- Move sections of a loop.
- Or rearrange the notes in a loop.

See Chapter 9 for details.

Reusing an edited loop in a different song

The fact that you can't save edits to a loop in the Loop Browser makes it harder to use edited loops in another song. But you can reuse that edited loop if you like by following these steps:

1. **Open the song that contains the loop that you want to reuse.**
2. **Copy the loop region to the Clipboard by choosing Edit➪Copy or using the shortcut ⌘-C.**
3. **Open a different (or new) song, create the appropriate type of track for the loop (software or real instrument), and then paste it (choose Edit➪Paste or press ⌘-V) into that track.**

   It's cumbersome, yes, but it makes sense within GarageBand's consumer-friendly approach to recording music. You'll never screw up one of the loops that came with the program — because you can't.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

Chapter 6

Recording with MIDI and Software Instruments

In This Chapter

- Finding out what MIDI is
- Choosing software instruments
- Recording tracks with software instruments
- Altering the sound of software instruments

GarageBand is more than just a recording studio-in-a-box; it's also a pile of high-quality musical instruments-in-a-box, just waiting to be played. Pianos, guitars, drums, horns, synthesizers, and even a chorus of heavenly voices are included; you can use them any way you like in your musical compositions.

You can play the software instruments with the built-in on-screen keyboard (choose Window➪Keyboard or press ⌘-K), but if you're even half-serious about making music, you'll want to use a more piano-like MIDI keyboard, such as the $99 M-Audio Keystation 49e, which I mention in Chapter 2.

What Is MIDI, Anyway?

MIDI stands for Musical Instrument Digital Interface and is pronounced "Middy." The term covers a lot of ground, as you can see from this description by the MIDI Manufacturer's Association (`www.midi.org`):

> *The Musical Instrument Digital Interface (MIDI) enables people to use multimedia computers and electronic musical instruments to create, enjoy and learn about music. There are actually three components to MIDI, which are the communications Protocol (language), the Connector (hardware interface) and a distribution format called Standard MIDI Files.*

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

In other words, MIDI is a language, a hardware interface, and a file format. The language of MIDI allows different devices to talk to each other. The hardware interface sends and receives MIDI information between devices that speak MIDI. Finally, music that is made with MIDI can be saved in a file format that can be understood by other MIDI devices.

The upshot is that many different kinds of devices that you may use in audio (or video) production — such as keyboards, computers, mixing boards (control surfaces), and even lighting gear — can talk to each other in a common language.

Controlling Software Instruments with a MIDI Keyboard

While MIDI is a multiheaded beast, in the context of using GarageBand, I focus on using a MIDI keyboard to play (control) GarageBand's software instruments.

Note that word *control.* MIDI keyboards are more appropriately called controllers because you are using a familiar interface — a piano-like keyboard — to control the software instruments on your Mac.

And, in fact, a pure MIDI keyboard is just that — a controller — and is incapable of making any sound of its own. All it can do is send MIDI information to a MIDI host (usually your Mac), which translates the information into sound. To further complicate things, many MIDI keyboards are also synthesizers, which *can* produce sound on their own. But even if your MIDI keyboard makes sounds all by itself, for the purposes of this chapter, think of it as nothing more than a MIDI controller.

If your sound-making keyboard supports MIDI, you'll see two ports labeled something like MIDI In and MIDI Out. If so, you'll also need a MIDI interface — a small piece of hardware — to connect those MIDI In and MIDI Out ports on the instrument to the USB port on your Mac.

In the pre-MIDI era, when you played a synthesizer or electric organ, it didn't control anything but its own internal circuitry. So each keyboard device produced only the sounds that its internal circuits knew how to make. This is why an Arp sounded like an Arp, a Moog sounded like a Moog, and a Prophet 5 sounded like — you guessed it — a Prophet 5. And any artist worth his or her salt had a rack of different synthesizer keyboards for producing different sounds. We've come a long way since then; that rack of keyboards and much more are built right into your copy of GarageBand.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

Here's the bottom line: When you play a MIDI keyboard (controller), the keyboard isn't producing sound. It's noting the keys that you press and sending that information to your Mac, where GarageBand translates it and plays that sound with a software instrument. Conversely, when you strike a drum, the sound occurs when the drumstick hits the drumhead. When you play an electric guitar, the sound occurs when the pick or a finger strikes the strings and is captured "directly" by your Mac (see Chapter 8) or is fed through an amplifier. And, when you play a piano, the sound occurs when the hammers hit the strings.

