Acknowledgments  My deepest gratitude to the artists and producers who agreed to provide their Logic sessions for this book: Blumpy and Joe Hedges for the song “Mitral Valve Prolapse,” Klayton from Celldweller for his remix “LVL-Home,” Myron for his song “Darkside,” and Alessandro Cortini from Modwheelmood for their song “Sunday Morning.”
Contents at a Glance

Getting Started .................................................. 1

Building a Song
Lesson 1 Make Music with Logic Now! .......................... 11
Lesson 2 Recording Audio .................................... 59
Lesson 3 Editing Audio ......................................... 101
Lesson 4 Recording MIDI .................................... 141
Lesson 5 Programming and Editing MIDI ................. 169
Lesson 6 Programming Drums ................................. 213
Lesson 7 Manipulating Tempo and Time Stretching ... 253

Arranging and Mixing
Lesson 8 Arranging and Preparing for the Mix .......... 285
Lesson 9 Mixing .................................................. 329
Lesson 10 Automating the Mix and Using Control Surfaces ... 379
Lesson 11 Troubleshooting and Optimization .......... 409
Appendix A Using External MIDI Devices............... 449
Appendix B Keyboard Shortcuts (U.S. Preset) ............ 461

Index .................................................................. 485
# Table of Contents

**Getting Started** .................................................. 1

## Building a Song

**Lesson 1**  
Make Music with Logic Now! ............................... 11
Opening Logic ......................................................... 12
Exploring the Interface ............................................ 15
Starting a Project with Apple Loops ....................... 18
Navigating the Project ............................................. 23
Building an Arrangement ......................................... 29
Mixing the Song ...................................................... 44
Exporting the Mix .................................................... 53
Lesson Review .......................................................... 56

**Lesson 2**  
Recording Audio ...................................................... 59
Setting Up Digital Audio Recording ......................... 60
Recording a Single Track ......................................... 64
Recording Additional Takes ..................................... 75
Recording Multiple Tracks ....................................... 79
Punching In and Out ............................................... 85
Changing Recording and Metronome Settings ............ 93
Lesson Review .......................................................... 98

**Lesson 3**  
Editing Audio ........................................................ 101
Comping Takes ......................................................... 102
Assigning Mouse Tools ............................................ 110
Editing Audio Regions in the Arrange Area ............ 113
Deleting Unused Audio Files ........................... 121
Quantizing an Audio Drum Recording ............... 124
Manipulating the Waveform with the Flex Tool ....... 128
Editing Audio Destructively in the Sample Editor .... 131
Lesson Review ....................................... 138

Lesson 4  Recording MIDI. .............................. 141
Recording MIDI ........................................ 142
Quantizing MIDI Recordings ........................... 146
Merging Recordings into a MIDI Region ............... 148
Recording MIDI Takes ................................ 156
Using Punch Recording ................................ 158
Using Step Input Recording ............................ 160
Filtering Incoming MIDI Events ........................ 165
Lesson Review ....................................... 167

Lesson 5  Programming and Editing MIDI .......... 169
Programming in the Piano Roll Editor ................. 170
Editing a MIDI Recording .............................. 178
Using the Score Editor ................................ 181
Editing Notes with a MIDI Keyboard .................. 187
Editing Note Velocity Using Hyper Draw ............... 190
Editing MIDI Continuous Controller Events .......... 193
Editing in the Event List ................................ 205
Lesson Review ....................................... 210

Lesson 6  Programming Drums ............................ 213
Programming a Drum Pattern in Ultrabeat ............ 214
Changing the Groove in the MIDI Editors ............. 229
Creating a Snare Roll Using the Hyper Editor ......... 237
Converting a MIDI Sequence into an Audio Region. .. 246
Converting an Audio Region into a
Sampler Instrument Track ............................ 248
Lesson Review ....................................... 251
Lesson 7  Manipulating Tempo and Time Stretching  . . . 253
   Matching the Project Tempo to an Audio Region’s Tempo . 254
   Working with Apple Loops . . . . . . . . . . . . . . . . . . . 257
   Inserting Tempo Changes and Curves . . . . . . . . . . . . . 262
   Creating Apple Loops . . . . . . . . . . . . . . . . . . . . . . . 266
   Change the Playback Pitch and Speed with Varispeed . . . 269
   Time Stretching and Tempo Matching
   with Flex Time Editing . . . . . . . . . . . . . . . . . . . . . . 272
   Creating a Turntable or Tape Slowdown Effect . . . . . . . 279
   Lesson Review . . . . . . . . . . . . . . . . . . . . . . . . . . . . 282

Arranging and Mixing

Lesson 8  Arranging and Preparing for the Mix . . . . . . . . . . . . . . 285
   Previewing the Song . . . . . . . . . . . . . . . . . . . . . . . . . 286
   Using Existing Material to Fill In Parts . . . . . . . . . . . . . . 289
   Adding and Deleting Sections . . . . . . . . . . . . . . . . . . . . 308
   Muting Elements . . . . . . . . . . . . . . . . . . . . . . . . . . . 312
   Cleaning Up Noisy Recordings . . . . . . . . . . . . . . . . . . . 315
   Lesson Review . . . . . . . . . . . . . . . . . . . . . . . . . . . . 326

Lesson 9  Mixing . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 329
   Previewing the Final Mix . . . . . . . . . . . . . . . . . . . . . . . 330
   Using the Amp Designer . . . . . . . . . . . . . . . . . . . . . . . 330
   Using the Pedalboard . . . . . . . . . . . . . . . . . . . . . . . . . 339
   Adjusting Levels . . . . . . . . . . . . . . . . . . . . . . . . . . . . 344
   Choosing Pan Positions . . . . . . . . . . . . . . . . . . . . . . . 351
   Choosing EQ Settings . . . . . . . . . . . . . . . . . . . . . . . . 355
   Using Delay and Reverberation . . . . . . . . . . . . . . . . . . 361
   Using Dynamic Processing Plug-ins . . . . . . . . . . . . . . . 367
   A Few Tips and Tricks . . . . . . . . . . . . . . . . . . . . . . . . 375
   Lesson Review . . . . . . . . . . . . . . . . . . . . . . . . . . . . 376
<table>
<thead>
<tr>
<th>Contents</th>
<th>ix</th>
</tr>
</thead>
</table>

| Lesson 10 | Automating the Mix and Using Control Surfaces | 379 |
|          | Creating and Editing Offline Automation | 380 |
|          | Recording Live Automation | 392 |
|          | Using Control Surfaces | 401 |
|          | Exporting the Mix | 405 |
|          | Lesson Review | 407 |

| Lesson 11 | Troubleshooting and Optimization | 409 |
|          | Making Backups | 410 |
|          | Solving Audio and MIDI Routing Problems | 422 |
|          | Optimizing Hardware Performance | 433 |
|          | Addressing Unexpected Behaviors | 440 |
|          | Lesson Review | 443 |

| Appendix A | Using External MIDI Devices | 449 |
|           | Configuring MIDI Hardware | 450 |

| Appendix B | Keyboard Shortcuts (U.S. Preset) | 461 |
|           | Transport Controls | 461 |
|           | Zooming | 462 |
|           | Tools | 462 |
|           | Channel Strip, Track, and Region Operations | 463 |
|           | Views | 465 |
|           | Automation | 466 |
|           | Finder | 467 |

|             | Glossary | 469 |
|             | Index | 485 |
This page intentionally left blank
Welcome to the official Apple Pro Training Series course for Logic Pro 9 and Logic Express 9. This book is a comprehensive introduction to professional audio production with Logic Studio. It uses real-world music and hands-on exercises to teach you how to record, arrange, mix, produce, and polish audio and MIDI files in a professional workflow. So let’s get started!
The Methodology

This book takes a hands-on approach to learning the software, so you'll be working through the project files and media on the accompanying DVD. It’s divided into projects that methodically introduce the interface elements and ways of working with them, building progressively until you can comfortably grasp the entire application and its standard workflows.

Each lesson in this book is self-contained, so you can jump to any lesson at any time. However, each lesson is designed to support the concepts learned in the preceding lesson, and newcomers to audio production should go through the book from start to finish. The first seven lessons, in particular, teach basic concepts and are best completed in order.

Course Structure

The book is designed to guide you through the music production process as it teaches Logic. The lessons are organized into two sections:

Building a Song: Lessons 1–7

In this section, you’ll learn the fundamentals of building a song. Lesson 1 starts you out with an overview of the entire process. You’ll get familiar with the interface and the various ways to navigate a project while building a song from scratch using Apple Loops, and then arranging, mixing, and exporting the song to an MP3 file.

In each of the following lessons, you’ll focus on a single topic in detail. You’ll start by learning how to come up with the building blocks of your musical project: recording, editing, and programming both audio and MIDI files. Finally, you’ll manipulate the project tempo, stretch audio files, and apply time and pitch effects.

Arranging and Mixing: Lessons 8–11

In Lessons 8–10, you’ll arrange and mix audio and MIDI files into a final project: adding and deleting sections, muting elements, eliminating noise, adjusting levels, panning, EQing, adding reverb, and automating the mix. You’ll also learn how to use hardware control surfaces to manipulate various parameters.

