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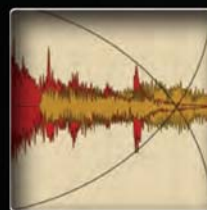
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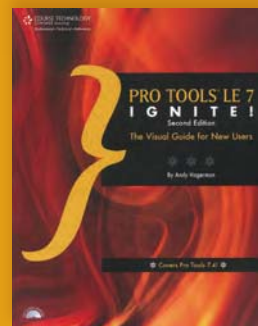
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MUSE

SCORING IN PRO TOOLS, SPACE-AGE STUDIO SESSIONS

A N APOCALYPTIC ROCK OPERA THAT EXPRESSES THERMODYNAMIC theories through mock spoken-word newscasts, Muse's *The 2ⁿᵈ Law* is a queasily perfect production piece comprised of full orchestra, an operatic choir, singer Matthew Bellamy's Freddie Mercury/Thom Yorke-styled vocals, ARP 2600 and Buchla Series 200e modular synths, Muse's surging stadium rock approach, and surprising variations on the dance trend of the moment: dubstep.

Muse includes singer Matthew Bellamy, Christopher Wolstenholme (bass, vocals, keyboards), and Dominic Howard (drums, synthesizers, sampling). "I've always been influenced by film music," says Bellamy. "Growing up I was drawn to Stanley Kubrick's *2001: A Space Odyssey* and [Ridley Scott's] *Alien.* Hans Zimmer is another great film composer I've enjoyed. All that worked its way into this album."

Like the late Frank Zappa, Matthew Bellamy likes nothing better than to spend his days in the studio, and if possible, go it alone. Extremely studio savvy, as are Wolstenholme and Howard, Bellamy tracks his own vocals, guitars and keyboards; he also scored Muse's dense orchestral accompaniment using Pro Tools MIDI functions and VSL and East West symphonic libraries before handing off to conductor/arranger David Campbell.

"I sort of audio-visualized the music on the album," he says. "On the more orchestral songs, I could hear them, visualize them, or audio-visualize them. I tried to remember the original feeling or sound I heard in my head and refocused on that. But ultimately, even though there are hundreds of overdubs, we always manage to keep what we do as a three-piece as the primary thing."

Two dissimilar tracks from *The 2ⁿᵈ Law* reveal Muse's amazing competency at production and

By Ken Micallef

performance. "We deliberately set ourselves a production challenge to produce [two tracks] in a way to create almost opposite results," Bellamy says. "'Follow Me' was originally a regular-sounding rock track with normal instrumentation, then once we recorded it we replaced each instrument with electronic samples. We found sounds that mimicked the acoustic instruments electronically. It sounds like a rock band but it's all synths and samples."

"Follow Me" thumps like Giger's Alien seeking human blood, while "The 2nd Law Part One: Unsustainable" spews coiled subterranean bass rhythms and screaming synth tones—the currency of contemporary dubstep. "On 'The 2nd Law Part One: Unsustainable,' we created something using synths and drum samples that evoked Nero or Skrillex," Bellamy explains. "That kind of build-up, then a drop down to a heavy bass line and electronic drums, then we replaced it all with real instruments; it's the direct opposite of 'Follow Me.' That was a challenge as well, because heavy dubstep—which some people call 'brostep'—that genre is actually closer to rock music, it's more interesting than what is coming from guitars in general. It was a real challenge; can real instruments even compete any more with that kind of genre?"

Bellamy loves arpeggiated synths, which adorn *The 2nd Law* like Rick Wakeman and Steve Reich dueling to the death. "We used a lot of modular synths on the album," Bellamy recalls. "An ARP 2600 and a Macbeth Studio Systems M5. But the most insane sounding and annoying one was the Buchla Series 200e. We've never been able to get that on a record before because it has such a glassy, brittle, bright, full range sound. It's so bright, when you put it in with rock it makes everything else sound dark and brown. The arpeggiated parts in 'Follow Me,' the synth in the beginning of 'Madness' going 'wow wow wow,' and a couple other songs, 'The 2nd Law Part Two: Unsustainable,' that's the Buchla. We'd use [Native Instruments] Massive and [Rob Papen] Predator soft synths as guides, then replace them with modular synths. We also used an Analogue Systems' French Connection, which is like an Ondes Martenot; it's basically a CV controller that gives you the exact same controls as a Martenot, but you can hook it up to modular synths to get crazier sounds. That was part of the complex overdubs in 'Follow Me.' When I sing '[When darkness] surrounds you,' there's 18 French Connections all going 'mmmmmmmm' and sliding in opposite directions. That created this very contrapuntal spreading-out sound."

MUSE

Is Matt Bellamy a control freak? A man on a mission? A genius? It's hard to tell. Like many geniuses, he seems to be at his best when he's alone, working at his own pace, "the hobgoblins of little minds" not obstructing his view. One of the greatest vocalists in rock, Bellamy is also perhaps one of the most shy.

"The engineers help me with setup and sounds, to where I have a few mic options," Bellamy explains. "Then I ask everyone to leave. Working with other people, sometimes I get impatient. Working alone I can go at my own speed; sometimes I am very perfectionist and will do things ludicrous amounts of times, but usually I will do three or four takes, then comp them together. I know all the plug-ins I may or may not need. Sometimes I try different mics, different approaches, different levels from singing to shouting. And I do like to be dramatic in my performance; I like to sing barefooted, it's silly things. But it also lets me be more brutal with myself."

Bellamy's vocal signal chain is a Neumann U67/Neve 1073 mic pre/Urei 1176. He runs an Empirical Labs Distressor on the return to get some "extreme compression" and a Bomb Factory LA-3A for a little additional compression in Pro Tools.

"One trick I do is to use a mastering finalizer on the lead vocal. It's a limiter that gives a much more full-on compression. I like SoundToys plug-ins for vocal delays as well. I also used the RCA 44 ribbon mic into a mic pre made by the Mercury [Recording Equipment] Company. It gives you the ability to really overdrive the input whilst trimming it back to the point where you can get an OK input level on the Pro Tools inputs. That enabled me to do songs like 'Madness' where I am singing very quietly, but I wanted to have a big sound. I am almost whispering there. It's overdriven, so I can really get it in your face."

In the surreal soundscape of "The 2nd Law Part Two: Isolated System," newscasters read dire reports over "Tubular Bells" styled piano patterns; it's the sound of the world running on empty. The track glitches and misfires as if the global power grid is suddenly going black.

"I did all that manually in Pro Tools using a combination of time-stretch, time-compress, and pitch-shift and literally, straight-up editing," Bellamy elucidates. "It was very improvised. We recorded the lady from Channel 4 reading the script. Then I enlarged the waveform and just chopped little milliseconds out of it. Other times, I cut and pasted a little bit to create a stutter effect. Then I'd take one word and time-stretch it slightly, or pitch-shift it. It's just applying randomness to create the sound of things falling apart."

The *2nd Law* is a seamless, tactile, present, extremely polished production. Muse are master studio boffins, and their team is equally proficient. But there's an indefinable quality to the album. It glistens. "We made a conscious effort not to overuse brickwall compression," Bellamy says, by way of possible explanation. "That works really well in electronic music like Daft Punk or Justice. But that's leaves nothing for the mastering engineer to do. With more organic sounds, especially sounds where there's a differential between the dry transients and the room reverb, if you brickwall that it can make it all brown and mushy. It's harder to take that approach with rock music. We steer clear of mastering our own tracks. It's dangerous territory."

On the other hand, the band doesn't seek much creative input. "Perhaps it's my knowledge of production and orchestration and arranging, but I [understand] producers and I've caught producers saying something because they feel that is what they're there to do. It's like bringing in the A&R guy from the label, which we've never done, but if you ask him what he thinks he has to say something and it might be critical. The more people you involve, the more people who will try to justify their existence. We will work with producers again, but I am definitely able to decipher genuine constructive input versus someone trying to justify their presence in the room.

"And Dom, Chris, and I are naturally drawn to production work," Bellamy concludes. "We're all good at Pro Tools and we all know our way around plug-ins and modular synths and miking. Production is a science, but it's not rocket science." ◉

1. Choosing an Audio Engine

You're probably aware of the open design of Pro Tools 10, enabling users to employ a wide variety of devices for audio I/O—in fact, any audio interface that includes an ASIO or Core Audio driver. To make the most of this new feature, though, you'll need to know how to choose the audio engine that works best in any given situation. To get this fundamental control over Pro Tools, you'll make use of Pro Tools' Playback Engine dialog box. **(SEE FIGURE 1)**

Tips on Choosing an Audio Engine

If there's a downside to this new flexibility, it's that it's sometimes hard to make a choice! Of course, convenience is a factor. Here are some other things to keep in mind:

A. When it comes to audio quality, one of the biggest factors in terms of clarity and stereo-imagery width is jitter—the lower the better. Jitter specs for audio gear are often printed on product documentation, and are readily available for professional interfaces on the Internet. Look for the interface with lowest jitter, and choose that one for your audio interface in the Playback Engine dialog box. If your audio interface's documentation doesn't include specific information about jitter, it's a safe bet that an external interface will have lower jitter than your computer's built-in I/O.

B. If your computer has built-in sound capabilities (most do), you'll see some degree of built-in Input or Output options listed in the Current Engine menu. Take care[md]on a mac, they mean what they say! For example, if you choose Built-In Output, you'll have no input capabilities in your Pro Tools system. If you choose Built-In Input, you'll have no output! If you want to use your computer's built-in audio hardware, choose Pro Tools Aggregate I/O (we'll talk more about that a little later in this chapter).

C. If you have a Pro Tools session open, and you change your audio engine, Pro Tools will automatically save and close your session. Click on the OK button to relaunch the session with the new audio engine. If you don't want to overwrite your session file, choose the Save As option before making your audio engine changes.

Fig. 1
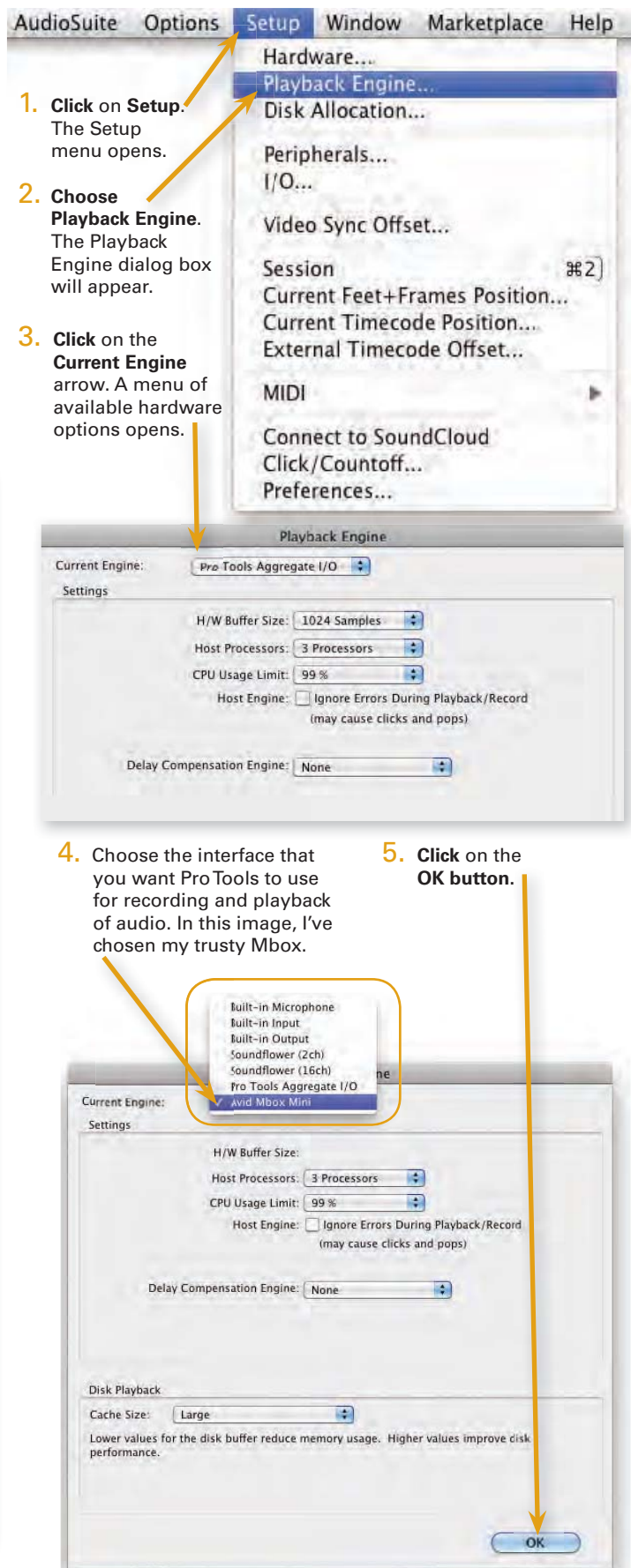
1. **Click** on **Setup**. The Setup menu opens.

2. **Choose Playback Engine**. The Playback Engine dialog box will appear.

3. **Click** on the **Current Engine** arrow. A menu of available hardware options opens.

4. Choose the interface that you want Pro Tools to use for recording and playback of audio. In this image, I've chosen my trusty Mbox.

5. **Click** on the **OK button**.

2. Setting Up Your Hardware

After you've chosen an audio engine, you might want to tweak it a bit, configuring the various options that are included with your audio interface. That's where the Hardware Setup dialog box comes in. It's the second stage in the process of getting your audio hardware properly configured for use with Pro Tools. (SEE FIGURE 2)

The Hardware Setup dialog box displays information related to the audio engine that you chose in the Playback Engine dialog box. If you change audio engines, the information displayed in the Hardware Setup dialog box will change accordingly. There are a few aspects that are commonly seen in this dialog box (this example shows the Hardware Setup dialog box that you would see with the Mbox Pro): (SEE FIGURE 3)

1. On the lower-left side, you can choose a sample rate and clock source.

2. Depending on the device, you'll see different options in the center of the Hardware Setup dialog box. In this case, you have the ability to configure the Mbox Pro's Multi-Button.