MIDI controllers can also be used to control other keyboards or anything that's dedicated to the task of working with the MIDI protocol. For example, "MIDI work surfaces" look like miniature versions of a big-time mixing board, complete with sliding faders, rotating knobs, and VU meters with needles. You use these work surfaces to control audio applications such as Logic, Pro Tools, and others (but not GarageBand as of this writing, although I'm sure you'll see an inexpensive work surface for GarageBand soon).

I highly recommend using a MIDI keyboard if you are even half-serious about recording with GarageBand. For purposes of this chapter, I assume that you are using a USB keyboard like the M-Audio Keystation 49e keyboard ($99; www.m-audio.com) that John Mayer demonstrated when Steve Jobs introduced GarageBand at Macworld San Francisco 2004. You may even be able to find a MIDI keyboard that's cheaper, but you can't go wrong with the Keystation 49e for under $100. If you're not sure that you want to spring for a keyboard yet, don't forget the on-screen keyboard that Apple thoughtfully included. To activate it, choose Window➪Keyboard or press ⌘-K.

I can see that this is going to get confusing, so for the rest of the book, I'll refer to the keyboard on which you type letters and numbers as the "QWERTY keyboard." Keyboards that have black-and-white piano-like keys will be referred to as plain old "keyboards."

You can use a MIDI keyboard (or GarageBand's built-in on-screen keyboard) to play the more than 50 software instruments that come with GarageBand.

If 50 instruments aren't enough for you, Apple's GarageBand Jam Pack ($99) has over 100 additional instruments and 2,000 new loops. Or you can choose from the abundance of third-party loops and software instruments that are easily added to GarageBand — all you need is cash. (See Chapter 15 for more info.)

Choosing Software Instruments

To record a software instrument, you create a software instrument track and then choose the instrument for it.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

A software instrument may be more than one actual instrument. Drum kits, for example, contain 50 or 60 different drum, cymbal, and percussion instrument sounds, each triggered by a different key. So, for example, playing middle C triggers the sound of a kick drum, D triggers the sound of a snare drum, and D-sharp triggers the sound of a closed hi-hat.

Even though it contains 50 or 60 different instrument sounds, a drum kit is considered a single software instrument. In any case, a track *may* contain the sounds of many instruments, but they all have to be part of the same software instrument, like those 50 or 60 different drum sounds.

Make sure that the type of software instrument you use matches the track that you are recording on. When you select a software instrument for a track, that instrument will play the MIDI notes on that track, even if they're not the right notes for that instrument. In other words, you can do horrible things to a song if you're not paying attention and drag, say, a drum region onto a track that's assigned to a piano. The notes will play on the drum kit and not the piano; trust me, it'll sound bloody awful. Hey, it's just a dumb machine. It only does what it's told, and you told it to play drum music on a piano — so don't do that!

To set up a software instrument track, follow these steps:

1. **Create a new song (if you haven't already) by choosing File➪New or by clicking the Create New Song button (if it appears when you open GarageBand). If you have created a song, skip to Step 3.**
2. **When the Save As dialog box appears, save the song file.**

   See Chapter 4 for details about creating and saving a new song.
3. **In the lower-left corner of the main song window, create a new track by clicking the plus sign (+) below the track list, by choosing Track➪New Track, or by pressing ⌘-Option-N.**

   A new track appears with the New Track dialog box, as shown in Figure 6-1.
4. **Because this is the software instruments chapter, click the Software Instrument tab at the top of the New Track dialog box.**

   I talk about real instruments in Chapters 7 and 8.
5. **On the left side of the New Track dialog box, select the category of software instrument that you want.**
6. **On the right side, select the instruments in the category that you want to play.**

   When you choose a software instrument, note that the icon in the lower-left corner of the New Track dialog box changes and that each instrument (or instrument family) has a different icon. This should, in theory, help you keep track of what's in your track list.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

You can change the icon by clicking it in the New Track dialog box (or the Track Info window) and dragging it. A window that's full of additional icons appears. Drag to select the one that's appropriate, and then release the mouse button.