Lesson 11 concludes your exploration of Logic by describing useful troubleshooting techniques that can improve your Logic system’s reliability and efficiency. You’ll learn
effective backup procedures, how to resolve audio and MIDI routing problems, and ways to optimize your hardware. Appendix A covers how to use external MIDI devices, and Appendix B lists a wealth of useful keyboard shortcuts.

**Using the DVD Book Files**
The *Apple Pro Training Series: Logic Pro 9 and Logic Express 9* DVD (included with the book) contains the project files you will use for each lesson, as well as media files that contain the audio and video content you will need for each exercise. After you transfer the files to your hard disk, each lesson will instruct you in the use of the project and media files.

**Installing Logic**
The exercises in this book require that you install Logic Studio or Logic Express along with the default content pre-selected in the installer. To install Logic Studio or Logic Express, insert the first installation DVD in your computer, double-click the installer, and follow the installer’s instructions to complete the installation.

**NOTE** If you have already installed Logic Studio but did not install some of the content, you can run the installer again and choose to install only the Logic Studio Content.

**Using Default Preferences and the U.S. Key Command Preset**
All the instructions and descriptions in this book assume that you are using the default set of preferences (unless instructed to change them) and the U.S. key command preset. If you have changed some of your preferences or have not selected the factory U.S. key command preset, you may not get the same results described in the exercises. To make sure you can follow along with this book, it’s best to revert to the initial set of Logic preferences and choose the U.S. shortcut preset before you start the lessons. Keep in mind that when you initialize your preferences, you will lose your custom settings, and later you may want to reset your favorite preferences manually.

1. From the main menu bar, choose Logic Pro > Preferences > Initialize All Except Key Commands.

   A confirmation message pops up.
**LOGIC EXPRESS**  When instructed to choose an item from the Logic Pro menu, choose the same item from the Logic Express menu.

2  Click Initialize.

Your preferences are initialized. To choose your key commands preset, you need to open the Key Commands window.

3  In the main menu bar, choose Logic Pro > Preferences > Key Commands.

The Key Commands window opens.

4  Click the Options pop-up menu and choose Presets > U.S.

5  Close the Key Commands window.

**Screen Resolution**

If you are using a small screen resolution, some of the project files may appear different on your screen than they do in the book. When you open a project, if you can’t see the whole Arrange window, move the window until you can see the three window controls at the left of the title bar, and click the zoom button (the third button from the left) to make the window fit the screen.

When using a small screen resolution, you may also have to zoom or scroll more often than instructed in the book to perform some of the exercise steps. In some cases, you may have to temporarily resize or close an area of the Arrange window to perform an action in another area.

**Installing the Logic Lesson Files**

On the DVD, you'll find a folder titled Logic 9 Files, which contains three subfolders: Lessons, Media, and Apple Loops for Logic Express Users. The first two folders contain the lessons and media files for this course. (See the section “Instruction for Logic Express Users” for an explanation of the third folder.) Make sure you keep these two folders together in the Logic 9 Files folder on your hard disk. If you do so, Logic should be able to maintain the original links between the lessons and media files.

1  Insert the *Logic Pro 9 and Logic Express 9* DVD into your DVD drive.
Drag the Logic 9 Files folder from the DVD to your desktop to copy it. The Media folder contains about 3 GB of media.

Wait for the “Copy” Progress indicator to close, and eject the DVD to make sure that you don’t work with the files on the DVD, but with the files you copied on your desktop.

Each lesson will explain which files to open for that lesson’s exercises.

**Instructions for Logic Express Users**

If you’re using Logic Express 9, most of the instructions in this book are exactly the same as those for Logic Pro 9. When there are differences, you’ll find a note in the exercises addressed specifically to Logic Express users. Keep in mind that Logic Express doesn’t come with the same instruments, effects, and sound library as Logic Studio, and sometimes your screen may look different from the pictures in this book (for example, you may see different settings in the Library, different Apple Loops in the Loop Browser, and different names on tracks and channel strips).

To install files from the Logic Pro 9 and Logic Express 9 DVD, follow the instructions in the previous section and then install the additional Apple Loops as explained in the steps below.

**LOGIC EXPRESS**

The additional Apple Loops for Logic Express Users were taken from the Remix Tools, Rhythm Section, and World Music Jam Packs, which come standard with Logic Studio. The loop Trip Hop Jungle Beat 01 was modified to use a GarageBand instrument available to Logic Express users and sounds different from the original Trip Hop Jungle Beat 01 included in the Remix Tools Jam Pack.

1. Open Logic Express.
   
   The Templates dialog opens (if you have used Logic Express before, and a Logic project automatically opens, skip to step 4).

2. Click the Empty Project template.
   
   An empty template opens, and a New Tracks dialog comes down from the Arrange window’s title bar. Don’t worry about the settings in that dialog; you just need to create at least one track (of any kind) to continue.
3 In the New Tracks dialog, click Create. The dialog disappears and a track is created.

4 From the main menu bar, choose Window > Loop Browser. The Loop Browser opens.

5 Close the main Arrange window underneath, and keep only the Loop Browser open so that you can see your desktop.

You may need to move the Loop Browser aside to see the Logic 9 Files folder on your desktop.

6 Double-click the Logic 9 Files folder on your desktop, and double-click Apple Loops for Logic Express Users.

You should see a folder named “Drag to Loop Browser.”

7 Drag the folder “Drag to Loop Browser” onto the Loop Browser window.

A green + (plus) sign appears at the mouse pointer, indicating that you can release the mouse button to install the Apple Loops.
In the “Adding Loops to the Loop Browser” dialog, click “Move to Loops Folder” to install the Apple Loops.

**System Requirements**
Before using *Apple Pro Training Series: Logic Pro 8 and Logic Express 9*, you should have a working knowledge of your Macintosh and the Mac OS X operating system. Make sure that you know how to use the mouse and standard menus and commands, and also how to open, save, and close files. If you need to review these techniques, see the printed or online documentation included with your system.

- Mac computer with an Intel processor
  - 1 GB of RAM (2 GB or more highly recommended)
  - Display with 1280 x 800 or higher resolution
  - Mac OS X v10.5.7 or later
  - QuickTime 7.6 or later
  - DVD drive for installation
- USB musical keyboard (or suitable MIDI keyboard and interface) to play software instruments
- Low-latency multi-I/O audio interface highly recommended for audio recording

**About the Apple Pro Training Series**
*Apple Pro Training Series: Logic Pro 9 and Logic Express 9* is both a self-paced learning tool and the official curriculum of the Apple Pro Training and Certification Program. Developed by experts in the field and certified by Apple, the series is used by Apple Authorized Training Centers worldwide and offers complete training in all Apple Pro products. The lessons are designed to let you learn at your own pace. Each lesson concludes with review questions and answers summarizing what you’ve learned, which can be used to help you prepare for the Apple Pro Certification Exam.

For a complete list of Apple Pro Training Series books, see the ad at the back of this book or visit www.peachpit.com/apts.
**Apple Pro Certification Program**

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

Upon completing the course material in this book, you can become a certified Apple Pro by taking the certification exam at an Apple Authorized Training Center. Successful certification as an Apple Pro gives you official recognition of your knowledge of Apple’s professional applications while allowing you to market yourself to employers and clients as a skilled, pro-level user of Apple products.

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

For more information, please see the ad at the back of this book, or to find an Authorized Training Center near you, go to training.apple.com.

**Resources**

*Apple Pro Training Series: Logic Pro 9 and Logic Express 9* is not intended as a comprehensive reference manual, nor does it replace the documentation that comes with the application. For comprehensive information about program features, refer to these resources:

- The *Logic Pro 9 User Manual* and the *Logic Express 9 User Manual*. Accessed through the Logic Help menu, the User Manual contains a complete description of all features. The other documents available in the Logic Help menu can be valuable resources as well.


Lesson Files
Logic 9 Files > Lessons > 04 Rock Song

Time
This lesson takes approximately 60 minutes to complete.

Goals
Record MIDI performances
Quantize MIDI recordings
Merge a MIDI recording with an existing MIDI region
Record MIDI in take folders
Punch record a MIDI recording
Capture a performance as a recording
Record MIDI using Step Input mode
Filter incoming MIDI events
Lesson 4

Recording MIDI

MIDI (the Musical Instrument Digital Interface) was created in 1983 to standardize the way electronic musical instruments communicate. Today, MIDI is extensively used in the music industry, from cell phone ringtones to major-label albums. Most TV and film orchestra composers use MIDI to sequence large software sound libraries, getting ever closer to productions that sound like a real orchestra.

MIDI sequences can be compared to piano rolls, the perforated paper rolls once used by mechanical player pianos. Like the punched holes in piano rolls, MIDI events do not contain audio. They contain note information such as pitch and velocity. To produce sound, MIDI events need to be routed to a software instrument or to an external MIDI instrument.

There are two basic types of MIDI events: MIDI note events that trigger musical notes, and MIDI continuous controller (MIDI CC) events that control parameters such as volume, pan, or pitch bend.