3. Many interfaces allow further customization through a dedicated Control Panel. In this case, if you click on the Launch Control Panel button, you'll see the device's dedicated mixer.
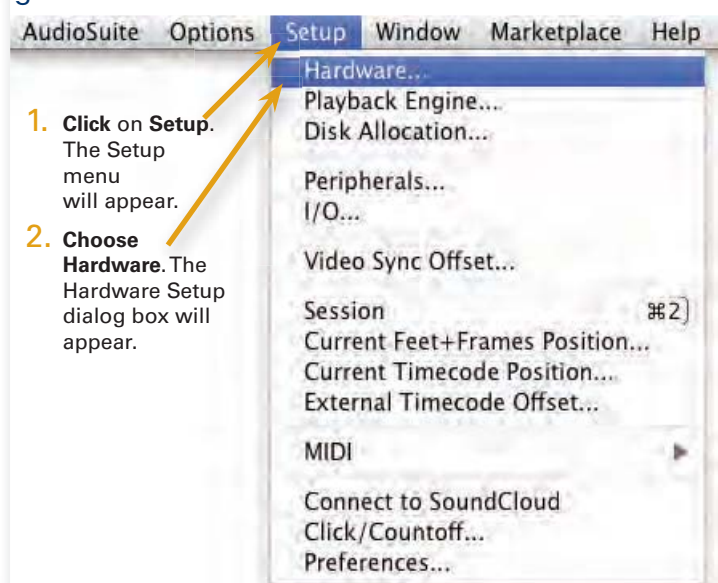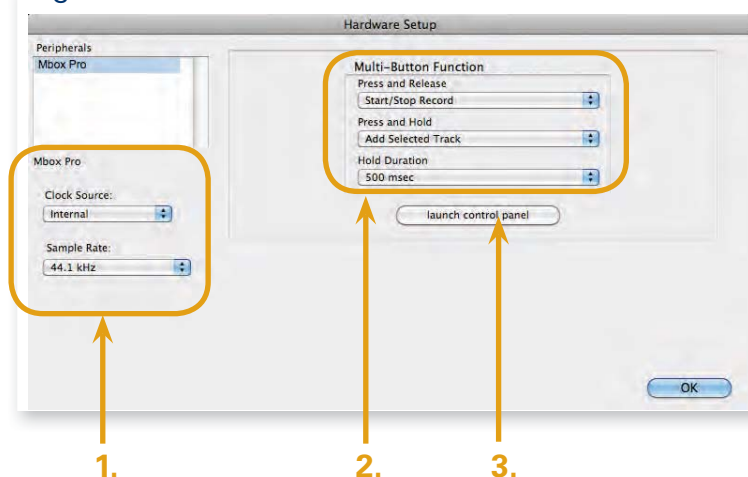
Control Panel

Although the appearance of the Control Panel will vary from device to device (shown here is the Mbox Pro Control Panel), it is here that you'll gain a deeper level of control over your audio interface.

Fig. 2

1. **Click** on **Setup**. The Setup menu will appear.
2. **Choose Hardware**. The Hardware Setup dialog box will appear.

Fig. 3

Fig. 4

For the most part, Pro Tools is identical whether you're using a PC or Mac. However, there is an interesting feature that is currently available only on Mac computers: the Pro Tools Aggregate I/O. Using the Aggregate I/O, you can simultaneously use multiple interfaces. For example, you can use a professional audio interface, plus your computer's built-in inputs and outputs. Let's take a look: (SEE FIGURE 4)

1. **Click** on **Setup**. The Setup menu will appear.

2. **Choose Playback Engine**. The Playback Engine dialog box will appear.

3. **Click** on **Current Engine**. A menu of available hardware options will appear.

4. Choose **Pro Tools Aggregate I/O**.

5. **Click** on the **OK button** to close the Playback Engine dialog box.

Fig. 5

Next, let's go back to the Hardware setup dialog box: (SEE FIGURE 5)

1. **Click** on **Setup**. The Setup menu will appear.

2. **Choose Hardware**. The Hardware Setup dialog box will appear.

3. **Click** on the **Launch Setup App** button. The Audio Devices dialog box of the Mac Audio MIDI setup dialog box will appear.
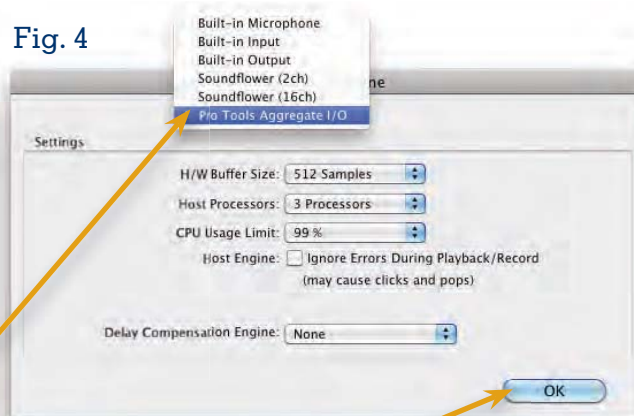

Notes:

Maximum I/O
When dealing with multiple interfaces, you can really start adding up channels of I/O. But is there any limitation? Actually, yes. With Pro Tools 10 (the basic standalone software version), you'll have up to 32 channels of inputs and outputs. That's often just fine for smaller facilities, but if you need more, consider Pro Tools|HD Native, which supports up to 64 channels of I/O, or Pro Tools|HD, which maxes out at a whopping 256 channels of I/O!

But first, a disclaimer…
The implementation of the Aggregate I/O is a powerful feature indeed, with so many different combinations of devices possible that it boggles the mind. It's important to note that Avid only officially supports the aggregation of a mac's built-in input and output. That's not to say that other combinations won't work, but from an official Avid tech support perspective, the only combinations that have been (exhaustively) tested and qualified are those of the built-in I/O of a mac computer.
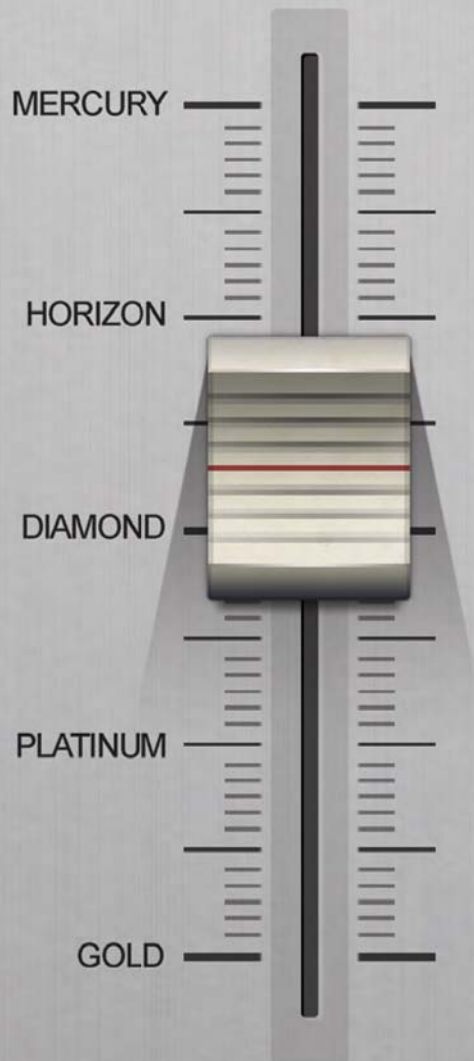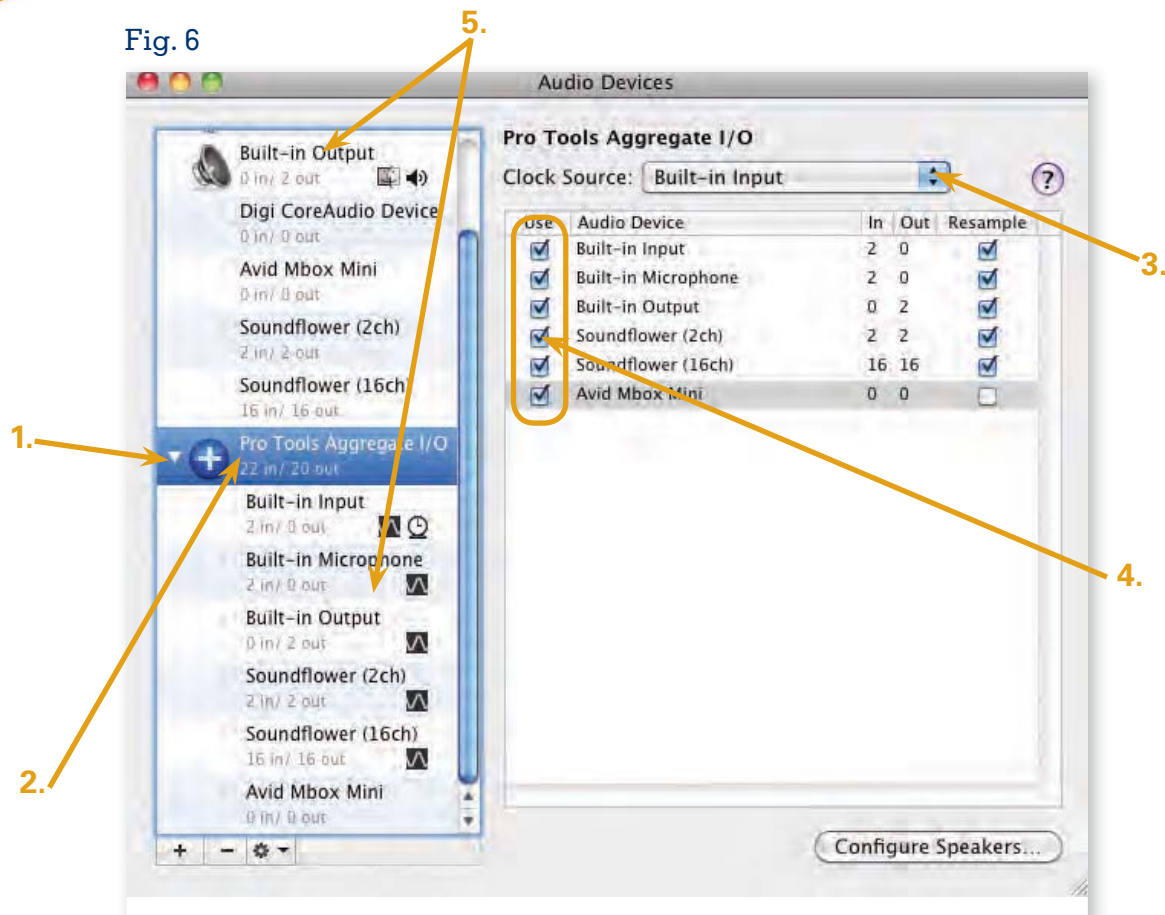
Fig. 6

The Audio Devices dialog box lists not only individual audio devices that are attached (or built in) to your computer, but also a collection (or *aggregate*) of devices that can be used collectively. There are a few essential elements of this dialog box that will help you get the most out of your system: **(SEE FIGURE 6)**

1. To reveal a list of all the devices included in the Pro Tools Aggregate I/O, click on the triangle icon to the left of the Aggregate icon.

2. Click on the Pro Tools Aggregate I/O menu item to manage the aggregate devices (these devices appear in the right section of the Audio Devices dialog box, as shown here).

3. The first thing you'll want to do is to choose a clock source for your aggregate devices. Because the Pro Tools Aggregate is intended for use with your Mac's built-in I/O, Avid recommends using the default clock settings.

4. You can add or remove devices from your aggregate by clicking on the checkboxes in the Use column. As you might expect, checked boxes indicate that the device is an active part of the aggregate (once again, please remember that the Pro Tools Aggregate I/O was designed with only your built-in I/O in mind).

5. Individual devices often include some level of configurability—things like volume control, audio source, and so on. Click on the device you want to tweak, and you'll see the setup options in the right section of the Audio Devices dialog box. (You can select a device either within the aggregate list or outside the aggregate.)

1. New in Pro Tools 10: Clip-Based Gain

Fig. 1

Perhaps the most significant improvement introduced in Pro Tools 10 is the new clip-based gain feature. Put as simply as possible, this is a second level of volume automation for audio clips—one that isn't tied to a track, but is instead part of the clip itself. This enables you to gain-match clips prior to mixing a track. Although this is aimed more at audio post-production (for video), it really can be used in any kind of situation.

Sound confusing? Let's take a look!

The Basics of Clip-Based Gain

In its simplest sense, clip-based gain will enable you to change the volume level of a clip independent of the volume of any track that the clip may be on. It couldn't be easier:

In the lower-left corner of a clip, you'll see a small fader icon and a gain value (which will initially read 0 dB. **Click and hold** on this **icon** to reveal a small volume fader. (SEE FIGURE 1)

If You're Not Seeing the Clip Gain Controller
Before you can work with clip-based gain, you'll have to be able to see the controls. If they are not visible, **click** on **View**, **choose Clip**, and **choose Clip Gain Info**. (SEE FIGURE 2)

Adjust the **fader** to change the gain of the clip. Note that as you change the gain, you'll see the waveform within the clip change accordingly—something decidedly different from volume automation! (SEE FIGURE 3)

The dB value in the lower-left corner of the clip will reflect the changes you've made, as will the visual representation of the audio within the clip. (In this image, I've decreased the gain by 10 dB for visual effect.) (SEE FIGURE 4)

In addition to the value indicator in the bottom-left corner of the clip, you can also view the gain as a line within the clip itself. To do so, click on View, choose Clip, and choose Clip Gain Line. (SEE FIGURE 5)

The gain for each clip will be shown as a line within the clip. (SEE FIGURE 6)

Initially this is a straight line, but in the next section, you'll see that it doesn't have to stay that way!

