound.

Creating an alien drone flyby

Audition's Doppler Shifter effect is a highly unusual processor that is unique to Audition. If possible, recommend that students complete this exercise using headphones, because the effect is more dramatic than when delivered on speakers, but also to use speakers and compare the results of using the two different types of transducers.

This is also an excellent effect for encouraging the students to try different presets so they can hear for themselves that this effect does far more than just what's presented in the lesson.

Because this lesson doesn't take particularly long, it could be productive to give students some "free time" to experiment further with testing the limits of what Audition can do. This is also the last lesson that's devoted exclusively to using the Waveform Editor prior to proceeding to lessons involving multitrack recording and editing, so it's a good time to take a bit of a mental break.

Lesson 8: Creating and Recording Files

So far, the lessons have concentrated on playing back existing files from the CD-ROM included with this book. This lesson covers how to record and import files into Audition (including extracting audio from commercial Red Book CDs), and also transitions from the Waveform Editor-based topics to the Multitrack Editor—the subject of the book's remaining lessons.

Goals for this lesson

In this lesson, students will learn how to do the following:

- Record into the Waveform Editor
- Record into the Multitrack Editor
- Drag and drop files into the Multitrack Editor
- Import tracks from CDs into the Waveform Editor
- Create custom templates for the Multitrack Editor

Notes about recording

This lesson adds the complication of needing to know how to use the computer's audio interfacing capabilities for recording (or using an external interface if applicable). Additionally, the physical inputs and outputs need to be mapped appropriately to Audition's virtual inputs and outputs.

It's also necessary to have some kind of audio source for recording. It's impossible to anticipate what will be available for these lessons, but many laptop computers have built-in microphones, and desktop computers sometimes have microphone-friendly inputs. Most computers also have line-level inputs.

Another option is a USB-compatible microphone. These are like standard microphones but include an internal preamplifier and analog-to-digital converter. This digital signal terminates in a USB output that will generally be compatible with Mac and Windows computers, although some USB mics are designed specifically for one platform or the other.

Initially, USB mics were targeted primarily to podcasters and designed to hit a budget price point. Over the years, they've improved dramatically in terms of quality and crept upward in price. However, for the purposes of teaching students, any one of several inexpensive USB mics will do the job.

An alternate signal source is an MP3 player, like a smartphone, iPod, and the like. The main point of this lesson isn't to create a stellar recording of, say, a guitar player or vocalist, but to find out how to get signal into Audition at the proper levels and with the correct destinations.

For students not particularly experienced in recording, individual assistance may be needed.

Recording into the Waveform Editor

If your class consists primarily of people experienced in video, you might want to present video-oriented analogies for sample rate and bit resolution. Sample rate is similar to frame rate in that more frames per second more accurately quantify motion, and more samples per second take more "snapshots" to capture an audio waveform's level at a particular instant. However, emphasize that there is a point of diminishing returns, and for most applications, sample rates of 44.1kHz and 48kHz are considered standards.

Also, remember that additional resources available from Adobe include information on digital audio basics. For a listing of these resources, refer to the "Getting Started" chapter.

Bit resolution is more like pixels per inch. Just as more pixels increase the resolution of electronic images, more bits increase the resolution of audio signals. Although 16 bits is the standard resolution for CDs, emphasize that this standard was adopted in the early days of digital audio, and contemporary audio productions are typically recorded with 24-bit resolution (even if the ultimate playback system is 16-bit).

Some may wonder why recording at 24 bits is needed with CDs, because eight of the bits go unused. Explain that this is like recording video in HD: Even if the final video

ends up on the Web in a data-compressed format like H.264, the quality will be better than if the original source material had been recorded at a lower resolution.

Be sure to emphasize that anything recorded into the Waveform Editor can be transferred to the Multitrack Editor.

Recording into the Multitrack Editor

A major advantage of recording into the Multitrack Editor is that it's possible to check the incoming levels to avoid distortion. This is not possible in the Waveform Editor, although with an external interface, either meters on the interface or an accompanying mixer applet should show incoming levels. Levels can usually be adjusted with input level controls on the external interface.

Drag and drop into an Audition editor

This lesson emphasizes techniques that haven't already been covered. But remind students that the Media Browser is usually the preferred way to drag files into Audition because you can preview the files and also check on numerous file attributes as listed in the Media Browser.

Importing a track from an audio CD

If appropriate, this exercise could serve as a springboard for an ancillary discussion about software piracy and "ripping" music. Naturally, this should not be a focus of the course, but it's sometimes a good idea to remind those who make their living from creative work that others make their living from it as well. Those who communicate this point effectively don't emphasize feeling guilt for stealing but rather feeling positive for not stealing and "doing the right thing."

