Performer® Lite
User Guide

MOTU®

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Contents

Part 1: Setup

16 **Computer Requirements**
16 Minimum computer requirements
16 Getting started
16 Familiarity with your computer
17 Visit motu.com for software updates
17 Technical support
18 **Installing Performer Lite**
18 Obtaining the Performer Lite installer
18 Running the Performer Lite installer
18 Opening Performer Lite
18 Examining VST and AU plug-ins
19 The Performer Lite Welcome Window
19 Enabling audio I/O
19 Setting up MIDI hardware
19 Using virtual instruments
19 Interapplication MIDI (macOS only)
19 Updating Performer Lite
19 The Performer Lite User Guide PDF
20 **Configuring Audio Devices**
20 Overview
20 What is the MOTU Audio System?
20 Preparing your computer
20 Supported audio hardware
20 Choosing which audio hardware to use
21 Configuring the hardware driver
25 Configure Studio Settings
27 **Configuring MIDI Devices**
27 Overview
27 Setting up your MIDI equipment
27 Connecting MIDI gear directly
27 Connecting MIDI gear using a MIDI interface
28 The MIDI Devices tab
30 Audio MIDI Setup (macOS only)
31 Interapplication MIDI (macOS only)

Part 2: Getting Started

34 **Quick-Start Guide**
34 Creating an Instrument track
35 Creating Audio Tracks
36 Bouncing
39 **About Performer Lite**
39 Overview
39 Design philosophy
39 MIDI sequencing
40 Digital audio recording
40 Seamless MIDI and audio
40 Editing
41 Arranging
41 Automated mixing
41 MIDI and audio effects processing
41 Virtual instruments
41 Mastering
41 Music notation
42 **Performer Lite Basics**
42 Overview
42 Learn to use your computer
42 The Performer Lite window
44 Control Panel
44 Track Selector
45 Track Inspector
46 Channel Strip
46 The Window menu
47 Modifier keys
47 Clicking shortcuts
47 Using modifier keys with cursor actions
48 Contextual menus
49 Standard keyboard shortcuts
49 Customizing keyboard shortcuts
49 Changing text box values by dragging
50 Main counter shortcuts
50 Using the numeric keypad
51 Performer Lite track limits
52 **Tutorials**
52 using the tutorials sidebar
52 Videos and example files
53 **New Features in Version 11**
53 New features in Version 11.1
53 New features in Version 11.0

Part 3: Tracks

58 **Track Basics**
58 Overview
58 Basic track types
59 Special track types
59 Track settings
63 Effect inserts panel
63 Creating a track
63 Creating several tracks at once
63 Duplicating a track's settings
63 Duplicating a track's settings and data
64 Renaming a track
64 Deleting a track
64 Track colors
67 **Audio Tracks**
67 Overview
67 Integrated MIDI and hard disk audio
67 Types of audio tracks
67 Audio (disk) tracks
67 Mono and stereo tracks
67 Creating an audio track
68 Creating several audio tracks at once
68 Audio track settings
68 Input source: Audio bundles
69 Choosing an audio input and output
69 Record-enabling an audio track
69 Input monitor enable
69 Stretch
70 Pitch and Stretch Cache
70 Enabled
71 Track Transpose
71 Track Detune
71 Monitoring an audio track input
71 Changing audio track settings on the fly
71 Making I/O assignments for multiple tracks
72 Track limits
72 Managing your computer's system resources
73 **MIDI Tracks**
73 Overview
73 Integrated MIDI and hard disk audio
73 MIDI only
73 What is a MIDI track?
73 Creating a MIDI track
73 Creating several MIDI tracks at once
74 MIDI track settings
75 Record-enabling a MIDI track
75 Choosing an input source
75 Choosing a MIDI output destination
76 Making I/O assignments for multiple MIDI tracks
76 Choosing a default patch (sound)
76 The patch list
76 Track Quantize
76 Track Transpose
77 MIDI Keys
78 Multi-channel MIDI tracks
78 MIDI Polyphonic Expression (MPE)
82 **Instrument Tracks**
82 Overview
82 Creating an instrument track
83 Instrument track settings
84 Working with instrument tracks
86 Instrument tracks in the Mixing Board
87 Instrument track inserts
87 Open Instrument shortcut
87 Instrument track automation
87 Instruments as audio plug-ins
87 Instrument plug-ins in V-Racks
88 Multiple audio outputs
88 Performer Lite's included instruments
88 Track limits
89 **Aux Tracks and Master Fader Tracks**
89 Overview
89 Aux tracks
90 Master Fader tracks
91 Track limits
92 **Track Folders and Track Groups**
92 Overview
92 Track Folders
92 Track Groups

Part 4: Project Basics

98 **The Performer Lite Project**
98 Overview
98 Components of a Performer Lite Project
99 Creating a new project
99 Creating a new project from a template
100 Opening an existing project
100 Open Recent sub-menu

100 Saving a project
100 Saving a project file under a different name
100 Save a Copy As
101 Using Save a Copy As for incremental backups
101 Autosave
101 Collecting a project for backup or transfer
102 Avoiding disaster
102 Exporting a project
102 Moving a project between Mac and Windows
102 Exporting to notation software through MusicXML
102 Reverting to a previously saved project
102 Adding project notes
102 Printing project windows
104 Closing a project
104 Quitting/Exiting Performer Lite
104 Helpful project and disk hints
106 **Control Panel**
106 Overview
106 Transport Controls
107 Counter
111 Tempo Controls
113 Transport settings
113 Overdub
114 Countoff
114 Countoff preferences
115 Click
115 Click Preferences
117 Memory Cycle
118 Auto-Record
119 Solo
119 Primary and alternate tools
119 Keypad shortcuts
121 **Sequence Editor**
121 Overview
122 Quick Reference
124 Sequence Editor menu
125 Sequence Editor basics
125 Opening the Sequence Editor
125 Switching sequences
125 Sequence management
125 Track management
126 Information Bar
128 The Time Ruler
128 The Marker Strip
129 The Memory Cycle strip
129 The Auto Record strip
129 Zoom buttons
129 Zooming techniques
129 Track settings
130 Audio editing
130 MIDI editing
130 Resizing tracks
131 The movie track
131 The Conductor track
132 **Notation Editor**
132 Overview
133 Notation Editor Quick Reference
134 Notation Editor menu
136 Notation Editor basics
137 Opening the Notation Editor
137 The Track Selector
137 The QuickScribe transcription engine
137 The playback wiper
138 Getting around in the Notation Editor
138 Zooming
139 Notation Editor options sub-menu
139 Score options
141 Track options
143 Marker options
144 Measure numbers
144 Measure spacing
145 Set Score Length
145 Controlling page size
145 Adjusting system margins
145 Information bar
146 The Notation Editor Tool Palette
146 Working with notes
150 Chord Symbols
152 Inserting a staff brace or bracket
152 The Dynamics Palette
153 The Articulations Palette
154 Popup Meter Changes, key changes and tempos
155 Working with text
158 Lyrics
161 Score Arrangement
166 Display-only and playback-only notes
167 Film Cues view
170 Printing
171 Exporting a musicXML file
174 **Mixing Board**

174 Overview
175 Mixing Board quick reference
177 Mixing Board menu
178 Mixing Board window basics
178 Track strips
184 EQ and Dynamics (audio tracks only)
189 Instrument tracks
190 Automated mixing
191 Mixing in real time
191 Editing your mix graphically
191 Monitoring
191 Audio mixing features
192 Aux tracks
192 Master faders
192 Track groups
192 VCA tracks
193 Remote control
193 Working with effects plug-ins
196 Working with multiple mixes
198 **Clips Window**
198 Overview
199 Quick reference
200 Clips window menu
201 What is a clip?
201 Opening the Clips window
201 Clips window basics
202 The track Stretch setting
202 Showing, hiding and arranging track columns
202 Track types
202 Track playback versus clip playback
202 Creating clips
203 The trigger button
204 Track clips
204 Clip menu
204 Scenes
205 The track scene
205 Playing clips and scenes
205 The multi-queue
206 Mixer channels
206 The Clip Editor
208 Clip Record mode
208 MIDI Learn Mode
208 Attaching MIDI controllers for mixing
209 Using a 3rd-party pad controller
210 Akai APC family
211 Akai APC40 mkII
212 Novation Launchpad
213 Novation Launchpad / SHIFT
214 **Content Browser**
214 Overview
214 Quick Reference
215 Content Browser menu
215 Opening the Content Browser
215 Opening the Content Browser as a window
215 Using the Content Browser
215 Auditioning audio clips
215 The Performer Producer Pack
216 **Soundbites**
216 Overview
216 Quick Reference
217 Soundbite menu
218 Opening the Soundbite list
218 Opening the Soundbite list as a window
222 Soundbite Basics
222 Mono and stereo audio
223 Soundbite Management
226 Dragging and dropping soundbites
226 Working with multiple sample formats
226 Converting sample rate/format
227 Automatic conversions
227 Importing and exporting audio
232 **Set List**
232 Overview
232 Set List Quick Reference
233 Set List basics
237 Sequence cuing and chaining
238 **Sequence Basics**
238 Overview
238 Sequence types
238 Managing sequences and V-racks
239 **V-Racks**
239 Overview
239 V-Rack basics
240 Creating a V-Rack
240 V-Rack quick reference
240 Working with a V-Rack
243 **Tools**
243 Overview
244 Main and Alternate Tools

244 Keyboard shortcuts for tools
244 Pointer tool
245 I-Beam tool
245 Pencil tool
246 Insert/Reshape Curve
246 Reshape tool
246 Reshape Mode menu
246 Zoom tool
247 Mute tool
247 Scissors tool
248 Trim tool
249 Roll tool
249 Slip tool
249 Slide tool
249 Comp tool
249 Velocity tool
249 Hand tool
249 Scale Per Note CC Data tool

Part 5: Preferences

251 **Preferences and Settings**
251 Overview
251 The Preferences window
252 Audio Plug-ins
252 Document
252 Data Display
252 Automatic Conversions
253 Chord Symbols
253 Information Bar
253 Lyrics
253 MIDI Editing
254 Soundbite List
254 Tools
254 Undo Pruning
255 Audio options
255 Click
255 Countoff
255 MIDI Options
255 Pitch and Stretch
255 Receive Sync
255 Transmit Sync
255 Transport
256 Scaling all windows up or down
256 Help menu
257 **Commands**
257 Overview
257 Opening the commands window
257 Navigating the commands window
258 Command groups
258 MIDI Masters
258 Assignments
259 Numeric Base note
259 Sequence remote assignment
259 Run command
260 Export Key Bindings
260 Import Key Bindings
261 **Bundles**
261 Overview
261 Audio bundles
262 Bundle types
262 Adding and deleting bundles
262 Renaming bundles
262 Working with tiles on the grid
263 Exporting and importing bundles
263 Bundle channel formats
264 Reassigning bundles
264 The instruments tab
264 The MIDI Devices tab

Part 6: Playing and Recording

268 **Playback**
268 Overview
268 MIDI Playback basics
268 Audio playback basics
268 How to play a sequence
269 Monitoring levels
269 Editing during playback
269 Screen re-display
269 Muting and unmuting tracks during playback
269 Soloing Tracks
270 Looping playback
270 Playing the current selection
270 Event Chasing
272 The playback wiper
273 Scrubbing multiple MIDI tracks
273 Scrubbing and grid snapping
273 Stop Sounding MIDI Devices (Panic)
274 **Recording**

274 Overview
275 Choosing a sequence to record into
275 Setting tempo and meter
275 Recording to a click
275 Recording with a Countoff
275 Input Filter
276 Non-destructive output quantize
276 Preparing a MIDI track for recording
277 Preparing an audio track for recording
277 MIDI input monitoring
280 Audio input monitoring
282 Using the countoff
282 Start recording
283 Stop recording
283 How audio is recorded on disk
283 Undo record
283 Recording stereo audio
284 Recording several audio tracks in one pass
284 Recording audio and MIDI at the same time
284 Manual punch-in/punch-out on the fly
284 Automatic punch-in/punch-out
286 Recording multiple takes
286 Cycle-recording
288 Recording in External Sync
289 Sample Format
289 Getting an error message
291 **Movie Window**
291 overview
291 Random access digital picture
291 Supported video formats
291 Opening movies
292 Closing movies
292 Movie control bar
293 The movie track
293 Movie window menu commands
294 Scrubbing the Movie window
294 Improving movie window performance
294 Exporting a Movie

Part 7: Editing

296 **Editing Basics**
296 Overview
296 Unlimited Undo/Redo
296 Editing during playback
296 Selecting and searching
296 Region editing
297 Track groups
297 View menu
298 Zooming
301 Scroll To
301 Graphic editing techniques
302 Audio editing basics
303 Sample accurate editing
303 Listening while editing
305 **Selecting**
305 Overview
305 Selection basics
306 Choosing a Pointer tool selection mode
307 Selecting events
307 Selecting tracks
308 Selecting a time range
310 Smart Selection
313 **MIDI Editing**
313 Overview
314 Quick Reference
315 Tool palette quick reference
315 Accessing a MIDI track
315 MIDI editing basics
315 Selection techniques
316 The Edit Layer
316 The Clips and Notes edit layers
316 The MIDI note grid
317 The Pitch Ruler
317 Inserting Notes
318 Selecting Notes
319 Editing Notes
320 Editing MIDI CC data
321 Three controller display modes
322 The MIDI CC Ruler
322 Changing MIDI CC colors
323 Note velocities
323 Editing MIDI CC's in Points or Bars mode
325 Editing CC data in Lines mode
327 Per-note continuous controller data
328 Discrete MIDI events
330 **Audio Editing**
330 Overview
331 Quick Reference
331 Tool palette quick reference

332 Accessing an audio track
332 The Edit Layer
332 Audio editing basics
333 Inserting soundbites
334 Moving soundbites
336 Muting and unmuting soundbites
337 Bite Gain
337 Overlapping and layering soundbites
338 Trimming (edge editing) soundbites
340 Graphic time stretching of audio
340 Graphic editing techniques
341 Selection techniques
341 Working with Clips
343 Working with breakpoint mix automation
347 Soundbite volume automation
348 **Fades and Crossfades**
348 Overview
348 What is a crossfade?
348 Creating a single fade or crossfade
351 Types of crossfades
352 Fade curves
353 How fades are generated
353 Fades are anchored to their splice
353 Applying multiple fades in one operation
354 Reapplying the last fade settings
354 Deleting fades
354 Editing existing fades
355 Fades that cannot be fully computed
355 Trimming soundbites that have a fade or crossfade
355 Clipping when crossfades are calculated
356 **Information Panels**
356 Overview
356 Opening an information panel
356 Floating windows or sidebar cells
356 The Information Bar
357 Snap Information
359 Cursor Information
359 Event Information
360 Selection Information
362 Sound File Information
364 Track Inspector
364 Channel Strip
364 Track Selector
365 **Edit Menu**
365 Overview
365 Undo
365 Redo
365 Cut
365 Copy
366 Paste
366 Other Paste commands
367 Erase
367 Duplicate
367 Repeat
367 Paste and Merge
368 Other Merge commands
368 Trim
368 Trim Audio
368 Trim End / Trim Start
368 Select All
368 Select All Tracks in Range
369 Deselect All
370 **Region Menu**
370 Overview
370 Region command windows
371 Previewing
371 Transpose
379 Quantize
386 Groove Quantize
391 Create (Extract) Groove
394 DeFlam
395 Change Velocity
398 Change Duration
401 Split Notes
404 Invert Pitch
405 Change MIDI Channel
405 MIDI Effects Plug-ins
406 Reverse Time and Retrograde
407 Scale Time
408 Scale Tempo
410 Audition Selection
411 **Audio Menu**
411 Overview
411 Fade
411 Delete fades
411 Merge Soundbites
411 Smooth Audio Edits
413 Smooth Audio Edits Again
413 Spectral Effects
413 Bite volume and gain

413 Pitch and Stretch
414 Apply Plug-in
414 Audio Beats
414 Soundbite Tempo
415 **Takes and Comping**
415 Overview
415 Take menu
416 Indication of multiple takes
416 Comp takes
418 Comp tool
420 Takes and key commands
421 Conductor track takes
421 Takes interact with multiple mixdowns
422 **Tempos and Audio**
422 Overview
422 Soundbite Tempo Maps
423 The track Stretch layer
424 Audio menu > Soundbite Tempo
424 Analyze Soundbite Tempo
424 Set Soundbite Tempo
425 Clear Soundbite Tempo
425 Halve/Double Soundbite Tempo
425 Find Tempo Factor Near Sequence Tempo
425 Copy Sequence Tempo to Soundbite
426 Adjust Soundbites to Sequence Tempo
426 Adjust Sequence To Soundbite Tempo
428 **Audio Beats and Tempo Detection**
428 Overview
428 The Beat Detection Engine
429 What works and doesn't work
429 Manually applying beat and tempo detection
430 Where beats and tempo maps are stored
430 Audio menu > Audio Beats
434 Using the beat grid
435 Stretching audio beats
436 Quantizing beats within soundbites
437 Applying a groove to beats within soundbites
437 Extracting a groove from audio
437 Ideas for quantizing audio
437 Beats determine tempo detection
438 Editing beats to improve tempo detection
438 Reanalyzing tempo after editing beats
438 Adjusting soundbite tempo maps
439 **System Exclusive**
439 Basics
439 Recording and playing SysEx messages
440 Viewing and editing SysEx data
441 Editing data in the system exclusive window
442 Inserting SysEx data
442 Editing SysEx data with the Edit Menu
442 Transmitting a SysEx message
443 Recording SysEx into the Editor Window
443 Recording SysEx into a track
443 Hints
444 Be Careful

Part 8: Arranging

446 **Conductor Track**
446 Overview
446 Conductor track basics
446 Types of Conductor track events
449 Editing in the Conductor Track
453 **Markers**
453 Overview
454 Markers window quick reference
455 Markers window menu
455 Basics
456 Opening a Markers Window
456 Switching between sequences and songs
456 Scrolling during playback
456 Creating new markers
456 Changing the name of a marker
457 Changing a marker time location
457 Marker streamer, punch & Flutter settings
457 Custom pre-gap for CD Burn
457 Setting the counter to a marker location
457 Marker locate numbers
458 Jumping to a marker with a shortcut
458 Selecting markers
458 Using markers to define an edit region
459 Selecting with markers
459 Markers in edit windows
459 Markers in the Song window
459 Editing markers in the conductor track
460 Locking and unlocking markers
460 Shifting locked markers in time
460 Locked markers and the sequence start time
460 Locked markers and changing meter
460 Recording hits

461 Using markers to find a tempo
461 Streamers
461 Marker hints
463 **Change Tempo**
463 Overview
463 Change Tempo quick reference
464 Change Tempo basics
465 Using Change Tempo
470 Viewing and editing tempo changes
470 Tempo editing resolution
470 Changing tempo on-the-fly during playback
471 **Change Meter**
471 Overview
471 Change Meter quick reference
471 Change meter basics
472 Using the Change Meter window
474 Viewing meter changes
474 Editing meter changes in the Conductor track
475 Hints and examples
476 **Change Key**
476 Overview
476 Change key Quick Reference
476 Change Key basics
477 Types of key signatures
477 Inserting key signatures
478 Viewing and editing key changes
479 **Insert Measures**
479 Overview
479 Before you use Insert Measures
479 Using the Insert Measures command
480 **Adjust Beats**
480 Overview
480 The problem
480 Using Adjust Beats
483 **Find Tempo**
483 When Find Tempo works best
484 Preparing markers
484 Opening Find Tempo
484 Entering search parameters
485 Processing the results
486 Browsing the tempo search results
487 Auditioning a specific tempo
487 Viewing the results of a specific tempo
487 Applying the tempo to your sequence
487 Copy and move locked markers
488 Locking tracks before applying a new tempo

Part 9: Mixing

490 **Mix Automation**
490 Overview
490 Automated mixing for MIDI and audio
491 Mix automation setup
491 Global automation enable/disable
492 Automation setup for each track
493 Automation settings in other windows
494 Reasons to disable automation
494 Automation modes
499 Recording automation
499 Inserting and editing automation
502 Insert and clear Mute Automation
503 Tempo locked, beat-based automation
503 Snapshot automation
507 Automation preferences
508 Removing and restoring plug-ins
508 VCA track automation
508 Automation and system resources
509 **VCA Tracks**
509 Overview
509 VCA tracks and track groups
509 Creating a VCA track
510 VCA control
510 Shared tracks and nested VCA groups
511 VCA tracks and mix automation
512 Releasing a VCA track from its group
512 MIDI tracks and VCA tracks
513 Exporting to earlier versions of DP

Part 10: Processing

516 **Effects Window**
516 Overview
516 Effects Window Quick reference
518 Opening and Closing the Effects window
518 Bypassing an effect
518 Saving, loading, and editing presets
520 Editing Effects
521 **Audio Effects Plug-ins**
521 Overview
521 Native plug-in processing

522 Real-time versus rendered effects
522 Live Performance Mode
523 File-based plug-in processing
523 Working with MAS plug-ins
524 Working with VST and Audio Unit plug-ins
525 Organizing plug-ins
525 Audio plug-in preferences
528 Using effect presets
528 Busing, master faders & aux tracks
528 Copying and pasting effect settings
528 Plug-ins from other companies
529 Plug-in automation
529 Taking an automation snapshot of plug-in parameters
529 Attaching a MIDI controller to plug-in parameters
529 Tempo-locked effects
529 Channel configurations
529 Side chain inputs
530 Multiple audio outputs
530 Making a real-time plug-in effect permanent
530 Performer Lite plug-ins
530 Performer Lite virtual instruments
532 **MIDI Effects Plug-ins**
532 Overview
532 Change duration
532 Change velocity
533 DeFlam
533 Echo and Arpeggiator
537 Groove Quantize
538 Humanize
538 Invert Pitch
538 Quantize
539 Reassign Continuous Data
539 Remove Duplicates
539 Time Shift
539 Transpose
540 **Audio File Conversion**
540 Overview
540 Performing conversions
540 Converting the sample rate
541 Converting the sample format
541 Converting the file format
541 Converting the interleave format
541 Converting entire audio files
541 Soundbite replacement options
541 Automatic Conversions
542 **Time-stretching and pitch-shifting**
542 Overview
542 ZTX™ audio processing
542 Selecting audio for processing
543 Editing MIDI and audio together
543 Constructive editing
543 Audio quality is preserved
544 Handling lengthy processing tasks
545 ZTX Preferences
547 **Transposing Audio**
547 Overview
547 Pitch Shifting mode
548 Pitch automation
555 Using the Transpose command
555 Transposing audio and MIDI together
555 Temporarily disabling pitch modifications
556 Converting audio pitch to MIDI data
557 ZTX processing preferences
557 Background processing
558 **Spectral Effects**
558 Overview
558 The Spectral Effects command
558 What is a formant?
559 What does Spectral Effects do?
559 Gender-bending
559 Special effects such as “chipmunking”
559 Any pitched audio can be used
559 Spectral Effects dialog controls
559 Spectral Effects presets
560 Applying Spectral Effects to audio
561 **Scale Time**
561 Time Scaling
561 The Scale Time command
561 Selecting a region to time scale
561 Audio and tempo
561 Graphically time-scaling audio

Part 11: Bouncing & Mastering

564 **Bounce To Disk**
564 Overview
564 Previewing
564 Bouncing to Disk
565 Bounce to Disk settings
569 Bouncing to MP3

570 Bouncing to a CD or disk image (Mac only)
575 Bouncing to a Movie
576 Bouncing stems
577 **Mastering**
577 Overview
577 Master fader
577 Allocating processing power
578 Real-time bounce to disk
579 Rendering audio
580 Bounce to disk
580 Delivery

Part 12: Synchronization

582 **Receive Sync**
582 Overview
582 Receive Sync basics
582 Basic types of sync
583 Using Receive Sync
583 Choosing a SMPTE frame format
584 Choosing a SMPTE start frame
584 Sync to port menu
584 Record while still-framed
585 Sample-accurate sync
586 MTC (MIDI Time Code)
587 MIDI Beat Clocks
588 Tap Tempo
589 Slaving to external sync
590 Using Tap Tempo
592 Using Tap Tempo while slaved to external sync
594 **Transmit Sync**
594 Overview
594 MIDI Time Code
595 MIDI Beat Clocks
596 Turn off Transmit Sync when you don't need it

Part 13: More Information

598 **Hard Disk Recording Concepts**
598 Overview
598 How audio is recorded on disk
599 How much disk space does audio require?
600 Hard disk requirements and maintenance
600 Digital audio terms
603 **Audio File Management**
603 Overview
603 The Audio Files folder
603 Renaming audio files
603 Moving audio files
603 Working with multiple drives
603 Deleting audio files
604 Getting rid of unused audio
607 **Frequently Asked Questions**
607 Overview
607 Setting up
608 Becoming familiar with Performer Lite
609 Recording and playback
611 Editing
611 Mixing and Finishing
612 Plug-ins
612 Virtual instruments ("soft synths")
614 **Additional Resources**
614 Overview
614 Frequently Asked Questions (FAQ)
614 The Performer Lite User Guide
614 Help Tags
614 Tutorials
614 motu.com
615 Training webinars
615 Youtube.com/motuTV

Part 14: Appendices

617 **Control Surfaces**
617 Overview
617 MIDI Device configuration
617 Enabling a control surface driver
618 Configuring a driver
618 Working with multiple control surfaces
618 CueMix Console control surface
619 Supported devices
619 EuCon
619 Native Instruments Komplete Kontrol mk2
621 Softube Console 1
621 Track Pinning Options
623 **Troubleshooting and Support**
623 Overview
623 Preventing Catastrophe
623 General troubleshooting
624 MIDI troubleshooting

624 Audio troubleshooting
625 Technical support
627 **Index**

Part 1

Setup

CHAPTER 1 Computer Requirements

MINIMUM COMPUTER REQUIREMENTS

Here are the computer system requirements for Performer Lite:

- Mac or PC with Intel Core 2 Duo CPU 2.0 GHz or faster recommended. Only Macs with 64-bit CPUs are supported, including Apple silicon (ARM processor) Macs. (Macs with PowerPC CPUs are not supported.) PCs must be 64-bit AMD or Intel only. (PC ARM processors are not supported).

☛ The faster the computer, and the more RAM installed in it, the more responsive Performer Lite is. Scrolling during playback is smoother, the counter updates regularly, and actions that you take with the program are faster — especially during playback.

- 4 GB of RAM is required; more is highly recommended.

☛ Since plug-ins and virtual instruments are loaded into the computer's RAM, add as much RAM as possible to your computer.

☛ Performer Lite is a 64-bit application, which allows full access to your computer's RAM.

- A display with at least 1024 x 768 resolution (1280 x 1024 resolution or higher is recommended).

- MacOS (version 10.13 or later) or Windows (10 or later).

- Large hard disk, preferably at least 100 GB. The disk on which tracks are recorded must be a fast drive.

Support for macOS Big Sur, Monterey, Ventura and Apple silicon

Performer is fully qualified for macOS Big Sur (11.x), macOS Monterey (12.x), macOS Ventura (13.x) and the latest generation Apple silicon Macs. Performer's audio engine is fully optimized for multi-core performance on Apple silicon, prioritizing audio threads on high-speed cores and reserving CPU bandwidth for critical, time-sensitive processing.

64-bit operation

Performer is a 64-bit only application. Therefore, on macOS 10.13 (which is the last version of macOS to support 32-bit apps), Performer runs 64-bit only. On Windows, Performer requires the 64-bit version of Windows 10.

☛ You cannot run 32-bit plug-ins or virtual instruments in Performer. Only 64-bit plug-ins and virtual instruments are supported.

Retina display support

If you are running Performer Lite on a Mac with a Retina™ display, which offers exceptionally high image resolution, Performer Lite supports the full resolution of your display. You can scale the size of Performer Lite's overall user interface to make it comfortable for your eyes. Choose View menu > Scale.

GETTING STARTED

Follow the directions in the next few chapters of this guide to successfully begin using Performer Lite.

FAMILIARITY WITH YOUR COMPUTER

This manual assumes that your are familiar with using your computer. If not, please review your computer's user guide before proceeding.

VISIT MOTU.COM FOR SOFTWARE UPDATES

Software updates are periodically posted on our web site, so check our web site for the latest updates at www.motu.com. You can also check for updates directly using the commands in Performer Lite's Help menu.

TECHNICAL SUPPORT

If you have questions, please review this manual carefully first. You can reach MOTU tech support as follows:

- 24-hour online tech support database with search engine: www.motu.com/support
- Online: www.motu.com/support
- Phone: +1 (617) 576-3066
  (9 a.m. – 5 p.m. Eastern)
- Downloads: www.motu.com/download

CHAPTER 2 Installing Performer Lite

Obtaining the Performer Lite installer 18
Running the Performer Lite installer 18
Opening Performer Lite 18
Examining VST and AU plug-ins 18
The Performer Lite Welcome Window 19
Enabling audio I/O 19
Setting up MIDI hardware 19
Using virtual instruments 19
Interapplication MIDI (macOS only) 19
Updating Performer Lite 19
The Performer Lite User Guide PDF 19

OBTAINING THE PERFORMER LITE INSTALLER

Performer Lite is available free of charge to owners of MOTU audio hardware products. To obtain your free Performer Lite software, locate the serial number of your MOTU hardware product (usually found on a label on the bottom of the unit), and then following these easy steps:

1 Log in to your motu.com account or to create a new account (required).

2 If you haven't already done so, register your purchased MOTU hardware product (required).

☛ Note: Performer Lite is only available to registered MOTU hardware users.

3 Click *View Details* for your registered hardware product.

4 Under *Included loops and software* click the Performer Lite banner.

5 Download the Performer Lite installer.

RUNNING THE PERFORMER LITE INSTALLER

1 Double-click the Performer Lite installer package or setup (.exe) file.

2 Follow the directions the installer gives you.

OPENING PERFORMER LITE

After a successful installation, you are ready to launch Performer Lite for the first time.

When you first run the Performer Lite application, you will be required to authenticate and activate your copy of the application. Follow the on-screen instructions. For further information, visit motu.com/activate-Performer Lite.

EXAMINING VST AND AU PLUG-INS

Performer Lite supports third-party VST plug-ins (on Mac and Windows) and macOS Audio Unit (AU) plug-ins. When you first run Performer Lite, it examines third-party plug-ins currently installed in your system, checking them for problems.

Choosing a primary external plug-in format (macOS only)

On macOS, Performer Lite will ask you to choose either VST or AU] as your primary external plug-in format. Choose AU if you have a large number of existing Performer Lite projects that use AUs, and you don't need to transfer Performer Lite projects to and from Windows systems. Choose VST to increase the cross-platform compatibility of your projects. This choice can be changed at any time in the audio plug-in preferences (see "Primary external plug-in format (Mac only)" on page 528). Once you've made your initial choice, Performer Lite scans and enables plug-ins in your primary format. Later, you can manually choose the desired format for each plug-in in the audio plug-in preferences.

The plug-in examination process

The plug-in examination process may take a few minutes, depending on the nature and quantity of the plug-ins installed in your system. Each plug-in is examined only once, the first time it is loaded by Performer Lite. On subsequent launches of Performer Lite, plug-ins that have already been examined will not be examined again. If a problem is detected with a particular plug-in, it will not be loaded for use in Performer Lite to prevent crashing and other serious problems. For more details about using VSTs and AUs, see "Working with VST and Audio Unit plug-ins" on page 524.

THE PERFORMER LITE WELCOME WINDOW

After Performer Lite launches, you'll see the welcome window, which provides a variety of convenient resources. The window provides a menu of file templates to choose from, for quickly creating new projects. You'll also see a list of recently opened projects for quick access.

If you prefer not to see the welcome window, you can disable it in the Performer Preferences in the Performer menu (Mac) or Edit menu (Windows) under the *Document>Startup Options*.

ENABLING AUDIO I/O

To enable Performer Lite's audio recording and playback abilities, choose *Setup menu> Audio System> MOTU Audio System*. For further details, see chapter 3, "Configuring Audio Devices" (page 20).

You can freely disable audio recording and playback at any time by choosing *Setup menu> Audio System> MIDI Only*.

SETTING UP MIDI HARDWARE

To set up Performer Lite for use with MIDI hardware devices connected to your computer, see chapter 4, "Configuring MIDI Devices" (page 27).

USING VIRTUAL INSTRUMENTS

Performer Lite includes a host of virtual instrument plug-ins, which provides dozens of instruments to choose from. Performer Lite also supports third-party instruments (in industry-standard VST and AU plug-in formats). Performer Lite does not require any additional preparation for use with virtual instrument plug-ins. Simply open virtual instruments as described in chapter 13, "Instrument Tracks" (page 82), and its audio and MIDI inputs and outputs will appear in Performer Lite's I/O menus. For details about Performer Lite's including instruments, go to Performer Lite's Help menu and choose the *Performer Lite Plug-ins Guide*.

INTERAPPLICATION MIDI (MACOS ONLY)

On macOS, if a virtual instrument operates as a separate application, run it concurrently with Performer Lite, and any MIDI inputs and outputs that it publishes to Core MIDI will appear in Performer Lite's MIDI input and output menus.

If you would like to work with Core MIDI-compatible MIDI software that does not publish MIDI inputs and/or outputs, Performer Lite has the ability to publish its own Core MIDI inputs and outputs, which the other application can access for MIDI I/O with Performer Lite. For details, see "Interapplication MIDI (macOS only)" on page 31.

UPDATING PERFORMER LITE

Performer Lite can automatically check for updates; see "Checking for updates" on page 256.

THE PERFORMER LITE USER GUIDE PDF

This *Performer Lite User Guide* PDF can be found in Performer Lite's Help menu. Table of Contents entries, index entries, and cross references are live links that will jump to their destinations. In some cases, you may need to click directly on the page number (rather than the heading).

CHAPTER 3 Configuring Audio Devices

OVERVIEW

This chapter helps you get the most out of Performer Lite's audio recording and playback features. This chapter explains what MAS is, how to configure it for your audio hardware, and how to obtain the best performance possible from your computer. The performance tips in this chapter can have a dramatic effect on how well Performer Lite operates, so be sure to review this chapter carefully.

Overview **20**
What is the MOTU Audio System? **20**
Preparing your computer **20**
Supported audio hardware **20**
Choosing which audio hardware to use **20**
Configuring the hardware driver **21**
Configure Studio Settings **25**

WHAT IS THE MOTU AUDIO SYSTEM?

MAS is the hard disk recording engine that drives Performer Lite's digital audio recording capabilities. MAS provides a complete audio recording environment, including many features previously only available on expensive hardware-based systems. Advanced features include an adjustable number of internal busses, aux tracks, master faders and sends. MAS also provides a plug-in architecture for real-time audio effects, such as reverb, compression and EQ. Real time effects are covered in detail in chapter 58, "Audio Effects Plug-ins" (page 521).

PREPARING YOUR COMPUTER

Here are several things you need to do before using Performer Lite's native audio recording and playback features.

SUPPORTED AUDIO HARDWARE

Performer Lite supports the built-in audio hardware in your computer and any Mac or Windows compatible audio hardware that ships with standard ASIO drivers, Mac OS Core Audio drivers, or Windows Audio (WASAPI) drivers. After the device's driver has been successfully installed (as described in its installation instructions), and it has been chosen for use in Performer Lite (*Setup menu> Configure Audio System>Configure Hardware Driver*), it will appear as a choice for audio input and output inside Performer Lite, as explained in the next section.

All MOTU audio hardware, including Thunderbolt and USB interfaces, ship with Core Audio and ASIO drivers that allow them to operate successfully with virtually all Mac and Windows audio software.

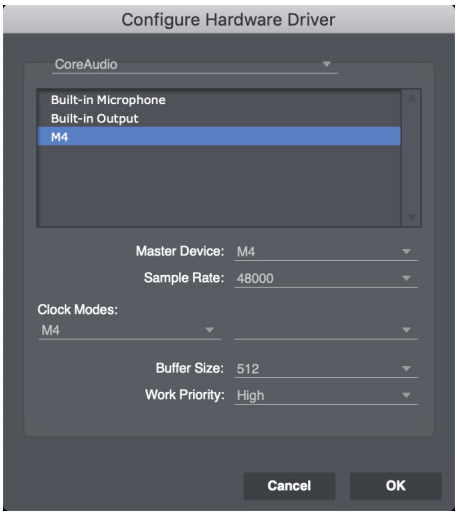
CHOOSING WHICH AUDIO HARDWARE TO USE

If Performer detects an audio interface or sound card with more than two inputs/outputs connected to your computer (and its driver is installed), Performer uses it for audio input and output. Otherwise, it uses your computer's built-in audio (or whatever you've chosen in your system sound settings). If you disconnect your audio interface, Performer reverts to the computer's built-in audio, then back again when you reconnect your interface. You can also explicitly choose a specific audio interface or sound card, as explained in the next section.

CONFIGURING THE HARDWARE DRIVER

A *hardware driver* is software component of your computer system that allows Performer Lite to communicate with a piece of audio hardware, such as the audio circuitry inside your computer, a Thunderbolt audio interface, a USB or USB 2.0 audio interface, or an audio PCI card installed in one of your computer's PCI slots. If you haven't already installed the driver for your audio hardware, do so now, before proceeding below.

To establish the link between Performer Lite and your audio hardware, you need to activate its driver in Performer Lite. To do so, go to the Setup menu and choose *Configure Audio System>Configure Hardware Driver*. The Configure Hardware Driver window appears as shown in Figure 3-1:



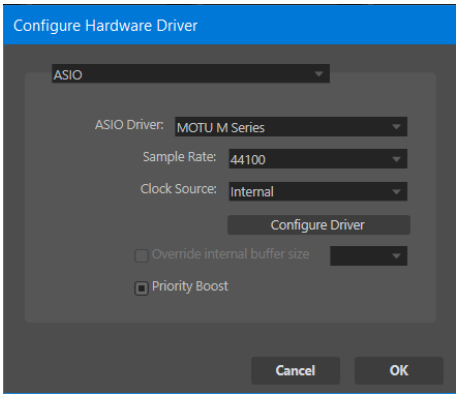


Figure 3-1: The Configure Hardware Driver window for Mac and Windows. On the Mac, you can select multiple drivers to operate several audio devices simultaneously by command-clicking them.

Enabling the hardware driver

All Core Audio and/or ASIO drivers currently installed in your computer appear as shown in Figure 3-1.

Enabling the hardware driver under Windows

For Windows, choose the ASIO or Windows Audio driver from the menu. Under Windows, only one driver can be active at a time. For ASIO, choose the desired ASIO driver (device) from the menu provided. For the best audio quality, highest channel counts, and lowest latency, use audio hardware that provides an ASIO driver.

The *Windows Audio* driver option is primarily intended for situations in which you do not have an ASIO driver installed, or you do not currently have access to ASIO-supported audio hardware. Window Audio is stereo only, but it can sample rate convert on both input and output. If sample rate conversion is engaged, the sample rate setting in Performer Lite's control panel turns red. In addition, Performer Lite uses the default audio device chosen in the Windows Sound control panel. For best audio quality and lowest latency, go to the *Advanced* tab of the properties dialog for the

default audio device and set the sample rate so that it matches the same rate as the Performer Lite project.

Enabling the hardware driver under macOS
For macOS, click a driver to enable it. Command-click to enable multiple drivers at one time. This allows you to use multiple audio devices simultaneously, but there are additional setup requirements for reliable operation. See "Enabling multiple drivers (Mac only)" on page 24. Note that some Macs have separate drivers for their built-in input and built-in output, so to use both simultaneously you must select both as described above.

Follow System Audio Settings (Mac only)
Enable the *Follow System Audio Settings* option if you want Performer to always use the audio input and output options you've chosen in your Mac's System Sound preferences, rather than selecting a specific driver in the list shown in Figure 3-1. When this option is enabled, you cannot change which driver is selected in the list because it is now being controlled by the Sound Control Panel in your System Preferences.

Master Device (Mac only)
If only one driver is enabled (highlighted) in the list, this menu can be ignored.

If you are operating multiple audio devices (you have two or more devices selected in the list), choose the device that you wish to use as the master clock. For further details about this important setting, see "Enabling multiple drivers (Mac only)" on page 24.

Sample Rate
Choose the desired sample rate for recording and playback. 44.1 kHz is the standard rate for audio compact discs. If you intend to play audio files that have already been recorded, make sure you match their sample rate. If you aren't sure what their sample rate is, import them into a Performer Lite file and look at them in the Soundbites list.

If you are operating multiple devices, this setting applies to all of them.

The choices in the sample rate menu are determined by the currently chosen audio hardware, according to the sample rates it supports. Sometimes, you may see non-standard sample rates in the menu (44,052 kHz for example). Consult the manual for your audio hardware for further details about non-standard sample rates.

Clock source/modes
For Windows, choose the desired clock source for your audio hardware. For macOS, this setting determines the clock source for each audio device. Choose each device from the menu on the left and choose its clock source from the menu on the right.

The choices in the clock source menu depend on the audio hardware, and the items in the menu are supplied by its driver. Most devices have an *Internal* setting, which means the audio device will run off its own clock. This means that audio playback and recording in Performer Lite will operate at the rate set by the hardware, and Performer Lite will use the hardware as its master time base (so that MIDI and audio stay in sync with each other).

If, however, you make Performer Lite slave to external sync while the audio hardware is running on its internal clock, the audio hardware — and therefore audio playback and recording in general — will *not* be resolved to external time code. The result is that your audio tracks will probably drift out of time with your MIDI tracks, and they won't stay in sync with the external time code. Your best bet in this scenario is to slave your audio hardware

to the same source that is feeding time code to Performer Lite. You can use a synchronizer to resolve to time code and supply your audio hardware with resolved digital audio clock via word clock or another digital audio sync format. See chapter 67, "Receive Sync" (page 582) for complete details.

If your audio hardware has digital inputs (such as a S/PDIF connector), the clock source menu will probably also provide settings that let you clock off the digital input source. In general, the audio hardware either needs to slave off the external digital source or vice versa. Or both the audio hardware and the external source need to be resolved via a third device, such as a digital audio synchronizer. If the two devices are not resolved with one another, you'll hear clicks, pops, distortion, or other similar artifacts in your digital transfers.

Configure Driver (Windows ASIO only)
Click the Configure driver button to launch your hardware's console software for further hardware settings, including the very important buffer size setting (explained below). Some ASIO drivers require that you make this setting in the hardware's own console software, which you can access from this button.

Buffer Size
Mac OS
On macOS, the buffer size is set in the Configure Hardware Driver window (Figure 3-1 on page 21).

Windows
On Windows, the buffer size can be set by checking the *Override internal buffer size* check box and choosing the desired buffer from the menu. If this option is grayed out, it means that your audio hardware's ASIO driver doesn't allow host applications to change its buffer size setting. In this case, click the *Configure Driver* button (Figure 3-1 on page 21) to launch the hardware's console software to change the setting there.

The importance of buffer size
A *buffer* is a small part of computer memory that briefly holds digital audio samples as they are passed between the computer and your audio hardware. Choosing a smaller buffer size reduces latency, which is the delay you may hear when listening to live audio input that you are monitoring through Performer Lite — or when triggering virtual instruments from your MIDI controller. But lower settings also increase the processing load on your Mac, which impacts the number of real-time effects plug-ins you can run at one time.

If you won't be running live inputs through Performer Lite, or playing software instruments, you can choose a higher buffer size to free up CPU processing bandwidth for plug-ins or other processor-intensive components of your virtual studio. A typical setting for this scenario is 512 or 1024 samples.

If you are running live input through Performer Lite, or triggering virtual instruments, choose the lowest setting that your computer can handle, keeping in mind that you still need to give your computer enough processing power to handle the plug-ins and virtual instruments you are using with Performer Lite. Settings of 256 or lower produce reasonable monitoring latency: a setting of 256 samples produces round-trip monitoring latency of around 12-13 milliseconds (ms), and the delay starts to become inaudible. For the lowest possible latency, you can go as low as 16 or 32 samples, if your audio hardware supports these buffer sizes. If, however, you hear clicks and pops in your audio, try raising the buffer size again.

Monitoring latency has no effect on recording: it only exists for a live signal as it is being monitored. It has no effect whatsoever on the timing accuracy of the material being recorded to disk. Performer Lite is precisely calibrated to record and play back hard disk audio perfectly on time.

If adjusting the Buffer Size setting just doesn't allow you to strike the right balance between processor load and acceptable monitoring latency, you can also try external hardware monitoring, as explained in "Audio input monitoring" on page 280.

Work priority (Mac only)

The *Work Priority* option (Figure 3-1 on page 21) lets you set the macOS thread priority for the MOTU Audio System engine. Choose the highest setting your audio hardware allows. Some audio devices require the *Low* setting. If you are experiencing audio performance problems with other third-party audio hardware, try the *Medium* setting. If problems persist, try the *Low* setting. When using the Medium and Low settings, you may need to increase the buffer size for best results. For all MOTU audio interfaces, leave this option set to *High*.

Enabling multiple drivers (Mac only)

As demonstrated in Figure 3-1 on page 21, you can Command-click multiple drivers in the Configure Hardware Driver window. This allows you to use two or more audio devices simultaneously, such as a MOTU 1248 Thunderbolt audio interface and a MOTU UltraLite AVB USB interface. All devices operate at the chosen sample rate in the Configure Hardware Driver window. To prevent two or more systems from drifting apart from one another during playback and recording, you need to resolve their audio clocks.

There are two basic methods for resolving two digital audio devices: slave one device to the other, or slave both devices to a third master clock. If you have three or more digital audio devices, you need to slave them all to a single master audio clock, such as a word clock distribution device or universal synchronizer.

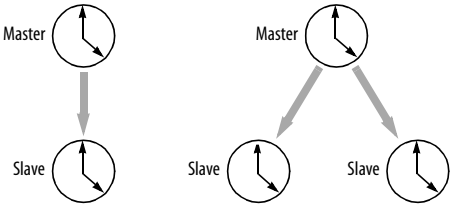


Figure 3-2: To resolve two or more digital audio devices with each other, you need to choose a clock master.

To continue with our earlier example, you could slave the UltraLite AVB interface to the 1248 using optical, as demonstrated below:

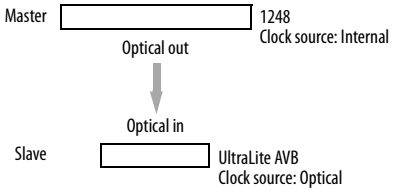


Figure 3-3: To resolve two or more digital audio devices with each other, you need to choose a clock master.

Specifying the master device

Specify the device that will be the master device by choosing it from the *Master Device* menu (Figure 3-1 on page 21).

CONFIGURE STUDIO SETTINGS

The *Configure Studio Settings* dialog can be opened by choosing *Setup menu> Configure Audio System > Configure Studio Settings*.

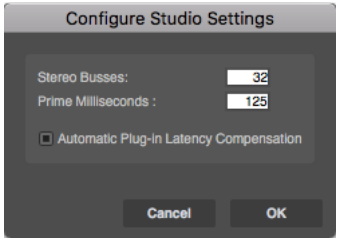


Figure 3-4: The Configure Studio Settings dialog.

The Configure Studio Settings dialog lets you fine-tune Performer Lite's audio engine. These options are best left at their default settings, but they can be adjusted as described in the following sections.

Stereo buses

This setting determines the number of internal audio buses provided by Performer Lite and seen in the audio I/O menus throughout the application. This value is fairly arbitrary and does not in itself affect system performance that much. The number of buses you actually *use,* however, may have an impact your system resources.

Prime Milliseconds

The *Prime Milliseconds* setting determines how far in advance Performer Lite processes and cues audio for playback, including any pre-rendering of effects processing or virtual instrument output, if any. For example, if Prime Milliseconds is set to 125, when playback is underway, Performer Lite will generate audio 125 milliseconds ahead of the playback wiper location.

If Performer Lite's playback isn't smooth, increasing the Prime Milliseconds value may help. The downside of doing so is that you may experience more latency (delay) when interacting with virtual instruments and effects (turning knobs, interacting with the instrument or plug-in window, dragging notes in the Sequence Editor, etc.)

Automatic plug-in latency (delay) compensation

Some plug-ins introduce a small amount of delay (latency) to the track on which they are instantiated. Here are a few examples of plug-ins that introduce latency:

- Universal Audio UAD plug-ins
- Any plug-in that employs look-ahead

The amount of the delay depends on the plug-in, and the delay is usually unavoidable, due to the nature of the plug-in itself. For example, a look-ahead peak limiter must delay the signal by the amount of the look-ahead in order to do its job (usually several milliseconds). Hardware accelerated plug-ins, such as UAD-1 plug-ins, require an extra loop in their signal path between the host computer and the acceleration hardware, and this loop introduces a small amount of delay (usually on the order of several hundred samples or so).

Performer Lite provides automatic compensation for plug-in latency when disk audio is being played through the plug-in. In essence, Performer Lite knows the exact amount of delay introduced by the plug-in (down to the sample) and simply feeds the disk audio to the plug-in early by that same amount, so that the plug-in has just enough time to process the audio and play it perfectly on time, with sample-accurate precision.

Automatic delay compensation only works with audio files being played back from a hard disk or virtual instruments being triggered by prerecorded MIDI tracks. Delay compensation cannot be applied to live audio or MIDI being patched through from an external live source (because it cannot be cued early by the audio engine).

Performer Lite automatically determines the delay compensation for each plug-in, if any. There is no additional preparation necessary. In addition, Performer Lite supports delay compensation for any MAS, VST, or Audio Unit plug-in or virtual instrument.

Most of the time, you will probably want to leave the *Automatic Plug-in Latency Compensation* option enabled. The only time you would likely need to disable it is if you are working with a project created in an earlier version of Performer Lite in which you set up latency compensation manually with delay plug-ins, etc. To make your old file play back exactly like it did in earlier versions of Performer Lite without making any changes to it, uncheck this option. If you wish, you could then remove your manual latency compensation and then re-enable automatic compensation.

CHAPTER 4 Configuring MIDI Devices

OVERVIEW

This chapter explains how to connect MIDI hardware devices to your computer and successfully establish MIDI input and output with the device. Here are some examples of MIDI devices:

- Controller keyboard
- Keyboard synthesizer
- Drum machine
- Sound module

Additionally, this chapter explains how to set up interapplication MIDI under macOS, which allows other software applications (such as stand-alone virtual instruments) to send and receive MIDI data to and from Performer Lite.

☛ Virtual instrument plug-ins, such as those included with Performer Lite, do not require any configuration for MIDI I/O.

Overview 27
Setting up your MIDI equipment 27
Connecting MIDI gear directly 27
Connecting MIDI gear using a MIDI interface 27
The MIDI Devices tab 28
Audio MIDI Setup (macOS only) 30
Interapplication MIDI (macOS only) 31

SETTING UP YOUR MIDI EQUIPMENT

MIDI gear connects to your computer in one of two ways:

- Directly (via USB, Thunderbolt, etc.)

OR

- Using a MIDI interface

CONNECTING MIDI GEAR DIRECTLY

For MIDI equipment that connects directly to your computer with USB, Thunderbolt or other standard computer peripheral connection, follow the directions for installation, including the installation of any software (drivers, etc.) that it may require. No special additional procedures are necessary for Performer Lite. When you are finished installing the MIDI device as directed, Performer Lite should be able to "see" the device's MIDI input and output channels (and cables).

CONNECTING MIDI GEAR USING A MIDI INTERFACE

For MIDI equipment that connects to your computer using a MIDI interface, you will need:

- Any Mac or PC compatible MIDI interface
- MIDI cables

1 Connect your MIDI interface to your computer and connect your MIDI devices to it as shown in Figure 4-1.

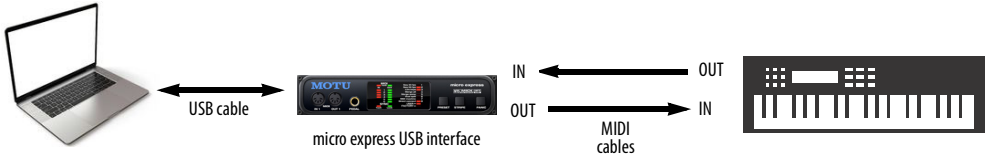


Figure 4-1: An example of connecting a single MIDI device to a MOTU micro express interface. Connect the device's MIDI OUT and MIDI IN ports to the interface.

2 Turn on the MIDI interface, if it has a power switch (some devices are bus-powered).

THE MIDI DEVICES TAB

Once you've connected your MIDI hardware devices, you are ready to configure them in Performer Lite for use in all of your Performer Lite projects. To do so:

1 Launch Performer Lite.

2 Create a new project from the File menu.

3 Choose *Studio menu* > *Bundles* to open the Bundles window.

4 Click the MIDI Devices tab (Figure 4-2).

The MIDI Devices tab lets you create and configure MIDI devices connected to your MIDI hardware. The settings you make here will be available to all Performer Lite projects. If you transfer the project to another computer system, the devices you used will be preserved so that you can easily remap them as needed.

Making MIDI connections in the I/O grid

Any connected MIDI interfaces appear across the top of the I/O grid, with their MIDI ports shown in columns beneath the interface. Use the Add button to create MIDI devices, which appear in the left-hand column and represent the hardware connected to the interface. Drag the MIDI in (I) and MIDI out (O) tile for each MIDI device to the appropriate MIDI interface port column (the column that represents the physical port it is connected to on the MIDI interface). For example, in Figure 4-2 the Roland JV-1080 is connected to MIDI IN port 1 and MIDI OUT port 1 on the micro express USB interface.

Devices connected directly with USB, etc.

If you have a controller keyboard or other MIDI device that connects directly to the computer with USB, Thunderbolt, or other standard computer peripheral connection, it will appear above the I/O grid in the same fashion as the MIDI interface shown in Figure 4-2 (as long as its drivers have been installed successfully). In this case, no additional I/O configuration is required and the device will be available as a MIDI input and/or output, as determined by its driver.

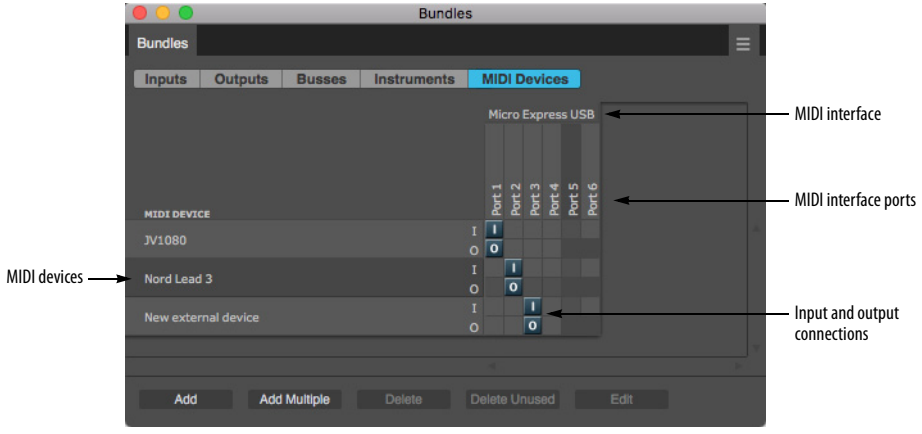


Figure 4-2: MIDI Devices tab in the Bundles window.

Renaming an interface or USB device

To rename an interface or USB device above the grid, double-click its name.

Deleting offline interfaces

If your USB MIDI interface or keyboard goes offline (it gets turned off or disconnected), its name appears in italics. If you wish to remove it from the Bundles window grid, click its name and click the Delete button.

MIDI device properties

Click a MIDI device in the left-hand column to select it and then click the *Edit* button to specify the manufacturer and model for the device and to make additional device property settings (Figure 4-3).

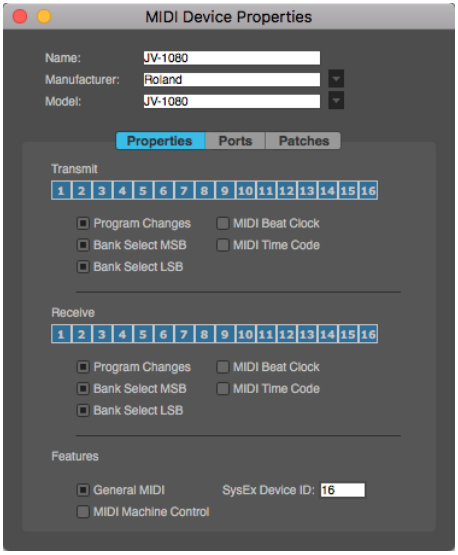


Figure 4-3: MIDI device properties.

Device

Choose the manufacturer of the device from the *Manufacturer* menu, then choose the model of the device from the *Model* menu. The *Name* field will be automatically filled in.

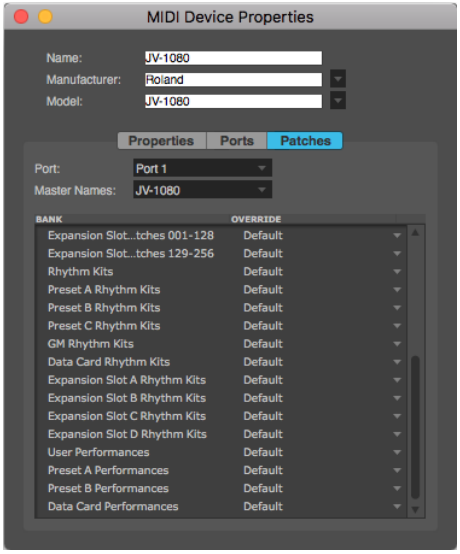
If you don't see the manufacturer or model of the device in the list, or you would like to rename it for whatever reason, you can fill in the *Name* field manually.

Properties and ports

Specify the properties that describe the device. For example, you can describe what MIDI channels it uses for transmitting and receiving MIDI data. Enable any MIDI data types that are supported. If the device has multiple sets of MIDI ports, configure them in the Ports tab.

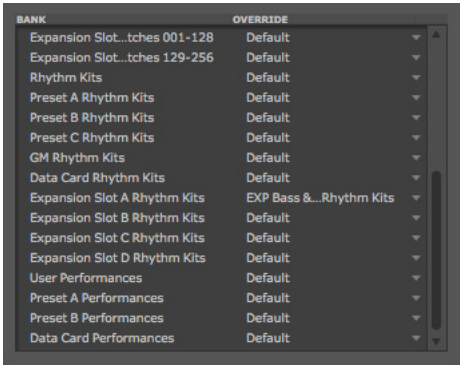
Patches

If you have a device which supports expansion boards, such as the Roland JV-1080, use this section to configure which expansion cards are loaded in the device. This will ensure that your patch lists are displayed accurately.



Let's say you have a JV-1080 and would like to specify that you have the "Bass & Drums" expansion card installed. To configure Expansion Slot A Rhythm Kits, for example, locate Expansion

Slot A Rhythm Kits in the Bank column on the left, then choose "EXP Bass & Drums Rhythm Kits" in the Override column.



AUDIO MIDI SETUP (macOS ONLY)

Audio MIDI Setup is a utility included with macOS that provides a graphical interface for configuring the MIDI devices connected to your computer. You can use Audio MIDI Setup as an alternative to the MIDI Devices tab in Performer Lite's Bundles window. Any changes you make in Audio MIDI Setup are automatically reflected in Performer Lite's MIDI Devices tab, and vice versa.

☛ Using Audio MIDI Setup is not required. It is merely an alternative to using Performer Lite's MIDI Devices tab.

Audio MIDI Setup provides two main advantages over the MIDI Devices tab:

- A graphical environment with device icons and "virtual cables" that you can arrange on-screen in a similar fashion to the physical layout in your studio space
- A single place to configure your MIDI devices for multiple MIDI applications, if you use other MIDI software besides Performer Lite

Audio MIDI Setup serves all Core MIDI compatible applications.

Getting started with Audio MIDI Setup

1 Connect your MIDI interface to your Mac and connect your MIDI devices to it as shown in the examples on page 27.

2 Turn on the MIDI interface, if it has a power switch (some devices are bus-powered).

3 Launch the Audio MIDI Setup utility.

This can be found in /Applications/Utilities.

4 Confirm that the MIDI interface is present in the *MIDI Studio window* of Audio MIDI Setup (Window menu).

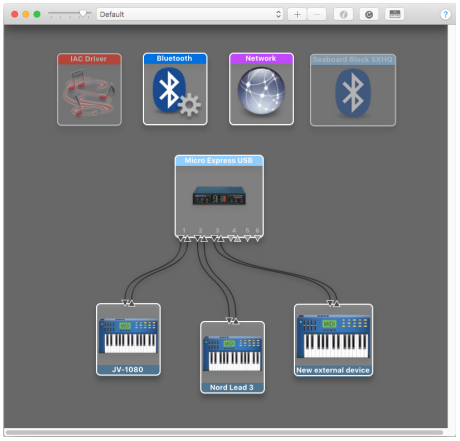


Figure 4-4: In this example, a MOTU Micro Express USB interface as it appears in Audio MIDI Setup.

Adding devices

After your MIDI interface appears in Audio MIDI Setup, you are ready to add devices in Audio MIDI Setup, connect them to the interface, and specify properties they may have for particular purposes. All of this information is shared with Performer Lite and other Core MIDI compatible applications.