Fig. 2
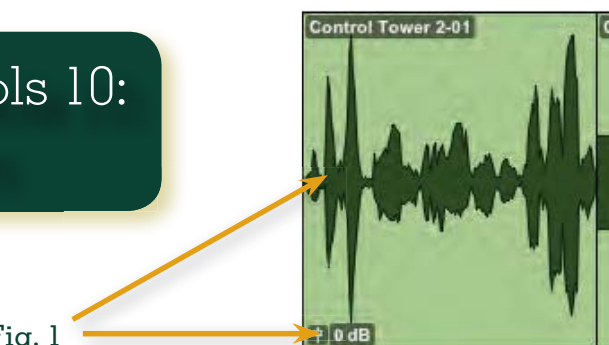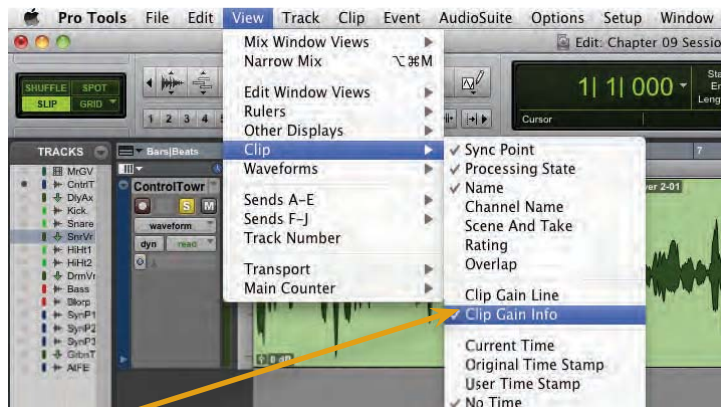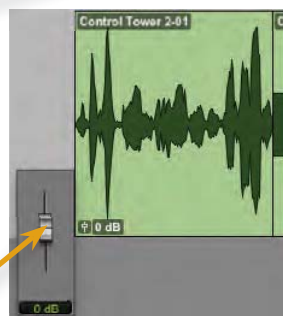

Fig. 3

Fig. 4

Fig. 5

Fig. 6

2. Editing Clip-Based Gain

You've probably noticed that the clip gain line looks an awful lot like a volume automation line—and that's essentially what it is, except that it is affecting the clip as opposed to affecting the track's volume fader.

Let's put this into more of a real-world situation. In the "Control Tower" track I've been using in this section there's audio in the middle section of the second clip is a bit low. In the previous section, you learned how to adjust an entire clip; now let's adjust a section within the clip using the Trim tool.

1. Using the Selector tool, **select** the **area** that you wish to change (in this case, the quieter middle section of the second clip).
(SEE FIGURE 7)

2. Using the Trim tool, **move** your **cursor** into the selected area, toward the clip gain line. The icon for the Trim tool will become downward-facing, as shown here. Next, **drag** your **cursor** up or down to adjust the gain of the selected area.
(SEE FIGURE 8)

Editing clip gain using the Pencil tool.
(SEE FIGURE 9)

Editing clip gain using the Grabber tool.
(SEE FIGURE 10)

You'll no doubt have noticed that this editing of clip-based gain is virtually identical to the editing of volume automation on a track. The Pencil and Grabber tools can similarly be used to change a clip gain line.

Clip Gain Shortcut

Here's a nifty shortcut for readers who have a mouse with a scroll wheel: Hold the Shift+Control keys (Mac) or Shift+Start keys (PC) and move your scroll wheel to raise or lower the gain within a selected area.
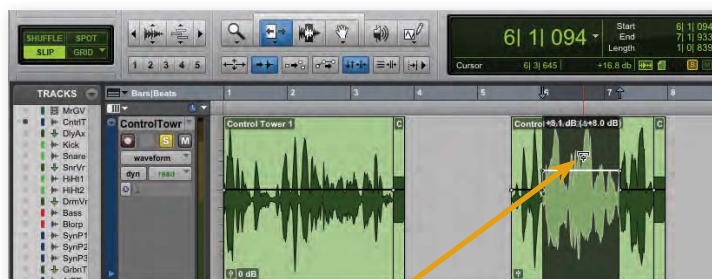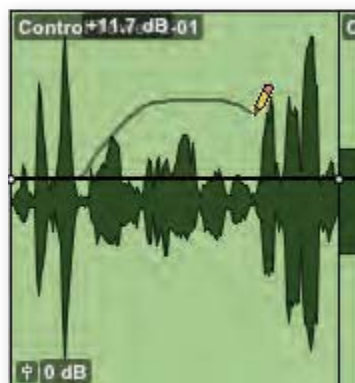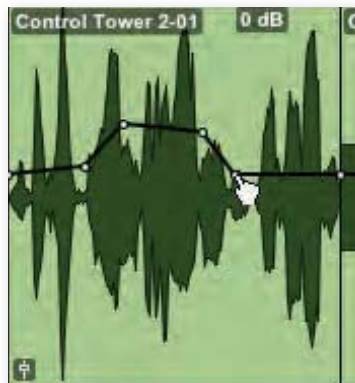

Fig. 7

Fig. 8

Fig. 9

Fig. 10

3. Clip-Based Gain Tools

Before we leave this very exciting new feature, let's take a look at a few more ways to work with clip-based gain.

1. Right-click the **Clip-Based Gain icon** in the lower-left corner of a clip. **(SEE FIGURE 11)**

The following options will appear:

● **Bypass Clip Gain.** Any clip-based gain will be suspended (until un-bypassed). The clip gain line will be gray, and the waveform view of the clip will revert to its original state.

● **Clear Clip Gain.** All clip gain changes will be removed, and the clip gain line will be reset to a flat line at 0 dB.

● **Render Clip Gain.** Clip gain is a real-time process, meaning that the changes are non-destructively applied to an audio file. If you choose to render clip-based gain, the changes you have made will be applied and a new audio file will be created. In the track, a new clip will replace the original clip, and the clip gain line will be reset to a flat line at 0 dB, enabling you to make further changes if you wish.

● **Show/Hide Clip Gain Line.** Depending on whether your clip gain line is shown or hidden, this option will enable you to change the view state of the clip gain line. (This affects all clips in your session.)

2. Right-click any **audio clip**. Within the menu of clip-related functions, you will find a section on clip gain, with similar commands and an added **Copy Clip Gain** option. **(SEE FIGURE 12)**

Clip gain can also be selectively imported (or not) in the Import Session Data dialog box. **(SEE FIGURE 13)**

Just click on the Track Data to Import button and choose Clip Gain to select or deselect it for import.

Clip-Based Gain and Clip Groups

When it comes to clip groups and clip-based gain, the news is all good. Not only is clip gain preserved by the clips within a clip group, but additional clip-based gain can be applied to the entire clip group!

Clip-Based Gain and the Signal Path

In addition to the editing possibilities opened up with Clip Gain, this feature importantly impacts the mixer's world as well. If you consider traditional volume changes, you'll notice that your volume changes are *post-insert*. For example, changing your volume information on an audio track won't impact the signal going to a compressor inserted on that track. Clip Gain, on the other hand, is *pre-insert*, meaning that changes made in the Clip Gain line *will* affect the signal hitting your plugins and other inserted effects. This can be a huge help in the mixing stage of production, especially when working with dynamic-based effects like compressors and limiters. ⏸
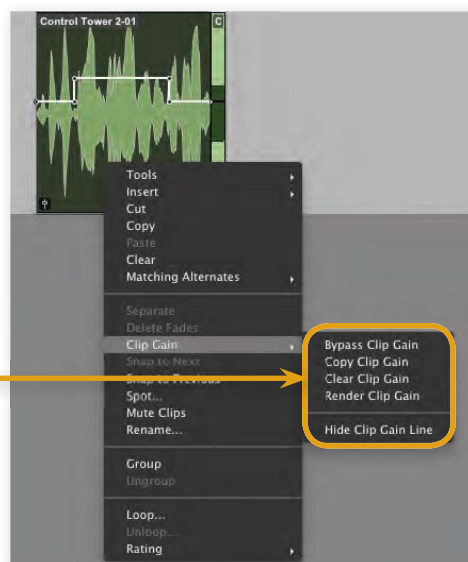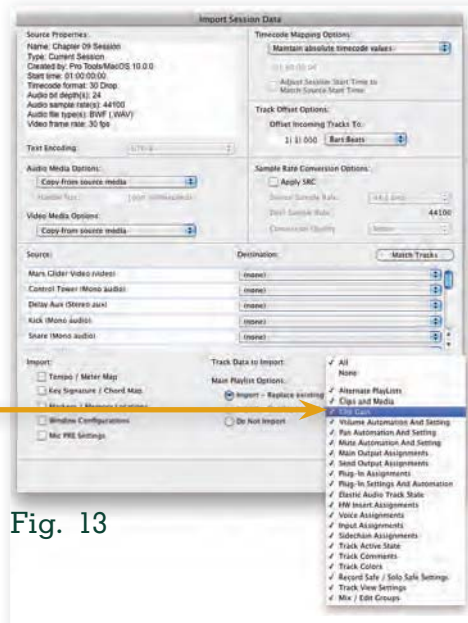

Fig. 11

Fig. 12

Fig. 13

1. Elastic Audio

Fig. 1

1.

Elastic Audio is a relative newcomer to the Pro Tools arsenal of features, and it's already a favorite for Pro Tools users worldwide. On its face, Elastic Audio enables you to change the timing and pitch of audio in a flexible and nondestructive way, and can give you the same kind of control over your audio that you have over MIDI. When you dig deeper, though, you'll see that Elastic Audio can be a tweaker's paradise!

Basic Operation

You can enable, disable, and customize Elastic Audio on a track-by-track basis. To activate Elastic Audio on an Audio track, follow these steps:

1. Click on the **Elastic Audio plug-in button**. A menu will appear. (SEE FIGURE 1)

2. Choose the appropriate **plug-in** for the job. You have five options: (SEE FIGURE 2)

- **Polyphonic.** This mode is a good general choice and well-suited to audio in which multiple pitches are being played simultaneously.

- **Rhythmic.** This mode is a good choice for drum tracks and other percussive audio.

- **Monophonic.** This mode is great for Audio tracks in which only one note is being played at a time (for example, wind instruments or vocals).

- **Varispeed.** This mode is fundamentally different from the others. Elastic Audio's other modes will maintain the original pitches of your audio regardless of whether they're being sped up or slowed down. Varispeed mode, on the other hand, will raise the pitch of your audio when it is being played faster than normal or lower the pitch when it's being played slower. This is particularly handy for turntable or tape-type effects.

- **X-Form (Rendered Only).** This is a high-quality algorithm and is often my personal choice, but it is only available as a rendered plug-in as opposed to real time. (We will discuss the difference between real time and rendered in a moment.)

3. You'll notice that once you choose an Elastic Audio plug-in, a button showing your choice will be displayed. Within that button, and next to the name of the algorithm (in this image, Rhythmic), you'll see a small rectangle, which will be either lit with a green color or dark. (SEE FIGURE 3)

This will indicate whether Elastic Audio for that track is being processed in real time (green) or in a rendered mode (dark).
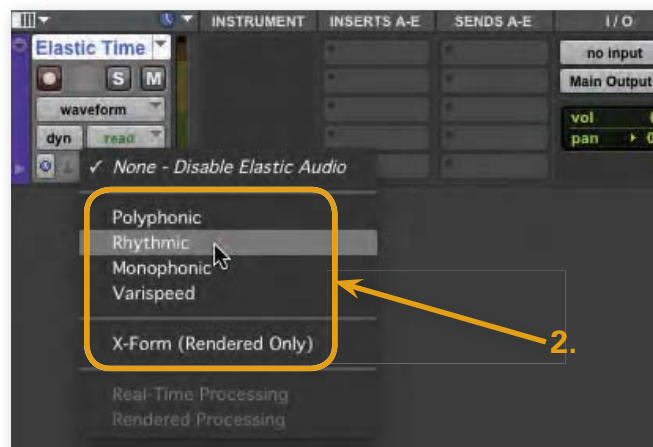
Fig. 2
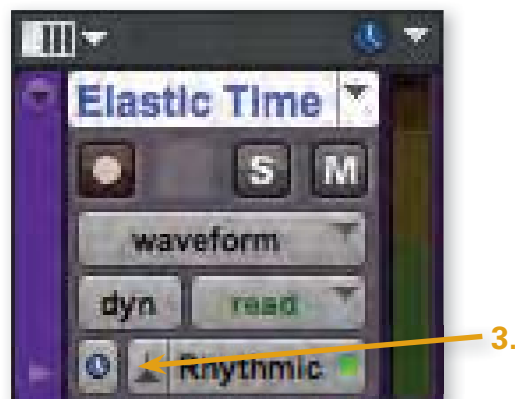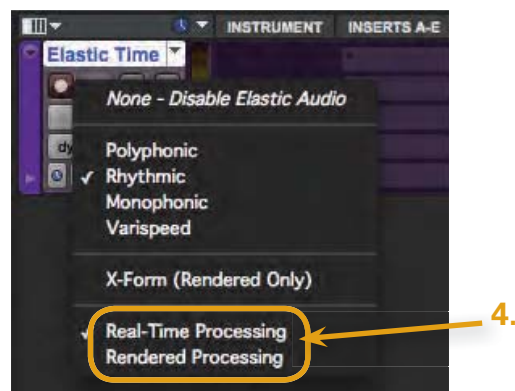

2.

Fig. 3

3.

Fig. 4

4.

Click on the **Elastic Audio plug-in button** once more so we can take a second look at the Elastic Audio plug-in list.

4. The bottom segment of the Elastic Audio plug-in list will enable you to choose the processing mode for Elastic Audio on that track. (The currently selected mode will be indicated by a checkmark.) **Choose** one of the **options**. (There are two in most cases.) **(SEE FIGURE 4)**

Real-Time Processing. Selecting Real-Time Processing will give you the quickest performance, and any changes you make to your audio will be applied immediately. That being said, processing in real time will place an additional load on your computer's CPU, which can be an issue (particularly with less-powerful computers).

Rendered Processing. When you choose Rendered Processing, your changes will not be immediately applied, but will take some amount of time (depending on the speed of your computer) to apply the change. During that time, the track will not be audible. Your changes will be written (or rendered) to new files that are saved in your session's Rendered Files subfolder.