For example, when you hit C3 on a MIDI controller keyboard, the keyboard sends a Note On MIDI event. The Note On event contains the pitch of the note (C3) and the velocity of the note (which indicates how fast the key was struck, measuring how hard the musician played the note).
By connecting the MIDI controller keyboard to Logic, you can use Logic to route the MIDI events to a virtual software instrument or to an external MIDI instrument. The instrument reacts to the Note On event by producing a C3 note, and the velocity typically determines how loud the note sounds.

MORE INFO ▶ To learn more about the MIDI standard specification, visit the MIDI Manufacturers Association website at http://www.midi.org/.

Recording MIDI

In Logic, the techniques used to record MIDI are very similar to the techniques you used to record audio in Lesson 2. When a MIDI controller keyboard is connected to your computer, and its driver is properly installed (some devices are class-compliant and don’t require a driver installation), you can use that keyboard to record MIDI in Logic. Logic automatically routes all incoming MIDI events to the record-enabled software instrument or external MIDI track.

If you don’t have a MIDI controller keyboard, press the Caps Lock key on your computer keyboard to turn your Mac keyboard into a polyphonic MIDI controller keyboard. A representation of your computer keyboard is displayed, showing the letter keys assigned to musical notes. The number keys allow you to choose the octave range, and the lower row of keys lets you choose the note velocities. Keep in mind that you may need to disable the Caps Lock keyboard to access some of Logic’s key commands. Press the Caps Lock key again to disable the Caps Lock keyboard.
To record a MIDI performance triggering a software instrument, you need to create a software instrument track, insert an instrument plug-in or choose a channel strip setting from the Library, and click Record.

1. Go to Logic 9 Files > Lessons and open the **04 Rock Song** project.
   - That project has a single audio track with a drum loop, which will provide a timing reference to record your new instrument.

2. At the top of the track list, click the New Tracks button (+) (or press Command-Option-N).
   - The New Tracks dialog appears.

3. Make sure that Number is set to 1, Type is set to Software Instrument, and Open Library is selected. Then, click Create.
   - A software instrument track is created, and it is automatically record-enabled. The Library opens, displaying software instrument channel strip settings.
   - By default, audio tracks have a blue icon and audio regions are blue. Software instruments have a green icon and MIDI regions are green.

4. Choose a channel strip setting from the Library.
   - For this exercise, choose 05 Keyboards > 01 Electric Piano > Suitcase V2.
   - **LOGIC EXPRESS** For this exercise, choose 05 Keyboards > 01 Electric Pianos > Tines Electric Piano, and in the following exercises, substitute Tines Electric Piano when you see Suitcase V2.
In the Inspector, the software instrument channel strip loads the necessary plug-ins. In the Arrange area, the name *Suitcase V2* is displayed on the Inst 1 track header.

While audio channel strip settings contain only processing plug-ins, software instrument channel strip settings also contain the software instrument plug-in. On the channel strip, the software instrument plug-in is loaded in the Instrument slot of the I/O section.

5 Play some notes on your MIDI controller keyboard.

You should hear the electric piano. In the Transport bar’s MIDI In display, the incoming MIDI note events are displayed as notes are played. If you play a chord, the display shows the chord name.

You are now ready to record, but first open the Piano Roll Editor so that you can see the MIDI notes appear as you record them.

6 At the bottom of the Arrange area, click the Piano Roll button (or press P).

The Piano Roll Editor opens in the editing area.

7 Go to the beginning of the project.

8 In the Transport bar, click the Record button (or press R).

The playhead jumps back one bar, giving you a four-beat count-in with an audible metronome click before recording starts. The Bar ruler turns red to indicate that Logic is recording.
9 When you can see the playhead, play some notes.

Play a simple bass line in an eighth-note pattern. You will record more notes in that region later in this lesson.

When you play the first MIDI note, a new MIDI region with a red halo is created on the record-enabled Suitcase V2 track. The region’s length constantly updates to include the most recent MIDI event played.

The MIDI notes appear in the Piano Roll Editor as you record them.

10 Stop recording.

In the MIDI region, the notes are displayed as small beams.

11 Go back to the beginning and listen to your MIDI recording.

If you are not happy with your performance, you can undo it (Command-Z) and try again.
If you record-enable several software instrument tracks, incoming MIDI events will be routed to all record-enabled tracks, allowing you to layer the sounds of several instruments.

**Quantizing MIDI Recordings**

If you are not happy with the timing of your MIDI performance, you can correct the timing of the notes. The time-correction process is called *quantization*. To quantize a MIDI region, you choose a grid resolution from the Quantize menu in the Region Parameter box. Each note inside the region will snap to the nearest position on the chosen grid.

**Quantizing MIDI Regions**

In the following exercise, you will quantize the recording you made in the previous exercise to correct its timing, so that the piano notes are in sync with the drums.

1. Make sure the new #default MIDI region is selected.
   First, you’ll rename the region so that you can easily identify it later.

2. In the Inspector’s Region Parameter box, double-click the name of the region and enter *Piano*.

   ![Inspector](image)

   The region is renamed *Piano*.

   Now choose the Quantize value, which determines the resolution of the grid used to quantize the notes.

3. Set the Quantize parameter to 1/8-Note while looking at the notes in the Piano Roll Editor.

   ![Quantize](image)

   All the MIDI notes snap to the nearest eighth note.
4 Go to the beginning and start playback.

You can hear your performance, perfectly in time with the drums. Unless of course
the performance timing was really poor, in which case some of the notes may not
snap to the desired 1/8 note.

In Logic, quantizing is a nondestructive operation. You can always go back to the way
the performance was originally recorded.

5 With the Piano region selected, open the Quantize parameter menu and choose
“off (3840).”

The MIDI notes return to their original recording positions.

MORE INFO ► The (3840) indicator identifies the shortest resolution of Logic’s MIDI
sequencer, the tick. When the time signature is 4/4, there are 3840 ticks in a bar (or
240 ticks in a sixteenth note). When Quantize is set to “off (3840),” the notes snap to
the closest tick.

6 From the Quantize parameter menu, choose 1/8-Note again.

The notes snap back to the grid.

MORE INFO ► The Quantize menu also offers Swing settings. The Swing settings
delay the position of every other note in the grid to obtain a swing, or shuffle groove,
common in many music genres such as blues, jazz, hip-hop, and house music. The
amount of delay goes from no delay (A = no swing) to a lot of delay (F = hard swing).
For example, 8B Swing will subtly delay the second eighth note of each beat.

Setting a Default Quantization Grid
You can set a default quantization value so that any new recording will automatically be
quantized to that grid resolution. This is very useful if you are not confident of your tim-
ing chops. Since the Quantize setting is nondestructive, you can always adjust it or turn it
off for that region after the recording is done.

1 Click in the background of the Arrange area.

All regions are deselected, and the Region Parameter box now displays the MIDI
Thru settings. The MIDI Thru parameter settings are automatically applied to any
new MIDI region that you record.
2 Set the Quantize parameter to 1/16-Note.

3 Select the Piano region.

   The Region Parameter box displays the region's name and settings. You can see the Quantize setting you applied to that region in the previous exercise: 1/8-Note.

4 Press Delete.

   The region is deleted.

5 Go to the beginning of the track and click the Record button (or press R).

   Record a new simple bass line as you did previously.

6 Stop recording.

   In the Piano Roll Editor, the notes immediately snap to the nearest 1/16 note. The new MIDI region is selected, and the Region Parameter box now displays its parameters: Quantize is automatically set to 1/16-Note, the MIDI Thru Quantize setting you set in step 2.

7 Set the Quantize parameter to “off (3840).”

   The notes return to their original recorded positions.

8 Set the Quantize parameter back to 1/16-Note.

**Merging Recordings into a MIDI Region**

Sometimes you may want to record a MIDI performance in several passes. For example, when recording piano, you can record only the left hand and then record the right hand in a second pass. Or, when recording drums, you can record the kick drum in the first pass, the snare in a second pass, and the hi-hat in a third pass.

In Logic, when recording MIDI events on top of an existing MIDI region, you can choose to merge the new events with the existing ones.
Recording into a Selected MIDI Region

In the previous exercise, you recorded a simple bass line onto a piano track. Now you will play chords as you listen to the bass line and record the new chords inside the same MIDI region. First, you will choose the correct recording setting to merge your new recording with the selected region.

1. In the Toolbar, click the Settings button and choose Recording.

2. Under MIDI, set Overlapping Recordings to “Merge with selected regions.”

![Recording settings](image)

Now you only have to select the existing MIDI region before recording, and the new notes will be recorded inside the selected region.

3. Make sure the Piano region is still selected.

4. Go to the beginning and start recording.

Try to play some chords that complement the bass line you recorded previously.

![Piano Roll Editor](image)

**NOTE** While you are recording, you are temporarily recording a new region on top of the existing one. The new region will be merged with the existing one as soon as you stop recording. The Piano Roll Editor displays the contents of the new region you are recording, and although the contents of the existing region are not displayed while you are recording, you can still hear the existing notes played back.
Stop recording.