To add a device in Audio MIDI Setup:

1 In the MIDI Studio window, click the "+" button in the title bar to add a device.

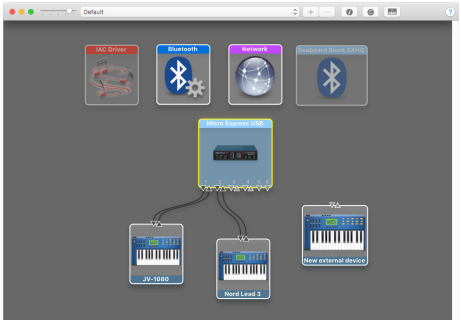


Figure 4-5: Adding an external MIDI device.

2 Drag on its input and output arrows to draw connections to the MIDI interface that match its physical connection.

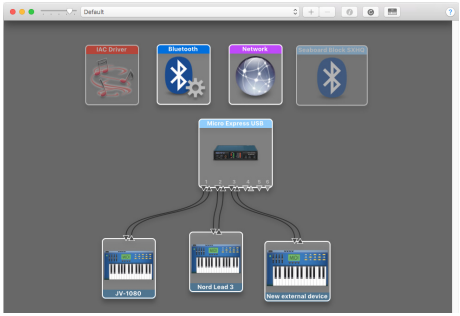


Figure 4-6: Connecting the device to the interface.

3 Double-click the device to make settings, such as input and output channels, that further describe the device.

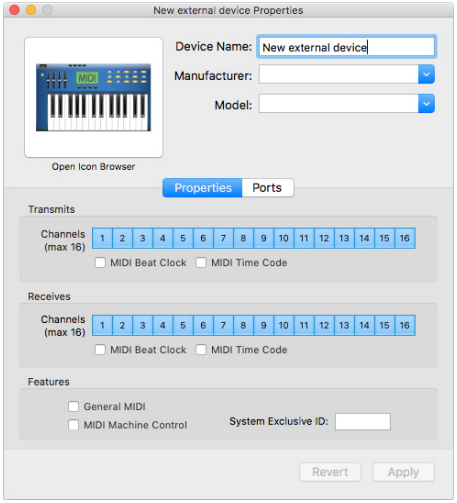


Figure 4-7: Device settings.

4 Repeat the above steps for each MIDI device connected to the interface.

5 When you are finished, quit Audio MIDI Setup.

Your configuration is automatically saved as the default configuration. You can use the Configuration menu to create, duplicate or delete alternative configurations.

INTERAPPLICATION MIDI (MACOS ONLY)

Performer Lite can send MIDI data to other applications and receive data from them as well. These *interapplication MIDI* streams are handled by Core MIDI, the Mac's built-in MIDI services.

Most applications that share MIDI input and output with Performer Lite publish their own virtual MIDI inputs and outputs, which automatically appear in Performer Lite's MIDI input and output menus. Most of the time, you can use the inputs and outputs provided by these other applications.

There may be times, however, when other applications require Performer Lite to publish inputs and outputs. Use the Interapplication MIDI window (Setup menu) to create them.

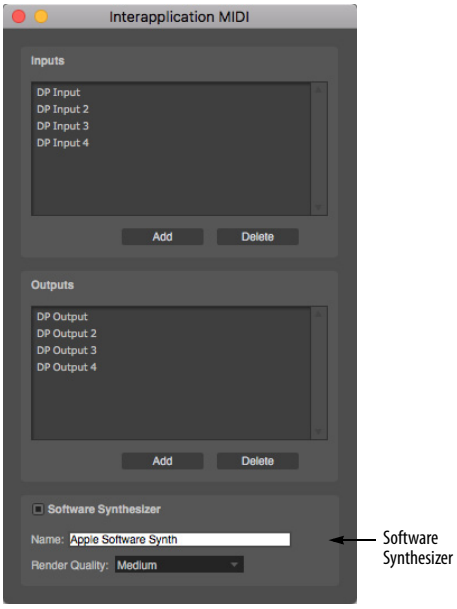


Figure 4-8: Creating interapplication inputs and outputs.

Click the Add buttons to create an input or output. To rename them, double-click the name. To remove an input or output, click it and click Delete.

Each input or output acts like a virtual MIDI cable, providing sixteen MIDI channels. Inputs appear by name in any menu in Performer Lite that displays MIDI inputs; outputs appear by name in any Performer Lite menu that displays MIDI outputs. For example, if you wish to send data from a Performer Lite MIDI track to another application, assign the track's output to a Performer Lite MIDI output.

Performer Lite's interapplication MIDI inputs and outputs are published to all MIDI applications that support the Mac's built-in MIDI services. A Performer Lite output appears as an input in other applications; conversely, outputs from other applications appear as inputs in Performer Lite.

The software synthesizer

MacOS provides a basic software synthesizer that supplies a general MIDI sound set. To make this virtual instrument available as a MIDI destination and sound source in Performer Lite, check the box provided (Figure 4-8), and give it a name. The name you choose then shows up as a MIDI output destination in Performer Lite and other Core MIDI-compatible applications (when Performer Lite is running). To specify the audio output destination for the software synthesizer (i.e. where you'll hear it), go to the *Audio* tab in macOS's Audio MIDI Setup utility and choose the desired *Default Output* destination. The *Render quality* menu lets you choose the audio quality for the instrument playback. Higher quality places higher demand on the computer's CPU resources.

Part 2
Getting Started

CHAPTER 5 Quick-Start Guide

Welcome to Performer Lite! Here's how to get started quickly.

Creating an Instrument track 34
Creating Audio Tracks 35
Bouncing.....36

CREATING AN INSTRUMENT TRACK

Let's start in the Sequence Editor.

Figure 5-1: The Sequence Editor button in the control bar.

1 From the Project menu, choose *Add Track* > *Instrument* >.

Here you can choose which MOTU or 3rd-party instrument you'd like to play. For this example, let's choose PolySynth (included with Performer Lite).

Figure 5-2: The PolySynth instrument track.

2 Once the track is created, tap on your MIDI controller and you should be able to hear the instrument.

3 If you don't have a MIDI controller handy, go to *Studio menu* > *MIDI Keys* and use your computer keyboard to play.

4 To record your performance, click the Record button in the Transport section of the control bar.

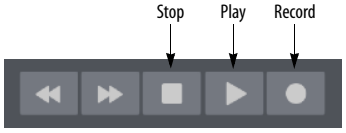


Figure 5-3: The Record and Stop buttons.

As you play on your MIDI Controller or MIDI Keys, you'll see the MIDI notes record into the instrument track.

Figure 5-4: Notes recorded in the instrument track.

To stop recording, press the Spacebar, or the Stop button (Figure 5-3).

You can now listen back to the recording by moving the wiper to the desired location and pressing space bar or Play.

☛ Press Enter/Return on your keyboard at any point to jump the wiper back to the beginning on the Sequence.

In the PolySynth plug-in window (Figure 5-2), you can make adjustments to the synth parameters to change the sound at any time, even after you've recorded.

CREATING AUDIO TRACKS

In Performer Lite, audio tracks can be either mono or stereo. So, which track format do you need?

Mono tracks are used for recording single inputs. Stereo tracks are used for recording two inputs at once, usually a left and right channel.

Keep in mind, both track formats use stereo outputs by default.

For example, if you want to record your voice using a single microphone, create a mono track. If you want to record a synthesizer with stereo outputs, create a stereo track to accommodate the left and right signals.

1 To create a mono or stereo track, choose *Project menu > Add Track > Mono or Stereo Audio Track*.

Figure 5-5: Creating an audio track (a mono track in this example).

2 To rename the track, hold the Option or Alt key on your keyboard and click on the name.

New tracks have default colors based on track type. To choose a custom color, click on the track color menu, to the left of the track name.

Figure 5-6: Changing the track color.

Choosing the Input and Output

Audio tracks have an Input and Output setting. By default, they should already be set to the first input and output on your audio interface. So, if you plugged in a microphone to Input 1 on your interface and connected speakers to Outputs 1-2, the track's settings are already correct for recording.

If you are recording on Input 2, go to the mono audio track and click on the "I" menu and choose Input 2 from the list (Figure 5-7).

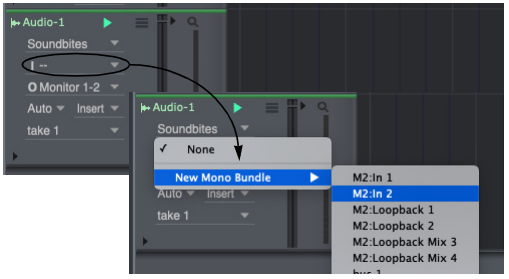


Figure 5-7: Changing the track's input setting (if needed).

If you are recording on channels beyond the 2nd input, or don't see your desired input, choose *New Mono Bundle*. You should be able to see your interface's full Input list here.

The same is true for outputs. If you don't see your desired output, click the "O" menu and choose *New Stereo Bundle*.

Input monitoring and arming tracks

Now that you have assigned the desired input and output to your track, you're ready to record.

1 To hear the input signal, click the blue speaker icon to the right of the track name (Figure 5-8).

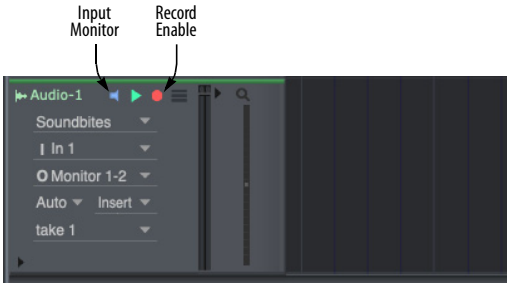


Figure 5-8: The Input Monitor button lets you hear the input signal.

This is called *input monitoring*. It allows you to hear the audio input before you actually record. It's great for setting your levels before you record.

2 Before pressing the main record button (Figure 5-3), make sure you've armed your track. You can do this by pressing the Record Enable button to the right of the Input Monitor button (Figure 5-8).

Recording

1 Once you've armed your track, press the master Record button in the Transport section of the control bar (Figure 5-3).

The wiper should start moving and the track will record.

2 To stop recording, press the spacebar, or click the Stop icon in the Transport.

Figure 5-9: Audio recorded in the audio track.

You can now listen back to the recording by moving the wiper to the desired location and pressing space bar or Play. If you want to quickly jump back to the beginning of the sequence, just press the Enter/Return key on your keyboard.

BOUNCING

When you're done recording or mixing, you'll want to bounce to disk. To do so:

1 Highlight a time range selection with the I-Beam tool.

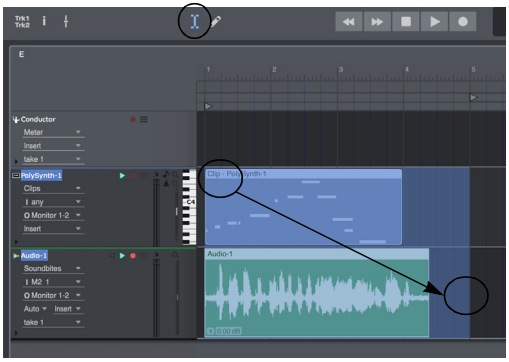


Figure 5-10: Making a time-range selection with the I-Beam tool.

2 Choose *File menu > Bounce to Disk*.

Here you can choose the Bounce Format and whether you want to add it back into the sequence.

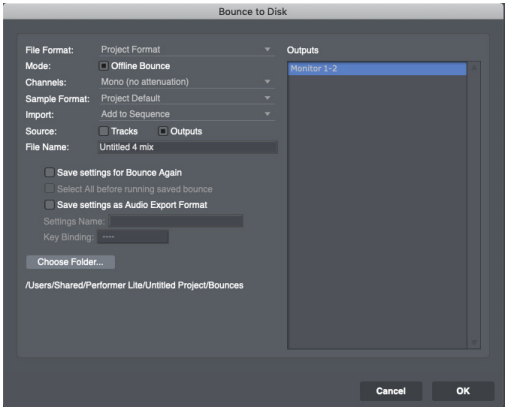


Figure 5-11: Bounce to Disk.

Bounce to Disk defaults to a Stereo Bounce of the mix. This means that all tracks playing in the sequence will be bounced down to a single Stereo file.

However, you can also bounce individual tracks by clicking on the *Tracks* button, and selecting the tracks you want to bounce.

Use the Tracks bounce feature to bounce stems or multi tracks for individual parts. Use the normal Output bounce for a single stereo mixdown of the whole sequence.

Before pressing OK, create a name for the bounce and make note of the location. By default, the bounce will go to the Bounces folder, which resides inside the Project Folder on your hard drive.

If you want to bounce it to a new location (like your Desktop), press Choose Folder.

To start the bounce, click OK.

Congratulations! You've created your first Performer project!

CHAPTER 6 About Performer Lite

OVERVIEW

Performer Lite is an integrated digital audio workstation and MIDI sequencer designed to make it easy to make music with your computer. Performer Lite is based on Digital Performer, MOTU's award-winning professional audio workstation software for music and audio professionals. Under the hood, Performer Lite is driven by the same cutting-edge technology as Digital Performer. What you see on screen, however, is a streamlined user interface that makes creating music easy and fun.

Performer Lite offers a combined total of 32 stereo audio and instrument tracks. If you need more tracks, and more advanced features and control, consider upgrading to Digital Performer. Special upgrade pricing is available.

Overview **39**
Design philosophy **39**
MIDI sequencing **39**
Digital audio recording **40**
Seamless MIDI and audio **40**
Editing **40**
Arranging **41**
Automated mixing **41**
MIDI and audio effects processing **41**
Virtual instruments **41**
Mastering **41**
Music notation **41**

DESIGN PHILOSOPHY

Performer Lite is designed to be simple and easy to use. The basic recording and playback functions are very straightforward, modeled after tape deck functions. They are located in Performer Lite's Control Panel (Figure 6-1).

Almost every operation in Performer Lite can be done while the sequence is playing back or recording, so you don't have to stop the music to get things done.

MIDI SEQUENCING

To use Performer Lite for MIDI sequencing, you must have a computer, a MIDI controller of some kind (such as a keyboard synthesizer or MIDI drum kit) and a sound source (such as a MIDI sound module or a software synthesizer running on the computer). Your external MIDI gear may also require a MIDI interface, although some MIDI hardware products now connect directly to a computer through USB.

Performer Lite is compatible with any MIDI-equipped hardware devices, such as synthesizers, samplers and drum machines. It is also compatible with just about all "virtual" software synthesizer and sampler products now available. Using the built-in sound capabilities of your computer and third-party virtual instrument products, you could complete Performer Lite projects with no extra hardware whatsoever.]

Figure 6-1: Performer Lite's Control Panel.

A MIDI sequencer is like a cross between a tape recorder and a player piano: the physical actions you make when playing the keyboard or other MIDI controller instruments are stored not as audio signals (as your tape machine would record) but as performance information that represents music (pitches, attacks, releases, pitch bends and more). The nuances in your musical performance are analyzed and its components encoded and stored. When played back, the synthesizer recreates your original performance. In this way, the recorded sequence is more like a player piano roll, telling the instrument exactly how to play itself. One nice thing about MIDI is that you can use any compatible instrument for playback. You can also edit the individual elements of your sequence, such as a single bad note in an otherwise flawless performance. MIDI sequencing provides you with a way to manipulate virtually any parameter of a musical performance.

Performer Lite offers sophisticated rhythmic correction (quantizing) features for both audio and MIDI tracks. It is possible to vary the degree of effectiveness of quantization, allowing you to preserve the "free" quality of your performance while putting the critical notes on the beat. In addition, special metric effects such as beat shifting and doubling attacks can be done.

DIGITAL AUDIO RECORDING

Performer Lite can record and play digital audio on any computer that meets the minimum requirements —without any extra audio hardware connected to the computer. Performer Lite supports Thunderbolt, AVB and high-speed USB hard disk recording systems from MOTU and other companies.

Performer Lite also provides mixing and mastering capabilities. A track bouncing feature allows you to create a mixdown of your project for mastering (in Performer Lite or any other mastering system). Performer Lite can take you from your initial creative idea all the way to your final mix.

If you are not familiar with hard disk recording and playback, there are aspects to Performer Lite that may be entirely new to you. If so, we recommend that you review chapter 69, "Hard Disk Recording Concepts" (page 598) for a briefing on concepts that are crucial for working with Performer Lite.

SEAMLESS MIDI AND AUDIO

Throughout Performer Lite, you'll find features that work on MIDI and audio data in exactly the same way — often in the same window. For example, the Sequence Editor window graphically displays MIDI and audio data side by side in resizable track strips. *Soundbites* (parcels of audio data) can be cut, copied, and pasted at the same time as MIDI note data.

EDITING

After you've recorded, there is a great deal of editing power at your fingertips — you can change anything in your sequence, from a single event to a large section of data. Single events or selections of data can be edited or inserted anywhere in the sequence. The basic Cut and Paste operations and the region editing commands allow you to edit and create data: you can transpose whole sections, change controller values smoothly, create new pitch bend data, control velocity to create dynamic effects, create echo effects and more, each in only a few steps. State-of-the-art quantizing features such as Quantize and Groove Quantize help you perfect the rhythmic nuance in your sequences.

To access the data that makes up your sequence, Performer Lite offers powerful event-editing environments: the Sequence Editor and Notation Editor. Both windows support single-event and region editing as described above.

The Undo/Redo commands gives you complete freedom to experiment, always allowing you to return your project to any prior state.

ARRANGING

Performer Lite's arranging features give you creative freedom to make large-scale changes to your project quickly and efficiently. In addition, many of its arranging features let you interact musically with your project, via key signatures, meter changes, very flexible and powerful tempo control features, and much more.

AUTOMATED MIXING

Performer Lite's Mixing Board window provides a virtual, automated mixing environment. Use pan pots, volume faders and plug-in parameter controls to automate your entire mix. Based on familiar mixing board designs, Performer Lite's Mixing Board can be customized to fit your computer screen and your mixing needs. Instantly show and hide tracks, and even hide cross-sections of the console that you aren't using at the moment. Real time MIDI effects processing inserts can be applied to any track. The Mix menu allows you to create multiple mixdowns, which store all of the mix automation data for the entire sequence under one name. You can create an unlimited number of multiple mixdowns.

MIDI AND AUDIO EFFECTS PROCESSING

Performer Lite ships with dozens of MIDI and audio effects plug-ins that you can apply freely to your mix in the Mixing Board. From a simple 2-band EQ to premium plug-ins such as the 64-bit MasterWorks series, Performer Lite's included plug-ins give you all the tools you need for great-sounding recordings.

VIRTUAL INSTRUMENTS

Performer Lite includes a host of simple, great-sounding virtual synth instruments that will get you started making music quickly. From the beefy, monophonic BassLine to the evocative FM synth, Proton, hundreds of presets and intuitive programming give you many sounds at your fingertips. Performer Lite also includes a 1.5 GB library of multi-sample instruments, synths, loops and phrases. Categories include acoustic and electronic drum kits, pianos, guitars and basses, along with church organs, electric organs, strings, brass, woodwinds, synths, choirs, voices, percussion, sound effects and more.

Performer Lite also serves as a virtual studio platform for a wide range of compatible third-party plug-in and virtual instrument products.

MASTERING

After you've recorded, edited, arranged, mixed and processed your project, Performer Lite gives you mastering plug-ins and bounce to disk features, allowing you to master your mix for delivery in any form, from WAVE and AIFF to audio compact disc and MP3.

MUSIC NOTATION

Performer Lite's Notation Editor displays any combination of tracks as music notation on screen exactly as it will print out. Add musical symbols such as hairpin dynamics, articulations, and lyrics. Then arrange your score with repeats, endings, codas and other score arrangement features. The Notation Editor is ideal for lead sheets, instrument parts, or scores, which can be printed on any printer.

CHAPTER 7 Performer Lite Basics

OVERVIEW

In this chapter you'll learn about Performer Lite's main window and how to do basic tasks.

Overview 42
Learn to use your computer 42
The Performer Lite window 42
Control Panel 44
Track Selector 44
Track Inspector 45
Channel Strip 46
The Window menu 46
Modifier keys 47
Clicking shortcuts 47
Using modifier keys with cursor actions 47
Contextual menus 48
Standard keyboard shortcuts 49
Customizing keyboard shortcuts 49
Changing text box values by dragging 49
Main counter shortcuts 50
Using the numeric keypad 50
Performer Lite track limits 51

LEARN TO USE YOUR COMPUTER

Before using Performer Lite, please review the standard user interface conventions for your computer. Be sure you are familiar with how to:

- Use the mouse, trackpad and keyboard
- Open, copy and delete files
- Drag and drop items
- Choose commands from menus
- Select options using push buttons, radio buttons and check boxes
- Respond to dialog boxes
- Use keyboard shortcuts
- Enter and edit text

THE PERFORMER LITE WINDOW

The Performer Lite window is shown in Figure 7-3 on page 43.

Window title

The window title shows the name of the project.

Window controls

Performer Lite's standard window controls, such as the close button, minimize button, zoom button, and scroll bars, work the same way as standard window controls.

Sidebars

The left- and right-hand sidebars are resizable columns that flank the main body of the window and can be independently shown or hidden. In addition, the sidebars can be divided horizontally into sections.

Sidebar divider

Drag the divider to resize the sidebar; double-click the divider to open or close the sidebar.

Cell divider

Drag the divider to resize the cell.

Left sidebar buttons

Click the sidebar buttons to show or hide each section of the left sidebar: Track Selector (page 44), Track Inspector (page 45) and Channel Strip (page 46).

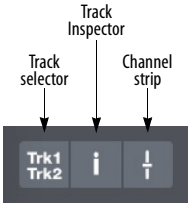


Figure 7-1: Left sidebar buttons.

Right sidebar buttons

Click the sidebar buttons to show or hide each section of the right sidebar: Content Browser (page 214), Soundbites (page 216), Set List (page 232) and Project Notes (page 102).

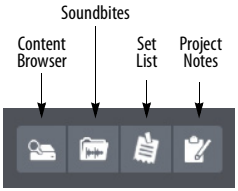


Figure 7-2: Right sidebar buttons.

Zoom controls

The Zoom controls enlarge and shrink the display horizontally and vertically.

Track Selector show/hide button

The *Track Selector* button shows and hides the Track Selector in the left sidebar.

Active cell

Click anywhere in a window cell to make it the currently active cell. When active, a cell displays a light gray border. The Settings menu in the title bar provides features that apply to the currently active cell.

Settings menu

The menu items in the Settings menu change, depending on which window cell is currently active. The items in the menu apply to the currently active cell.

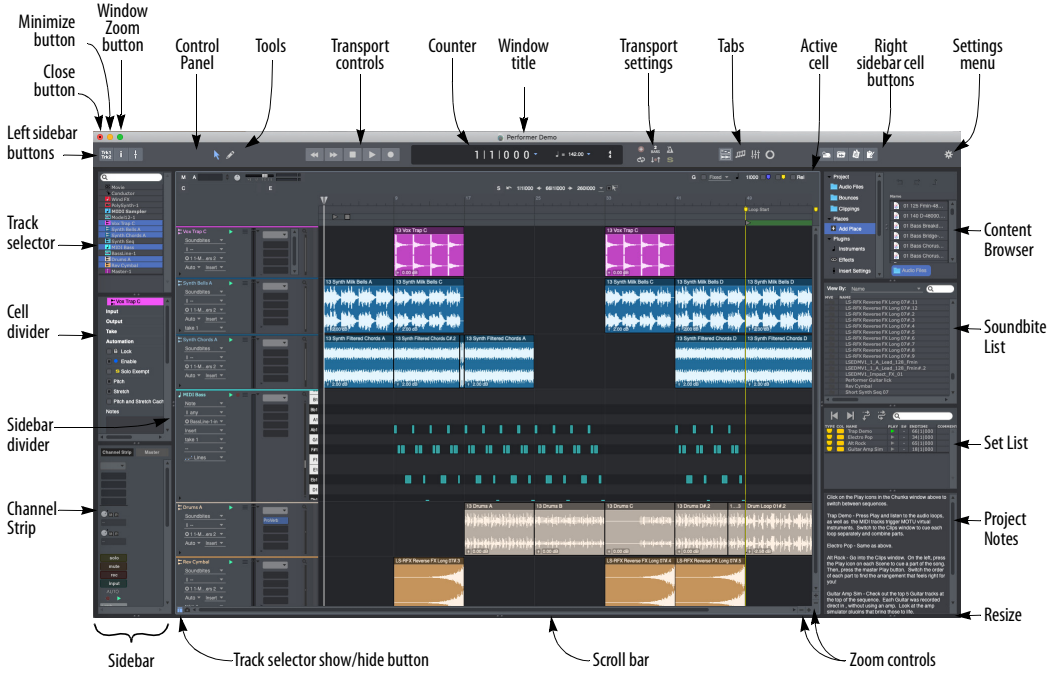


Figure 7-3: The Performer Lite window.

CONTROL PANEL

The Control Panel (Figure 7-3) is the command center for your Performer Lite project. It contains basic transport controls, playback location counters, additional playback controls such as Memory Cycle, tools and buttons to access Performer Lite's main features.

Tools

Use the tools in the Sequence Editor and Notation Editor to edit your music. See chapter 27, "Tools" (page 243).

Transport controls

Use the Transport Controls to play, stop, rewind, pause, record, skip and return to the beginning. See "Transport Controls" on page 106.

Counter

The Counter displays the current playback position in one of Performer Lite's four time formats: measures|beats|ticks, real time, SMPTE time, or samples. See "Main counter shortcuts" on page 50 and "Counter" on page 107.

Transport settings

The transport settings include features like the metronome click, countoff, and memory cycle. See "Transport settings" on page 113.

Tabs

The Tabs control what is displayed in the Performer Lite window: Sequence Editor (page 121), Notation Editor (page 132), Mixing Board (page 174) or Clips View (page 198).

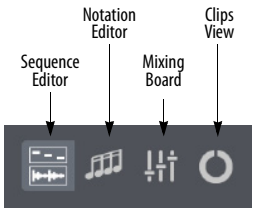


Figure 7-4: Right sidebar buttons.

TRACK SELECTOR

The Track Selector (Figure 7-5) lets you show or hide tracks. In addition, the Track Selector provides additional view filtering for various data types.

To open the Track Selector (Figure 7-3), click its button in the Control Panel (Figure 7-1). Or click the Track selector show/hide button (Figure 7-3).

Figure 7-5: The track selector.

Tracks, Channels and Event Types

The Track Selector list provides three collapsible sections:

- Track Selector
- Channel Selector
- Event Type Selector

Each section functions as a quick-access view filter to show/hide tracks, MIDI data (by MIDI channel), or various data types.

Showing/hiding items in the Track Selector list

Click a track name (or other list item) to show (select) it or hide (deselect) it. Option/Alt-click to hide all except the one you click; Command/Ctrl-click to show all except the one you click. Drag across several adjacent items to show or hide them.

Track folders in the track selector

You can click track folders to show or hide the entire folder. Click the disclosure triangle of a track folder to show or hide the tracks (and sub-folders) contained in the folder.

Right-clicking Track Selector items

Here are few additional features in the Track Selector that can be accessed by right-clicking:

- Right-click a track to open the track color assignment.
- Right-click a channel to specify a color for data in channel. You can choose either to use the track color for the channel or to assign a custom color.
- Right-click an event type to specify a color for that type of event. You can choose 1) to use the track color, 2) the color of the channel (if it's a MIDI event) or 3) a custom color.

Track Selector menu

When the Track Selector is the active cell, the Settings menu (Figure 7-3) provides options for showing and hiding tracks, groups, etc. These are the same options as found in Performer Lite's View menu. For details see "View menu" on page 297. There is one additional command that is specific to the Track Selector:

Show Only Data Types in Sequence: Causes the Channel Selector and Event Type lists to only display the data types that are actually in the sequence.

TRACK INSPECTOR

The Track Inspector (Figure 7-1) provides easy access to track settings such as color, input, output, play-enable status, record-enable status, Pitch mode, Stretch mode, and so on. These are the same settings shown in the track info pane in the Sequence Editor (Figure 18-13 on page 129).

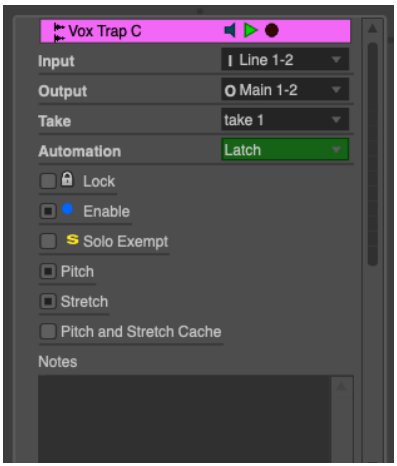


Figure 7-6: The Track Inspector.

Track Inspector settings can also be displayed in the Info Bar of the Sequence Editor and Notation Editor using *Preferences* > *Information Bar*. See "Information Bar" on page 253.

When the Track Inspector is the active cell, the Settings menu (Figure 7-3 on page 43) provides several options.

Configure Info Bar: Displays settings in the Track Inspector cell that let you choose which settings in the Track Inspector will appear in the Information Bar. See "Information Bar" on page 253.

Info Bar Preferences: Opens the Information Bar preferences. See "Information Bar" on page 253.

Use Small Menus in Info Bar: When checked, this menu item reduces the size of the Track Inspector menus shown in the Info Bar.

CHANNEL STRIP

The Channel Strip (Figure 7-1, Figure 7-3) shows the Mixing Board channel strip controls for the current track you select or work in. If your sequence has a master fader, click the Master button at the top (Figure 7-7) to view its channel strip.

For details about the specific controls in the Channel Strip, see chapter 20, "Mixing Board" (page 174).

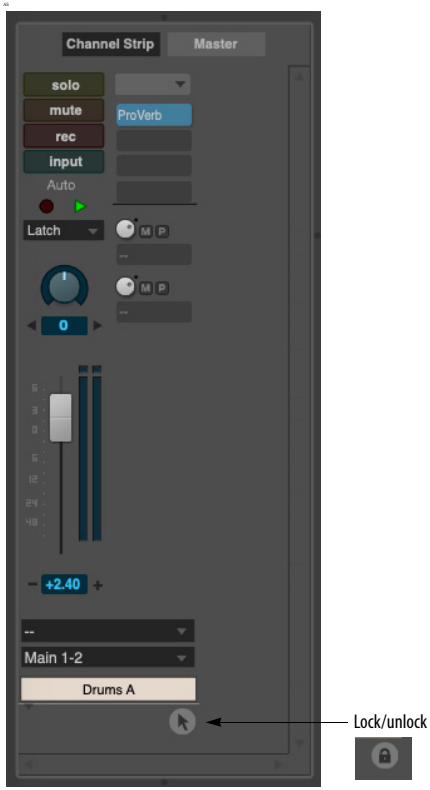


Figure 7-7: The Channel Strip.

When the Channel Strip is the active cell, the Settings menu provides several options. Use the *Show/hide* section (Figure 7-8) to show or hide sections of the Channel Strip as desired. Use the *Layout* and *Configuration* sections to best arrange the controls within the cell, as desired.

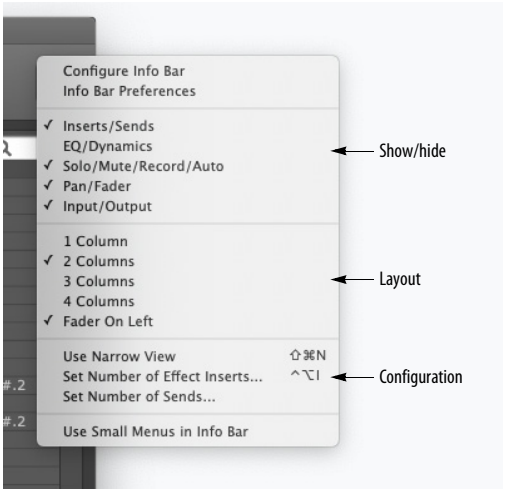


Figure 7-8: The Channel Strip menu.

Locking the Channel Strip

The Channel Strip normally updates to follow the selected track, but it can be "locked" to display the track of your choice regardless of the selected track. To lock the Channel Strip to the track currently showing in the Channel Strip, click the lock button beneath the track name (Figure 7-7); click the icon again to unlock it.

THE WINDOW MENU

The Window menu helps you manage the Performer Lite windows on your computer screen.

Enter Fullscreen causes the Performer Lite window to fill your entire computer screen. Choose Exit Fullscreen to return Performer Lite to a separate window.

The **Close** command closes the top-most window.

Push Window to Back moves the topmost Performer Lite window behind all other Performer Lite windows.

The **Set Focus to Next/Previous Cell** commands let you move the cell focus in the Consolidated window, for things like keyboard shortcuts and menu commands. **Close Cell** closes the currently focused cell.

Pop Out of Consolidated Window removes the currently focused cell from the Performer Lite window and puts it into its own window. **Pop Into Consolidated Window** puts the cell back into the Performer Lite window.

The Windows List displays all of the open windows, with a check next to the active window. Select a window to make it the active window.

Closing all windows

To close all open windows (except the Control Panel, if it is), press Command-Control-W (Mac) or Ctrl-Win-W (Win). If you hold down the Command and Control keys (Mac) or Ctrl and Win keys (Windows) when choosing the Close command in the Window menu, it changes to Close All Windows.

Closing all effect windows

To close all open effect windows, press Command-Shift-Control-W (Mac) or Control-Shift-Win-W (Windows). If you hold down the Shift and Control/Win keys when choosing the Close command in the Window menu, it changes to Close All Effect Windows.

MODIFIER KEYS

Performer Lite employs the following modifier keys on Mac and Windows:

Mac	Windows
Shift	Shift
Option	Alt
Command	Ctrl
Control	Windows logo (Win)

In this manual, references to the Mac Control key spell out the whole word, while references to the Windows Ctrl key use the abbreviated form found on most PC keyboards.

When referring to modifier keys, this manual uses the following conventions:

Separator	Example	What it indicates
- (dash)	Ctrl-Alt-click	Indicates modifier keys that should be pressed in combination
/ (slash)	Option/Alt-click	Serves as a separator between Mac and Windows keys.

CLICKING SHORTCUTS

Option/Alt-click: If you hold down the Option/Alt key and click on a check box, all check boxes will be unchecked except for the one you Option/Alt-clicked.

Command/Ctrl-click: If you hold down the Command/Ctrl key and click on a check box, all check boxes will be checked except for the one you clicked.

USING MODIFIER KEYS WITH CURSOR ACTIONS

Some actions are done with the cursor and keyboard together:

To Control/Win-click: Hold down the Control/Win key, move the mouse to position the arrow cursor on the object and click the mouse. In many places, Control/Win-clicking will cause a contextual menu to appear with convenient shortcuts to relevant commands and options. See “Contextual menus”, below.

To Command/Ctrl-click, hold down the Command/Ctrl key, move the mouse to position the arrow cursor on the object and click the mouse. Command/Ctrl-clicking is used for selecting non-contiguous items; for example, you would use Command/Ctrl-click to select several

independent events in an Edit window. Command/Ctrl-click also toggles the current grid snapping setting. For example, if grid snapping is turned on, holding down the Command/Ctrl key temporarily disables it.

To Shift-click, hold down the Shift key, move the mouse to position the arrow cursor on the object and click the mouse. Shift-clicking is used for selecting contiguous items; for example, to select ten consecutive tracks in the Sequence Editor, click on the first track, the hold shift and click on the tenth track. You can also click and drag across items in a list to make a contiguous selection.

To Shift-drag, hold down the Shift key while dragging. Doing so extends the current selection — with one exception: in the graphic editors, Shift-dragging one or more events constrains dragging vertically or horizontally.

To Option/Alt-click, hold down the Option/Alt key, move the mouse to position the arrow cursor on the object and click the mouse. Option/Alt-click is used to edit the name of a track, sequence, or marker for editing. After editing, the new entry can be confirmed by pressing the Return key.

To Option/Alt-drag, hold down the Option/Alt key while dragging. Doing so makes a copy of what you are Option/Alt-dragging. This is also a shortcut for zooming in edit window, if you hold Option/Alt before you click and drag.

CONTEXTUAL MENUS

Contextual menus appear throughout Performer Lite to provide convenient access to frequently used commands and options.

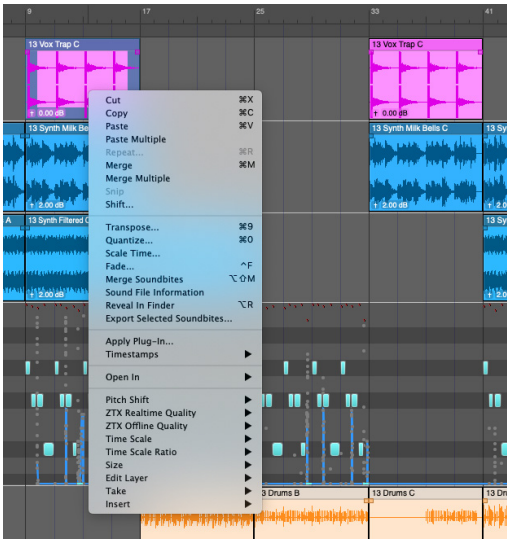


Figure 7-9: The contextual menu for an audio selection in the Sequence Editor

To access the contextual menu, click with the right mouse button or hold the Control/Win key and click with the left mouse button.

☛ Existing behaviors which utilize clicking while holding the Control/Win key take precedence over the contextual menu. That is, when Control/Win-click is already used in a particular context for a different function, you must use right-click to access the contextual menu.

Contextual menu items

The menu items shown in the contextual menu will depend on the context, as the name implies. For example, if you right-click on a selection of audio data in the Sequence Editor (as shown in Figure 7-9), you will see contextual menu items for moving and editing audio data, opening the data in other windows, and Sequence Editor track options. Some menu items may be unavailable temporarily (grayed out) depending on the kind of selection you have made, which layer is active, whether there is any data on the clipboard, and so on.

All items that appear in the contextual menus are available elsewhere as regular menu items, mini-menu items, keyboard shortcuts, and so on. That is, the contextual menu is never the only place to find a command or option.

Event selections

When there is an event selection (such as MIDI notes, soundbites, and so on), right-clicking directly on the selected events will open the contextual menu for those events.

STANDARD KEYBOARD SHORTCUTS

The following keyboard commands are applicable to dialog boxes and text boxes.

Pressing on the return key is the same as clicking on OK: it confirms the selection in the dialog box.

Pressing on the enter key will also OK a dialog box. It is also used when editing a list of names or data, confirming the current one and moving to the next.

(Mac only) *Pressing the command and period keys* together is the same as clicking on the Cancel button: it cancels the selection and leaves the previous settings/values unchanged.

Pressing the escape key is the same as clicking a Cancel button and (Mac only) pressing Command-period (.).

Pressing the tab key will confirm the current entry field, then move to the next field in the box or list and highlight it. Pressing *Shift-tab* does the same thing, only it moves to the previous field or box.

The *up arrow* will move through a list of names or events, confirming the current selection and moving to the previous one.

The *down arrow* will move through a list of names or events, confirming the current selection and advancing to the next one.

The *left and right arrows* move to adjacent text fields, confirming the current selection and advancing to the next one in the arrow direction.

In addition to these, there are many shortcut keyboard commands that will allow you to choose commands from menus very quickly. They are indicated on the menus to the right of the commands themselves and can be used instead of pulling down the menu and selecting the command. To use a shortcut command, hold down the Command/Ctrl key and press the indicated key. For example, Command/Ctrl-X is the shortcut for the Cut command. Instead of pulling down the Edit menu and selecting Cut, hold down the Command/Ctrl key and press the *X* key.

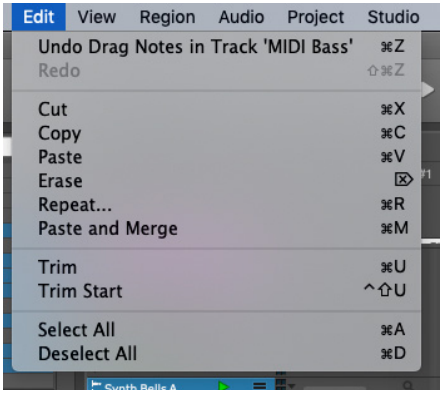


Figure 7-10: Examples of keyboard equivalents for menu commands in Performer Lite.

CUSTOMIZING KEYBOARD SHORTCUTS

Just about all keyboard shortcuts can be customized. For details, see chapter 29, "Commands" (page 257).

CHANGING TEXT BOX VALUES BY DRAGGING

You can change number or note values in text edit boxes throughout Performer Lite by pressing on the text box and dragging up or down. You can also edit text box values in the usual ways (by typing, etc.)

MAIN COUNTER SHORTCUTS

The current playback location can be changed at any time by editing the main Counter directly. This is a more precise method for locating than many of the other numerous ways of cuing Performer Lite. You can edit the counter even while the sequence is playing back. There are several ways to edit the current Counter location in Performer Lite, as described below.

By typing

To edit the counter by typing:

1 Click on the field in the time display to highlight it.

2 Type in a new time value.

While a field is highlighted, just type in a new value. Use the backspace key to erase an incorrect entry.

Press the Tab key or the decimal key on the numeric keypad to cycle through each field of a time display, highlighting each so that you can type in a value. (On Windows, make sure the Num Lock key is engaged before you use the decimal key on the keypad.) For example, to enter the time 11|1|015 as shown in the example above:

1 Click on the bars field to highlight it.

2 Press 11.

3 Press the Tab or decimal key.

4 Press 1.

5 Press the Tab or decimal key.

6 Press 0, 1, and 5.

7 Press the Return key.

As a shortcut, you can press the decimal key on the numeric keypad (with the Num Lock key engaged under Windows). To cancel the edit, press Command/Ctrl-period (Mac only) or escape.

By dragging

This is a great short cut for quickly "yanking" the counter:

1 Press on the desired measure, beat, or tick field (or hour, minute, second, or frame field if you are working with SMPTE).

2 Drag up or down.

By pasting

Counter values can be copied and pasted from nearly any field where a counter value is displayed: the main counter, aux counter, Information Bar, and so on.

1 Click in any counter field.

2 Press Command/Ctrl-C or choose *Edit menu* > *Copy.*

3 Click in the main or aux counter field to highlight it.

4 Press Command/Ctrl-V or choose *Edit menu* > *Paste*.

USING THE NUMERIC KEYPAD

Performer Lite provides many factory default shortcuts on your computer's standard extended numeric keypad (if it has one), from basic transport controls to specialized shortcuts for specific features, such as Notation Editor note entry functions.

Windows Num Lock key

On Windows, be sure to engage the Num Lock key to enable the numeric keypad shortcuts discussed in this manual.

PERFORMER LITE TRACK LIMITS

As a "lite" version of MOTU's flagship Digital Performer audio workstation software (which has no track limits), Performer Lite has the following track limits (and other limitations):

Feature	Limit in Performer Lite	Limit in Digital Performer
Sequences and V-racks	6	Unlimited
Audio tracks	16	Unlimited
MIDI tracks	16	Unlimited
Instrument or aux tracks	16	Unlimited
Busses	16	1024
Master faders	1	Unlimited

If your projects require more sequences, tracks, busses or master faders, please consider upgrading to Digital Performer. Visit motu.com for details.

CHAPTER 8 Tutorials

An excellent way to learn Performer Lite quickly is to follow the tutorials. Choose *Help menu > Tutorials* to open the Tutorials sidebar.

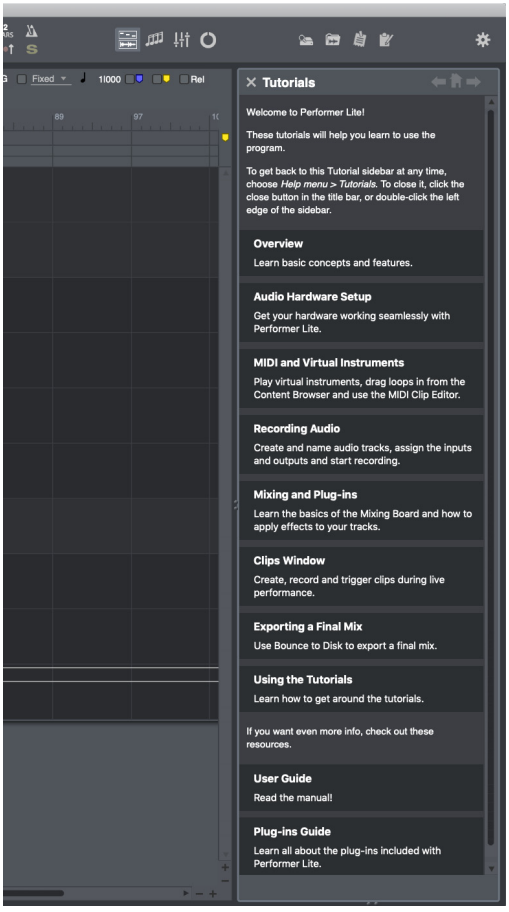


Figure 8-1: The Tutorials sidebar.

USING THE TUTORIALS SIDEBAR

Getting around the Tutorials sidebar is easy.

Use the *Home* button at the top to return to the main menu.

Use the *Forward/Back* buttons next to the Home button to flip through the pages you've already visited.

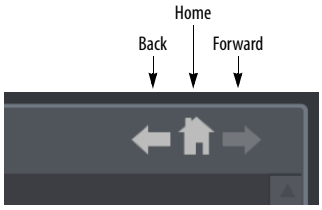


Figure 8-2: The Home button and Forward/Back buttons.

To explore a topic, click it, and then use the *Next/Previous* buttons at the bottom to page through the topic.

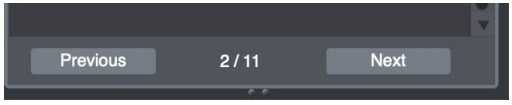


Figure 8-3: The Next/Previous buttons.

To get back to this Tutorial sidebar at any time, choose *Help menu > Tutorials*.

To close it, click the close button in the title bar, or double-click the left edge of the sidebar.

VIDEOS AND EXAMPLE FILES

Within the tutorial pages, you'll find links to short, helpful videos and demo files that illustrate the material being covered.

CHAPTER 9 New Features in Version 11

Performer version 11 introduces the following major enhancements.

NEW FEATURES IN VERSION 11.1

Consolidated instrument tracks . . . . . page 82
Instrument tracks can now hold MIDI data, so everything you need is consolidated into a single track. You no longer need to have a separate MIDI track for the instrument (although you can still do so, if you wish).

Enhanced articulations . . . . . page 153
A new Text Articulation tool has been added, allowing you to enter text as an articulation. Articulations are now easier to delete: simply select them and hit the delete key.

Slurs . . . . . page 153
You can now add slurs to your music score and graphically adjust their shape.

QuickScribe Editor page scaling . . . . . page 139
You can now scale the notation on the page relative to the page size. This allows you to fit more music on the page or enlarge it for better viewing of printed scores and parts.

Registered and assignable controllers
Registered and *assignable* controllers (also referred to as *RPN's* and *NRPN's*, respectively) are similar to controllers but allow you to manipulate additional settings not covered by controllers. Performer 11.1 now fully supports registered and assignable controllers, with all the same powerful tools as regular controllers.

Support for macOS Monterey
Performer version 11.1 brings support for macOS Monterey (version 12).

NEW FEATURES IN VERSION 11.0

Nanosampler 2.0 . . . . . Plug-in Guide PDF 55
This major upgrade of nanosampler is your new go-to virtual instrument for creating unique beats, instruments and sounds. Drop in 4a sample and start stretching, slicing, randomizing and transforming audio into just about any sound or instrument you can imagine. New features include:

- 3 Playback Modes: Classic, 1-shot, Slice
- ZTX time stretching
- Settings tab with Envelopes and LFO graphs
- Trigger and Gate playback
- Snap sample start/end, loop start/end and slice start points to minimize clicks
- Sample Gain and Fade-in/out
- Repeat and Reverse
- Full UI redesign
- Support for 32 and 64-bit floating point sound files

Support for MPE and Per-Note CCs. . . . . page 78
MIDI Polyphonic Expression (MPE) is now supported. You can record multi-channel output from an MPE controller — such as a Roli™ Seaboard™ — as regular MIDI notes containing MPE expression data. In the track, you see MIDI notes that each contain their own note-specific controllers, for easy and intuitive editing. You can hide and show the contained per-note controller and pitch-change events. Zoom in the note grid for finer detail. Zoom per-note data independently of the notes that contain them.

New Scale Tool . . . . . page 249
Quickly scale per-note expression data or MIDI CCs by simply dragging vertically with the new Scale Tool.

Per-note Expression Data Lanes. . . . . page 328
There are now separate lanes in the Sequence Editor to view and edit per-note MPE expression data with Performer's familiar continuous controller (CC) editing tools. A check box in each lane allows you to easily toggle the lane between track data and per-note data.

Multi-channel MIDI tracks . . . . . page 78
You can now record and play multiple channels of MIDI data in a single track. When setting MIDI track input and output assignments, instead of choosing a specific channel, you can choose *any*. When you choose *any* for input, you can record all 16 MIDI channels into the track at once. The channels are stored with the MIDI events in the track. When you choose *any* in the track's output assignment, the events will be played on the same channel they were recorded.

View Filtering in the Track Selector. . . . . page 44
You can now show and hide individual MIDI channel data using new *Channel Selection* section in the Track Selector. Use the *Event Type Selector* section to show and hide specific event types.

Clip Triggering With Pad Controllers . . . . . page 209
Gain complete hands-on control of Performer's extensive Clips window with a pad controller like the Novation™ Launchpad™ Pro mk3 or Akai™ APC-40. Trigger individual clips or entire scenes (sections of songs). Apply filter sweeps and other effects processing.

New Control Surface plug-ins for Native Instruments™ and Softube™. 619, 621
Performer 11 includes new control surface plug-ins for the current Native Instruments™ Komplete Kontrol™ series including the M32, A-Series, and S-Series MK2 controller lines. Softube Console 1, Console 1 mkII and Console 1 Fader are also supported. These state-of-the-art control surfaces empower your Performer workflow so you can work faster and more intuitively.

Enhanced Avid™ EuCon Support. . . . . page 619
Performer's EuCon plug-in has been substantially updated, including support for the Avid S6™ console and the Artist Series™. In addition, you can now use your EuCon worksurface with Performer running on Windows 10.

Track and Clip Effects . . . . . , page 71, 76, 207
Every audio track, MIDI track and clip now has a basic transpose setting that you can use to transpose the content of that track or clip by an interval on playback, leaving the original data unaffected. You can conveniently change the setting at any time. MIDI tracks and clips also have a quantize setting, in addition to transpose. Audio tracks and clips have a Detune setting as well that can be used together with transpose or independently.

Clips Window Enhancements . . . . . page 204
The *New Empty Clips Scene* command fills any empty clips in the scene you've right-clicked on with new empty clips. The *Double Clip Loop* feature doubles the length of the looped portion in a clip and repeats the material to fill the new loop, so you can easily creates changes that will be heard every other time through the looped material.

Intelligent Audio Interface Selection. . . . . page 20
On macOS, if you haven't yet selected the audio hardware you wish to use with Performer, Performer finds the best option for you. If you have a MOTU interface, or other professional interface, Performer uses it. If not, Performer uses whatever input and output devices you have selected in the System Preferences Sound Panel, and will follow your selection there if you change it. Of course, if you do choose an interface from within Performer, Performer uses it.

Follow System Audio Settings ..... page 22
(macOS only) You can now have Performer always use the audio input and output options you've chosen in your Mac's System Sound preferences, rather than selecting a specific driver.

Text Rendering on Windows
Taking advantage of the latest text rendering engine in Windows 10, Performer's text appears significantly crisper. Numerous additional text alignment tweaks improve Performer's look on Windows.

Dynamically resizable channel strips, dialogs and menus
Performer's faders resize when you make the Mixing Board and Channel Strip windows taller (or shorter). Performer also resizes system dialogs and menus appropriately for the size and resolution of your computer screen.

Support for Monterey, Big Sur and Apple silicon Macs
Performer is fully qualified for macOS Big Sur (11.x), macOS Monterey (12.x) and the latest generation Apple silicon Macs. Rosetta is not required. Optimized for native multi-core performance, Performer's audio engine prioritizes audio threads on high-speed cores and reserves CPU bandwidth for critical, time-sensitive processing.

Part 3

Tracks

CHAPTER 10 Track Basics

OVERVIEW

Each track in Performer Lite holds an individual stream of MIDI or audio data. Each track has its own settings, input/output assignment, and a separate mixer channel. Tracks can be edited individually or together with other tracks. They can be grouped into track folders.

Overview 58
Basic track types 58
Special track types 59
Track settings 59
Effect inserts panel 63
Creating a track 63
Creating several tracks at once 63
Duplicating a track's settings 63
Duplicating a track's settings and data 63
Renaming a track 64
Deleting a track 64
Track colors 64

BASIC TRACK TYPES

A sequence can have the following types of tracks.

MIDI tracks

A MIDI track is where MIDI data is recorded, edited and played back. In Performer Lite, MIDI data is stored in a MIDI track without channel information. Instead, each track can be assigned to play back to one or more MIDI channels. During playback, the MIDI data in the track is transmitted to the assigned channels. Any MIDI instrument that is listening to (receiving on) that same channel will respond to the MIDI data from the track.

Audio tracks

An audio track is where digital audio data is recorded, edited, and played back. It could be a recording of a single instrument, containing any number of punch-ins and overdubs for the instrument. Or it could contain a wide variety of sounds occurring at different times, such as sound effects. You can record any audio you want into an audio track, including speech, vocals, sound effects, etc.

Instrument tracks

An instrument track is a special kind of track which has a virtual instrument plug-in as its first effects insert. Virtual instrument plug-ins work very much like synthesizers, samplers and other hardware instruments: you send them MIDI data and they output an audio signal. Instrument tracks contain MIDI data to trigger their instrument. You can also insert and record mix automation data into an Instrument track. For details, see chapter 13, "Instrument Tracks" (page 82).

Aux tracks

An Aux track is a special kind of audio track that routes an input directly to an output. You cannot record audio into an Aux track, nor can you place pre-recorded audio into it. But you *can* insert and record mix automation data into an Aux track.

Aux tracks are primarily intended as a routing mechanism. Aux tracks allow you to route audio from any source to any destination. For example, you can route several audio tracks to a single effects plug-in that you have placed on an Aux track effects insert.

Master Fader tracks

A Master Fader track controls the overall level of a output or bus bundle. Like Aux tracks, master fader tracks have no record button, and you cannot place audio in them. Instead, the master fader track provides an output assignment and volume control and automation over the output or

bus you assign to it. The most common way to use a master fader is as a sub-mix fader for an output (or a bus) to which you have assigned a group of audio tracks. You can then control (automate, process, etc.) them as a group with the master fader.

VCA tracks

Similar to their analog mixing console counterparts, VCA tracks are used to control the relative volume, and other mixing parameters, of a group of other tracks with a single VCA track. You can create as many VCA tracks as you want in your mix, and you can even have VCA tracks control other VCA tracks as sub-groups. See chapter 56, "VCA Tracks" (page 509).

SPECIAL TRACK TYPES

In addition to the basic track types, there are two special-purpose tracks.

The Conductor track

The Conductor track stores meter, key, tempo, and marker information. For details, see the chapter 47, "Conductor Track" (page 446).

The Movie track

The Movie track is for playback and display purposes only, and is displayed only in the Sequence Editor. For details, see chapter 18, "Sequence Editor" (page 121).

TRACK SETTINGS

The panel to the left of each track shows all of the settings for the track, as demonstrated below.

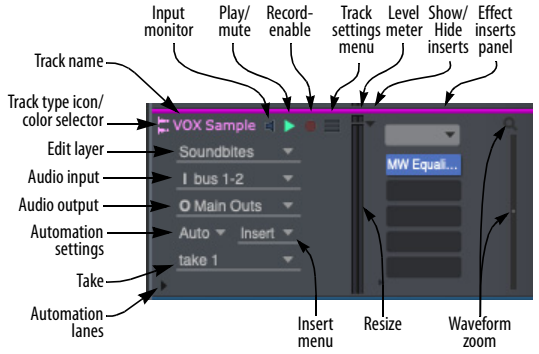


Figure 10-1: Audio track settings. The display of these controls changes depending on the vertical size of the track.

Track settings menu

The track settings menu (Figure 10-1 on page 59) provides additional settings in menu form, as shown in Figure 10-2. Since tracks can be resized vertically (see "Resizing tracks" on page 130), many of their panel settings get covered up when their vertical size is reduced. However, the Track Settings menu remains visible, even at a track's smallest vertical height, so that you always have access to all of the track's settings.

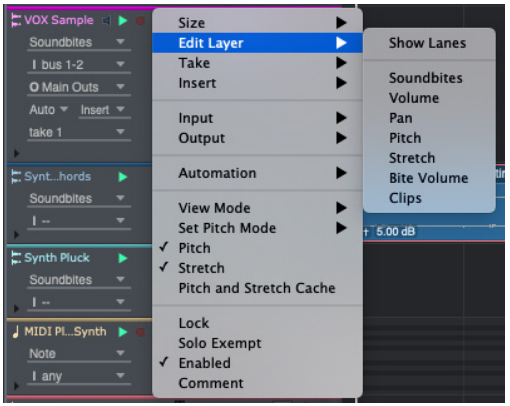


Figure 10-2: Even when a track is reduced vertically to its smallest size, the Track Settings menu gives you access to all track settings.

Common track settings

All basic track types have the following common track settings:

- Name
- Track type icon
- Play/mute
- Solo exemption
- Output assignment
- Take
- Edit Layer
- Insert menu
- Automation settings
- Level meter
- Lock
- Color
- Comment

Each track type may also have additional settings which are specific to the track type. Refer to the following chapters for more information on each track type.

Track name

Use the track name as follows:

- Click, Command/Ctrl-click, or Shift-click a track name to select the track for deleting, duplicating and other track management tasks.
- Option/Alt-click the track name to rename it. To confirm your change, press the Return key. To cancel the change, press the Command and period keys, or the Escape key. You can also click outside the box to confirm your edit. Use the Enter or Down Arrow key to OK the name change and move to the next track. Use the Up Arrow key to OK the name change and move to the previous track.
- Command–double-click a track name to open the Mixing Board with that track's channel showing.
- Track names highlight if there is a selection in the track.
- The Conductor Track's name cannot be changed.

The track type icon/color selector

Performer Lite provides the following types of tracks, with the following icons to identify them in the Sequence Editor:

Icon	Track type
	Conductor track
	MIDI track
	Mono audio track
	Stereo audio track
	Aux track
	Instrument track
	Master fader
	VCA fader

The track type icon serves two roles: 1) it tells you what type of track you are looking at with an icon, and 2) if you click on the icon, you can choose the track color. See "Color" on page 63.

Play/mute

The Play-Enable button (Figure 10-1 on page 59) engages a track for playback. When the button is lit, the track plays; when the button is empty, the track is muted. If muted, the data for the track is still there; you are just silencing the track during playback. Click the button to toggle between these two states.

Any number of tracks may be play-enabled at one time, but your MIDI and audio hardware resources — the MIDI devices in your studio and the audio hardware installed in your computer — ultimately determine how many tracks you can truly play all at once.

When Solo mode is engaged, clicking the play button toggles between play-enabled (blue) and muted (orange) or disabled (gray), depending on its state before entering solo mode.

The Conductor track contains no MIDI or audio data, so it therefore has no Play-Enable button.

Here are a few shortcuts for play-enabling tracks: to toggle the status of several tracks at one time, just drag ("glide") over their play buttons. To Play-enable all tracks except for one, command click its play-enable button. To play-enable only one track and unplay-enable all others, Option/Alt-click the track's play-enable button. This convention also applies throughout Performer Lite to similar toggle buttons, such as record-enable buttons, play and record buttons in other windows (such as the Sequence Editor), and Lock buttons in various windows.

For important information about track soloing and how it relates to the play-enable buttons, see "Soloing Tracks" on page 269.

Solo exemption

When you solo a track, the track you solo plays and all other tracks are muted. However, there are often tracks that should never be muted, even during soloing, such as master faders and aux returns. In addition, there might be disk tracks that you wish to always hear as you work (such as a tempo reference of some kind). For cases like these, tracks provide a setting called *Solo Exempt*, which appears as a checkable menu item in the track settings menu. If you check this menu item for a track, it turns on solo exemption for the track. This means that the track will not be muted when other tracks are soloed. To further indicate this, the track's solo button in the Mixing Board disappears. Master faders are always solo exempt; therefore, their setting in the Sequence Editor cannot be toggled. Aux tracks are always Solo Exempt by default (although you can defeat their exempt status, if you wish). Solo exempt status can also be toggled in the track settings menus in the Sequence Editor and the Mixing Board (below the track name).

Output assignment

the Output (Figure 10-1 on page 59) displays the destination for the MIDI or audio data in the track.

MIDI tracks, are assigned to a MIDI device in your studio followed by a dash and a MIDI channel number (between 1 and 16). It can also be a MIDI device group, which consists of several devices. The list of possible MIDI devices is provided by your MIDI device configuration (Studio menu > Bundles > MIDI Devices tab). For information, see "Choosing a MIDI output destination" on page 75, and "Changing the MIDI device list" on page 75.

Audio tracks are assigned to physical outputs on your audio hardware (such as the headphone output of your computer or a pair of outputs on an audio interface), or to one of Performer Lite's internal busses. For information, see "Choosing an audio input and output" on page 69.

Take

The Take menu (Figure 10-1 on page 59) is used to manage track takes. Takes are a way to store multiple versions of a track within a single track. You can add, delete, expand, absorb, and comp takes using the Takes menu and the Comp tool. For complete details, see chapter 43, "Takes and Comping" (page 415).