Elastic Audio and the TCE Trim Tool

One of the first things you'll notice when you enable Elastic Audio on a track is that the TCE Trim tool works a bit differently. When Elastic Audio is set up with real-time processing, instead of creating a new file and clip each time you use the TCE Trim tool, your audio will simply be time-compressed or expanded immediately. (New files will *not* be created.) Regardless of the processing mode chosen, you might also notice that as you use the TCE Trim tool repeatedly on the same clip, the clip's audio quality won't progressively degrade (something that can happen with non—Elastic Audio tracks).

2. Event and Warp Markers (and How to Use Them)

When Elastic Audio is enabled on a track, you'll notice that there are two new track views available to you: Analysis and Warp. Both of these track views have their parts to play. Let's take a look at them one at a time.

1. **Click** on the **Track View button** (which in this image currently reads Waveform). The Track View menu will appear. **(SEE FIGURE 5)**

2. **Choose Analysis** from the list of view options. **(SEE FIGURE 6)**

3. You'll immediately note that there are vertical lines marking transients in your audio—even the very low-level ones. Each of these lines is called an *Event marker*. **(SEE FIGURE 7)**

For experienced Pro Tools users, event markers are loosely analogous to the Beat markers that can be seen when working with Beat Detective. These markers determine the locations within an audio clip that will move as the audio follows tempo changes or when the audio is quantized, which we'll discuss later in this section.
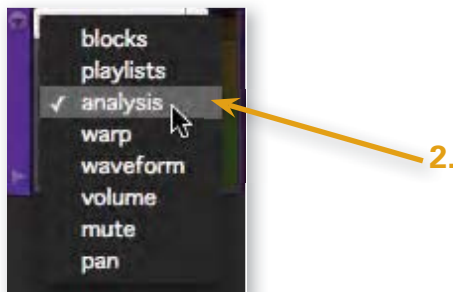
Fig. 5

1.

Fig. 6

2.

3.

Fig. 7

If you need to, you can move, delete, and add Event markers. The Grabber tool will help you do this. (SEE FIGURE 8)

1. Using the Grabber tool, move your cursor over an existing Event marker. Your cursor will change to the double-arrow shown here. You can click and drag the Event marker to a new location.

2. You can delete an existing Event marker by holding down the Option (Mac) or Alt (PC) key and clicking on it using the Grabber tool. The cursor will be shown as a pointing hand with a minus—sign next to it.

3. If you want to create a new Event marker, just double-click where you want to create it! Now, let's move on to the Warp view:

4. Click on the **Track View button** and **choose Warp** from the list of options. (SEE FIGURE 9)

5. Here again, the Grabber tool will be your greatest ally. Move your mouse over any Event marker. (Yes, you can still see your Event markers, even though you're in Warp view.) The cursor will turn into the icon shown here, indicating that you're ready to use the telescoping warp. (SEE FIGURE 10)

Just **click** and **drag** to the **left** or the **right** to proportionally compress or expand the entire clip. Markers can be dragged smoothly if you're in Slip, Shuffle, or Spot mode. If you're in Grid mode, you'll see that your marker snaps according to your grid resolution.

Although telescoping warp does have its uses, to really make the most of the Warp view, you'll need to create a new kind of marker, called a Warp marker. Conceptually, you can think of a Warp marker as being a handle that you can grab and move to stretch your audio. Warp markers can be identified by their darker color and the small blue triangle at the base of the marker.

Just as you saw with Event markers, you will find that the Grabber tool helps you get started easily: (SEE FIGURE 11)

6. Here's a common starting point: Double-click on an existing Event marker to change it into a Warp marker (shown here). Here are a few other ways to work with Warp markers: (SEE FIGURE 12)
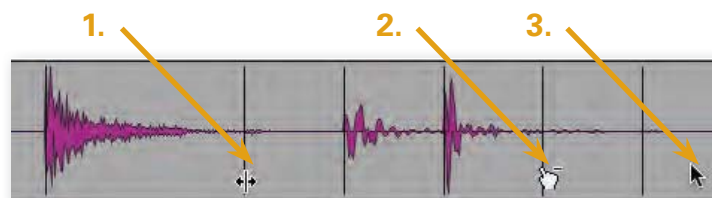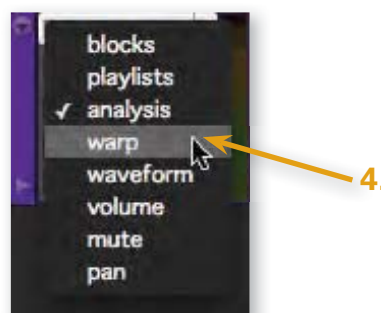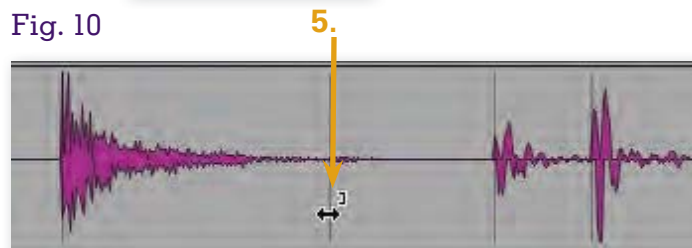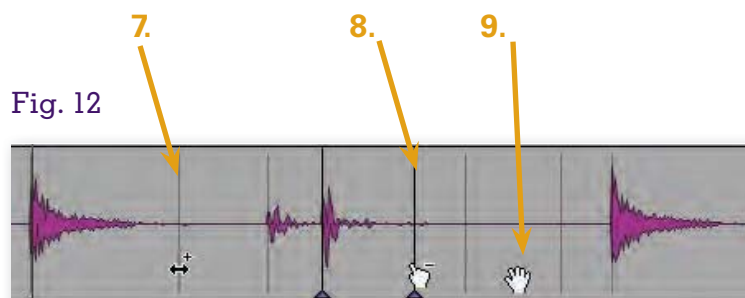
Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

7. If you have an existing Warp marker to the right of an Event marker, and you want to promote that Event marker to a Warp marker, you'll see a small plus (+) sign next to the cursor. In these cases, a single-click will create a Warp marker.

8. You can remove an existing Warp marker by holding down the Option (Mac) or Alt (PC) key and clicking on it with the Grabber tool. The cursor will be shown as a pointing hand with a minus—sign next to it. Double-clicking on an existing Warp marker will also remove.

9. If there are no existing Event markers at the location where you want to create a new Warp marker, no problem—just double-click where you want to create one! **(SEE FIGURE 13)**

Here's a typical Warp marker setup: The center Warp marker in this scenario is the point of audio that I want to move. The Warp markers to the left and right of the center Warp marker, although they *can* be moved, will act as anchors in this case. Now we're ready to do some serious warping!

10. **Click** and **drag** the **center Warp marker** left or right. **(SEE FIGURE 14)**

You'll immediately see that the audio is being pulled like taffy, giving you control over minute aspects of your audio clip, with the adjacent Warp markers acting as anchors.

Here's an even quicker way to create the Warp markers you need for this kind of work: **(SEE FIGURE 15)**

11. **Hold down** the **Shift key** and **move** your **mouse** over an Event marker that you want to promote to a Warp marker and then move.

Click on the **Event marker**.
You'll notice that not only has the Event marker you clicked changed to a Warp marker, so have the markers immediately adjacent to it. This puts you in position to adjust the center Warp marker, just as you did earlier in this section. **(SEE FIGURE 16)**

From time to time, moving a Warp marker can case audible side effects. While one possible solution is to eschew the Elastic Audio plug-in for one more suited to the job, you can also tweak the current plug-in a bit to improve its performance. **(SEE FIGURE 17)**

12. **Click** on the **Elastic Audio Plug-In button** (which in this image reads Rhythmic, the currently selected Elastic Audio plug-in). The plug-in window will appear.

13. The appearance of the Elastic Audio plug-in window will vary depending on the Elastic Audio plug-in you're using, enabling you to adjust parameters that are most relevant to each one. In the case of the Rhythmic plug-in shown here, you can just **adjust** the **decay rate**, which can remove
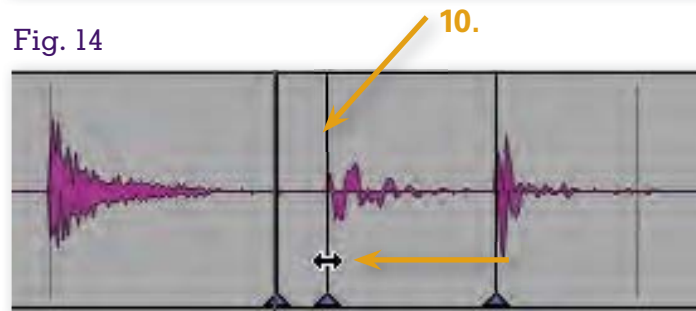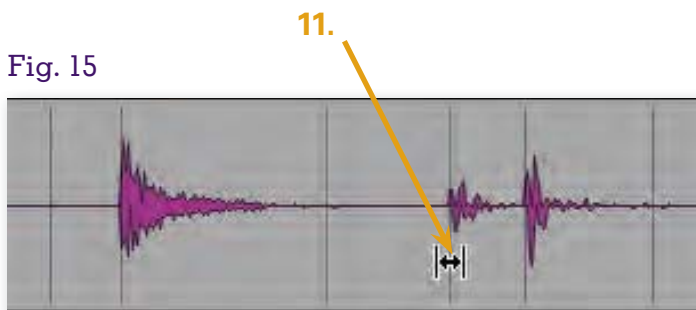
Fig. 13

Fig. 14

10.

11.

Fig. 15

Fig. 16

12.   13.

Fig. 17

Pro Tools®
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AUDIO

2. Event and Warp Markers
(and How to Use Them) CONT.

unwanted artifacts that sometimes accompany this particular plug-in.

You also have the ability to adjust specific Elastic Audio settings on a clip-by-clip basis.
(SEE FIGURE 18)

1. **Select** the **clip** you want to work with.

2. **Right-click** on the **clip**. A menu will appear.

3. **Select Elastic Properties**. The Elastic Properties dialog box will appear.

4. **Type** new **values** into the appropriate fields. The upper part of the Elastic Properties dialog box will give you overall information about the clip (which will vary depending on whether the track is sample-based or tick-based). In the bottom part, you'll see more specific data, including the following:

Event Sensitivity. Notice that as your sensitivity percentage increases, you will begin to see vertical lines intersecting the transients of your audio. (The loudest transients will be marked first.) Though the default value (100%) works in most cases, you will occasionally find that you can get better results by reducing this percentage. When you are satisfied that the important transients have been marked (and no others), stop adjusting the value.

Input Gain. You can adjust this downward if you find that your clip clips as a result of warping. A clipping clip will be indicated by a small red rectangle in the upper right-hand corner of the clip.
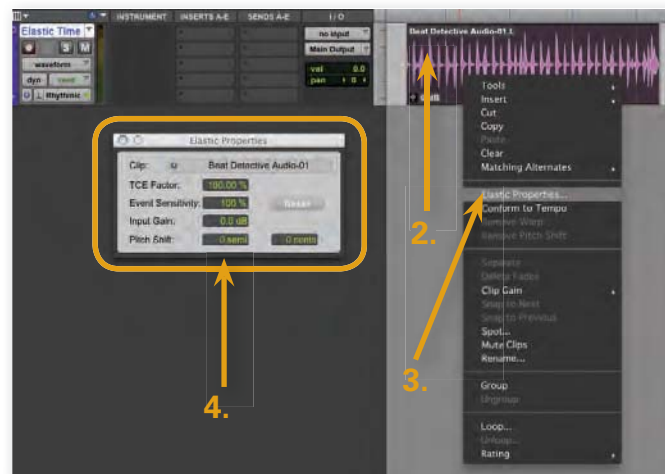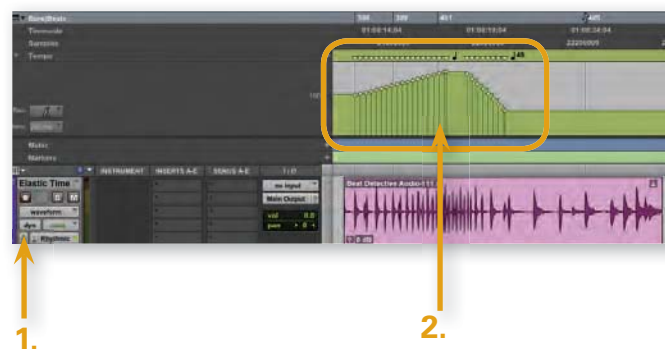
Fig. 18

3. Elastic Audio and Tempo

This party's just getting started! Let's now set up our Audio track to follow tempo changes.
(SEE FIGURE 19)

1. **Change** the **Audio track** from sample based to tick based (remember, tick-based tracks follow tempo changes).

2. Using the Pencil tool, **draw** some **tempo change events** onto the expanded Tempo ruler, as shown here.
If you play back your session, you'll hear that the clip has been compressed or expanded to follow your session's Tempo ruler.

With Elastic Audio, not only do you have the ability to have

Fig. 19

your audio follow tempo changes, but you can also quantize it as if it were MIDI!

Quantization and Track Timebase

The quantization process outlined in the following section can be done on either tick-based or sample-based tracks. (SEE FIGURE 20)

1. **Select** the **area** you want to quantize.

2. **Click** on the **Event menu**.

3. **Select Event Operations**. A submenu will appear.

4. **Click** on **Quantize**. The Event Operations/Quantize window will appear. (SEE FIGURE 21)

Because you've selected a clip on an Elastic Audio[nd] enabled track (which contains Elastic Audio events, covered next), you have the option of quantizing this drum clip, almost as if it were MIDI! Note that when an Elastic Audio clip is selected, the What to Quantize menu button reads "Elastic Audio Events." You can quantize to either a grid increment (such as 16th notes, as shown here) or a groove template when quantizing MIDI.

Combining Tools

For users that have both Beat Detective and Elastic Audio under their belt, are some great ways to get them to work together. Here's one scenario: Suppose you have two drum clips, and you want them to have the same feel. Here's one way to go: Choose the drum clip whose feel you prefer and use Beat Detective's Bar|Beat Marker Generation mode to change your session's tempo map. Just quantize the other drum clip to the new grid (the track needn't be tick-based to do this), and you're all set!