7. **To see what the instrument you selected sounds like, play any note on your keyboard.**

   Don't be too quick to click the OK button; you can try out as many instruments as you like before you click OK.

   You can use the up-, down-, left-, and right-arrow keys on your QWERTY keyboard to quickly change instruments.

8. **When you're happy with your instrument selection, click the OK button.**

   You're now ready to record a track with this instrument. You can find the details about recording tracks in the next section.

Figure 6-1: Choose a software instrument.

Or, if you decide that you want to try a different software instrument (even if you have already recorded on the track), follow these steps:

1. **Open the Track Info window by double-clicking the track name, by choosing Track➪Show/Hide Track Info, or by pressing ⌘-I.**

   The Track Info window looks like the New Track dialog box, with some additional settings. I talk about that in a moment; for now, the important thing is to understand that you can choose another software instrument.

2. **Choose a different instrument by clicking its name in the rightmost column.**

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

You can preview your selection in the Track Info window by playing a note or notes on your keyboard. In fact, you can leave the Track Info window open while you record, mix, or master. If you're experimenting with different instrument sounds, leaving the window open is incredibly handy.

The change occurs as soon as you click the new instrument name and your track instantly sounds different — perhaps completely different.

Recording Tracks with Software Instruments

After you create a new track and select a software instrument (see the previous section), you're ready to move on to the fun stuff — recording some music.

The funny thing is, this is either the hard part or the easy part, depending on your musical chops. If you know your way around a keyboard, you'll probably find it very easy to record a software instrument in GarageBand. Even if you simply have a bit of theoretical knowledge, it will likely be a snap. But even if you don't have a shred of musical talent, it won't take long for you to figure out enough to make music, as long as you take the time to experiment.

GarageBand's software instruments can sound like a million bucks — or like a million cats fighting. In the immortal words of Peter Parker (also known as Spiderman), "With great power comes great responsibility." You hold the power of an orchestra in your hand; please don't abuse it.

After you have created the track and chosen the software instrument, you're ready to rock.

To practice, just play your keyboard with the appropriate track selected. Because you are probably going to want to practice before laying down a new track, you can either play solo (without clicking the Play button), or you can click the Play button to play along with other tracks or loops in the project.

The selected track will be recorded. If you don't hear what you expect, make sure that you have the proper track selected and that no tracks have their Solo or Mute button activated. If you don't hear what you expected to hear, the Solo or Mute button is often the culprit.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

If a track's Solo button is activated, you hear only that track during recording and playback; if a track's Mute button is activated, you do not hear that track during recording and playback.

To record a track, follow these steps:

1. **Move the playhead to the point in your song where you want to record or press Home to move the playhead to the beginning of the song.**

   GarageBand offers two features to help you record — the Metronome and a Count In.

   With the Metronome on, you hear a soft click marking the beat of your song. (The sound of the Metronome is never recorded.)

   You can hear the Metronome on playback only or on record and playback. Make your choice in GarageBand preferences, as I discuss in Chapter 3.

2. **If you want to use the Metronome, choose Control➪Metronome or press ⌘-U.**

   The Metronome is a toggle; it's on when it has a check mark next to its name in the menu.

   The second useful feature for recording is the Count In. When you have it turned on, you get an additional measure counted out before GarageBand starts recording.

3. **If you want to use the Count In, choose Control➪Count In (there is no keyboard shortcut for this feature).**

   The Count In is a toggle; it's on when it has a check mark next to its name in the menu.

4. **Click the Record button (the red dot) or press R, and recording begins.**

That about covers it. As soon as you click the Record button or press R, GarageBand begins to record everything that you play on your keyboard. When you're done, click the Play/Pause button or slap the spacebar to end the recording.

Altering the Sound of Software Instruments

Apple made GarageBand incredibly powerful for a so-called "consumer" application. It could have gotten away with just the presets, but the company put in the power for those who need it. Ergo, GarageBand lets you edit software instrument presets to your heart's content to get a different sound.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

Some users will be perfectly happy with every software instrument just the way it sounds right out of the box; they'll never even click the Details triangle. But for the rest of us, Apple makes it easy to twiddle the sound of a software instrument, which can be a very good thing. If your drum track lacks bass, you can add more bass to it with an equalizer. If your piano doesn't sound like a piano, you can add echo, reverb, compression, and equalization effects until it sounds perfect to your ear. Almost anything you can think of doing to change the sound of an instrument can be done with the audio effects built into GarageBand.