The new recording is merged with the existing region and you can see all the notes in the Piano Roll Editor. (You might have to scroll or resize the Piano Roll Editor window to see all the notes.) Note that the notes you just recorded snap to the nearest 1/16 note, the default quantize resolution you chose in the previous exercise.

**Tip** You can also use this technique to add MIDI Controller events such as pitch bend or modulation to a region after you have recorded the MIDI notes.

**Merging Recordings in Cycle Mode**

Recording in Cycle mode allows you to continuously repeat the same section and only record new events when you are ready. This can be very useful when recording a drum pattern, for example. When repeating a one-bar or two-bar section, you can add new elements to the pattern during each pass of the cycle, while listening to everything that you have recorded.

When you are recording in Cycle mode, notes recorded in all consecutive passes of the cycle are merged into a single MIDI region. In this exercise, you will use Cycle mode to record drums—first recording the kick, then the snare, then the hi-hat.

1. In the Arrange area, mute both existing tracks.
Remember that you can click the Mute button on the first track header and drag down the mouse to mute both tracks.

2 At the top of the track list, click the New Tracks button (+) (or press Command-Option-N).

The New Tracks dialog appears.

3 Make sure that Number is set to 1, Type is set to Software Instrument, and Open Library is selected. Then, click Create.

This time, you will insert the software instrument in the Inspector, on the Arrange channel strip.

4 In the I/O section of the channel strip, click the Instrument slot.

A menu appears, allowing you to choose one of Logic's software instruments.

5 Choose Ultrabeat (Drum Synth).

**NOTE** When you place your pointer over Ultrabeat (Drum Synth), a menu opens on the right that allows you to choose between Stereo and Multi-Outputs. For now, do not use the lower-level menu, and simply choose Ultrabeat (Drum Synth). By default, a stereo Ultrabeat will be inserted.
The Ultrabeat plug-in is inserted in the Instrument slot of the channel strip, and the Ultrabeat plug-in window opens.

6 Close the Ultrabeat window.

MORE INFO ▶ For now, you will use Ultrabeat to produce drum sounds as you record MIDI in Cycle mode. In Lesson 6, “Programming Drums,” you will use the Ultrabeat interface to program a drum pattern.

Notice the white frame around the Ultrabeat plug-in on the channel strip. A white frame indicates the selected section of the channel strip, whose settings are automatically displayed in the Library. The Library now displays Ultrabeat settings.

7 In the Library, choose 01 Drum Kits > Funk Boogie Kit.

Wait a few seconds while Ultrabeat loads the kit. When the kit is fully loaded, the drum kit name is displayed on the track 3 track header in the Arrange area.

Selecting a software instrument track automatically record-enables it, but the instrument is not always in live mode. (An instrument in live mode requires more CPU resources) When an instrument is not in live mode, the first note you play will take about 100 ms (milliseconds) to trigger the instrument, which is then placed in live mode.

You can put an instrument in live mode by sending any MIDI event to it (playing a dummy note, moving the modulation wheel, and so on) or by clicking the Record Enable button in its track header.
First, locate the notes on your controller keyboard that trigger the kick, the snare, and the hi-hat. In Ultrabeat, you will use the following:

- C1: kick
- E1: snare
- F♯1: hi-hat

8. Play the lowest C note on your MIDI controller while watching the MIDI Activity display in the Transport bar.

If the MIDI In display doesn’t show a C1, press your MIDI controller keyboard Octave Up and Down buttons until the lowest C plays a C1.

**NOTE** If your MIDI keyboard has a C lower than C1, locate the C1 on a higher octave.

MORE INFO If you are using the Caps Lock keyboard, press 4 to set the right octave, and press A to trigger a C1 MIDI note.

When you can trigger a kick with C1, locate E1 (two white notes to the right) to play the snare and F♯1 (the next black note to the right) to play the hi-hat.

9. In the Bar ruler, click the cycle area.

Cycle mode turns on, and the cycle area is shown as green.

10. Resize the cycle area so that it spans one bar starting at the beginning of the song.

You will now record the drums, one at a time.
11 Click in the background of the Arrange area.

The Region Parameter box displays the MIDI Thru parameters.

12 Set the Quantize parameter to 1/8-Note.

13 Start recording.

You hear a four-beat count-in before the playhead reaches the beginning of the cycle area. Play two C1 notes: one on the first beat, one on the third beat. In the Piano Roll Editor’s Bar ruler, the first beat is on 1, the third beat on 1.3 (bar 1, beat 3).

When a new cycle begins, you can hear the kick drum notes you just recorded. Notice that the notes snap to the nearest 1/8 note because you chose that grid resolution for your default MIDI Thru parameters.

You have all the time in the world before you continue to record. As long as you don’t play anything, there are no MIDI events, and Logic keeps cycling over the existing region, playing back your kick drums. If you feel the need to practice the snare before recording, you can return to play mode while cycling continues.
Click the Play button (or press Shift-Return).

Logic is no longer in record mode (and the metronome stops clicking), but playback continues as Logic repeats the cycle area without interruption. Notice that the two C1 notes are now quantized to the grid.

On your MIDI keyboard, locate the snare (E1) and practice a snare pattern. Try to hit the snare on beats 2 and 4.

Click the Record button.

Playback continues without interruption, but Logic reenters record mode.

Click your drum region on track 3 to select it. When you feel ready, record the snare.

When the playhead jumps to the beginning of the cycle, you can see the two kick notes and the two snare notes in the Piano Roll Editor.

Use the same techniques to record your hi-hat (F#1) on every eighth note in the same MIDI region.

Stop recording.

The merge MIDI-recording techniques you used in the two previous exercises provide a lot of flexibility and allow you to take your time, recording a single part of a performance. These techniques will work in many situations. For example, consider recording a violin or cello on a software instrument track; then, on a second pass, record the movements of the pitch bend wheel to add vibrato to some of the notes.
Recording MIDI Takes

When you want to nail a performance or experiment with various musical ideas, you can record different takes and later choose the best one. The techniques to record MIDI takes are similar to the techniques you used to record audio takes in Lesson 2. You can record over an existing MIDI region, or you can use cycle recording to record one take for each pass of the cycle.

Cycle mode should still be turned on from the previous exercise. Let’s record takes in Cycle mode and experiment using different melodies for a bass line.

1. In the Transport bar, hold down the Record button and choose Recording Settings from the pop-up menu.

   The Recording Project Settings window opens.

2. In the MIDI area, from the Overlapping Recordings pop-up menu, choose “Create take folders.”

3. Close the Project Settings window.

4. In the Arrange area, unmute track 1 (Drums/Audio 1) and mute track 3 (Funk Boogie Kit/Inst 2).

5. Create a new software instrument track and open the Library.

6. In the Library, choose 03 Bass > 02 Electric Bass > Aggressive Fretless.

   **LOGIC EXPRESS** Choose 03 Bass > 02 Electric Bass > Rock Fretless, and in the following steps, use Rock Fretless instead of Attitude Bass.

7. Start recording and play a different melody for each pass of the cycle until you have three or four takes.
A MIDI take is recorded for each pass of the cycle where you play MIDI notes. If you don’t play anything for a whole cycle, no take is recorded. The takes are packed into a take folder.

When a new cycle begins, the take you just recorded is automatically muted. You can listen to it by switching to play mode.

8 Click the Play button (or press Shift-Return).

You are now in play mode, and you can hear the last take you recorded.

9 Open the take folder menu and choose the take you want to hear.

You can also double-click the take folder to open it and click the take you want to hear. Double-click the take folder to close it.

**MORE INFO**  
Unlike audio take folders, you cannot comp the takes in a MIDI take folder.

10 Stop playback and turn off Cycle mode.
Using Punch Recording

You can use the punch-on-the-fly and autopunch techniques you learned for audio recording to punch on MIDI recordings. The only difference is that you'll have to turn on the Replace mode.

In the next exercise, you will record a piano performance, and then use both the Replace and Autopunch modes to rerecord a section of the performance.

1  Mute the Aggressive Fretless track.
2  Select and unmute the Suitcase V2 track.

The track is record-enabled, and the MIDI region on the track is selected. If you have several MIDI regions on that track, all the regions are selected.

**NOTE** Make sure that Cycle mode is turned off. If Cycle mode is turned on, selecting a track selects only those regions within the cycle area (and the regions that overlap the cycle area).

3  Press Delete.

All the selected MIDI regions are deleted.

4  Press Record, play your keyboard for four or five bars, and stop the recording.

You will now correct a bar of your performance.

5  Click both the Autopunch and Replace buttons.

In order to merge the new events you are going to record over the Autopunch area with the existing region on the track, you need to change your recording settings back to the default settings.
6 In the Transport bar, hold down the Record button and choose Recording Settings from the pop-up menu.

The Recording Project Settings window opens.

7 In the MIDI area, from the Overlapping Recordings pop-up menu, choose “Merge only in Cycle record.”

8 In the Bar ruler, adjust the Autopunch area around a section of the Piano that you want to record over.

Make sure the Autopunch area is placed over a section of the piano performance you captured in the previous exercise.