4. Elastic Audio and the Workspace

Elastic Audio is not only at work in your session, but in the Workspace, Volume, and Project Browsers as well. Within these browsers, audio files that are analyzed by Elastic Audio and are determined to have a musical pattern (such as a drum beat) are listed as being tick-based files (indicated by a green metronome icon in the Kind column). Files that are analyzed and found not to have this sort of pattern (for example, a single drum hit or a spoken sentence) will be listed as being sample-based (indicated by a blue clock icon in the Kind column). (SEE FIGURE 22)

1. **Click** on the green **Audio Files Conform to Session Tempo button** at the top of the Workspace Browser. Your tick-based audio files will play at your session's tempo (rather than at their original tempo) when previewed.
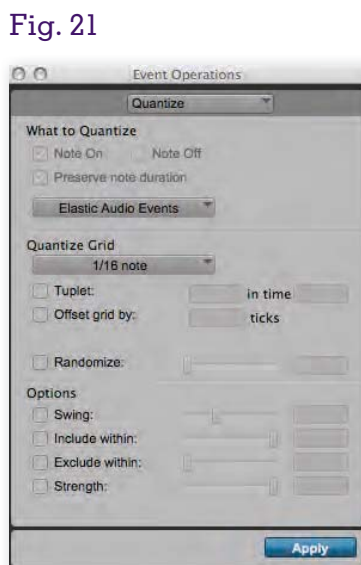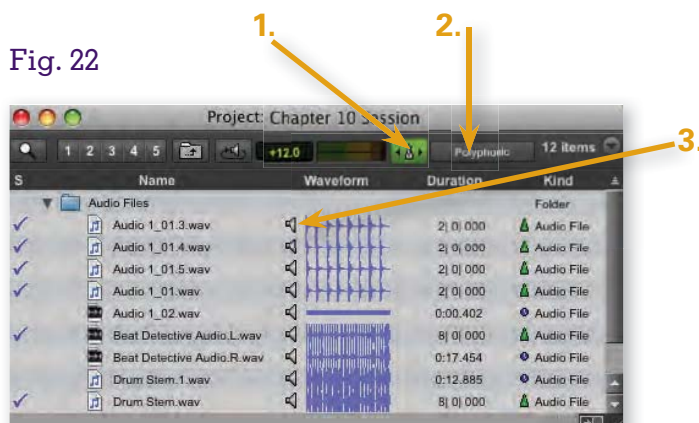
Fig. 20

Fig. 21

Fig. 22

2. Click on the button to the immediate right of the Audio Files Conform to Session Tempo button, which displays the currently chosen Elastic Audio plug-in (the one being used for previewing audio files in the browser). A list of all the real-time Elastic Audio plug-in options will appear, from which you can choose the algorithm that sounds best to you.

3. Click on the **speaker icon** next to the file waveform that you want to preview.
(SEE FIGURE 22)

If the file is tick-based, the tempo of the previewed audio will match the tempo of your session.
The Audio Files Conform to Session Tempo feature also has an effect on the process of importing files into your session. When the feature is active, a tick-based file will be imported to a tick-based, Elastic Audio—enabled track, with the same plug-in algorithm that you had in your Workspace Browser being applied to that track.

Fig. 23

5. Elastic Pitch

Fig. 24

Elastic Audio can adjust not only the timing of your audio, but its pitch as well. Using Elastic Audio, you can easily change pitch on a clip-by-clip basis.

Elastic Pitch Limitation
Adjusting pitch with Elastic Audio can only be done when using the Polyphonic, Rhythmic, or X-Form Elastic Audio plug-ins.

There are two different methods by which you can adjust the pitch of a selected clip, each with its own particular advantages. Let's start by looking at a way to transpose a clip. (SEE FIGURE 23)

1. Select the **clip** whose pitch you want to transpose.

2. Click on the **Event menu**.

3. Choose Event Operations. A submenu will appear.

4. Click on **Transpose**. The Event Operations/Transpose dialog box will appear.
(SEE FIGURE 24)

5. Adjust the **transposition parameters** just as you would if working with MIDI data. (For more details on the parameters in the Event Operations/Transpose dialog box, see Appendix A, included as a PDF on your book's disc.)

6. Click on the **Apply button**, and you're finished!
The previous workflow is very handy in situations when you want to make relatively large changes in pitch. But what
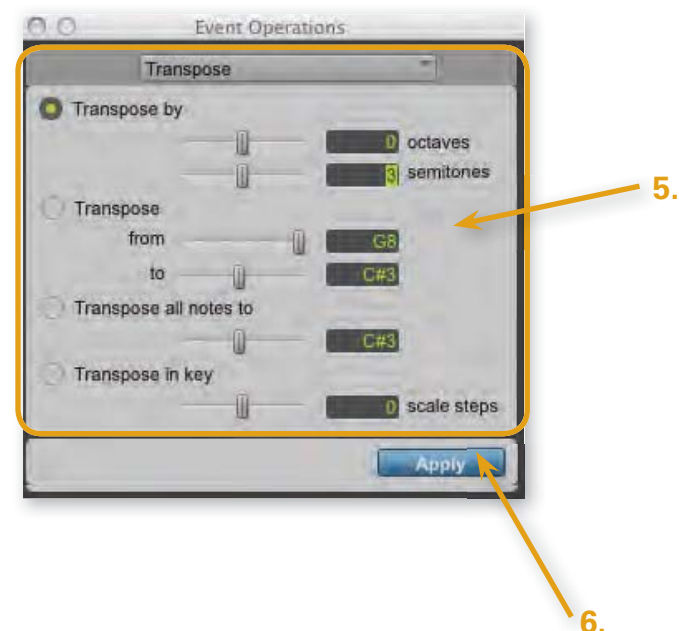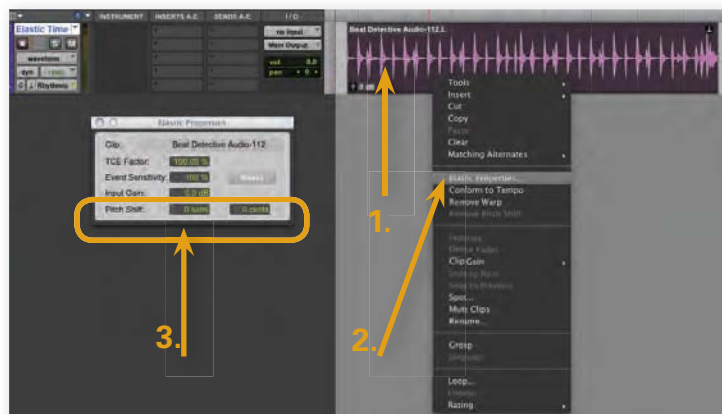
Fig. 25

Fig. 26

if you just want to tweak the pitch of a flat note? No problem. You can make those kinds of fine adjustments in the Elastic Properties dialog box.
(SEE FIGURE 25)

1. Right-click on the **clip** you want to change. A list of options will appear.

2. Choose Elastic Properties. The Elastic Properties dialog box will open.

3. The Pitch Shift controls in the Elastic Properties dialog box will enable you to adjust pitch not only in semitones (something you could also do in the Transpose dialog box), but also in cents, which are very small units of pitch. There are 100 cents in a semitone, or half-step. You will find that by adjusting pitch in terms of cents, you have very fine control over the pitch of the audio.

Are You Warped?
(SEE FIGURE 26)

If you're unclear as to whether a given clip has been altered through the application of Elastic Audio, the clip itself will give you a clue: Clips changed by Elastic Audio (including pitch changes) will be indicated by a small icon in the upper-right corner of the clip, as shown here.

Elastic Warnings

One final point: From time to time, you might see sections of your audio turn red when dragging Warp markers. Not to worry—Pro Tools is just letting you know that you've applied a good deal of time compression or expansion. Technically speaking, you've gone beyond Pro Tools' recommended limits, but if it sounds good to your ears, go for it! 🎸

melodyne

What is Melodyne?

Melodyne is a program for Mac or PC that offers truly extraordinary possibilities for the editing of audio. Melodyne recognizes the notes that are sung or played in your recording and shows them to you. It's like the audio recording turns into sheet music or a MIDI piano-roll editor window.

How does Melodyne work?

In Melodyne, you don't work like a technician with meaningless wave forms but like a musician with notes. Melodyne displays each note as a *"blob"* that you can grab and move, stretch or squeeze, and edit in a wide variety of ways.

What can Melodyne do?

Melodyne makes editing audio recordings an easy, musical experience and will constantly provide fresh inspiration. Correct, optimize, be creative – you'll discover a whole world of new possibilities, from Melodyne's celebrated pitch correction to the editing of polyphonic material.

Why is Melodyne better?

The underlying concept, unique algorithms and intuitive interface – everything about Melodyne reflects a profoundly musical way of thinking. You feel it, you hear it, and it's a quality attested to by many awards – including the **2012 Technical GRAMMY Award**.

Can I use it with Pro Tools?

Melodyne is fully compatible with Pro Tools. You can use it as an Insert Effect on any audio track, use the Melodyne Bridge to lock Melodyne to Pro Tools. You can also export files for offline editing in Melodyne. You choose what suits you best.

Can I try Melodyne?

You can experience Melodyne yourself so you can see, grab and modify the notes in your very own recordings. Then you will understand what a quantum leap Melodyne represents and why it is valued so much. Try our free trial version today. Download Melodyne at www.celemony.com

1. Making the Most of The Pro Tools Mixer

When it comes to DAWs, there are two schools of thought on mixing: mixing inside the box and mixing outside the box. Mixing *inside* the box refers to making use of your DAW's virtual mixer and virtual effects entirely within the Pro Tools environment. At any given time, you will listen to a summed (for example, stereo) output of your mix through your audio interface, and all the required processing is performed by your computer (the "box"). Mixing *outside* the box refers to the practice of assigning individual tracks to individual outputs of your audio interface, and from there to individual channels on a separate physical mixing board. The mixing and automation are performed by this external mixer, and Pro Tools is reduced to a recording, editing, and playback device (still playing critical roles in any production workflow).

There is lively discussion (and I'm being polite here) within the professional community regarding the virtues of mixing outside the box versus inside the box. There are valid points on both sides of the debate, but for the end-user, it all boils down to this essential truth: Great work is being done using both methods, and individuals should follow the path that best enables them to realize their creative vision.

No matter where you stand regarding the inside-the-box/outside-the-box discussion, there's no denying that the internal mixer within Pro Tools offers some pretty powerful control over your mixing environment. This section will take a look at two often overlooked – but hugely powerful – features in Pro Tools 10.

2. Pan Depth Options

Okay, this can get a little technical, but hear me out: When identical signals are combined, their levels go up. (Makes sense, right?) Well, that means when a signal is panned to the center of a stereo pair of speakers, the perceived volume of that signal should logically be louder than if that signal were panned to the hard left or hard right. Now, if *that* were actually the case in real-world practice, we'd have some pretty serious issues to contend with as we mix, especially when automating things like panning! Clearly, somebody has fixed the problem behind the scenes, and that solution is called pan depth.

Basically, what pan depth refers to is an attenuation (reduction in volume) of a signal as it is panned to the center so that the perceived loudness stays the same. The

problem is that there's no hard-and-fast rule about which amount of attenuation is correct. It depends on a number of factors, including the acoustic quality of the room you're working in. As a result, different mix-console and DAW manufacturers have settled on using different pan depths. This can really do a number on a mixer's ears, though— particularly if you mix in different systems with different pan laws—so Pro Tools gives you the ability to choose the pan depth you prefer!

(SEE FIGURE 1)

1. **Click** on the **Setup menu**.

2. **Choose Session**. The Session Setup window will appear.

(SEE FIGURE 2)

You'll find your session's pan depth displayed in the lower-left corner of the Format section of the Session Setup window.

3. **Click** on the **Pan Depth drop-down list** to display a list of pan-depth options.

4. You can **choose** a different **Pan Depth setting** for your session from this list (the current setting is indicated by a checkmark). You're sure to find a setting you like—all the standard pan depths are represented here.

3. Automatic Delay Compensation

Technically speaking, Automatic Delay Compensation (ADC) isn't all that new to Pro Tools, but until recently, it's only been available on Pro Tools HD systems. Recently though, it's available to every Pro Tools user, so let's talk about it a bit.

When you launch a plug-in, you're effectively adding a mathematical formula to the signal path. Like all math, simple formulae can be processed quickly, whereas more-complex equations take more time. This is as true for computer chips as it is for the human brain. When we talk about delay caused by plug-in math, we call it latency.