The Edit Layer

Each type of data resides in its own edit layer, which you can make *active* (bring to the front) while other layers remain dimmed or hidden in the background.

The *Edit Layer menu* (Figure 10-1 on page 59) lets you choose what type of data you would like to make active, as shown below in Figure 10-3. In audio tracks, mix automation data (volume, pan, etc.) is displayed directly on top of the soundbites, which are dimmed in the background. When soundbites are made active, automation data is hidden. In MIDI tracks, the same is true for MIDI continuous controller (CC) data and MIDI notes on the note grid.

When a data type is made active, it can be inserted and edited independently of other data types.

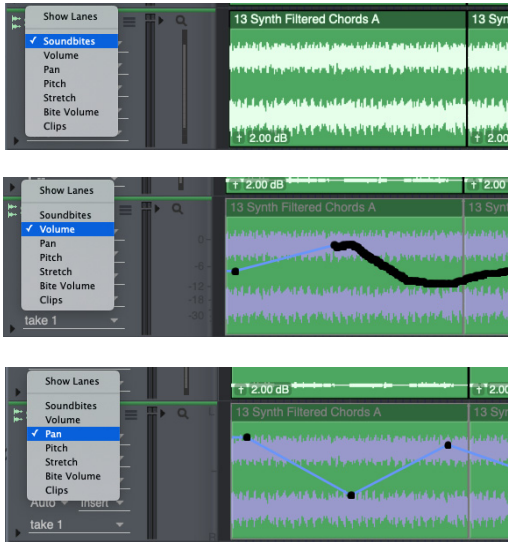


Figure 10-3: Choosing the edit layer.

Choosing the edit layer for all tracks at once

Hold down the Option/Alt key when choosing what to display to change all tracks at once. You can do so from any track.

Using lanes instead of edit layers

As an alternative to using edit layers, you can show separate lanes for each type of automation data. See "Displaying automation lanes" on page 344.

Using edit layers

For further information about using each edit layer, see below.

Edit layer	For more information
Show Lanes	"Displaying automation lanes" on page 344
Soundbites	"Audio editing basics" on page 332
Volume Pan	"Working with breakpoint mix automation" on page 343
Pitch	chapter 62, "Transposing Audio" (page 547)
Stretch	"Stretching audio beats" on page 435
Bite Volume	"Soundbite volume automation" on page 347
Clips	"The Clip edit layer" on page 341

Automation settings

The Automation menu (Figure 10-1 on page 59) lets you specify various mix automation settings for the track. For details, see "Automation settings in other windows" on page 493.

Waveform/note grid vertical zoom

The vertical zoom menu (Figure 10-1 on page 59) vertically shrinks or expands the waveform display in an audio track and the note grid in a MIDI track. In audio tracks, it has no effect on the actual amplitude of the audio in the track; it is for display purposes only. Option-drag to vertically zoom all audio tracks or all MIDI tracks.

Insert menu

The insert menu in each track (Figure 10-1 on page 59) lets you choose any type of data to insert into the track (except soundbites). In audio tracks, you can insert volume, pan, send levels, track mutes and plug-in parameter automation for any plug-ins currently assigned to the track. For

complete details, see "Inserting and editing automation" on page 499. In MIDI tracks, you can insert any type of MIDI data.

Level meter
Each audio and MIDI track displays

a mono or stereo level meter (with red clip indicator). These level meters function identically to the level meters in the Mixing Board. For details, see "Level meters" on page 188.

Lock
When a track is unlocked (the default setting), all data in the track stays anchored to its measure location. If you change the tempo of the sequence, the SMPTE frame location of the data will change.

When a track is locked, its name becomes underlined and all data in the track stays anchored to its current SMPTE frame location, even if you change the tempo of the sequence.

Color
To choose a color for a track, click on the track type icon next to the track name, as shown below in Figure 10-4.

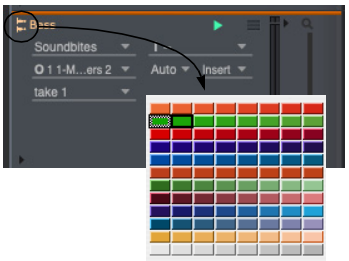


Figure 10-4: Choosing track color.

See "Track colors" on page 64 for more information on creating, using, and editing color schemes, and "Assigning colors" on page 66 for details about how to assign colors to multiple tracks at one time.

EFFECT INSERTS PANEL

Click the *Effect Inserts panel* button to show or hide the effect insert panel for each track as shown in Figure 10-1 on page 59. These are the same effects inserts for the track in the Mixing Board. See "Inserts" on page 178.

CREATING A TRACK

To create a track, choose the desired track type from the *Project menu* > *Add Track* sub-menu: MIDI, mono audio, stereo audio, and so on. New tracks are added to the Sequence Editor and all other windows that display tracks. In addition, a fader strip is added to the Mixing Board. You can create as many tracks as you like. If a current track is selected when you add new tracks, the new tracks are added below the selected track (or the last selected track, if more than one is selected).

CREATING SEVERAL TRACKS AT ONCE

If you want to add several tracks at once, hold down the Option/Alt key and choose the desired track type from the *Project menu* > *Add Track* submenu.

DUPLICATING A TRACK'S SETTINGS

You can add new, empty tracks by duplicating existing tracks. To duplicate one or more tracks' layout, select the desired tracks and choose *Add Similar Tracks* from the Project menu. The new track will have the word "copy" appended to its name.

This command does not copy the data in the track; instead, it copies only the track's settings, such as name, input/output assignments, volume fader level, and so on.

DUPLICATING A TRACK'S SETTINGS AND DATA

To duplicate one or more existing tracks, including the contents of the tracks, select the tracks you wish to duplicate and choose *Duplicate Tracks* from the Project menu. The new track will have the word "copy " appended to its name.

RENAMING A TRACK

Option/Alt-click the track name to change it.

DELETING A TRACK

To delete a track, select it and choose *Delete Tracks* from the Project menu. The track will be removed from the sequence. Delete several tracks at once by selecting them all before choosing the Delete Track command. When a track is deleted, all of its data is gone. You can undo the Delete command. You may also assign a keyboard shortcut to the Delete Tracks command.

TRACK COLORS

Performer Lite allows you to choose any display color you want for each track, as shown in Figure 10-4 on page 63. Coloring tracks can help you to distinguish them more easily in the Sequence Editor and Mixing Board. Performer Lite provides many different color *schemes* (sets of colors) for you to choose from. You can even create your own schemes.

Working with color schemes

A color *scheme* is a set of related colors that can be easily interchanged with a different set of related colors. For example, you could have a "Metallic" scheme and a "Earthy Pastels" scheme. Performer Lite provides several preset schemes, and you can freely change between them at any time. You can also create your own schemes.

Changing the color scheme

To switch to a different color scheme, go to the View menu, choose *Colors* and choose the desired scheme from the sub-menu.

Editing color schemes

To edit a color scheme, go to the View menu, choose *Colors* > *Edit Track Color Schemes*. Doing so opens the Edit Track Color Schemes dialog as shown below in Figure 10-5. The scheme currently being used is highlighted.

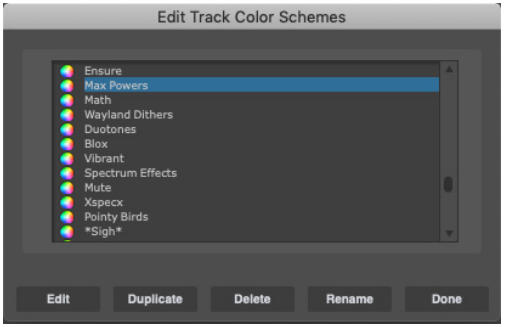


Figure 10-5: The Color Schemes dialog.

To do this	Do this
To choose a different scheme	Click it once to select it and then click Done.
To edit a scheme	Double-click it. Or click it once to highlight it and click the Edit button.
To delete a scheme	Click it once to highlight it and click the Delete button.
To rename a scheme	Click it once to highlight it and click the Rename button.
To duplicate a scheme	Click it once to highlight it and click the Duplicate button.
To make a new color scheme	Duplicate an existing one (as described above), rename it, and edit it as desired.

Modifying a color scheme

To modify a color scheme, double-click it in the Edit Track Color Schemes dialog (shown in Figure 10-5). When you do, the color palette appears as shown below in Figure 10-6.

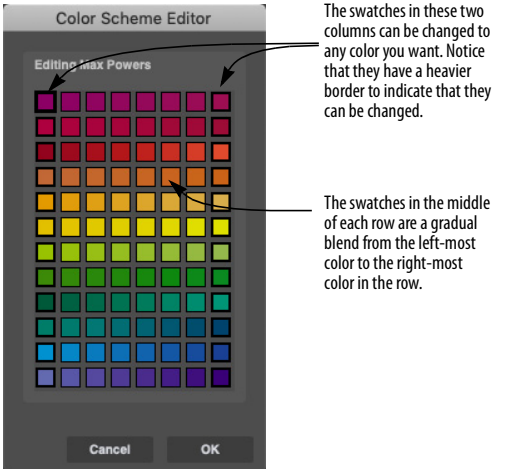


Figure 10-6: A color scheme palette. The 12 swatches in the in left-most and right-most columns — the ones with the heavier borders — can be changed. The swatches in-between are automatically filled with a gradual blend of the colors on either end of the row.

Here is a summary of what you can do in this window:

To do this	Do this
To open the color picker	Double-click on any swatch in the left-most or right-most columns.
To fill a swatch using the eyedropper tool	Click once on the swatch to select it and then move the cursor over any color on your screen — even colors outside of Performer Lite and its windows.
To move a row up or down	Drag the swatch on either end of the row.
To flip a row (switch the left- and right-most swatches)	Drag either swatch to the other side of the row.
To change which swatch is currently selected (with a heavy border)	Use the arrow keys, or click the desired swatch.

Using the Color Picker

The color palette (as shown in Figure 10-6 on page 65) also lets you create your own colors using the macOS or Windows Color Picker. To open the color picker for a swatch, just double-click the swatch. Remember, only the swatches in the left-most and right-most columns of the palette can be modified. The swatches in the middle of each row are automatically filled with a gradual blend between the colors on either end of the row.

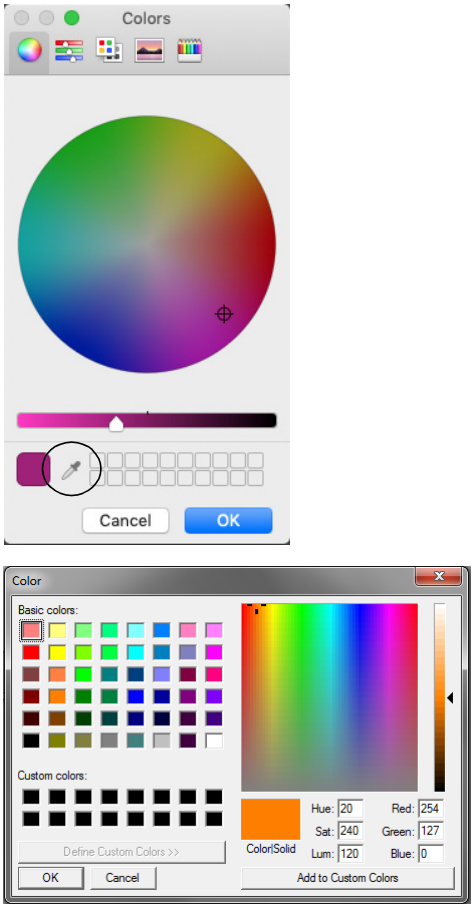


Figure 10-7: Double-click any swatch with a heavy border to open the standard macOS or Windows color picker. Use the eye-dropper tool (circled) to choose any color on your screen.

Using the color picker to "import" colors (Mac only)

The color picker (as shown in Figure 10-7 above) lets you import any color you like using the magnifying glass tool. Just click the magnifying glass, and then move the cursor anywhere on your computer screen — even windows, dialogs, icons,

and other items outside of Performer Lite (on the macOS desktop or in other applications running at the same time as Performer Lite).

For example, you could open a graphic image of some kind in Adobe Photoshop (or other graphics program) and then use the magnifying glass tool to import any color that is currently visible in the graphic image on your screen. You might find it helpful in this situation to close all of Performer Lite's other windows before opening the color picker so that they will not cover up parts of the image you would like to click with the magnifying glass tool. You could also make a window set that consists of all windows being closed (except the Control Panel, of course).

Assigning colors

The *Assign Track Colors* sub-menu command (View menu) lets you Assign Track Colors to multiple tracks at one time. Numerous options are provided, as shown below in Figure 10-8:

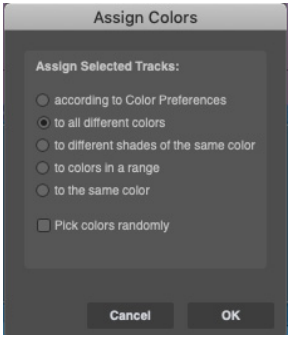


Figure 10-8: Assigning colors to many tracks at one time.

To use the Assign Track Colors command, select one or more tracks and then choose *View menu* > *Colors* > *Assign Track Colors*. Choose the option as desired and the click OK. Below is a summary of the assign color options:

Option	Explanation
according to Color Preferences	Assigns colors to each track according to the currently chosen color scheme in the View menu.
to all different colors	Assigns a color to each track from the currently selected color scheme (palette). When the "Pick Colors Randomly" check box is not checked, this option starts at the beginning of the palette and works its way towards the end as needed according to the number of tracks selected. If "Pick Colors Randomly" is checked, it will assign colors randomly from the palette.
to different shades of the same color	Lets you choose a specific color from the color palette and then only uses the various shades of that color (from the same row in the palette).
to colors in a range	Lets you choose a start color and an end color from the color palette and then cycles through all the colors in between as needed according to the number of tracks selected.
to the same color	Lets you assign all currently selected tracks to a single color of your choice (as specified by the swatch provided).

The 'Pick Colors Randomly' option

The *Pick colors randomly* option appears for several of the choices above it in the *Assign Track Colors* dialog. When it is checked, it assigns the specified colors at random to all currently selected tracks. When it is unchecked, colors are assigned from the current color scheme palette starting with the first color specified and then proceeding to the right and then down to the beginning of the next row.

CHAPTER 11 Audio Tracks

OVERVIEW

This chapter covers topics that are specific to the setup of audio tracks. For MIDI track setup, see chapter 12, "MIDI Tracks" (page 73).

Overview 67
Integrated MIDI and hard disk audio 67
Types of audio tracks 67
Audio (disk) tracks 67
Mono and stereo tracks 67
Creating an audio track 67
Creating several audio tracks at once 68
Audio track settings 68
Input source: Audio bundles 68
Choosing an audio input and output 69
Record-enabling an audio track 69
Input monitor enable 69
Stretch 69
Pitch and Stretch Cache 70
Enabled 70
Track Transpose 71
Track Detune 71
Monitoring an audio track input 71
Changing audio track settings on the fly 71
Making I/O assignments for multiple tracks 71
Track limits 72
Managing your computer's system resources 72

INTEGRATED MIDI AND HARD DISK AUDIO

In Performer Lite, *audio tracks* are very similar to MIDI tracks, and they all appear together in Performer Lite's Sequence Editor and Mixing Board.

TYPES OF AUDIO TRACKS

Performer Lite provides these audio track types:

- Audio (disk) tracks
- Instrument tracks
- Aux tracks
- Master faders

Audio tracks are used for recording and playing hard disk audio. For information on Instrument tracks, Aux tracks, and Master Fader tracks, refer to the following chapters.

AUDIO (DISK) TRACKS

An *audio track* (disk track) is where digital audio data is recorded, edited, and played back. It could be a recording of a single instrument, containing any number of punch-ins and overdubs for the instrument. Or it could contain a wide variety of sounds occurring at different times, such as sound effects. You can record any audio you want into an audio track, including speech, vocals, sound effects, etc.

Audio (disk) tracks are the only type of audio track into which you can record or place audio. They can be mono or stereo (discussed later in this chapter).

MONO AND STEREO TRACKS

A mono track holds one channel of audio. A stereo track holds two channels of audio. Stereo tracks are designed to support stereo recording and editing. Mono tracks can only hold mono soundbites, while stereo tracks can only hold stereo soundbites. Stereo tracks have an input pair (i.e. in 1-2) instead of a single input, like mono tracks.

CREATING AN AUDIO TRACK

Choose *Add Track* from the Project menu, and then from the *Add Track* sub menu choose the desired type of audio track you wish to create

(mono or stereo track). If you choose stereo, you'll see the inputs for the track shown as pairs (e.g. 1-2, 3-4, etc.)

New tracks are added to the Sequence Editor and all other windows that display tracks. In addition, a fader strip is added to the Mixing Board.

New audio tracks are named *Audio-1*, *Audio-2*, etc. You can rename the track by Option/Alt-clicking the name.

CREATING SEVERAL AUDIO TRACKS AT ONCE

If you want to add several audio tracks at once, hold down the Option/Alt key while accessing the Project menu and choose one of the *multiple* track options from the *Add Track* submenu.

AUDIO TRACK SETTINGS

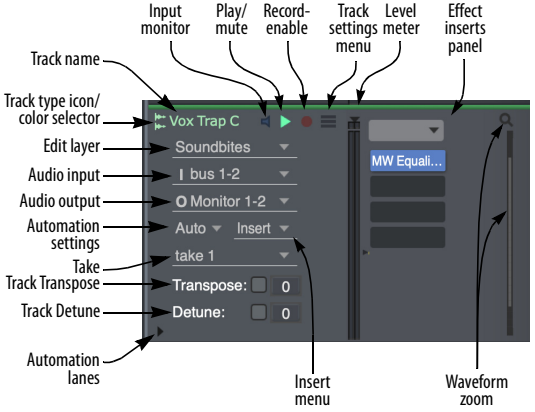


Figure 11-1: Choosing an input and output for an audio track.

Each audio track has the following universal track settings:

- Name
- Track type icon
- Play/mute
- Solo exemption
- Output assignment
- Take
- Edit Layer
- Insert menu
- Automation settings
- Level meter
- Lock
- Color
- Comment

For further details on these universal settings, see "Track settings" on page 59. Each audio track also has the following audio-specific settings, discussed in this chapter:

Setting	For further information
Audio Input	"Choosing an audio input and output" on page 69
Record-enable	"Record-enabling an audio track" on page 69
Input Monitor-enable	"Input monitor enable" on page 69
Stretch	"Stretch" on page 69
Pitch and Stretch Cache	"Pitch and Stretch Cache" on page 70
Enabled	"Enabled" on page 70
Track Transpose	"Track Transpose" on page 71
Track Detune	"Track Detune" on page 71

In addition, the Track Settings menu (Figure 11-1) contains a few settings that are specific to the Sequence Editor window, and they are covered in "Track settings" on page 129.

INPUT SOURCE: AUDIO BUNDLES

Audio bundles serve as the crucial link between the virtual mixing world in Performer Lite and the actual audio hardware that is physically connected to (or installed in) your computer. Bundles provide a convenient layer between them that lets you effectively manage audio and MIDI input and output. To save time, you can create bundles as

part of the process of making audio track input and output assignments (as explained in the next section). If you have a more elaborate studio setup, you can set up your audio bundles in advance using the Bundles window. For further information, see chapter 30, "Bundles" (page 261).

CHOOSING AN AUDIO INPUT AND OUTPUT

For each audio track, choose an *input* source and *output* destination as shown in Figure 11-1. The available choices in the input and output menus reflect the physical input and output jacks on the audio hardware installed in or connected to your computer. They also include any virtual instrument software running at the same time as Performer Lite.

You can choose an existing input or output (or input or output pair), or you can create a *New mono bundle* or *New stereo bundle* to assign the track to a new input or output. Or you can assign it to an input or output bundle that you created in the Bundles window, as explained in chapter 30, "Bundles" (page 261). Bundles which are already in use are bolded in input and output assignment menus, and a red dot in the input menu indicates that the input is currently record-enabled.

Output assignments

The track in Figure 11-1 above is assigned to — and panned across — the main outs of the audio interface. To play a track on a single output, pan hard left or right (where the odd numbered output is left and even is right). Alternatively, you can create a mono bundle and assign the output to that bundle.

RECORD-ENABLING AN AUDIO TRACK

The record-enable button (arms the track for recording). When the track is armed, the button is red.

Record-enable buttons are only present if the sequence is selected for playback in the Set List.

Multiple audio tracks may be record-enabled at one time, although there is a preference that can restrict them to being record-enabled only one at a time, if you wish.

To arm several adjacent audio tracks, glide the arrow cursor over their record buttons (with the mouse button held down).

INPUT MONITOR ENABLE

The Input Monitor enable button (Figure 11-1 on page 68) lets you listen to the live audio signal being received on the audio track's chosen hardware input. See "Audio input monitoring" on page 280.

STRETCH

Stretch is found in the Track Settings menu (Figure 11-1 on page 68) for audio tracks, as shown in Figure 10-2 on page 59. When this menu item is checked, the track's Stretch edit layer is enabled and all soundbites in the track that have been beat and tempo analyzed (and therefore have their own tempo map) will be stretched to conform to the sequence tempo. As a result, they will always play in time with Performer Lite's click, as well as other audio and MIDI tracks that have been recorded or sequenced in time with the sequence tempo. This is true regardless of whether the sequence is running under a constant tempo with the Fixed Tempo mode, or with variable tempos in the Conductor Track.

When *Stretch* is unchecked, no stretching occurs automatically. Instead, soundbites play at their original tempo and duration. For example, if you have a dialog track or sound effects track for a movie, you would want to uncheck Stretch so that the dialog and sound effects do not get time-stretched (unless you do it manually on a per-soundbite basis).

☛ If you lock the track ("Lock" on page 63) when the Stretch layer is enabled, doing so disables track stretching, as if it is turned off. Beat editing, however, remains available for editing.

There are preferences for enabling Stretch in the current project and new projects. See "Pitch and Stretch" on page 255.

For details about beat and tempo analysis, see chapter 45, "Audio Beats and Tempo Detection" (page 428). For details about managing soundbite tempos, see chapter 44, "Tempos and Audio" (page 422).

PITCH AND STRETCH CACHE

Pitch and Stretch Cache is found in the Track Settings menu (Figure 11-1 on page 68), as shown in Figure 10-2 on page 59. When this menu item is checked, Performer Lite stops processing audio pitch and stretch operations for the track in real time and instead caches them on disk to reduce the CPU overhead required to produce them. This processing occurs off line, in the background, so it won't affect playback performance.

If you are making pitch or stretch edits in an audio track, it is recommended that you leave this setting checked to reduce the demand on your computer's CPU, especially during playback.

The advantage to keeping this menu item unchecked is that making edits in the track's Pitch and Stretch could be a little more smooth and responsive, depending on how fast your computer is. The disadvantage is that the track will place higher overall demands on your computer's CPU, especially during playback. There are preferences for enabling this cache in the current project and new projects. See "Pitch and Stretch" on page 255.

ENABLED

Audio tracks require varying amounts of computing resources, depending on the amount of mix automation data in the track, what plug-ins or instruments are instantiated on the track and other factors. The audio track *Enabled* option (Figure 11-2 on page 71) allows you to temporarily take an audio track off line to free up its computing resources. Note, however, that doing so causes Performer Lite to re-allocate its audio engine resource. Track enabling/disabling is not designed to produce totally smooth transitions during playback or recording. Therefore it is best done when Performer Lite is stopped. You can certainly do it during playback, but it is strongly recommended that you avoid doing so in critical listening situations.

☛ When an audio track has been disabled, it's volume fader cap in the Mixing Board disappears, to clearly indicate that the track has been disabled.

If you wish to simply mute and unmute a track during playback (or recording), leave it enabled and use its play button to mute and unmute it. Doing so preserves the track's system resources and ensures a completely smooth transition.

Track Enable

Each audio track has its own *Enable* feature (Figure 11-2).In the Sequence Editor and Mixing Board, this setting is a checkable menu item in the track settings menu. When a track is disabled, it relinquishes all of its system resources. But note that bringing it back on line is not instantaneous.

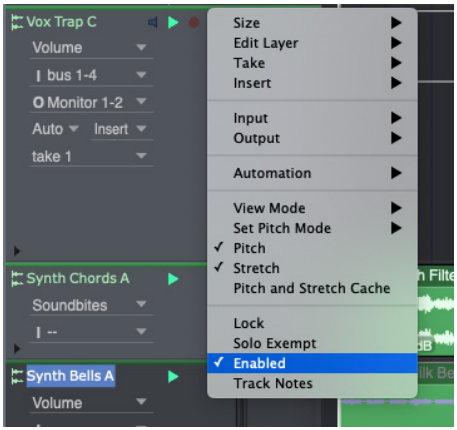


Figure 11-2: Audio track enable.

TRACK TRANSPOSE

The *Track Transpose* setting (Figure 11-1) allows you to apply non-destructive, real-time pitch transposition to the audio material in the track. Transposition is applied during playback and is not reflected in the track data itself. Click the check box to enable or disable transposition. Enter the desired number of half steps in the text box. The nature and quality of the pitch processing is determined by each soundbite's *Transpose* setting ("Transpose" on page 363) and its *ZTX Realtime Quality* setting ("ZTX Realtime and Offline Quality" on page 363).

TRACK DETUNE

The *Track Detune* setting (Figure 11-1)is similar to Track Transpose above, except that it detunes the track by the specified number of cents (0-99). This setting can be used in addition to the Track Transpose setting, or by itself.

MONITORING AN AUDIO TRACK INPUT

Performer Lite lets you listen to the live input signal being fed to a track via its chosen hardware input by "patching thru" the input signal to the track's output destination. See "Audio input monitoring" on page 280.

CHANGING AUDIO TRACK SETTINGS ON THE FLY

When operating Performer Lite under MAS, you can change audio track input, output and send assignments while playing. However, as noted above, enabling or disabling a track entirely to free up its system resources is best done when Performer Lite is stopped.

MAKING I/O ASSIGNMENTS FOR MULTIPLE TRACKS

The *Track Assignments* command (Studio menu) provides a convenient way to reassign audio (and MIDI) inputs and outputs. Just select the tracks you wish to assign and then choose this command.

☛ Tip: To quickly change the I/O assignments for all tracks, use keyboard shortcuts: Command/Ctrl-A to Select All, then Option/Alt-A to open the Track Assignments dialog.

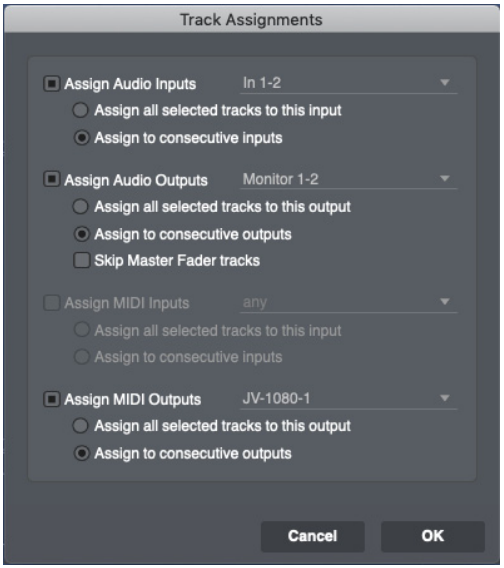


Figure 11-3: The Track Assignments feature.

Assigning inputs and outputs

You can choose to include or exclude inputs and/or outputs with the check boxes provided. You can either assign them to the same input/output pair

or assign them to consecutive input/output pairs (1-2, then 3-4, etc., for example), starting with the pair that you choose in the menu.

Skipping master faders

Typically, you'll quickly select all tracks when using the track assignments feature. But master faders usually have their own special output assignment and should therefore be excluded from the audio assignment operation. For your convenience, the *Skip Master Fader tracks* option, when checked, causes master faders to be left alone. If, for some reason, you would like them to be included, you can unchecked this option.

TRACK LIMITS

As a "light" version of Digital Performer, Performer Lite restricts the number of tracks that can be created. For a summary, see "Performer Lite track limits" on page 51.

MANAGING YOUR COMPUTER'S SYSTEM RESOURCES

The number of tracks you can play or record at the same time depends on the computing resources provided by your computer. See "Configuring the hardware driver" on page 21 to optimize your system for the maximum number of audio tracks.

Track bouncing with the Bounce command

One way to hear more tracks at once is to mix many tracks down to one track. You can do this freely in Performer Lite because in the realm of digital audio, there is no noise accumulation as a result of digital mixing. Another great advantage to digital mixing is that the original tracks remain intact, so you can always go back to them if you want (or you can delete them to free up space on your hard disk). You can even create multiple versions of a mix and quickly A/B the mixes. For more information about using the Bounce command, see chapter 65, "Bounce To Disk" (page 564).

CHAPTER 12 MIDI Tracks

OVERVIEW

This chapter covers topics that are specific to the setup of MIDI tracks for playback and recording. For audio track setup, see chapter 11, "Audio Tracks" (page 67).

Overview 73
Integrated MIDI and hard disk audio 73
MIDI only 73
What is a MIDI track? 73
Creating a MIDI track 73
Creating several MIDI tracks at once 73
MIDI track settings 74
Record-enabling a MIDI track 75
Choosing an input source 75
Choosing a MIDI output destination 75
Making I/O assignments for multiple MIDI tracks 76
Choosing a default patch (sound) 76
The patch list 76
Track Quantize 76
Track Transpose 76
MIDI Keys 77
Multi-channel MIDI tracks 78
MIDI Polyphonic Expression (MPE) 78

INTEGRATED MIDI AND HARD DISK AUDIO

Performer Lite is designed to facilitate seamless MIDI sequencing and digital audio recording. If you would like to work with both MIDI and audio tracks, choose *Setup menu > Audio System > MOTU Audio System*. Performer Lite's MIDI sequencing features are available regardless of whether you use audio or not.

MIDI ONLY

If you would like to run Performer Lite as a MIDI sequencer only (no digital audio), choose *Setup menu> Audio System>MIDI Only.* Doing so streamlines Performer Lite for MIDI sequencing, although many "off-line" audio features are still available (i.e. features that don't involve the real-time recording or playing of audio data). For example, you can create new audio tracks and edit existing audio data.

WHAT IS A MIDI TRACK?

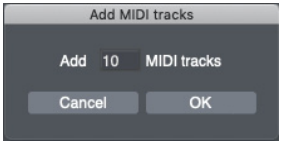
A MIDI track is where MIDI data is recorded, edited and played back. In Performer Lite, MIDI data is stored in a MIDI track without channel information. Instead, each track can be assigned to play back to one or more MIDI channels. During playback, the MIDI data in the track is transmitted to the assigned channels. Any MIDI instrument that is listening to (receiving on) that same channel will respond to the MIDI data from the track.

CREATING A MIDI TRACK

To create a MIDI track choose *Add Track>MIDI Track* from the Project menu. New tracks are added to the Sequence Editor and all other windows that display tracks. In addition, a fader strip is added to the Mixing Board. You can create as many MIDI tracks as you like.

CREATING SEVERAL MIDI TRACKS AT ONCE

If you want to add several MIDI tracks at once, hold down the Option/Alt key and choose the *Add Track>Multiple MIDI tracks* from the Project menu.



MIDI TRACK SETTINGS

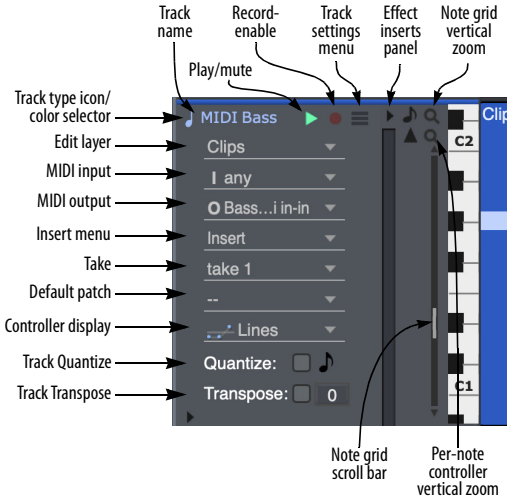


Figure 12-1: MIDI track settings. The display of these controls changes depending on the vertical size of the track.

MIDI track settings menu

The track settings menu provides all of the track's settings in menu form.

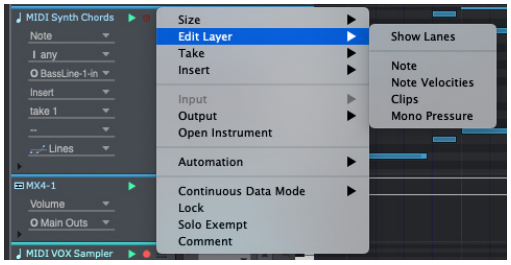


Figure 12-2: All of a MIDI track's settings are available in its track settings menu, including MIDI device output assignment and continuous data display mode.

Each MIDI track has the following universal track settings:

- Name
- Track type icon
- Play/mute
- Solo exemption
- Output assignment
- Take
- Edit Layer
- Insert menu
- Automation settings
- Level meter
- Lock
- Color
- Comment

For further details on these universal settings, see "Track settings" on page 59. Each MIDI track also has the following MIDI-specific settings:

- Record-enable
- MIDI input source
- MIDI output destination(s)
- Patch
- Default patch
- Track Quantize
- Track Transpose
- Input/output protocol

This chapter covers these MIDI track settings.

For the following settings (shown in Figure 12-1), refer to the section indicated.

Setting	For further information
Edit Layer	"The Edit Layer" on page 62
Note grid vertical zoom	"Zooming the Pitch Ruler" on page 317
Per-note controller vertical zoom	"Per-note controller vertical zooming" on page 328
Controller display	"Three controller display modes" on page 321
Effect Inserts panel	"Effect inserts panel" on page 63
Track settings menu	"Track settings menu" on page 59

For additional information about working with MIDI tracks, see:

- chapter 36, "MIDI Editing" (page 313)
- chapter 19, "Notation Editor" (page 132)

Note grid vertical zoom

The note grid vertical zoom menu (Figure 12-1) lets you grow or shrink the number of octaves visible in the track's note grid.

Note grid scroll bar

The note grid scroll bar (Figure 12-1) lets you scroll the note grid up and down. See "The Pitch Ruler" on page 317 and also see "Viewing notes that are out of view" on page 316.

RECORD-ENABLING A MIDI TRACK

The record-enable button arms the track for recording (red). Record-enable buttons are only present if the sequence is selected for playback in the Set List. Multiple audio tracks may be record-enabled at one time, although there is a preference that can restrict them to being record-enabled only one at a time, if you wish.

CHOOSING AN INPUT SOURCE

A record-enabled MIDI track will record data from any MIDI channel. Each MIDI track can record from an individual MIDI device on a particular MIDI channel. This lets you record into several independent tracks from several independent sources during a single record pass. Each MIDI track displays its own incoming MIDI device and channel number next to its record-enable button. See "Recording several audio tracks in one pass" on page 284 for details.

Click on the current input source to change it. If the input assignment for a MIDI track is blank, click in the blank space to open a menu of MIDI devices. You can select only one device and channel for each MIDI track.

MIDI channel data is stored with each event

Each recorded MIDI event stores the channel it was recorded from, along with all of the other parameters for the event (velocity, duration, CC value, etc.)

CHOOSING A MIDI OUTPUT DESTINATION

Each MIDI track has an output destination. This is where the MIDI data in the track will be sent. For example, it could be a MIDI synthesizer or sampler in your studio, connected to the computer via a MIDI interface, or it could be a virtual (software) instrument running as a plug-in with Performer Lite, or perhaps concurrently on the computer with Performer Lite.

To select a MIDI output destination, choose it from the *Output* menu for the track (Figure 12-1 on page 74). Each MIDI output device in the menu provides a MIDI channel sub-menu. Choose the desired destination channel from the sub-menu, or choose *Any* to send MIDI data to the channel it was originally recorded from.

For your convenience, this same MIDI output assignment menu also appears below each track name in the Mixing Board as shown in Figure 20-2 on page 180.

The output destination MIDI device list

The devices in the output assignment list are provided by your MIDI device configuration. If a device you want is not present in the list, choose *Bundles* (Setup menu) and click the MIDI Devices tab to create a device in your setup. For further information, see "The MIDI Devices tab" on page 264.

Changing the MIDI device list

Performer Lite relies on your MIDI configuration for an up-to-date list of the MIDI devices connected to your computer. If a device is connected to the MIDI OUT of your MIDI interface, and the connection is accurately

reflected in your MIDI configuration, then the device shows up in the output assignment list with the same name it has been given in MIDI Devices tab in the Bundles window (Setup menu). You can make any necessary changes to your MIDI device list there.

MIDI ports which do not have a device connected to them will be listed in the "Unconfigured Ports" sub-menu, as shown in Figure 12-3.

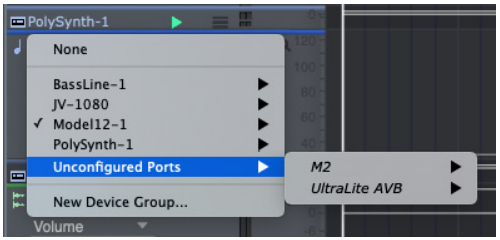


Figure 12-3: MIDI output selection

MAKING I/O ASSIGNMENTS FOR MULTIPLE MIDI TRACKS

The *Track Assignments* command (Studio menu) provides a convenient way to reassign MIDI inputs and outputs. Just select the tracks you wish to assign and then choose this command. For details, see "Making I/O assignments for multiple tracks" on page 71.

CHOOSING A DEFAULT PATCH (SOUND)

The *default patch* is the sound that the track always begins with. It is remembered when you save the Performer Lite project so that the next time you open the project and press play, the default patch is called up from the synthesizer before playback begins so that the track will play with the correct sound. To select a default patch for a track, choose it from the default patch column or menu.

THE PATCH LIST

The list of patches (sounds) you see in the *Default Patch* menu displays the 'factory' sound names for many popular MIDI instruments. In some cases, patches are given the generic name "Patch-1", "Patch-2", etc.

Click in the Default Patch menu (Sequence Editor) to choose a sound for the track. For many popular MIDI devices, Performer Lite provides a list of the factory-default sounds in the instrument.

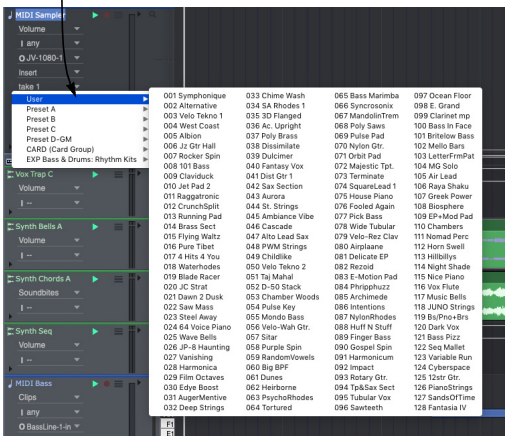


Figure 12-4: Choosing a MIDI instrument sound from the patch menu. If you see generic names like "Patch 1, Patch 2", etc., you can go ahead and use them anyway, as long as you know what sounds correspond with each patch change number.

TRACK QUANTIZE

The *Track Quantize* setting (Figure 12-1 on page 74) allows you to apply real-time Quantizing (on playback) to the MIDI notes in the track. Click the check box to enable or disable quantizing. Choose the desired grid from the menu.

TRACK TRANSPOSE

The *Track Transpose* setting (Figure 12-1 on page 74) allows you to apply real-time transposition (on playback) to the MIDI notes in the track. Click the check box to enable or disable transposition. Enter the desired number of half steps in the text box.

MIDI KEYS

The *MIDI Keys* window (Studio menu) turns your computer keyboard into a basic MIDI controller (Figure 12-5). Keys in the "q-w-e-r-t-y" and "a-s-d-f" rows trigger an associated MIDI note event. Other surrounding keys serve as modifier keys for changing octave, changing on-velocity, applying pitch bend and applying modulation wheel. As a "virtual" controller, MIDI Keys may not be suitable for performing a Chopin Nocturne, but they do serve as a quick and convenient way to enter MIDI data when a "real" MIDI controller is not available.

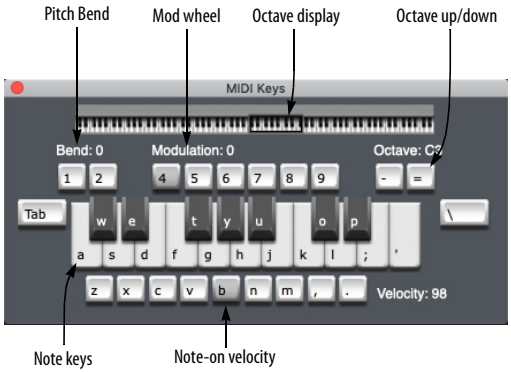


Figure 12-5: MIDI Keys

Playing notes

Press the keys in the top row (W through P) and middle row (A through ')of the computer keyboard (Figure 12-5) to trigger the notes in the current octave, where the letter A is the pitch C and the letter J is the B just below the next octave.

Octave up/down

Press the minus (-) and equal (=) keys to go down or up one octave, respectively.

Octave display

Displays the current octave being played by the MIDI Keys, as controlled by the octave up/down keys. Or click anywhere on the octave display keyboard to jump directly to the desired octave.

Note-on velocity

Press the Z through period (.) keys to adjust the note-on velocity between 0 and 127 as follows:

Key	Note-on velocity
z	10
x	32
c	54
v	76
b	98
n	120
m	127
, (comma)	decrease by 1
. (period)	increase by 1

Pitch Bend

Press the 1 and 2 keys to apply pitch bend down or up, respectively.

Mod wheel

Press the 4 through 9 keys to apply modulation wheel as follows:

Key	Mod wheel value
4	0
5	25
6	51
7	76
8	102
9	127

MIDI sustain

The tab and back slash (\ ) keys provide MIDI sustain (CC# 64).

Recording into a MIDI track with MIDI Keys

To record into a MIDI track with MIDI Keys, simply record-enable the MIDI track, start recording and play MIDI Keys.

Playing a virtual instrument with MIDI Keys

To play a virtual instrument with MIDI Keys, set up a virtual instrument track for it as described in "Creating an instrument track" on page 82, record-enable the track and then play MIDI Keys.

MULTI-CHANNEL MIDI TRACKS

As explained in "MIDI channel data is stored with each event" on page 75, MIDI events have a MIDI channel setting. Therefore, it is possible for a MIDI track to contain events with different channel settings. This could result from editing operations (such as pasting and merging) or by Multi Recording from several channels at once.

If you want all events in the track to play back on the same MIDI channel, set the track's MIDI output to the desired channel (1-16).

If you want each event to play back on its stored channel, set the track's MIDI output to *Any*, as explained in "Choosing a MIDI output destination" on page 75.

If, for some reason, you need to convert events to the same MIDI channel, use the *Change MIDI Channel* command (Region menu).

Split by Channel and Merge by Channel

There are two additional commands, available in the Commands window (shift-space bar), for managing MIDI data by its channel number setting. These commands can be used for compatibility with older versions of Performer and Digital Performer, and for other purposes.

The *Split by Channel* command splits a single track with multi-channel data into multiple tracks by channel. In addition, the MIDI output assignment for each track matches the channel setting for the data in the track.

The *Merge by Channel* command does the opposite: it combines data from two or more selected MIDI tracks into a single track with mixed channel data. If you perform this operation on MIDI tracks assigned to an instrument track, and the instrument track is included in the selection, the MIDI tracks will be consolidated into the Instrument track.

MIDI POLYPHONIC EXPRESSION (MPE)

MIDI Polyphonic Expression (MPE) is a newly adopted industry standard protocol for supporting MPE-enabled MIDI controllers such as the Roli™ Seaboard™. MPE controllers have the ability to generate per-note controllers that affect performance parameters such as pitch bend, vibrato, timbre and volume.

Normally, continuous controller (CC) data in a track affects *all notes* in the track. What makes MPE different is that each note has its own stream of controllers that affect *only that note*. In addition, each note can have up to three CC parameters (controller streams) that affect it.

Needless to say, it would not be practical to separate each MIDI note of a performance into its own track, with its own CC data streams. But if all the notes are combined in the same track, their CC data streams would conflict with each other. Fortunately, Performer provides several related features to streamline MPE editing, allow you to easily record, edit and manage MIDI data generated by an MPE controller.

Per-note parameters

The basic MPE specification prescribes the following three per-note parameters:

- Mono pressure
- Pitch bend
- Other (CC74)

Roli also refers to *Strike* and *Lift,* but those simply refer to Note-on and Note-off velocity, not CC's.

Preparing for MPE

To get started with MPE workflows, you need:

- An MPE controller (such as a Roli™ keyboard)
- An MPE-compatible synth or virtual instrument

The controller *generates* MPE data and the synth *receives* the MPE data and maps it to parameters for each patch (sound).

The following synth instruments that are included with Performer are MPE compatible:

- Bassline
- Modulo
- MX4
- Nanosampler
- Polysynth
- Proton

MPE is gradually being adopted by 3rd-party virtual instrument developers. Check with the developers for the latest news regarding MPE compatibility in their products.

MPE setup for a MIDI track

To set up a MIDI track for MPE:

1 In the Sequence Editor, go to the Track Settings menu for the MIDI track (Figure 10-2 on page 59) and choose *Open Protocol Settings* (Figure 12-6).

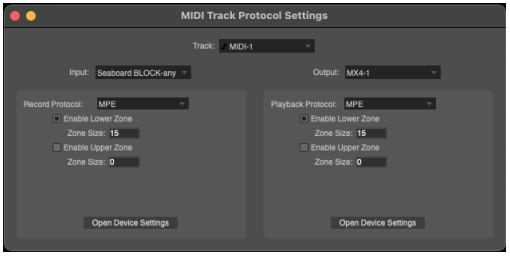


Figure 12-6: MIDI Track Protocol Settings.

2 From the *Input* menu, choose the MPE device you will be recording from.

3 Set the *Record Protocol* to *MPE*.

4 Set the zones as explained below in "MPE Zones".

5 From the *Output* menu, choose the MPE synth that the MIDI track is assigned to and set the *Playback Protocol* to *MPE*.

6 Set the zones as explained below in "MPE Zones".

7 If you are recording with Multi Record, choose your MPE controller as the track's input device.

MIDI Track Protocol Settings

The *MIDI Track Protocol Settings* (Figure 12-6) let you specify the MIDI protocol for recording and playback for each device in the list. Currently, two protocols are supported: *MIDI 1* (the MIDI 1.0 spec) and *MPE*. Eventually, other protocols may be supported in the future (such as MIDI 2.0).

MIDI 1 settings

Use the *MIDI 1* protocol for any device that is not MPE-enabled. When enabled, the *Record Poly Touch into Notes* option (Figure 12-6) causes polyphonic aftertouch CC streams to be recorded as note-specific data within the note, similar to MPE CC data.

MPE settings

For each MPE controller in the list, choose MPE for the *Record Protocol* (Figure 12-7). For any MPE-enabled virtual instruments or hardware synths that respond to MPE, choose MPE for the *Playback Protocol*. If you have a hardware synth connected to a MIDI interface via MIDI cables, double-click the MIDI interface column in the Bundles window (such as the *M4* shown in Figure 12-7) and make the settings in the interface's MIDI Protocol Settings window.

MPE Zones

MPE controllers are capable of sending out two separate streams of MPE data via lower and upper *zones*. Consult your MPE controller documentation regarding zones. The Zone settings you enter here should match your controller's zone settings.

Each zone functions similarly to an individual MIDI channel but for MPE. The zone size essentially represents the polyphony of the zone, i.e. the number individual notes that can be played with their own per note expression. The lower zone uses channel 1 plus a number of channels above it equal to the zone size, and the upper zone uses channel 16 plus a number of channels below that equal to its zone size. If you are not sure about these settings, try setting the lower zone size set to the maximum of 15 channels (and leave the upper zone disabled).

MIDI protocol settings in the Bundles window

You can also access MIDI protocol settings for each MIDI device in the Bundles window (Studio menu). To do so, double-click the column for the device, as shown below in Figure 12-7. These are the same settings as shown in the *MIDI Protocol Settings* window (Figure 12-6).

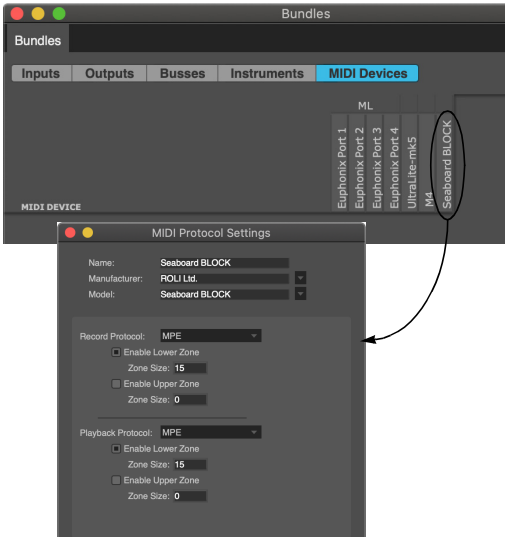


Figure 12-7: Accessing MIDI protocol settings in the Bundles window.

Accessing MIDI protocol settings in the plug-in window

MIDI protocol settings for virtual instruments also appear in the top section of the instrument's plug-in window, as shown below. These are the same settings as shown in the Output section of the *MIDI Protocol Settings* window (Figure 12-6).

Figure 12-8: MIDI Protocol settings in the plug-in window.

Automated MPE configuration

Some MPE controllers have the ability to transmit a configuration message to Performer, so that their settings in Performer are automatically configured by the device when it first establishes communication with Performer. Just make sure that the *Listen to MPE Configuration Message* is enabled in the MIDI Options preferences.

☛ Some MPE controllers on the market do not support auto configuration. In this case, manually adjust their settings in Performer (Figure 12-7) to match the settings in the controller itself.

MPE recording and playback

Once you've made the preparations described above, you can now record from your MPE controller into the MIDI track, patch through to your MPE-enabled synth or virtual instrument and play back the results.

Any pitch bend, mono pressure, and CC74 messages played on the note's channel are recorded as "per note events" and become part of the note event itself, instead of becoming separate events in the track.

MIDI notes recorded into an MPE track are assigned the base channel from the controller's MPE configuration of the device. However, during playback to an MPE destination, the note's channel is ignored. Instead, its playback channel is determined by the destination device's MPE settings. This means that you can easily change the MPE playback destination for a track (such as a different instrument plug-in) without having to think about MIDI channel assignments.

Editing per-note MPE CC data

You can edit per-note MPE CC data in a similar fashion to regular CC data, as described later in this guide in the various edit windows. However, there are a few unique aspects to per-note event editing covered in the sections below.

Editor / Window	For more information
Sequence Editor	"Per-note continuous controller data" on page 327
Sequence Editor	"Displaying MIDI CC data lanes" on page 321
Preferences	"MIDI Editing" on page 253
Tool palette	"Scale Per Note CC Data tool" on page 249

Managing MPE tracks

There are several commands (*Setup menu > Commands*) that help you manage MPE tracks.

Split Tracks with MPE
This command allows you to split tracks with notes containing Per Note Events into separate tracks assigned to channels based on their MPE assigned channels.

Merge Tracks with MPE
This command does the inverse of the Split command (above): any selected tracks are merged into one track with Pitch Bend, Mono Pressure and Controller data converted to Per Note Events based on the channel that the track is assigned to.

Pack MPE Events into Notes
This command takes multi-channel data within a single track and converts it to notes with Per Note Events.

Pack Events into Notes
This command converts selected CC data into Per Note Events and packs them into any note that occurs at the same location on the time line. The CC data must be MPE-compatible (i.e. mono pressure, pitch bend or CC74).

Unpack Per Note Events
This command converts Per Note Events in selected MPE notes to regular events in the track at the time they would occur based on the note's position, and assigns them to the MPE channel of the note.

CHAPTER 13 Instrument Tracks

OVERVIEW

Virtual instruments (also called *VI's*, *software synthesizers*, or *soft synths*) are MIDI instruments which are software-based rather than hardware-based. These can be loaded (instantiated) as a plug-in on *instrument tracks* in Performer. MIDI data in the instrument track triggers sounds from the virtual instrument instantiated on the track. The track's resulting audio output can be routed anywhere in the Digital Performer mixing environment.

Performer Lite provides a variety of included virtual instrument plug-ins; for details on these instruments, see chapter 2, "Instrument Plug-ins" (page 53) in the *Performer Plug-ins Guide*. It also supports third-party virtual instrument plug-ins in its native MAS plug-in format (Mac and Windows), the VST format (Mac and Windows), and macOS's Audio Unit (AU) format. For further details about VSTs and AUs, see "Working with VST and Audio Unit plug-ins" on page 524.

Overview **82**
Creating an instrument track **82**
Instrument track settings **83**
Working with instrument tracks **84**
Instrument tracks in the Mixing Board **86**
Instrument track inserts **87**
Open Instrument shortcut **87**
Instrument track automation **87**
Instruments as audio plug-ins **87**
Instrument plug-ins in V-Racks **87**
Multiple audio outputs **88**
Performer Lite's included instruments **88**
Track limits **88**

CREATING AN INSTRUMENT TRACK

To create an instrument track, choose *Project menu> Add Track*.

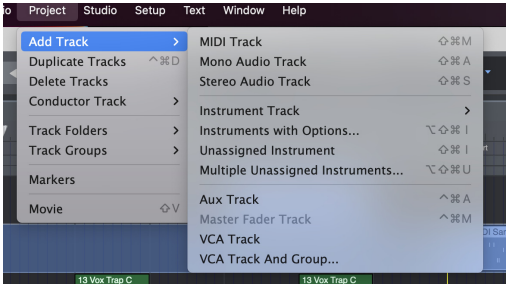


Figure 13-1: Creating an instrument track.

From the sub-menu, you have several choices:

- Choose a specific instrument from the *Instrument Track* sub-menu. This creates an instrument track for it with the instrument already instantiated.
- Choose *Add Instruments with Options*. This opens a dialog that lets you add one or more instrument tracks and one or more separate MIDI tracks for each instrument at the same time.

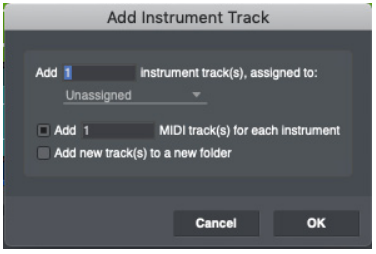


Figure 13-2: The Add Instruments dialog.

If you create multiple MIDI tracks and the instrument you choose has multiple MIDI destinations, Performer Lite will map each MIDI track to a separate channel.

An option is also provided to place the new instrument and MIDI tracks together in a new Track Folder, if desired. Each instrument is placed in its own folder, with its MIDI tracks.

- Choose *Add Unassigned Instrument*. Doing so creates the new instrument track with no instrument yet assigned. You can then choose an instrument from the track's instrument insert, as shown below in Figure 13-3.

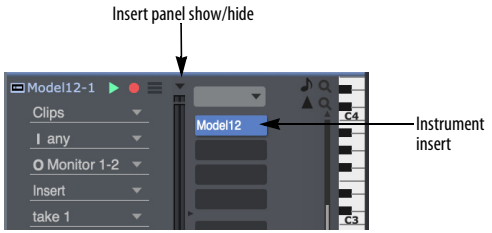


Figure 13-3: Assigning a MIDI track to an instrument plug-in.

- If you hold down the option/alt key while choosing a specific instrument from the *Add Tracks* sub-menu or while choosing *Add Unassigned Instrument*, they change to *Add Multiple...*, which allows you to add multiple tracks in one operation.

VST, AU, and MAS instruments

All instruments in all supported formats (VST, AU and MAS) appear in Performer Lite's instrument plug-in menus. You can manage which formats you wish to use, using the audio plug-in preferences. See "Plug-ins with multiple versions (formats)" on page 527.

Organizing instrument menus

Instruments are organized into several convenient sub-menus, which you can further customize using the plug-in browser. See "Choosing a plug-in for an insert" on page 179.

Unavailable instruments in the sub-menu

If an instrument is unavailable (grayed out) in the Instrument Track sub-menu, it means that there is no current audio bundle in the project that supports the instrument's audio output format (mono, stereo, etc.) Create a bundle that matches its format, and it will become active in the menu.

INSTRUMENT TRACK SETTINGS

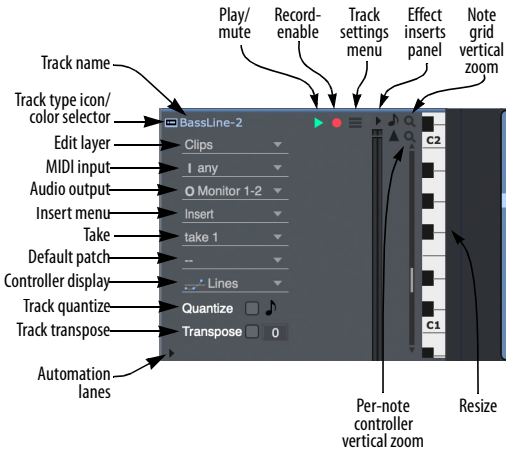


Figure 13-4: The instrument track settings above are available in Sequence Editor track settings panel.

Each instrument track has the following universal track settings:

- Name
- Track type icon
- Play/mute
- Solo exemption
- Output assignment
- Take
- Edit Layer
- Insert menu
- Automation settings
- Level meter
- Lock
- Color
- Comment

For further details on these universal settings, see "Track settings" on page 59.

Each instrument track has the following MIDI track settings:

- Record-enable
- MIDI input source
- Patch
- Default patch
- Track Quantize
- Track Transpose
- Input/output protocol

For further details, see "MIDI track settings" on page 74.

The following settings (shown in Figure 13-4) are specific to the Sequence Editor.

Setting	For further information
Edit Layer	"The Edit Layer" on page 62
Note grid vertical zoom	"Waveform/note grid vertical zoom" on page 62
Per-note controller vertical zoom	"Per-note controller vertical zooming" on page 328
Controller display	"Three controller display modes" on page 321
Effect Inserts panel	"Effect inserts panel" on page 63
Track settings menu	"MIDI track settings menu" on page 74

Each instrument track also has the following setting, discussed in chapter 11, "Audio Tracks":

- Enable/disable (page 70)

WORKING WITH INSTRUMENT TRACKS

Virtual instrument plug-ins are controlled by MIDI data (notes, continuous controller data, etc.), so their *input* is MIDI data, but their *output* consists of an audio signal (the sounds they produce when triggered by the MIDI data).

Therefore, instrument tracks function like a MIDI track for recording, inserting and editing notes, but for output they function like an audio track. Overall, think of an instrument track as a MIDI track that has audio output settings, instead of MIDI output. In addition, an instrument track's insert section (Figure 10-1 on page 59) holds the instrument plug-in itself (the topmost insert), plus additional audio and MIDI plug-ins, if desired.

Refer to the table below for further information about instrument track recording and playback.

Task or feature	For further information
Recording	"Record-enabling a MIDI track" on page 75
	"Choosing an input source" on page 75
	"Preparing a MIDI track for recording" on page 276
Playback	"Record-enabling an audio track" on page 69
	"Choosing an audio input and output" on page 69

For more information about working with MIDI tracks, see:

- chapter 12, "MIDI Tracks" (page 73)
- chapter 36, "MIDI Editing" (page 313)
- chapter 19, "Notation Editor" (page 132)

Assigning MIDI tracks to an instrument track

MIDI data feeding a virtual instrument doesn't necessarily need to come from the instrument track itself. If you wish, you can send output from another MIDI track to the instrument. Here are a few examples of why you might want to do this:

- Earlier versions of Performer Lite required separate MIDI tracks for instrument tracks, and you may prefer to continue working this way.
- You may wish to organize various MIDI elements into separate tracks for musical reasons.

■ You are working with a multi-timbral virtual instrument that receives MIDI data on two or more MIDI channels to trigger a different instrument sound on each channel, and you would like to split each part (channel) into its own track. This is discussed further below in "Working with instrument tracks and multiple MIDI channels".

To assign a MIDI track to a virtual instrument:

1 Create an instrument track with the desired instrument plug-in instantiated on it.

When you first instantiate an instrument plug-in, it publishes its MIDI ports, which appear in the output menu of all MIDI tracks, as shown in Figure 13-5.

2 Create a new MIDI track.

3 Assign the MIDI track's output to one of the instrument plug-in's MIDI channels, as demonstrated below in Figure 13-5.

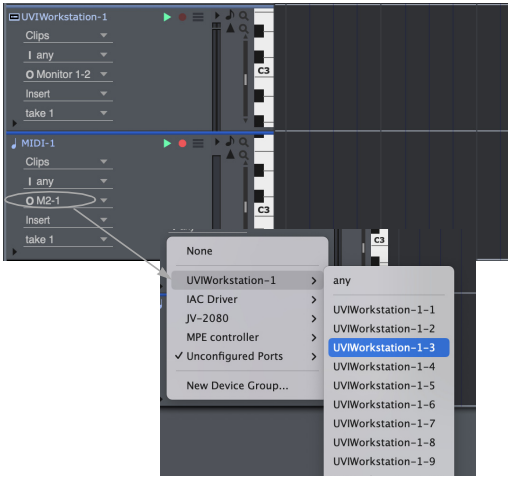


Figure 13-5: Assigning a MIDI track to an instrument plug-in.