Saving a template

Encourage students to create templates that can serve as starting points for the types of projects they do, because the faster you can start creating, the better. Templates also provide a good foundation for working on particular types of projects and reduce the amount of time spent customizing the workspace. As just one example, if you're not doing audio for video, there's no need to have a video panel carried over from a previous project.

This might also be a good time in the course to start a discussion in which students can present their ideas of ways to save time and streamline workflow when using Audition—for example, the benefits of using a dual-monitor setup and the optimum way to arrange the Audition workspace when using dual monitors.

Lesson 9: Multitrack Editor Orientation

Lesson 9 is the first lesson devoted exclusively to the Multitrack Editor. Lessons 10–16 build on the material presented in this lesson, so it's important that students fully understand the topics presented here before proceeding.

Goals for this lesson

In this lesson, students will learn how to do the following:

- Integrate the Waveform and Multitrack Editors so you can switch back and forth between the two

- Play back a specific part of music repeatedly (looped playback)

- Edit track level and position in the stereo field

- Apply EQ, effect, and send areas in tracks

- Apply EQ to tracks using the Multitrack Editor's built-in parametric EQ

- Apply effects to individual tracks

- Process multiple tracks with a single effect to save CPU power and produce more consistent results

- Map effects channels so that outputs can feed different audio channels than the default settings

- Set up side-chain effects so that one track can control the effect in another track

Multitrack and Waveform Editor integration

The integration of the Multitrack and Waveform Editors has been mentioned several times as one of Audition's outstanding features, but this lesson covers the topic in more detail. Emphasize that in step 6, all individual audio files used in the Multitrack Editor are available for editing in the Waveform Editor.

Looped playback

The concept of music using loops is different from the concept of looped playback, which can be considered as a sort of "diagnostic" technique. It allows you to repeat a section of a multitrack production to simplify making adjustments, because you can concentrate on just the section containing the material you want to edit.

Track controls

Track controls is the most important part of the lesson, because it explains how controls are arranged in the Multitrack Editor. Students will need to feel comfortable with selecting appropriate controls for particular tasks, as well as be familiar

with a track's "areas" and how they change to allow for working with various aspects of a multitrack project (EQ, sends, Effects Rack, and inputs/outputs).

Some aspects of the Multitrack Editor will be familiar. For example, opening the EQ interface for a track's EQ reveals the same EQ interface already covered in Lesson 4. Also, point out that the Effects Rack handles effects almost identically to the Waveform Editor, but make sure that students understand the significance of placing effects pre- or post-fader, as shown in the "Effects Rack area" section.

The Master Track output

The section after this one covers sends, which is a concept that is difficult to grasp at first for some people. However, "The Master Track output" section helps set the stage for understanding sends by introducing the concept of a bus.

The Master Track output control can also help students minimize distortion when building up a project with lots of tracks. Many times people will not monitor the output as they add tracks and then wonder why the sound "isn't right" (distorted). Reemphasize the importance of gain-staging, as previously discussed in the introduction to Lesson 4, in terms of avoiding distortion. The difference here is that in a multitrack environment, gain-staging is more about combining tracks in parallel than combining effects in series.

The sends area

Lesson 9 is a fairly long lesson and uses the classic example of implementing send buses to accommodate adding reverb to multiple channels simultaneously to create room ambience. Emphasize that it's important to watch send levels to make sure the bus output, or the input level of the effect the bus feeds, doesn't distort.

The section, "Sending buses to buses," basically builds on the previous section, "The sends area." Sending buses to other buses is not necessarily a common occurrence, but it's not rare either and is a technique students should learn. Sometimes it can also help "cement" their knowledge about sends in general by showing a different way to use them.

Channel mapping in the Multitrack Editor

Channel mapping is a technique that is most applicable to surround productions because you can reassign effect inputs and outputs. A deep treatment of surround sound is beyond the scope of this book for three reasons:

- Surround productions remain relatively rare compared to stereo productions, and many students will never need that knowledge.

- Those doing surround work are probably already familiar with audio in general and the types of tools offered by Audition.

- Anyone who does get involved in surround work will be building on the basic principles described here for stereo. Audition's Help files and other resources can fill in the blanks for areas that differ or are unique for surround productions.

Direct those who are potentially interested in surround productions to pay close attention to the sidebar, "Applying the Channel Map Editor in the Multitrack Editor." This gives a concise explanation of how channel mapping differs in surround compared to stereo.

Side-chaining effects

Side-chaining within multitrack digital recording programs is becoming more common. The example in this lesson describes how to reduce background music when narration occurs and then bring the background music back up in the absence of narration.