You can probably see where this is going. When you're working with multiple tracks, with different kinds of plug-ins on them (different math, and different amounts of latency), your audio can get out of sync. Although this might not sound like a big deal, these small misalignments can lead to problems of phase alignment, and can quickly muddy up your mix.
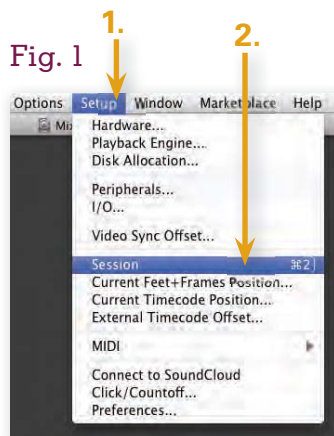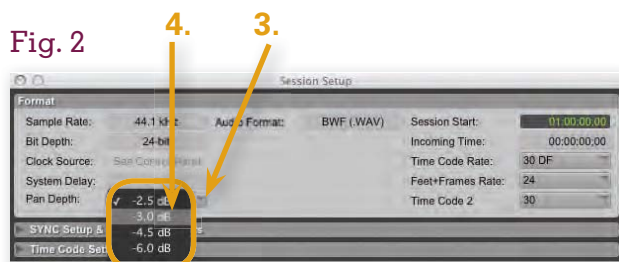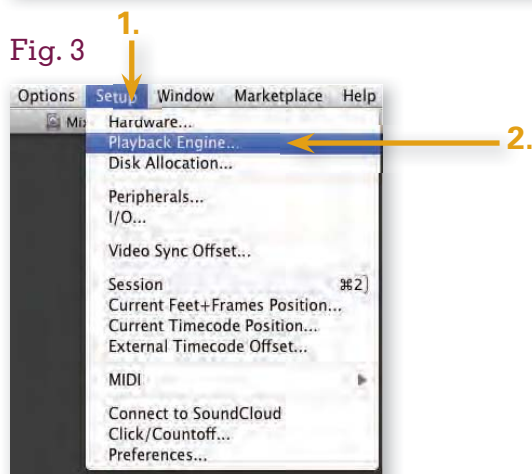
Fig. 1

Fig. 2

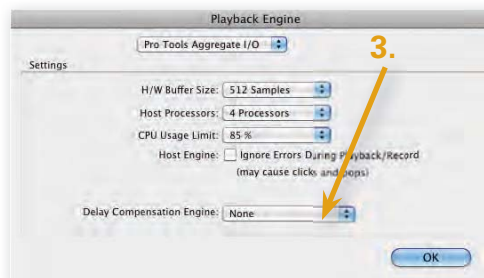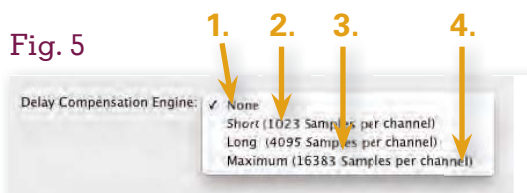
Fig. 3

Fig. 4

Fig. 5

ProTools' Automatic Delay Compensation fixes this problem by *adding* varying degrees of latency to individual tracks. It uses the most latent track as a guide so that all tracks share the same amount of latency and are thereby perfectly aligned. Let's take a simple example: Say you have three tracks. One has 100 samples of plug-in latency, the second one has 20 samples of latency, and the third one has zero plug-in latency (there aren't any plug-ins on that track). ADC would add 80 samples of latency to the second track and 100 samples of latency to the third track, so that all three tracks have the same amount of latency (100 samples in this case). What's better, ADC is always keeping tabs on how much latency is on each track and maintains sample accuracy between all the tracks, so all you need to do is to turn ADC on and get to mixing!

There's a little bit of setup involved with using ADC, but it's well worth the effort as you move into the mix stage of production:

1. **Click** on the **Setup menu**. (SEE FIGURE 3)

2. **Choose Playback Engine**. The Playback Engine dialog box will appear.

(SEE FIGURE 4)

3. The Delay Compensation Engine menu button will show the current setting for Automatic Delay Compensation (in this image None, meaning that ADC cannot be enabled for this session as things stand). **Click** on the **Delay Compensation Engine menu button** to view your ADC options:

(SEE FIGURE 5)

1. **None**. This means Automatic Delay Compensation can't be activated. In this image, this is the current mode, as indicated by a checkmark.

2. **Short (1023 Samples per Channel)**. This will enable ADC to compensate to up to 1,023 samples of plug-in latency per signal path. This is often adequate and has the advantage of keeping the overall system latency low—especially important when syncing ProTools with external devices like video decks.

3. **Long (4095 Samples per Channel)**. This is a good choice if you're going to use a good deal of plug-ins and virtual instruments. It does mean your overall system can get a little delayed in its playback, but it doesn't make a real difference if you're not synchronized to external devices.

4. **Maximum (16383 Samples per Channel)**. This is a new option in ProTools 10, and is designed for really big mixes, using a large number of inserts per channel. If you make changes to the Delay Compensation Engine, you'll see a

notification that Pro Tools must save, close, and then reopen your session to apply the changes you've made. You have the option of canceling your changes at this point if you don't want to save your session.

Once you have set things up in the Playback Engine dialog box, you can enable and disable ADC from the Options menu:

(SEE FIGURE 6)

1. Click on the **Options menu**.

2. **Choose Delay Compensation**. When it's active, you'll see a checkmark next to the menu item.
You're pretty much done at this point, and can mix secure in the knowledge that your audio is all sample-aligned. There are just a few other tidbits that will come in useful:

(SEE FIGURE 7)

1. In the Session Setup window (which you saw in the previous section, when we talked about pan depth), you'll see a System Delay value if ADC is active. This value represents the delay caused by ADC plus the delay of your audio interface. This data is invaluable when synchronizing with an external device. You can compensate for this delay in the Sync Setup & Timecode Offsets section of the Session Setup window.

2. By default, your delay values will be shown in Pro Tools in samples, but you have the option of viewing them in milliseconds instead. Just go to the Preferences dialog box (from the Setup menu) and from there to the Operations tab.

(SEE FIGURE 8)

You'll find the Delay Compensation Time Mode drop-down list in the lower-right corner of this page; just click on the list and choose the time scale you want to use (samples or milliseconds). Note that this preference will not be visible unless Automatic Delay Compensation is enabled in your session.

You can easily see what's going on in your session by taking a look at what ADC is doing on a track-by-track basis. There are two ways to show the Delay Compensation view in your Mix window:

From the View menu, choose Mix Window Views. From there, choose Delay Compensation.

Click on the Mix Window View button (in the bottom-left corner of the Mix window) and choose Delay Compensation from the menu.
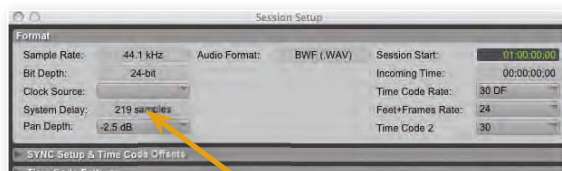
Fig. 6

Fig. 7

Fig. 8

Pro Tools® MIXER TIPS

2. Event and Warp Markers
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You'll then see a display at the bottom of each track in your Mix window, displaying a variety of useful information:

(SEE FIGURE 9)

1. The top section will show you the original latency of each track. In this image, the first and third tracks have no plug-ins instantiated, and therefore no latency. The second track, however, has some plug-in latency (quite a bit actually—1,024 samples!).

2. The middle section enables you to manually add or subtract from this value, effectively nudging the audio forward or backward in time. It's rarely used, but if you need to tweak a particular track's timing, you have the power to do it here.

3. The bottom section will tell you the amount of latency that's been added by the Delay Compensation Engine. In this example, 1,024 samples of latency had to be added to the first and third tracks to keep them perfectly lined up with the middle track.

Clipping the ADC

Although it's pretty tough to do, it is possible to accumulate more plug-in latency than the Delay Compensation Engine can compensate for. You can see if you're exceeding the capacity of your ADC in two places:

(SEE FIGURE 10)

1. If a track is clipping the ADC, the displays in its Delay Compensation section will appear red.

In the counter display section of the Edit window, Dly appear (in the lower-right section) whenever Delay Compensation is activated. If the letters are green, all is well, but if Dly is shown in red type, that means you've clipped at least one track and the Delay Compensation Engine can no longer keep all your audio in perfect synchronization. **(SEE FIGURE 11)**

Delay Compensation and Recording

The Delay Compensation Engine operates by adding delay to your session's tracks. When you're recording, you might think this'll create some issues! This usually isn't a problem, though—the Delay Compensation Engine is automatically bypassed on recording tracks, and recorded audio and MIDI is time-aligned with the rest of the session once a recording pass is finished. ⊕

Fig. 9

Fig. 10

Fig. 11

INDIE MUSIC AND THE CD

THE LOVE AFFAIR CONTINUES

As the world of digital music continues to evolve, the CD format has been riding a roller coaster. CD album sales were up in 2011 and trended down in 2012, but with figures exceeding 300 million units sold in the U.S. alone in 2012, it's clear the CD is still a beloved medium for music lovers.

The fact is, the trends that play out in regard to major-label sales never hold true for independent artists, anyway. CD sales at live shows have continually provided income and exposure for independent musicians, and indie demands have continually sustained (and have even grown) the CD market. In fact, Disc Makers, the largest independent CD manufacturer in the U.S., had a record breaking month in October 2012. That month marked the most CDs manufactured by the company in its entire history, with a 16% increase over October 2011, and 9% more than any month ever recorded. More independent artists ordered more CDs than ever, and there are plenty of reasons why.

When moved by a performance or turned on to a new band, people want a way to take the music home with them, and CDs are the most widely accepted format with which to do this. In addition to their universal playability, CDs offer artists the ability to express themselves through packaging choices and design. The music industry has always been driven by image-conscious consumers, so the ability to distinguish oneself from, or align oneself with, a style, crowd, or movement can be an important factor.

Not to mention, there is a huge segment of people who don't do digital, or who simply want a physical product in exchange for their money. Physical CD sales still outnumber album downloads nearly 3 to 1, and that gap isn't narrowing as quickly as some would have you believe, especially in the independent music world. As much as 75% of indie music revenue comes from CD sales, and an independent artist makes more money selling CDs at gigs or on CD Baby than selling downloads.

Luckily for the independent musician, both CDs and downloads are great revenue generators. In fact, it takes the availability and advertising of both formats to successfully sell music in today's marketplace. By providing different options, artists offer a choice to the music buyer to make decisions that fit comfortably with their listening habits. In other words, give the customers what they want, and in this day and age, some want CDs, some want downloads, and some want both.

Let's not also forget that when it comes to audio fidelity, a compressed music file is no match for what you get on a CD. MP3s use high compression rates to break down files so they take up less space on portable music players and computers, and as a result, the audio fidelity is compromised. There are discerning fans out there who want their music to be of the highest quality, and offering CDs lets them buy your music at the highest level of clarity and fidelity available. Plus, once they have the CD, they can always import it for use on their portable music players.

The truth is, CDs and digital downloads work well in conjunction with each other. CDs sold at live shows can help drive fans to an artist's website, where they often have the option of downloading more songs. By promoting themselves online – possibly with a free download – artists give fans an opportunity to get to know them better and share digital files with friends, increasing the potential for growing a fan base. And, of course, the more fans an artist has, the more CDs and downloads they'll sell.

Then, since fans have your CD, why not autograph it for them? CDs give consumers a physical reminder of your show and your band. People inherently love the tactile quality of a CD, it makes them feel better about having spent their money when they have something tangible they can show for it.

In the end, it is in the best interest of an artist to provide music in as many formats as he or she can to ensure that fans are offered the option that best suits them. The savvy independent artist recognizes this and will take full advantage of every format the market supports.

CHOOSE YOUR CD MANUFACTURER WISELY

Open any musician trade magazine or do an online search and you'll find dozens of CD manufacturers. The competing offers and promises can be bewildering, and the jargon they use, such as "backprint," "glass master," and "four-color printing" is tossed around as if every reader has worked in a manufacturing plant. To further complicate things, one ad may offer a deal on quantity, another on design, another on a package deal... how do you compare the offers? Let's take some of the mystery out of the CD manufacturing business to help you make the best decision.

First, all legitimate manufacturers offer free catalogs or brochures with pricing and product information. Gather materials from several companies to start comparison shopping, and look beyond the hype.

COMPARE DETAILS:

● Are they all full-service plants that will create a production master from your CD-R, or are they expecting you to provide less common, disc image files like a PMCD or DDP for your audio master? You may find that the inexpensive advertised price is based on a supplied master in a format you can't easily produce, and you would be much better off with a full-service manufacturer who can work with your design and audio in formats you're familiar with.

● Are the manufacturers on your list typically handling runs of 10,000 units or more? If so, your smaller project will sit on the sideline while their major label and larger clients' projects head to production.

● Are prices clearly marked, without a lot of fine-print additions that will drive up your final cost? Do they provide free templates for your art files?

● You want a company that will manufacture a major-label-quality product. Have they won awards in design or printing? Are the samples appealing and professional-looking? Do they have client testimonials and a list of well-known clients?

● Do they offer a full range of products, services, and promotional materials, or will you have to put together a patchwork quilt of companies to fill your order?

● How long have they been in business? Are they financially stable or could they go under before your album is finished? (It's not uncommon for bargain-basement manufacturers to declare bankruptcy, fail to deliver product, and lose a precious audio master in the process.)

● Is the work done in-house to ensure fast turnaround and quality control, or is everything outsourced to who-knows-where?

● What about after you get your CDs? Do they offer help with distribution and promotion? Are they set up to quickly process re-orders when you need to replenish your stock?

● Do they offer a 100% satisfaction guarantee?

DETERMINE YOUR NEEDS. Ask yourself the following questions:

● What medium will your master be on (CD-R, digital file upload)?

● Will you supply finished art files formatted properly in the manufacturer's templates, or will you ask them to design your project?

● How many pages of a CD booklet or folder will you need to get your message across?

● Aside from CDs, what other products will you need? How about posters, stickers, and postcards?

Knowing this information will help you further narrow the field of manufacturers.

GET REALISTIC ESTIMATES. Next, get a realistic price and turnaround estimate from prospective providers. Remember, if you are using a broker, he/she may have no control over the turnaround time.

BEWARE OF PITFALLS. Even after selecting a manufacturing house, beware of pitfalls. Don't assume everything will go smoothly, especially if you are working with a low-price provider. Don't be afraid to call your representative if you haven't heard from him or her in a while. If the job is going well, you will feel reassured, but if it slipped through the cracks, your call will put it back on track.

CHECK YOUR PROOFS. Make sure you are given audio and design proofs and check them carefully. Make sure every word is spelled properly, that the song sequence on your design matches your audio, and that it is laid out properly. Listen to your audio tests without interruption, checking for any audible anomalies that were not present on your original master. If you are paying for post-production (mastering) services, make sure you are satisfied with the adjustments that were made. Be careful: the approval process is your last opportunity to catch mistakes. If you overlook any errors at this stage (even if they were made by the manufacturer), they will end up on your final product. Once everything is to your satisfaction, approve your proofs promptly – delay here will only delay the final delivery of your project.

PAY ATTENTION TO TAX, FREIGHT, AND OVER/UNDER-RUN COSTS. Depending on where you live (or ship your merchandise), local sales tax and/or freight fees may be added. If your manufacturer has a good quality control program, a certain number of "overs" (up to 10% is standard) will be produced so substandard pieces can be rejected without reducing your order. Find out beforehand how much overs could cost you and budget accordingly.