9 Go to the beginning of the project and make sure the Suitcase V2 track is still record-enabled.

10 Click the Record button and start playing right away.

On the Piano track, the section below the Autopunch area is deleted.

Notes are deleted.
You can hear the notes you are playing over the previous recording, but only the notes played within the Autopunch area are recorded inside the MIDI region.

11 Turn off the Autopunch and Replace modes.

**Using Step Input Recording**

Instead of recording a real-time performance, you can record notes one at a time. In Step Input mode, you position the playhead and play a note or chord on your MIDI keyboard. The note(s) are recorded, and the playhead moves one step ahead, waiting for the next note(s).

This mode is very useful for recording complex musical phrases that you can’t perform in real time, such as complicated chord patterns or really fast arpeggios (a great technique for dance music).

1 Select the Suitcase V2 track and press Delete.

All the regions on the track are deleted.

**TIP** If you don’t want to select the regions on a track when selecting the track, hold down Option as you select the track.

You start by creating an empty MIDI region using the Pencil tool (as the Command-click tool). You will step-record notes inside that new region.

2 Press Esc and Command-click the Pencil tool.

3 Command-click the Suitcase V2 track between bars 1 and 2.
Using Step Input Recording

The Pencil tool creates an empty one-bar MIDI region.

4 Resize the region so that it is four bars long.

5 At the upper left of the Piano Roll Editor, click the MIDI In button.

The button turns red and MIDI Step Input Recording is turned on.

MORE INFO  You can also enable Step Input Recording in the Score Editor or the Event List.

6 Go to the beginning of the project.

7 Play a single note on your MIDI keyboard.
A 1/16 note is recorded at the playhead position, and the playhead moves forward one 1/16 note. The recorded note has the pitch and velocity of the note you played. The length of a step is identified by the division setting in the Transport bar, below the time signature.

8 In the Transport bar, click the division setting and drag down until it reads /8.

In the Piano Roll Editor, the grid resolution is the same as the division setting. The vertical grid lines are now placed at eighth-note intervals.

9 Play a chord.

An eighth-note chord is recorded at the playhead position, and the playhead moves forward one eighth note.
You can also use the Step Input Keyboard to exercise more control over your step input recordings.

10 From the main menu bar, choose Options > Step Input Keyboard.
The floating Step Input Keyboard appears. The selected note-length button overrides the division setting in the Transport bar.

11 On the Step Input Keyboard, click the quarter-note button.

12 Play a note.

A quarter note is recorded at the playhead position, and the playhead moves forward one quarter note.

If you were recording a quarter-note pattern and wanted to record a single half note, you could click the half-note button, record your half note, and click the quarter-note button again to record the next quarter note.

An easier way is to use the Sustain Insert Note button.

13 Play a note and hold down the key on your MIDI keyboard.

A quarter note is recorded. You need to hold down the MIDI key for the next step, so that the note you are recording remains selected in the Piano Roll Editor.

Tip: You can also release the key on your MIDI keyboard and click the inserted note to select it.
14 On the Step Input Keyboard, click the Sustain Inserted Notes button.

The selected note is lengthened by a quarter note, so it is now a half note. You can click the Sustain Inserted Notes button several times to lengthen the selected notes by the current step length. You can now release the key on your MIDI keyboard.

Now let's record quarter notes starting on bar 2.

15 With the pointer positioned over the lower half of the Piano Roll Bar ruler on bar 2, hold down the mouse button.

The playhead snaps to bar 2.

16 Play three notes, one at a time.

Now you want to insert a quarter-note rest.

17 On the Step Input Keyboard, click the Sustain Inserted Notes button.
The playhead jumps forward one quarter note. When no notes are selected, the Sustain Inserted Notes button makes the playhead move one step ahead, and you can resume step input recording.

Try using step input recording techniques to record fast 1/16-note arpeggios or even crazy chord patterns. With a little experimentation, you will quickly end up with cool musical phrases that couldn’t possibly be performed live.

18 Click the MIDI In button to turn off Step Input recording, and close the Step Input keyboard window.

**Filtering Incoming MIDI Events**

Sometimes your MIDI controller keyboard sends MIDI events that you may not want to record in Logic. Maybe you are using a faulty MIDI keyboard that generates random pitch bend events, or your keyboard is sending aftertouch MIDI events when you apply pressure to the keys, but the instrument you are recording does not react to aftertouch.

Logic allows you to filter out undesired incoming MIDI events so that they are not recorded. Since input filter settings are project settings, you can adjust them to filter various types of events in different projects.

1 In the Toolbar, click the Settings button and choose MIDI from the pop-up menu.
2 Click the Input Filter tab.

In this tab, you can select the MIDI events you want to filter.

3 In the Arrange area, click the Suitcase V2 track header.

The track is selected and record-enabled.

4 Play some notes on your MIDI controller keyboard and move the pitch bend wheel.

You can hear the note pitches change as you move the pitch bend wheel.

5 In the MIDI Project Settings window’s Input Filter tab, select Pitch Bend.

6 Play some notes on your MIDI controller keyboard and move the pitch bend wheel.

This time the pitch bend MIDI events are filtered at their input into Logic, and your pitch bend wheel movements have no effect on the pitch of the notes you play.

Separating the MIDI data from the audio signal produced by the instrument allows for very flexible recording. Throughout this lesson you quantized your notes to a grid and chose to merge new recordings into an existing MIDI region or to record separate takes in a MIDI take folder. You also used step input recording to enter notes one step at a time, without the pressure of recording a real-time performance.

After a MIDI performance is recorded, you can still change the sound of the instrument independently of the MIDI events, or edit the MIDI events independently of the instrument’s sound. Those vast sound- and performance-editing possibilities take you to a new realm of experimentation. Enjoy it!
MORE INFO ▶ To learn how to use external MIDI instruments with Logic, read the Appendix, “Using External MIDI Devices.”

Lesson Review

1. How does Logic route incoming MIDI events?
2. How can you time-correct a MIDI region?
3. How do you choose the default quantize settings for new MIDI recordings?
4. How do you record MIDI takes?
5. What do you need to do before you can punch in on a MIDI track to replace a portion of a MIDI region?
6. How do you turn on Step Input mode?
7. When recording in Step Input mode, identify two ways you can adjust the step length.

Answers

1. All incoming MIDI events are routed to the record-enabled track(s).
2. In the Inspector’s Region Parameter box, choose a grid resolution value from the Quantize menu. The MIDI notes in the region will snap to the nearest position on the chosen grid.
3. Deselect all regions to choose the MIDI Thru parameters in the Region Parameter box.
4. Open the Recording project settings and choose Overlapping Recordings > Create take folders, and then record on top of an existing record, or record in Cycle mode.
5. You need to turn on the Replace mode.
6. Click the MIDI In button in the Piano Roll Editor, Score Editor, or Event List.
7. In the Transport bar, adjust the division setting; or open the Step Input Keyboard and use the note-length buttons.
Index