This is a quick bird's-eye view of how to make the magic happen, for those of you who just can't wait. Don't worry if it seems daunting; you find out all about using those generators and effects in just a moment (and it's easy — all you need are your ears):

1. **Select the track you want to alter by clicking its name.**
2. **Open the track's Track Info window by double-clicking its name in the Tracks column, choosing Tracks➪Show Track Info, or using the keyboard shortcut, ⌘-I.**
3. **Click the triangle that's next to the word Details at the bottom of the window.**

   You reveal a dazzling array of options, including generators, compressors, equalizers, echo, reverb, and more. You discover more about these effects in the upcoming section, "Adding and changing effects."
4. **Choose a generator from the Generator menu and/or select the check boxes for the effects you want to enable.**

The next sections involve changing generator and effect presets, so please be careful! I know I've said it before, but since you're about to mess with the presets, I wanted to remind you that if you save any changes you make to the preset without changing its name, you're saving those changes permanently — and perhaps blowing away the hard work of those Apple employees who were paid to make the presets sound fabulous. So be careful when you save.

Tweaking an instrument's generator

The *generator* is the foundation for every software instrument. If you change the generator for a software instrument, you drastically alter the sound of the instrument. If you're looking for an unusual sound, one that you may not otherwise come across in GarageBand, changing a software instrument's generator is a good place to start.

As you can see in Figure 6-2, you have fewer than 20 generators.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

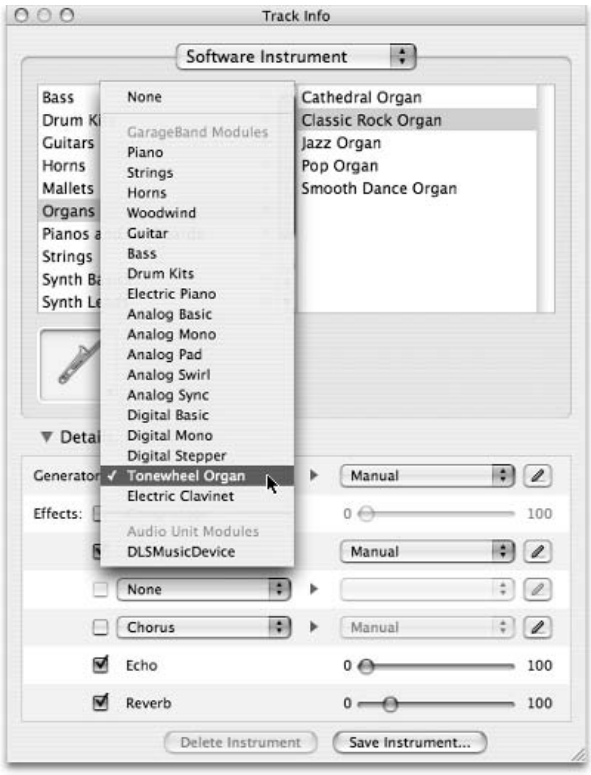

Figure 6-2: From piano to percussion instruments and from woodwinds to drum kits, each software instrument starts out with one of these generators.

Among the Generator and Effects options in the Track Info window, you can see some little triangles in the space between the two columns. Logically, you would expect that clicking a triangle would reveal additional options, but you would be wrong — clicking these triangles does nothing. As far as I can tell, they're just for decoration, which seems pretty lame to me.

To the right of the Generator menu is its Presets menu, which says, "Manual" in Figure 6-2. You choose the Generator from the menu on the left, and then choose a preset for that Generator from the menu on the right. The little pencil button, which I get to in a moment, opens the settings window for that generator.

Many presets have a name that's similar to the name of the software instrument; other preset names bear no relation whatsoever to the sound that you hear.