Working with instrument tracks and multiple MIDI channels

If a virtual instrument is multi timbral, it can provide multiple parts, each with a unique preset (sound or instrument) and MIDI channel. In this scenario, there are multiple streams of MIDI data, each with a separate MIDI channel, for each part. There are several ways to approach this:

■ Keep all MIDI channel streams together in the instrument track. See "Multi-channel MIDI tracks" on page 78.

■ Split each MIDI channel stream into a separate MIDI track and assign each track to the corresponding MIDI channel on the instrument plug-in (see the previous section, "Assigning MIDI tracks to an instrument track").

■ A combination of both approaches above.

Merging MIDI tracks into an instrument track

If, at some point, you need to combine one or more separate MIDI tracks into an instrument track, use the *Merge by Channel* command (in the Commands window in the Setup menu) as follows:

1 Assign the MIDI tracks to the virtual instrument instantiated on the instrument track (if they aren't already).

If the virtual instrument is multi-timbral and supports multiple parts receiving on separate MIDI channels, assign each MIDI track to the appropriate channel (part).

2 If the instrument track is a "legacy" track (that can't hold MIDI data), convert it. See "Converting legacy instrument tracks" below).

3 Select the MIDI tracks and the instrument track.

4 Invoke the *Merge by Channel* command, either by pressing the keystroke you've assigned to it in the Commands window, or by using Run Command (shift-spacebar).

The MIDI tracks are now consolidated into the Instrument track. Channelized MIDI data inherits the output channel assignment of its source track, allowing you to easily combine multiple channel streams. (See "Multi-channel MIDI tracks" on page 78.) If you need to change the MIDI channel of any data in the merged track, use the *Change MIDI Channel* command (Region menu).

Splitting an instrument track into separate MIDI tracks by MIDI channel

If an instrument track has multiple MIDI channel data streams, and you wish to split them out into separate MIDI tracks, use the *Split by Channel* command (in the Commands window in the Setup menu):

1 Select the entire instrument track, or the portion you wish to split out.

2 Invoke the *Split by Channel* command, either by pressing the keystroke you've assigned to it in the Commands window, or by using Run Command (shift-spacebar).

The resulting separate MIDI tracks remain assigned to the instrument track.

Converting legacy instrument tracks

In earlier versions of Performer Lite, instrument tracks could not hold MIDI data like they can now. When you open a legacy project, you are presented with the option of converting legacy instrument tracks into current instrument tracks (that can hold MIDI). If you choose not to do so, these legacy instrument tracks will not allow you to record, paste or otherwise place MIDI data in the track. The *Convert Legacy Instrument Track* command (in the Commands window in the Setup menu) allows you to select an instrument track and convert it at any time. To do so:

1 Select the legacy instrument track.

2 Invoke the *Convert Legacy Instrument* command, either by pressing the keystroke you've assigned to it in the Commands window, or by using Run Command (shift-spacebar).

3 You can now insert or record MIDI data directly into the instrument track itself.

4 If you wish, you can consolidate any other MIDI tracks (feeding the instrument track) into the instrument track itself. See "Merging MIDI tracks into an instrument track" on page 85.

5 If you have a multi-timbral VI instantiated on the instrument track, and you have two or more MIDI tracks sending to a different MIDI channel on the track's VI, you can either keep them separate, as is, or merge them together into the instrument track as described above in Step 4.

INSTRUMENT TRACKS IN THE MIXING BOARD

Instrument tracks appear in the Mixing Board, just like other audio tracks. See "Instrument tracks" on page 189.

Volume control of instrument tracks

The volume fader on instrument tracks in the Mixing Board (and channel strip) controls the audio volume of the virtual instrument. It does not control MIDI volume (CC#7), as it does for MIDI tracks. However, MIDI CC#7 can still be recorded or inserted in the track to control volume, if desired. The same applies to pan (CC#10). If you're using multiple MIDI streams assigned to the same instrument, think of the mixer volume fader as an overall output level for the track.

Individual MIDI volumes can still be created and edited to control the levels of individual MIDI channels assigned to the instrument.

Soloing instrument tracks

When you use the solo control for an instrument track, you are soloing the MIDI data in the track, not the audio output of the virtual instrument. This allows separate MIDI tracks feeding the instrument to be soloed without having to solo the instrument track itself.

INSTRUMENT TRACK INSERTS

Instrument tracks have three types of plug-in inserts: instrument, audio and MIDI, as shown below in Figure 13-6. For more information, see:

Insert type	For further information
Insert settings	"Insert Settings presets" on page 182
Instrument	"Instrument tracks" on page 189
Audio	"Inserts" on page 178
MIDI	"Inserts" on page 178

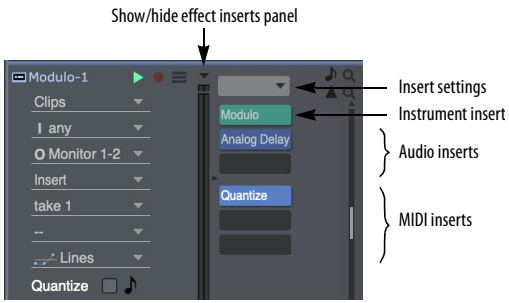


Figure 13-6: The insert panel for an instrument track in the Sequence Editor.

Insert setting presets for instrument tracks save the instrument insert, plus audio and MIDI inserts as well (the entire insert chain).

OPEN INSTRUMENT SHORTCUT

For instrument tracks and MIDI tracks assigned to virtual instruments, an *Open Instrument* shortcut is available to quickly open the instrument plug-in window. This shortcut is available in a number of ways:

- keyboard shortcut
- Sequence Editor track menu
- Mixing Board track menu
- Track Inspector/Info Bar button

If a MIDI track is not assigned to a virtual instrument, the *Open Instrument* command will be unavailable.

INSTRUMENT TRACK AUTOMATION

To control volume, panning, etc. for the instrument, you can use the controls on its channel strip in the Mixing Board. As with aux tracks and disk tracks, these parameters can be automated. Instrument plug-in parameter automation depends on the plug-in. If the plug-in supports automation, it is handled either via Performer Lite's control point automation features in the instrument audio track, or via MIDI continuous controller data. You can record, insert, edit and otherwise manage the MIDI controller data in the instrument track itself. For example, in MachFive, you can control the filter cutoff frequency by sending MIDI Controller #74.

INSTRUMENTS AS AUDIO PLUG-INS

In all other respects, instrument plug-ins work just like audio effects plug-ins. For more information, see chapter 57, "Effects Window" (page 516) and chapter 58, "Audio Effects Plug-ins" (page 521).

INSTRUMENT PLUG-INS IN V-RACKS

If you need to use an instrument plug-in with multiple sequences in a Performer Lite project, you can conserve computer processing power by instantiating the instrument in a V-Rack, which

can then be accessed from all sequences in the project. See chapter 26, "V-Racks" (page 239) for more information.

If you move an existing instrument track to a V-rack (see "Moving tracks from a sequence to a V-Rack" on page 241), its MIDI data stays in a MIDI track that remains behind in the original sequence and is assigned to the VI in the V-rack. However, automation data in the MIDI track is removed, since it will not play to the VI in its new location.

MULTIPLE AUDIO OUTPUTS

Some instrument plug-ins provide multiple audio outputs. You can access them in the *Instruments* tab in the Bundles window (Studio menu).

Creating instrument output bundles

To make the instrument plug-in's outputs appear across the top of the Bundles window, instantiate the instrument plug-in as usual. Then use the *Add* button at the bottom of the window to create as many bundles as needed in the usual fashion: choose the desired channel format, specify a name, and place the tiles on the desired channels.

Using instrument output bundles

Instrument output bundles operate just like a bus: they can be used to route audio from the instrument to any other destination within Performer Lite's mixing environment. For example, you could route the instrument's output to an aux track.

PERFORMER LITE'S INCLUDED INSTRUMENTS

Performer Lite includes a variety of instrument plug-ins, plus the *MOTU Instruments Lite* soundbank, which provides over 100 multi-sampled instruments. Refer to chapter 2, "Instrument Plug-ins" (page 53) in the *Performer Plug-ins Guide*.

TRACK LIMITS

As a "light" version of Digital Performer, Performer Lite restricts the number of tracks that can be created. For a summary, see "Performer Lite track limits" on page 51.

CHAPTER 14 Aux Tracks and Master Fader Tracks

OVERVIEW

Aux tracks and *Master Fader tracks* are special kinds of audio tracks for routing and grouping audio signals in the Performer Lite project.

Overview 89
Aux tracks 89
Master Fader tracks 90
Track limits 91

AUX TRACKS

An *Aux track* is a special kind of audio track that routes an input directly to an output. Think of it as an individual signal path within Performer Lite's virtual mixing environment. You cannot record audio into an Aux track, nor can you place pre-recorded audio into it. But you *can* insert and record mix automation data into an Aux track (as well as loops).

Aux tracks are primarily intended as a routing mechanism. Aux tracks allow you to route audio from any source to any destination. Here are just a few examples: you can route disk tracks to an Aux track via a bus; you can route an input on a external audio interface (such as a MOTU 2408mk3) directly to an output. You can route several audio tracks to a single effects plug-in that you have placed on an Aux track effects insert.

Figure 14-1: Aux tracks as they appear in the Sequence Editor. They do not have a record button, and you cannot record audio into them (or place soundbites in them). They are meant to serve purely as a 'virtual' routing mechanism.

You can add as many Aux tracks as you like, and, as mentioned earlier, you can use them in many situations to get audio from here to there in your system using the Aux track's input and output assignments. For details about bussing and aux tracks, see Part 9 "Mixing" (page 489).

Conserving CPU resources with aux tracks

If you would like to apply the same plug-in to two or more audio tracks, consider assigning the plug-in to a single Aux track insert instead. Then, apply it to multiple audio tracks by bussing them to the Aux track, using either their main output assignment, a send, or both (if you'd like a a bit of the original signal mixed in with the affected one). Having one plug-in with multiple inputs requires far less processing resources than applying the plug-in on multiple tracks.

Using aux tracks for live inputs such as synthesizers

You can use Aux tracks to feed live inputs (synths, etc.) into your mix. However, you may need to compensate for your system's monitoring latency. See "ing latency" on page 281.

Monitoring with Aux tracks present

Here's a problem you may encounter when monitoring inputs: you keep hearing an input, even though you don't have any tracks record-enabled. Or, you keep hearing an input, no matter which track you record-enable.

The most likely cause of these situations is the presence of an Aux track. If you have created an Aux track that patches an input directly to an output, you'll always hear the signal from the Aux track's assigned input — unless you un-play-

enable the Aux track altogether. So if you encounter monitoring problems, check your Aux tracks.

Aux track shortcut

You can create an aux track while assigning a track output or a send to a bus. The bus will then feed the track's signal to the newly created aux track.

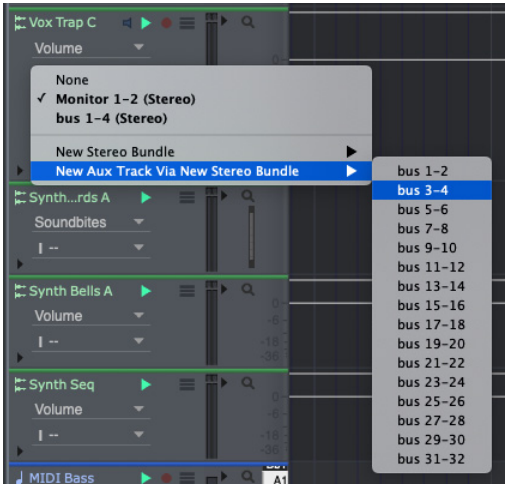


Figure 14-2: Shortcut for routing a track to an aux track via a bus.

Aux track settings

Each aux track has the following universal track settings:

- Name
- Track type icon
- Play/mute
- Solo exemption
- Output assignment
- Take
- Automation settings
- Lock
- Color
- Comment

For further details on these universal settings, see "Track settings" on page 59. Each aux track also has the following setting, discussed in chapter 11, "Audio Tracks":

- Input source (page 69)
- Enable/disable (page 70)

MASTER FADER TRACKS

A *master fader* track controls the overall level of a output or bus bundle.

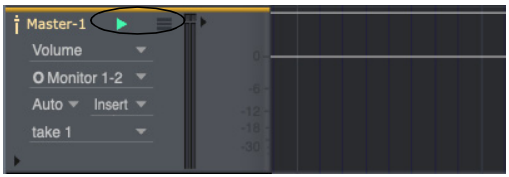


Figure 14-3: A master fader as it appears in the Sequence Editor. Master faders do not have a record button, and you cannot record audio into them (or place soundbites in them). They are meant to serve purely as a 'virtual' level control mechanism for outputs and busses. Notice that the track 'Master-1' has stereo outputs.

Like aux tracks, master fader tracks have no record button (or pan knob), and you cannot place audio in them. Instead, the master fader track provides an output assignment and volume control and automation over the output or bus you assign to it. The most common way to use a master fader is as a sub-mix fader for an output (or a bus) to which you have assigned a group of audio tracks. You can then control (automate, process, etc.) them as a group with the master fader. This is a great way to automate the level of a group of tracks without having to create a fader group.

Master Fader track settings

Each master fader track has the following universal track settings:

- Name
- Track type icon
- Play/mute
- Solo exemption

- Output assignment
- Take
- Automation settings
- Lock
- Color
- Comment

For further details on these universal settings, see "Track settings" on page 59. Each master fader track also has the following setting, discussed in chapter 11, "Audio Tracks":

- Enable/disable (page 70)

TRACK LIMITS

As a "light" version of Digital Performer, Performer Lite restricts the number of tracks that can be created. For a summary, see "Performer Lite track limits" on page 51.

CHAPTER 15 Track Folders and Track Groups

OVERVIEW

Track folders allow you to visually group, collapse, and manipulate multiple tracks in the Sequence Editor, Mixing Board and Notation Editor.

Track groups allow you to functionally link multiple tracks for editing and mixing purposes.

Overview **92**
Track Folders **92**
Track Groups **92**

TRACK FOLDERS

There is a *Track Folders* sub-menu in the Project menu. Choose *New Track Folder* to create one, and then drag tracks into it (see below). Or select two or more existing tracks first and choose *New Track Folder from Selected Tracks*. Track folders can be used in all windows that display multiple tracks (the Sequence Editor and Mixing Board). Track folders can be nested (folders within folders).

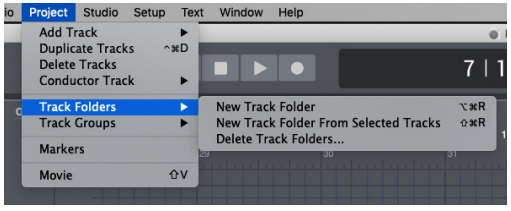


Figure 15-1: Track folders.

Working with track folders

To show or hide the contents of a folder, click its disclosure triangle. Command/Ctrl-click it to show/hide all sub-folders inside it. Option/Alt-click to show/hide all other folders at the same level. Command/Ctrl-Option/Alt-click to show/hide all folders at all levels.

To delete a folder, use the *Project menu* > *Track Folders* > *Delete Track Folders* command.

Folders also have track controls, such as Play-enable, Solo Exempt, and Lock, which toggle the corresponding settings on the tracks inside the folder.

TRACK GROUPS

Performer Lite allows you to create an unlimited number of track groups. Tracks can be linked for editing, mixing, editing and mixing, a customized set of operations that you specify, or VCA control. Tracks can be a member of more than one group. Groups can also be "nested" within each other.

☛ Track folders are independent of track groups.

Creating a track group in the Sequence Editor

To create a track group in the Sequence Editor, select two or more tracks (or make a multitrack selection) and choose *Project menu>Modify Track Groups>New Track Group*. Or press Command/Ctrl-Shift-G. (This shortcut can be customized in *Setup menu* > *Commands*).

Creating a track group in the Mixing Board

To create a track group in the Mixing Board:

1 Choose *New Track Group* from the Mixing Board mini-menu.

The cursor turns into a plus sign to indicate that you are now ready to add (or remove) faders and/or pan knobs from the group. Existing faders in the group display a flashing green box.

2 Click the faders (and/or knobs) you want to add.

A flashing green box appears around the fader to indicate that it has been added to the group.

3 To remove faders (and/or knobs) from the group (ones that already have a flashing box), click them.

4 When you are finished adding and removing items, press the return or enter key to confirm the group, or double-click the last item you want to add or remove.

To cancel, press Command/Ctrl-period, the escape key (esc), or click elsewhere in the window (such as the title bar).

Deleting a track group

To delete a track group, click one of its tracks to select it and choose *Project menu>Modify Track Groups>Ungroup Tracks*. Or delete it in the Track Groups window (explained below).

The Track Groups window

Track groups are displayed and modified in the Track Groups window (Project menu).

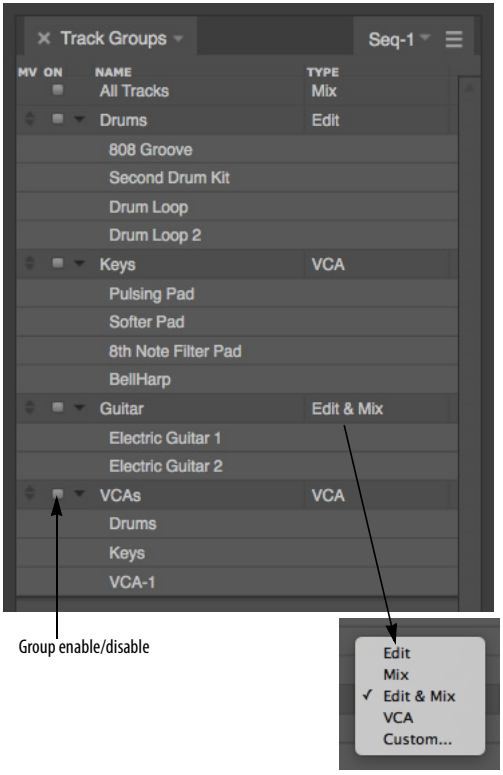


Figure 15-2: Track Groups window.

Use the Track Groups window as follows to manage track groups:

To do this:	Do this:
To rename a track group	Double-click or Option/Alt-click its name.
To delete a track group	Click it to highlight it and choose Delete Track Group from the mini-menu.
To view the tracks in a group	Click its disclosure triangle
To add a track to a group	Select the tracks (or make a selection in the tracks you wish to add), click the track group in the Track Groups window to highlight its name, and then choose *Add Selection to Group* from the mini-menu.
To add a grouped track to another group	Temporarily disable track grouping (see "Temporarily suspending track groups" on page 95) and then use the procedure above.
To remove a track from a group	Click it to highlight it and choose *Remove Tracks from Group* in the mini-menu.
To temporarily disable or enable a group	Click the box to the left of its name.
To change the group type	Choose it from the Type menu as shown in Figure 15-2.

Group types

Track grouping allows you to apply operations to the tracks in the group as a single unit. For example, for a mix group, moving the volume fader for one track in the group moves the faders in all tracks in the group. The Group Type menu (Figure 15-2) lets you determine which operations are affected by the group:

Mix group
A *Mix* group controls track volume, play-enable (mute/unmute), solo, solo exempt status, automation play-enable, automation record-enable and automation mode.

If tracks are grouped for mix volume, dragging any fader within the group moves all members of the group, scaling them proportionally to their current values. Option/Alt-dragging temporarily overrides the group to adjust a control relative to the group.

☛ You can override the grouping for volume and pan in the Mixing Board by holding down the Option/Alt key while dragging the fader or pan pot.

Edit group
An *Edit* group controls time range selections. If you make a time range selection in one track, all other tracks in the group are included. It also includes inserting, reshaping and dragging continuous data, as well as the following track display characteristics in the Sequence Editor: edit layer, continuous data mode, track size and vertical zoom size.

Mix & Edit group
A *Mix & Edit* group controls both the Mix and Edit group operations described above.

VCA group
Use the VCA group setting when you wish to control the volume of the tracks in the group with a VCA track, but you don't want (or need) any Edit, Mix or Custom group parameters for the group. With VCA volume control, the VCA track controls all of the individual track faders, but dragging an individual track fader only controls that fader, not the rest of the group, as it does for a Mix group. In addition, the VCA track controls the Solo, Mute, and Record Enable settings for the VCA group. Mix automation data, if any, is also affected. For more information about VCA tracks, including how to assign a VCA track to a group, see chapter 56, "VCA Tracks" (page 509).

Custom group
A *Custom* edit group lets you control a customized set of operations that you specify in the Custom group dialog (Figure 15-3). Check the items you wish to control in the group. If you choose Edit, Mix, Edit & Mix or VCA from the menu at the top

of the window, the check boxes in the window will update to show you what the default settings are for these preset groups.

☛ If the custom group is being controlled by a VCA track, the Volume Fader option will be grayed out to indicate that volume faders are solely under the control of the VCA track (not individual track faders within the group).

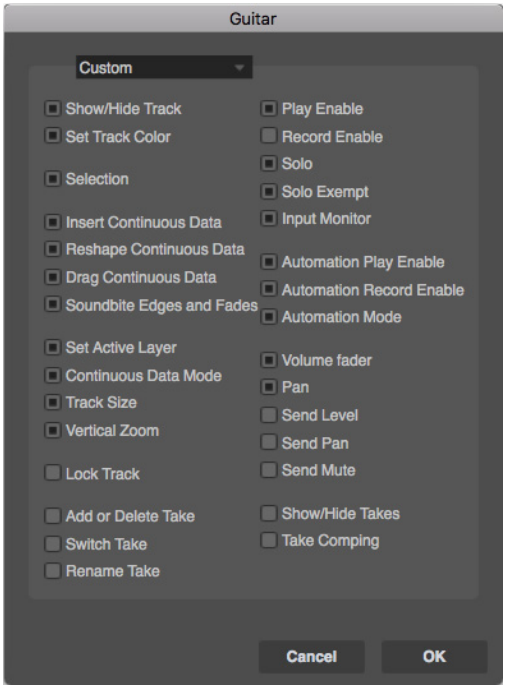


Figure 15-3: Customizing a track group.

Including a track in several different groups

Tracks can be a member of more than one group. If a track is already in a group, you can easily add it to another group as follows:

1 Select the tracks or make a selection in the tracks you wish to add. If they are already in a group that is an Edit group, you'll need to temporarily suspend track grouping so that you can select the tracks independently of the rest of their current group.

2 Click the track group in the Track Groups window to highlight its name.

3 Choose *Add Selection to Group* from the mini-menu.

Nesting groups within each other

Because tracks can be part of other groups, this allows you to create any grouped configuration you need, including nested groups. For example, you might group your kick, snare and hi-hat tracks into a group called *Drum Kit*, which is part of a larger group called *Percussion*, which is part of yet another larger group called *Rhythm Section*, which might include bass guitar, rhythm guitar, organ, etc. In addition, the group type can be different at each level. For example, the *Rhythm Section* group in our example might be for mixing only, whereas the *Percussion* and *Drum Kit* groups might be mixing and editing.

Temporary track groups

To temporarily group any currently selected tracks (that aren't already members of an active group), hold down the T key. Or double-tap the T key to make the temporary group "stick" until you tap or tap the T key again.

You can temporarily group all currently visible tracks in the Sequence Editor (or other multitrack editor) using the W key in the same fashion as described above.

Temporarily suspending track groups

To temporarily suspend a track group, press Command-Option-G (Mac) or Ctrl-Alt-G (Windows). Then type in the number of the group (in the order in which it appears in the Track Group window list). Or click the box next to its name in the Track Groups window. The track group name is displayed in italic text when it is temporarily suspended.

To temporarily suspend track groups globally, choose *Project menu>Modify Track Groups>Suspend Track Grouping*, or press Command-Option-Control-G (Mac) or Ctrl-Alt-G (Windows). To do so even more temporarily, hold down the G key. Doing so temporarily toggles the current suspension state.

Temporarily overriding the group on the fly

To temporarily override a group when moving a fader, Option/Alt-drag it. This allows you to adjust a track's level relative to the rest of the group.

Deleting tracks that belong to a track group

If you delete one or more tracks that are the sole remaining tracks in a track group, the track group is also discarded.

Track group keyboard shortcuts

Track grouping has its own set of fully customizable keyboard shortcuts in the Commands window (Setup menu):

Command	Default keyboard shortcut
New Track Group	Command/Ctrl-Shift-G
Ungroup Tracks	Command-Control-G Ctrl-Win-G
Temporarily Group Selection	T
Temporarily Group Visible Tracks	W
Track Group Enable…	Command-Option-G Ctrl-Alt-G
Suspend Track Grouping	Command-Option-Control-G Ctrl-Alt-Win-G
Temporarily Toggle Track Grouping	G
Add Selection to Group	none
Remove Tracks from Group	none
Delete Track Group	none
Set Temporary Group Type to Edit	none
Set Temporary Group Type to Mix	none
Set Temporary Group Type to Edit & Mix	none
Set Temporary Group Type to Custom Type	none

Part 4
Project Basics

CHAPTER 16 The Performer Lite Project

OVERVIEW

This chapter reviews basic procedures for handling Performer Lite projects. Most are standard File menu procedures; however, Performer Lite is in some ways unique in how it manages projects and their many associated files.

Overview 98
Components of a Performer Lite Project 98
Creating a new project 99
Creating a new project from a template 99
Opening an existing project 100
Open Recent sub-menu 100
Saving a project 100
Saving a project file under a different name 100
Save a Copy As 100
Using Save a Copy As for incremental backups 101
Autosave 101
Collecting a project for backup or transfer 101
Avoiding disaster 102
Exporting a project 102
Moving a project between Mac and Windows 102
Exporting to notation software through MusicXML 102
Reverting to a previously saved project 102
Adding project notes 102
Printing project windows 102
Closing a project 104
Quitting/Exiting Performer Lite 104
Helpful project and disk hints 104

COMPONENTS OF A PERFORMER LITE PROJECT

A typical Performer Lite project consists of the following components:

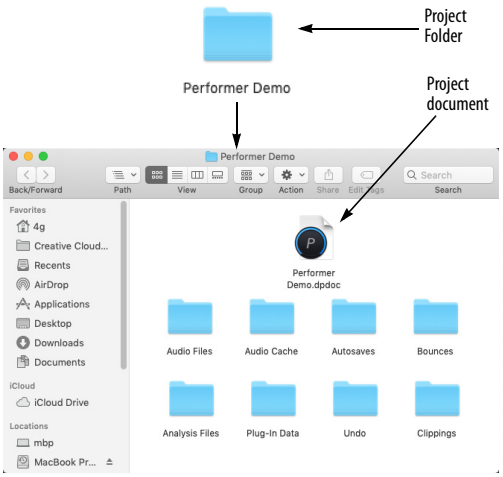


Figure 16-1: The components of an example Performer Lite project.

The Project Folder

When you first create a new project, Performer Lite makes a *project folder* in which it places your new Performer Lite *project file*. In addition, several additional folders, described below, are created to store files that Performer Lite may generate as you work on the project.

Audio Files folder

An audio file is a document on your computer's hard disk that contains digital audio data. (For further explanation, see chapter 69, "Hard Disk Recording Concepts" (page 598)). As you record, Performer Lite places newly generated audio files into the Audio Folder. Audio files are not *required* to be in this folder. A Performer Lite project can use audio files located on any available hard drive. Performer Lite keeps track of them, even if you

move them on the computer desktop. The Audio Files folder is primarily intended as a default location for new files that you record in the project.

Audio Cache folder

At times, Performer Lite may make temporary audio files for various tasks it is called upon to do. These files are stored temporarily in the Audio Cache folder.

Autosaves folder

Performer Lite has the ability to autosave your documents. When doing so, it stores autosaved files in this folder. See "Autosave" on page 101.

Bounces folder

The *Bounces* folder is the default location for audio files created by Performer Lite's Bounce to Disk feature. See "Bouncing to Disk" on page 564.

Analysis Files folder

A Performer Lite project folder may also include an *Analysis Files* folder; Performer Lite generates analysis files for each audio file being used in the project. Analysis files greatly reduce the amount of time it takes Performer Lite to apply time stretching and pitch-shifting to the audio files. Performer Lite handles analysis files automatically, so you never need to be concerned with them. For further details, see "Audio file analysis" on page 544.

Plug-in Data folder

This folder may be created automatically as needed by some of Performer Lite's included plug-ins. For more information, see chapter 1, "Audio Effects Plug-ins" (page 7) and chapter 2, "Instrument Plug-ins" (page 53) in the *DP Plug-in Guide*.

Undo folder

This folder is created automatically as needed when an operation gets rid of an audio file. For further details, see "Undo" on page 365.

CREATING A NEW PROJECT

To create a new project:

1 Launch Performer Lite (if it is not already running).

2 Choose *File menu> New*.

You'll now see a standard Save dialog.

3 Navigate to the hard drive and folder where you'd like to save the new project.

4 Click Save.

CREATING A NEW PROJECT FROM A TEMPLATE

Performer Lite provides many useful file templates to get you going quickly. These files have tracks already set up with virtual instruments ready to play and record, such as piano, bass, guitar, drums and more, depending on the template. They also include tracks already prepared for recording vocals, guitar and other instruments.

To create a new project based on one of these template files, close the currently open file, if any. You should then see the *Welcome to Performer Lite* window. If not, choose it from the Help menu. Choose the desired template from the menu at the top of the window and click the *New* button.

OPENING AN EXISTING PROJECT

Here are several ways to open a Performer Lite project:

Action	What happens
Double-click the project file icon.	Launches Performer Lite (if it's not already running) and opens the project.
Choose Open from Performer Lite's file menu.	A standard open dialog appears, from which you can select the project you wish to open. If an unsaved project is open at the time you do this, you'll be asked if you wish to save the changes before the newly chosen project is opened.
(Mac only) Drag and drop a project file onto the Performer Lite application icon.	Launches Performer Lite (if it's not already running) and opens the project.

Only one Performer Lite project can be open at a time.

OPEN RECENT SUB-MENU

For convenient access, the *Open Recent* sub-menu in the File menu displays the most recent Performer Lite projects you have opened, so you have quick access to them.

To clear the list of recent files, choose *Clear Menu*.

SAVING A PROJECT

When you choose *Save* from the File menu, Performer Lite writes the changes you have made into the original project file on the disk. If you do not save, the changes you have made are never written to the disk. For example, if you quit without saving changes, the work you have done is not saved on the disk and is permanently deleted from the computer's memory.

This is why you should save frequently. If Performer Lite or your computer should malfunction, all of the work you have accomplished since you last saved may be lost! (See "Avoiding disaster" on page 102.) However, if the project was recently saved, you can retrieve the latest version from the disk and proceed without having lost much work.

To save a project:

1 Choose *Save* from Performer Lite's File menu.

Your project is saved on disk in its current state, replacing the old version with the same name. If you want to keep the old version, use the *Save As* command on the File menu (see below) instead to save the current version under a different name.

2 Type in the name of your file.

You can't use a colon in the name; all other characters are permitted, including spaces. If you enter a name that is already in use, a dialog box will ask you to confirm your choice.

3 Click Save.

SAVING A PROJECT FILE UNDER A DIFFERENT NAME

To preserve the last-saved version of the project and save the current state of the project under a different name:

1 Choose *Save As* from Performer Lite's File menu.

The Save As dialog appears.

2 Choose the desired location for the new project file and type in the new name for the project, if desired.

3 Click Save.

Your project is saved on the disk in its current state under the new name. In addition, the project you currently see on your computer screen is the newly created project.

SAVE A COPY AS

The *Save a Copy As* command works exactly the same way as the *Save As* command described above, except for the very last sentence. When you've completed the *Save a Copy As* operation,

the project you see on your computer screen is *not* the newly created project; instead, it's the original project that you were saving from. In addition, it may still be in an unsaved state (if you haven't saved it since making any changes).

USING SAVE A COPY AS FOR INCREMENTAL BACKUPS

The *Save a Copy As* feature as described above is great for making incremental backups of your project file. To do so:

1 Every 15 minutes (or as often as you can bear), choose *Save A Copy As*.

2 Type in new name for the backup file.

For example, you might adopt a numbering convention, such as MyProject.1, MyProject.2, etc.

3 Click Save.

4 Continue working on your current project file, which is still on screen.

By choosing *Save a Copy As* every 15 minutes or so and incrementing the number, you have a separate copy of your project file that is never more than around 15 minutes old. This means that if the most current project file is damaged or corrupted somehow, you've never lost more than 15 minutes of work. You can also automate this process using Autosave (below).

AUTOSAVE

If the Autosave preference is enabled, Performer Lite will save automatically, according to your preferred settings. You can either save, or save a copy as for automatic incremental backups. See "Autosave" on page 252.

COLLECTING A PROJECT FOR BACKUP OR TRANSFER

The *Save As* commands described in the last two sections only save the project *file* under a different name. The rest of the files related to the project (audio files and analysis files) are not included in the *Save As* operation.

There may be times, however, when you need to use the *Save As* operation with the entire project, including all related audio files and analysis files.

There is an option in the *Save As* and *Save a Copy As* windows called *Duplicate audio data and copy shared samples to project*. When checked, this option makes Performer Lite create an entire duplicate set of all the audio files being used by the current project. Also included are all of the analysis files, if any. This command will "collect" all audio files that are being used, even if they are scattered across several hard drives.

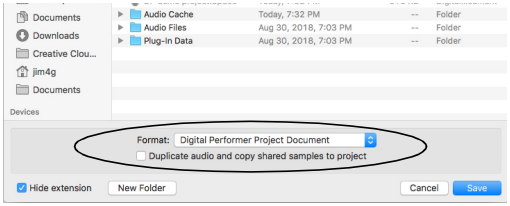


Figure 16-2: The 'Duplicate audio data and copy shared samples to project' option makes a copy of the entire project folder.

The *Duplicate audio data and copy shared samples to project* option is ideal for backing up Performer Lite projects, as well as transferring them to clients or collaborators, because it ensures that all associated audio files, analysis files, and shared samples are included.

AVOIDING DISASTER

Performer Lite project files often represent many hours of hard work. If something bad should happen to the file, and it's your only copy, you've lost all that hard work forever. So please follow these guidelines and make them habit:

- ☛ Save early and save often
- ☛ Make incremental backups with *Save As*
- ☛ Backup early and backup often

For details about incremental backups, see "Using Save a Copy As for incremental backups" on page 101.

EXPORTING A PROJECT

Performer Lite can export a project to a variety of industry standard interchange formats. Choose the desired Format menu in the Save As dialog, as shown in Figure 16-2 on page 101.

MOVING A PROJECT BETWEEN MAC AND WINDOWS

Performer Lite runs on macOS and Windows. You can move Performer Lite projects between Mac and PC computers. Remember, however, that Audio Unit plug-ins and virtual instruments are Mac-only, so if they are used in a Performer Lite project on your Mac, they will not be available when you open the project in Performer Lite running under Windows.

All plug-ins and instruments included with Performer Lite will transfer across platforms just fine. The same is true for any VST plug-ins or instruments, as long as they are installed in both your Mac and PC systems. Check with the plug-in developer for information regarding any differences that may exist between their Mac and Windows VSTs.

EXPORTING TO NOTATION SOFTWARE THROUGH MUSICXML

Performer Lite can export a notation score as a MusicXML file for import into notation programs such as Finale™ and Sibelius™. See "Exporting a musicXML file" on page 171.

REVERTING TO A PREVIOUSLY SAVED PROJECT

If you've made unwanted changes to a project, you can undo the changes you've made by returning to the last saved version. This operation is identical to closing the project without saving and opening it again.

1 Choose *Revert to Saved* from the File menu.

A dialog box asks you to confirm this choice.

2 Click on OK to confirm the action, Cancel to withdraw it.

Reverting to the last saved version of the project means that all changes you've made since you opened or last saved the project will be lost.

Reverting to a previously saved version is useful when experimenting with a project. You can quickly discard all changes by using this command. Make sure that you save the file in the state you want it before beginning to experiment.

ADDING PROJECT NOTES

Click the Project Notes button (Figure 7-2 on page 43) to open the Project Notes cell in the right-hand sidebar (Figure 7-3 on page 43). This is a simple text editor that allows you to type in notes about your project and store them within the project itself.

PRINTING PROJECT WINDOWS

You can print the contents of some Performer Lite windows. This includes list windows, such as the Set List and Soundbite List, and Notation Editor.

Printing the contents of a list window

To print the listed contents of a sidebar cell:

1 Click the cell to make it the active cell.

2 Choose *Page Setup* from the File menu, make any desired changes to the page settings, and click OK to confirm the settings.

The options that appear in this dialog box depend on the type of printer you are using. For example, if you are printing on a laser printer, you can choose an enlargement or reduction above or below 100%.

3 Choose *Print Window* from the File menu.

The standard print setup dialog box appears for your printer.

4 Set up the printer options as needed, such as the number of copies, and click OK.

The entire contents of the list is printed.

Printing notation

Printing notation in Performer Lite is easy. Performer Lite transcribes unquantized or quantized MIDI data in a readable fashion. You can format the music on screen exactly as it will print, including text, page margins, staff spacing, measure spacing, and more.

To print notation:

1 Choose Page Setup from the File menu, choose the desired page size, make any desired changes to the page settings, and click OK to confirm the settings.

The options that appear in this dialog box depend on the type of printer you are using. For example, if you are printing on a laser printer, you can choose an enlargement or reduction above or below 100%.

2 Open the Notation Editor.

A window appears containing staves for the MIDI track or tracks you have selected. This window displays the music on a page exactly as it will print out. For information about editing music and formatting it in this window, see chapter chapter 19, “Notation Editor” (page 132).

3 Use the track selector to show the tracks that you would like to print (and/or hide the ones you don’t).

4 Use the Notation Editor setting menu and Page Setup commands to format the music on the page as desired.

Summarized below, these menu commands are discussed in detail in chapter chapter 19, “Notation Editor” (page 132).

Formatting command	Brief description
Score Options (Mini-menu)	Provides control for title page, staff names, measure numbering and spacing, and staff spacing. The *Scale page contents by* option controls how much music is displayed on the page. See “Page Scaling” on page 139.
Page Margins (Mini-menu)	Lets you adjust top, bottom, left, and right page margins.

5 Add text and musical symbols as desired with the text and symbol tools in the Tools palettes.

See “Working with text” on page 155 for more information.

6 Choose Print from the File menu.

The standard print setup dialog box appears for your printer.

7 Set up the printer options as needed, such as the number of copies desired, and click Print.

Performer Lite proceeds to print the document, providing you with a status window as it does.

CLOSING A PROJECT

To close a project, choose *Close 'Project Name'* from the File menu.

Closing a project without saving

If new audio files have been created in an unsaved project, and you don't save the project before closing, Performer Lite will alert you to the fact that there are unsaved audio files on disk:

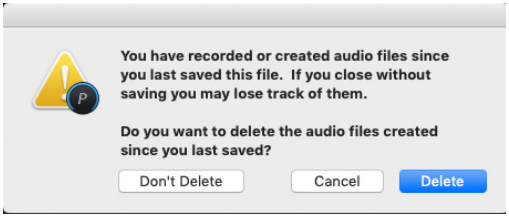


Figure 16-3: If you close an unsaved project, Performer Lite warns you about audio files that were created in the unsaved project and lets you either keep them or discard them.

The alert dialog shown above in Figure 16-3 lets you choose whether you want to delete them or not.

QUITTING/EXITING PERFORMER LITE

Quitting or Exiting Performer Lite returns you to the computer desktop. On the Mac, choose *Quit* from the Performer Lite menu. On Windows, choose *Exit* from the File menu.

As when closing a project with unsaved changes, if you quit Performer Lite without saving your project a dialog box may appear asking you if you want to save changes made to the file. To save the changes, press Yes. If you don't want to save changes, press No. To withdraw the Quit command and return to your Performer Lite file, press Cancel.

HELPFUL PROJECT AND DISK HINTS

File menu commands (except Save) cannot be used during playback. To use a command in the File menu, press the Stop button beforehand.

Save your file as often as possible. You should use the Save command after every significant change to your project. Consider using Autosave.

Always keep backup copies of your important projects. We cannot emphasize enough the importance of this. At the end of a working session, copy to a backup disk all of the files you recorded and edited. (The Save A Copy As command is good for this, together with the Duplicate Audio Data option.) If anything should happen to your original, you will have fully updated backup of the file.

Using the *Save A Copy As* command while working can be useful when you want to keep a record of earlier versions. You can also use Autosave for this purpose.

Be sure to backup your projects as often as is bearable, at least at the end of every working session and several times during the session if possible. The consequences of not making backups are severe: if your hard disk is damaged, some or all of the projects may be lost forever.

Using the Mac OS stationery feature (Mac only)

Performer Lite supports the Mac OS "Stationery pad" feature in the Get Info window for a project file as shown below:

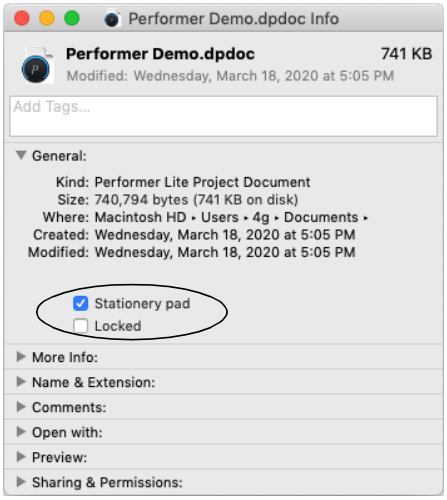


Figure 16-4: Stationery pad option in the Get Info window.

When this option is checked, the project file can be opened, but the Finder will prevent you from modifying the original file by forcing you to Save As when you attempt to save the project. This option is great for preserving projects that you do not want to modify and that you use regularly as a "template" from which to build other files. For more information about the Stationery pad option, consult your Mac OS help.

CHAPTER 17 Control Panel

OVERVIEW

Performer Lite's Control Panel (Figure 17-1) appears across the top of the Performer Lite Window and contains all the functions that make Performer Lite "go": buttons to record, play, rewind, set tempo, and more. The Transport controls look and act just like standard transport controls. Additional buttons provide immediate access to many of Performer Lite's significant features.

Overview **106**
Transport Controls **106**
Counter **107**
Tempo Controls **111**
Transport settings **113**
Overdub **113**
Countoff **114**
Countoff preferences **114**
Click **115**
Click Preferences **115**
Memory Cycle **117**
Auto-Record **118**
Solo **119**
Primary and alternate tools **119**
Keypad shortcuts **119**

TRANSPORT CONTROLS

The Transport Controls (Figure 17-1) let you record, play, rewind, etc. The Transport Controls are enabled by clicking them. When a button is enabled, it is highlighted and its function is active: the Record button records, the Pause button pauses, etc. Most buttons can be disabled by clicking a second time. To disable the Play and Record buttons, press the Stop button.

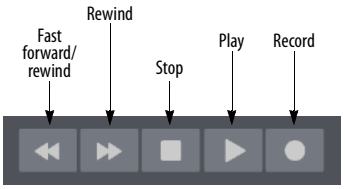


Figure 17-2: Left sidebar buttons.

The Play button and playback

Clicking the Play button starts playback. Playback will begin from the current time specified in the Counter. Playback can be delayed by the Countoff button and held by the Pause button. The Play button turns green while the sequence is playing.

If you start playback in the middle of a sequence, and you do not hear exactly what you expect, check Performer Lite's event chasing settings. for details, see "Event Chasing" on page 270.

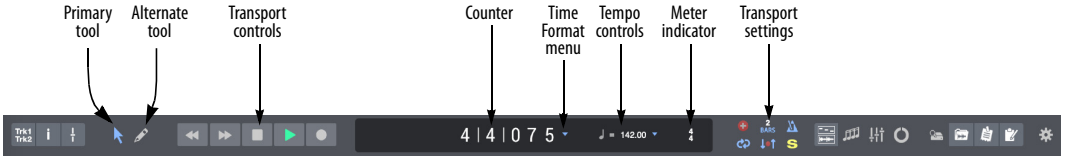


Figure 17-1: Performer Lite's Control Panel.

During playback, most Performer Lite features remain accessible, including the Save command and all editing commands. As a general rule, commands that cannot be used will either appear greyed out during playback or they will have no effect.

The Stop button

Clicking the Stop button stops playback and recording. It also turns off the Pause button. All notes sounding when the Stop button is clicked will cease (unlike pause).

The Record button and recording

Clicking the Record button turns it on and begins recording from the current location in the counter. When it is on, the Record button is red and can be turned off by clicking it again. This disables the record function while continuing playback. You can also turn on and off the record button during playback for manual punch-in and punch-out, as many times as you like. A more general way to think of the Record button is as an on/off toggle switch that you control manually.

At least one track must be record-enabled before the record button is pressed. This is done by clicking the record-enable button for the desired track (or tracks). Record-enabling a track makes it the destination for incoming recorded data.

Also see "Auto-Record" on page 118 and "Overdub" on page 113.

Undo Record

Recording can be undone at any time with Performer Lite's unlimited undo features. For details, see "Undo" on page 365.

Fast Forward & Rewind

The Fast Forward/Rewind buttons skip or scrub through your sequence quickly, forward or backwards. The right set of arrows cues forward in time, the left set cues backwards. Use the Transport preferences (in the File menu under macOS and the Edit menu under Windows) to choose whether cuing occurs smoothly and continuously or in fixed increments of your choosing. For example, you could program the forward/rewind buttons to cue by one measure at a time or by four measures at a time. See "Fast Forward/Rewind buttons" on page 255.

When cuing continuously, the left arrows cause playback to pause while cuing backwards until the arrow is released. If used during recording, the Record button will be turned off before cuing.

COUNTER

The Counter (Figure 17-1) displays the current playback position in the currently play-enabled sequence, expressed in different forms: *measure time* (measure|beat|tick), *real time* (hours:minutes:seconds.hundredths), *frame time* (hours:minutes:seconds:frames), *samples* (digital audio samples), or *markers* (the most recent marker in the sequence).

For information the marker counter, see "Marker counter" on page 109.

Using the Counter to change the current playback location

The *current playback location* is the position where the sequence will next play or record from. You can edit the counter fields to change the current location.

You can change the current location in the currently play-enabled sequence by editing the counter numbers. This can be done while the sequence is stopped or playing. If you edit the counter while the sequence is playing, it will continue to play while you enter the values and will cue to the new location after you confirm your edit. To edit the counter:

1 Click on the time value you wish to change.

The number field will highlight.

2 Enter the number you want.

Use the Tab key to move from one value field to the next. The decimal point on the keypad can also be used to cycle through fields. (On Windows, make sure the Num Lock key is engaged to use keypad shortcuts.) If you make a mistake in entering a value, press the delete key or click on the field again and re-enter the value.

3 Click outside the highlighted number field or hit the Return key.

Using the decimal key or Command/Ctrl-T to edit SMPTE main counter

The decimal key on the numeric keypad (with Num Lock engaged under Windows) will highlight the main counter, even if it is SMPTE time, real time or samples.

There is a shortcut for setting the measure time: using Command/Ctrl-T or the decimal point on the keypad will select the measure field and set the beat field to 1 and the tick field to 000. You may then enter the number of the measure you want to move to. As soon as you click outside the highlighted field or press the Return key, the specified value will be entered.

These keys will always edit the main counter, even when it is set to SMPTE time, real time or samples.

Setting the counter time format

To change which time format is shown in the Counter, click the Time Format menu to the right of the counter.

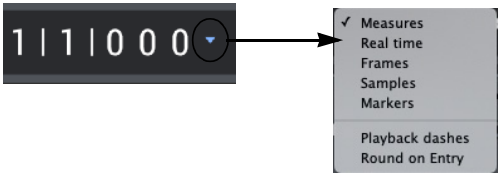


Figure 17-3: Use the Time Format menus to choose which of Performer Lite's various time formats you would like to display in the counter.

The counter displays dashes when no sequence is play-enabled in the file. To display numbers, play-enable a sequence in the Set List.

During playback, the measure time counter is updated each time a metronome click would occur. If the click value is set to a half note in 4/4 time, only beats 1 and 3 will display in each measure. The click value can be set with the *Change Meter* command in the Conductor Track sub-menu in the Project menu.

Playback dashes

If you would like for the last field of the counter to be displayed as dashes, instead of numbers quickly rolling by, enable the *Playback Dashes* option. You can set this independently for each counter.

Round on Entry

By default, the *Round on Entry* option (Figure 17-3) is enabled and edits to larger time fields will clear smaller time fields. When the *Round on Entry* is disabled, smaller time fields are preserved when editing larger fields.

For example, locate to 3|2|017, then select the counter's measures field and drag it upward. With *Round on Entry* enabled, the counter value will become 4|1|000, 5|1|000, 6|1|000, etc.; with *Round on Entry* disabled, the counter value will become 4|2|017, 5|2|017, 6|2|017, etc.

Marker counter

The *Markers* time format displays the most recent marker in the sequence.

The Markers counter can also be used to move the main transport to a marker location. Clicking the marker name makes the field editable and displays a menu; choose the highlighted marker by clicking it, or by pressing the Return or Enter keys.

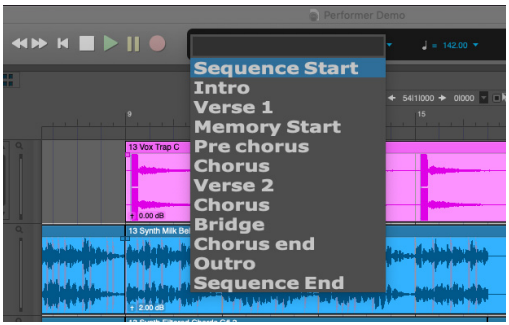


Figure 17-4: Selecting a marker from the Markers counter

You can also type in the text field. As you type, the drop-down menu will narrow the list to show only the markers containing the characters that you've typed. In the example shown in Figure 17-4, typing "ver" would narrow the list to Verse 1 and Verse 2, while typing "2" would narrow the list to Verse 2. The Up Arrow and Down Arrow keys can be used to navigate the list.

For more information about markers, see chapter 48, "Markers" (page 453).

Setting the start time

The start time of the sequence is what you see in the counter when you rewind to the very beginning. Normally, the default start time for a sequence is measure time 1|1|000, real time 0:00:00.00 and frame time 0:00:00:00.

You can, however, use the *Set Sequence Start Time* command under the Settings menu For the Set List ("The Set List menu" on page 233) to change the start time. For example, you might want to create one or more pickup measures before measure 1 (1|1|000).

The start times you enter for measure and real time are arbitrary and only affect the display of time locations.

To set the start times of a sequence:

1 If you have more than one sequence in the file, make sure it is the currently play-enabled sequence in the Set List. Otherwise, click the Set List cell so that it becomes the active cell.

2 Click the Settings menu and choose *Set Sequence Start Time*.

3 A dialog box appears. The current sequence name is displayed near the top of the dialog box.

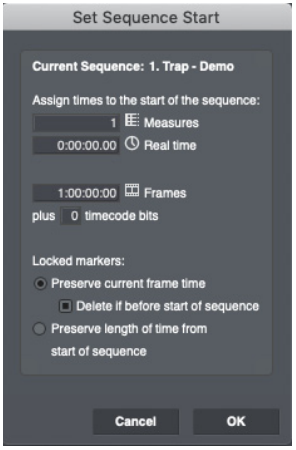


Figure 17-5: The Set Sequence Start dialog lets you choose completely different start times for each of Performer Lite's various time formats. This is where you determine the sequence's SMPTE start time (offset).

4 Click on the values you wish to change.

5 Enter the new values.

You may enter a value for each of the various time formats. Measure values range from -9999 to 9999. Real time ranges from 0:00.00 to 59:59.99. Frame time ranges from 0:00:00:00 to 23:59:59:30.

6 Click on OK to confirm your choice or Cancel to cancel it.

Using SMPTE timecode bits
In addition to the start frame, you may offset the SMPTE start time by a number of bits. There are 80 bits per frame. Although Performer Lite does not have single bit time resolution, it does offer sub-frame time resolution. Use the bit offset to finely adjust the start time.

Setting the SMPTE frame rate
The SMPTE frame rate can be set with Frame Rate command in the Setup menu.

Creating pickup measures before 1|1|000
Normally, when you rewind Performer Lite back to the beginning of the sequence, the measure counter reads 1|1|000. But sometimes you may have several pickup beats (or measures) in your music, and you may still want the music at measure 1 to remain at measure 1. If so, you can create as many pickup measures before 1|1|000 as you need.

To create a pickup measure:

1 As described in the previous section, set the measure start time of the sequence to 0 to create 1 pickup measure.

If you need two pickup measures, set the Measure start time to -1. If you need 4 measures, set it to -3.

2 Now, when you press Rewind back to the beginning of the sequence, the Counter window will read 0|1|000.

If you set up two or four pickup measures instead of only one, the counter would read -1|1|000 or -3|1|000 respectively.

3 If you already had data recorded in the sequence, shift the data back to its original location.

When you change the Measure start time, data that used to be at 1|1|000 is now at 0|1|000, and so on. All data has changed to match the new start time. To restore all data to its original position before you changed the start time, copy and paste it back to where it was before.

4 Choose *Edit menu* > *Select All.*

This selects the entire sequence.

5 Choose *Cut* from the Edit menu.

6 Set the Counter to 1|1| 000.

7 Choose *Edit menu* > *Paste.*

You have now successfully restored all data back to its original location before changing the measure start time, and you also have several empty pickup measures in which to record.

Controlling how often the counter updates
During playback, the measure time counter is updated each time a metronome click would occur. For example, if the click value of the current meter in the sequence is set to a half note in 4/4 time, only beats 1 and 3 will display in each measure. The click value can be set with the Change Meter command in the Conductor Track sub-menu in the Project menu.

Negative numbers in the counter display
When using an external sync source, Performer Lite may run for a little while before the sequence actually starts. During this time, you may see

negative measure numbers. These increase in value (towards zero) until the start measure is reached.

TEMPO CONTROLS

The Control Panel displays the tempo and meter of your sequence.

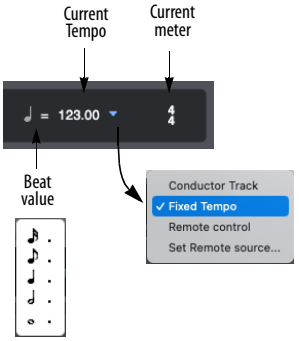


Figure 17-6: Performer Lite's Tempo Controls give you real time control of the tempo, as well as tempo programming (via the Conductor Track) and remote control of tempos from any MIDI source, such as the mod wheel on your controller keyboard.

The current tempo

By default, tempos are displayed in beats per minute (bpm). To change the tempo, click the current tempo directly to type in a new tempo (Figure 17-6). If necessary, click the current beat value to change it (see below).

Tempos are displayed and entered with an accuracy of a hundredth of a beat per minute. This allows you to specify tempos with two numbers to the right of the decimal point, e.g. 104.78 beats per minute, providing you with a high degree of resolution.

The beat value

The beat value (Figure 17-6) is the note duration that "gets the beat" in a given meter. Click it to change it.

The beat value can be any standard musical duration between a sixteenth and whole note. All beat values can be dotted. A dotted value is equivalent to one and a half times the value of the duration. (A dotted quarter note is equivalent to one and a half quarter notes, for example.) In 4/4 time, the quarter note usually gets the beat: in this case, the beat value is a quarter note. In 6/8, the beat generally falls on the first and fourth eighth notes in the measure, thus the dotted quarter is the beat value.

The beat value you set does not necessarily correspond to the value you set for the metronome click. The metronome click value is set when specifying the meter with the Change Meter command in the Conductor Track sub-menu in the Project menu. For example, in 6/8 meter, you may set a tempo of an eighth note = 220, but, set the metronome click to a dotted quarter note (standard in 6/8 time). Quite often though, the beat value will be the same as the meter denominator (the lower number of the meter marking).

The current meter

The meter at the current counter location is displayed for your reference (Figure 17-6). To change meter, use the Change Meter command (Project menu > Conductor Track > Change Meter).

The Tempo Control menu

Tempo can be controlled by one of five possible sources:

- The Current Tempo setting
- The Conductor track
- The Tap Pad
- By remote control from an external MIDI controller, such as a modulation wheel
- The back slash key (Tap to Enter Tempo command)

The Tempo Control menu (Figure 17-6 on page 111) displays the current tempo source with a check mark; choose any other source from the menu to change it. You can change the tempo source at any time, even during playback, and the tempos you set in each mode are remembered. In addition, the tempo control settings are saved with each sequence.

Fixed Tempo
When the Tempo Control is set to Fixed Tempo, you can change tempo by entering a value in the tempo box. Tempo is expressed in beats per minute (bpm). Any programmed tempo changes (the tempo map) are ignored. You control the tempo directly with the tempo box. This mode is useful for sequences with one constant tempo or for temporarily adjusting tempos when working on a sequence.

Conductor Track
When the Tempo Control is set to Conductor Track, you cannot use the tempo box to set the tempo. Instead, the tempo map in the Conductor track takes control of the sequence. In this mode, the tempo box is merely an indicator of the current tempo; you cannot change the tempo or beat value directly.

To hear tempo changes that you create with the Change Tempo command or by using Tap tempo sync, set the Tempo Control to Conductor Track, where programmed tempo changes and tempo maps are stored. See chapter 47, "Conductor Track" (page 446).

Remote control of the tempo
When the Tempo Control is set to *Remote Control*, the tempo can be controlled from an external MIDI source such as a modulation wheel on a MIDI keyboard, or any other source of continuous controller data.

To set up the tempo for external MIDI control:

1 Choose Remote Control from the Tempo Control menu.

2 Choose Set Remote Source from the Tempo Control menu.

A dialog box appears.

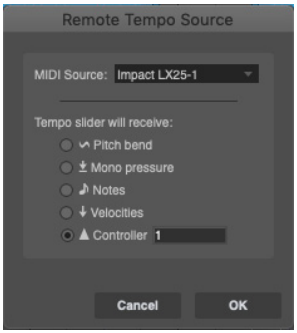


Figure 17-7: The Set Remote Source feature allows you to control Performer Lite's tempo dynamically, during playback or recording, with an external MIDI source, such as the mod wheel on a keyboard.

3 Select the MIDI device from which the external control data will be received from the menu provided.

4 Select which type of MIDI data will be used to control the slider.

Modulation wheels send controller #1.

5 Click OK to confirm your choice or Cancel to withdraw the command.

Tap to Enter Tempo

The *Tap to Enter Tempo* command in the Commands window (Setup menu) allows you to tap a tempo setting from your computer keyboard (or a MIDI trigger event):

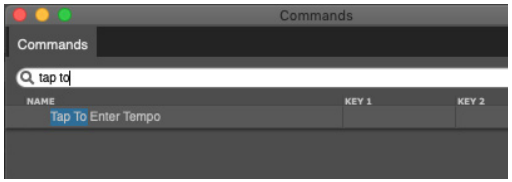


Figure 17-8: To locate and customize the Tap to Enter Tempo command, search on the word 'tap,' and then enter the desired computer keyboard and/or MIDI event.

When the Project's Tempo control is set to *Fixed Tempo (*Figure 17-6 on page 111*)*, you can change the tempo of the entire project (as displayed in the Control Panel) by simply tapping the back slash key (or your customized keyboard shortcut or MIDI controller event for the *Tap to Enter Tempo* command). The BPM text box will highlight to indicate that it is being modified by your taps. When you achieve the tempo you want, press the return key to confirm the change. If you attempt to do this while the sequence is playing back, Performer Lite will not closely track your tapping, like it does for the Tap Tempo Receive Sync mode (Setup menu), so you will probably find it most useful to use Tap to Enter Tempo while the sequence is stopped. If you would like Performer Lite to track your tapping during playback, use the Receive Sync Tap Tempo mode (see "Tap Tempo" on page 588).

Tapping to enter a tempo in a text box

The *Tap to Enter Tempo* command also allows you to tap a tempo setting into any text box where you can also type a tempo number (in beats per minute). For example, if you open the Change Tempo window (Project menu>Conductor Track), and you wish to enter a tempo in one of the text boxes in the dialog, instead of typing the number, simply click the text box (as if you were going to type in a number) and then tap the *Tap to Enter Tempo* keyboard shortcut at the tempo you wish to enter. This allows you to specify the tempo by "feel", rather than by typing a number.

The default keyboard shortcut for the *Tap to Enter Tempo* command is the back slash key (\ ). You can easily change this default key binding by searching for the word "tap" in the commands window as shown in Figure 17-8. You can also assign a MIDI event from a drum pad or other MIDI source.

☛ The Tap to Enter Tempo command shown in Figure 17-8 is not the same as the *Tap Tempo* feature (see "Tap Tempo" on page 588). The Tap Tempo command shown above is meant solely for entering a BPM value in tempo text boxes.

Canceling tempo entry

If you begin to tap in a tempo, but then change your mind, press the escape key (esc) to exit the tempo text box without making a change to it.

TRANSPORT SETTINGS

The transport settings provide additional functionality to Performer Lite's transport controls.

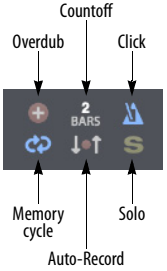


Figure 17-9: Transport settings.

OVERDUB

If you click the Overdub button (Figure 17-9), Performer Lite goes into Overdub record mode. Overdub mode causes all recorded MIDI notes to merge with,

instead of replace, pre-existing notes on the record-selected track. The pre-existing notes on the track are not erased. For audio data, new data is overlaid on top of existing data, rather than erasing and replacing existing data.