A
accents, 226–229
AD (analog-to-digital) converter, 60
Add Device button, 449
Add Every Downbeat command, 224
Add Every Upbeat command, 224
aftertouch, 206–207
AIFF format, 95
All Drums button, Loop Browser, 19, 267
Alternative tempo maps, 262–266
Amp Designer
choosing amp model, 331–333
customizing amp model, 334–339
overview of, 330
analog signal, to digital data stream, 60
analog-to-digital (A/D) converter, 60
Analyzer button, Channel EQ plug-in, 357
Apple Loops
browsing and previewing loops, 18–22
differentiating between different loops, 22
overview of, 18
setting key signature using, 261–262
troubleshooting audio output, 422–424
using Loop Browser, 258–261
Arrange area, Arrange window
continuously repeating section, 26–29
cutting and copying audio regions, 117–121
definition of, 17
deselecting all regions in, 25
dragging loop onto, 21
looping and positioning regions in, 29–32
zooming whole arrangement, 39–40
Arrange channel strip, 370–371
Arrange window, 15–18
arrangements, building
adjusting loop repetitions, 36–37
arranging middle section, 37–39
copying and resizing regions, 32–36
dragging loop onto, 21
looping and positioning regions in, 29–32
saving work and undoing actions, 29
arranging and mixing
adding introduction, 308–310
cutting section, 310–312
experimenting with order of regions, 294–296
filling in Bass track, 290–294
humanizing percussion part, 304–308
mating elements, 313–315
packing regions into folders, 297–300
previewing song, 286–289
reducing noise using Soundtrack Pro, 322–326
reducing wah noise from Guitar track, 319–321
removing snare leakage from Kick track, 315–319
review Q & A, 326–327
slicing and doubling percussion, 300–304
Assign section, Ultrabeat, 215–216, 219–222
Attitude Bass track, 170, 176, 189, 190, 196
Audio Bin adding introduction, 310
deleting unused audio files from, 121–123
using, 72–73
viewing takes recorded in Cycle mode, 79
audio drivers, disabling at startup, 444
audio files
creating digital, 60–61
deleting unused, 121–123
setting, 62–64
detected tempo of, 254–255
matching project tempo to, 278–279
previewing for quantizing drum recording, 124–127
saving selection as new, 131–133
Audio Files folder, 412–413
Audio MIDI Setup, 448–452
Audio Preferences, 403
Automation button, 381–382
Automation Parameter menu, 381, 383
Audio Windows, 390, 398, 404–405
Automation Preferences, 403
automation tracks, Arrange area, 381–387, 397–399
automation, keyboard shortcuts for, 464–465
Autopunch mode, 88–92, 158–160
aux sends, adding reverb using, 363–367
B
B key (Media button), 122, 178, 248, 310
background noises. see noisy recordings, cleaning up
backups
importance of, 410
preferences files, 442–443
project files, 414–417
project folders to external devices, 420–421
rebuilding project files using, 417–420
saving project and automatic, 410–414
Balance control. see Pan/balance control
Band On/Off button, Channel EQ plug-in, 357
Bar ruler
adding introduction using, 308–310
automating volume using Hyper Draw, 199
ending song using, 39
exporting mix using, 33
filling in Bass track using, 290
Piano Roll Editor’s, 164, 170
previewing song using markers, 286
previewing takes for comping, 103
red, indicating that Logic is recording, 71
toggling Autopunch mode in, 85, 90, 92
toggling Cycle mode in, 79, 84, 114, 153, 310
yellow, indicating Solo mode, 288
Bass button, 27
Bass track, 290–296. see also Attitude Bass track
bit depth
Audio Bin, 73
digital recording and, 61–62
setting, 62–64
blue loops, Loop Browser continuously repeating section, 27, 29
creating, 266–269
defined, 21
bouncing
exporting automated mix, 405–406
exporting mix, 53–55
region in place, 246–247
Broadcast Wave File (BWF, or WAV), 95
Browser tab, 124–127
buffer size, setting I/O, 93–94
Built-in Audio (or Output), 424
Effects section, Amp Designer, 337–338
Empty Project template, 13–14, 417–420
ending, arranging song, 39–44
EQ settings
  choosing, 355–361
  customizing amp model, 334–337
  processing plug-ins, 49–51
Esc (Escape) key, 111
event definitions, 201–202, 239–241
Event List
  cleaning up MIDI region, 205–207
  dragging Ultrabeat pattern to Arrange area, 232
  enabling Step Input mode in, 161
  hiding type of event in, 206–207
  quantizing note lengths, 208–210
  events, Arrange window listing, 17–18
  events, MIDI
    editing in Event List, 205–210
    filtering incoming, 165–167
    putting record-enabled instrument into live mode, 152
    types of, 141–142
  exporting mixes
    automated, 405–407
    overview of, 53–55
  external devices, backing up project folders to, 420–421
  external MIDI devices
    choosing program remotely, 454–457
    configuring MIDI hardware, 448–452
    routing external MIDI tracks, 452–454
  fades
    adding to edit point between two regions, 120–121
    adding to region, 114–117
    speed, 285–288
  Fast Forward button, 24, 287
  Fast Rewind button, 24, 287
  feedback, avoiding when recording, 64
  File Browser, 124–127, 418–419
  File size, Audio Bin, 73
  files, see also project files
    deleting unused audio, 121–123
    recording formats for, 95
  Filter button, Event List Editor, 206
  filtering incoming MIDI events, 165–167
  Finder
    copying project folder to new location, 420
    keyboard shortcuts, 465
    opening, 12
    previewing audio files in, 124
    saving project, 411–414
    switching to, 35
  Finger tool, 67, 79
  Flatten, 109–110
  Flex Mode parameter, 128, 264, 273–274, 278–279
  Flex tool, 128–131, 272–277
  folders
    backing up to external devices, 420–421
    closing, 307–308
    opening, 297
    packing regions into, 297–300, 304–305
    saving project, 412
  Format button, 365–366
  format, recording file, 95–96
  Forward button, 24–25, 70–71, 287
  freeze process, 439–441, 444
  frequency analyzer, Channel EQ plug-in, 353–360
G
  G key, see Global Tracks (G key)
  Gain knob, Adaptive Limiter, 373–374
  Gain knob, Amp Designer, 333
  Gain Reduction meter, Compressor, 369–370
  gate time, adjusting note, 225–226
  General MIDI (GM) device
    choosing program remotely, 454–457
    creating custom hyper set for snare roll, 238–239
    routing external MIDI, 453
  General tab, Audio Preferences, 95
  Global Tracks (G key)
    global Marker track, 286–289
    global Signature track, 261–262
    global Tempo track, 262–266
    rebuilding project file, 418
    toggling, 286
  GM device, see General MIDI (GM) device
  Go to Beginning command (return key), 24–25, 77, 81
  GoldVerb plug-in, 366
  green loops, Loop Browser, 21, 267, 269
  grid, setting default quantization, 147–148
  grooves
    applying laid-back feel to snare, 232–234
    changing in MIDI editors, see MIDI, changing groove in editors
    quantized vs. laid-back patterns for, 234–237
    grouping tracks, adjusting levels by, 349–351
  Guitar track, reducing wah noise, 319–321
H
  H key (Hide View), 89–90, 92
  handclaps
    humanizing percussion part, 304–308
    slicing and doubling percussion part, 300–304
  hard disks
    backing up project folders to external, 420–421
    deleting unused audio files from, 121–123
    optimizing hardware performance, 437–438
  hardware
    configuring MIDI, 448–452
    performance optimization, 436–441
    HD meter, monitoring usage, 455–459
    HOME button, 24, 77, 87
    horizontal zoom in (Option-Control-Right Arrow), 43, 77
    horizontal zoom out (Option-Control-Left Arrow), 39–40, 43
    horn line, creating, 184–187
    humanizing project
      applying laid-back feel to snare, 232–234
      changing groove in MIDI editors, 229–237
      editing velocities and accents, 225–229
      percussion part, 304–308
      using hi-hat notes, 236
      using quantized vs. laid-back patterns, 234–237
    Hyper Draw
      editing note velocity, 190–193
    Hyper Editor
      vs., 200
      pitch bend automation, 193–196
      track automation vs. automation of, 380
      volume automation, 196–200
    Hyper Editor
      creating custom hyper set for snare roll, 237–241
      drawing snare roll, 241–246
      pan automation, 200–204
    hyper sets, 201, 237–241
I
  I/O buffer size, 93–94, 444
  I/O Labels window, 428–429
  IAC (Inter-Application Communication) buses, 449
  Import button, 418
  Import Project Settings, 419
  Include Assets, 411–412, 420
  initializing preferences, 441–442
  input
    checking audio, 427–430
    creating new track for recording, 65
    filtering incoming MIDI events, 165–167
    reassigning track, 81
    recording multiple tracks, 80–81
    Input Device, setting bit depth, 63–64
    Input Scale, Adaptive Limiter, 373
    Insert Silence Between Locators, 308
    Inspector, Arrange window
      channel strip settings, 21
      defined, 17
      Region Parameter box, see Region Parameter box
    Track Parameter box, 127, 263
    instruments, live mode, 152
    Inter-Application Communication (IAC) buses, 449
    interface
      bypassing audio, 424–426
      checking audio input, 427–430
    Logic, 15–18
    Ultrabeat, 215
  introduction, creating, 308–310
J
- Junction pointer, 119–120

K
- key signature, setting project’s, 261–262
- keyboard shortcuts (U.S. Preset)
  - automating, 464–465
  - channel strip operations, 461–462
  - Finder, 465
  - Mac OS X, 55
  - navigation, 23–26
  - region operations, 461–462
  - tools, 460–461
  - track operations, 461–462
  - transport controls, 459–460
  - views, 463–464
- zooming, 460
- Kick track
  - adjusting levels by grouping tracks, 349–351
  - adjusting levels of drum tracks, 345–346
  - previewing song, 287–289
  - removing snare leakage from, 315–319

L (Loop checkbox), 30, 33, 38
- labels, checking audio input, 428–429
- laid-back patterns
  - applying to snare, 232–234
  - removing snare leakage from, 315–319
  - to Kick track, 316
- Library, routing external MIDI events
  - levels, choosing during mixing, 344–351
- level fader, 47–49, 394–397
- Left-Click tool, assigning, 110–113, 118
  - level fader, 47–49, 394–397
  - levels, choosing during mixing, 344–351
  - Library, routing external MIDI events using, 452–454
  - limiter, 370–375
- Line tool
  - crescendo for snare roll, 244
  - editing note velocities in Hyper Draw, 191–192
  - pan automation in Hyper Editor, 203–204
- Link modes, Score Editor, 182–184
- lists of events, Arrange window, 17–18
- live automation.
  - see recording live automation
- live mode, putting instrument into, 152