For example, Figure 6-3 shows the Preset menu for a Mallet instrument called "Aurora Bell." This instrument sounds more like an old clavinet or organ than any kind of bell, at least to me. And as you can see, it's built using the Digital Basic generator and the FM Polysynth preset, neither of which bring bells (or clavinets or organs, for that matter) to mind.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

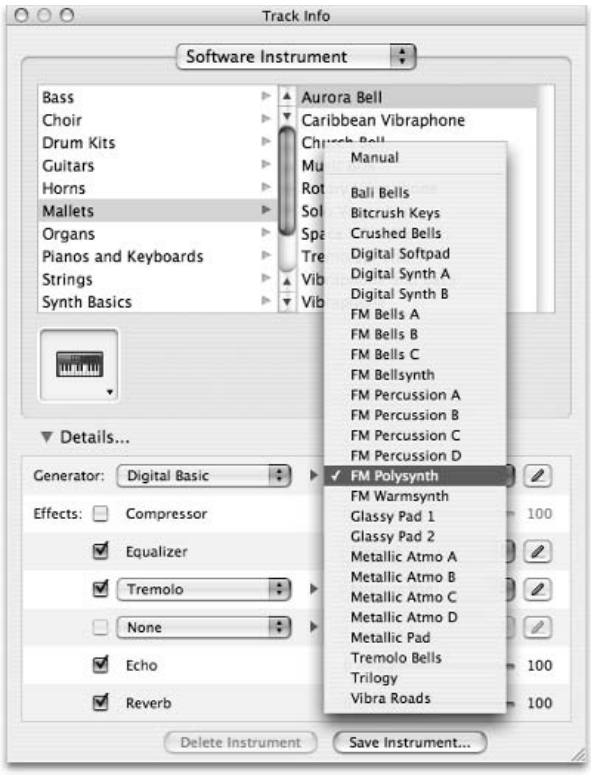

Figure 6-3: The menu to the right of the Generator menu offers presets for the chosen generator.

The point is that you really should try every preset, regardless of whether it has a dorky name. You never know which preset is going to be "the one," so here's a hint: It is frequently the one with a dorky name.

But wait, there's more! Do you see the little pencil icon? That's the Edit button for the preset. If you click the pencil button you can twiddle the settings for this preset.

Each instrument has a different group of attributes, and the controls offered by any preset may be specific to that instrument. So, for example, when you click the Edit button for a Generator (or an effect), you may see slider controls for Volume, Cutoff, and Release. Or you may find sliders for Mix, Tuning, and Harmonics, or Timbre, Attack, Decay, and Release. That's barely scratching the surface.

Alas, delving further into the details is beyond the purview of this book. Suffice it to say that if you want to tweak a software instrument, there's never a shortage of options. If you are looking for something completely different, play around with the generators and their presets.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

Adding and changing effects

Each instrument also has its own Effects settings, and like the Generators, each effect has its own preset menu and presets that can be edited as needed.

The four effects present (although not always turned on) on all software instruments are Compressor, Equalizer, Echo, and Reverb.

Compressor

The Compressor does just what its name suggests: It compresses sound. It's hard to explain what something sounds like using only words, so suffice it to say that compressing an instrument track is going to do something in between making it louder and making it more intense. Technically, it's making the softer passages louder and the loudest passages less loud. Unless you crank the Compressor to 100, its effect will be subtle, but if you have an instrument track with a lot of dynamic range, you should definitely add a little Compressor effect to it.

To adjust the Compressor, select or deselect the check box to turn it on or off. If it is turned on, you can adjust the intensity of the effect by moving the slider to the left (for less effect) or to the right (for more).

You may have to lower the volume level of the track as you increase the compression; just keep an eye on the LED lights and take the level down a notch or two if you start seeing red.

Equalizer

The Equalizer is like EQ on your home stereo or iTunes: It enables you to adjust the relative loudness of different parts of the sound spectrum. So, for example, if the cymbals on your drum track don't sizzle and hiss enough for your ears, try the Add Brightness preset, which will emphasize the high frequencies on the track. Or, if your software instrument guitar sounds wimpy to you, check out the Improve Guitars preset, which adds a bit of emphasis to both the low and high frequencies on the track.

GarageBand comes with a number of presets for EQ, as shown in Figure 6-4. In this case, the names are mostly descriptive.