DON'T CONFUSE VALUE WITH ECONOMY. In manufacturing, your decision comes down to who will provide you with the most value for your purchase. Of course, how you define value is up to you. Helpful customer service, high quality control, quick turnaround, additional services (i.e. distribution, a UPC bar code, free marketing and promotion guides, a guarantee of customer satisfaction, free master screening, additional print materials, etc.), location, and one-stop convenience fit into the picture every bit as much as the price.

DON'T CUT CORNERS. It's a common mistake for musicians, many of who have spent more time and money in the studio than they expected, to try to cut corners in manufacturing. Don't sabotage your release just to save a few bucks. This is a major purchase, one with a big impact on your career. While a reasonable price is important, you really do get what you pay for.

1. Edit Playlists and Track Comping

From time to time, you'll hear the term "workflow" bandied about in audio production circles. Essentially a workflow is the succession of many small steps that are taken in a certain sequence to achieve a certain end result. Over the years, Avid has been focusing more and more on refining common workflows, one of which being a thing called "track comping"—the combination of different recorded takes to create the best final track possible.

Pro Tools' recent advances in the area of track comping work hand in hand with another powerful feature called "Edit Playlists". This section will take a close look at both features and how to take full advantage of their power.

Fig. 1

2. Edit Playlists

An *edit playlist* is perhaps best defined as a sequence of clips on a track. For example, any given mono Audio track may have clips that sound like anything (music, dialog, sound effects, etc.). The track is the same; only the edit playlist is different. Although edit playlists are among the most unsung of Pro Tools' features, they're easy to use. Better still, there's no limit to the number of edit playlists you can have, so if you know how to use playlists, you have a whole new dimension of editing flexibility to work with.

Fig. 2

1.

Here's an example of how edit playlists can be used. (SEE FIGURE 1)

The track shown here is a mono Audio track with two guitar clips on it. Normally, we would say that the track name is Guitar, but that's not 100-percent accurate. It is actually more technically accurate to say that the edit playlist's name is Guitar and describes the sequence of audio clips on this track.

Fig. 3

2.

Suppose we want to make a few changes on this track but keep the original version as well. No problem—that's just what edit playlists are good at!

1. **Click** the **Playlist selector button** on the track you want to change. (SEE FIGURE 2)

(From here on out, I'll call this the *Playlist button* for simplicity's sake.) A menu will appear. (SEE FIGURE 3)

2. Because in this case we want to make a change on an existing playlist, **choose** the **Duplicate menu item**. Effectively, what you'll be doing is copying this sequence of clips. A dialog box in which you can name your duplicated playlist will appear. (SEE FIGURE 4)

3. **4.**

Fig. 4

Fig. 5

1.   **2.**

Fig. 6

Fig. 7

Fig. 8

1.

Fig. 9

2.
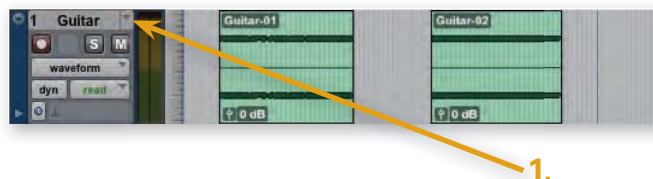
Duplicate Playlist Shortcut

Instead of using the edit playlist menu, you can press Control+Command+\ (Mac) or Start+Ctrl+\ (PC) after selecting a track.
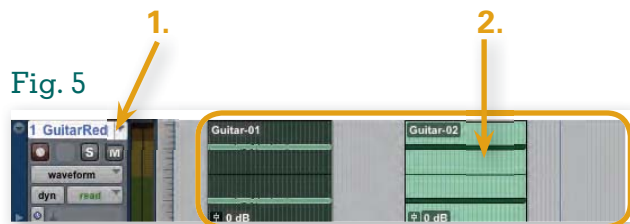
3. **Type** a descriptive **name** for your duplicate playlist.

4. **Click** on the **OK button**. The dialog box will close, and your new playlist will be created.
(SEE FIGURE 5)

1. Notice that your track name (which you now know is actually the edit playlist name) has changed to match your new edit playlist.

2. Now you're free to make whatever changes you like to your clips (in this case, I'll delete the first clip).
Here's the coolest part: You can change between playlists anytime and compare the two different edits!
(SEE FIGURE 6)

1. Now, if you click the Playlist button, you'll see both of the edit playlists that you've created, and you can choose the desired one at any time—even during playback! Edit playlists are a great way to explore different creative directions and compare multiple versions.

Of course, you can use edit playlists for more than just creating multiple versions of a given track. If you like, you can create entirely different playlists on a given track.

Let's try a different scenario: Again, we have a mono Audio track, this one with one bass solo clip on it.
(SEE FIGURE 7)

The edit playlist's name (which we commonly would refer to as the track name) is Bass Solo. What if we wanted to try something completely different on this track?
(SEE FIGURE 8)

1. **Click** on the **Playlist button**. The edit playlist menu will appear.
(SEE FIGURE 9)

2. In this case, we want to create a blank playlist—one with no clips on it—so that we can do something completely different. **Click** on **New** to do this. A dialog box in which you can name your new playlist will open.

2. Edit Playlists CONT.

New Playlist Shortcut

Instead of using the edit playlist menu, you can press Control+\ (Mac) or Start+\ (PC) after selecting a track. (SEE FIGURE **10**)

3. **Type** a descriptive **name** for your new playlist. (In this case, I typed Sax Solo.)

4. **Click** on the **OK button.** The dialog box will close, and your new playlist will be created. (SEE FIGURE **11**)

We still have our mono Audio track, but now we have one with a brand-new edit playlist—a blank track ready for us to work with. In this particular case, I would record my saxophone solo on this track. (SEE FIGURE **12**)

Once you've recorded your sax solo, you can switch between the different edit playlists by again clicking on the Playlist button. You can change between the edit playlists at any time, even during playback, so that you can determine which fits best.

3. Track-Comping Tools

Let's say you've just finished multiple takes of a section (either by recording a number of times or though loop recording). In most cases, the next step is to compile a final track that includes the best parts of each take. This process is called *comping* a track, and it is one of the cornerstones of professional editing.

As with many other processes in Pro Tools, there are a number of ways to comp a track, with different methods appropriate for different situations. However, some relatively new features in Pro Tools (added in Pro Tools version 8) have revolutionized the way Pro Tools editors assemble a comped track.

This workflow relies heavily on the knowledge you've just gained about edit playlists. Essentially, what we'll be doing is putting the best parts of the different takes, each of which will reside on individual edit playlists, to a blank track (which you now know is simply an edit playlist with no clips on it). How you record your individual takes is important; it will enable you to utilize these new track-comping tools during the editing phase of your process, so let's start there. If you're recording multiple takes *without* loop recording:

Fig. 10

Fig. 11
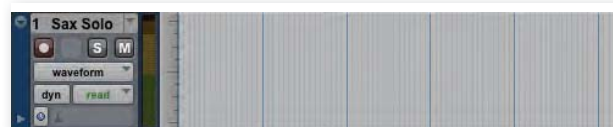
Fig. 12

Fig. 13
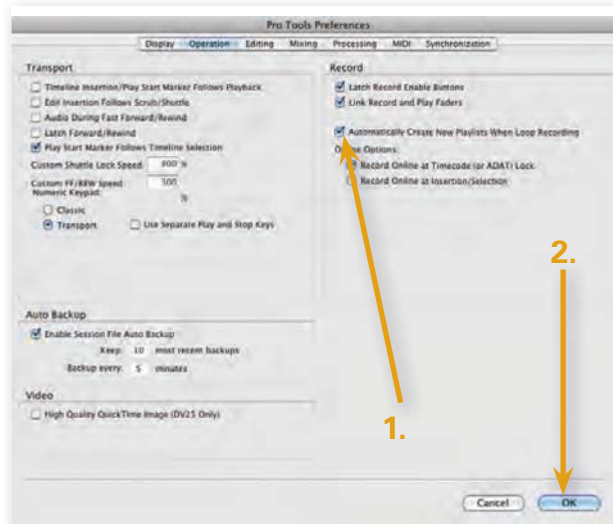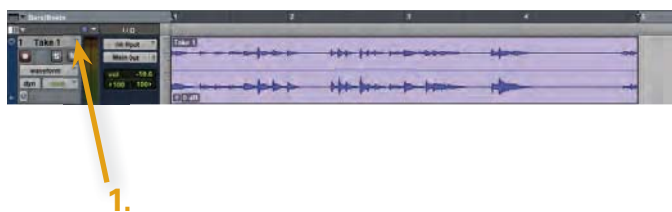
1. **Record** the **first take** normally.

2. Before recording the second take, **create** a **new edit playlist** (using the steps outlined in the previous section). The track will now be empty, because the first take's clip resides on a different edit playlist.

3. **Record** the **second take** normally.

4. For each additional take, **create** a **new edit playlist** before recording. This will ensure that each recording pass will be represented individually on its own edit playlist.

If you are recording multiple takes *with* loop recording: (SEE FIGURE **13**)

1. In the Preferences dialog box (which you access from the Setup menu), **click** the **Operation tab** and **check** the **Automatically Create New Playlists When Loop Recording checkbox**.

2. **Click** on the **OK button** to close the Preferences dialog box.

3. **Loop record** normally. (SEE FIGURE **14**)

In either case, you can access each individual take by clicking the Playlist button (again, as discussed in the previous section) and choosing the desired take from the list of edit playlists.

Fig. 14

Fig. 14

Fig. 15

Fig. 15

Fig. 16

Fig. 16

4. Viewing Playlists in the Edit Window

Now that you have all your takes separated into individual playlists, you can get down to some serious comping. In this example, we have a single mono Audio track, upon which was recorded four different takes of a keyboard solo. In this case, it doesn't matter whether we recorded the solo using Loop Record; our job is to pull out the best parts of each take and make a final comped track. (SEE FIGURE **15**)

1. **Click** the **Playlist button** to reveal a menu of edit playlists. As you've done before, you can choose the take you want to view. Once you see a take you like, you can select an area, copy it, change playlists, and paste the section to the new playlist. Although that's an effective way of editing, it's not the most efficient way of working. (SEE FIGURE **16**)

4. Viewing Playlists in the Edit Window CONT.

2. It would be great if we could see *all* the edit playlists for a given track at one time and create our comped track without having to switch playlists all the time. That's exactly what Pro Tools allows you to do. **Click** the **Track View selector** (which reads Waveform in this example) on the desired track. A menu will appear.

(SEE FIGURE 17)

3. Click the Playlists menu item. **(SEE FIGURE 18)**

In Playlists view, you'll see all the edit playlists associated with a given track, displayed as different lanes.

Working in Playlists view—especially when you're using this view with multiple tracks simultaneously—can result in a pretty complicated-looking Edit window. To let you know which lanes are associated with which tracks, alternate playlists lanes are indented (both in the playlist area and in the Tracks list).
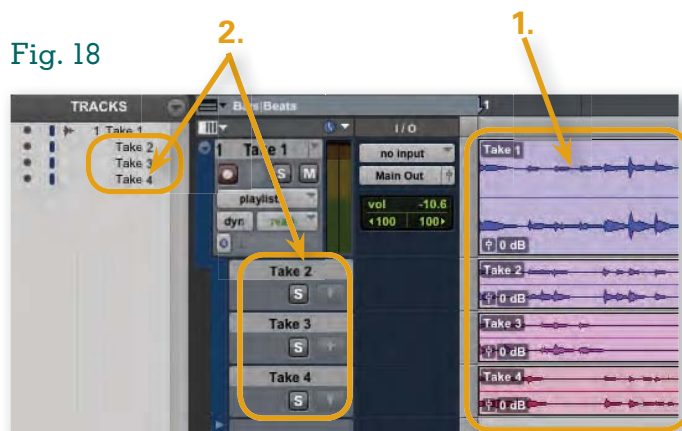
5. Basic Track Comping

Now the fun starts. The first thing to do is to create a *new* playlist, giving you a blank track to comp to. Playlists view makes this easy!

(SEE FIGURE 19)

1. Using the Grabber tool, **drag** the desired **clip(s)** to the empty lane at the bottom of the track. When the clip has been dragged to the proper place, you'll see an empty box. **Release** the **mouse button**, and the clip will be moved to a new playlist, leaving a blank area at the top for comping.

2. You can **double-click** on the track's **name** to rename the main playlist if you wish. Similarly, you can **click** on the **alternate playlists' names** to name individual takes.

3. You can **rearrange** the **alternate playlists** by clicking the playlist name and dragging it up and down, just as if you were rearranging tracks. If you're working with the tutorial session, you might want to rearrange your takes sequentially.

(SEE FIGURE 20)

4. To preview alternate playlists, **click** on the **Solo button** for the desired Playlist lane. The soloed playlist will be heard instead of the active edit playlist.