Logic, introduction to
- building arrangement.
  - see arrangements, building
  - exporting mix, 53–55
  - interface, 15–18
  - mixing song, see mixing
  - navigation of project, 23–29
  - opening, 12–15
  - review Q & A, 56
  - starting project with Apple Loops, 18–22
- Loop Browser.
  - see also Apple Loops
  - blue vs. green loops in, 21
  - browsing and previewing loops, 18–22
  - continuously repeating section, 26–29
  - creating Apple Loops, 267–269
  - troubleshooting audio output, 422–424
  - using, 258–261
- Loop checkbox (L), 30, 33, 38
- Loop tool
  - filling in Bass track, 294
  - packing regions into folders, 298, 300
  - using on multiple regions, 40–42
  - working with, 36
- loops
  - benefits of, 18
  - browsing and previewing, 18–22
  - cutting, 256–257
  - looping and positioning regions, 29–32
- L (Loop checkbox), 30, 33, 38
  - labels, checking audio input, 428–429
  - L (Loop checkbox), 30, 33, 38
  - Link modes, Score Editor, 182–184
  - Link modes, Score Editor, 182–184
  - Marquee tool
    - adjusting levels of drum tracks, 347–348
    - adjusting volume of section, 386
    - cutting, 256–257
    - filling in Bass track, 290–292
    - indicating playback position, 352
    - muting sections of instrument, 313–315
    - removing snare leakage from Kick track, 316
    - selecting portion of audio region, 117–119
    - master channel strips, 370–375
    - Master volume, Amp Designer, 333
    - Media button (B), 122, 178, 248, 310
    - Media, Lists, or Notes area of Arrange window, 18
    - menus, Loop Browser, 258
    - merging recordings, 149–155
    - metronome
      - detecting tempo of audio file, 255–256
      - MIDI, 98
      - quantized patterns vs. laid-back patterns, 236
      - setting, 96–98
      - turned on when recording audio, 71
      - microphone preamps, 60–61, 68–70
      - microphones
        - adjusting levels of drum tracks, 347
        - creating digital audio files, 60–61
        - customizing amp model, 336, 339
        - middle section, arranging, 37–39
      - MIDI (Musical Instrument Digital Interface)
        - displaying notes on regions, 42
        - programming in Piano Roll Editor, 170–178
      - setting metronome, 98
      - solving routing problems, 430–436
      - troubleshooting MIDI In display, 432–436
      - troubleshooting MIDI Out routing, 430–432
      - MIDI CC (continuous controller) events
        - adding to MIDI region, 150
        - MIDI Controls, 201
        - overview of, 141–142
      - MIDI CC (continuous controller) events, editing
        - automating pan in Hyper Editor, 200–204
        - automating pitch bend using Hyper Draw, 193–196
        - automating volume using Hyper Draw, 196–200
        - overview of, 193
      - MIDI controller keyboards
        - control surfaces for, 492
        - editing notes, 187–189
        - filtering incoming MIDI events, 163–167
        - previewing drum kit, 216–218
        - recording MIDI, 142–146
        - recording MIDI in Cycle mode, 150–155
        - Step Input mode, 161–165
        - using Ultrabeat Pattern mode, 221
      - MIDI Monitor, 432
      - MIDI Through parameters, Region Parameter box, 147–148, 154
      - MIDI, changing groove in editors
        - applying laid-back feel to snare, 232–234
        - comparing quantized and laid-back patterns, 234–235
        - dragging pattern to Arrange area, 222–232
      - MIDI, editing
        - in Event List, 205–210
        - MIDI CC events.
          - see MIDI CC (continuous controller) events, editing
        - note velocity using Hyper Draw, 190–193
        - notes with MIDI keyboard, 187–189
        - recorded MIDI sequence, 178–181
        - review Q & A, 210–211
        - using Score Editor, 181–187
      - MIDI, recording, 140–167
        - merging into MIDI region, 148–155
        - overview of, 141–142
        - quantizing, 146–148
        - review Q & A, 167
        - standard specification, 142
        - techniques for, 142–146
        - using punch recording, 158–160
        - using Step Input mode, 160–165
    - Mix switch, Pedalboard, 343
    - mix, exporting, 53–55
Mute tool (M)
Mute button, 47, 430
Musical Instrument Digital Interface.
multi-timbral instrument, 453
multiple tracks
mouse tools, assigning, 110–113
Moog keyboard track, 313–315
mono channel strips, 354, 365
modulation effect, PedalBoard, 340
mono channel strips, 354, 365
Moog keyboard track, 313–315
mouse tools, assigning, 110–113
multiple tracks
recording, 79–82
recording additional takes, 82–85
multi-timbral instrument, 453
Music view, Loop Browser, 258–259
Musical Instrument Digital Interface. see MIDI (Musical Instrument Digital Interface)
Mute button, 47, 430
Mute tool (M)
editing recorded MIDI sequence, 180
getting MIDI out, 431–432
muting sections of instrument, 313–315

N
naming track, before recording it, 67
navigation
continuously repeating section, 26–29
Transport buttons and key commands, 23–26
network MIDI ports, configuring, 449
New Tracks dialog
creating software instrument track, 14
merging recordings in Cycle mode, 151
preparing track for recording, 65
recording MIDI, 143
recording multiple tracks, 80
routing external MIDI tracks, 452
No Overlap Drag mode, 117
nodes
creating in Hyper Draw, 195, 197–199
Tempo track displaying changes as, 264–265
Noise Print, 323–324
noisy recordings, cleaning up
reducing wah sound from Guitar track, 319–321
removing snare leakage from Kick track, 315–319
using Soundtrack Pro, 322–326
nondestructive editing, 113–115
note events, MIDI, 141–142
Note-length buttons, Step Input keyboard, 162–165
note-on MIDI event, 176, 190–193
notes
applying laid-back feel to snare, 232–234
correctly placing or stretching with Flex tool, 272–277
desecting single, 234
displaying Project or Track, 17–18
editing velocities and accents, 225–229
hiding note events in Event List, 206–207
inserting on every downbeat or upbeat, 224
randomizing positions of, 236
notes, MIDI
copying and deleting with Pencil tool, 174–178
creating with Pencil tool, 170–174
editing velocity using Hyper Draw, 190–193
editing velocity using Velocity tool, 176–178
editing with MIDI keyboard, 187–189
editing with Score Editor, 181–187
quantizing lengths of, 208–210
offline automation
adjusting volume of section, 380–387
creating decrescendo, 387–390
creating pan automation, 390–392
defined, 380
1/8 Note, 147
one-shot sounds, quantizing note lengths, 208–210
Open Library command, 14
opening
File Browser, 124
folders, 297
Logic, 12–15
Loop Browser, 18
 Mixer, 44
selected application, 12
take folder, 102
Templates dialog, 13
Tool menu, 111
Option-click (delete crossfade), 115
Option-Control-click (zoom out), 43
Option-Control-click (zoom in), 39, 43, 202
Option-Control-drag (zoom in), 43, 107–108
Option-Control-Left Arrow (horizontal zoom out), 39–40, 43
Option-Control-Right Arrow (horizontal zoom in), 43, 77
Option-Delete drag (vertical zoom out), 43
Option-drag, 32–33
Output Device, setting bit depth, 63–64
Output sliders, Tape Delay window, 363
Output volume slider, Sound preferences, 426
output, restoring audio, 422–424
Overhead fader, 347
Overlapping Recordings, MIDI takes, 167
P
P (Piano Roll button), 144
pan automation
creating, 390–392
recording live automation in Latch mode, 397–399
using Automation Quick Access, 404
using Hyper Draw, 200–204
Pan control, choosing pan positions, 352–355
Pan/Balance control
adjusting levels, 47
panning instruments, 51–52
slicing and doubling percussion part, 302
panning instruments
automating in Hyper Editor, 200–204
choosing positions, 351–355
mixing songs, 51
parameters
automation. see Automation Parameter menu
Flex Mode. see Flex Mode parameter Region Parameter box. see Region Parameter box
Track Parameter box, 127, 263
patterns, Ultrabeat, 221–225, 229–232
Peak button, 369
peak detector, channel strips, 47–48
Pedalboard, 339–344
Pencil tool
copying/deleting notes, 174–176
creating empty-one bar MIDI region, 160–161
creating markers, 286
creating notes, 170–174
drawing freehand automation, 198
drawing pan automation, 202
drawing snare roll, 241–246
percussion part
humanizing, 304–308
slicing and doubling, 300–304