Side-chaining is being used increasingly for special effects, particularly in dance music. Covering this in depth is probably not suitable for most students, but be aware that creative use of side-chaining is on the rise. If your students are interested in this topic, mention other applications, such as one instrument gating another (e.g., drums gating bass to create a super "tight" sound).

Lesson 10: The Multitrack Mixer View

There are two different interfaces for the Multitrack Editor. The one we've covered so far resembles the editor in a video program, whereas the Mixer view emulates the "look and feel" of a traditional hardware mixer as used in audio productions for well over half a century. The major difference, aside from the look, is that the Mixer view does not allow for working with clips. However, you can see more multitrack project parameters at once, which is often convenient for mixing.

Although some students might feel more comfortable with one option or the other initially, encourage them to get used to switching to whichever view is "the right tool for the right job." When doing recording and arrangement with a multitrack project, the regular Multitrack Editor is usually the preferred interface. But when all tracks are recorded and the arrangement is complete, the project will transition to mixing, and the Mixer view is usually the best choice for that function.

Goals for this lesson

In this lesson, students will learn how to do the following:

• Switch from the Multitrack Editor to the Mixer view

• Adjust the Mixer fader heights to allow for greater resolution when setting levels

• Show/hide various areas to customize the Mixer size and configuration

• Scroll through different Effects Racks inserts and sends within their respective areas

• Scroll to view different groups of channels if the Mixer window isn't wide enough to show them all

• Differentiate among channel types via color coding

• Rearrange the Mixer channel order

Mixer view basics

Although this section mostly orients the student to the Mixer interface, pay attention to the way you can extend or shorten the height of the virtual faders. Longer faders take up more screen space but make it easier to do fine adjustments. Typically, the student will use shorter faders to see more of the Mixer functions onscreen while setting up for a mix. But as the mix progresses to the point where it's mostly about fine-tuning levels, then it makes sense to extend the mixer faders.

Also, note the sidebar "Using hardware controllers." Some find that being able to use physical controls allows for a more satisfying mixing experience, and compared to a mouse, it's possible to alter multiple parameters simultaneously (for example, to bring up several channels of background vocals while simultaneously reducing the rhythm guitar level to create more "sonic space" for the vocals).

Currently, Audition supports several different protocols for hardware controllers. If possible, borrow or rent a supported controller to demonstrate how to hook up a controller and show why it can be convenient to have physical controls.

Configuring the Mixer

The sections on show/hide options, channel scrolling, and rearranging Mixer channel order all relate to customizing the Mixer for particular applications. For example, sends will likely be assigned early on in the mixing process; then the emphasis will shift to adjusting EQ, altering levels, adding effects for sweetening a track, and so on. When the sends are no longer needed, they can be hidden to allow more space for other Mixer elements. Of course, they can always be shown as needed in case additional tweaks are required.

Lesson 11: Editing Clips

Although the Multitrack Editor doesn't have the same kind of deep editing as the Waveform Editor, different editing techniques are required for multitrack productions. This lesson concentrates on the many ways to work with clips, including exporting collections of clips.

Goals for this lesson

In this lesson, students will learn how to do the following:

- Use crossfading—both symmetrical and asymmetrical—to create remixes from individual clips

- Export the mix as a single file

- Pan individual clips on a per-clip basis

- Edit a clip to fit a specific length of time (e.g., for a commercial)

- Apply global clip stretching to fine-tune a piece of music's specific length

- Change volume on a per-clip basis

- Add effects to individual clips

- Extend a clip via looping

Creating a DJ-style continuous music mix with crossfading

Although students learn how to crossfade clips to create a DJ-style mix, they also learn about the wider subject of crossfading disparate clips together to make seamless transitions. This often needs to happen with far more than DJ mixes; for example, a piece of music may need to be shortened, and simply cutting and pasting could lead to an overly abrupt transition among the various segments. This lesson explains how overlapping and crossfading clips can create a smooth transition.

Mixing or exporting a collection of clips as a single file

In the course of doing a multitrack production, sometimes there may be an extreme number of edits where clips are cut, pasted, copied, stretched, and so on. Consolidating these edits into a single clip that reflects all the edits and changes can tidy up a project, as well as simplify backing up.

Although backing up is not covered explicitly in the book, emphasize to students the importance of backing up data. Some people don't get the message until a hard drive crashes. Backing up a project is essential, but also mention that exporting individual clips in a track as a single file that starts at the beginning of the project

and extends to the end is also a good idea, because these files can then be read in programs other than Audition (sometimes working with another program becomes necessary at some point—for example, if a particular studio or collaborator uses an app other than Audition).