In recording terms, brightness usually means treble; fullness usually refers to sounds in the middle ranges; and flat means neutral equalization for all frequencies.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

The best way to understand what each preset does to the sound of an instrument is to apply it to your own tracks. It's harmless — if you don't like the sound it creates, either choose a different preset or deselect the check box to turn the Equalizer off.

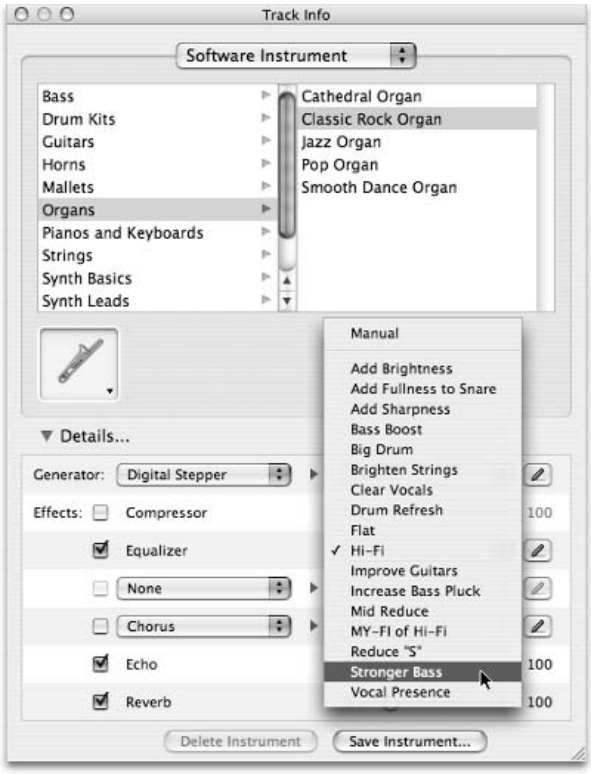

Figure 6-4: You can choose from a variety of presets for the EQ on your software instrument.

If none of the presets does the trick, GarageBand also offers manual adjustments for Bass Gain, Mid Gain, Mid Frequency, and Treble Gain, as shown in Figure 6-5. To access these settings, click the pencil icon that's next to the Preset menu.

The settings in the Equalizer window are as follows:

- **Bass Gain:** Boosts or cuts the low frequencies. You hear its effects most on the bass guitar (or string bass) and kick drum, which both contain a lot of low frequency information.
- **Mid Gain:** Boosts or cuts the midrange frequencies. You hear its effects on vocals, guitars, horns, strings, and almost everything.
- **Mid Frequency:** Sets the frequencies affected by the Mid Gain control; sliding the control towards Low chooses the lower midrange frequencies and sliding it towards High chooses higher midrange frequencies.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

- **Treble Gain:** Boosts or cuts the high frequencies. You hear its effects most on instruments that play in the higher registers, such as cymbals, flutes, and guitar solos.

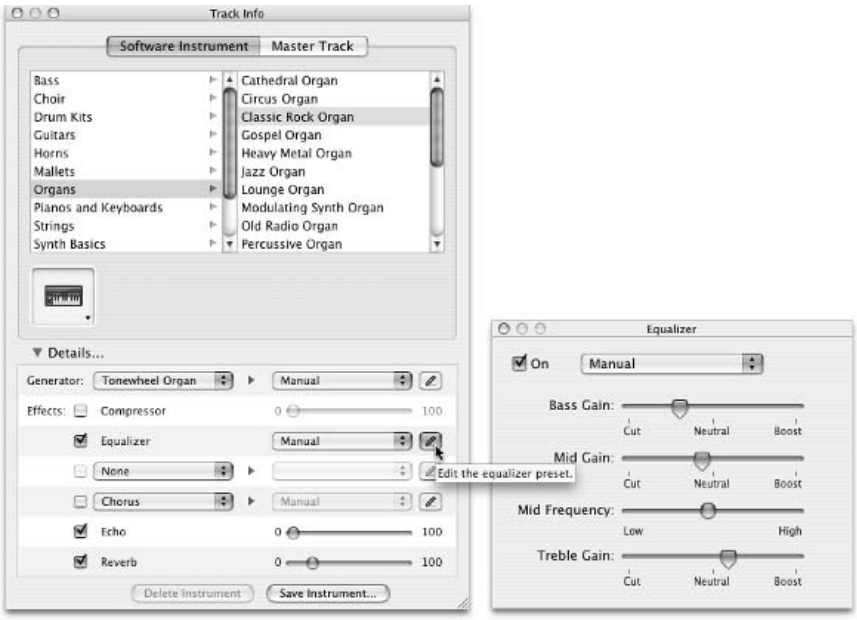

Figure 6-5: You can create manual settings on your equalizer by clicking the Edit button.