For MIDI tracks, the word *overdub* is used in a very specific sense in Performer Lite: real-time merging of incoming notes with note data already in a track. It works as if you recorded one track, recorded a second track to go along with it and then merged the two. You can use Overdub mode in conjunction with Memory Cycle to build patterns in multiple passes over a time range, similar to drum machines. (Overdub does not affect the Conductor Track; specifically, recording on the Conductor Track while slaved to Tap tempo sync always erases existing tempo events.)

For further information, see "MIDI overdub recording" on page 285 and "Audio overdub recording" on page 286.

COUNTOFF

Enabling the Countoff (Figure 17-9) causes a countoff of a specified number of measures and/or beats before playback or recording. Clicking the Countoff button enables and highlights it. You must enable the Click (Figure 17-9) to hear the countoff.

To set the number of countoff measures and/or beats, double-click the Countoff button. The Countoff preferences will open, where you can enter the number of measures and beats. Several other options are also provided. See "Countoff preferences" below.

If you choose a countoff that is not simply a whole number of measures, the Countoff button in the Control Panel displays the number of beats in the countoff that you have chosen. For example, the countoff button displays *2 Bars* if you have chosen 2 measures and 0 beats. But it displays *9 Beats* if you have chosen 2 measures and 1 beat (in 4/4 time).

Use the Countoff to give yourself time to adjust to the current tempo and prepare for recording.

The counter runs during countoff

The counter updates during the countoff. For example, if you have a two-measure countoff, and you begin playback at 1|1|000, then the counter begins the countoff at -1|1|000 and counts the two measures leading up to 1|1|000. If you begin playback at 9|1|000, the counter starts at 7|1|000 and counts the two measures leading up to 9|1|000.

The movie window and countoff

The movie window runs during countoff. This allows you to see what is happening in the movie during the countoff so that you can better prepare for the downbeat when the countoff is over.

COUNTOFF PREFERENCES

To access the *Countoff* preferences, double-click the Countoff button (Figure 17-9). You can also choose *Preferences* from the Performer Lite menu (macOS) or Edit menu (Windows) and click the *Countoff* list entry (Figure 17-10).

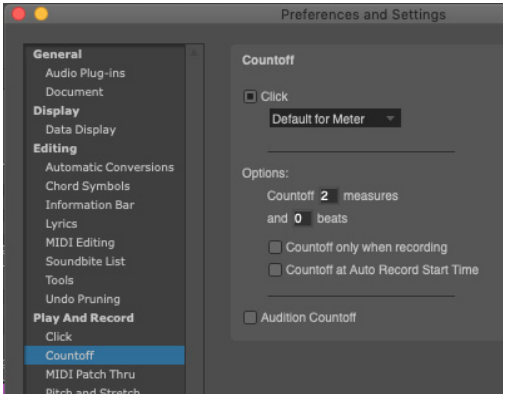


Figure 17-10: Countoff preferences.

Specifying an audio click during the countoff

The *Click* option (Figure 17-10) lets you hear an audio click during the countoff. Use the menu to choose the type of audible click you would like to hear. The choices are *Follow Conductor, Default for Meter*, and *Beat Value*.

Follow Conductor

The *Follow Conductor* option causes the Countoff click to follow the Conductor track's click mode for the bars during which the click will be occurring.

Beat Value

The *beat value* option clicks according to the current meter's beat value. See "Change meter basics" on page 471 for an explanation of what a meter's beat value is.

Default for Meter

The *default* click is similar to the beat value click, except that the click follows the generally accepted click conventions for various meters and tempos. For example, in 12/8 time, the default click clicks on dotted quarter notes at fast tempos and eighth notes at slow tempos.

Countoff length

The length of the countoff (Figure 17-10) can be specified in a number of whole measures and/or individual beats using the *Countoff n measures and y beats* setting. Accordingly, the Countoff button in the Control Panel ("Countoff" on page 114) displays the number of beats in the countoff, if you have chosen a countoff that is not a whole number of measures. For example, the countoff button displays *2 Bars* if you have chosen 2 measures and 0 beats, and it displays *9 Beats* if you have chosen 2 measures and 1 beat (in 4/4 time).

Countoff only when recording

The *Countoff only when recording* option causes the countoff to occur only before recording, not before playback or any other function.

Countoff at Auto-Record Start Time

The *Countoff at Auto-Record Start Time* option causes the countoff to start the appropriate number of bars before punch-in when Auto-Record is enabled.

Audition Countoff

Check the *Audition Countoff* option to hear what the countoff will sound like.

CLICK

The Click (Figure 17-9) is the audible indication of the Metronome beat. The Click can "click" on the beat, or you can customize it to click in any pattern that you prefer. When it clicks on the beat, we refer to the click pattern as a *beat click*. For the beat click, the beat is determined by each meter change in the Conductor track (or the default 4/4 beat if no meter changes have been added). If the Click is on, Performer Lite will click at the beginning of every measure. The first beat of every measure is slightly accented. The subsequent clicks in the measure depend on how the metronome click value is set in the current meter. To learn more about setting meters, see chapter 50, "Change Meter" (page 471).

Enabling the click

To turn on the Click, press the Click button. You can also choose *Click* from the Studio menu or press Command/Ctrl-5. To turn off the click, press the Click button again (or choose it from the menu again). When the Click is on, the *Click* menu item will be checked.

CLICK PREFERENCES

The *Click Preferences* (Studio menu) provides settings for the click (. You can also open this dialog by Option/Alt-clicking the Click button in the Control Panel, or by opening the Preferences

from Performer Lite menu (macOS) or Edit menu (Windows) and clicking the *Click* list entry (Figure 17-11).

Audio click menu

Choose the desired audio output in your system from the *Audio Click* menu. This is where you will hear the click. A variety of preset click sounds are provided, and you can add an unlimited number of your own custom click sounds. The click plays back with sample-accurate precision.

Accented and Normal click

Choose the desired accented and normal click sounds from the menus provided (Figure 17-11). A variety of preset sounds are provided, including the ubiquitous Urei metronome click sound. Or you can use any compatible audio file you wish using the *Choose File* menu item.

Audio click volume control

Use the *Master Volume* slider (Figure 17-11) to control the overall volume of both the accented and normal clicks. Use the individual volume knobs to the right of each click sound menu to adjust their volume relative to each other.

Adding your own click sounds

To add your own clicks to the click sound menus, save them as a mono AIFF, or WAVE audio file, give the file the name you wish to see in the menu, and then drop it into the *Clicks* folder below. You can add as many click sounds as you wish.

Platform	Path
macOS	/Library/Application Support/MOTU/Digital Performer Lite/Clicks
Windows	C:\ProgramData\MOTU\Performer Lite\Clicks\

Playing the audio click on the computer internal speaker (Mac only)

You can play the audio click on the computer's internal speaker, even when you are using a third-party audio interface product general audio input and output. Just Command/Ctrl-click the *Built-in Audio* option in the Configure Hardware Driver dialog to select it (along with your third-party hardware driver), as shown in Figure 3-1 on page 21. Then choose *Built-in Audio* from the audio click's output menu (Figure 17-11).

Click options

Always click makes the click audible whenever Performer Lite is counting off, playing or recording.

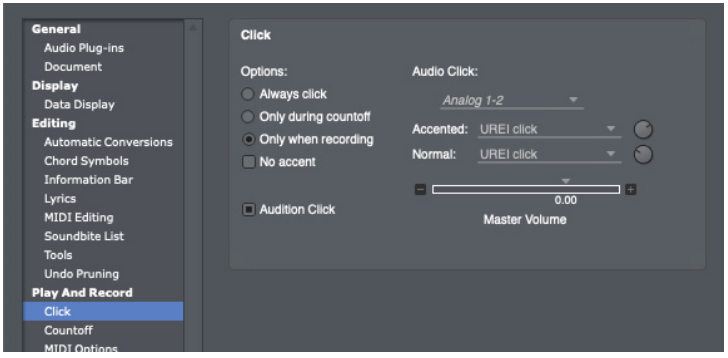


Figure 17-11: Click preferences.

Only during countoff makes the click audible only during countoff measures. When playback or recording begins, the click will fall silent. See "Countoff preferences" on page 114 for more information about the countoff.

Only when recording makes the click audible only when Performer Lite is in record mode. If the Countoff button is enabled, Performer Lite will also click during the countoff in this mode.

No accent removes the accent from the first click in each measure. This option affects both the audio click and the MIDI click.

Audition Click

If the *Audition Click* option is enabled, Performer Lite will audition the metronome sound as it is currently configured, at the current tempo.

MEMORY CYCLE

Memory Cycle (Figure 17-9 on page 113) is a cycle-playback and cycle-recording feature that causes a portion of the entire sequence to be played repeatedly until the stop button is pressed, just like drum machines and hardware sequencers. Cyclic playback begins when the sequence reaches the specified Memory Cycle time rage. When the Counter reaches the end of the cycle range, it seamlessly returns to the beginning and will continue to do so until you press the stop button, un-highlight the Memory Cycle button, or cue past the end time.

Use Memory Cycle for multiple consecutive playbacks of a particular time range. This can be very useful for cycle-recording a loop section or drum pattern, mixdowns, rehearsing a part that you plan to record, or for scrutinizing a particular section of a performance.

When cycle-recording, you add a new part to the loop with each consecutive pass. For MIDI tracks, be sure Performer Lite is in overdub record mode so that each new pass doesn't erase the last one. For audio, you can use Memory Cycle to overdub multiple audio passes into new takes. For details, see chapter 43, "Takes and Comping" (page 415).

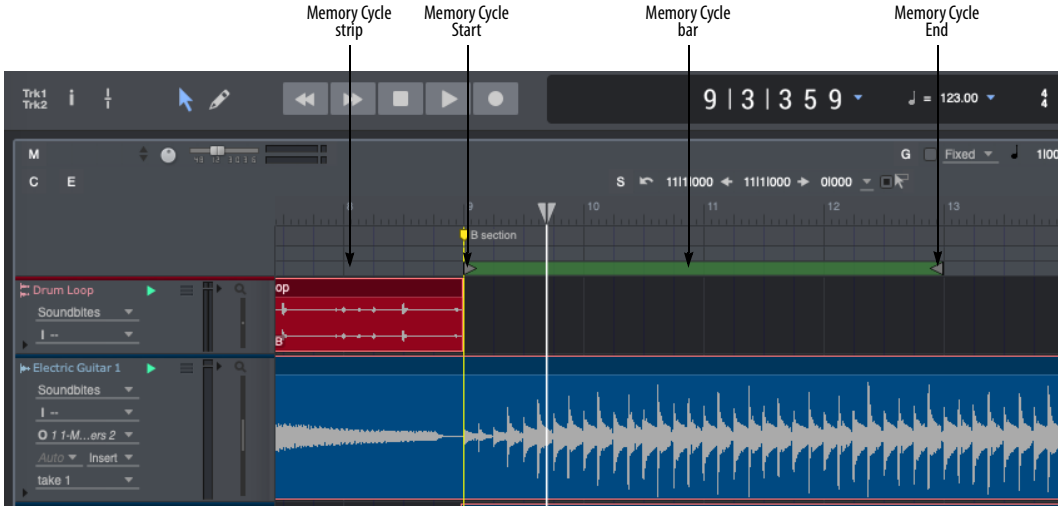


Figure 17-12: Playback and recording loop seamlessly between the Memory Cycle start and end markers, which you can drag with Snap to Grid turned on or off.

If you want to permanently loop a clip in one or more tracks and specify the number of times the clip will repeat, see "Looping a clip" on page 343.

Click on the Memory Cycle button to enable it. The next section discusses several ways to set the start and end times in the Memory Bar as shown in Figure 17-12.

Controlling the Memory Cycle bar and endpoints

When Memory Cycle is enabled, the Memory Cycle Strip displays the Memory Cycle loop as a green bar (Figure 17-12). Drag in the strip to enable Memory Cycle and set the start and end times. Drag the endpoints of the bar to change them, or drag the bar to move it. Click the bar to toggle Memory Cycle on or off.

If the edit resolution check box is checked, dragging gestures snap to the current resolution setting (such as 8th notes, for example). For an explanation of edit resolution, see "Snap to Grid" on page 357.

You can adjust the cycle points at any time, even during playback. This lets you build patterns and other tasks without ever having to stop the music.

Selecting the Memory Cycle range for editing

If you would like to quickly select the time range within the Memory Cycle repeat barlines to insert a loop, quantize, or any other editing operation, click one of the two repeat barlines.

AUTO-RECORD

Auto-Record (Figure 17-9 on page 113) causes recording to automatically turn on and off in a specific time range. This allows you to record without having to manually enable and disable the Record button.

Clicking on the Auto-Record button enables and highlights it. Clicking on the Auto-Record button also causes the Auto-Record punch in and punch out bar to appear in the Auto-Record strip (Figure 17-13). Drag in the strip to enable Auto-Record and set the punch-in and -out times. Drag

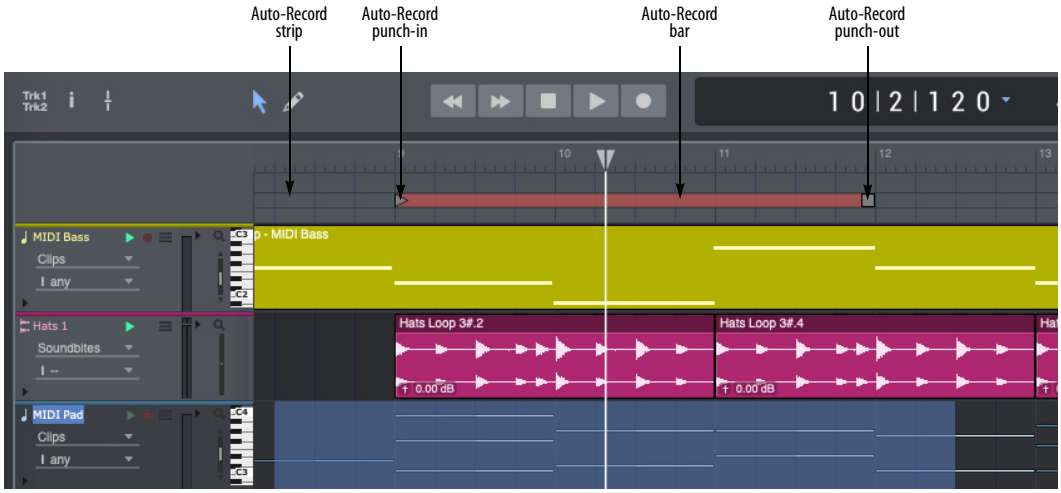


Figure 17-13: Punch-in and Punch-out points are depicted graphically as a red bar in the Auto-Record strip, which you can drag with Snap to Grid turned on or off.

the endpoints of the bar to change them, or drag the bar to move it. Click the bar to toggle Auto-Record on or off.

If the edit resolution check box is checked, your actions snap to the current resolution setting (such as 8th notes, for example) as you drag. For an explanation of edit resolution, see "Snap to Grid" on page 357.

You can adjust the Auto-Record bar at any time, even during playback or recording. This lets you adjust punch-in and punch-out on the fly without having to stop the music.

Auto-Record will remain enabled until you click on its button again to disable it. Remember to disable it when you finish using it.

Quickly selecting what you have recorded

You can quickly select the time range between the punch points by clicking one of the arrows. This is a handy shortcut for editing what you have just recorded with auto-record.

SOLO

The Solo button toggles Solo Mode on and off. For more details on Solo Mode, see "Soloing Tracks" on page 269.

PRIMARY AND ALTERNATE TOOLS

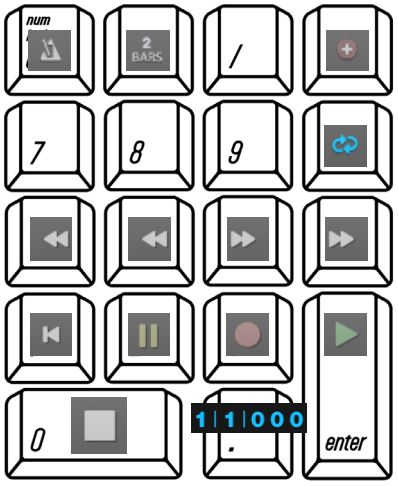
Choose the desired tool from *Primary Tool* menu (Figure 17-1 on page 106). The cursor will then switch to the primary tool when you hover over an edit window, or any location where the tool applies.

The *Alternate Tool* (Figure 17-1 on page 106) serves as a temporary alternative to the primary tool. To temporarily switch to the alternate tool, hold down the 'x' key. This keyboard shortcut allows you to quickly switch between the main and alternate tool, without having to visit the Tool palette (Figure 27-1 on page 243). This keyboard shortcut can be changed in the Commands window (page 257): search for the *Alternate Tool* shortcut.

For more information about the tools, see chapter 27, "Tools" (page 243).

KEYPAD SHORTCUTS

The Control Panel functions can be operated from the numeric keypad on an extended keyboard.



Mac Keypad

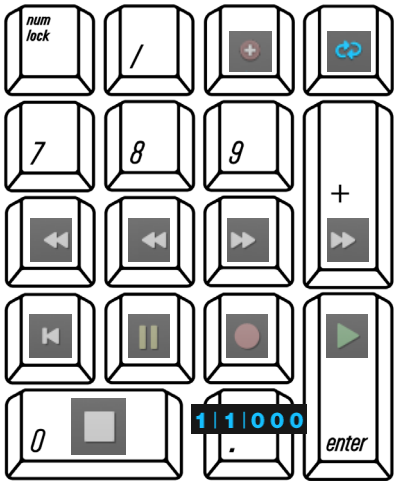


Figure 17-14: The extended keypad assignments for Performer Lite's Transport controls.

In addition, the spacebar acts as a play/stop toggle. These key assignments are provided for your convenience. However, you can create your own customized key assignments using the Commands window. See chapter 29, "Commands" (page 257) for more information.

CHAPTER 18 Sequence Editor

OVERVIEW

The Sequence Editor provides a multitrack graphic environment for editing audio tracks and MIDI tracks side by side. It includes a movie track for displaying a project's movie along the same timeline. You can view one or more tracks at a time using Performer Lite's standard track selector to show and hide tracks as desired.

MIDI tracks are displayed with a "piano roll" style graphic note grid. Similarly, audio tracks display waveform data. MIDI continuous controller (CC) data and audio automation data are displayed and in separate edit layers. You can switch edit layers in each track independently to bring any type of data to the front for editing.

The Sequence Editor provides sample-accurate editing of MIDI and audio.

The Sequence Editor includes basic track management features, such as adding, duplicating and deleting tracks and sequences. Combined with its MIDI and audio editing features, the Sequence Editor provides "one-stop shopping" for editing and managing a Performer Lite project.

Overview 121
Quick Reference 122
Sequence Editor menu 124
Sequence Editor basics 125
Opening the Sequence Editor 125
Switching sequences 125
Sequence management 125
Track management 125
Information Bar 126
The Time Ruler 128
The Marker Strip 128
The Memory Cycle strip 129
The Auto Record strip 129
Zoom buttons 129
Zooming techniques 129
Track settings 129
Audio editing 130
MIDI editing 130
Resizing tracks 130
The movie track 131
The Conductor track 131

QUICK REFERENCE

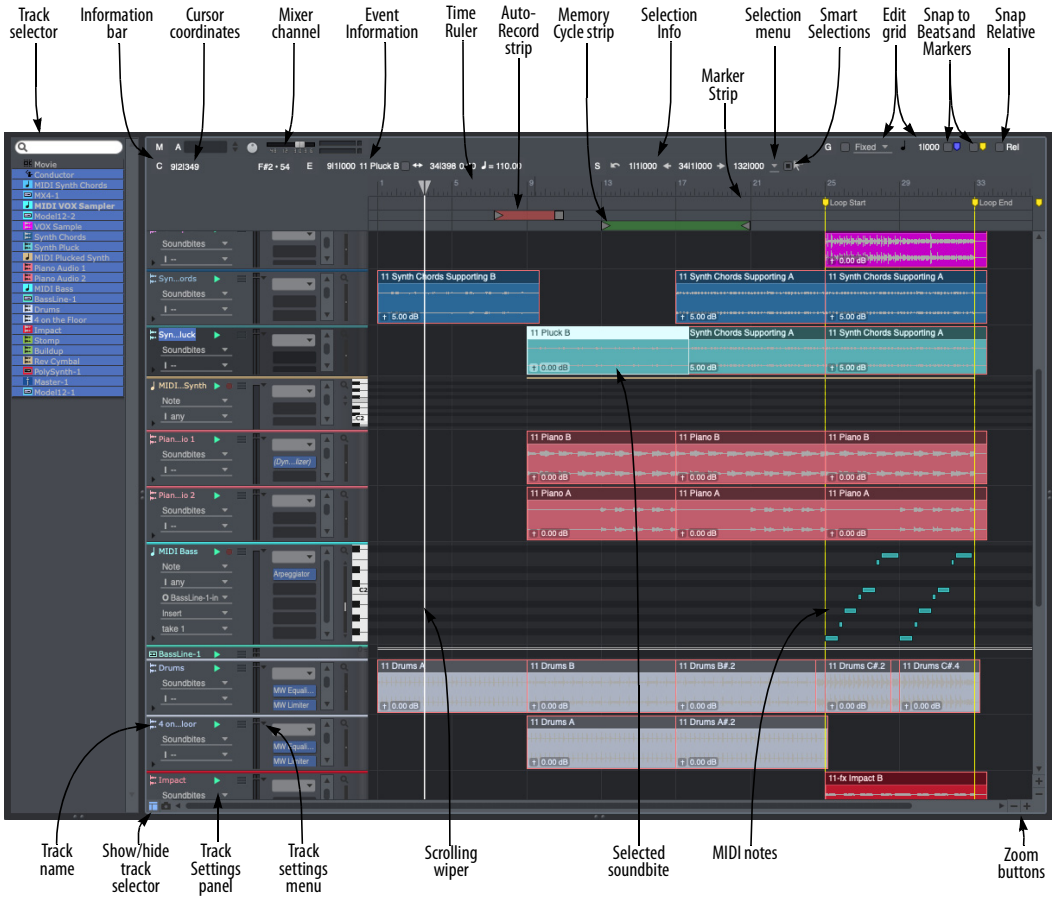


Figure 18-1: The Sequence Editor

Track selector: Click or drag over the names of the tracks in this list to show or hide them in the Sequence Editor. Option/Alt-click to hide all except the one you click; Command/Ctrl-click to show all except the one you click. Use the commands in the View menu to show/hide tracks.

Information bar: A configurable strip for displaying some or all of the information shown in each of the Information panels. See "Information Bar" on page 126.

Cursor Coordinates: Displays the mouse pointer's current location in the unit of measurement for the currently active Edit Layer in the track (dB for audio volume, 0-127 for MIDI volume, note pitch for MIDI notes, the name of the soundbite the cursor is currently over for, etc.)

Mixer Channel: Displays basic mix controls for the currently selected track.

Event Information: Displays the currently selected soundbite, MIDI note, audio automation control point, MIDI controller, or other type of event numerically and allows you to edit the event's parameters, such as name, velocity, and attack time.

Time Ruler: Measures time in any combination of Performer Lite's various time formats. Double-click on the ruler to place the playback wiper. Drag within the ruler to make a time range selection. Shift-click in the ruler to extend or shorten the existing time range selection.

Marker Strip: Displays markers, meter changes, and key changes. Markers and meter changes must be edited in the Conductor track or Markers window. No MIDI or audio data appears in the Marker Strip.

Auto Record strip: Displays the Auto Record region as a red bar. Click and/or drag in the Auto Record strip to enable the feature and set the punch-in and punch-out times. Drag the endpoints to change them, or drag the bar to move it.

Memory Cycle strip: Displays the Memory Cycle loop as a green bar. Drag in the strip to enable the feature and set the start and end times. Drag the endpoints of the bar to change them, or drag the bar to move it. Click the bar to toggle Memory Cycle on or off.

Selection Info: Displays precise, numerical information about the current selection, if any. Double-click the "S" symbol to open the selection Info panel.

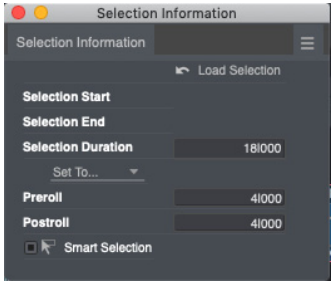


Figure 18-2: The Selection Info panel.

Selection menu: Provides several shortcuts for making selections.

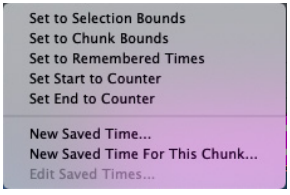


Figure 18-3: The Selection menu.

Smart Selections: Toggles the Smart Selections feature. See "Smart Selection" on page 310.

Edit Grid: If the Edit Grid box is turned on, data snaps to the edit grid. If it is turned off, data doesn't snap to grid. Edit Resolution can be changed by typing in a different number of beats|ticks, or by choosing a duration from the note menu.

Beat Grid: Snaps actions to the beats within the waveform. See "Snap to Beat" on page 358.

Snap to Marker: Snaps actions to markers. See "Snap to Markers" on page 129.

Snap Relative: When checked, an event moves relative to its original position, rather than snapping to the time line's absolute grid. For example, if the grid unit is set to 120 ticks, and the original event is located at 013 ticks, it will snap to 133, 253, and 373 (which are all 13 ticks after 000, 120, 240 and 360).

Show/hide track selector: Opens and closes the track selector.

Track settings panel: Displays information and track settings. The amount of information displayed depends on the track's current vertical size. All settings are always available in the Track settings menu.

Track settings menu: Contains all settings for the track. Some of these settings might also be displayed in the Track settings panel, depending on the track's current vertical size.

MIDI Notes: MIDI tracks in the Sequence Editor display notes on a note grid. The note grid changes into a continuous data grid when any type of MIDI controller data is chosen as the Edit Layer for the track.

Scrolling wiper: Indicates the current playback location. Drag it to change it or double-click in the time ruler.

Selected soundbite: Soundbites can be manipulated directly (and inserted) when they are chosen as the Edit Layer for the track. Use the Pointer tool for most soundbite editing operations.

Zoom buttons: Reduce and enlarge the display vertically or horizontally. Click the plus sign to zoom in; click on the minus sign to zoom out. Press to zoom continuously. Zooming out gives you an overview; zooming in focuses on a shorter period of time at higher resolution. Editing can be done at any zoom level. Option/Alt-click to zoom in or out to minimum or maximum zoom level.

SEQUENCE EDITOR MENU

To access the Sequence Editor menu, click anywhere in the Sequence Editor to activate it and click the menu icon on the far right of the Control Panel.

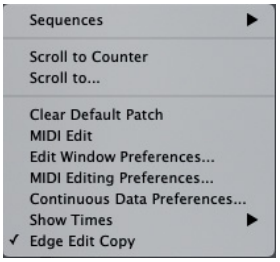


Figure 18-4: The Sequence Editor menu.

Sequences: "Sequence management" on page 125.

Scroll To Counter: Scrolls the editor window to the time currently displayed in the Counter.

Scroll To: Scrolls the editor data display to a time you specify.

Clear default patch: Removes the default patch assignment in the Default patch column for the currently selected MIDI tracks.

MIDI Edit: Allows data in the Sequence Editor to be edited from a MIDI controller.

Edit Window Preferences: Opens the preferences for edit windows.

MIDI Editing Preferences: Opens the preferences for the MIDI editing.

Continuous Data Preferences: Opens the preferences for the display of continuous data in the Sequence Editor.

Show Times: This menu item produces a sub-menu, from which you can choose which timestamp to display on soundbites: *none*, the *current time*, the *original timestamp* (if any) or the *user timestamp* (if any).

Edge Edit Copy: This item affects soundbite trimming (edge editing). When checked, this item causes a new soundbite to be created when you trim (edge edit) any soundbite, preserving the original. When Edge Edit Copy is unchecked, trimming a soundbite affects the original soundbite (and all instances of it in elsewhere in the project). Option/Alt-drag to override the current Edge Edit Copy setting (checked or unchecked).

SEQUENCE EDITOR BASICS

The Sequence Editor is the most comprehensive edit window in Performer Lite. It serves as a multitrack waveform editor for audio tracks, a side-by-side multitrack graphic editor for MIDI tracks, and a combined editor for both MIDI and audio tracks. There is one Sequence Editor window for each sequence. In projects with more than one sequence, you can open multiple Sequence Editors (one for each sequence).

OPENING THE SEQUENCE EDITOR

To open the Sequence Editor, click the Sequence Editor button (Figure 7-4 on page 44).

SWITCHING SEQUENCES

If your Performer Lite project has multiple sequences in the Set List (Figure 24-1 on page 232), play-enable the sequence you wish to view in the Sequence Editor.

SEQUENCE MANAGEMENT

Use the Sequences sub-menu in the Sequence Editor menu (Figure 18-4 on page 124) to view a different sequence in the Sequence Editor window, to create a new sequence, or to conduct other sequence management tasks.

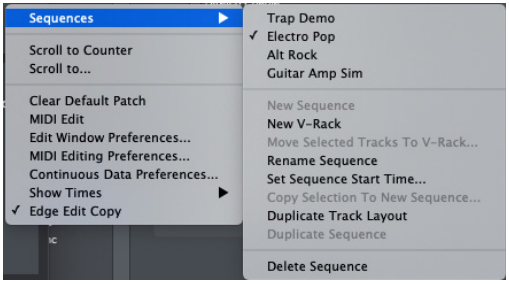


Figure 18-5: Managing sequences.

TRACK MANAGEMENT

The Sequence Editor provides many features for managing both audio and MIDI tracks in the project.

The Track Selector

Performer Lite's track selector lets you show and hide tracks (and track folders) as desired in the Sequence Editor. See "Track Selector" on page 44.

Moving tracks up or down

To move tracks up or down in the Sequence Editor, drag them by the left edge of their information panel as shown below in the Sequence Editor, or you can grab the area just to the right of its name.

Track Folders

To show or hide the contents of a folder, click its disclosure triangle. Command/Ctrl-click it to show/hide all sub-folders inside it. Option/Alt-

click to show/hide all other folders at the same level. Command/Ctrl-Option/Alt-click to show/hide all folders at all levels.

In the Sequence Editor, you can freely drag tracks in and out of folders, even empty folders, by dragging them vertically. To span multiple levels of the folder hierarchy, drag left or right as you also drag vertically. Tracks become indented when they are dragged into a folder. You can also use Performer Lite's track color assignment features to further enhance your track folder organization.

Selecting tracks

To select tracks for the track management operations discussed in the next three sections, click or Command/Ctrl-click their names to select them.

Adding, duplicating and deleting tracks

Use the track-related menu items in the Project menu to add, duplicate, delete and otherwise manage tracks in the Sequence Editor. Select the tracks you wish to duplicate or delete. You can also select a track to add a new track just below it.

Making audio track input/output assignments

The Track Assignments command in the Studio menu is a convenient shortcut for making input and output assignments to many tracks in one quick operation. Select the tracks you wish to assign and then choose the *Track Assignments* from the Studio menu. For further details, see "Making I/O assignments for multiple tracks" on page 71.

INFORMATION BAR

The Information Bar (Figure 18-1 on page 122) is a configurable strip at the top of the Sequence Editor (Figure 18-6). It provides convenient access to essential settings from the Information panels (chapter 39, "Information Panels" (page 356)).

Configuring the Information Bar

To configure the Information Bar, right-click anywhere on it (as shown in Figure 18-6) or go to the *Preferences* > *Information Bar* (Figure 18-7). Show and hide sections as desired.

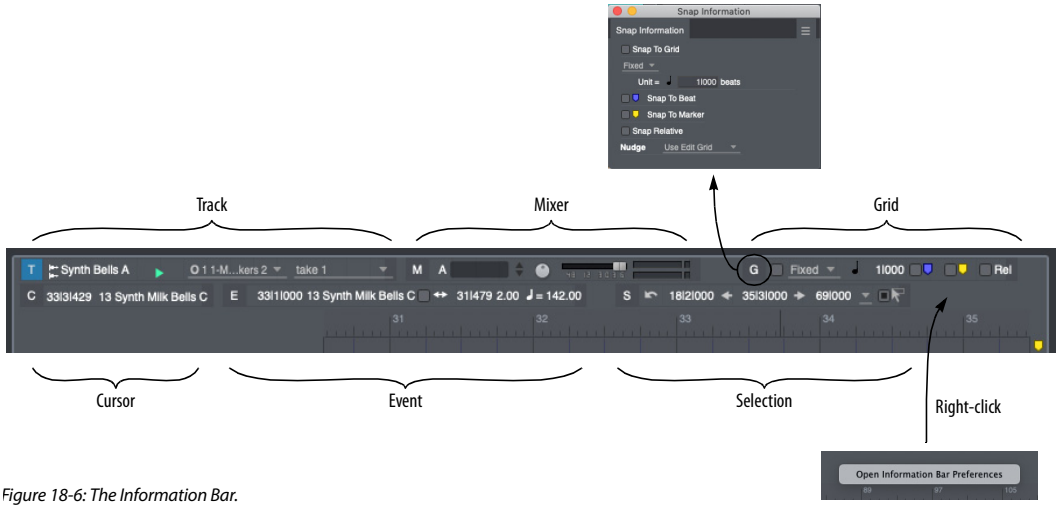


Figure 18-6: The Information Bar.

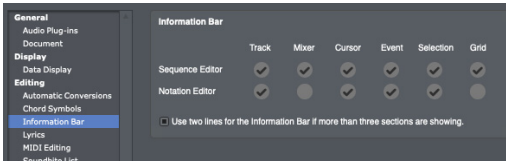


Figure 18-7: Information Bar preferences.

When configuring the Information Bar, you can:

- choose which sections are visible, and
- choose which fields are shown within each section.

To choose which sections are visible, check or uncheck them as desired (Figure 18-7). To completely hide the Information Bar, hide all panels.

To choose which fields from a particular Information panel appear in the Information Bar, open the panel and choose *Configure Info Bar* from its mini-menu: the panel will enter configuration mode, as shown in Figure 18-8.

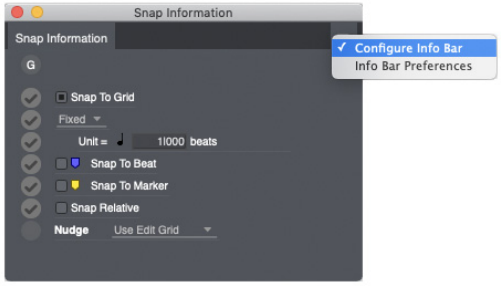


Figure 18-8: Choosing which fields to show in the Information Bar.

To display a field in the Information Bar, check the circle next to the field; to hide the field, uncheck it.

Each window maintains its own configuration of each Info Bar section. For example, you can choose to show Selection Start, Selection End, and Selection Duration in the Sequence Editor, but only show Selection Start and Selection End in the Notation Editor.

When an Information window is in configuration mode, you're configuring its appearance in the active window's Information Bar. For example, when the Sequence Editor is focused and the Cursor Info window is open in configuration mode, enabling or disabling a field does so for the Cursor Info section of the Information Bar in the Sequence Editor. If you leave the Cursor Info window in configuration mode and change which edit window is focused, say, from the Sequence Editor to the Notation Editor, the Cursor Info window will update to the configuration used for the new window. If you wish to enable or disable a field for all windows at once, Option/Alt-click the field's circle.

Using two lines for the Information Bar

The "Use two lines…" option in the Information Bar preferences splits the Information Bar elements into two lines when more than three sections are showing to give each section more room to display its contents.

Opening the Information panels

To open an Information window from the Information Bar, click the letter at the left of the section, as shown in Figure 18-6. Option/Alt-click the letter to open the Information panel in configuration mode. Command/Ctrl-click the letter to open the Information Bar preferences.

For more information about the Information Panels, see chapter 39, "Information Panels" (page 356).

THE TIME RULER

The Time Ruler (Figure 18-1 on page 122) measures time horizontally for all MIDI and audio data in the Sequence Editor tracks below it.

Figure 18-9: The Time Ruler gives you a visual indication of where data is. It can display time in any of Performer Lite's various time formats.

Cursor tracking

To help align the mouse pointer with the Time Ruler, a line appears inside the Time Ruler to indicate the current position of the mouse. The cursor location is displayed numerically in the cursor information section of the information bar.

Choosing time formats

The Time Ruler can display time in any of Performer Lite's various time formats. Right-click to choose the desired format.

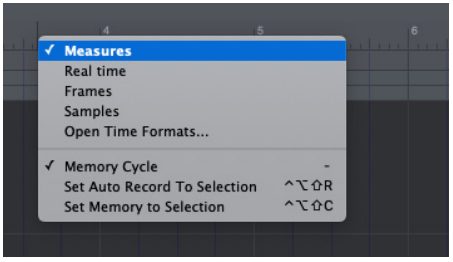


Figure 18-10: Setting the format for the Time Ruler.

Zooming the Time Ruler

See "Zoom buttons" and "Zooming techniques" on page 129.

Using the Time Ruler to cue playback

You can click the time ruler as shown below to cue Performer Lite to that location.

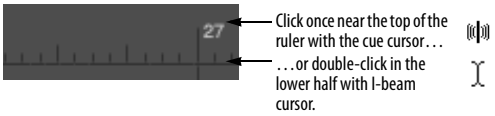


Figure 18-11: Cueing playback in the Time Ruler.

Using the Time Ruler to select a time range

A time range can be selected by dragging horizontally in the lower half of the Main Time Ruler with the I-beam cursor as shown below. For more similar techniques, see "Time Ruler selection techniques" on page 309.

Figure 18-12: Selecting a time range in the Time ruler.

THE MARKER STRIP

The Marker Strip appears just below the Time Ruler (Figure 18-1 on page 122). It displays markers, meter changes, and key changes. It is always visible and is not affected by vertical scrolling.

The Marker Strip shares the Time Ruler with the audio, MIDI and movie tracks below it. Therefore, the location of items in the Marker Strip will always correspond with data displayed below.

Markers

To add a marker, click the marker icon to the right of the strip and drag and drop the marker onto the Marker Strip at the desired location.

In the Marker Strip, a marker appears as a marker icon, followed by the marker's name. The marker icon indicates the marker's exact location. If the marker is locked, a lock icon will appear between the pointer and the marker name.

Snap to Markers
To make items snap to marker locations (regardless of whether marker grid lines are currently displayed), enable the *Snap to Marker* option (Figure 18-1 on page 122).

Making a time-range selection with markers
Click the marker to make a time range selection that extends to the next marker.

Meter and key changes

Meter and key changes appear in the Marker Strip (Tempo changes are not displayed in the Marker Strip.) Similarly, they can only be edited in the Conductor track. See "Editing in the Conductor Track" on page 449.

THE MEMORY CYCLE STRIP

The Memory Cycle strip (Figure 18-1 on page 122) displays the Memory Cycle loop as a colored bar. Drag in the strip to enable Memory Cycle and set the start and end times. Drag the endpoints of the bar to change them, or drag the bar to move it. Click the bar to toggle Memory Cycle on or off. Also see "Memory Cycle" on page 117.

THE AUTO RECORD STRIP

The Auto Record strip (Figure 18-1 on page 122) displays the Auto Record punch-in/out region as a colored bar, which works in the same fashion as described for the Memory Cycle bar above. Also see "Auto-Record" on page 118.

ZOOM BUTTONS

The Sequence Editor zoom buttons (Figure 18-1 on page 122) let you zoom all tracks both horizontally and vertically. Zoom in using the 'plus' button to get more detail. Zoom out with the 'minus' to get more of an overview. If you press continuously, the window zooms continuously. Shortcut: Option/Alt-click to zoom to the maximum or minimum setting. When zooming vertically, tracks proportionally maintain their relative vertical sizes.

ZOOMING TECHNIQUES

In addition to the zoom buttons shown in Figure 18-1 on page 122, Performer Lite provides many other ways to zoom in and out, including many useful zooming shortcuts. In particular, you can very quickly and conveniently zoom in and out by Control/Win-dragging vertically on the green playback wiper.

Zoom shortcuts

The *View menu* > *Zoom* sub-menu provides many useful options for magnifying or reducing the data displayed in the Sequence Editor. See "Zoom menu shortcuts" on page 299.

TRACK SETTINGS

The panel to the left of each track shows all of the settings for the track, as demonstrated below.

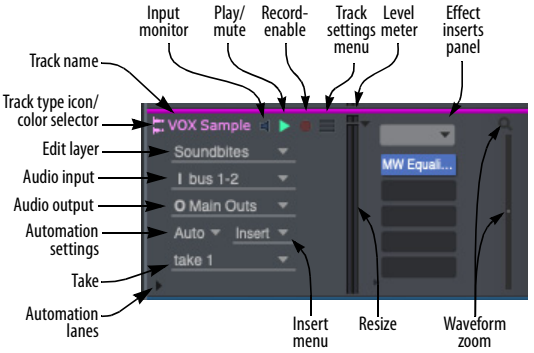


Figure 18-13: Audio track settings. The display of these controls changes depending on the vertical size of the track.

Additional settings can be found in the Track settings menu for each track (shown above). The following track settings menu items are specifically related to the Sequence Editor:

Setting	For further information
View mode	"View Mode" below
Set Pitch Mode	"Setting the pitch mode" on page 552
Pitch	"Temporarily disabling pitch modifications" on page 555

For further information about track settings:

Track Type	For further information
All tracks	"Track settings" on page 59
Audio tracks	"Audio track settings" on page 68
MIDI tracks	"MIDI track settings" on page 74
Instrument tracks	"Instrument track settings" on page 83
Aux tracks Master Fader track	chapter 14, "Aux Tracks and Master Fader Tracks" (page 89)
VCA tracks	chapter 56, "VCA Tracks" (page 509)

View Mode

The View Mode sub-menu lets you display an audio track in the Sequence Editor in three ways: as a waveform, as a spectrogram or both.

The spectrogram display

The spectrogram display shows frequency content (along the vertical axis) against the Sequence Editor time line (horizontal axis). Bright spots indicate harmonic content in the audio frequency spectrum. This gives you visual insight into the frequency content of your audio, which can help you do things like balance the frequency content of your tracks using visual feedback. You can also use Performer Lite's extensive plug-in processing to manage and manipulate the frequency content of your audio tracks, and the spectrogram display allows you to view the results visually.

AUDIO EDITING

To learn about Performer Lite's powerful audio editing features, see chapter 37, "Audio Editing" (page 330).

MIDI EDITING

To learn about Performer Lite's powerful MIDI editing features, see chapter 36, "MIDI Editing" (page 313).

RESIZING TRACKS

Both MIDI and audio tracks can be resized vertically. Position the mouse over the bottom edge of the track settings panel until you see the hand cursor. Then drag up or down as desired.

Shortcuts for vertical track resizing

Use the following shortcuts to resize tracks:

To do this:	Hold down this key while dragging:
To make all tracks the same height	Option/Alt key
To enlarge one track and make all other tracks scale their height to fit in the window	Control/Win key
To zoom back to the previous state after either of the above operations	Press command-[(left bracket), or choose Zoom Back from the Zoom sub-menu in the Sequence Editor menu.
To make tracks snap to fixed sizes vertically	Command/Ctrl key

These modifier key shortcuts can also be used when vertically resizing from track setting menus as shown below:

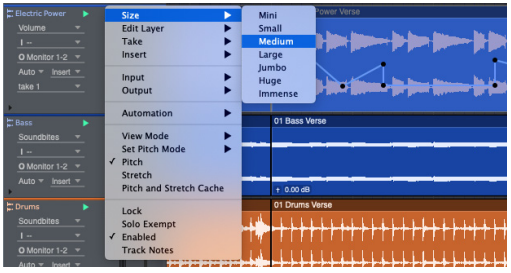


Figure 18-14: Resizing tracks from the track settings menu.

Resizing the track info panel

The Track Info Panel (Figure 18-13 on page 129) can be resized horizontally by dragging the handle on its right-hand edge. The menu items for each track automatically rearrange themselves in the panel as its width changes. By dragging it further to the right, you have more direct access to the menus when viewing many tracks at once with small vertical track settings, as demonstrated in Figure 18-15:

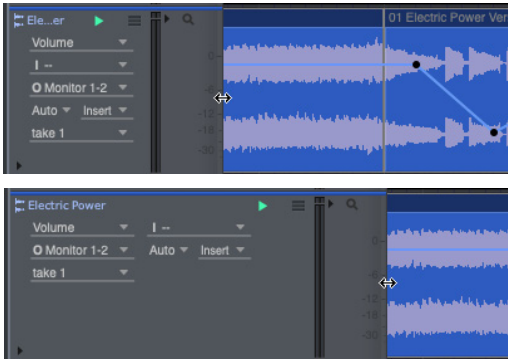


Figure 18-15: Track Info panel can be resized horizontally.

THE MOVIE TRACK

The movie track displays the movie you've opened in the Performer Lite project, if any. Frames are displayed as frequently as possible, given the horizontal frame size. Frames will never overlap, but if you zoom in further than the resolution of the movie frames (such as 15 frames per second), movie frames might be repeated in the display (if there's room) until the next frame occurs.

All of the controls for the Movie window, such as the movie start time, are available in the track setting panel to the left of the movie track. For details about these settings, see "Movie Window" on page 291.

THE CONDUCTOR TRACK

See "Editing in the Conductor Track" on page 449.

CHAPTER 19 Notation Editor

OVERVIEW

The Notation Editor allows you to view and edit any number of MIDI tracks and instrument tracks as standard music notation.

Performer Lite interprets unquantized MIDI data, notating it in a readable fashion without permanently quantizing the data, so your original performance is always preserved. In fact, the notation transcription engine used in Performer Lite has been recognized by industry experts as the best available in *any* music software program. Music is displayed and edited on a page on the screen exactly as it will print on your printer.

Notes can be inserted with the mouse, computer keyboard, or via MIDI step entry. You can also transpose and edit using all of Performer Lite's powerful commands in the Edit and Region menus.

The Notation Editor provides intuitive text entry for preparing title pages, headers, footers, lyrics, and page numbers. It lets you adjust system margins, staff spacing, measure spacing, and other formatting. Arrangement features let you print out scores, lead sheets and other music documents that have been fine-tuned and consolidated for printing.

Overview 132
Notation Editor Quick Reference 133
Notation Editor menu 134
Notation Editor basics 136
Opening the Notation Editor 137
The Track Selector 137
The QuickScribe transcription engine 137
The playback wiper 137
Getting around in the Notation Editor 138
Zooming 138
Notation Editor options sub-menu 139
Score options 139
Track options 141
Marker options 143
Measure numbers 144
Measure spacing 144
Set Score Length 145
Controlling page size 145
Adjusting system margins 145
Information bar 145
The Notation Editor Tool Palette 146
Working with notes 146
Chord Symbols 150
Inserting a staff brace or bracket 152
The Dynamics Palette 152
The Articulations Palette 153
Popup Meter Changes, key changes and tempos 154
Working with text 155
Lyrics 158
Score Arrangement 161
Display-only and playback-only notes 166
Film Cues view 167
Printing 170
Exporting a musicXML file 171

NOTATION EDITOR QUICK REFERENCE

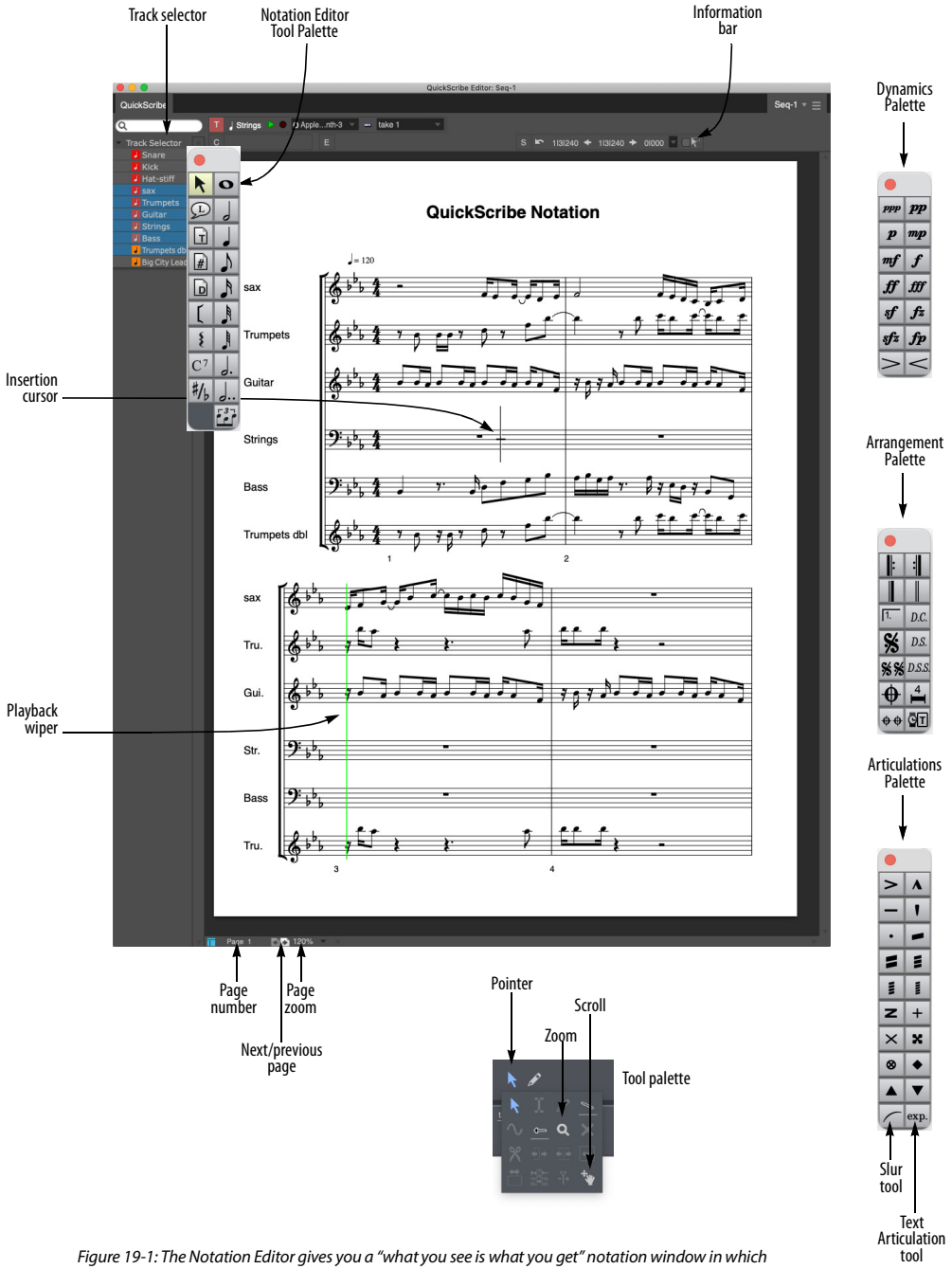


Figure 19-1: The Notation Editor gives you a "what you see is what you get" notation window in which you can view, edit, and print your music.

Dynamics Palette: Provides graphic insertion of dynamics symbols.

Arrangement Palette: Provides symbols, such as repeat barlines and endings, that help to condense the display of the score for previewing and printing.

Articulations Palette: Provides standard articulation symbols and percussion noteheads.

Insertion Cursor: Indicates the location at which notes will be inserted via computer keyboard entry. Click on the staff with the pointer to activate the insertion cursor, and then use the arrow keys to change its location and pitch.

Next/Previous Page: Scrolls to the next or previous page, if any.

Page number: Click on the page number and type in a different page number to jump directly to that page.

Page zoom: Provides preset levels at which to enlarge or reduce the size of the notation displayed in the window. You can also zoom with the Zoom tool in the Tool palette.

Playback Wiper: Indicates the main counter location. Drag it to scrub all MIDI tracks.

Notation Tool palette: Provides mouse insertion of notes, dotted notes, triplets, text, lyrics, chord symbols, braces, brackets and note spellings.

Tool palette: When the Notation Editor is open, the Tool palette gives you access to the Pointer and Zoom tools, which both can be used in the Notation Editor.

Track Selector: Click track names to show or hide them in the Notation Editor.

NOTATION EDITOR MENU

Go to Page: Provides sub-menu commands for scrolling to the next, previous, first or last page.

Go to measure: Jumps to the page containing the measure you specify.

Options>Score options: Provides many options for displaying the score in the Notation Editor.

Options>Track options: Provides unique display options for individual tracks.

Options>Marker options: Provides options for the display of markers in the score.

Options>Lyrics options: Provides options for the display of lyrics in the score.

Options>Chord Symbol options: Provides options for the display of chord symbols in the score.

Options>Measure numbers: Provides options for the display of measure numbers in the score.

Options>Measure spacing: Provides options for how tightly or loosely notes are spaced in the score.

Options>Set Score Length: Lets you specify the length of the score, for both linear view and arrangement view. In linear view, the score length can also be determined automatically.

Edit System Margins: When checked, this menu item displays draggable system margins for the current page. The Notation Editor provides separate system margin settings for the first page versus all subsequent pages. The system margins control the distance of staff lines, as well as all staff-related text like instrument names, from the edge of the page.

Print Individual Parts: Prints each staff currently being shown in the Notation Editor as a separate part using the current system margin and page text settings. Each part is printed exactly the same way as it would if it were being displayed by itself in the Notation Editor, including its part transposition, if any.

Tool Palette: This checkable menu item shows and hides the Notation Editor tool palette.

Dynamics Palette: This checkable menu item shows and hides the Notation Editor dynamics palette.

Arrangement Palette: This checkable menu item shows and hides the Notation Editor Arrangement palette. These tools only work when you have selected *Show Arranged Score* (described earlier), except for the Time-Anchored text tool, which can be used in the linear score view as well.

Switch Staff: Moves the currently selected notes into the other hand on a piano (grand) staff.

Change Selected Notes to: Lets you specify notes as *Display-only* (silent) or *Playback-only* (hidden), change notes to small noteheads (or back to normal-sized noteheads), or change note durations to *Automatic* or *Manual*.

Split Selected Normal Notes: This command operates only on those selected notes that are *normal*, i.e. a note that is not set to be *Display-only* or *Playback-only*. This command replaces each selected normal note with two copies of itself: a Playback-only copy and a Display-only copy. The purpose of this command is to make it easy to start editing the appearance of a measure without changing the playback of the measure.

Display-only Notes: This sub-menu provides several commands for selecting, showing/hiding, and playing/muting notes that have been designated as *Display-only* notes (with the *Change Selected Notes to* menu command described above).

Playback-only Notes: This sub-menu provides several commands for selecting, showing/hiding, and playing/muting notes that have been designated as *Playback-only notes* (with the *Change selected notes to* menu command described above).

Show Lyrics: This option toggles the display of lyric text in the Notation Editor score.

Show Film Cues: This checkable menu item shows and hides the Film Cues View at the top of each system in the Notation Editor.

Show Arranged Score: When checked, this menu item causes the Notation Editor to display the arranged notation view. When not checked, the Notation Editor will show the linear notation view. Initially, the arranged view will be the same as the linear view, except that certain tools and commands can be used only in the arranged view. In the arranged view, the score can contain repeats, endings, coda and segno symbols, and score jumps like D.S. al Coda (which the wiper will follow during playback). As you apply tools from the Arrangement palette and begin to "hide" and "move" measures, the arranged view will start to differ from the linear view. Changing the arranged view does not change the playback of the piece — it just changes the look of the score and changes where the wiper goes during playback (and makes your notation more readable when you print it out). See "Score Arrangement" on page 161 for a complete explanation of how to create and print out an arranged view of your score.

Show Alternate Bar Menus: Displays a small square pop-up menu next to each regular measure number displayed on the Notation Editor page. Each alternate bar menu shows all of the linear

bars that are currently associated with an arrangement bar. This menu item is only available when the *Show Arranged Score* command is checked. When working on an arrangement, also be sure that *Show measure numbers* is turned on (under *Options> Measure Numbers*), and that they are set to display on every measure.

Allow Measure Selection: When checked, this menu item lets you select entire measures by clicking and Shift-clicking on them with the Notation Editor arrow tool. When a measure is selected, you can then apply score arrangement operations to the measure (such as hiding, "popping-out" or moving them).

Clear Arrangement: Reshuffles the measures in the arrangement view back to a completely linear state where no bars are hidden. All consolidated rests are unconsolidated. Deletes all Coda, double Coda, Segno and double Segno symbols from the score, as well as all endings. It will NOT delete any time-anchored text, including time-anchored text boxes that were created using the D.C., D.S., or D.S.S. tool.

Edit Selected Measures>Hide: When you *Hide* a measure behind another measure, it disappears. But when playback reaches a hidden linear measure number, the wiper will jump to the measure where you "hid" it and wipe over that measure while playing the hidden linear measure. Use this feature to hide the second instance of repeated measures behind the first instance, or to hide the second and third verse measures behind the first verse measures.

Edit Selected Measures>Pop Out: Extracts the currently visible linear measure (in a selected arrangement measure that has several linear measures "hidden" in it) and places it just to the right of the arrangement measure you selected. After being liberated, you can then move the popped-out measure anywhere in the score (such as its original linear position). This operation is the opposite of "hiding" a measure.

Edit Selected Measures>Move: Positions the currently selected measure anywhere in the score. You will be asked where you want to move the selected measure to, and you then specify an arrangement measure location.

Consolidate Rests / Unconsolidate Rests: Specifies the minimum number of consecutive empty measures that will be displayed as consolidated rests for all tracks currently visible. If a track is already set to consolidate rests in a certain way, it will continue to prefer that setting when it is shown by itself or in combination with other tracks.

Make Arrangement Markers: Creates markers for interesting points in an arranged score. In particular, a marker is created at the start of every repeat, at segno and coda marks, and at the start of each ending. Open the markers window to quickly navigate to the various parts of the arrangement. Markers can be shown or hidden in the Notation Editor with the *Show Markers* check box in the Marker Options window.

Open Selected Ending Bracket: Gets rid of the small vertical line at the end of the currently selected ending bracket. Doing so implies that the reader of the score should continue on after taking the ending.

NOTATION EDITOR BASICS

The Notation Editor display MIDI tracks as music notation, and you can easily change which tracks are displayed. Page formatting is preserved, even if you decide to change what is displayed in the window. The Notation Editor is ideal for quickly printing scores and parts.

The Notation Editor uses engraver spacing so that the notation looks more natural for printing. In addition, the Notation Editor displays staves on a page — essentially a virtual piece of paper — such that what you see on-screen is what you get when you print a Notation Editor score. The Notation Editor automatically generates as many pages as needed to hold your score. The contents of the Notation Editor can be printed at any time. This chapter explains all about preparing the appearance of the score. For information about printing it, see "Printing project windows" on page 102.

OPENING THE NOTATION EDITOR

To open the Notation Editor, click it's button in the Control panel (Figure 7-4 on page 44).

THE TRACK SELECTOR

Use the Track Selector (page 44) to choose which tracks (instruments) you'd like to see in the Notation Editor.

THE QUICKSCRIBE TRANSCRIPTION ENGINE

The Notation Editor employs a highly sophisticated transcription engine called *QuickScribe* to interpret unquantized MIDI data as readable music notation. QuickScribe tries to write the music just like it sounds — perhaps like you might write it down if you listened to a tape of it and tried to transcribe it yourself by ear. Transcription is not an exact science, and QuickScribe does its best to take precisely recorded MIDI data (which is often played much differently than the way it is written), make "human" judgments about how it might be written, and then turn it into readable notation.

Floating split points and multiple voices

Performer Lite's QuickScribe transcription engine is quite sophisticated. For example, it employs floating split points when notating a track on a grand staff, intelligently deciding whether notes should be written on the treble or bass clef staves. QuickScribe can also notate multiple voices on a single staff — that is, notes that have different rhythms happening at the same time in the same measure. But you don't really need to know any of this; the result of it all is that you get some of the best automated notation transcription available in music software.

Displaying triplets and tuplets

In addition to being able to properly display unquantized data, Performer Lite automatically detects triplets and tuplets and displays them with the appropriate bracket and note spacing. In some cases, the placement of the notes in the tuplet may not be accurate enough for Performer Lite to properly detect the tuplet. If you'd like to see the tuplet properly displayed, try quantizing the data with the tuplet option in the Quantize command. Try experimenting with Strength settings less than 100%, as the tuplet does not need to be fully quantized for Performer Lite to recognize it. However, if all else fails, quantize the start time of all notes in a given measure to be sure that triplets and certain other rhythms will be detected.

Context sensitive note spelling

QuickScribe's transcription engine also takes into account the context in which an accidental is spelled. For example, in an ascending line, QuickScribe will use a sharp to notate an accidental, but use a flat in a descending line.

THE PLAYBACK WIPER

The playback wiper operates as usual in the Notation Editor, with the following exception: since the Notation Editor employs engraver spacing for notes, it does not have a linear time ruler like Performer Lite's other editors. Therefore, to make the playback wiper jump immediately to a particular location, double-click on a staff at the desired spot. To scrub, drag the wiper as usual. Note that you can drag it vertically to jump to the next or previous staff system. If you drag horizontally off the end of a system, the wiper will

continue on to the next system at its current speed, as long as the mouse is held down. Continuing to drag left and right with the mouse will change the speed and direction of the "runaway wiper".

GETTING AROUND IN THE NOTATION EDITOR

Use the next/previous page buttons (Figure 19-1 on page 133) or the corresponding Notation Editor menu commands to scroll through each page and go to the first or last page. The menu commands have the following keyboard shortcuts:

Menu command	Keyboard shortcut
Next page	N
Previous page	P
First page	F
Last page	L

You can also jump to a particular page by using the page number box at the bottom of the window.