Editing for length

Editing for length is an extremely common procedure, particularly when you're working with music libraries; for example, a piece of music one-minute long may need to be cut down to 30 seconds for a commercial. Another possible application is when scenes are cut from a video, and the music has to be recut to fit a different length of time. This lesson makes extensive use of the Razor tool and also highlights using the timeline as a way to edit music using a musical timebase (bar and beats) and using absolute time to check the overall length in minutes and seconds.

Editing individual clips in the Waveform Editor

Although the idea of being able to edit Multitrack Editor clips in the Waveform Editor has already been discussed, this lesson explores the concept of creating "unique clip" copies. Normally, any edits made to one clip affect all copies of that clip, because all copies of the clip "point" to a single piece of digital audio. Creating a unique clip from a copy creates a second, unique piece of audio that can be processed differently from other copies. So, the unique copy can be transferred to the Waveform Editor and edited freely without changing any of its copies in the Multitrack Editor.

Panning individual clips

As happens often in this book, concepts that are explained in more detail later are "foreshadowed" where appropriate. Lesson 14 covers automation in depth, but the "Panning individual clips" section gives students a taste of how automation works by automating a panning change using clip automation.

Combining ripple delete and crossfading

Those who approach Audition from a video background will already be well-versed with the concept of ripple editing, which is used extensively in this lesson. However, unlike video where it's rare to have the equivalent of a "double exposure" with two different video tracks playing at the same time, this is common in audio. This lesson shows how to combine crossfading, as described at the beginning of this lesson, with ripple editing to make smoother transitions when altering the length of a piece of music.

Using global clip stretching

Global clip stretching is another outstanding Audition feature that is exceptionally useful when you're trying to match audio to video, although it's also applicable to hip-hop and dance music where individual pieces of music need to "stretch" to match a particular tempo.

Emphasize to students how easy it is to implement global stretching: The fact that this lesson has only four steps helps get that point across. However, also note that the amount of stretching needed in this particular example is relatively minor and that stretching cannot do miracles. The greater the amount of stretching required, the greater the reduction in fidelity.

This is why the section on stretching follows the section on using editing techniques to shorten or extend music; it's preferable to get as close as possible to the target length using conventional techniques and then employ stretching to fine-tune the length.

Clip edits: split, trim, volume

Modifying clip properties is often essential in multitrack productions. This lesson covers how to split clips so individual elements can be edited individually, as well as how to rearrange a clip via splitting particular sections, copying them, and then trimming a clip to make room for pasting the copied sections.

There's additional foreshadowing about automation by using clip automation to change the volume of a particular clip and therefore add emphasis to that clip.

These techniques are also used in the next section on doing "stutter edits," which is another application that demonstrates how splitting and recombining elements from a clip can transform the clip into something completely different.

Adding effects to individual clips

So far, adding effects has always involved using the Effects Rack to process files in the Waveform Editor or tracks in the Multitrack Editor. However, now that splitting clips has been covered, it's a good time to explain the value of being able to add effects to individual clips, no matter how short.

Extending a clip via looping

Audition can designate a piece of audio as a loop that's extendable for as many iterations as necessary. Because much music repeats particular motifs, looping repetitive sections like drum parts can save a lot of time. Also, this lesson is an important prelude to the next lesson on creating music with sound libraries.

Lesson 12: Creating Music with Sound Libraries

Using commercially available sound libraries in conjunction with Audition's Multitrack Editor lets you create music easily for commercials, other audio for video projects, kiosks, and more—even if you don't play a musical instrument. This lesson covers not only the tools in Audition that can help you create music, but also the procedures for making this kind of music.

Goals for this lesson

This lesson includes a "music construction kit" created especially for this book that students can use to create musical compositions. Using this "kit," students will learn how to do the following:

- Preview clips in the Media Browser before bringing them into the Multitrack Session

- Modify clip lengths to add more variety to a composition

- Use files from a "music construction kit" to assemble music quickly

- Use pitch transposition and time-stretching to incorporate clips with a different native tempo or pitch than the current session

- Add effects processing to a track to complete the composition

About sound libraries

Adobe provides gigabytes of free content for Audition users. To access this content, choose Help > Download Sound Effects and More, and then follow the onscreen directions to download the content.

Assuming there's an Internet connection in the classroom, if your students are not familiar with sound libraries or aware of how many there are (and how many genres are covered), it might be worth looking at some of the available offerings. Here are some suggested sites:

- www.soundsonline.com

- www.bigfishaudio.com

- www.sonycreativesoftware.com/loops

- www.bestservice.de

- www.ueberschall.com

All of these companies make products that can be used with Adobe Audition.

Building a rhythm track

After setting up a multitrack project for this lesson, the process begins by building a rhythm track. Students are shown how to bring drum and bass files into the project, and then arrange them to create a musically valid rhythm track upon which additional parts can build.