Echo

What what exactly exactly is is echo echo??

Hey, is there an echo in here? Okay, it's a groaner, but I couldn't resist. It's the easiest way that I know to explain the sound of echo.

Each software instrument can have an echo applied to it. When used judiciously, echo is a potent effect. And, as usual, GarageBand makes using this feature simple. Merely turn the Echo effect on or off by selecting or deselecting its check box. When Echo is on for a track, you can adjust its intensity from 0 to 100 using the slider.

Adjusting the intensity of the Echo effect can change how loud the echoes are and how long they last. Move the slider to the right, and the first echo is louder than the original note — and lasts for several echoes. Move it to the left, and the echo gets fainter.

You apply echo (and reverb) to make your track sound more lifelike and realistic. By adjusting echo (and reverb) you can simulate the sound of the instrument being played in a spacious cathedral or a sound-deadened recording studio. It's your call — let your ears be your guide.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

Reverb

Reverb is another important effect, perhaps the most-used in recording history. Reverb is technically a kind of echo, but it's more of a bouncing-off-the-walls-all-around-you sound than the repeated sound of echo.

Weird Al Yankovic recorded "Another One Rides the Bus" in a bathroom with just his accordion. In fact, recording engineers love bathrooms for recording because their hard surfaces give the recording a rich, warm, natural reverb. You can get the bathroom effect with GarageBand by cranking up the echo and the reverb.

Select or deselect the check box to turn Reverb on or off. The slider adjusts the intensity. The farther you move the slider to the right, the bigger the sound of the room. Slide it to the left, and you add just a bit of ambient reverb that makes many instruments sound more realistic.

The first electronically produced reverb effects used springs to create the reverberation effect. The effect was like listening in an enclosed room (like the aforementioned bathroom, only springier, or more accurately, more metallic). In fact, many early guitar amps had springs built in to provide that spring reverb sound. And many engineers use a bathroom as an isolation booth for a guitar amp. They run a long microphone cable into the bathroom and record the amp sitting in the middle of this very live room with all its hard surfaces and reverberation.

Other Effects

In addition to the Compressor, Equalizer, Echo, and Reverb effects, each software instrument can have one or two additional effects. In Figure 6-6, the Rotary Vibraphone has one effect applied — Bass Reduction — but look at all those other choices!

Of course, you can choose from the presets that each effect includes or you can click the pencil icon and create your own settings. As with the Generator menu, the settings for each effect may be specific to that particular effect, and some effects have fewer options than others.

For laughs, I added some distortion to Rotary Vibraphone, as shown in Figure 6-7.

If necessary, I can tweak Distortion 3 by clicking the Edit button and adjusting the sliders. Figure 6-8 shows the settings for the distortion effect.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