Figure 19-2: Click the page number to go to any page.

Mouse wheel scrolling

If your mouse has a wheel on it, you can scroll the Notation Editor vertically and horizontally with the wheel. To scroll horizontally, hold down the Shift key.

Notation Editor commands

There are many Notation Editor commands in the Commands window. These keyboard shortcut operations can greatly speed up your work in the Notation Editor, and they can be fully customized. For details, search for "Notation Editor" in the Commands window (Setup menu).

ZOOMING

The contents of the Notation Editor can be magnified and reduced with the following mouse techniques:

To do this:	Do this:
To go directly to a particular zoom magnification (such as 400%)	Choose it from the zoom menu at the bottom of the window (Figure 19-1 on page 133).
To zoom in with the Zoom tool	Select the Zoom tool in the Tool palette (Figure 19-1 on page 133) and drag over the desired area, or click to zoom in one level.
To zoom in or out with the scroll wheel	Hold Option/Alt while moving the scroll wheel.
To zoom out with the Zoom tool	Option/Alt-click.
To zoom in with the Pointer tool	Select the Pointer tool and Option/Alt-drag over the desired area.
To zoom forward with the Pointer tool	Option/Alt-Control/Win-Shift-click.
To zoom back with the Pointer tool	Option/Alt-Shift-click.

Keyboard zooming shortcuts

The Notation Editor supports Performer Lite's zooming keyboard shortcuts for *Zoom to Selection*, *Zoom Forward/Back*, *Zoom to Setting*, and *Set Zoom Setting*. These shortcuts are explained in "Zoom menu shortcuts" on page 299. They can be customized as explained in chapter 29, "Commands" (page 257). When zooming to a selection, the Notation Editor zooms to the center of the area prescribed by the currently selected notes.

NOTATION EDITOR OPTIONS SUB-MENU

The Options sub-menu in the Notation Editor menu provides several commands for controlling the appearance of your score.

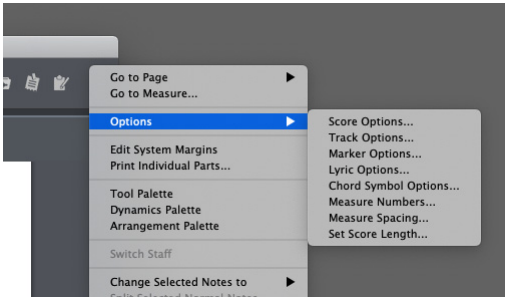


Figure 19-3: The Options sub-menu.

Separate Notation Editor options for three different views

Performer Lite maintains a separate set of score options for three separate Notation Editor views: *Normal Notation*, *Notation + Film Cues*, and *Film Cues Only*. (See "Three different Notation Editor views" on page 169.) When you enable one of the three different views, they are displayed with their own set of options. Four of the options dialogs shown above in Figure 19-3 (Score Options, Measure Spacing, Measure Numbers and Marker Options) contain a popup menu that lets you select which set of preferences you are editing:

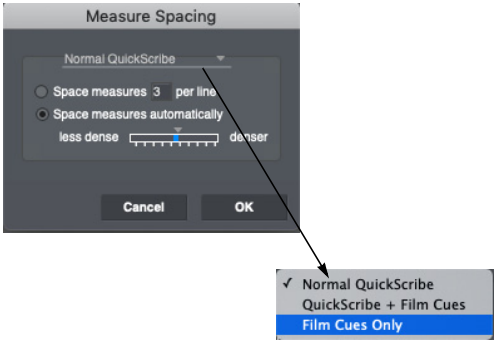


Figure 19-4: Setting options for the three different Notation Editor views.

SCORE OPTIONS

Choose Score Options (Figure 19-3) to open the Score Options dialog box:

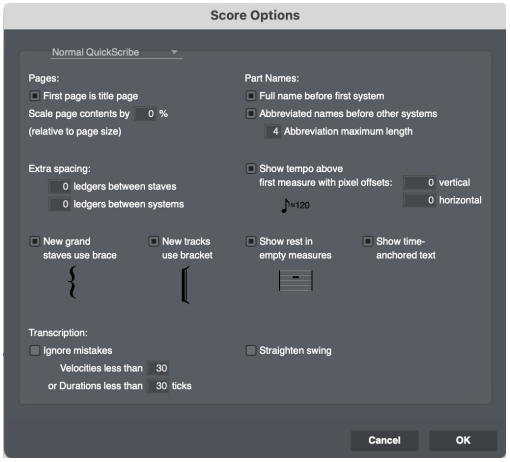


Figure 19-5: The Score options command in the menu gives you many choices for laying out your score.

Creating a title page

The "First page is title page" option allows the first page of music to be formatted differently from the rest of the body pages. Its system margins can be adjusted separately from other pages to allow for a title, subtitle, composer, and other text. Text can be inserted on the title page without having it be displayed on other pages.

Page Scaling

The Page Setup command (File menu) lets you control the size of the page in the QuickScribe Editor. The *Scale page contents by ___%* option (Figure 19-5) lets you control the size of the notation relative to the page size. To fit more material on the page, enter a percentage lower than 100%. Values higher than 100% make the notation larger on the page. Either way, the page size remains the same and QuickScribe material scales relative to the page size.

On Mac, the *Scale page contents* setting produces results similar to the *Scale* setting in Page Setup (File menu). However, the Page Setup setting is bound to the currently selected printer driver on your computer. If you open the document on a different computer, or change the printer driver, you may lose the Scale setting and the layout of your notation in the QuickScribe Editor could change dramatically. Therefore, it is recommended that you leave the Page Setup Scale setting at 100% and use the Score Options setting instead. The benefit of this approach is that the page scaling is saved with the project and transfers across platforms and devices. If you open the project with a different printer driver selected, or open it on a different computer, the scaling won't change.

System margins and text
When adjusting the *Scale page contents* setting, system margins ("Adjusting system margins" on page 145) are not affected: they remain the same at any percentage.

When changing the *Scale page contents* setting, page text such as titles, page numbers, time-anchored text, etc. (see "Working with text" on page 155) may shift slightly, due to the interaction between the scaling engine and the page size. Therefore, try to choose an optimal scale setting for your score prior to entering a lot of text, in order to minimize this effect.

Full part names/Abbreviated part names

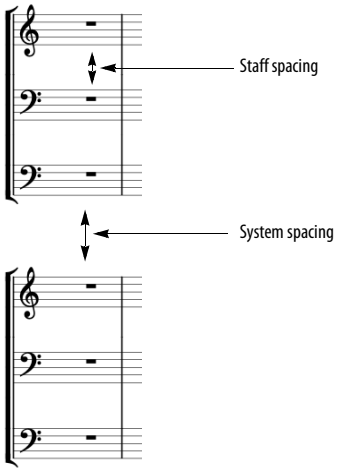
Two options are provided for displaying staff names, which appear between the left margin and the left edge of the staff. In both cases, the staff name is derived from the track name. Check the first option, *Full name before first system*, to display the full track name to the left of the first staff. Check the second option, *Abbreviated names before other systems*, if you would like an abbreviated name to appear next to each staff after the first one. By default, the abbreviation is the first four letters of the staff name, but this can be customized as explained in "Track name abbreviation" on page 143. If you don't want staff names, uncheck both options.

The *Abbreviation maximum length* option lets you choose the maximum length of the default abbreviated staff names.

To set the font, style, size, etc. of all staff names, click any staff name and choose the desired text settings from the Text menu. The settings you choose will affect all staff names and abbreviations.

Adjusting the space between staves and staff systems

In addition to the space created above and below individual staves by their ledger line settings, you can make more space between staves and staff systems globally with the "Extra spacing" options. When you are printing a single track, use either option to increase the amount of space between the staves. If you are printing several tracks at the same time, they are grouped together into a staff system. Use the staff spacing option to increase space within the system; use the system spacing option to increase space between systems.



Show tempo marking above first measure
Performer Lite takes the tempo for the metronome marking from the tempo setting in the first measure displayed in the score. The tempo number is taken from the current settings in the metronome panel. For example, if the tempo control is set to the Fixed Tempo, the current tempo setting is used. If tempo control is set to the Conductor track, the current tempo setting in the Conductor track is used.

The *Pixel offsets* option lets you adjust the position of the tempo marking. Positive offsets move the marking up and to the right. Negative offsets move it down and to the left.

System Bracket/Grand Staff Brace options
These two options let you choose whether or not new tracks should default to using a bracket or a brace. Brace and bracket groupings can easily be changed by using the brace and bracket tools in the Notation Editor Tool Palette.

Show rests in empty measures
You may choose whether or not to show a whole rest in empty measures (measures with no note data in them).

Showing/hiding time-anchored text
Use the *Show time-anchored text* option (Figure 19-5 on page 139) to show or hide time anchored text ("Time-Anchored Text" on page 156).

Transcription
The *Ignore Mistakes* options help clean up the transcription by ignoring (hiding) notes that have either a very short duration or a very low velocity—typical characteristics of notes that were played by mistake. You can adjust threshold for what is considered a "mistake" by adjusting the duration and velocity settings provided. The Ignore Mistakes option can be especially helpful when viewing performances with lots of grace notes or lead-ins. Note, however, that if you want to choose which notes to show on a case-by-case basis, you can also make any note invisible by setting it to be "playback only". For details, see "Display-only and playback-only notes" on page 166.

When you check the *Straighten Swing* option, the Notation Editor automatically writes swung eighth notes as straight eighths, instead of writing them as triplets with a triplet bracket. Only the display of the notes is affected. The actual MIDI data remains unmodified, so it will still play back with the original feel. This option is a great way to instantly clean up any score that was recorded with a swing feel.

TRACK OPTIONS

When displaying a track in the Notation Editor, the Track options sub-menu command (Figure 19-3) lets you specify how you want it to be displayed, such as whether to display the track on a single staff or a grand staff.

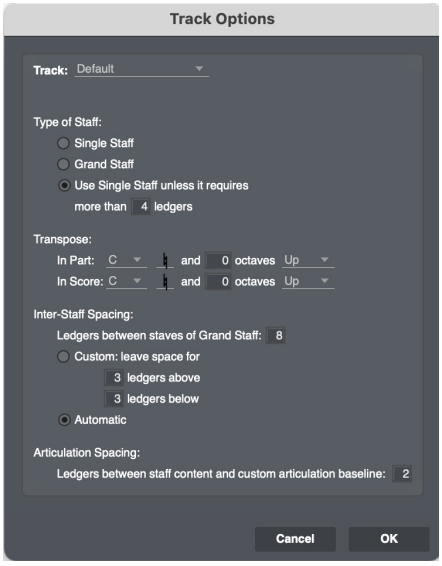


Figure 19-6: Track options.

Track menu

Choose each track one at a time from this menu and, below, choose the unique settings you want for each track. Settings are remembered. You can change them at any time. The "Default" item in this menu has its own settings, too; they are applied to any track for which you have checked the *Use Default* option (see below).

Use Default

This check box causes the track to use the default settings. To change the default settings, choose *Default* from the Track menu at the top of the dialog box (as shown in Figure 19-6).

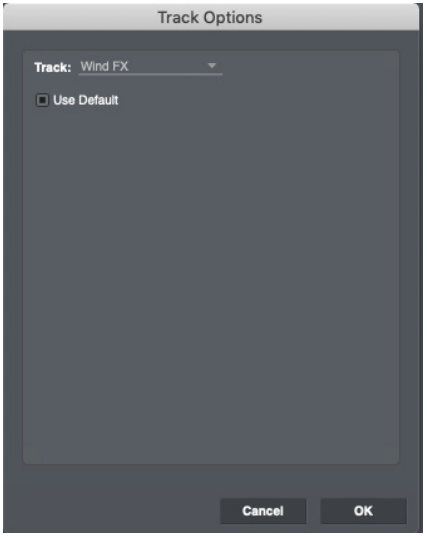


Figure 19-7: The 'Use Default' track option.

Type of staff (and clef)

When viewing the track options for an existing track as shown in Figure 19-6, choose the desired staff type and clef from the menu provided.

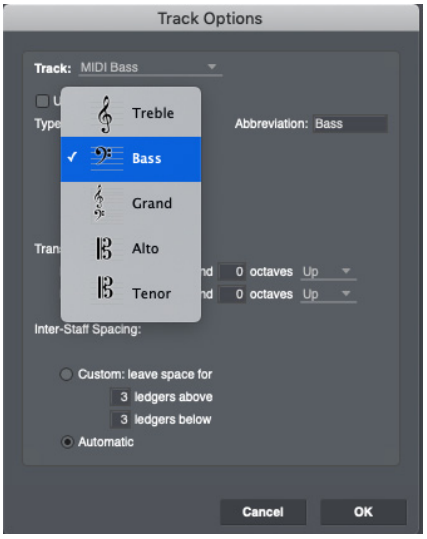


Figure 19-8: Choosing a staff type and clef for a track.

When viewing the 'Default' track options as shown in (Figure 19-7), you have five staff options.

Single staff

The *Single staff* option causes tracks using the default settings to be displayed on a single staff, regardless of what notes are in the track. When using a single staff, Performer Lite automatically chooses either a bass clef or treble clef in an effort to place most of the notes inside the staff and to avoid lots of ledger lines.

Grand staff

The *grand staff* option causes tracks using the default settings to be displayed on a grand staff, regardless of the notes in the track. Hand splitting is taken care of dynamically by Performer Lite's transcription engine.

Use single staff unless it requires more than ___ ledgers

This option causes Performer Lite to use a grand staff for the track if notes exist more than the specified number of ledger lines above or below a single staff. Use the ledger line option to control

when a grand staff will be used instead of a single staff. Raise the number if you want to avoid using the grand staff very often.

Track name abbreviation

When viewing the track options for an existing track as shown in Figure 19-6, type in any track name abbreviation you wish in the text box provided. This custom name abbreviation overrides the "Default" track abbreviation (as specified by the track abbreviation settings in the Score Options menu command).

When viewing the 'Default' track options as shown in (Figure 19-7), each track is given a default track abbreviation as specified in the Score Options (Figure 19-5 on page 139). See "Full part names/Abbreviated part names" on page 140.

Transposition

The *Transpose* settings specify a part (instrument) transposition for each track, as well as a score transposition. The Notation Editor uses the part transposition when you view or print the track by itself; it uses the score transposition when you view or print the track together with other tracks. You will most likely want to set the score transposition for each track to concert pitch, which is represented as C natural. For transposing instruments, choose the appropriate transposition. For example, you will also most likely want to set the part transposition for a B flat trumpet track to B flat.

Inter-staff spacing

These options give you control over the amount of space above and below the staff. This spacing is specific to the one track you are making settings for. To change the spacing of all staves, see "Adjusting the space between staves and staff systems" on page 140.

MARKER OPTIONS

Choose *Marker Options* (Figure 19-3) to display markers in the score at their location in the sequence. The marker text can appear above or below the staff, and you can control the distance from the staff by typing in a number of ledger lines in the box provided.

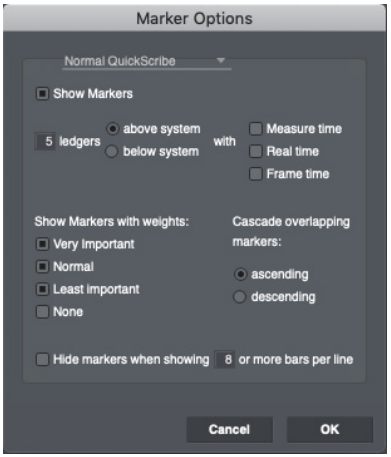


Figure 19-9: Marker options.

Displaying marker location

You can also choose to show the exact location of markers along with their name in any combination of Performer Lite's various time formats. Just check the box next to the time format you wish. This time is appended to the marker text:

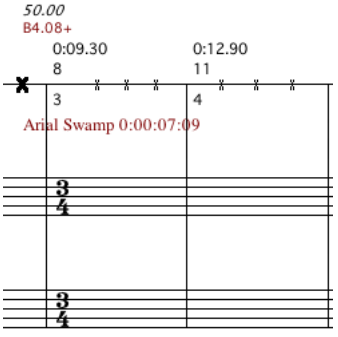


Figure 19-10: Displaying the marker (cue point) time in frames in Film Cues View.

Cascading overlapping markers

If markers occur close to one another, given the spacing of your score, you can use the *Cascade overlapping markers* option to force the Notation Editor to cascade them vertically rather than overlap their names:

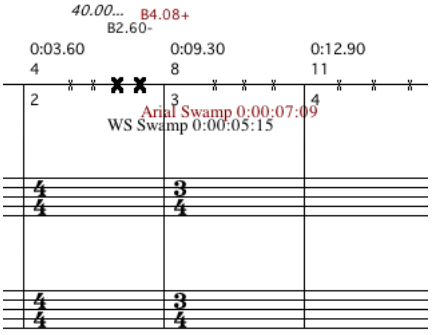


Figure 19-11: Cascading overlapping markers in Film Cues View.

Hiding markers in a dense score

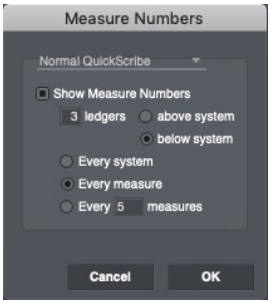
If you are using the *_ measures per line* measure spacing option, and measure spacing gets very dense, you can hide markers altogether with the *Hide markers when showing _ or more bars per line* option. When this option is enabled, and markers are being hidden, markers weighted *Very Important* remain visible and are displayed as dots.

Setting marker font, size, and style

To set the font, style, size, etc. of all markers, click any marker name and choose the desired text settings from the Text menu. The settings you choose will affect all markers.

MEASURE NUMBERS

The *Measure numbers* sub-menu command (Figure 19-3) sets the frequency and position of measure numbers in the score.



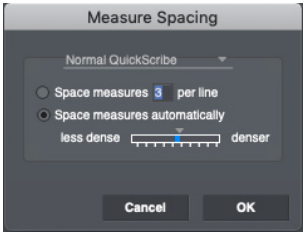
Measure number text formatting

Click any measure number displayed in the Notation Editor to select all measure numbers and change their font, size and style using the Text menu. Changes apply to all measure numbers in the document. Changes are saved in the preferences for the current view (Notation, Notation + Film Cues, or Film Cues Only), so the setting can be made independently by view.

☛ The measure numbers displayed just below the Show Film Cues staff (Figure 19-39 on page 168) cannot be formatted in this manner. They are displayed in a fixed font, size and style.

MEASURE SPACING

The measure spacing sub-menu command (Figure 19-3) lets you determine the number of measures per line or the overall spacing of notes.



Space measures ___ per line
This option lets you choose a certain number of measures per line, such as four or five. You can type in the desired number. With this option, each measure is the same size no matter what notes are in the measures.

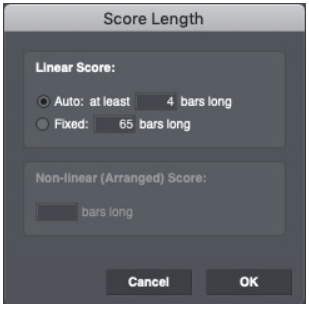
If measures have lots of notes in them, use automatic spacing for best results.

Space measures automatically
This option lets Performer Lite decide how many measures to put on each line, depending on how many notes are in them. You can tighten or expand the overall spacing of measures by adjusting the slider. Its range depends on the music: don't hesitate to experiment with its full range.The score will update in realtime as you drag the slider.

In many cases (depending on the music itself), automatic spacing produces the best-looking results.

SET SCORE LENGTH

The Set Score Length sub-menu command (Figure 19-3) lets you determine the length of the score.



Linear Score
The "Auto" option lets Performer Lite determine how long the score is; however, it won't be shorter than the minimum length specified here. The "Fixed" option sets the score to the exact length specified.

Non-linear (Arranged) Score
This specifies the length of the score when "Show Arranged Score" is enabled. This section is unavailable when "Show Arranged Score" is not enabled; likewise, when "Show Arranged Score" is enabled, the Linear Score section is unavailable.

CONTROLLING PAGE SIZE

The size of the page in the Notation Editor is controlled by the Page Setup command in the File menu. Custom page sizes are not supported.

ADJUSTING SYSTEM MARGINS

System margins can be adjusted graphically by choosing the *Edit System Margins* menu command in the Notation Editor. Doing so causes system margins to appear on each page. The adjustments you make on any page will automatically be reflected on all other pages, except for the title page, if there is one. If the *First page is title page* option is enabled in the Score options dialog (Notation Editor menu), the title page margins can be adjusted separately from the rest of the pages to allow for title text. In this case, you can adjust the system margins of the other pages by scrolling to any page besides the title page.

INFORMATION BAR

Similar to the Sequence Editor, the Information Bar (Figure 19-1 on page 133) can display useful information, such tracks settings, mixer channel settings and so on, as shown below in Figure 19-12.]

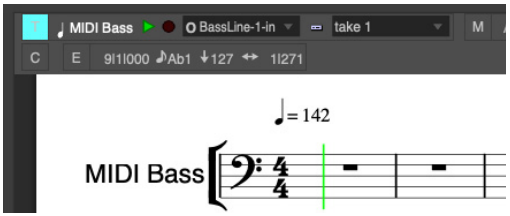


Figure 19-12: The Track Inspector in the Notation Editor Information Bar.

THE NOTATION EDITOR TOOL PALETTE

The Notation Editor Tool Palette allows you to insert notes, text, system brackets and braces, dots and tuplets. It also provides a tool for changing the enharmonic spelling of accidentals. The tools in this palette are explained in the following sections.

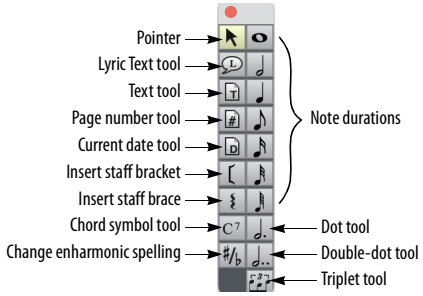


Figure 19-13: The Notation Editor Tool Palette.

Braces, brackets and barlines

Barlines extend across the staff systems that are grouped together with a brace or bracket.

WORKING WITH NOTES

The Notation Editor allows you to do basic sequencing tasks, including inserting, step-recording, transposing, and editing notes.

You can insert notes with the mouse, the computer keyboard, or a MIDI keyboard. All three methods involve using the tool palette.

Rests are automatic

Rests are handled automatically by Performer Lite's transcription algorithms. You do not need to enter them.

Inserting notes with the mouse

Insert notes and chords with the mouse as follows:

To insert this	Do this
A note	Click the desired note duration in the tool palette. Press anywhere in the measure where you want to insert the note. With the mouse still held down, drag to the desired pitch and location. Watch the Cursor Information window to help determine the beat location.
A note with an accidental	Same as above.
A dotted note	Click both the desired note duration and the dot in the palette. Then insert the same as above.
A chord	Insert the first note as described above. Click directly above or below the first note to add more notes to the chord.
A triplet	Click a note duration in the tool palette and click the triplet tool. Both are now selected. Insert each note in the triplet as described above. See "Displaying triplets and tuplets" on page 137 for more information about triplet detection.
To add a dot to a note	Click the dot tool and then click on the notehead you want to add it to.
To change the duration of a note	Click the desired duration in the palette and click the note.
To change several notes to the same duration	Select the notes with the pointer. Command/Ctrl-click the desired duration or dot in the tool palette. Note: to scale durations (to double or halve them, for example) use the Scale Time command in the Region menu.
To change the location or pitch of one or more existing notes	Choose the pointer and then drag the note as desired. To drag multiple notes, select them before dragging.

Inserting notes with the computer keyboard

To insert notes and other symbols with the computer keyboard:

1 Click the Pointer tool in the palette.

2 Click on the staff at the desired pitch and location for the symbol.

A blinking insertion cursor appears on the staff.

3 After you have a blinking insertion cursor on the staff, refer to the following table:

To do this	Do this
To move the cursor	Use the arrow keys.
To determine the exact beat location and pitch of the insertion cursor	Use the Cursor Information window.
To select a duration	Use the open bracket ([ ) and closed bracket ( ]) keys to choose the next highest and lowest duration. Or use the extended keypad (see "Selecting durations with the extended keypad" on page 147). Or click the desired duration in the palette.
To add a dotted duration to the current note duration	Press the d key to turn on the dotted duration tool; press it again to turn it off.
To insert a note and advance	Press return.
To insert a note with an accidental	Press the + or - key on the extended keypad.
To insert the first note of a chord	Press the enter key. (Enter inserts the note without advancing the insertion cursor.)
To insert the second, third, fourth, etc. note in a chord	Press the enter key.
To insert a tuplet	Press the t key to turn on the tuplet tool, and use the bracket keys as described above to select any note duration. Press t again to toggle off the tuplet tool.
To delete a note or chord	Position the insertion cursor to the right of the note and press the delete (backspace) key.

Selecting durations with the extended keypad

The extended keypad can be used to select durations in the Notation Editor tool palette during keyboard insertion, as shown below in Figure 19-14. On Windows, the Num Lock key must be engaged to enable these keypad shortcuts. These Notation Editor keypad shortcuts are only available when there is an active insertion cursor somewhere in the Notation Editor. Otherwise, the keypad keys are bound to Performer Lite's standard transport shortcuts.

Command	Keyboard shortcut
Arrow tool	[Clear]
Tuplet	[/]
64th note	[8]
32nd note	[7]
16th note	[6]
8th note	[5]
Quarter note	[4]
Half note	[3]
Whole note	[2]
Dot	[.]
Double dot	[=]

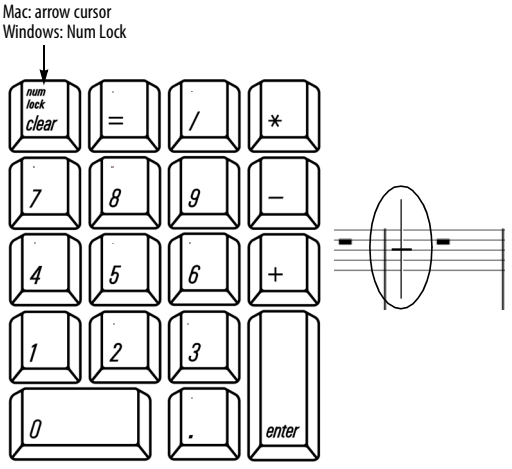


Figure 19-14: When there is an active insertion cursor in the Notation Editor (and it is the front-most window), the extended keypad provides these Notation Editor Tool Palette shortcuts. On Windows, the Num Lock key must be engaged.

Hearing notes while inserting them with the mouse

To hear notes played back on a MIDI device as you insert them, make sure the device is on line and audible (through your headphones or speakers).

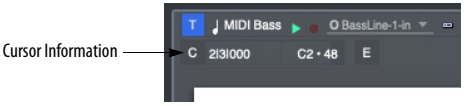
Step Recording notes with a MIDI controller

To insert notes with a MIDI controller:

1 Click the Pointer tool in the palette.

2 Click on the staff at the location where you would like to begin entering notes.

A blinking insertion cursor appears on the staff. Use the Cursor Information window to determine the exact location in the measure. If necessary, use the Left Arrow and Right Arrow keys to move the cursor.



3 Select a note duration.

There are several ways to select a duration: 1) click the desired note duration in the tool palette, 2) press the open bracket ([ ) and closed bracket ( ]) keys on the computer keyboard repeatedly, or 3) use the extended keypad as described in "Selecting durations with the extended keypad" on page 147. The currently selected duration is displayed in the tool palette.

4 Play the desired note or chord on your MIDI controller.

Notes appear when you release the keys, so be careful not to slur notes together. It's best to play in a staccato fashion to avoid accidentally inserting two notes when you only want to enter one. If you would like to hold one note while inserting others, just keep holding it down while inserting the other notes.

5 Play as many notes and chords as you'd like.

Change durations as needed. Step Recording uses many of the same keyboard actions as computer keyboard entry, so you may want to review the section "Inserting notes with the computer keyboard" on page 146.

Getting the pointer temporarily

While working with the Notation Editor Tool palette, you may want to temporarily restore the pointer for selecting or some other purpose. To do so, press the Option/Alt key. While you hold it down, the cursor turns into a pointer. When you release the Option/Alt key, the cursor switches back to whatever it was.

Selecting notes for editing

Below is a summary of how to select notes for editing in the Notation Editor. Notes are selected with the Pointer tool.

To select this	Do this
A single note	Click it once.
Several notes that are not next to one another	Shift-click each note.
The notes in several measures	Drag a selection box over the measures.
A region of notes	Drag a selection box over them.
All notes in the track	Double-click any note

☛ If a note is displayed as several tied notes, you can click any notehead to select the entire note.

When a single note is selected, its information appears in the Event Info window. This information can be edited as usual.

Dragging selected notes
To change the pitch of selected notes, drag them vertically. To change their time location, drag them horizontally. In either case, your action is constrained to the direction you first drag. For example, if you drag vertically to change pitch, your action is constrained to the vertical axis as soon as you begin dragging so that you don't accidentally move the notes in time as well. Conversely, if you drag horizontally first, your action is constrained horizontally so that you don't accidentally change pitch.

When dragging horizontally across multiple systems, you can drag to any staff in the system. (You are not limited to the original staff.)

Hold down the Option/Alt key when dragging notes if you want to drag copies of the notes.

Drag and drop from the Notation Editor
You can drag and drop selected notes out of the Notation Editor onto your computer desktop or into other Performer Lite windows. To do so, drag the material horizontally, not vertically, as vertical dragging is reserved for transposing the pitch.

Cutting, copying & pasting notes
After notes are selected as described in the previous section, they can be cut, copied, and pasted using the commands in the Edit menu. To paste notes you have either cut or copied, click the staff with the pointer on the location at which you would like to paste the material. Watch the Cursor Information window to specify the exact beat location at which you will paste. You can copy and paste between other editing windows as well.

Using Region menu commands
Similar to the Edit menu commands mentioned above. Any Region menu command can be applied to notes you have selected. This includes quantizing, transposing, and any other command from the Region menu.

Changing note durations
To change a note duration, click the desired duration from the tool palette and click on the note you wish to change. To change several notes at once, select them and then Command/Ctrl-click the desired duration in the tool palette.

Automatic vs. Manual durations
The Notation Editor's transcription engine automatically displays notes with intelligent durations that are best for notation. The *Change Selected Notes to Automatic Durations* and *Change Selected Notes to Manual Durations* commands, available under the Notation Editor menu's *Change Selected Notes to* sub-menu, let you change the display duration for selected notes.

Using *Change Selected Notes to Manual Durations* is somewhat like quantizing durations in the Notation Editor without changing the actual durations in the MIDI data. It means, "Be more precise in how the durations are notated, instead of using durations that make live recorded MIDI data look simpler." Using *Change Selected Notes to Automatic Durations* tells the Notation Editor to use durations which may be less precise but produce simpler notation. Neither command changes the duration of the actual MIDI note event.

Controlling note spellings
Accidentals in the Notation Editor are automatically calculated by the transcription engine.

Changing how an accidental is spelled
To change how an accidental is spelled:

1 Click the Change Enharmonic Spelling tool (Figure 19-13 on page 146).

2 Press on the notehead to the right of the accidental with the Change Enharmonic Spelling Cursor as shown below in Figure 19-15.

3 Choose the desired enharmonic spelling from the menu. Choose *Auto* to let the Notation Editor automatically choose the spelling using context-sensitive note spelling algorithms.

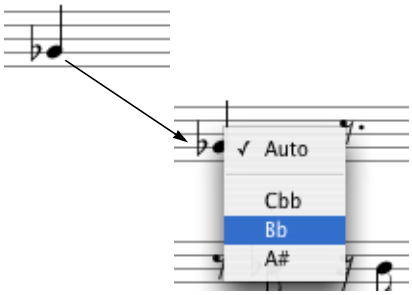


Figure 19-15: Changing the spelling of an accidental. Choose 'Auto' to let the Notation Editor automatically choose the accidental using context-sensitive note spelling algorithms.

Moving a note into the left or right hand on a grand staff

The QuickScribe transcription engine employs sophisticated, context-sensitive algorithms to determine if a note should be written in the right hand (treble clef) or left hand (bass clef) on a piano staff. There may be times, however, where you'd like to manually override QuickScribe and move a note to the opposite staff. To do so, select the note and choose *Switch Staff* from the Notation Editor menu.

Changing the size of a notehead

Performer Lite offers two notehead sizes: normal and small. Small noteheads can be used for embellishments, cue notes, and other notational elements that call for small noteheads. To change the size of noteheads:

1 Select the notes.

2 From the Notation Editor menu, choose *Change Selected Notes to> Small noteheads* or *Change Selected Notes to> Normal noteheads.*

CHORD SYMBOLS

Chord symbols can be added to your score. Chord symbols are MIDI track events, and can be transposed along with MIDI notes.

Entering chord symbols

To enter a chord symbol, choose the Chord Symbol tool in the Notation Editor tool palette (C7) and click on or above the desired note. Alternatively, assign a keyboard shortcut to the *Enter Chord Symbol* command (Setup menu> Commands) and press the keyboard shortcut to enter a chord symbol above the selected note (or if there is no selection, above the playback wiper).

An empty chord symbol edit box will appear, ready for you to type in the symbol:

Figure 19-16: An empty chord symbol edit box

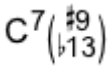
Type the desired chord symbol in the empty box. The first character, the root note, must be a letter A–G ; after that, you may use any of the following symbols:

Symbol	Description	What to type
♯	sharp	pound sign (#)
♭	flat	B
-	minor sign	hyphen (-)
°	diminished symbol	Option/Alt-Shift-8
ø	half diminished symbol	Option/Alt-Shift-O
Δ	major 7th triangle	Option/Alt-Shift-J
6/9	6/9 chord suffix	6/9
/	diagonal slash for hybrid chord, inversion, or altered bass	slash (/)
—	horizontal slash for a poly chord	underline (_)
	any other text	the text itself

For chord suffixes, type the opening character, the desired suffix, then the closing character. Use these opening and closing characters:

Symbol	Description	What to type
( )	stacked suffix with parentheses	Left parenthesis, Right parenthesis
{ }	stacked suffix with braces	Left Braces ({), Right Braces (})
[ ]	stacked suffix with brackets	Left Bracket ([ ), Right Bracket ( ])
	stacked suffix with no braces or brackets	Option/Alt-Backslash («), Option/Alt-Shift-Backslash (»)

For example, to create this chord symbol:



…type "C7(#9b13)".

After typing a chord symbol, press Enter or Return to confirm.

To enter additional chord symbols, press Tab or Shift-Tab to advance to the next/previous metric position in the measure (as determined by the "Tab key advances" preference explained below) or Option/Alt-Tab or Option/Alt-Shift-Tab to jump to the next/previous measure. If a chord symbol already exists at or before the next position that you will Tab or Shift-Tab to, the chord symbol will be selected for editing.

Transposing chord symbols

Chord Symbols are transposable along with other MIDI data. Select the desired chord symbols, with or without a MIDI note selection, and choose *Region menu* > *Transpose*. Select the "Transpose chord symbols" check box, choose the desired transpose options, and Apply.

Hiding chord symbols

Chord symbols can be dragged freely within the score; hold the Shift key to constrain the drag horizontally or vertically, as described in "Shift-drag to constrain" on page 301.

The arrow keys can also be used to nudge the selected chord symbol up, down, left, or right.

Chord symbols preferences

The Preferences window has a Chord Symbols pane to specify the default text style and tabbing behavior.

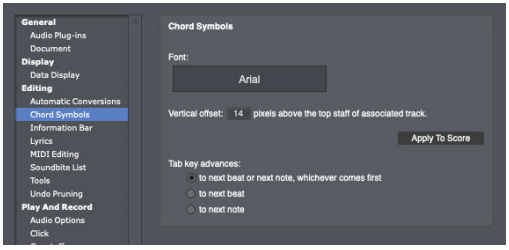


Figure 19-17: Chord symbol preferences.

Text style

These options specify the default font, size, style, and vertical positioning of chord symbols.

Tab key advances

The options for Tab are to advance in one of three ways:

- To the next beat or the next note, whichever comes first
- To the next beat
- To the next note

Apply To Score

The *Apply To Score* button applies changes made in the Chord Symbol preferences to the current project's score.

Setting preferences from existing chord symbol
The Commands window (Setup menu) includes a *Use Chord Symbol Settings as Prefs* command. If you select a chord symbol and invoke this command, the font, size, style and vertical offset settings for the selected chord symbol are copied into the Chord Symbol preferences for use by all new chord symbols.

☛ This command is available only when you have a single chord symbol selected.

Setting preferences on-the-fly
Hold down the Control/Win key while dragging a chord symbol to set the resulting vertical offset of the chord symbol in the Chord Symbol preferences, which will be used by all new chord symbols.

INSERTING A STAFF BRACE OR BRACKET

The Staff Brace and Bracket tools in the Notation Editor Tool Palette (Figure 19-13 on page 146) allow you to add and remove staff braces and brackets as desired to a staff system. Each staff can display—or be grouped by—one brace, one bracket or both. Each staff (track) remembers its brace/bracket status when you show or hide it. It might be useful to think of staff braces and brackets as an *attribute* of each staff that can be toggled on or off, rather than thinking of the brace or bracket as an object. With this in mind, below is a summary of how to add and remove brackets and braces:

To do this:	Do this:
To add a brace or bracket to a single staff or grand staff	Click the staff with the Brace or Bracket tool.
To remove a brace or bracket from a single staff or grand staff	Click the staff with the Brace or Bracket tool.
To add a brace or bracket to several adjacent staves	Drag over them with the Brace or Bracket tool.
To remove a brace or bracket from several adjacent staves	Drag over them with the Brace or Bracket tool.

THE DYNAMICS PALETTE

To open the Notation Editor Dynamics Palette (Figure 19-1 on page 133), choose it from the Notation Editor menu. This palette allows you to insert standard dynamic symbols, including hairpin crescendos and decrescendos.

Dynamic symbol placement
Dynamic symbols are associated with the nearest staff (track). If you show and hide the track, the dynamic symbol will show and hide with its track. When you insert or move a dynamic symbol, make sure it is closest to the track and measure to which it applies. In regards to time, dynamic symbols are associated with and remain at the measure and time location at which you place them, except as noted in the next section when moving them together with notes.

Working with dynamic symbols
Below is a summary of how to work with dynamic symbols:

To do this:	Do this:
To insert a dynamic symbol	Click the desired symbol in the palette and then click on the page.
To insert a crescendo/decrescendo	Click the Crescendo or Decrescendo tool and then either click or drag on the page.

To select one or more dynamic symbols	Use the same Pointer tool selection techniques as described in "Selecting notes for editing" on page 148.
To move a dynamic symbol	Drag it with the Pointer tool.
To duplicate a dynamic symbol	Option/Alt-drag it.
To move a dynamic together with notes	Select both with the Pointer tool and then drag the selected notes.
To copy and paste dynamic symbols	Select them (as described above), copy, click at the desired location to place the insertion cursor, and paste.
To copy and paste dynamic symbols together with notes	Select them both with the Pointer tool, copy, and then paste the notes as explained earlier in "Cutting, copying & pasting notes" on page 149.
To adjust the shape of a crescendo or decrescendo	See "Adjusting a hairpin crescendo/decrescendo" below.
To remove a dynamic symbol	Click it with the Pointer tool to select it and the press the delete key.

Adjusting a hairpin crescendo/decrescendo

You can adjust the length and angle of a hairpin crescendo or decrescendo as shown below:

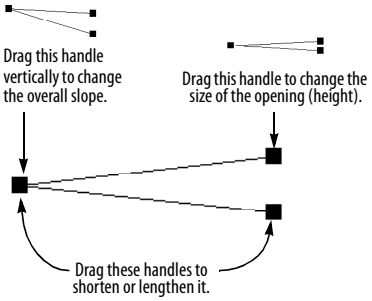


Figure 19-18: Adjusting a hairpin crescendo or decrescendo.

Closing the Dynamics Palette

To close the Dynamics Palette, uncheck it in the Notation Editor menu, or click the close button in its title bar.

THE ARTICULATIONS PALETTE

To open the Articulations Palette (Figure 19-1 on page 133), choose it from the Notation Editor menu. This palette allows you to insert standard articulation symbols (including text articulations), stem ornaments, percussion noteheads and special noteheads.

To insert an articulation, stem ornament or notehead on one or more notes, select them and then click the desired symbol(s) in the Articulations palette.

To remove any articulation palette item from one or more notes, select the articulation(s) and hit the delete key.

To insert notes with symbols from the Articulations palette:

1 Choose a note duration in the Notation Editor tool palette (Figure 19-13 on page 146).

2 Select the desired symbols in the Articulations palette so that they are selected while inserting the notes.

3 Insert the notes as usual.

Articulation Text tool

The Articulation Text tool (Figure 19-1 on page 133) allows you to bind text to a notehead, such that the text always stays with the note, just like other articulation symbols.

☛ If you wish to bind text to a particular measure, instead of a particular notehead, see "Time-Anchored Text" on page 156. For other types of text, see "Working with text" on page 155.

There is a preference for controlling the height of articulation text above the staff. See Figure 19-6 on page 141.

Slurs

To insert a slur, select a range of notes (or just the first and last note) and click the Slur tool (Figure 19-1 on page 133). To adjust the slur, drag

it, or click it to select it and then reshape it using the handles, as shown below in Figure 19-19. To remove a slur, select it and hit the delete key.

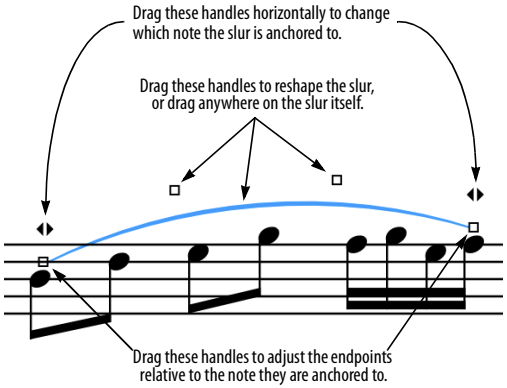


Figure 19-19: Adjusting a slur.

Articulations, slurs and MusicXML

Articulations and slurs are supported by Performer's MusicXML feature, so they will export to other applications that support MusicXML. "Exporting a musicXML file" on page 171.

POPUP METER CHANGES, KEY CHANGES AND TEMPOS

You can change meters directly on the score page using the Arrow tool as follows:

To do this	Do this
To change an existing meter	Click on it with the "4/4" cursor for a pop-up menu of options.
To add a meter change after a key change	Click on the right third of a key signature with the "4/4" cursor to get the meter change popup.
To add a meter change at a measure that has no key or meter change	Click on the barline itself with the "4/4" cursor to get the meter change popup.

Meter changes performed with the mouse always use the *Only move barlines* option ("Only move barlines" on page 474), and take effect until the next meter change. The metronome click value is set to the denominator of the time signature (except that for 6/8, 9/8 and 12/8 it is set to a dotted quarter note). For more options, use the *Change Meter* dialog in the *Project menu> Conductor Track* sub-menu.

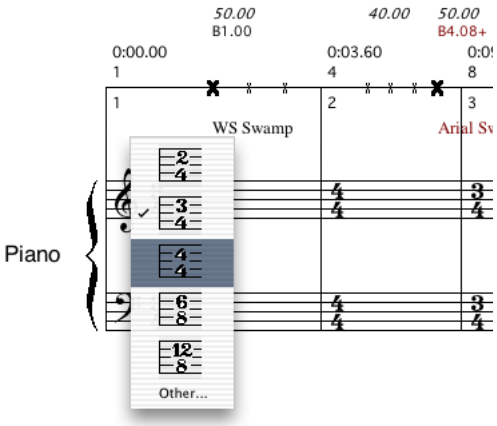


Figure 19-20: Changing meter in the Notation Editor.

Popup Key Changes

You can change keys directly on the score page using the Arrow tool as follows:

To do this	Do this
To change an existing key signature	Click on it with the "#/b" cursor for a popup menu of options.
To add a key change before a meter change	Click on the left third of a meter with the "#/b" cursor to get the key change popup.
To add a key change at a measure that has no key or meter change	Hold down the Option/Alt key and click on the barline itself to get the key change popup.

Key changes performed with the mouse take effect until the next key change. For more options, use the *Change Key* dialog in the *Project menu> Conductor Track* sub-menu. Note that popup key changes cannot be performed in the Film Cues only view, which does not display key signatures.

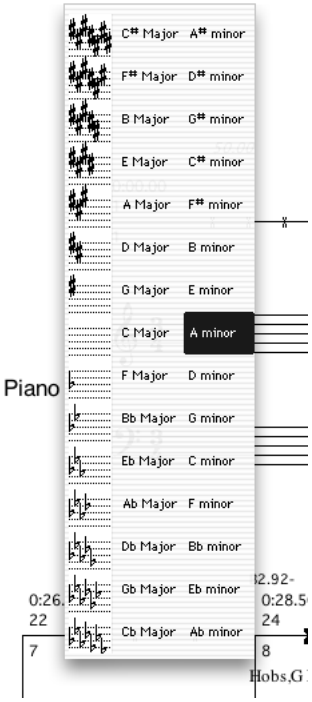


Figure 19-21: Changing key signature in the Notation Editor.

Popup Tempo Changes

You can change tempo at the beginning of a measure directly on the page using the mouse. To do so, hold down the Control/Win key and click on any barline (or near the beginning of the first measure in a system) with the "bpm" cursor to get a simple Set Tempo dialog box.

Figure 19-22: Setting the tempo directly in the Notation Editor.

Tempo changes performed with the mouse take effect until the next tempo change. For more options, use the Change Tempo dialog in the *Project menu> Conductor Track* sub-menu.

☛ Tempo changes that you enter in the Notation Editor are placed in the Conductor track. They display in the Notation Editor only if you have set Performer Lite's main Tempo Control to *Conductor Track* as explained in "Tempo Controls" on page 111. Even then, only the tempo at the start of the first measure is displayed in the Notation Editor via the metronome marking — unless you have checked *Show Film Cues* in the Notation Editor menu. Then all tempos that don't collide with other text in the Film Cues View will be shown in italics.

WORKING WITH TEXT

The Notation Editor Tool palette has several text items that let you enter titles and other text on the page, including page numbers and metronome markings.

Text is handled in a similar fashion to standard computer graphics programs. Text is placed on the page inside text boxes, which can be cut, copied, pasted, and otherwise edited. A text box is a resizable, transparent box in which you can type and edit text. If you have worked with graphics software, you are already familiar with how to use text boxes in Performer Lite.

Inserting text

To insert text:

1 Scroll to the page on which you'd like to insert the text.

If you are inserting title page text, scroll to the title page. If you'd like the text to appear on body pages, scroll to any body page.

2 Click the Text tool in the Tool palette (Figure 19-13 on page 146).

3 As a shortcut, if you want the text to be time-anchored text (see "Time-Anchored Text" on page 156), hold down the Control/Win key.

4 Drag out a text box on the page.

5 Choose the desired font, point size, style, justification, and display properties from the Text menu. For details about the *Display* text attribute, see the next section, "Choosing where to display text".

6 Type the desired text.

7 Click anywhere outside the text box to complete the text entry.

Choosing where to display text

The display sub-menu (in the Text menu) provides several ways to control where text appears in your score. Here is a summary:

Display menu item	Explanation
This page only	Text only appears on the page on which it is entered.
Title page only	Text only appears on the first page of the score.
Body pages only	Text only appears on body pages (all pages except the first page).
Both title & body pages	Text appears on all pages.
Time anchor left/center/right	Text is anchored to the linear measure where it is inserted.
On linear score only	Text only appears when the *Show Arranged Score* menu item is unchecked.
On arranged score only	Text only appears when the *Show Arranged Score* menu item is checked.
On These Parts Only	Text only appears when one or more of the checked tracks in this submenu are showing in the Notation Editor.
On Single Part Only	Text only appears when a single part (track) is showing in the Notation Editor. When two or more tracks are visible, the text box will not appear.

The first two groups of items in the Display menu are mutually exclusive: either the text box is time-anchored in some way, or it is set to appear on title page/body pages/both. The last four items in the Display menu (linear or arranged score visibility; on specific track[s] or on single part displays) can be used with either type of text box.

Time-Anchored Text

Time-anchored text boxes stay with the measure where they are inserted. If the Notation Editor display changes in such a way that the measure moves to a different location on the page — or to a completely different page altogether — the text will stay with the measure. For example, if you change the measure spacing of the score, the text will move with the measure. Time-anchored text sticks to a particular time within a linear measure. If you "hide" a linear measure that contains time-anchored text (see "Hiding, extracting and moving measures" on page 163), the text will become invisible until the linear measure containing that time is made visible again.

Time Anchored Text will adjust its horizontal position on the page when notes are added or removed, or when anything else happens that changes the position and size of measures on the page. If the time-anchored text is not associated with a particular track (see "On These Parts Only" below), then its vertical position will always be a constant distance from the top of the system in which it appears. If the time-anchored text is associated with a particular track, then its vertical position will always be a constant distance from the top of the first staff for that track.

Time-anchored text is good for entering the names of chords over the top of each system, and for adding arranged score directions and labels like *To Bridge, To Coda*, and *ritard*. Time-anchored text that is also associated with a specific track can be used to enter textual directions that apply only to the performance of a specific part, or symbols that you want to attach to specific notes within that part.

Time-anchored text can be shown or hidden with the *Show time-anchored text* option in the Score Options dialog. See "Showing/hiding time-anchored text" on page 141.

On These Parts Only
When one or more of the items in this sub-menu are checked, the text box will appear only when one or more of the checked tracks are showing in the Notation Editor. You can associate a text object with as many tracks as you'd like.

On Single Part Only
When this *Display* sub-menu item (in the Text menu) is checked, the text box will appear only when a single part (track) is showing in the Notation Editor. When two or more tracks are visible, the text box will not appear.

If both *On "Track-1" Only* and *On Single Part Only* are checked, then the text box will appear only when Track-1 is the only track showing.

Making titles, headers and footers
Titles, headers, and footers are inserted in the manner described in "Inserting text" on page 155. Just choose the appropriate *Display* attribute in the Text menu.

If the *Title page only* and *Body pages only* menu items are grayed out, check the *First page is title page* option in the Score options command located in the notation view menu. For more information about this option, see "Creating a title page" on page 139.

Making page numbers
Page numbers are inserted using the Page Number tool (Figure 19-13 on page 146). Using this tool, insert them in the same manner as described in "Inserting text" on page 155. The page number automatically appears in the text box. Be sure to choose the appropriate Display attribute *(Body pages only* or *Both title & body pages*). See "Choosing where to display text" on page 156 for more information.

Displaying the current date
The current date can be inserted using the Date tool (Figure 19-13 on page 146). Using this tool, insert the date in the same manner as described in "Inserting text" on page 155. The current date (as specified by your computer) automatically appears in the text box. Be sure to choose the appropriate Display attribute *(Body pages only* or *Both title & body pages*).

Selecting text
To select an entire block of text, click it once with the Pointer tool. Handles appear to indicate that it is selected.

To select individual words within a text box:

1 Double-click the text box with the Pointer tool, or click once on it with the Text tool.

2 Select the desired text by dragging over it.

To select multiple text boxes, hold the Shift key while clicking on each text box, or make a lasso selection with the Pointer tool.

After text is selected, it can be cut, copied, or deleted. You can also change the font, style, and other attributes of the text.

Moving page text
Page text objects can be dragged freely within the score; hold the Shift key to constrain the drag horizontally or vertically, as described in "Shift-drag to constrain" on page 301.

The arrow keys can also be used to nudge the selected page text object up, down, left, or right.

Typing and editing text inside a text box

To edit text, double-click it with the Pointer tool (or click once with the Text tool) to get an insertion cursor inside the text box. After you have an insertion cursor inside the text box, use the following actions to edit the text:

To do this	Do this
Move the text cursor within the text box	Press the arrow keys
Delete a character	Position the cursor to the right of it and press the delete key
Select a word	Double-click the word
Select several words or sentences	Drag over them inside the text box
Change the font, point size or style of some text in the text box	Select the text and choose the desired font, size, and style in the Text menu
Justify the text to the left margin, to the right margin or to the center	Choose Justify from the Text menu and select the desired justification
Finish inserting or editing the text	Click anywhere outside the text box
Cut, copy, and paste text within the text box	Select the text and choose the desired command from the Edit menu.

Pasting text into Performer Lite from other programs

You can copy text from a text editing program such as Microsoft Word and then paste it into a text box in the Notation Editor. Just copy the text from the other program, switch into Performer Lite, double-click or insert a text box, and then paste.

Changing text attributes

Text attributes like point size, style (bold, italic, etc.), justification (left, center, or right), and display properties (title page only, time anchored, arranged score versus linear score, etc.) can be changed after text has been entered.

To change the attributes of an entire text box, click the text once with the Pointer tool to select it. Then choose the desired attributes in the Text menu. This works for staff names, staff abbreviations, measure numbers and marker text as well.

To change the attributes of individual words within a text box:

1 Select the desired text as described in "Selecting text" on page 157.

2 Choose the desired text attribute from the Text menu.

3 Click anywhere outside the text box to complete the edit.

Installing fonts in the Text menu

The fonts that you see in the Text menu are the fonts that you have installed in your computer system. If you are not familiar with how to install text fonts in your computer system, refer to your computer documentation.

☛ When troubleshooting font problems in Performer Lite, determine if the problem occurs in a word processor program, or other programs that deal with text. For example, if you can't find a font that should be in the list, check the font list in your word processor. Most likely, it will be missing there, too, and you then know that the problem lies somewhere in the computer system.

LYRICS

Lyrics can be added to your score in the Notation Editor.

Figure 19-23: Lyrics in the Notation Editor.

Entering lyrics for a single track

To enter lyrics for a single track, choose the Lyric Text tool in the Notation Editor tool palette and then click on or below the desired note. Alternatively, assign a keyboard shortcut to the *Enter Lyric* command (Setup menu> Commands) and press the keyboard shortcut to enter a lyric below the selected note (or, if there is no selection, below the note nearest to the playback wiper).

An empty lyric text box will appear, ready for you to type in:

Figure 19-24: An empty lyric text box

Type a single word or syllable in the empty box. To advance the edit box to the next note, press the space bar to start a new word, a dash (-) to enter another syllable in the current word, or an underscore (_) to extend the current word or syllable to the next note. (Note, however, that you don't have to add underscores for a syllable that extends across tied notes —þunderscores are added automatically beneath tied notes when you hit the space bar to go to the next non-tied note.)

To dismiss the lyric text box, press Enter or Return to confirm, or Escape to cancel.

Entering lyrics shared by multiple tracks

Lyrics can be associated with two or more tracks. For example, in a SATB choral score (Soprano, Alto, Tenor and Bass), you might have lyrics that are shared among the Tenor and Bass parts (tracks) for a portion of the score, or perhaps shared by all four parts. You can freely choose which parts the lyrics are associated with, at any time. For example, the four SATB parts might have individual lyrics for some sections of the score and shared lyrics for other sections of the score. You have complete control over which parts (tracks) the lyrics are associated with.

If you wish to associate lyrics for multiple tracks when first entering the text, simply select a note in each track at the location where you want the shared lyric text to begin, and then either click with the Lyric Text tool or press the Enter Lyric command keyboard shortcut, as usual. An empty lyric text box will appear, but its vertical position below (or between) the shared staves will be governed by the Lyrics Preferences. See "Lyrics placement" on page 160.

Working with shared lyrics

Lyric text that is shared among several staves, will appear with each staff that it is linked with, whether the staff is displayed by itself or together with shared tracks.

If you have existing lyric text on the page, and you would like to see which tracks it is linked with, click the lyric text box with the Arrow cursor to select it and choose *Text menu> Display> On These Parts Only*. Tracks with check marks next to their names are linked to the lyric. Choose any track from this sub-menu to toggle its checked/unchecked status. Doing so will link/unlink the track to the lyric text, respectively.

You can freely assign and unassign lyric text to any track or tracks using the *On These Parts Only* submenu as explained above.

Editing lyric text

To edit existing lyric text, double-click the lyric. While the lyric text box is selected for editing, you can press Tab or Shift-Tab to advance to the next/previous lyric. Tabbing will go to the next or previous lyric that is linked with that same track or tracks. Be sure to keep this in mind when you are working on a section of a score that has lyrics linked to different tracks, as tabbing may not necessarily jump to the very next, adjacent lyric text box if it is not linked to the same tracks as the current text box.

Erasing lyrics

To erase lyrics, use the Arrow tool to select the desired lyrics in the Notation Editor and press the Delete key or choose *Erase* from the Edit menu.

Copying and pasting lyrics

Lyrics are not MIDI events; rather, they are a special kind of page text. Therefore, they will not copy along with notes if you cut and paste sections of the notes themselves. You can, however, easily copy and paste them separately. After you paste the notes, copy the original lyrics and paste them beneath the copied notes.

Hiding lyrics

To temporarily hide lyrics, deselect "Show Lyrics" in the Notation Editor menu.

Lyrics in an arranged score

You can enter lyrics into a linear score and then arrange it. Once arranged, lyrics for verses will automatically stack on top of each other in verse sections. You can also arrange the score first, and then Auto Flow into the arranged score. In that case, the Auto Flow algorithm still flows the lyrics into each linear measure in turn, stacking the lyrics as needed in the second, third, etc. pass through the repeated sections.

Lyrics preferences

The Preferences window in the Performer Lite menu (Mac OS) or Edit menu (Windows) has a Lyrics pane to specify the default text style, placement, and syllable extension behavior of lyrics.

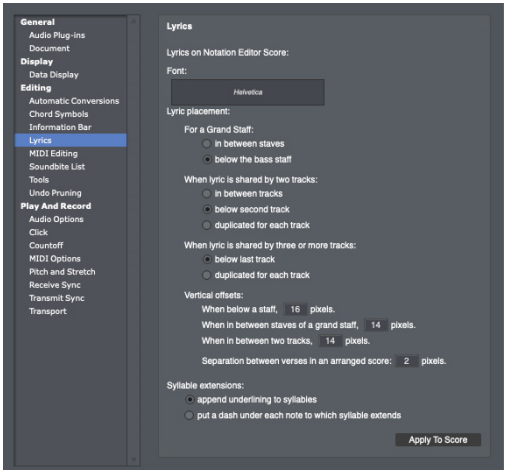


Figure 19-25: Lyrics preferences.

Lyric text style

Options are provided to specify the font, size, and style of lyric text on the page.

Lyrics placement

Various options specify the placement of lyric text on the page.

☛ When specifying a vertical offset between two staves or tracks, the offset is the distance beneath the top staff or track.

Syllable extensions

By default, syllables are extended by underlining, but you can alternatively put a dash under each note.

Apply To Score
The *Apply To Score* button applies changes made in the Lyrics preferences to the current project's score.

SCORE ARRANGEMENT

The Notation Editor arrangement view is shown by selecting *Show Arranged Score* from the Notation Editor menu. The purpose of this view is to collapse a linear score into a compact arrangement using repeats, endings, and score jumps like D.S. al Coda. When you add a repeat in the arrangement view, it does not change the playback of the piece: it just changes the look of the score and changes where the wiper goes during playback (and makes your notation more readable when you print it).

In a linear score, measures are displayed consecutively as demonstrated below:

Figure 19-26: A linear score.

In an arranged score, you use repeat barlines, endings, and other similar arrangement symbols to condense the score. For example, when a repeat happens, the continuous linear measures are folded back on themselves, like a ribbon, for the length of the repeated section:

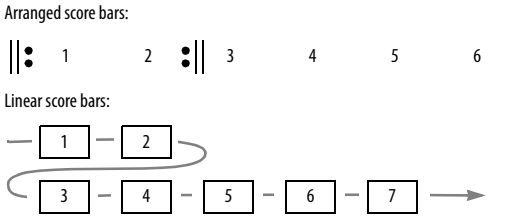


Figure 19-27: In an arranged score, linear measures are folded back like a ribbon to share arranged score measures.

If, in the example above, we made the repeat a 2x ("two times") repeat, meaning that you repeat twice instead of just once, the linear measures would flow through the arranged score like this:

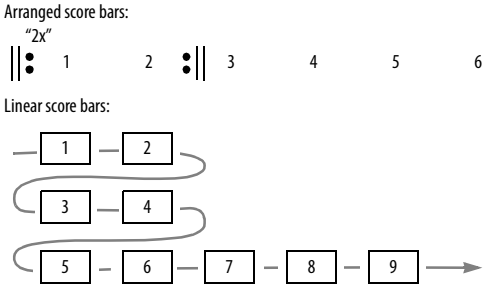


Figure 19-28: In this example, the repeat is taken twice, so measures 5 and 6 are included in the repeat, and therefore fall in measures 1 and 2 of the arranged score.

Figure 19-29 below shows an arrangement that has a repeat followed by first and second endings, along with how this would look in the arranged score.

Linear bars and Arrangement bars

A *linear bar* number is the number of the bar from the beginning of the unarranged piece, the number of the bar that appears in the global counter, and the number of the bar in every other editing window in Performer Lite. Every bar of music has a unique linear bar number. The first bar is linear bar 1.

An *arrangement bar* number is the number of the bar in an arranged score. Each arrangement bar will be associated with one or more linear bars. In other words, if your chorus is visited three times during playback, then each bar of the chorus will have a single arrangement bar number, but will be associated with three different linear bar numbers.