Note that this lesson gives specific directions for creating a piece of music so that even students who aren't musicians can simply follow the directions and end up with actual music. However, music is all about creativity. As long as students are willing to take the steps needed to learn the material presented in this lesson, it doesn't really matter if they deviate from the specific arrangement used in this lesson.

The subsequent sections, "Adding percussion" and "Adding melodic elements," follow the same basic procedures to augment the track.

Using loops with different pitch and tempo

"Construction kit" libraries make it easy to assemble music by making sure that loops designed to be used together are in the same key and have the same tempo. However, when you're mixing and matching across different sound libraries, it's unlikely that all loops will share the same key and tempo. Fortunately, Audition allows you to alter pitch and stretch tempos of individual loops so they can be used in projects with a different native pitch or tempo. This lesson even uses a loop that not only differs in terms of key and tempo, but also file format.

Tempo/time stretching is done most conveniently in the Multitrack Editor. However, to change key, it is necessary to transfer the file to the Waveform Editor for editing. Therefore, this lesson once again shows the value of being able to transfer files seamlessly from one environment to another.

The lesson closes with adding an effect to one of the tracks.

Once the piece of music has been created, everything meant to be learned in the lesson will have been conveyed to the students. If there's time and interest, they might want to continue modifying and personalizing the music based on what they've learned. This lesson also recommends revisiting Lessons 10 and 11 for ideas on how to make additional changes to the music.

Lesson 13: Recording in the Multitrack Editor

Although Lesson 8 concentrated on recording into the Waveform Editor, it also presented the basics of recording in the Multitrack Editor. This lesson provides more detail about recording procedures with the Multitrack Editor.

Goals for this lesson

Please refer back to Lesson 8 (the "Notes about recording" section) for recommended sound sources to use for recording, such as USB mics and MP3 players.

In this lesson, students will learn how to do the following:

- Assign a track to the audio interface's input or the computer's default sound inputs to record into a Multitrack Editor track

- Monitor the interface input while recording

- Set up the metronome for different patterns and sounds

- Record an overdub (additional part)

- "Punch in" over a mistake to correct it

- Record multiple takes and choose the best parts to create a composite track

Getting ready to record a track

The section "Getting ready to record a track" covers the basics of assigning Audition to physical audio inputs and outputs, as well as monitoring the input signal and arming for record. These basics must be completed successfully, or it won't be possible to either record or play back audio (or both).

Because completing these basics involves elements outside of the program, specifically audio interfaces, it's not always possible for a lesson to cover all possible options. Therefore, some instructor assistance may be necessary to make sure that everyone has successfully assigned the inputs and outputs.

Setting up the metronome

Recording is much easier with a rhythmic reference. This lesson is longer than you might expect, because Audition's metronome is very sophisticated. It can play back different sounds in different rhythms and accent particular beats, and it has independent Volume and Pan controls.

Recording a part in a track

The section "Recording a part in a track" briefly recaps the information in Lesson 8 on recording into the Multitrack Editor, but also sets up the student for the next section on recording an additional part, also known as an *overdub*.

"Punching in" over a mistake

Punching is a very powerful, real-time recording technique. It doesn't really have an equivalent in video editing, other than removing a piece of footage and replacing it with something else. The difference with punching is its real-time nature; it lets a musician (or narrator) listen to a previously recorded part while playing or narrating a new part. At a previously designated time when there's a problem with the original track, recording begins and replaces the original section with the new part; recording then stops at a designated time.

Punching can encompass anything from a single word, to a phrase, to a longer section.

Composite recording

Many digital audio recording programs have special recording modes where a musician can play a part and when finished playing, the program returns immediately to where recording began, mutes the just-recorded track, and starts recording another track. This allows the musician to "get in the groove" and record multiple takes without stopping. After recording as many tracks as desired, it's then possible to keep the best parts of each track, erase the rest, and combine the best bits together into one "composite" track.

Although Audition doesn't have a special mode to automate this process, it's still possible to do something very similar and again edit the best sections together to create a final composite track. This part of the lesson details how to create a single, composite track from multiple tracks.

Lesson 14: Automation

Audition can retain parameter changes (whether applied to individual clips or complete tracks) that are made in a Multitrack Session and store those changes as part of the Session file. Automation greatly simplifies the mixing process, because a mix can be changed over time until it's perfect. Parameter changes can be performed in real time as control movements, including control surfaces, as covered previously in Lesson 10, or created/edited in non-real time.