Index
preferences
Pre/Post EQ button, Channel EQ plug-in, 357
preferences initializing, 441–442
restoring, 442–443
Preferences, Audio
bit depth, 62–64
bypassing audio interface, 424
checking audio input, 427
defined, 62
I/O buffer size, 93–94
recording file type, 95
turn off Software Monitoring, 67
Preferences, Automation, 403
Preferences, General
assigning third tool to right mouse
button, 113
Limit Dragging to One Direction, 175
project files in backup folder, 414
Presence knob, Amp Designer, 334–335
Preview Bypass Effect, Reduce Noise window, 324
previewing
audio files for quantizing drum
recording, 124–127
drum sounds in Ultrabeat, 214–218
final mix, 330
loops, 18–22, 26–29
song before arranging, 286–289
takes for comping, 102–105
processing plug-ins
automating bypass, 400–401
copying, 52–53
creating MIDI recording, 143–144
mixing songs using, 49–51
processing plug-ins, dynamic
overview of, 367–368
using compressor, 368–370
using compressor and limiter on
master channel strip, 370–375
program, remotely choosing, 454–457
programming
drums, see drums, programming
in Piano Roll Editor, 170–178
progress window, 71
Project End, exporting mix, 53
Project File Backups folder, 414
project files
backing up, 414–417
rebuilding, 417–420
saving, 410–414
troubleshooting corrupted, 443–444
troubleshooting MIDI In, 433–436
project folders, backing up to external
devices, 420–421
project settings
count-in, 95–96
defined, 62
metronome, 96–98
preference settings vs., 97
punching on MIDI recordings, 159
recording MIDI takes, 156
punching automatic, 88–92
on the fly, 86–88
on MIDI recordings, 158–160
overview of, 85
Q
Quantize parameter, 146–148, 154,
234–237
quantizing
audio regions, 124–128
individual notes, 181
layback patterns vs., 234–237
MIDI regions, 146–147
note lengths, 208–210
recording MIDI in Cycle mode
using, 154
setting default quantization grid,
147–148
Quick Swipe Comping, 105–110
QuickTime, 330
R
R key (record), 24, 70–71, 75–77
RAM, 410, 437–438
randomizing
grooves, 236
percussion part, 305–308
regions, 294–296
velocities, 225–229
Read automation mode, 392, 397, 399
record command (R), 24, 70–71, 75–77
Record Enable button, 152, 429
recording audio
additional takes on multiple tracks,
82–85
creating additional takes, 75–79
delayed recorded MIDI sequence,
178–181
MIDI, see MIDI, recording
multiple tracks, 79–82
overview of, 59
punching in and out, 85–92
review Q & A, 98–99
setting count-in, 95–96
setting file type, 95
setting I/O buffer size, 93–94
setting metronome, 96–98
setting up, 60–64
single tracks. see tracks, recording
single
track, see tracks, recording
recording live automation
in Latch mode, 397–399
plug-in bypass automation, 400–401
in Touch mode, 392–397
Reduce Noise window, 324
Region Parameter box
copying and resizing regions, 33
looping and positioning regions, 30
quantized patterns vs. laid-back
patterns, 234–235
quantizing audio regions, 127–128
quantizing MIDI regions, 146–148
recording MIDI in Cycle mode, 154
region-based automation, 193, 196
Regions, audio
adding fade-in or fade-out to, 115–117
applying speed fades to, 279–282
arranging middle section of, 37–39
changing color of, 92
converting into sampler instrument track, 248–250
converting MIDI sequence into, 246–247
copying and resizing, 32–36
creating blue Apple Loops with, 266–269
crossfading between two, 120–121
editing in Arrange area, 113–121
ending song, 39–44
experimenting with order of, 294–296
keyboard shortcuts for, 461–462
looping and positioning, 29–32
matching project tempo to tempo of, 254–257
moving individual note with Flex tool, 128–131
packing into folders, 297–300
previewing multiple, in Solo mode, 287–289
quantizing, 124–128
selecting, 38
selecting portion of, 117–119
swapping positions of, 294–296
using Resize tool to adjust start or end of, 94
viewing result of comp as, 109–110
Regions, MIDI
cleaning up, 203–207
converting sequence to audio region, 246–247
creating green Apple Loops with, 267, 269
dragging pattern to Arrange area, 230–232
emptying with Pencil tool, 160
how notes are displayed on, 42
merging recordings in Cycle mode, 150–155
quantizing, 146–148
remotely choosing program, 454–457
repetitions
adjusting loop, 36–37
preparing song for mixing in Cycle mode, 44
previewing loops in section with continuous, 26–29
Replace mode, punching on MIDI recordings, 158–160
Resize tool, 34, 172
resizing
Editing Area of Arrange window, 16–17
regions, 33–36
resolution, 164
Reverb Level, Amp Designer, 336–337
reverberation, 361–367
Revert to Saved command, 88–89
Rewind button, 24–26, 70–71, 287
Right-click tool menu, 113
Room fader, 347
routing external MIDI tracks, 452–454
Sample Editor
defined, 131
positioning audio region in Arrange area, 135–137
reversing sample, 133–135
saving selection as new audio file, 131–133
sample rate, 61–62, 73
sample instrument, converting audio region into, 248–250
saving project backups, 414–417
every couple of steps, 29
for first time, 14–15
Logic’s behavior when, 410–414
Scale menu, Loop Browser, 258
Scissors tool, 295, 300–301
Score Editor
creating horn line in, 184–187
editing MIDI, 181
editing MIDI CC automation, 200
editing notes with MIDI keyboard, 187–188
enabling Step Input mode, 161
Link modes, 182–184
Search Results list, Loop Browser, 19
Set Locators button, 26, 231, 348
Setting button, 49–51
Shift key, key commands with, 175–176
Shift-click, 79, 234
Shift-Command-A (Applications folder), 12
Shift-Command-click (applying fades with)
Shift-Control-drag (applying fades), 121
Shift-Control-drag (applying fades with)
Shift-Enter (Play from Selection), 24–25
Shift-Return (Play button), 24
Shift-Toggle (Arrange window areas), 16
Shift-W (open in Soundtrack Pro), 322
Speaker button, Audio Bin, 122
Speaker cabinet, 334–335, 339, 342
speed
applying speed fade-ins and fade-outs, 280–282
changing with Varispeed, 269–272
customizing amp mode, Amp Designer, 338
Spinbox effect, Pedalboard, 340–341
Status icon, Audio Bin, 73
step sequencer, Ultrabeat
defined, 215
dragging pattern to Arrange area, 229–230
programming or editing patterns, 218–222
turning off to stop flange sound, 234
tuning
stereo channel strips, 354
Stereo Out channel strip, 371–372, 424, 429
Stop button (Spacebar), 24–25
Strip Silence, 317–319
Sustain Footswitch button, Step Input mode, 163–165
Swing settings, Quantize menu, 147
Synthesizer section, Ultrabeat, 215
System Preferences, 425
W7
track-based automation

adjusting volume of section, 380–387
creating crescendo, 387–390
creating pan automation, 390–392
defining, 380
ing, 383–387
tracks
adjusting levels of grouped, 349–351
keyboard shortcuts, 461–462
recording additional takes on multiple, 82–85
recording multiple, 79–82
resetting all to same height, 79
routing external MIDI, 452–454
tracks, recording single
adjusting level, 68–70
preparing track, 64–67
recording audio region, 70–72
using Audio Bin, 72–74
transitions, 114–117
Transport bar, Arrange window
adjusting settings in display fields, 19–20
adjusting step length in Step Input mode, 162–163
browsing and previewing loops, 19–20
comparing quantized with laid-back patterns, 236
defining, 17
detecting tempo of audio file, 255–256
Transport buttons and key commands on, 23–26
using Solo mode in, 287–289
using Varispeed, 270–272
Transport buttons, 23–26, 33
transport controls, keyboard shortcuts, 459–460
Trash, 123
troubleshooting and optimization
addressing unexpected behaviors, 441–444
backing up project files, 414–417
backing up project folders to external devices, 420–421
optimizing hardware performance, 436–441
overview of, 409
rebuilding project file, 417–420
restoring audio output, 422–424
review Q & A, 445
saving project and making automatic backups, 410–414
Tuner plug-in, 69–70
turntable effect, applying, 279–282
24-Bit Recording, bit depth, 64

U
U.S. Preset, see keyboard shortcuts (U.S. Preset)
Ultrabeat (Drum Synth)
choosing drum kit/previewing drum sounds, 214–218
ing velocities/accents, 225–229
programming pattern, 222–225
quantized vs. laid-back patterns, 233–237
recording MIDI in Cycle mode, 151–155
regions of interface, 215
using step sequencer, 218–222
viewing pattern as MIDI region, 230–232
Up Arrow key, 20
upbeat, inserting notes on, 224
USB, troubleshooting MIDI In, 433

V
Varispeed, 269–272
velocity
adjusting notes with MIDI keyboard, 187–189
editing note, 225–229
snare roll, 242–246
using Hyper Draw to edit note, 190–193
using Velocity tool to edit note, 176–178
Velocity tool, 171, 176–178, 193
vertical zoom in (Option-Control-Down Arrow), 39, 43, 202
vertical zoom out (Option-Control-Up Arrow), 43
View menu, Loop Browser, 258
views, 238, 463–464
vocals, with delay and reverb, 362–367
volume
adding accents to notes, 225–229
adjusting levels of drum tracks, 345–349
setting metronome, 97
volume automation
adjusting section, 380–387
creating crescendo, 387–390
in Hyper Draw, 196–200

W
wah noise, reducing Guitar track, 319–321
WAVE file, 95
waveforms, manipulating with Flex tool, 128–131
Write automation mode, 399

X
X key (Mixer button), 44

Z
Z key (Toggle Zoom to fit Selection or All Content), 33–34, 127, 405
zooming
Auto Zoom (Control-Z), 382
basic commands, 39–40, 43
keyboard shortcuts for, 460