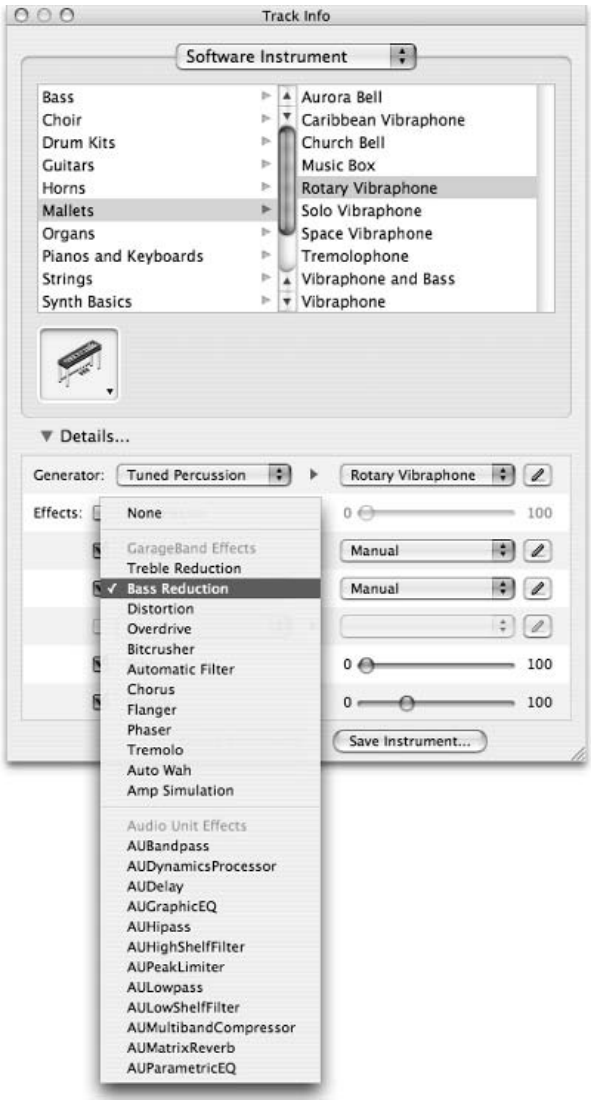

Figure 6-6: Use the two user-defined Effects menus to add additional effects to software instrument tracks.

Remember earlier in the chapter when I warned you about saving presets with a different name to avoid blowing away your Apple-created presets? Here's how you actually do it:

After you have made a manual adjustment, you can either leave it as manual or make it permanent by choosing Make Preset in the Preset menu, as I have done in Figure 6-9. Just change the preset name to something that's unique and easy to remember.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

Figure 6-7: Each effect comes with its own presets.

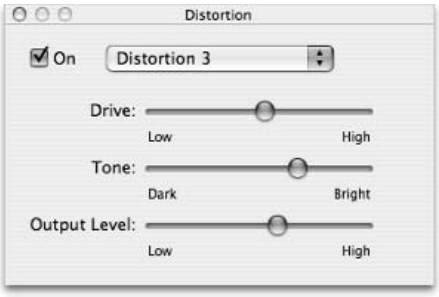

Figure 6-8: The settings for the Distortion 3 effect, which I can now edit if I choose.

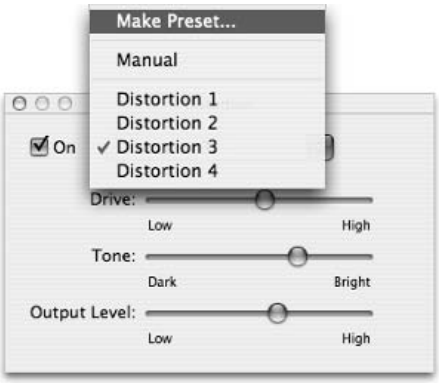

Figure 6-9: When you create settings that sound great, save them by making a preset.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

If you go around calling all your presets something like "Custom 1-20," you'll quickly lose track of them. Try naming your presets after the instrument that you are using or perhaps after something that's specific to your song. That way, you can more easily remember what that preset is when you come back to it later.

You can add a second effect to each software instrument, too; just select the second check box and Effects menu to choose the second effect.

Look for a reason to leave it alone! Too many effects on an instrument can ruin it by making it sound muddy — or just plain stupid. Most of the software instruments sound quite good without any tweaking. If you want to add something, but aren't sure what, try adding a little reverb, chorus, or echo. You don't need to add effects to every instrument; sometimes it's best to leave things alone.

Testing your changes

When you're not sure what an effect does to the sound, here's the best way I know to get familiar with how an effect affects sound:

1. **Click the track's Solo button to listen to only that track.**
2. **Open the Track Info window and turn off the effect in question by making sure its check box is deselected.**
3. **Click the Play button or press the spacebar and listen to the track in its natural state.**
4. **Turn on the effect by selecting its check box.**
5. **Now, while the track plays, increase the effect's intensity with the slider until you can definitely hear it.**
6. **Now move the slider back to the left until you can only just barely hear the effect.**

   The perfect setting is probably between those two points.

Christina Lupo Friday, September 23, 2016 at 9:51:16 AM Eastern Daylight Time 10:dd:b1:c4:db:68

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