Goals for this lesson

In this lesson, students will learn how to do the following:

• Automate volume, pan, and effect changes within clips by using automation envelopes

• Use keyframes to edit automation envelopes with a high degree of precision

- Use spline curves to smooth automation envelopes

- Show/hide clip envelopes

- Automate Mixer fader and Pan control moves

- Create and edit envelopes in the Multitrack Editor track lanes

- Protect envelopes from accidental overwriting

Clip automation

Explain to students that Audition offers two types of automation: clip automation and track automation. As the names imply, clip automation applies to individual clips, and track automation provides automation for an entire track. Both have their uses: Clip automation is ideal for creating detailed changes, and track automation is commonly used for general mixing and varying track levels over time.

Clip automation defaults to showing volume and pan envelopes, although it's possible to show and hide envelopes. The section "Move parts of an envelope or an entire envelope" shows how to tweak clip envelopes beyond how they're drawn originally.

One of the most useful aspects of clip envelopes is automating effects parameters. Emphasize that parameters like EQ can change dynamically over time; for example, with a singer playing guitar, during vocals the guitar part can be equalized to create a mild response dip in the same range as the voice to give the voice more "space." Effects parameters, like the wet/dry balance for delay, are also automatable, so effects no longer have to be restricted to "set and forget" parameters.

With extensive automation, the clip can look very cluttered. The last section of clip automation describes how to show and hide envelopes. However, also emphasize that hiding envelopes "locks out" any chance of adjusting the wrong envelope by mistake.

Track automation

Track automation is the most common form of automation used with digital recording software. With programs like Audition that offer both clip and track automation, sometimes users are confused about when it's appropriate to use one method compared to the other. The sidebar "Clip vs. track automation" is important; review the points mentioned in the sidebar with students and provide additional clarification if needed. Also, mention that Mute is automatable in tracks but not in clips.

To tie in track automation with clip automation, explain that automation moves created by moving controls nonetheless generate envelopes within the track that can be edited in ways similar to editing clip envelopes.

Automating fader mixes

The concept of moving faders to create changes in level should be obvious after Lesson 10. However, make sure students understand the concept of Touch mode, where a fader follows existing automation until it's clicked; then new fader moves overwrite the existing automation.

Also emphasize that most, but not all, effects parameters can be automated. This even applies to most third-party plug-ins, not just the ones bundled with Audition.

Editing envelopes

Because envelopes created by moving controls are far more complex than those created by entering keyframes with a mouse, students may find editing these envelopes daunting. This is particularly true if there are multiple envelopes, because all of them default to being shown in the automation.

There are two main ways to make envelope editing less intimidating to students:

One is to use the Show Envelopes drop-down menu and restrict the number of envelopes that are visible at one time. The other is to Shift-click at the beginning and end of a series of keyframes to define multiple keyframes for moving or deletion. This is described in the Note on page 220 and relates to clip automation, but remind students that this can be even more relevant to track automation created by moving controls or faders.

Creating envelopes in the automation lane

Although most of the section on track automation relates to using faders for mixing, emphasize that it's also possible to create envelopes in an automation lane and enter, delete, and otherwise work with keyframes in the same manner as with clip envelopes. Several methods are presented for editing keyframes with great precision. This is probably something you won't want to dwell on because it's not that common to edit envelopes with this kind of precision, but students should be aware of it as an option.

Protecting automation envelopes

As mentioned earlier, working with large numbers of envelopes can be confusing, which is why they can be hidden. However, there may be situations in which you need to see two or more envelopes at once, for example, if they control related parameters (e.g., you can adjust delay feedback and the delay wet/dry mix so that feedback increases when there's more wet signal). In this case, it's possible to protect particular envelopes from accidental modification while editing other envelopes.

Lesson 15: Mixing

Lesson 15 is fairly lengthy, but it also ties together many concepts discussed previously in a real-world scenario. To emphasize that real-world aspect, the lesson begins with using Audition to create test tones for checking out a room's acoustics.

Goals for this lesson

In this lesson, students will learn how to do the following:

• Use Audition to help test room acoustics and determine its suitability for creating accurate mixes

• Review tracks for glitches or other issues prior to mixing

• Change a song's arrangement through mixing and remixing techniques

• Optimize tracks to mesh well together using effects

• Take into account artistic considerations in mixing

• Set up the mixing environment for an efficient workflow

• Use automation in the Mixer view to record and edit fader, panning, and other moves while perfecting each component of a mix

• Create clip groups

• Add a fade-out using the Master Track

• Export the completed song in a variety of formats

• Burn an audio CD of the completed song

Testing acoustics

Controlling acoustics is not the responsibility of Audition, but of the end user. However, Audition does not work in a vacuum. Many end users realize that the monitoring system (monitor speakers, headphones, or both) influences the accuracy of what they hear, but fewer realize that room acoustics influence the accuracy of the monitoring system. If a room isn't treated acoustically and mixing is done with monitor speakers, there will surely be frequency response anomalies that affect the quality and accuracy of the mixing process.