Fig. 17

Fig. 18

Fig. 19
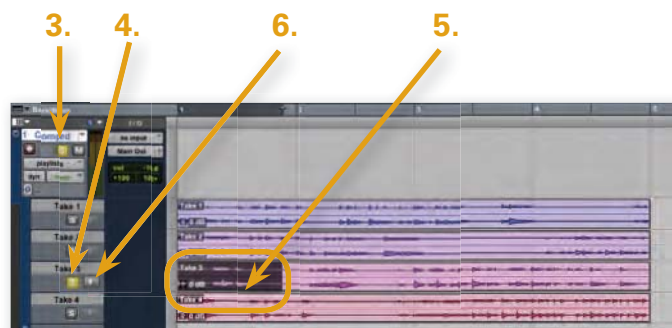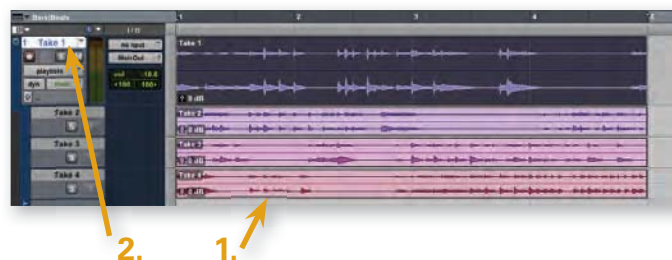
Fig. 20

Fig. 21
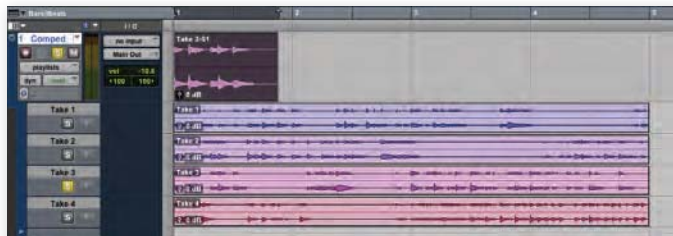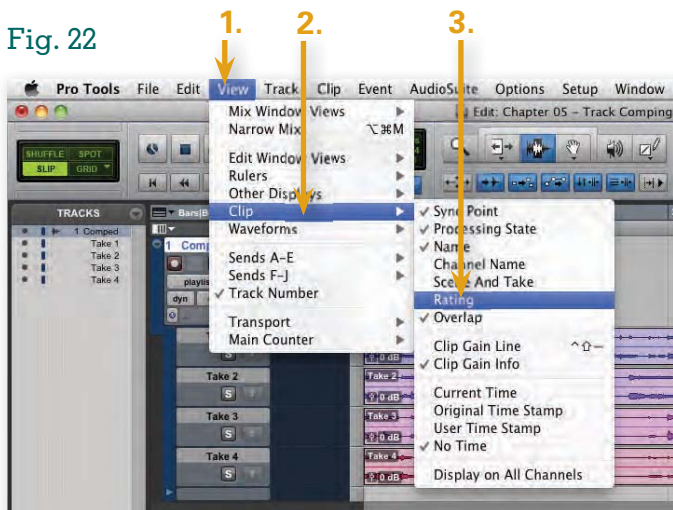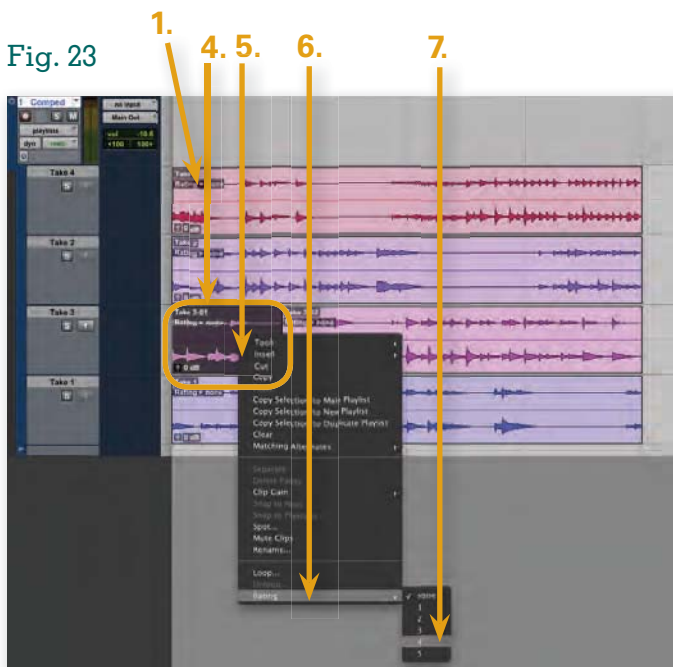
5. If you **click** on the track's main **Solo button**, all the other non-soloed tracks in your session will be muted.

6. With the Selector tool, **mark** an **area** that you wish to use in your comped track.

7. **Click** the **Copy Selection to Main Playlist button**. (SEE FIGURE **21**)

As you can see here, the selected area has been copied from the original playlist and automatically pasted to the main playlist. At this point, you can audition other sections, pick your favorites, and send them from the alternate playlist to the comped track playlist as well, creating a new track that represents the best parts of each take. Because this is all nondestructive, you can still adjust boundaries with the Trim tool or move segments around with the Grabber tool. If a particular transition from one clip to another is abrupt, you can use crossfades to smooth things out. (You'll learn more about crossfades in the next chapter.)

Comping Shortcut

Instead of clicking the Copy Selection to Main Playlist button, you can press Control+Option+V (Mac) or Start+Alt+V (PC) after selecting an area on a Playlist lane to paste the selected area in the main edit playlist.

Fig. 22

6. Beyond The Basics

As if this radical improvement in the editing process wasn't enough, Pro Tools has more ways to organize and view your takes!

Clip Ratings

In the preceding example, we had four takes. In a normal comping situation, you might have dozens! It might be hard to believe, but the mere act of separating the good takes and sections from the bad is often an important and time-saving step. Pro Tools has some important features to help with this as well, in the form of clip rating.

The first thing to do is make sure you can *see* the ratings of clips. (SEE FIGURE **22**)

Fig. 23

1. **Click** on **View**. The View menu will appear.

2. **Click** on **Clip**. The Clip submenu will appear, showing different display options for clips.

3. As with other menus you've seen so far, aspects that are shown are indicated with a checkmark. Because we want to see clips' ratings, **click** the **Rating menu item** to check it (assuming that it's not already checked). (SEE FIGURE **23**)

6. Beyond The Basics CONT.

1. You'll see that all the clips on your track show an initial ranking of none.

4. When you find a section of a clip that you want to rank, simply **separate** the **section**, creating a new clip. This new clip also has an initial ranking of none.

5. **Right-click** the **clip** you want to rank. A menu will appear.

6. **Choose** the **Rating menu item**. The Rating submenu will appear.

7. **Choose** the desired **ranking** for the clip. It's up to you whether 5 or 1 is the best ranking, but it's important to be consistent with your method.

Rating Shortcut

Instead of right-clicking the clip to rank it, you can press Control+Option+Command+[number from 1=5 (Mac) or Ctrl+Start+Alt+[number from 1=5 (PC) after selecting a clip.

Filtering Lanes

When you've picked out the best takes, you can show only the lanes containing good takes and hide the lanes that you don't want to include in the comping process.
(SEE FIGURE 24)

1. **Right-click** the **name** of any lane. A menu will appear.

2. **Choose** the **Filter Lanes menu item**. The Filter Lanes submenu will appear.

3. In this menu, you can **show or hide** all **lanes** or show/hide lanes based on their ranking. Here's where your ranking system will make a difference:
(SEE FIGURE 25)

If your ranking system is set up so that your best takes are ranked higher (the best being ranked a 5), you'll want to choose Show Only Lanes With and then choose Clips Rated >= 1-5. In this case, I've chosen 3, which means only lanes with clips ranked 3, 4, or 5 will be shown.
(SEE FIGURE 26)

2. If your ranking system is set up so that your best takes are ranked lower (the best being ranked a 1), you'll want to choose Hide Only Lanes With and then choose Clips Rated >= 1-5. In this case, I've chosen 3, which means only lanes with clips ranked 3, 2, or 1 will be shown. 🎵

Fig. 24

Fig. 25

Fig. 26

PROCESSING IN THE BOX

Techniques for incorporating effects while recording in your DAW

Linkin Park's Mike Shinoda at a workstation in NRG Studios in Hollywood.

IT MAY NOT BE OBVIOUS, BUT WHEN YOU RECORD INTO MOST DAW software, any plug-ins that you insert in an audio track are in the *monitor* path. They affect *playback* of audio, and not the file that is being *written* onto disk. For example, when you apply EQ to a track during recording, that EQ affects only what you hear in the monitors. Furthermore, when recording guitar or bass tracks using amp simulator plug-ins, you are *always* recording unprocessed instruments and not committing "your sound" to the audio files.

This "nondestructive" processing means good news and bad news. The good news is that you have the option at any time to remove or alter that plug-in or amp simulation simply by removing or bypassing it. The bad news is that if you spend a lot of time working on the sound, and then for some reason it changes or you lose it (maybe the session crashes), you will have to manually re-create it. (Note: One of the great things about recording guitar or bass using an amp simulator plug-in is that—the recorded file preserves the unprocessed sound of the instrument—you have the flexibility to change the tone later in the production. You can even split the guitar output while tracking, then route it separately into the session and to a real amp for monitoring. This configuration lets you hear and interact with your amp for sustain, etc. while recording, but still gives you the option of re-amping the dry track later on.)

Computer crashes notwithstanding, there are several valid reasons for committing an effect to the recorded file. You may be recording on someone else's DAW and they have plug-ins (or hardware processors) you don't own. If you save the session with their plug-ins and take it back to work with it in your studio, those plug-ins will be inactive, making your session sound different. As you're probably aware, plug-ins consume DSP resources. The more plug-ins you use, the more DSP resources are required, whether the DSP is happening on the host processor ("native") or on a processing card such as an HD Core or HD Accel card ("TDM"). By recording the plug-in to the audio file, you can later play back the track *without* instantiating the plug-in, which frees up DSP. If you are "old school" and grew up EQ-ing to tape, you may feel comfortable "printing" EQ and/or effects.

I have no problem EQing or compressing to tape, but I have never been comfortable recording echo or reverb into a sound file because such effects are very difficult to "undo." If you're concerned with running out of the horsepower required for quality 'verbs, we'll examine ways you can record reverb (or echo) onto separate audio tracks to free up DSP. During the early days of my recording career, I worked with a singer who insisted that we record his lead vocal track with his favorite echo. It always freaked me out. When the track was isolated you could hear discontinuity in the echo where we punched. Fortunately most of it was masked when the vocal track was placed in the mix.

DON'T BE LATE!
Some of the ideas that follow can cause latency when used with certain combinations of CPU, software, track count, and plug-ins.

BY STEVE LA CERRA

MOD DELAY III

(As a refresher, latency is the slight delay introduced when a sound is routed into a DAW, through a record-enabled track, the back to the monitor output.) Latency can affect a performance, so you may need to play with the allocation of resources such as buffer size and/or number of processors dedicated to the audio app in an effort to make latency tolerable. (This will be system-dependent.)

It pays to be up-to-date on the latest drivers for your hardware, and if multiple drivers are supported), it's worth trying *all* of them to see if one may outperform the others. Some audio interfaces eliminate latency by routing the input signal directly to a separate monitor output as well as into the computer. This is known as "zero-latency monitoring" and may be enhanced by the interface's ability to provide DSP-based reverb (or other effects) for the monitor path. Keep in mind that these effects too, are not being recorded to the file.

One more important point: If you record with a compression *plug-in*, you are *not* compressing the input to your audio interface, which means you still need to set your input level with care. Compressing via plug-in while recording can help even out the *dynamics* of a track but—unlike using an analog compressor after the mic preamp—it will absolutely *not* keep the input of your audio interface from *clipping*. If your goal is to do the latter, you'll need to patch a hardware compressor into the signal chain between the mic pre and audio interface. (More about this later.)

SOFTWARE SETUP

Here's how to record plug-ins into your DAW. When you are ready to record a new track, you add two new tracks to the session: one aux track and one audio track. The live signal is routed to the aux track, not the audio track. The output of the aux track is set to a bus. Any unused bus will do, except the main L/R output bus that you use for monitoring. Set the input of the audio track to the same bus as the output of the aux track. The output of the

Fig 1. Recording an effect to a separate track.

audio track should be set to the "normal" monitor bus.

FEAR OF COMMITMENT

What if you like the idea of recording the effect (especially when you are visiting a friend who has a great reverb plug-in), but you don't want to marry the effect to the dry signal? Record the effect to a separate track. Here's how to record reverb to a separate track while recording a snare drum, shown in Pro Tools (see Figure 1).

First, add three tracks to the session: one mono audio track, one stereo aux track, and one stereo audio track. Route the snare microphone to the input of the mono audio track ("Snare Mic," framed in red) per "normal" procedure. Add an aux send on the snare track as shown. The output of our aux send is set to Bus 1-2. On the aux track ("Aux 1," framed in blue), the input is set to Bus 1-2, and a reverb plug-in is inserted. Make sure that the reverb is 100 percent "wet." We don't need any dry snare because we already have that on a separate track.

The output of the aux track is set to Bus 3-4. Input to the second audio track ("Reverb," framed in yellow) is set to Bus 3-4, and its output is set to Analog 1-2. The snare microphone comes into the first audio track. The main fader feeds the signal to the L/R mix. The aux send fader routes the snare to the aux track where it is processed with reverb. This processed signal is routed to another audio track and recorded. Note that the aux send is set to pre-fader (notice the "P" highlighted in blue to the right of the small fader), so you can adjust the level of the snare without changing the level being recorded on the reverb track. It's also worth noting that this type of routing can add a few milliseconds of latency, but we're talking about reverb here, so a few ms aren't going to hurt anyone.

Such additional routing can be scary if you are tracking a live session with a lot of instruments. You can always record the effect separately using the above routing after the session has been recorded. In fact, you can do this several times with different reverb or delay tracks, giving yourself or your client a few choices, plus you get the bonus of freeing up DSP resources. If you like that idea, entertain the idea of bouncing a track with effects over to a new audio track. Alternatively, you can "freeze" the track to accomplish the same thing, and freezing tracks (particularly instrument tracks) often frees up quite a bit of DSP resource. Once the new track is recorded, you can disable the plug-in on the original, mute the original, or even delete it.

PROCESSING USING OUTBOARD GEAR

There's a trend for audio interfaces to include insert points on the inputs, greatly simplifying the use of line-level processors when recording mic- or instrument-level signals. You'll probably need a TRS-to-dual-TS insert cable to accomplish this because invariably the insert will be send and return on a single TRS jack. Simply patch the interface's insert to the in and out of the processor, and the processor becomes part of the recording chain. Remember that anytime you involve a hardware processor with your DAW session, you must process and bounce in real time, even when using an external plug-in processor.

If you're lucky enough to have an arsenal of outboard mic pres, simply route the output of the pre into a compressor or EQ, etc., and then route the output of the processor to the input of your audio interface. The signal will be compressed or EQ'ed before it's recorded. You now have a reason to keep some of your old hardware around! ⊕