Showing alternate bar menus

When working on an arrangement, you should turn on *Show Alternate Bar Menus* in the Notation Editor menu. This displays a small pop-up menu next to the regular measure number on the page:

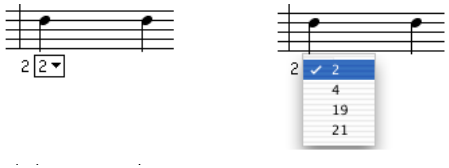


Figure 19-30: Showing alternate bar menus.

The alternate bar menu shows all of the linear bars that are currently associated with an arrangement bar. In the example above, arrangement bar 2 will be visited four times during playback: when the

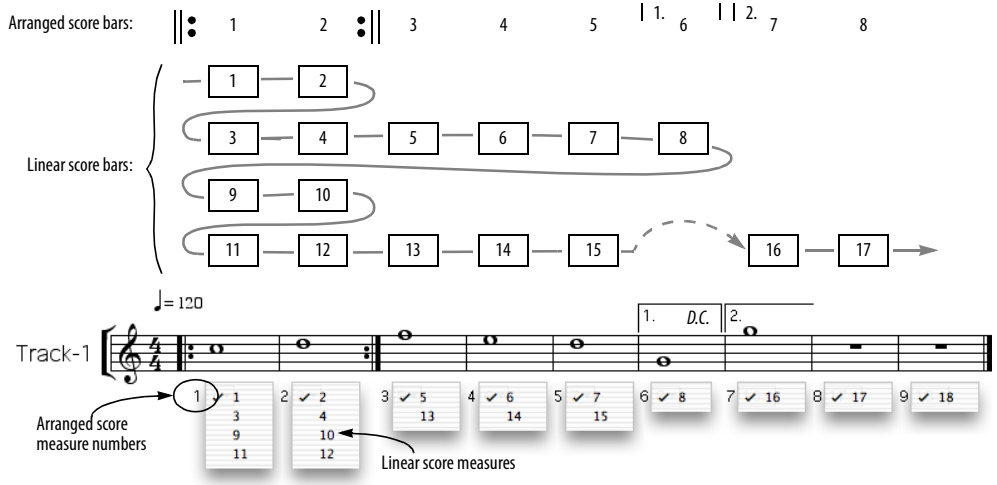


Figure 19-29: Above, linear bars are condensed into an arranged score with a repeat, combined with first and second endings. Below, this same example is shown as it would appear in the Notation Editor, except that the alternate bar menus have all been opened simultaneously to show you which linear bars reside in each arranged score measure.

counter reaches linear bars 2, 4, 19 and 21. The checked item is the linear bar whose data is currently being shown. The rest of the associated linear bars are hidden.

☛ When working on an arrangement, also be sure that *Show measure numbers* is turned on (Notation Editor menu> Options> Measure Numbers) and that they are set to display on every measure.

Hiding, extracting and moving measures

Most of the tools for arranging a score simply make cosmetic changes to it. There are only four operations that cause the wiper to jump around on the score during playback. One of them is rest consolidation, which will be discussed later. The other three all appear under *Edit Selected Measures* in the Notation Editor menu:

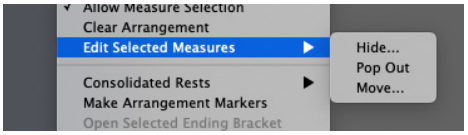


Figure 19-31: Use these commands to hide, extract and move measures in the arranged score.

Hide

When you "Hide" a measure behind another measure, it disappears. But when playback reaches a hidden linear bar number, the wiper will jump to the bar where you "hid" it, and wipe over that bar while playing the hidden linear bar. Use this feature to "hide" the second or third instance of some repeated measures behind the first instance, or to hide the second or third verse measures behind the first verse measures.

To hide a measure:

1 Make sure that *Show Arranged Score* is enabled in the Notation Editor menu.

2 Turn on *Allow Measure Selection* in the Notation Editor menu.

3 Click the Pointer tool in the Notation Editor tool bar.

4 Click anywhere in the measure you wish to select. Shift-click to select two or more measures.

You cannot hide a measure which contains hidden measures itself, so be sure to select a measure that has none.

Figure 19-32: Selected measures appear with a box around them.

5 Choose *Edit Selected Measures> Hide.*

You will be asked where you want to hide the measures. You must specify an arrangement measure location as the destination.

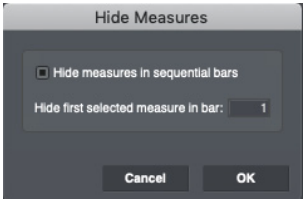


Figure 19-33: Choosing a destination for the hidden measures.

After you click OK, the selected measures will be hidden in the arrangement measures you specified. You can view them by choosing them from the alternate bar menu in that measure, as demonstrated below.

Figure 19-34: Hidden measures can be viewed by choosing them from the alternate bar menu.

Displaying hidden measures does not change playback

Note that when you hide a measure behind another measure, you do not change playback. If you have linear bars 2 and 4 associated with arrangement bar 2 in your arranged score, you can choose either linear bar as the representation that you want to see for that bar (as demonstrated in Figure 19-34). But choosing a linear bar for display purposes does not mean that *those notes* are going to play every time through the bar. The hidden linear bars always play exactly as recorded when it is their turn to play. The wiper will wipe over whatever representation is on the screen for that bar, but the performance of linear bars 2 and 4 will happen exactly as recorded regardless of what is on the screen (and on the printed page).

The Hide measures in sequential bars option

If the *Hide measures in sequential bars* option is unchecked, then all of the measures that you have selected will be hidden in the destination bar you choose. For example, if you've selected bars 7, 8 and 9, and you choose bar 1 as destination bar to hide them in, they will all go into bar 1. However, if the *Hide measures in sequential bars* option is checked, then bars 7, 8 and 9 will be hidden consecutively in bars 1, 2 and 3.

Locating hidden linear measures

To quickly locate a hidden linear measure, try entering that measure number in the global counter and hitting play. The wiper will jump to the arrangement measure where that linear measure is hidden. You can then select the hidden linear measure from the alternate measure popup next to the measure number in order to see it and edit its data. You can also use the *Pop Out* command (explained below) to extract it from that arrangement measure.

Pop Out

Pop Out is the opposite of *Hide*. If you select an arrangement bar that contains more than one linear bar, the *Edit Selected Measures> Pop Out* command (Figure 19-31 on page 163) extracts the currently visible linear bar and places it just to the right of the arrangement bar you selected. After being liberated, you can then move the popped-out bar anywhere in the score (such as its original linear position).

Moving measures

Edit Selected Measures> Move (Figure 19-31 on page 163) allows you to position a selected measure anywhere in the score. You will be asked where you want to move the selected measures, and you specify an arrangement measure location. This command is seldom needed, but will become necessary sometimes when you have multiple endings in a score, with other sections (like a bridge) occurring in between. After you finish collapsing the score, you may find that your bridge lies between your second and third ending, and the only way to get all of the endings together is to move the third ending measures just after the second ending measures.

A suggested approach to hiding measures

In general, when building an arrangement you want to start at the beginning of the piece and proceed forward. As soon as you encounter a measure that is another instance of a previously played measure, hide that measure under the previous instance. Later, you can use the alternate measure menu to select which linear measure instance is the best representation of the notation for a given arrangement measure.

The Arrangement palette

To open the Notation Editor Arrangement palette, choose it from the Notation Editor menu. The Notation Editor Arrangement palette contains tools that work only when you have selected *Show Arranged Score* from the Notation Editor menu, except for the Time-Anchored Text tool, which can be used in the linear score view as well.

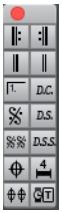


Figure 19-35: The Arrangement palette.

Selecting any of these tools changes your cursor to an image of the tool, and allows you to click on the score to do something.

Begin Repeat: Click near a barline to enter a begin repeat. Click near the barline again to remove a begin repeat.

End Repeat: Click near a barline to enter an end repeat. Click near the barline again to remove an end repeat.

Fine Bar: Click near a barline to select where the Fine bar should go. There can only be one Fine Bar in the score, so if it is already present in a score, clicking with this tool will move the Fine Bar to where you click.

Thin Double Barline: Click near a barline to enter a thin double barline. Click near the barline again to remove a thin double barline.

Endings: Click and drag over a number of sequential measures to create an ending bracket. To extend an existing ending, hold down the Shift key and drag in the measures after the existing ending. (This is especially useful if an ending needs to extend across a page break.)

Figure 19-36: A first and second ending.

To adjust the height of an ending, uncheck *Allow Measure Selection* and then drag it vertically with the arrow tool. All ending brackets in the score are adjusted.

To edit the ending number, or change its font or style, uncheck *Allow Measure Selection* and then click the ending number with the Arrow tool.

To remove the vertical bar at the right-hand edge of the ending, click the ending with the Arrow tool to select it and choose *Open Selected Ending Bracket* from the Notation Editor menu.

To get rid of an ending, click it with the Arrow tool to select it, and press the delete key.

D.C.: Click on the page to enter time-anchored text that says "D.C.". You can set the font, size, style, etc. of the text as described earlier in this chapter.

Segno: Click on the page to enter a time-anchored Segno symbol.

D.S.: Click on the page to enter time-anchored text that says "D.S.". You can set the font, size, style, etc. of the text as described earlier in this chapter.

Double Segno: Click on the page to enter a time-anchored double Segno symbol.

D.S. S.: Click on the page to enter time-anchored text that says "D.S.S.". You can set the font, size, style, etc. of the text as described earlier in this chapter.

Coda and Double Coda: Click on the page to enter a time-anchored coda or double coda symbol.

Consolidated Rest tool

Click an empty measure to consolidate it with another empty measure just to the right of it. To unconsolidate one measure within a consolidated rest, hold down the Control/Win key while clicking with this tool.

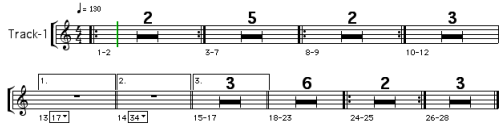


Figure 19-37: Consolidated rests in an arranged score.

The Consolidated Rest tool makes small changes to a specific consolidated rest, whereas the *Consolidate /Unconsolidate Rests* commands in the Notation Editor menu make changes to all consolidated rests in the visible tracks. These operations change the pattern of consolidated rests for all tracks currently visible. However, if a track is already set to consolidate rests in a certain way with the Consolidate Rest tool, it will continue to prefer that setting when it is shown by itself or in combination with other tracks. This makes it possible to customize rest consolidation for each part individually, but still control the way rests consolidate when a specific combination of tracks are shown.

Consolidated rests automatically break at meter changes.

Time-Anchored Text tool

Use the Time-Anchored Text tool in the Arrangement palette just like the normal text box tool in the main Notation Editor tool palette. However, this tool creates a text box that is anchored to a time in the score. For details, see "Time-Anchored Text" on page 156.

Use the Text menu in the main menu bar to select whether the time anchor is at the left, center or right of the text bounding box. You can also choose whether you want your time-anchored text to appear in the arranged view, the linear view, or both, and whether it should appear only when a certain track is showing, or when any single track is showing.

The Time-Anchored Text tool is just a convenience. You can actually create either type of text box with either text tool with these shortcuts:

- If you are using the normal Text tool, hold down the Control/Win key to enter time-anchored text.
- If you are using the Time-Anchored Text tool, hold down the Control/Win key to make normal text.

DISPLAY-ONLY AND PLAYBACK-ONLY NOTES

There may be times when you wish to hide notes in the Notation Editor, but still hear them play back. For example, you may have played a grace note or other performance-related material that wouldn't normally be written as notation.

Conversely, you may sometimes wish to display notes in the Notation Editor that don't play back, such as cue notes for individual instrument parts, or simplified notation for an embellished performance.

The Notation Editor menu lets you specify notes as playback-only (hidden) notes or display-only (silent) notes. Just select the notes and then choose *Playback-only* or *Display-only* from the Notation Editor's *Change Selected Notes to* menu command.

To change notes back to normal notes (i.e. they appear in the Notation Editor and play back), choose *Change Selected Notes to> Normal*. If the notes are hidden (Playback-only), you'll need to display them in order to select them and turn them back into normal notes.

Figure 19-38: Above: the two circled notes will be turned into Playback-only notes.

Split Selected Normal Notes

The *Split Selected Normal Notes* menu command operates only on those selected notes that are normal. A normal note is a note that is not set to be display-only or playback-only. This command replaces each selected normal note with two copies of itself: a playback-only copy and a display-only copy. The purpose of this command is to make it easy to start editing the appearance of a measure without changing the playback of the measure. After issuing this command, you can then edit the display-only notes without affecting the (now hidden) playback-only notes. Just make sure that playback-only notes are set to be hidden (their *Display* sub-menu item is unchecked).

Finding hidden notes

If there is a note in the track that is not showing up in the Notation Editor, then one of the following is happening:

- The note is being hidden from the Notation Editor display due to the *Ignore Mistakes* settings in the Score Options dialog.
- The note has been designated as a playback-only note, and playback-only notes are currently being hidden (the *Notation Editor menu> Playback-only Notes> Display* setting is unchecked).
- The note has been designated as a display-only note, and display-only notes are currently being hidden (the *Notation Editor menu> Display-only Notes> Display* setting is unchecked).
- The note is in a linear measure that has been hidden using the *Edit Selected Measures> Hide* command in the Notation Editor menu, and the linear measure is currently *not* being used to represent the arrangement measure to which it belongs. To view it, choose the measure from the alternate measure menu. If you can't find the hidden measure, see "Finding hidden notes" on page 167.

FILM CUES VIEW

The Notation Editor can display film cues in a manner familiar to film composers. To see this view, open the Notation Editor and choose *Show Film Cues* from the Notation Editor menu.

When *Show Film Cues* is checked, the Notation Editor includes an extra area of film cue information above the top staff in every system, as shown in Figure 19-39.

Tempo changes

As shown in Figure 19-39, the top line of information in this view (50.00, 40.00, 50.00) shows tempo changes in Beats Per Minute (BPM) in italic text.

Beat location

The next line of information in Figure 19-39 (B1.00, B4.08) shows the beat location of a cue point (marker), accurate to hundredths of a beat. These numbers appear only where a cue point falls within a measure. It is displayed with the same color as the cue point text. In addition, beat location times are appended with a + or - sign if their associated cue point is late or early, in relation to the closest beat or half-beat. The hit range settings in the Markers window for the cue point's marker are considered when determining whether or not a cue point is hitting a beat or half-beat.

Measure start time

The next line in Figure 19-39 (0:00.00, 0:03.60, 0:09.30, etc.) shows the time at the start of each measure in minutes:seconds:hundredths of a second.

Beat number

Also at the beginning of each measure in Figure 19-39, two integers are displayed. The number above the horizontal line is the beat number from the beginning of the sequence. The number below the horizontal line is the measure number from the beginning of the sequence.

Beat marks

Each measure in Figure 19-39 shows a small "x" where the beats lie in the measure. If a cue point lies within the measure, then the nearest beat to the cue point is marked with a bold "X".

Cue points

The Film Cues view uses markers as cue points, as demonstrated below in Figure 19-39 by the words *WS Swamp* and *Arial Swamp*. To create or edit markers, choose *Project menu> Markers*. For complete details, see chapter 48, "Markers" (page 453). This section covers the specifics of marker operation with regard to the *Film Cues View*.

Markers appear in the same measure as their closest beat. By default, the Film Cues View does not display any marker whose weight is set to *None* in the Markers window. To change which types of markers appear on the page, use the Marker Options window. If the weight of a marker is set to *Very Important*, it appears in red. Use the *Very Important* weight to indicate markers that are key hits.

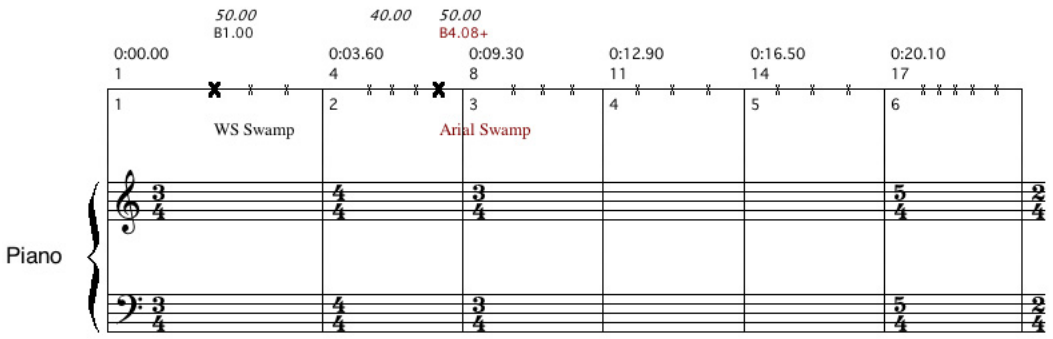


Figure 19-39: Notation + Film Cues view.

Three different Notation Editor views

Performer Lite maintains a separate set of score options for three separate views:

View	How to view it
Normal Notation	Uncheck the *Show Film Cues* menu item
Notation + Film Cues	Check the *Show Film Cues* menu item and display one or more staves in the Notation Editor using the track selector.
Film Cues Only	Check the *Show Film Cues* menu item and hide all staves in the Notation Editor using the track selector.

Film Cues Only view

If you use the track selector in the Notation Editor to turn off all tracks, and if you have selected *Show Film Cues* in the Notation Editor menu, then you will see a trackless *Film Cues Only* view shown below in Figure 19-40.

In the Film Cues only view, you can use the popup meter change and popup tempo change features described in "Popup Meter Changes, key changes and tempos" on page 154, but not the popup key change feature. Key signatures do not display in this view.

Default Options in the Film Cues Views

When you choose *Show Film Cues* for the first time in a document, Performer Lite will set the following default viewing options for optimal appearance:

Setting	Notation plus Film Cues	Film Cues only
Score options		
Show rest in empty measures	Off	Off
Show tempo above first measure	Off	Off
Tempo mark pixel offsets (first measure)	V = -4 H = -18	V = -43 H = -20
Measure numbers		
Show measure numbers	Off	Off
Measure spacing		
Space measures _ per line	On 6 per line	On 6 per line
Marker options		
Show markers	On 5 legers above system	On 2 legers below system
Measure time, real time, frame time	Off, off, off	Off, off, off
Show markers with weights	All except markers weighted *None*	All except markers weighted *None*
Hide markers when showing >= _ bars per line	Off 8 or more bars per line	On 8 or more bars per line

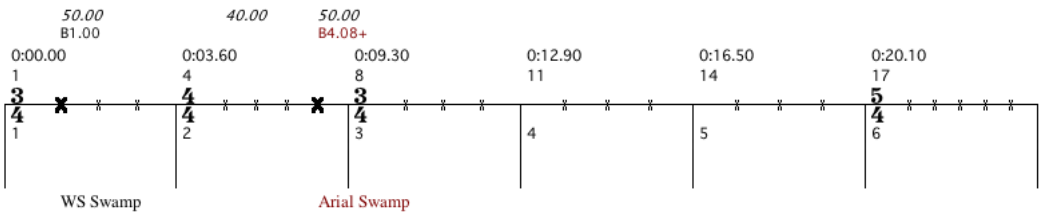


Figure 19-40: Film Cues Only view.

You can change these options, and any other score options that you wish, in order to adjust the Film Cues view to your liking. Remember only that *Show Markers* must be turned on (Marker Options window) in order to see the names of your cues.

Displaying markers in Film Cues View

Use the Marker options dialog (Figure 19-9 on page 143) to set up how markers are displayed in the Film Cues View. See "Marker options" on page 143.

Changing the height of the Film Cues staff

You can change the height of the Film Cues staff simply by dragging it up or down. The staff height will be the same for every system in the document.

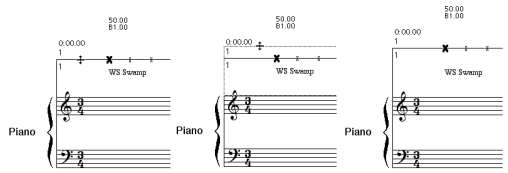


Figure 19-41: Adjusting the height of the Film Cues staff.

PRINTING

The following sections explain the procedure for various common printing tasks.

Printing instrument parts

To print instrument parts:

1 Use the Track Selector list (Figure 19-1 on page 133) to display a single track (instrument), and then format the page as desired (system margins, text, track name, etc.) as described in this chapter. To display the track name in front of the staff as the instrument name, use the Part Names option in the Score Options menu command.

2 Use the Track Selector to show all tracks that you wish to print as individual parts.

3 Choose *Print Individual Parts* from the Notation Editor menu.

Each track currently being displayed in the Notation Editor will be printed by itself using the formatting you arranged in step 1.

Preserving formatting for individual parts

If you want to preserve the Notation Editor formatting separately for each track, you can do so by copying each track into its own separate sequence. Since each sequence has its own separate Notation Editor, each part will be preserved.

Print Individual Parts and grouped tracks

When using *Print Individual Parts* with tracks which are a member of an active track group, the grouped tracks will print together, once for each track in the group. For example, if you have four horn parts grouped together and you print them with *Print Individual Parts*, you will get four copies, each showing all four parts.

This is useful when printing out a copy for each member of the group. However, if you have grouped tracks which will be played by a single player, such as the individual elements of a drum kit, suspend the track group before printing with *Print Individual Parts*, or use *File menu > Print*.

Printing a keyboard part on a piano staff

To print a keyboard track on a grand staff:

1 Use the Track Selector list (Figure 19-1 on page 133) to display the track.

2 Choose *Track Options* from the Notation Editor menu.

3 Choose the track that contains the keyboard part from the Track menu.

4 Uncheck the Use Default check box, if necessary.

5 Choose the Grand Staff from the staff type menu.

6 Set the spacing options as desired and click OK.

7 Set the Score Options, text, margins and other formatting as desired.

8 Choose Print from the File menu.

Printing a score

When you display multiple tracks in the Notation Editor, Performer Lite places them together in the same staff system. So, to print a score, use the Track Selector to show all tracks that you wish to include in the staff system for the score. To adjust the spacing between the staves in the system, as well as the spacing between systems, choose Score Options (Notation Editor menu).

Creating blank staff paper

To create blank staff paper:

1 Create one or more empty MIDI tracks.

2 Use the Track Selector to display the empty MIDI tracks in the Notation Editor.

3 In Score Options, disable the "Show rest in empty measures" option.

4 In Measure Spacing Options, choose *Space measures _ per line* and set the number of measures per line as desired.

5 If necessary, you can lengthen the tracks (and therefore the number of pages) by extending the length of the sequence. To do so, choose *Notation Editor menu> Options> Set Score Length*.

EXPORTING A MUSICXML FILE

MusicXML is an XML-based file format for representing Western musical notation. It is a proprietary file format developed by Recordare LLC that is fully and openly documented, and it can be freely used under public license. For further information, visit musicxml.com.

MusicXML can be used to export a Performer Lite score to other programs that support MusicXML importing, such as Finale™ and Sibelius™. For a list of music software applications that support MusicXML, visit musicxml.com/software.

What gets exported

Performer Lite exports the following elements of a score:

- Notation transcription, as it appears in the Notation Editor
- Key signatures
- Meter changes
- Dynamic markings
- Lyrics
- Transpositions
- Marker text
- Tempo changes (requires that the tempo source is set to *Conductor Track*)

As of this writing, the following elements are not exported, although future versions of Performer Lite may support these elements as well:

- Score arrangement markings (repeats, endings, etc.)
- Chord symbols
- Page text

Exporting a MusicXML file

To export a Music XML file, choose *File menu> Export*. In the resulting sub-menu, there are two MusicXML export commands.

Export> Selected Tracks As MusicXML: Exports the currently selected tracks, which can be selected in any edit window. If no tracks are currently selected, then all MIDI tracks are exported.

Export> Score As MusicXML: This command is only available when the Notation Editor is open, and it exports whatever is currently being shown in the Notation Editor.

Tips for exporting MusicXML

Importing MusicXML files into Sibelius, Finale or any program that imports this file format is a simple and straightforward process. The key to smooth transfers is preparing the score in Performer Lite to make sure all the information you require is included in the exported MusicXML file.

Here are some things to check before exporting a Performer Lite project as a MusicXML file.

Key signatures
It is easy to work in Performer Lite without specifying a key signature. Therefore, be sure to choose *Project>Conductor Track>Change Key* to place a key signature at measure one (and any other locations in the score where the key changes).

Tempos
Performer Lite will include all tempo changes as metronome markings in the MusicXML file. *However, you must have the conductor track selected in Tempo Control Menu as your tempo source to have all your tempo changes included.* If you have another source selected, it will only include a metronome marking on measure one of the exported MusicXML file.

Markers
Performer Lite will include all markers as staff text attached to the top staff of the exported score. You may find it helpful to go through your project and add markers at all the important points to make them easier to find when you import the MusicXML file into your notation program.

Instrument transpositions
The transposition of each track in the score is dictated by the transposition of the instrument's staff in the score. If, for example, you have a trumpet staff set to C transposition in the score and B flat transposition in the part, the exported MusicXML file will use the C transposition (not B flat). If you require the trumpet to be in B flat, you will need to change the staff to B flat transposition in the score before exporting. Alternately, you can change the instrument definition in your notation program after you import the MusicXML file.

Selecting which tracks to include
You may have a project with many tracks that do not need to be included in the exported MusicXML file, such as key switch control tracks, synth tracks, etc. In this case, go to the Sequence Editor, select only the tracks you wish to export and use the *Export>Selected Tracks as MusicXML* command.

If you have tracks organized into track folders, you can select a folder (or folders) and just those tracks will be included in the exported MusicXML file.

Importing MusicXML files into Finale

Once you have exported your Performer Lite project as a MusicXML file, it can be imported into Finale 2014 (and several earlier versions) by following these steps.

- From the Launch window, click on the "IMPORT MUSICXML" button. Locate the MusicXML file you have exported from Performer Lite on your hard drive and click the open button.

or

- Go directly to the File menu and select *Import>MusicXML...* Locate the MusicXML file you have exported from Performer Lite and click the open button.

Finale now opens the MusicXML file as Finale score.

Importing MusicXML files into Sibelius

Once you have exported your Performer Lite project as a MusicXML file, it can be imported into Sibelius 6, 7 or 7.5 by following these steps.

Sibelius opens MusicXML files the same way it opens Sibelius score files.

- From the Quick start window, click the *Open Other...* button in the lower left corner, locate the MusicXML file you have exported from Performer Lite on your hard drive and click the open button.

or

- Go directly to File menu bar, select Open, locate the MusicXML file you have exported from Performer Lite and click the open button.

The *Open MusicXML File* window appears. Here you can specify paper size, house style and instrument options. Explore these options and see what best fits your workflow. Generally speaking, the default settings with the house style you need for your project works well.

Sibelius now opens the MusicXML as a Sibelius score.

CHAPTER 20 Mixing Board

OVERVIEW

Performer Lite's Mixing Board window provides a powerful integrated mixing environment for MIDI and audio tracks. It also provides access to real-time effects processing and virtual instrument plug-ins.

The Mixing Board will seem familiar because it is modeled after standard hardware consoles. Lurking under the hood, however, are many powerful features, as well as many time-saving shortcuts. This chapter covers them all.

Overview 174
Mixing Board quick reference 175
Mixing Board menu 177
Mixing Board window basics 178
Track strips 178
EQ and Dynamics (audio tracks only) 184
Instrument tracks 189
Automated mixing 190
Mixing in real time 191
Editing your mix graphically 191
Monitoring 191
Audio mixing features 191
Aux tracks 192
Master faders 192
Track groups 192
VCA tracks 192
Remote control 193
Working with effects plug-ins 193
Working with multiple mixes 196

MIXING BOARD QUICK REFERENCE

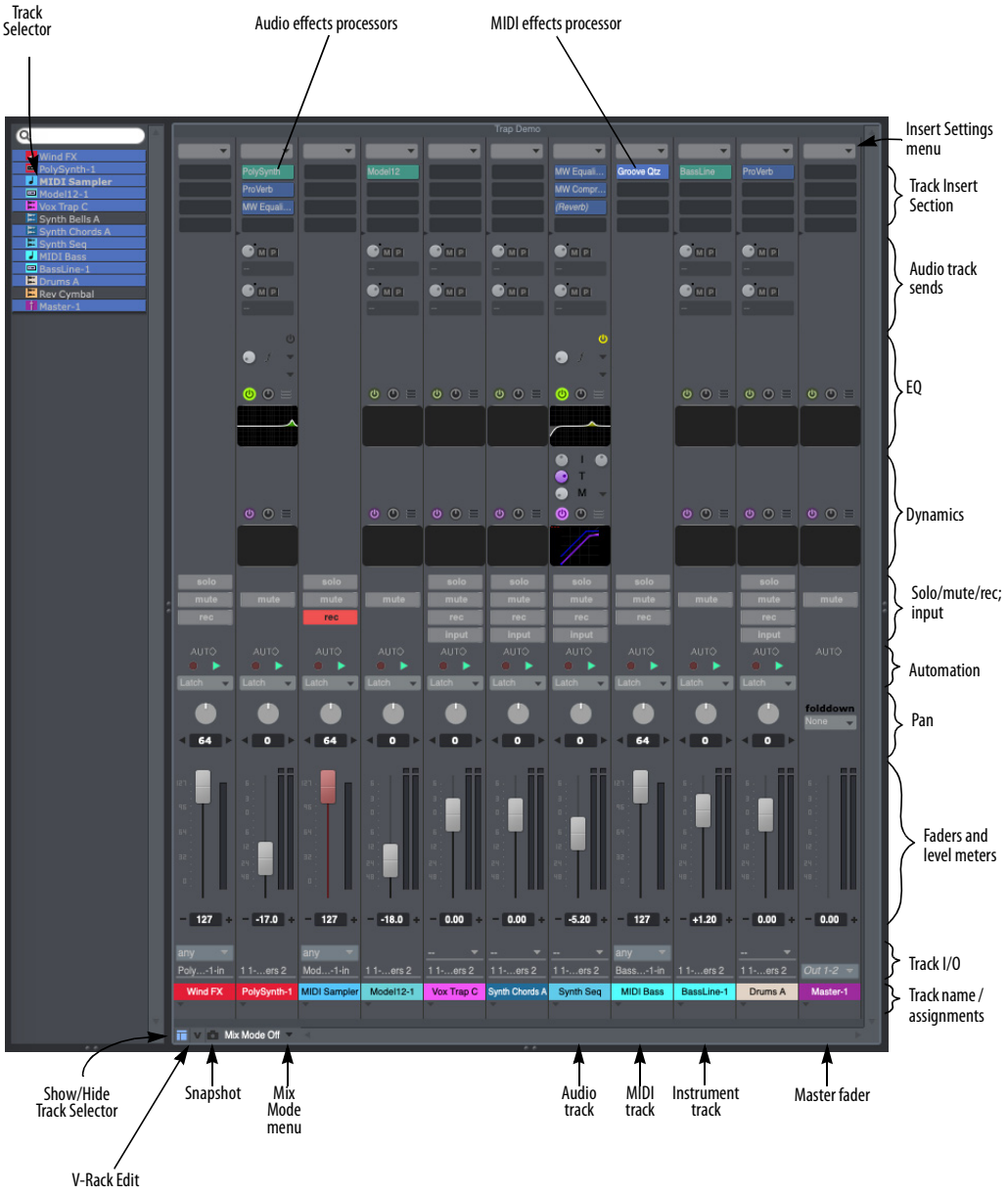


Figure 20-1: The Mixing Board gives you a fully automated mixing environment.

Track Selector: Click or drag over the names of the tracks in this list to show or hide them in the Mixing Board. Option/Alt-click to hide all except the track you click; Command/Ctrl-click to show all except the track you click.

Show/Hide Track Selector: Shows and hides the list of tracks at the left side of the window.

V-Rack Edit: Toggles the Mixing Board between the currently play-enabled sequence and the last viewed V-Rack. Option/Alt-clicking this button toggles the "Show V-Racks" menu option.

Snapshot button: Takes a snapshot of the current mix automation settings of your choice for the tracks and time range you specify. The snapshot operation inserts mix automation events in each included track at the current main counter location. This can be done while Performer Lite is stopped or playing back.

Mix Mode menu: Lets you create and manage multiple mixes for a sequence. A *mix* consists of all of the volume pan and effects automation data in all tracks. You can duplicate a current mix and then modify it, or start from scratch by creating a new, blank mix. Volume and pan automation data for the current mix is recorded into tracks as usual with the Mixing Board controls, or with the other continuous controller features in Performer Lite. After you've created more than one mix, you can instantly switch between mixes by choosing them from this menu.

Insert Settings menu: Save, recall, and manage chains of inserts.

Track Insert Section: Displays real-time processing inserts for MIDI and audio tracks. Choose the desired effect from the insert. MIDI track inserts consist of MIDI processing effects such as the transposer and Change velocity. Audio inserts consist of plug-in effects, such as EQ, dynamics, reverbs, delays, and any 3rd-party plug-ins you currently have installed in your system. You can change the number of inserts per track with the *Set Number of Inserts* menu item.

MIDI effects processors: MIDI effects processors are non-destructive, real-time output processors that affect the track's playback. The choices include Shift, Quantize, Transpose, Change velocity, Echo and many others. These effects only affect playback and can be changed or turned off (bypassed) at any time. They do not modify the original data in the track.

Audio effects processors: These are real-time, non-destructive audio processing inserts that can be applied to audio tracks.

Audio track sends: Allow you to bus the track's signal, either pre- or post-fader, to other tracks.

EQ and Dynamics: Provide visual feedback and quick-access control of each track's EQ and dynamics plug-ins.

Solo/Mute/Rec/Input: These buttons perform standard solo, mute, record and input monitor enable functions. "Glide" horizontally across these buttons with the mouse to quickly toggle several tracks at once.

Automation: Enables playback and recording of automation data and sets the automation mode. For more information, see chapter 55, "Mix Automation" (page 490).

Pan: For MIDI tracks, the pan knob generates standard MIDI pan controller data (controller #10). Typically, this controls the panning of the MIDI track across the main stereo outputs of the MIDI instrument, although this depends entirely on the instrument. For audio tracks, the pan knob pans an audio track across its pair of outputs. For example, if a track is assigned to outputs 3 and 4,

pan hard left sends the track to output 3; pan hard right sends it to 4. Double-click the pan knob to go to pan center. If pan automation data has been recorded, knobs animate during playback (when the Automation play button is enabled).

Faders: Control volume for each MIDI and audio track by generating MIDI and audio volume events, which can be recorded into the track for automation. If automation data has been recorded, faders animate during playback (when the Automation play button is enabled). If the fader cap is missing, it means that the audio track has been disabled. See "Enabled" on page 70.

Level Meters: The level meters display the audio output level for each audio track. For MIDI tracks, the level meters indicate MIDI note-on velocities.

Track I/O: These menus give you direct access to each track's input and output assignments. Master faders don't have inputs. MIDI tracks only have an input assignment when the project is in Multi Record mode.

Track name and assignment: Double-click the track name to open the editor for the track. Drag it left or right to move the track in Mixing Board.

Tracks: Each strip in the Mixing Board represents a MIDI, audio, instrument, aux or master fader track in the currently play-enabled sequence. Show or hide them as desired using the Show/Hide Track Selector (described above). Drag the track strip name horizontally to re-order them.

MIXING BOARD MENU

Mixer section show/hide: This section of the Mixing Board menu displays checkable menu items that show and hide each section of the console. Checked items are visible. Unchecked items are hidden. Hold down the Option/Alt key to hide all sections except the one you choose; use the Command/Ctrl key to show all sections except the one you choose. If the Auto Resize command is checked, the console window will automatically resize itself when sections are shown or hidden. You can use these options to customize your mixing board and save screen real-estate.

☛ By default, sends are not shown. If you would like to use sends in your project, be sure to check 'Sends' in the menu.

Use Narrow View: When checked, this menu item reduces the mixer channels horizontally, enabling you to display more channels in the same space.

V-Rack Edit: Toggles the Mixing Board between the currently play-enabled sequence and the last viewed V-Rack. This is the same as pressing the V-Rack button in the lower left corner of the Mixing Board. See chapter 26, "V-Racks" (page 239).

Show V-Racks: Toggles the display of V-Rack tracks alongside your sequence tracks. See chapter 26, "V-Racks" (page 239).

Enable Mouse Wheel for Sliders and Knobs: When enabled, the mouse scroll wheel can be used to adjust the volume fader, pan knob, and other sliders and knobs; when disabled, the mouse scroll wheel only scrolls the Mixing Board window.

Set Number of Effect Inserts: Lets you determine the number of insert slots per channel. Up to 20 insert slots can be specified.

Automatically Add Inserts: When checked, the Mixing Board adds another row of inserts automatically when you fill the last (bottom-most) insert slot.

Set Number of Sends: Lets you determine the number of sends per channel. Up to 20 sends can be specified.

New Track Group: Lets you create a track group of any kind.

Attach MIDI Controller: Lets you connect a mixing board fader or knob to an external MIDI controller, such as a mod wheel. This includes send level knobs, send pan and send mute buttons.

Clear MIDI Controller: Removes the connection to an external controller from the knob or fader that you select with the cursor.

Min Time and Value Change: Allows you to set the minimum amount of time between volume and pan events that the mixing board controls will generate when you move them. Also lets you choose the minimum value change. Raising these values can prevent unnecessarily high data density. But raising them too high can result in zipper noise, or audible "stepping" during smooth changes.

MIXING BOARD WINDOW BASICS

The Mixing Board is a track-based mixing console for all MIDI and audio tracks. It has one strip for each track in the sequence.

Opening the Mixing Board

To open the Mixing Board, click it's button in the Control panel (Figure 7-4 on page 44). If you have multiple sequences in the file, the Mixing Board shows the sequence that is currently play-enabled.

Showing and hiding tracks

Use the Track Selector (page 44) to choose which tracks you'd like to see in the Mixing Board.

Changing the order of the track strips

To move tracks left or right, drag them by their name at the bottom of the strip.

Showing and hiding sections

Use the section names at the top of the Mixing Board window menu to show and hide console sections, such as the Inserts section. Checked items are visible. Unchecked items are hidden. This allows you to optimize the console appearance for your screen size. Hold down the Option/Alt key to hide all sections except the one you choose; use the Command/Ctrl key to show all sections except the one you choose. If the Auto Resize command is checked, the console window will automatically resize itself when sections are shown or hidden.

Switching sequences

To quickly switch the sequence you are looking at in the Mixing Board window, change the play-enabled sequence.

Switching between sequences and V-Racks

To switch to a V-Rack, click the V-Rack Edit button in the lower left corner of the Mixing Board (Figure 20-1 on page 175) or choose *V-Rack Edit* from the menu to toggle the Mixing Board between the currently play-enabled sequence and the last viewed V-Rack. See chapter 26, "V-Racks" (page 239).

TRACK STRIPS

Each MIDI and audio track strip has the sections shown below in Figure 20-2 on page 180.

Inserts

An *insert* is a real-time effect that is non-destructively applied to the data in the track on playback. MIDI tracks can be processed with MIDI plug-ins (such as the transposer and velocity compressor) and audio tracks can be processed with audio plug-ins. Virtual instrument

plug-ins can also be inserted on the top-most insert of instrument tracks (see chapter 13, “Instrument Tracks” (page 82)).

Each insert slot in the track can hold one effect. To choose the desired effect plug-in for the insert, see “Choosing a plug-in for an insert” on page 179.

Up to 20 inserts can be simultaneously applied to an individual track, depending on how many inserts are configured with the *Set number of inserts* menu option. When you choose the desired effect plug-in for the insert slot, the Effects window opens to display the selected processor’s parameters. See chapter 57, “Effects Window” (page 516) for more information.

The signal for a track passes through the inserts from top to bottom. Accordingly, inserts are labelled A, B, C, etc. from top to bottom. Similar to hardware mixing consoles, the order in which effects are applied makes a difference, so keep this in mind when employing multiple inserts. Insert settings apply globally to the entire track and are remembered until you change them.

Configuring the number of insert slots (audio tracks only)

If you find yourself running out of insert slots, you can add insert slots with the *Set Number of Effect Inserts* command located in the Mixing Board menu. You can configure up to 20 inserts per channel.

If you place an effects plug-in in the last (bottommost) insert, another row of inserts will be added automatically. If you don’t want this behavior, uncheck the *Automatically Add Inserts* menu command.

Configuring inserts as pre- or post-fader

Performer Lite allows you to graphically configure inserts as either *pre-* or *post-fader* inserts with the pre/post fader divider line as shown below in Figure 20-3. Inserts above the line are pre fader. Inserts below the line are post fader. A pre-fader insert is applied to the signal running through the channel *before* it reaches the channel’s fader; similarly, a post-fader insert effect is applied to the signal *after* the channel’s fader.

You can grab the handle on either side of the pre/post fader divider to move the location of the divider in the inserts chain.

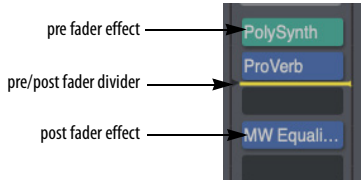


Figure 20-3: Configuring pre- and post-fader effects with the pre/post fader divider line.

Be careful when boosting gain

Some plug-ins provide volume controls of their own. By default, Performer Lite’s effects inserts are pre-fader, so it is possible to boost level above unity gain with a plug-in’s volume control. So be careful when setting levels for plug-ins that have been configured pre-fader.

Choosing a plug-in for an insert

For MIDI tracks, insert slots are menus. Simply choose the desired MIDI plug-in from the menu.

For audio tracks, click the insert slot to open the plug-in chooser (Figure 20-4). This window lets you quickly find the effect you are looking for, and you can then click *Select* to place it in the insert.

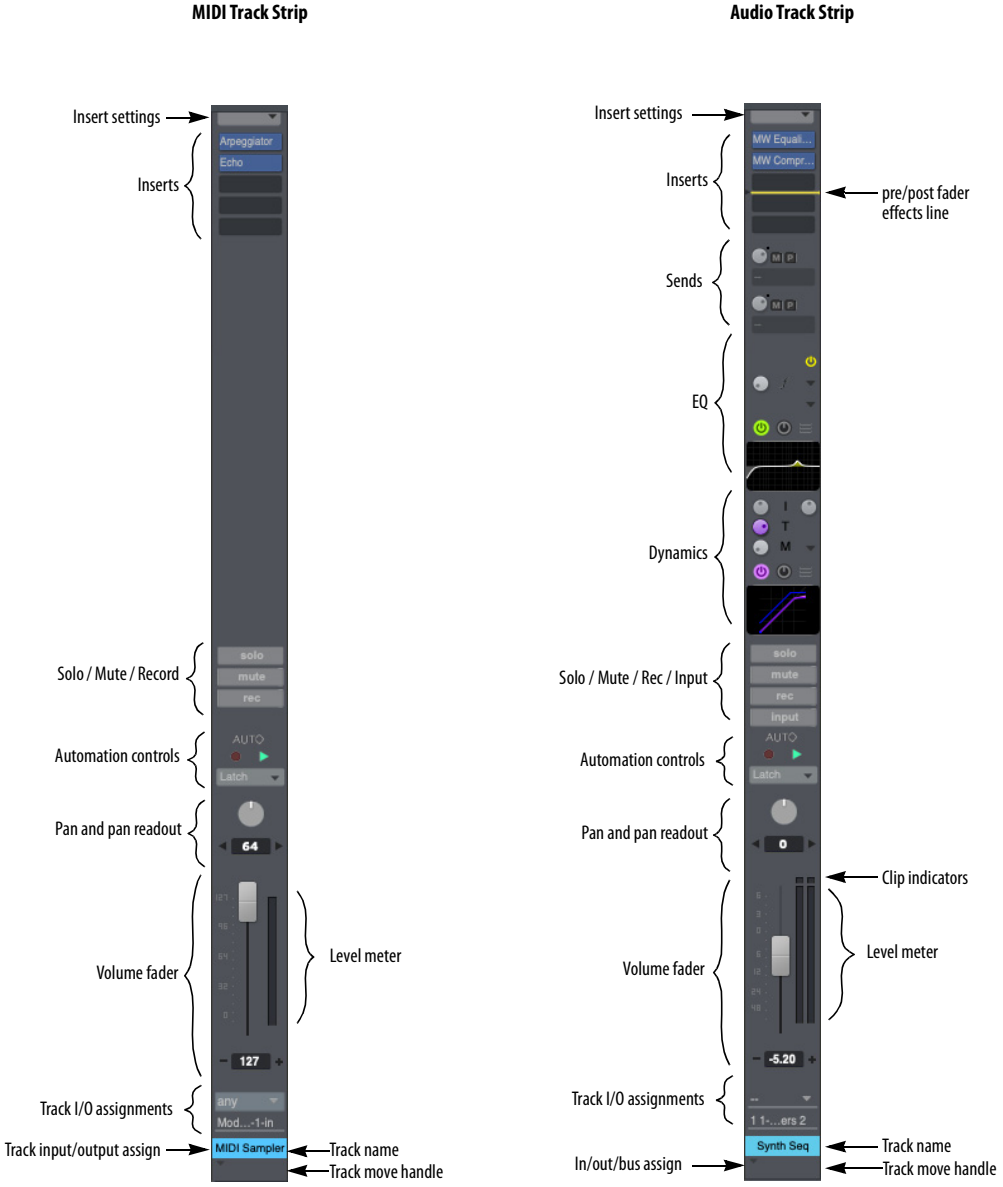


Figure 20-2: A Mixing Board track strip.

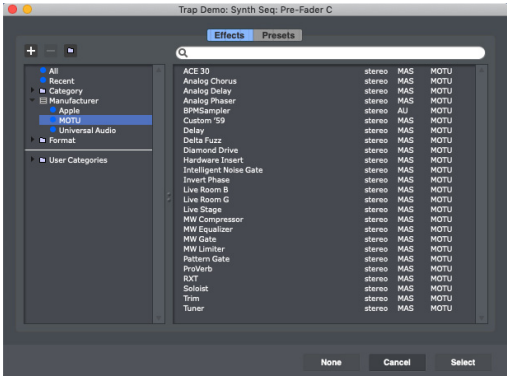


Figure 20-4: Click an audio track insert to open the plug-in chooser.

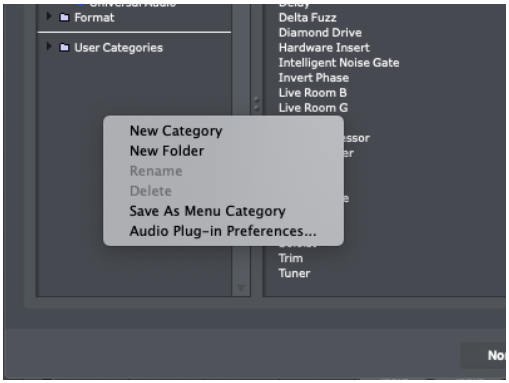


Figure 20-5: Organizing plug-ins and presets in the chooser.

If an insert already holds a plug-in, right-click or Command/Ctrl-click the existing plug-in to open the plug-in chooser.

Effects versus presets

The plug-in chooser provides two buttons at the top, which let you browse plug-ins by name or by their presets. The window functions in a similar fashion, either way.

Searching

To search for a particular effect or preset, type its name into the search field above the list. All matches appear in the list.

Folders and categories

The left-hand list provides organized folders and categories for your effects plug-ins. Factory-supplied folders include Categories, Manufacturers, and Formats. Use the plus (+), minus (-) and folder buttons above the list to create your own. Or right-click anywhere in the list. User-created categories can be dragged into user-created folders. Folder can also be dragged into other folders to create hierarchical organization.

To organize your plug-ins, drag and drop them from the right-hand list into the categories in the left-hand list. Shift-click and Command/Ctrl-click to select and drag multiple plug-ins at a time.

The same organizational techniques apply to both effects plug-ins and presets.

You can also right-click in the right-hand list to access several shortcuts (Figure 20-6).

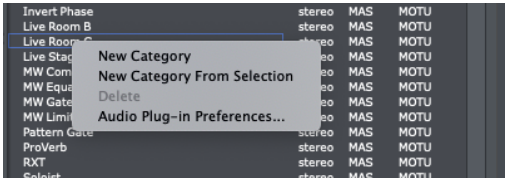


Figure 20-6: Right-click the plug-in list to access these shortcuts.

Save As Menu Category

When choosing plug-ins in the Mixing Board inserts, as a shortcut, you can right-click an insert to access a menu of the category you have designated as the *Menu Category*. To do, right-click the desired category and choose *Save As Menu Category* (Figure 20-5).

Insert Settings presets

Chains of inserts can be saved and recalled with the Insert Settings menu found at the top of the Inserts section in the Mixing Board and Channel Strip. A variety of factory presets are included, and you can edit, save, and recall your own presets.

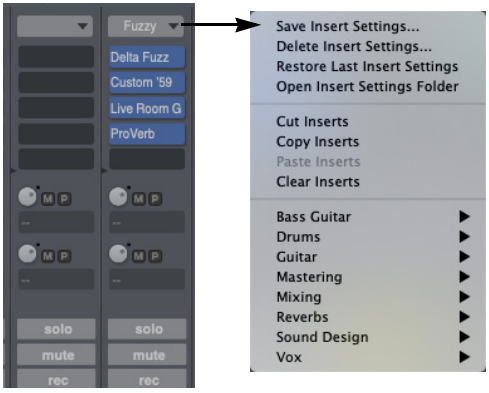


Figure 20-7: Insert Settings presets menu in the Mixing Board.

These presets affect only the inserts; other track settings, such as the fader or pan knob, are not affected.

Insert Settings menu commands

Save Insert Settings: saves a new insert settings file.

Delete Insert Settings: deletes the current insert settings file and clears the inserts. You will be warned that the action cannot be undone.

Restore Last Insert Settings: reloads the preset which was most recently loaded.

Open Insert Settings Folder: opens a Finder or Explorer window revealing the insert settings files. There, you can rename, copy, delete, and move your files.

Cut Inserts: Removes all effects on the channel and places the effects chain on the clipboard.

Copy Inserts: Copies all effects on the channel onto the clipboard.

Paste Inserts: Pastes any effects inserts currently on the clipboard onto the track's inserts.

Clear Inserts: removes all effects inserts. On instrument tracks, this command removes only the effects inserts; the instrument insert is unaffected.

Common folder

Presets for each track type (MIDI, Audio, Aux, and so on) are saved in separate folders. However, if you would like a preset to appear in the Insert Settings menu for all types of tracks that use audio effects plug-ins (Audio, Aux, Instrument, and Master Fader), save the preset in the Common folder. Common presets appear at the bottom of the Insert Settings menu on audio tracks.

Bypass toggle

Option/Alt-click the Insert Settings menu to toggle Bypass of all inserts on that track at once.

Insert Settings presets in insert slots

Insert Settings presets can also be loaded from individual insert slots (using the plug-in chooser). In this case, the Insert Settings preset will be spliced in starting at the chosen slot. Other inserts that are already loaded on that track will not be removed; if necessary, existing inserts will be moved to lower slots to allow room for the new inserts.

Insert Settings presets when adding instrument tracks

Insert Settings presets are also available when adding an instrument track via *Project menu* > *Add Track* > *Instrument Track* or *Project menu* > *Add Track* > *Add Instruments*.

Sends (audio tracks only)
The Mixing Board provides up to 20 sends per track. (See "Configuring the number of sends" on page 184.) A send can be routed to a physical output in your system or to any virtual bus that you configure in the Bundles window.

Each send has the following controls:

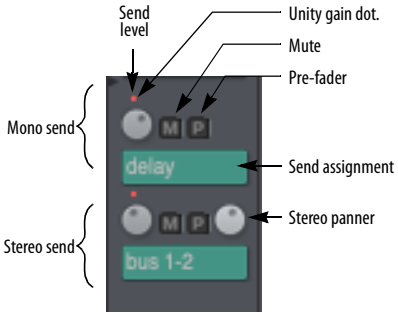


Figure 20-8: Send controls.

When viewing the Mixing Board in Narrow Mode ("Mixing Board menu" on page 177), the send mute buttons and pre-fader buttons are converted into a checkable menu command in the send menu.

Mono or stereo sends
Use the *Send assignment* menu (Figure 20-8) to route the send to any desired bus or output destination. Sends can be assigned to a destination in any channel format (mono or stereo).

Send level
Use the *Send level* knob (Figure 20-8) to control the amount of signal going to the send destination. The range is from -× to +6.02dB. Option–double-click the send level knob to set the send level to unity gain (0 dB), as indicated by the blue dot at the 2 o'clock position.

When you turn the send level knob, Performer Lite displays the send amount (in dB) in a pop-up box.

Send mute/unmute switch
Click the "M" button to mute or unmute the send. When engaged (on/illuminated), the send is muted.

Pre-fader button
The "P" *Pre-fader* button (Figure 20-8) determines whether the signal is passed to the send bus before the channel fader (pre) or after the channel fader (post). When disengaged (off/dark), the send is post-fader. When engaged (on/illuminated), the send is pre-fader. When set to *pre-fader*, the send level is not affected by the main volume fader of the track. When set to *post-fader*, it is affected by the main volume fader.

Send panners
If you have assigned a send to a stereo destination, a stereo panner appears, as shown in Figure 20-8, to control send panning. As a shortcut, double-click the panner to return to pan center.

Send From Channel
For stereo tracks (or tracks whose signal has been split into stereo by insert plug-ins), the *Send From Channel* command in the Send Assignment menu (Figure 20-8) lets you choose how the source signal is fed to the send.

For mono send destinations, the *Send From Channel* sub-menu lets you choose which individual source channel (left or right) goes to the send. Or you can choose *Mono Sum* to send both source channels merged down to one channel.

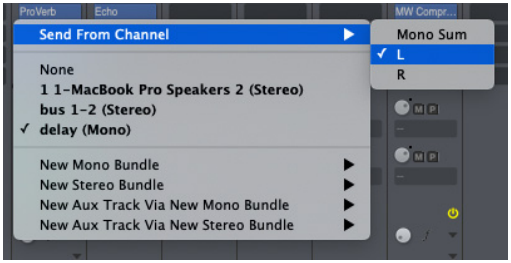


Figure 20-9: The 'Send From Channel' sub-menu for stereo tracks. In this example, only the left channel of a stereo track is going to the send.

For stereo send destinations, choose *Stereo* from the *Send From Channel* sub-menu to feed the stereo source signal to the stereo send. Or you can choose an individual component channel (left, right, etc.) to go to the send (in stereo). For example, you could feed only the left channel of the source signal to the left and right channels of the send.

Configuring the number of sends

If you find yourself running out of sends, you can add more with the *Set Number of Sends* command located in the Mixing Board menu. You can configure up to 20 sends per channel.

Replicating active sends using drag & drop

To replicate an active send (one that already has a send assignment) to any other send slot in the Mixing Board, Option/Alt-drag it to any other empty or occupied send slot.

EQ and Dynamics (audio tracks only)

The EQ and Dynamics sections provide visual feedback and quick-access control of each track's EQ and dynamics plug-ins.

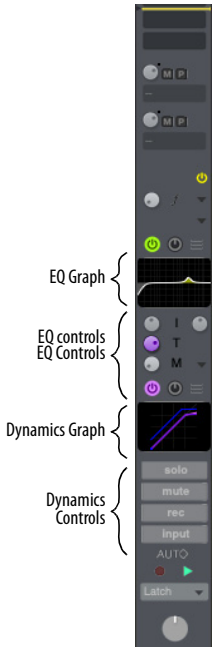


Figure 20-10: The EQ and Dynamics sections in the Mixing Board

Each section has two components: a group of controls for configuring and editing the plug-in, and a graph displaying a visual representation of the plug-in settings.

The controls which edit the plug-in settings work in the same manner as they do in the regular plug-in window, but there are a few additional controls to be aware of which are used for managing the EQ and Dynamics sections themselves.

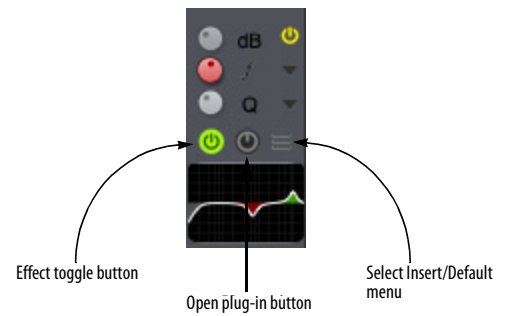


Figure 20-11: EQ and Dynamics controls

Effect toggle button: When the section is empty, this button instantiates the default EQ or Dynamics plug-in (as chosen in the Select Insert/Default menu, below). When a plug-in is already present, clicking this button toggles the plug-in's bypass.

Open plug-in button: Clicking this button opens the Effects window for the associated EQ or Dynamics plug-in.

Select Insert/Default menu: The top portion of this menu chooses the insert assigned to the section; the bottom portion chooses the default kind off EQ or Dynamics plug-in.

Compatible plug-ins

The EQ and Dynamics sections are compatible with all of Performer Lite's included EQ and dynamics plug-ins:

- MasterWorks EQ
- MasterWorks Compressor
- MasterWorks Gate
- MasterWorks Limiter

Selecting a plug-in

To select a plug-in for the EQ or Dynamics section when the section is empty, you can choose the desired plug-in from the bottom portion of the Select Insert/Default menu. You can also instantiate the default (checked) plug-in by pressing the Effect toggle button or by double-clicking the graph.

Figure 20-12: Select Insert/Default menu

Alternatively, you can associate the EQ or Dynamics sections with any compatible EQ or Dynamics plug-ins which are already instantiated. Use the top portion of the Select Insert/Default menu to choose an existing instance.

When opening projects from previous versions of Performer Lite, the EQ and Dynamics sections will automatically display the first compatible EQ and Dynamics plug-ins. If you have multiple EQ or Dynamics plug-ins instantiated on a track, use the top portion of the Select Insert/Default menu to change which plug-in's controls appear in the EQ or Dynamics section, as described above.

EQ Controls

The EQ controls display the settings for the EQ band chosen under the *Band Selection* menu.

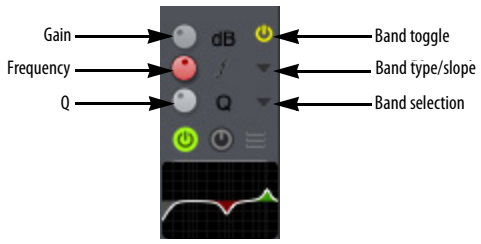


Figure 20-13: EQ controls

The controls in the EQ section work similarly when using MasterWorks EQ. For more information on each plug-in, see "MasterWorks EQ" on page 27 in the *DP Plug-in Guide*.

Dynamics Controls

The controls shown in the Dynamics section vary according to the plug-in you have chosen.

MasterWorks Compressor

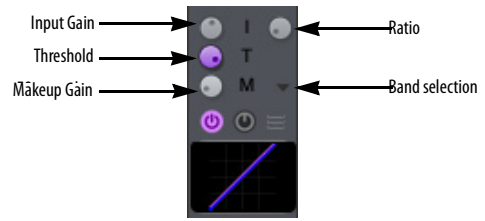


Figure 20-14: Dynamics controls for MasterWorks compressor

For more information, see "MasterWorks Compressor" on page 24 in the *DP Plug-in Guide*.

MasterWorks Gate

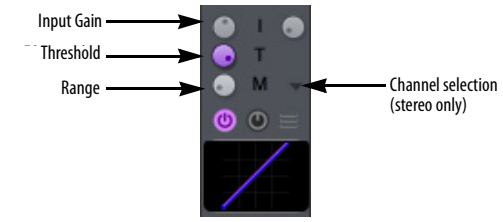


Figure 20-15: Dynamics controls for MasterWorks Gate

For more information, see "MasterWorks Gate" on page 34 in the *DP Plug-in Guide*.

MasterWorks Limiter

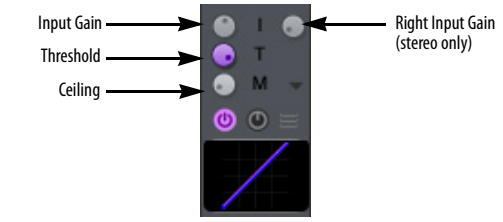


Figure 20-16: Dynamics controls for MasterWorks Limiter

For more information, see "MasterWorks Limiter" on page 36 in the *DP Plug-in Guide*.

Graphs

The EQ and Dynamics graphs provide a visual representation of the plug-in's settings. The graphs are customized for each plug-in so the most relevant settings are displayed. Two example graphs are shown below:

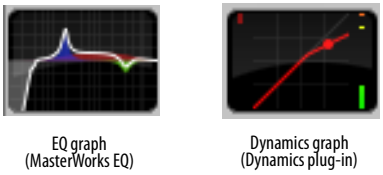


Figure 20-17: EQ and Dynamics graphs

The controls shown in the graphs cannot be edited directly. To edit the plug-in settings, use the EQ or Dynamics controls beneath the graphs, or double-click a graph to open the Effects window.

To toggle the plug-in's bypass state, Option/Alt-click the graph.

Pre-rendering

Showing the EQ and Dynamics sections in the Mixing Board causes any associated plug-ins to be processed in real-time, i.e. not pre-rendered.

Hiding the EQ and Dynamics sections

The EQ and Dynamics sections can be shown or hidden by toggling them in the Mixing Board menu. The EQ Controls, EQ Graph, Dynamics Controls, and Dynamics Graph can all be hidden or shown independently.