It's assumed that most classrooms will not have good acoustics. Although there's little an instructor can do to remedy an acoustical problem, this lesson offers techniques that illustrate how flawed the acoustics are in most rooms.

The lesson includes test tones students can load into their system. As they walk about the room, they'll hear the level of these tones vary dramatically. This emphasizes the importance of acoustic treatment to minimize these anomalies. Test procedures are also included to check that monitor speakers are in phase with respect

to each other. In addition, there's information on how students can create their own test tones if they want to test room acoustics at frequencies other than the three test tones included on the CD-ROM.

Also, make sure students pay attention to the sidebar "Acoustics and hearing." Although the intention of the book is not to preach to students, take advantage of this chapter to urge students to have their hearing checked periodically. This isn't just so they have an understanding of where there might be problems with their hearing, but some hearing problems that lead to deafness can be stopped before additional deterioration sets in if caught early enough.

Emphasize that the most important "gear" in any studio is the ears of the person working in that studio. Hearing protection is an important, yet often underemphasized, topic. Students who travel a lot or are subjected to city noise or and other loud sounds should get into the habit of carrying hearing protection with them. Note that there are two main types of protection; some are designed solely to reduce incoming noise levels to the ear as much as possible. These are used by those on rifle ranges, workers in industrial situations who use machinery, and the like. They are the most inexpensive form of protection.

A more expensive type of hearing protection usually doesn't offer quite as much noise reduction, but maintains a more accurate frequency response so musicians don't hear a "muffled" sound. Musicians who play onstage often use this type of protection so they aren't subjected to high volume but can hear their sound relatively accurately.

The mixing process

Mixing isn't just about technical considerations, but also procedural ones. As a result, there's a substantial amount of material in this lesson on mixing workflow, as well as two sidebars that contain background material about mixing.

Mention to students before getting too deeply into this section that although the described procedure is typical and quite common, no two people mix in exactly the same way. A good example is that some engineers consider vocals the most important part of any song and will work on that first and bring in other instruments with the goal of complementing the voice. Others consider the rhythm section the foundation for music and will tweak that first. However, all the steps delineated as part of the mixing process will be done at some point while mixing, even if the order in which those steps occur varies.

Sections within this lesson take the student through the mixing process from beginning to end, adding specific steps in a sequential manner. Very little of this requires explanation, because students will hear how the mix develops as they complete each step.

Using groups

Groups are a new feature in Audition CS6. This lesson presents one real-world situation in which groups would be helpful; however, it also mentions that grouping represents an easy way to repeat entire sections of a piece of music, or rearrange the flow of the music.

Exporting a stereo mix

Once a mix is complete, it needs to be exported so it can be published. Audition allows you to export in lossless audio formats like WAV and lossy ones like MP3.

Many younger students will have been raised on MP3 format files. Although they can sound quite good when created at high bit rates (e.g., 256 or 320 kbps), emphasize that lossless file formats are preferred for export and are the format that should be saved as backup. Lossy files can always be generated from lossless formats, but lossy files can never return to a lossless format.

Burning an audio CD of the song

Although the CD is waning somewhat as a universal music distribution medium, it's still important to know how to create an audio CD. This is particularly handy for playing back through numerous playback systems to test the mix's "transportability."

The procedure is simple. The only needed commentary is that students should be aware that recordable CDs are not as robust as commercially produced ones, because they use different media and different procedures for creating a CD. As a result, although a commercially available CD may be playable decades after its creation, the same may not be true for recordable CDs. Stress to students that their CDs should not be subjected to excessive heat or humidity and are best preserved in the same type of environment that favors any kind of musical instrument—moderate temperatures and moderate humidity.

Lesson 16: Scoring Audio to Video

Audition can load video files and preview them within a Video panel. This provides a crucially important reference when composing soundtracks or adding dialogue.

Goals for this lesson

In this lesson, students will learn how to do the following:

- Load a video preview file into Audition

- Analyze the video and alter Audition's tempo to create "hit points" so the music correlates closely to the video

- Create a soundtrack music bed

- Add musical or sonic "hits" in musically appropriate places to accent the visuals

- Synchronize ADR (dubbed) dialogue with original dialogue

- Evaluate which type of dialogue synchronization provides the best audio quality

Importing a video

A "practice video" is included so students can get hands-on experience without having to create a video. This video is optimized to hit the "sweet spot" between file size and quality, but you might want to expand on this with students.

Mention that running a video concurrently with a multitrack project takes more CPU power than running an audio-only project. Uncompressed video files can take up a huge amount of memory—often gigabytes for even a short video. As a result, when they are working with a video file, students should request one that has been data compressed to a reasonably small size. Although quality deteriorates with extreme compression, for preview purposes, quality usually isn't all that important. Upon completing the audio portion of the project, it can be exported as audio and imported into the original video project.

Those using Premiere Pro and/or After Effects should consult its manual, as well as resources available on the Adobe site, for information on the most efficient way to use Adobe's video software with Audition.

Using markers to create hit points

Audition does not have a way to create a tempo map with hit points, but its ability to create markers provides references to where particular audio events should occur. The student then adjusts the tempo so that measure and beat boundaries line up as closely as possible to these markers.

Mention that the lesson simplifies this process by suggesting an initial tempo that's "in the ballpark." In real-world projects, it's possible to get lucky and have hit points magically line up with a tempo, but it's also possible that those hit points just never seem to be in the right place. As a result, there is some trial and error involved.

Also, mention that the global stretching function described in Lesson 11 can vary timing slightly for clips to make it easier for specific musical events to land on hit points.

The sidebar "Don't forget video for audio" describes an easier way to make sure the video lines up with the audio: Edit the video to the audio instead of vice versa. Although this tends to be a less-common approach, it can make for a much more efficient project workflow.

Building the soundtrack

The "Building the soundtrack" section reprises much of the material presented in the previous lesson on mixing, but covers it from the viewpoint of matching audio to video.

The subsequent section describes how to add particular musical events to emphasize hit points. Note how in some cases these events don't really line up with hit points, but a variety of techniques can provide a workaround.

Automatic speech alignment

Movie dialogue that's recorded on location is often subject to issues like noise, an inability to get actors close enough to the microphone without the mic appearing in the picture, ambient noises, and the like. As a result, the actors will come in after the shoot and dub new parts. This process is also called *looping*, or *ADR (Automated Dialogue Replacement)*.

Dubbing is not easy to do. The actor typically listens to the original part on headphones in a recording studio (as opposed to being on location) and tries to match the original speech as closely as possible. Sometimes actors do ADR even if it's not absolutely necessary, because they want to add a different emotional inflection than what they originally used while shooting the scene.

Audition's Automatic Speech Alignment feature automates this process within a multitrack project. The original reference dialogue is loaded into one track and the new dialogue into another track. Audition compares the two and uses stretching to match the new dialogue to the reference.

Although this process can appear downright magical, emphasize to students that there are three different stretching options available in Audition and that they should try each one to determine which produces the best results with respect to accuracy and audio quality. It's not always possible to predict which will work best based on listening to the dialogue, so it's important to try all the options.

Appendix: Panel Reference

This Appendix is not an afterthought and is an important part of the book. It's a reference on all Audition panels; however, not all of these panels have been covered in previous lessons.

As you no doubt realize, Audition is a very versatile program that can be used for very different purposes by different users. The lessons in this book are intended to cover the most often-used applications with an emphasis on real-world tasks. However, several aspects of Audition can go very "deep" for specific situations. For example, mastering engineers who need to match levels among multiple pieces of

music will find the analysis tools invaluable, whereas most users will not need to know this level of detail about their files.

Batch processing is another function that will likely be used only by a small percentage of users, but for those users, it's a tremendous time-saver. For example, an entire library of files may need to be converted from WAV to MP3 format. Doing so manually could take hours, whereas batch processing handles the task in minutes.

Urge your students to spend some time studying the Appendix not just to reinforce what they've learned about the panels they've used, but also to become acquainted with some of Audition's more esoteric features.

Enjoy the book!

Audition is a versatile, capable program that includes some unique features not found elsewhere. One goal of this book is to make people aware of these features, but also, the "Classroom in a Book" context allows for creating lessons that showcase real-world applications. All the files used for these lessons were created from scratch specifically for this book, and students should be encouraged to exercise their creativity as much as possible as they go through the lessons.

One of the wonderful aspects of computers is that you can experiment with all kinds of wild approaches and not break anything: It's always possible to back out of a program and just start over if a project becomes too messed up. Music is about creativity, so encourage your students to "stretch" into new and interesting areas.

Also, emphasize that this book is not a substitute for the complete documentation, but rather represents a sort of "Audition's Greatest Hits." Make sure students understand that after graduating this "class," further study of the documentation is the equivalent of graduate studies.

Additionally, don't let your students lose sight of the difference between music and something with the "look and feel" of music. With today's tools, good sound quality is a given with even a modest computer setup. Remind your students that all that matters with any kind of musical expression is its emotional impact: Attaining that isn't something learned from a book, but pulled from inside the human spirit.

I hope this book helps you in the process of teaching your students so that you can concentrate on inspiring them!

Craig Anderton