Solo / Mute buttons

Solo and Mute buttons perform standard soloing and muting functions for each track. In fact, they correspond directly to the soloing and muting features throughout Performer Lite. For example, if you mute a track in the Mixing Board, its play-enable button becomes disabled in the Sequence Editor.

When soloing and muting, the volume fader color changes to indicate the playback state of the track as follows:

Fader background color	Meaning
Light gray	Track can play
Dark gray	Track cannot play because at least one other track is soloed, or the track is muted

Record / Input (monitor) buttons

The *Record* button puts the track into record. The *Input* button engages input monitoring. These buttons function identically to their counterparts in the Sequence Editor. See "The record button" on page 280 and "Audio input monitoring" on page 280.

Button shortcuts

The table below describes several shortcuts for the Solo, Mute, and automation play buttons:

To do this	Do this
To solo or mute all tracks except the one you click	Command/Ctrl-click the track's solo or mute button
To unsolo or unmute all tracks except the one you click	Option/Alt-click the track's solo or mute button
To change the solo, mute, or auto setting for several adjacent tracks quickly	Drag across the buttons horizontally with the cursor

Automation controls

When the Automation Play button is turned off, all automation data in the track is temporarily disabled and the current channel strip settings (fader position, pan setting, etc.) take over. The Automation Record button lets you record automation data into the track. The Automation Mode menu below the record button lets you specify how automation data will be recorded. For details, see chapter 55, "Mix Automation" (page 490).

Panning

For MIDI tracks, pan pots generate standard MIDI panning controller data (controller #10). The data range for MIDI tracks is zero to 127, where 64 is pan center, 0 is hard left, and 127 is hard right. The data range for audio tracks is <64 (hard left) to 63> (hard right) with zero as pan center.

Pan pots pan an audio track across its pair of outputs. For example, if a track is assigned to outputs 3 and 4, pan left sends the track to output 3; pan right sends it to 4.

Below is a summary of techniques for pan knobs:

To do this	Do this
Change panning smoothly over time	Drag the pan knob up and down or left and right, or click on the number in the value readout and drag up or down
Go directly to pan center	Double-click the knob
Increment or decrement the pan setting by one	Click the left or right arrow button

Stereo panning

The following chart demonstrates the results of stereo panning. In general, center the knob for full separation of the stereo signal.

Stereo pan knob position	Left signal	Right signal

☛ The Trim plug-in (see "Trim" on page 47 in the *DP Plug-in Guide*)can be used to invert the phase of an audio signal or constrain the stereo image of a stereo track.

Volume faders

The volume faders control the output level for each MIDI and audio track by generating MIDI and audio volume events, which can be recorded into the track for automation. If automation data has been recorded, faders will animate during playback (when the Automation play button is enabled).

☛ If the fader cap is missing, it means that the audio track has been disabled. See "Enabled" on page 70.

MIDI volume has a scale from 0-127; audio volume is expressed in decibels (dB) where zero is unity gain. Audio faders provide an additional +6 dB of boost above zero dB. For example, if you move a fader in the Mixing Board as high as it can go, it will be set at 6.02 dB above unity gain. This range is provided throughout the program, wherever audio volume data values are displayed.

The background color of volume faders changes depending on the solo and mute state of the track. See "Solo / Mute buttons" on page 186 for details.

Below is a summary of mousing techniques for changing the values of Mixing Board volume faders:

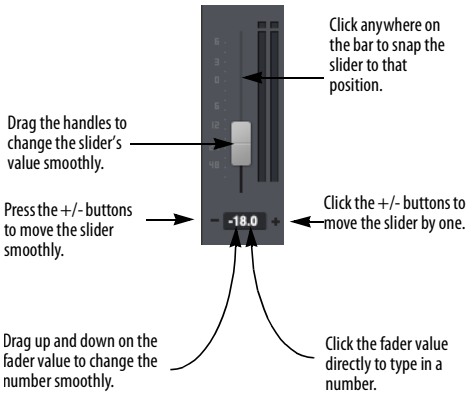


Figure 20-18: The many ways to control a fader.

Using MIDI note velocities to control volume

MIDI notes have on-velocities that affect their volume. The range is from zero to 127. You can edit velocities individually in the edit windows, or you can use the Change Velocity command in the Region menu. Keep in mind, however, that velocity only affects the initial volume of the note and offers no way to change the note's volume while it's playing.

Controlling pan, volume and send controls from an external MIDI controller

To control a volume fader, pan knob, send level knobs, send pan, or send mute buttons from an external MIDI controller such as a mod wheel on a keyboard, use the *Attach MIDI Controller* command in the Mixing Board window menu as described later in this chapter in "Remote control" on page 193.

Level meters

For MIDI tracks, the level meters indicate MIDI note-on velocities only (the fader indicates controller #7 MIDI volume).

For audio tracks, the level meters display the audio output level in dB for the track as determined by the volume automation data in the track. For even more detailed metering, you can use the Trim

plug-in (“Trim” on page 47 in the *DP Plug-in Guide*), or third-party metering products such as SpectraFoo from Metric Halo.

On stereo audio tracks or tracks that have been made stereo by the application of a stereo (or mono-to-stereo) effects plug-in, the level meter displays the signal with true stereo meters.

Clip indicators

Audio tracks display a clip indicator above their level meter. These clip indicators remain illuminated until you click them. Double-click to clear all clip indicators, or choose *Clear all clipping indicators* from the Studio menu.

Track name

Track names appear here, with an ellipsis for long names, if necessary. You can drag a name horizontally to reposition its channel strip in the Mixing Board window. Option/Alt-clicking on a name allows you to rename the track from the Mixing Board.

You can open the Sequence Editor from the Mixing Board by double-clicking any track name. Use the same modifier keys as you do in the Track.

Input/Output/Bus Assignment menu

The menu below the track name lets you make the following assignments for the track:

For MIDI tracks, this menu includes a MIDI output device assignment, and a MIDI input device assignment.

For audio tracks, this menu provides assignments for input and output, bus assignments, and audio track enable/disable. Solo Exempt status is also provided.

In both cases, these are the same assignments that you can make for the track in other windows, such as the Sequence Editor. They are provided here in the Mixing Board for your convenience.

You can also remove a track entirely using the *Delete Track* menu item.

For more information about the I/O menus, see chapter 12, “MIDI Tracks” (page 73) and chapter 11, “Audio Tracks” (page 67).

Figure 20-19: Input/output assignments for both MIDI and audio tracks can be made in the Mixing Board with the menu under the track name. This example shows an audio track I/O assignment menu, with Input, Output, Solo Exempt, and ‘Enabled’ assignments.

INSTRUMENT TRACKS

Instrument tracks (Figure 20-1) appear in the Mixing Board, just like audio tracks and MIDI tracks. However, instrument tracks have a special instrument insert, shaded in green, at the top of the insert section:

To open an instrument plug-in, choose it from the green-shaded menu at the top of the insert section for the instrument track.

In other respects, virtual instrument plug-ins work the same as audio effects plug-ins in the Mixing Board.

Instrument tracks also have MIDI effects inserts below the audio inserts.

For more information about virtual instruments, see chapter 13, “Instrument Tracks” (page 82).

AUTOMATED MIXING

The Mixing Board is a powerful environment in which to automate the combined mix of your MIDI and audio tracks. This section explains how to accomplish basic mixing tasks with the Mixing Board.

The importance of event chasing for MIDI tracks

Automated mixing of MIDI tracks in Performer is heavily dependent on event chasing. Event chasing causes Performer to always scan tracks for MIDI controller events to make sure that playback levels are correct, regardless of where you start playback. (For complete information, see "Event Chasing" on page 270.)

For consistency during the mixing process, it is best to enable event chasing for MIDI controllers. To do so, choose the *Event Chasing* command from the Setup menu and make sure that these items are checked.

Setting initial levels with the Mixing Board

Regardless of whether you plan to automate your mixing directly in Performer or externally using an automated mixing console or other hardware automation system, it is always best to set initial mix automation settings in all of your tracks. This ensures consistency in your mix, gives Performer Lite an initial setting to chase to, and gives you a basis for any changes made later in each track. Performer Lite's snapshot feature is a powerful and convenient way to create initial values. Snapshots can include any mix automation parameters, including volume, pan, plug-in parameters, mutes, solos, etc. See "Snapshot automation" on page 503.

Setting initial values in MIDI tracks

To set initial values in MIDI tracks, you can either insert volume and pan controllers at the beginning of each track (either individually or all at once via a snapshot), or you can simply set the volume fader and pan knob as desired in the Mixing Board. In the latter case, be sure that MIDI volume and pan are being chased (make sure they are checked in the *Event Chasing* dialog in the Setup menu).

Defeating initial volume and pan values in MIDI tracks

There may be times when you wish to prevent Performer Lite from sending initial volume and pan controllers for MIDI tracks. For example, you may want to control volume from the front panel of your synthesizer. If so, you can either defeat volume and pan initialization globally for all MIDI tracks, or disable it specifically for individual tracks.

To defeat volume and pan initialization globally for all MIDI tracks, turn off MIDI volume and pan in the Event Chasing window (Setup menu).

To defeat volume and pan initialization for a few individual tracks (while preserving it for others):

- Be sure that MIDI volume and pan chasing is turned on globally (in the Event Chasing window)
- Use the Automation Setup window (Setup menu) to defeat MIDI volume and pan for the desired individual MIDI tracks. (For details about this window, see "Automation setup for each track" on page 492.) In this case, volume and pan controllers will not be sent, regardless of whether automation playback is enabled for the track or not.

Viewing initial settings

To view initial settings, open the Sequence Editor select volume or pan from one of the track display menus with the Option/Alt key held down (which switches all tracks to display volume). To make changes graphically, drag the control points up or down as desired.

Making snapshots elsewhere in the mix

You can make snapshots as described above anywhere in your Performer Lite mix.

Changing initial levels (or any snapshot)

You can change your initial settings at any time, or any snapshot for that matter, by queuing to the same tick location in the main counter and repeating the procedure described earlier in "Setting initial levels with the Mixing Board". The snapshot feature will never duplicate controller data on the same tick, replacing existing data with the new snapshot value if data already exists at that location. Just make sure the main counter is exactly at 1|1|000 (or wherever your initial settings are located).

MIXING IN REAL TIME

Mix automation is control data that changes the behavior of the effects and mixing board over time. Automation data can be recorded, edited and played back using the sophisticated set of tools that Performer Lite provides. Automation data can be used to control volume, pan, sends and most effects parameters. For complete information on automation, see chapter 55, "Mix Automation" (page 490).

EDITING YOUR MIX GRAPHICALLY

You can edit your mix graphically in the Sequence Editor. See "Inserting and editing automation" on page 499.

MONITORING

An important part of mixing is the process of monitoring live inputs. A live input could be a signal that you are currently recording, such as a microphone, or it could also be a stereo input from a MIDI instrument that you are triggering live from a MIDI track. For complete information about monitoring, see "MIDI input monitoring" on page 277 and "Audio input monitoring" on page 280. Also see "Effects can be applied to Patch Thru" on page 194.

AUDIO MIXING FEATURES

The Mixing Board and Effects windows gives you access to Performer Lite's sophisticated digital audio mixing and routing environment. The following sections discuss several topics that are specific to audio mixing.

Audio mixing features

Performer Lite's virtual mixing environment provides the following features:

- Mixing
- Automation
- Bussing
- Audio track sends
- Aux tracks
- Master faders
- Real time effects plug-ins

Bussing

A *bus* is an internal signal path. Performer Lite's virtual bussing is modeled after a conventional mixing board. Under the MOTU Audio System, Performer Lite provides up to 16 stereo busses. You can set the number of busses in the Studio Configure Studio Settings dialog (Setup menu > Configure Audio System).

A bus routes signal from one place to another. It can also combine several signals as a sub-mix and route them together. To use a bus, you assign a bus bundle as an input or output of an audio track or aux track (explained in the next section). You can also assign a bus bundle as the output of a master fader. Audio track sends can also be assigned to a bus.

There are many useful ways to employ this powerful bussing architecture. For example, you can save large amounts of your system's processing resources by applying effects plug-ins to an aux

track and then bussing multiple audio tracks to it, rather than applying the same plug-in multiple times to each individual audio track. By applying the plug-in only once on the aux track, you conserve processing resources.

The impact of mixing and bussing on MOTU Audio System resources

The MOTU Audio System relies on the main CPU in your computer for all of its processing. Mixing and bussing require a certain amount of CPU power; the more you mix, split, route, and merge tracks using input, output and bus assignments in the Sequence Editor and Mixing Board, the more CPU power you'll use up. Each time you make a connection, split a signal, or merge two or more signals together in Performer Lite's virtual mixing environment, you'll use a tiny bit more CPU power. However, the amount of bandwidth taken up by such a connection is relatively small compared to the amounts required by MOTU Audio System effects plug-ins—even low-overhead ones like the EQ plug-ins. You won't need to be very concerned about CPU power for basic mixing and routing. But you *will* need to be a lot more conscious of your CPU resources as soon as you start using effects plug-ins.

Multi-processor support

When operating Performer Lite with the MOTU Audio System on a multi-processor or multi-core computer, you can take full advantage of distributed processing. A dual-processor or dual-core computer, for example, effectively doubles the amount of processing available for mixing and plug-in processing (over its single-CPU or single-core counterpart). If you have a multi-processor/core computer, Performer Lite takes full advantage of the multiple processors/cores.

AUX TRACKS

In the Mixing Board, Aux tracks look just like disk tracks, with effects inserts, sends, solo, mute, etc. The only difference is that aux tracks have no input monitoring button and no record-enable button. If the Aux track has stereo inputs, it will only display stereo effects plug-ins in the effects insert menus. If the track has mono inputs, it will only display mono or mono-to-stereo plug-ins in the insert menus. Aux tracks are primarily intended as a routing mechanism. Aux tracks allow you to route audio from any source to any destination. For further information, see chapter 14, "Aux Tracks and Master Fader Tracks" (page 89).

MASTER FADERS

In the Mixing Board, the only way master faders differ from other types of audio tracks is that they do not have a pan knob. In their place, master faders have built in fold-down menu. When working in stereo, the fold-down menu allows you to 'fold down' your mix to stereo or mono if you need to generate a mono or stereo mix or to check for mono/stereo compatibility. Note that you can apply plug-ins to the inserts of a master fader to apply the plug-in effect to your entire mix (or all tracks being sub-mixed to that master fader). For additional information about master faders, see chapter 14, "Aux Tracks and Master Fader Tracks" (page 89).

TRACK GROUPS

Performer Lite allows you to create an unlimited number of track groups. Tracks can be linked for mixing, editing, both, or for a customized set of operations that you specify. Tracks can be a member of more than one group. Groups can also be "nested" within each other.

For information about track groups, refer to "Track Groups" on page 92.

VCA TRACKS

Similar to their analog mixing console counterparts, VCA tracks are used to control the relative volume, and other mixing parameters, of a group of other tracks with a single VCA track. You

can create as many VCA tracks as you want in your mix, and you can even have VCA tracks control other VCA tracks as sub-groups. See chapter 56, "VCA Tracks" (page 509).

REMOTE CONTROL

You can control any of the faders or pan knobs in the Mixing Board from any external source that can generate MIDI controller data, such as a mod wheel on your controller keyboard or a fader on a control surface that generates MIDI data.

Attaching a MIDI controller to faders and pan knobs

Use the *Attach MIDI Controller* command to set up external control of faders and pan knobs as follows:

1 Choose Attach MIDI Controller.

The cursor changes to a plus sign.

2 Click the fader or pan knob you wish to control externally.

A red box appears around the control indicating that Performer Lite is waiting for an incoming MIDI controller event.

3 Transmit the data from your MIDI Controller and the box flashes green.

Only MIDI continuous controller data can be used; pitch bend, note-ons, etc. cannot.

4 (Optional) Click another fader or pan knob, or use the arrow keys to move the flashing box around to attach other controls in a similar fashion.

5 When you are done attaching controllers, press return or enter, or double-click the last item you attached.

To cancel, press Command/Ctrl-period (.), the Escape key (Esc), or click elsewhere in the window (such as the title bar).

Clearing MIDI controllers

Use the Clear MIDI Controller command to display all controls that have MIDI controllers attached. They all flash green. Click a control to detach it from the controller. Type Return or Enter to confirm the detachment or Command/Ctrl-period (.) to cancel.

Attaching a MIDI controller to sends or send pan

To attach a MIDI controller to a send knob or send pan knob in the Mixing Board, use the *Learn Controller* command. See "Attaching a MIDI controller to plug-in parameters" on page 529.

Setting the punch-out delay

When you record a fader or knob via remote control, it punches in and out in much the same fashion as when you grab it with the mouse. To punch in, the fader or knob waits to receive an event from its external controller. When it does, it punches in. Punch out, however, is done automatically by Performer Lite and is determined by the amount of time after the last event was received from the controller. Since controllers send data with different degrees of sensitivity, you may find that punch out occurs too frequently. To avoid stuttering the punch out, you can lengthen the delay before Performer Lite punches out with the *Auto Punch-Out Delay* command in the Automation Setup window (Setup menu).

WORKING WITH EFFECTS PLUG-INS

How effects settings apply to a track

Effects settings apply globally to the entire track. To apply an effect to just a portion of a track, you can use bypass automation to disable, enable and then disable again the effect. Or you can apply the

effect 'constructively' using one of the following procedures. Make a time range selection in the track and then do one of the following:

- Bounce to disk (for audio tracks only)
- Choose *Capture real-time MIDI effects* in the Region menu (MIDI tracks only)
- Save the plug-in settings as a preset, remove the real-time plug-in from the track (delete the plug-in from the insert) and then apply it 'constructively' from the *Audio menu>Apply Plug-in* submenu using the same preset you just saved. (Audio tracks only)

Effects can be applied to Patch Thru
Both MIDI and audio effects processors can be applied to any MIDI or audio input that you are Patching Thru. To real-time process a patched thru signal:

1 Assign the desired effects insert to a track in the Mixing Board window insert section.

2 Record-enable the track in the Sequence Editor.

3 If its a MIDI track, play your MIDI controller.

4 If its an audio track, feed live audio to its input.

Patch thru effects work even when playback is stopped
Plug-in effects can be applied to a live input signal, even when playback is stopped.

Audio monitoring settings
When monitoring live audio through MAS effects, be sure to enable *Monitor record-enabled tracks through effects* in the Input Monitoring Mode window which is accessed from the *Configure Audio System* (Setup menu). For details, see "Audio input monitoring" on page 280.

Copying and pasting parameters from one insert to another
You can copy and paste effects parameters from one insert to another. Just choose *Copy* from the Edit menu while a specific insert's effect is being displayed, switch to a different insert with that same effect, and choose *Paste*.

Plug-in insert assignments and effects settings are remembered
Effects settings are saved with the file. In addition, the settings for each insert and track are remembered even if you temporarily remove the effect and re-apply later on. Settings are also remembered if you switch audio hardware.

Mono and stereo effects
Audio plug-ins come in mono and stereo variants. When using a stereo mix bus destination, effects plug-ins can be mono-to-mono, stereo-to-stereo or mono-to-stereo. If a mono audio track is assigned to a stereo bundle, it is panned across the bundle's output pair. If you assign mono plug-in, the track remains mono. However, as soon as you choose a mono-to-stereo plug-in, the track's output becomes stereo. In addition, all plug-ins on subsequent inserts will dynamically switch to stereo as well. If you remove the stereo plug-in, the track output will revert to mono.

When DSP resources are exceeded
Performer Lite will warn you if it cannot successfully allocate resources as a result of something that you do, such as add more audio tracks or choose a new type of effect.

Missing plug-ins in effects inserts
If an effect plug-in is missing when you open a Performer Lite project that uses it, an alert window appears, and you are given the option of remembering or forgetting the missing plug-in. If you choose to remember it, the missing effect will be displayed in parentheses in any inserts in the Mixing Board where it was being used. This allows

you to preserve missing effects assignments in a project when they are not present. For example, you might copy a project from the main computer in your studio onto your laptop, but perhaps your laptop doesn't have all the same plug-ins installed. You can work on the project, save it, and then open it again in the studio without losing plug-in assignments in the Mixing Board.

Drag & drop plug-ins

After you choose a plug-in for an insert, it fills the slot as shown in the Insert section of the channel strip shown in Figure 20-2 on page 180. You can now treat the plug-in as an object that can be selected, deleted, dragged to a different insert or duplicated.

Here is a summary of drag and drop techniques for plug-ins in the Mixing Board.

To do this	Do this
To change to a different plug-in on the same insert	Click the right-hand side of the insert with the chooser cursor to open the plug-in chooser.
To open the plug-in's window	Double-click the left side of the insert with the hand cursor.
To select a plug-in	Click the left side of the insert with the hand cursor.
To remove a plug-in	Select it and press the delete key.
To move a plug-in to another insert	Position the hand cursor over the left side of the insert, and then drag it.
To duplicate a plug-in on another insert	Hold down the Option/Alt key while dragging, as above.
To select several plug-ins	Shift-click the left side of each insert with the hand cursor.
To move several plug-ins to other inserts	Select them, grab the left side of one of them with the hand cursor, and drag them to the destination inserts.
To duplicate several plug-ins	Hold down the Option/Alt key while dragging them with the hand cursor, as above.

WORKING WITH MULTIPLE MIXES

The Mixing Board window has a very powerful feature called the Mix Mode menu, which is located in the lower left-hand corner of the window as shown below. This feature allows you to create an unlimited number of independent *mixes* in a sequence.

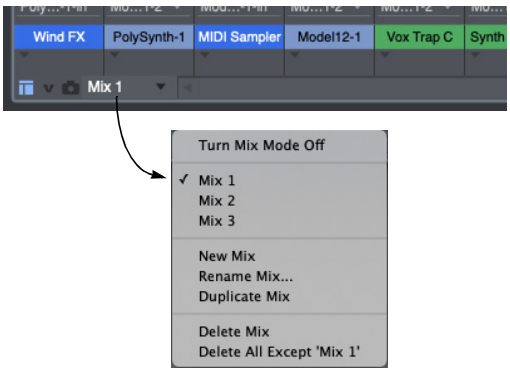


Figure 20-20: The Mix Mode menu.

What is a mix?

A *mix* consists of all of the volume, pan and other mix settings and automation data in all tracks in the sequence, as well as all of the current effects insert assignments and their settings. The Mix Mode menu allows you to create, save, and recall any number of mixes. Each mix can be completely different than the others. You can also create alternative mixes that are slightly different from each other by starting with the Duplicate Mix command. You can even copy and paste data between mixes by simply switching between them.

How mix mode impacts your sequencing

When Mix Mode is *off*, mix settings and automation data "belong" to the Track and Take in which they were set, recorded or inserted. If you switch takes, the mix settings and automation data switch along with the take, just like the rest of the data in the take. (For an explanation of takes, see chapter 43, "Takes and Comping" (page 415).)

When Mix Mode is *on*, however, mix settings and mix automation data "belong" to the current *mix*. If you switch takes, the mix settings and automation data in the track remain behind as part of the current mix. If, however, you switch to a different mix, the current mix automation data goes along with the mix, temporarily disappearing from all tracks. (You can restore the data, of course, simply by reselecting the Mix from the Mix Mode menu.)

Mixes include initial track settings

Each mix includes the following initial track settings, regardless of whether there is currently any automation data in the track:

- Track volume
- Pan
- Send levels
- Send mute states
- Track automation mode
- Track play-enable/disable state

By including these track attributes to each saved mixdown, the Mix Mode menu provides complete independence among separate mixes, even if they don't have any automation data in them. For example, you could simply set initial volume and pan settings for each track, create a mix, duplicate it, adjust the faders and then switch back and forth between the two mixes. You can then freely switch between them, comparing the fader settings, without the need to insert or render any automation data. In general, you will find it very easy to create and use multiple mixdowns because they include initial track settings.

Creating a new or duplicate mix

To create a new, empty mix (with no mix automation data in any of the tracks), choose *New Mix* from the Mix Mode menu (as shown in Figure 20-20 on page 196). Or you can choose

Duplicate Mix to create a new mix based on the current mix (that is, the current volume and pan in all tracks, as well as the current effects insert assignments in the Mixing Board).

Renaming or deleting a mix

To rename or delete a mix, choose it by name from the Mix Mode menu and then choose either *Rename Mix* or *Delete Mix* from the same menu.

Recalling a mix

To recall a mix, just choose it by name from the Mix Mode menu Figure 20-20 on page 196.

Copying and pasting data between mixes

You can easily copy and paste data between mixes by switching between them (as described in "Recalling a mix" above). Copy data from the desired tracks in one mix, recall a different mix, and paste into the same or different tracks in the second mix.

CHAPTER 21 Clips Window

OVERVIEW

The Clips window is a dynamic, interactive environment for triggering audio and MIDI clips during live performance. You can prepare any number of MIDI and audio clips and then individually trigger them during playback. If you enable the queue, you can cue up any number of clips in advance to play consecutively. You can also set up and trigger scenes, which consist of multiple clips arranged in a single row for simultaneous triggering. The Clip Editor lets you view, edit and create clips. You can also copy and paste track material to make clips, or drag and drop them from the Soundbites list or Content Browser.

Overview 198
Quick reference 199
Clips window menu 200
What is a clip? 201
Opening the Clips window 201
Clips window basics 201
The track Stretch setting 202
Showing, hiding and arranging track columns 202
Track types 202
Track playback versus clip playback 202
Creating clips 202
The trigger button 203
Track clips 204
Clip menu 204
Scenes 204
The track scene 205
Playing clips and scenes 205
The multi-queue 205
Mixer channels 206
The Clip Editor 206
Clip Record mode 208
MIDI Learn Mode 208
Attaching MIDI controllers for mixing 208
Using a 3rd-party pad controller 209
Akai APC family 210
Akai APC40 mkII 211
Novation Launchpad 212
Novation Launchpad / SHIFT 213

QUICK REFERENCE

Audio track (column): Each track is represented as a column.

Clips: Clips of any length can be placed in cells and triggered randomly in any order you wish. Audio clips go in audio tracks (mono or stereo) and MIDI clips go in MIDI tracks.

Clip trigger: Click to play or queue the clip. The clip drops to the *Now Playing* row or *Multi-queue* section at the bottom of the column.

Track clip: The top row of cells are track clips, which represent material in the track itself. When a track clip plays, you will hear any audio or MIDI data in the track at that moment (i.e. the main counter location).

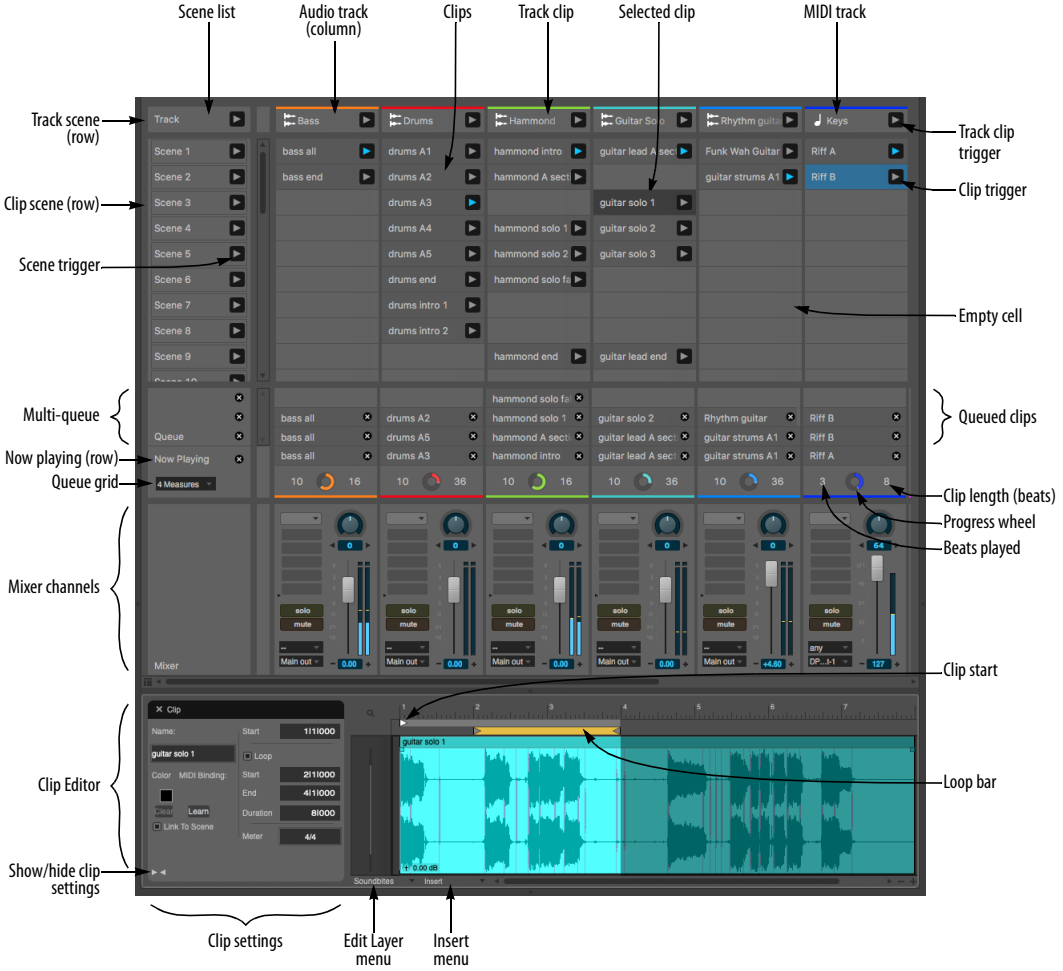


Figure 21-1: The Clips window.

Track clip trigger: Click to play or queue the clip. The clip drops to the *Now Playing* row or *Multi-queue* section at the bottom of the column.

Selected clip: Select a clip to view it in the Clip Editor. You can also cut, copy and delete it.

Scene list: A scene consists of an entire row of cells. Each row represents a different scene.

Scene trigger: Click to queue or play the scene (row). All the clips in the row drop to the *Now Playing* row or *Multi-queue* section at the bottom of the column.

Clip scene (row): A scene consisting of any clips present in the row. Click the scene trigger to play or queue the scene.

Track scene (row): A scene consisting entirely of track clips (in the top row). Click the scene trigger to play or queue the scene.

Multi-queue: Enable the Multi-queue from the Clips window menu. When enabled, you can cue any number of clips, in the queue, where they then play consecutively.

Queue grid: Determines the interval at which queued clips begin to play, i.e. every 2 bars, 4 bars, 8 bars, etc.

Queued clips: When the Multi-queue is enabled, queued clips appear in stacked fashion here. When the cue empties, the last clip will loop continuously.

Now playing (row): Shows the clip currently playing in each track.

Clip length (in beats): The length of the current clip (in beats).

Progress wheel: Shows the playback progress of the current clip.

Beats played: The number of beats already played for the current clip.

Mixer channels: Displays basic Mixing Board settings for each track, including volume fader, pan, Solo, Mute, I/O assignments and inserts.

Clip Editor: Displays the contents of the selected clip. Lets you set basic parameters and edit the clip's audio or MIDI data.

Clip settings: Basic settings for the clip, including its name, start/end times, etc.

Show/hide clip settings: Shows or hides the clip settings section of the Clip Editor.

Edit layer menu: Access edit layers for clips here, just like the Sequence Editor.

Insert menu: Insert audio or MIDI data into the clip using this menu, just like the Insert menu in the Sequence Editor.

Clip start: Drag the Clip Start marker to graphically adjust the clip's start location.

Loop bar: If the clip's Loop option is enabled, drag the loop bar or its end points to adjust the loop graphically.

CLIPS WINDOW MENU

Play on Clip Queue: When enabled (checked), Performer Lite's main transports will begin playback when you trigger a clip. When unchecked, cuing clips does not start playback.

Auto End Clip Record: When recording into a clip, enable (check) this option if you would like the record pass to finish after the first time through the queue grid loop (four bars, for example). When disabled (unchecked), recording continues indefinitely for the entire duration of the record pass.

Show Clip Editor: Displays the Clip Editor (Figure 21-1) below the Clips window.

Enable Multi-Queue: Enables the Multi-queue (Figure 21-1). When enabled, you can stack any number of clips in the queue, where they then play consecutively.

Show Mixer: Shows or hides the mixer section at the bottom of the window (Figure 21-1).

Attach/Clear Mixer MIDI Controller: Lets you assign MIDI controller data to items in the Clips window mixer panels for hands-on mixing from your MIDI controller device.

MIDI Learn Mode: Puts the Clips window into a special mode where you can click active items to assign them to any incoming MIDI triggers, like keyboard keys, controller pads, MIDI pedals, etc.

Enable MIDI Bindings: Temporarily enables or disables any MIDI assignments you've made in *MIDI Learn Mode*.

WHAT IS A CLIP?

A clip is a container for a single track's worth of data. Think of it as a small slice of a track that you can manipulate as a single object.

Clips are typically one, two, four or eight bars long. However, they can be of any length, as short as one beat or as long as an entire song.

Clips can contain any combination of track data. For example, a MIDI clip can contain anything that goes in a MIDI track, such as notes and controller data. Audio clips can contain anything that goes in an audio track, including one or more soundbites, volume automation, plug-in automation, pitch and stretch layer edits, and so on.

Clips also have their own object settings, such as a clip name, color, duration and so on. These settings can be accessed and edited in the Clip Editor (see "Clip settings" on page 206).

Clips can reside in the Clips window and also in tracks. However, they are required to match the basic format of their track. MIDI clips can only go in MIDI tracks. Audio clips can only go in audio tracks. Further, mono audio clips can only go in mono audio tracks, stereo clips in stereo tracks, and so on.

Clips are independent objects. For example, if you duplicate a clip, the resulting duplicate is a new, completely different clip. It is not a 'clone' — or 'instance' — of the original clip. Therefore, if you make change in one, it will not be reflected in the other.

OPENING THE CLIPS WINDOW

To open the Clips window, choose *Project menu* > *Clips*. You can also simply click the Clips tab in the Consolidated clips Window.

CLIPS WINDOW BASICS

The Clips window displays tracks in the current sequence as columns with cells that hold clips (Figure 21-1 on page 199). Clips can be dragged and dropped into cells from the Content Browser, Soundbites list, Sequence Editor and other edit windows. Clip data can also be copied from other windows and pasted into a cell, or recorded directly into a cell. Within a track (column), clips can be arranged however you want in the cells; their order top to bottom doesn't matter (except for arranging scenes, as explained later).

Each clip has a trigger (play) button (Figure 21-1). Clicking it causes the clip to be queued for playback, either before or while Performer Lite is playing back. Once queued, clips initiate playback according to the queue grid setting at the time they are triggered (Figure 21-1). The Queue grid is

adjustable and typically set to 2 bars, 4 bars, 8 bars, etc. For example, if the queue grid is set to 4 bars, newly queued clips will begin to play on the downbeat of bars 1, 5, 9, 13, 17, 21, etc. The queue grid only affects clips at the time they are triggered; clips that have already been triggered are not affected if you change it.

As explained earlier, clips consist of audio or MIDI data compatible with their corresponding track type. If you try to put a MIDI clip into a mono audio track, for example, it won't play; accordingly, it will have no trigger button (as shown in Figure 21-3 on page 204).

THE TRACK STRETCH SETTING

Before you begin using the Clips window, it is a good idea to enable the *Stretch* setting for any audio tracks you'll be using in the Clips window. This ensures that your clips will play in time with the time line and each other. See "Stretch" on page 69.

SHOWING, HIDING AND ARRANGING TRACK COLUMNS

Use the Track Selector to show and hide tracks in the Clips window.

Tracks are ordered left to right according to their position in the Sequence Editor, top to bottom. To rearrange the track columns, reorder the Sequence Editor ("Moving tracks up or down" on page 125).

TRACK TYPES

You can use any type of track in the Clips window ("Basic track types" on page 58). Most often, you'll be using MIDI tracks, and mono and stereo audio and instrument tracks. However, you can also include aux tracks, VCA tracks or even Master Fader tracks, for the purposes of triggering mix automation data.

TRACK PLAYBACK VERSUS CLIP PLAYBACK

Once clips have been placed in the cells of a track, they aren't actually "in" the track. In other words, they exist independently of any material in the track, as viewed in the Sequence Editor or other edit windows. Accordingly, they won't play until you trigger them with their trigger buttons. Until you do, you'll hear whatever material is in the track. As soon as you trigger the clip, it "takes over" the track's playback. So at any given time, you will only hear either the clip or the track material, but not both. Similarly, only one clip can play at a time within a track. So, if you have clips that you intend to play consecutively, you can place them in the same track. For clips that you might want to play simultaneously, place them in separate tracks.

☛ The top row of clips are an exception: see "Track clips" below.

CREATING CLIPS

To create a clip, you can:

- place existing material into a cell in the grid
- create a new, empty clip and use the Clip Editor to construct new material
- record directly into a new, empty clip
- record into an existing clip

☛ When placing existing material in a cell, it must be compatible with the track format (MIDI, mono audio, stereo audio, etc.)

Drag and drop

Drag and drop items from other windows (the Soundbites list, Content Browser, Sequence Editor, etc.) into any compatible cell. If the cell is already occupied by a clip, the existing clip is replaced.

Copy and paste

To create a clip using copy and paste:

1 Copy material from any single track in the Sequence Editor or any other editor.

You can do so from an object selection or a time-range selection.

2 Select a cell in the Clips window and paste. Be sure the cell belongs to a track that is compatible with the data you've copied (MIDI, mono audio, stereo audio, etc.)

A new clip is created from the material on the clipboard. If the cell is already occupied by a clip, the existing clip is replaced.

Create a new, empty clip

1 Right-click an empty cell and choose *New Clip* from the menu.

2 Use the Clip Editor to build the clip's content. See "The Clip Editor" on page 206.

Record into an empty clip

To record into an empty audio or MIDI clip:

1 Disable the *Play on Clip Queue* option in the Clips window menu (page 200).

Otherwise, recording will begin as soon as you click the cell's record button (Figure 21-2).

2 Record-enable the track (Figure 21-7 on page 206).

Each empty cell in the track now displays a record button.

Figure 21-2: Recording into an empty clip cell.

3 Click the cell's record button to record-arm the cell.

4 Set the Queue Grid for the desired duration of the clip you wish to record (such as two bars).

5 Start recording.

Recording occurs the first time through the loop (for duration you set for the queue grid, such as two bars). Then the clip drops into the queue and starts looping.

Record into an existing clip

To record into an existing clip, follow the same procedure as above, except for the following two additional steps after Step 2:

- Option/Alt-click the Record button (Figure 21-11 on page 208) to engage Clip Record mode. This gives existing clips a record button, similar to what is shown in Figure 21-2.
- If you are recording into a MIDI clip and wish to overdub record over the existing material in the clip, enable *Overdub Record* mode (page 113).

☛ While recording in Clip Record mode, the clip is also recorded into its respective track. The same goes for any existing clips that you trigger in the Clips window: they are also recorded into their respective tracks, even if those tracks are not record-enabled. See "Recording triggered clips to tracks" on page 208. Be careful if there is existing material in the tracks that you wish to preserve; if so, don't trigger any other clips while recording into an existing clip.

THE TRIGGER BUTTON

To trigger a clip, click its trigger button (Figure 21-1 on page 199).

☛ If the trigger button is missing from a clip, it means that the clip is not compatible with the track. For example, if you place a MIDI clip in an audio track cell, its trigger button will disappear to indicate that it cannot be played.

While a clip is playing, its trigger button is shaded blue. When not playing, it is gray.

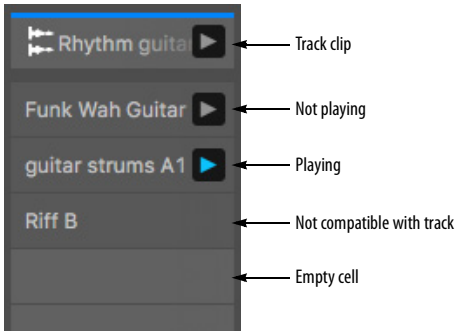


Figure 21-3: Clips.

TRACK CLIPS

Track clips are displayed across the very top of the Clips window grid, in the top row. These track clips are "hard-coded" to represent material in the track itself. When a track clip plays, you will hear any audio or MIDI data in the track at that moment (i.e. the main counter location). Because track clips exclusively represent time line material in the track, they cannot be pasted into, and the clip menu (Figure 21-4) is not available.

CLIP MENU

Right-click a clip to open the Clip menu.

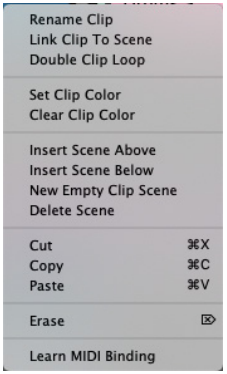


Figure 21-4: Right-click to open the Clip menu.

Rename Clip: Lets you rename the clip.

Link Clip to Scene: Links or unlinks the clip to its corresponding scene. When linked, it will get triggered with the scene. When unlinked, it won't.

Double Clip Loop: (For MIDI clips only) Doubles the length of the looped portion in a MIDI clip and repeats the material to fill the new loop, so you can easily creates changes that will be heard every other time through the looped material.

Set Clip Color: Brings up the standard color picker with eye dropper, allowing you to set the clip's color.

Clear Clip Color: Reverts the clip color to black.

Insert Scene Above/Below: Inserts a new, empty scene (row) above or below the row you've right-clicked.

New Empty Clip Scene: Fills any empty cells in the scene you've click on with new empty clips. If you wish to fill an entire scene with new empty clips, create a new empty scene first and then use this command on it.

Delete Scene: Removes the scene (row) that you've right-clicked.

Cut/Copy/Paste: Cuts, copies or pastes into the contents of the cell.

Erase: Empties the cell without affecting the clipboard.

Learn MIDI Binding: Lets you to assign a MIDI command to the clip, as indicated in the Clip Editor.

SCENES

A *scene* is an entire row of cells in the Clips window (Figure 21-1 on page 199). Each row represents a different scene. When you trigger a scene using the scene trigger button (Figure 21-1), the entire row of clips is queued for playback. A typical use of scenes is for different sections of a

song, such as the intro, chorus, verse, bridge, solo section, etc. However, you can structure and use scenes however you want.

THE TRACK SCENE

The *track scene* (Figure 21-1 on page 199) triggers track time line playback for all tracks in the Clips window, as explained earlier in "Track clips" on page 204).

PLAYING CLIPS AND SCENES

When you trigger clips or scenes, they "drop" into the *Now Playing* row (Figure 21-5) and either begin playing, or they are queued to begin playing at the next *queue grid* boundary. The clip continues to loop until you either cancel it or trigger another clip (unless it's a one-shot clip, as explained later in this chapter).

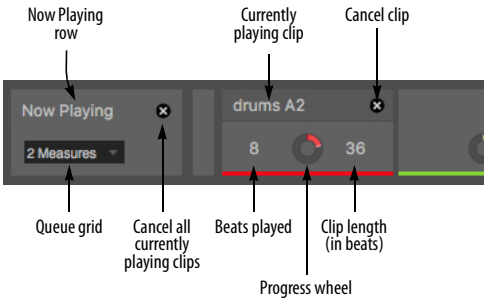


Figure 21-5: The 'Now Playing' row.

For example, in Figure 21-5, the queue grid is set to 2 measures. If you trigger a clip or scene at 5|3|000, it will be queued to begin playing at the next two-bar downbeat, which would be 7|1|000.

Queue grid boundaries are measured from the beginning of the sequence. So, if you set the queue grid to 4 measures, the queue grid boundaries occur at the downbeats of bars 1, 5, 9, 13, 17, 21, 25, etc., When you then trigger a clip or scene, it plays at the next grid boundary.

To cancel a clip, or all currently playing clips, click the cancel buttons shown in Figure 21-5.

THE MULTI-QUEUE

When the *multi-queue* is enabled in the Clips window menu, the multi-queue appears above the Now Playing row (Figure 21-6). When you then trigger clips or scenes, they get stacked in the queue, each playing consecutively until the final clip makes it to the Now Playing row, where it will loop indefinitely until you either cancel it or trigger another clip.

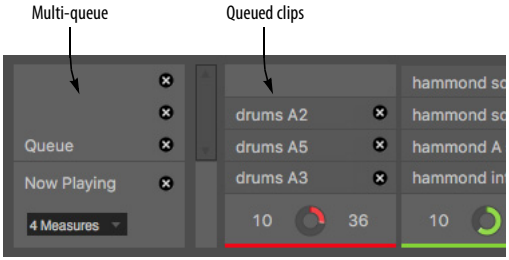


Figure 21-6: The multi-queue.

When queued clips play consecutively, they play as follows, depending on their length and the size of the queue grid:

If...	Then...
The clip is shorter than the queue grid	It loops until the next queue grid boundary.
The clip is the same duration as the queue grid	It plays once through.
The clip is longer than the queue grid	It plays partially, stopping at the next queue grid boundary.

For example, if you had an 8-bar grid and you queued a 1-bar drum loop, followed by a 4-bar drum loop and then an 8-bar drum loop, the 1-bar drum loop would play eight times, the 4-bar loop would play twice and then the 8-bar loop would play all the way through, indefinitely (since it's the last one queued).

This is really useful, for example, when you have eight bar bass and rhythm lines but you want to use 2-bar drum loops with them.

Once clips are queued, you can't rearrange their order, but you can cancel them, regardless of where they are in the queue stack.

MIXER CHANNELS

Use *Show Mixer* in the Clips window menu to show or hide the mixer channels (Figure 21-1 on page 199). These mix settings are the same as described for the Mixing Board. See chapter 20, "Mixing Board" (page 174).

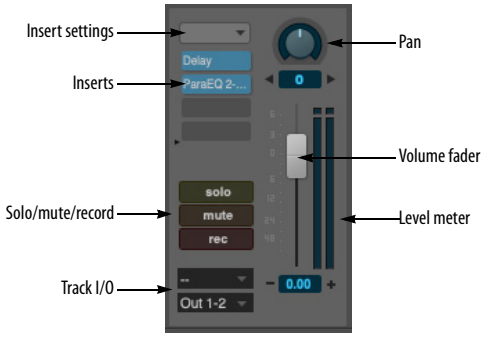


Figure 21-7: Mixer channel.

THE CLIP EDITOR

Use *Show Clip Editor* in the Clips window menu to show or hide the Clip Editor (Figure 21-1 on page 199). The Clip Editor lets you view the contents of a clip, along with basic clip settings such as its name, length, etc.

Clip settings

Each clip has the following clip settings:

- Name
- Color
- MIDI binding
- Link clip to Scene
- Start time
- Loop enable
- Loop start
- Loop end
- Loop Duration
- Meter

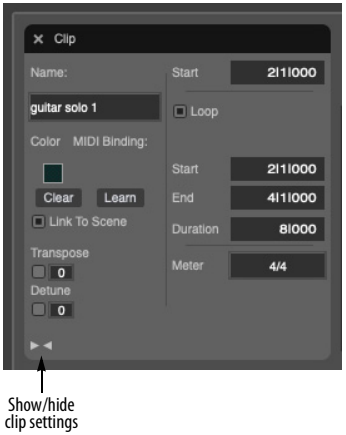


Figure 21-8: Clip settings.

Color

Each clip can be assigned a color to help you organize clips visually by color. Click the color swatch to open the standard color picker, which includes the eyedropper for copying other colors on your screen.

MIDI binding

Click *Learn* to assign the clip to a MIDI command. When you send that MIDI command, doing so triggers the clip. Also see "MIDI Learn Mode" on page 208.

Link Clip to Scene

When checked, the clip is linked to its corresponding scene. When linked, it will get triggered with the scene. When unlinked, it won't.

Start

The Start time (Figure 21-8) lets you determine where the Clip will start playing, relative to the data it contains. You can also adjust this setting graphically, as shown in Figure 21-9.

Loop (versus one-shot)
When *Loop* is checked, the clip loops indefinitely until you either cancel it or trigger another clip. When Loop is unchecked, the clip will play as a one-shot clip (once through only).

Loop Start time/End/Duration
Use the Loop Start/End/Duration times to determine when the clip starts and stops looping. You can set these values wherever you want in the clip. You can also edit them graphically using the loop points in the clip editor time ruler (Figure 21-9).

Meter
Enter the desired meter for the clip.

Clip Transpose/Detune/Quantize
These settings apply non-destructive, real-time transposition, detuning or quantizing to the clip. The effects are applied during playback and are not reflected in the clip data itself. Click the check box to enable or disable the effect. For transposition, enter the desired number of half steps in the text box; for Detune, the value is in cents (0-99). For quantize, choose the desired grid from the menu. These settings are similar to the corresponding track settings. See "Track Transpose" and "Track Detune" on page 71 (for audio tracks) and "Track Quantize" and "Track Transpose" on page 76 for MIDI tracks.

Clip Editor

The Clip Editor works the same way as the equivalent features found in the Sequence Editor (chapter 18, "Sequence Editor" (page 121). Here, you can edit audio data, MIDI data, automation, pitch, stretch and so on.The Start Time strip works similarly to the Loop strip: drag the start time marker to change it. If you hold down the shift key while dragging the start time handle, the loop start handle or either bar, both move together. As another shortcut, click the start time handle or the loop boundary handles to make a time range selection.

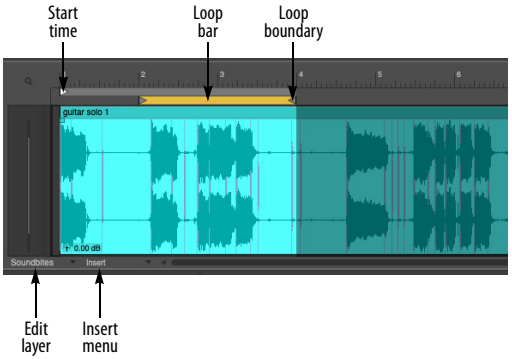


Figure 21-9: Clip Editor for an audio clip.

For MIDI tracks, the clip editor works like MIDI track editing in the Sequence Editor (chapter 36, "MIDI Editing" (page 313)).

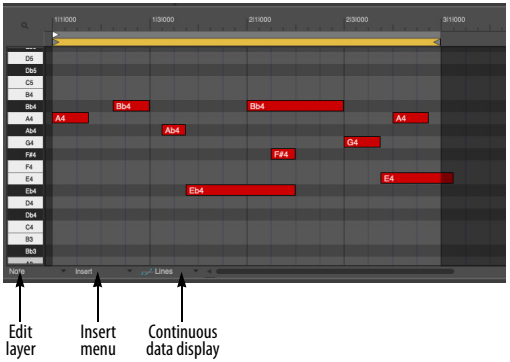


Figure 21-10: Clip Editor for a MIDI clip.

CLIP RECORD MODE

Option/Alt-click the Record button to toggle between Record mode and Clip Record mode.

Figure 21-11: Option/Alt-click the Record button to toggle between Record mode and Clip Record mode.

In Clip Record mode, two things happen:

- Clips that are triggered in the Clips window are recorded into their respective tracks.
- Existing clips in the Clips window can be recorded into (see "Record into an existing clip" on page 203).

Recording triggered clips to tracks

Clip Record mode allows you to capture your performance as you trigger clips in the Clips window. You do not need to record-enable any tracks beforehand. With Clip Record mode enabled (as shown in Figure 21-11), simply click the Clip Record button (in Figure 21-11) to start recording. Any clips you trigger are placed in their respective track at the current counter location. If they repeat, they are looped within the track for as long as they remain looping. (For more information about looping clips in tracks, see "Looping a clip" on page 343.)

☛ When using Clip Record mode, you do not need to record-enable each track. Any clip that is triggered is recorded.

☛ Be mindful when using Clip Record. Every triggered clip is recorded, covering up any material already in the track. For details about editing clips, especially layered ones, see "Clip layering" on page 342.

MIDI LEARN MODE

Choose *MIDI Learn Mode* from the Clips window menu to put the window into a mode where you can assign MIDI bindings to items in the window, to be able to trigger them from a MIDI controller (Figure 21-12). Assignable items appear in gray against a darkened background. The currently active item flashes blue, and its MIDI settings are displayed in the pane below the window, as shown.

Making assignments

To make an assignment click the item you wish to assign. Alternately, you can use the tab key to move to different sections of the window, and then use the arrow keys to navigate through the eligible items in that section to choose the desired active item. Once active, send the MIDI data from your MIDI controller and it appears in the pane below.

Learn channel/source

When making MIDI bindings, use the *Learn Channel* and *Learn Source* check box options to remember the specific MIDI channel or even MIDI source for the MIDI binding. This can be very useful when you are using multiple MIDI devices to trigger clips and other items in the Clips window.

ATTACHING MIDI CONTROLLERS FOR MIXING

Choose *Attach Mixer MIDI Controller* from the Clips window menu to assign a MIDI controller to any item in the Clips window Mixer panel for remote control from any MIDI device. Use the *Clear Mixer MIDI Controller* command to remove the assignment. You can also access these commands by right-clicking a mixer item. This works the same way as the Mixing Board. See "Remote control" on page 193.

USING A 3RD-PARTY PAD CONTROLLER

To set up Performer for use with a supported 3rd-party pad controller, see Appendix A, “Control Surfaces” page (617).

When a clips-based control surface is bound to the Clips Window, the Clips Window will highlight the portion of the grid that corresponds to the currently banked cells on the surface.

Clip button states

By default, the pad for a cell with a clip in it will be illuminated the color of the clip. This will default to the track color unless a custom color is set for the clip.

A pad turns off when its corresponding cell in the Clips window is empty (and its track is not currently record-armed).

When an empty cell is record-armed, its pad illuminates dim red to indicate that it is record-enabled.

In Clip Record mode, a filled cell on a track that is record-armed illuminates bright red to indicate that it is record-enabled but not empty.

When a clip is queued for playback, its pad flashes white.

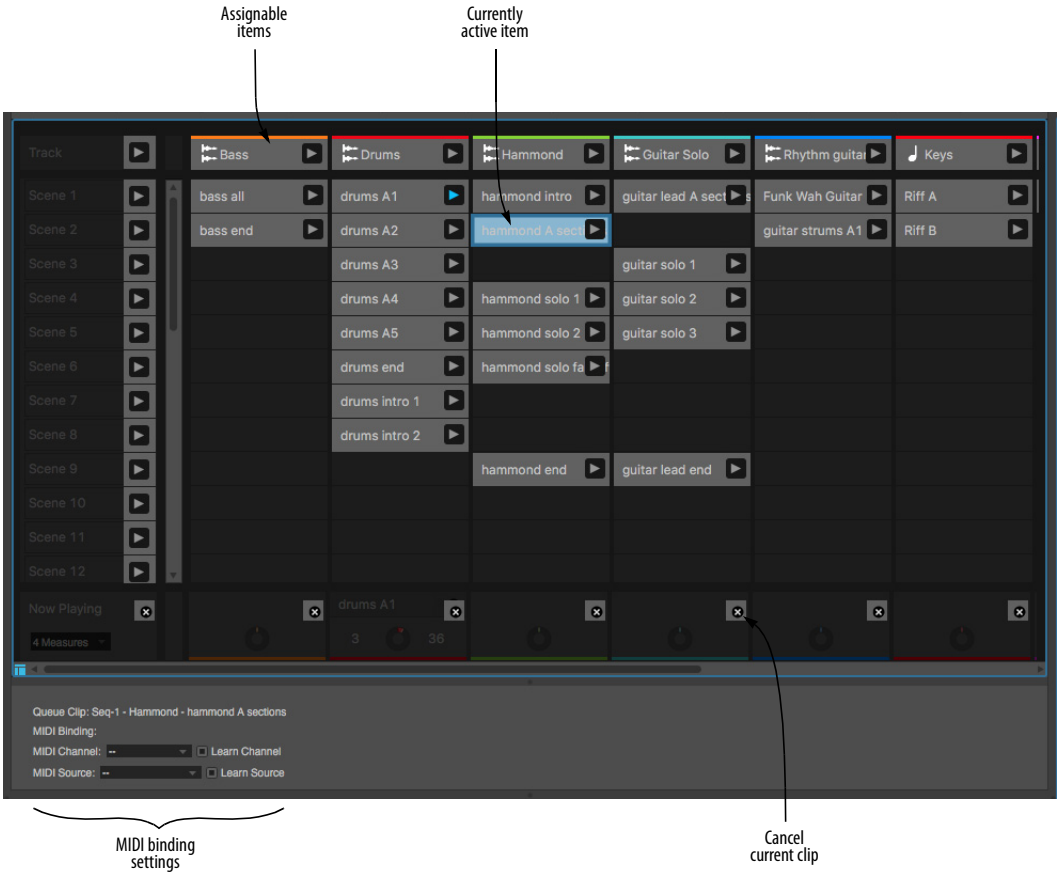


Figure 21-12: MIDI Learn mode in the Clips window.

When a cell is playing, its pad illuminates green.

Scenes

Pressing a scene play button queues all clips in that scene for playback. When all clips in a scene are playing back, that scene button is illuminated green.

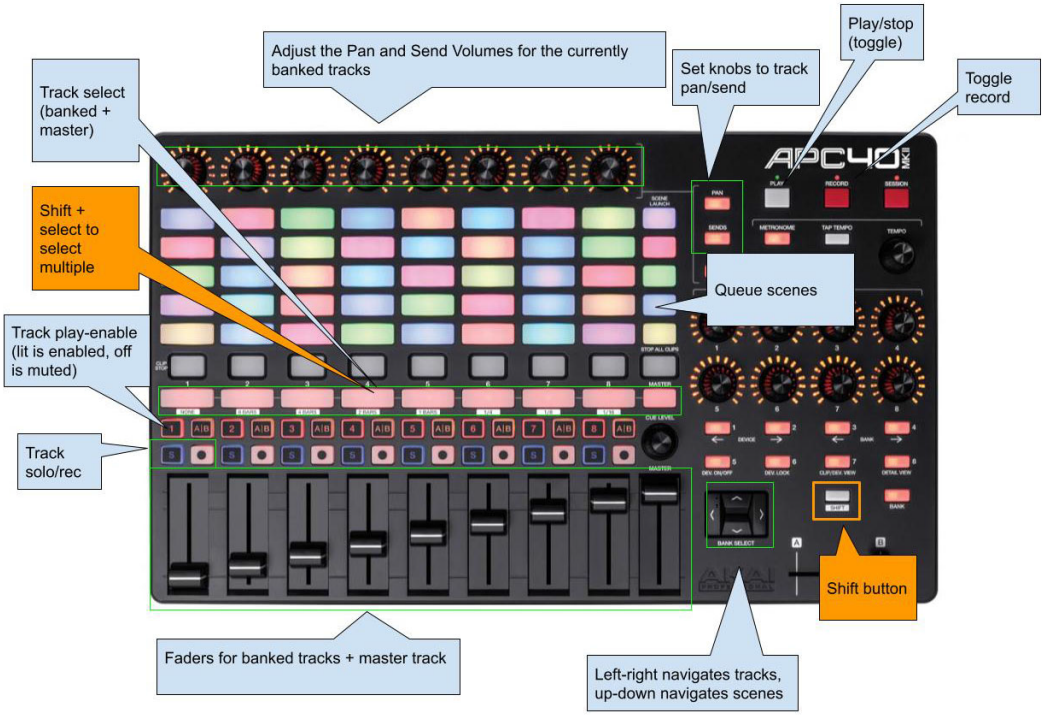
Supported controllers

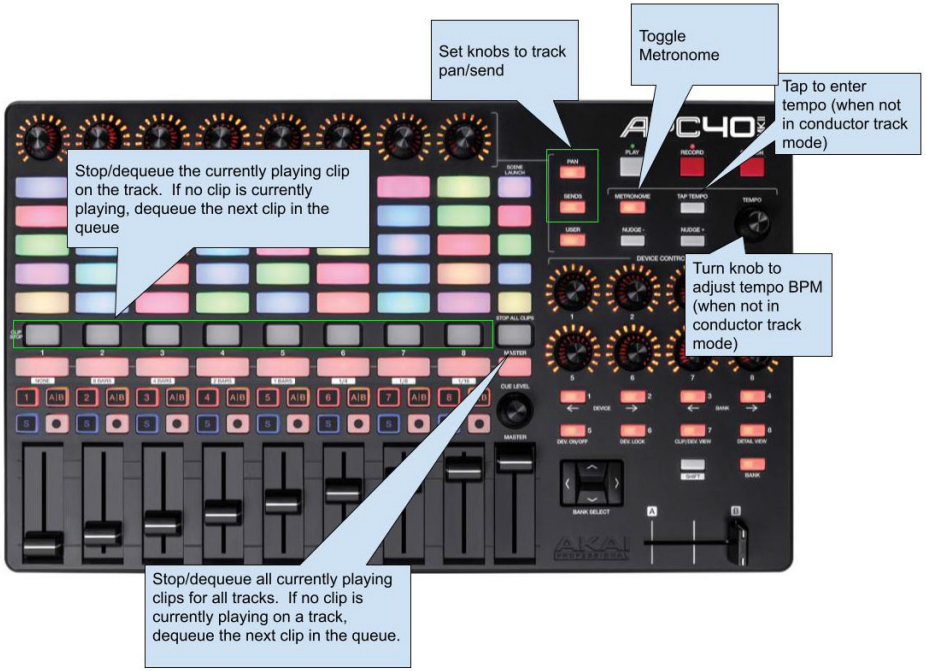
Akai APC family.....210
Akai APC40 mkII.....211
Novation Launchpad.....212
Novation Launchpad / SHIFT.....213

AKAI APC FAMILY

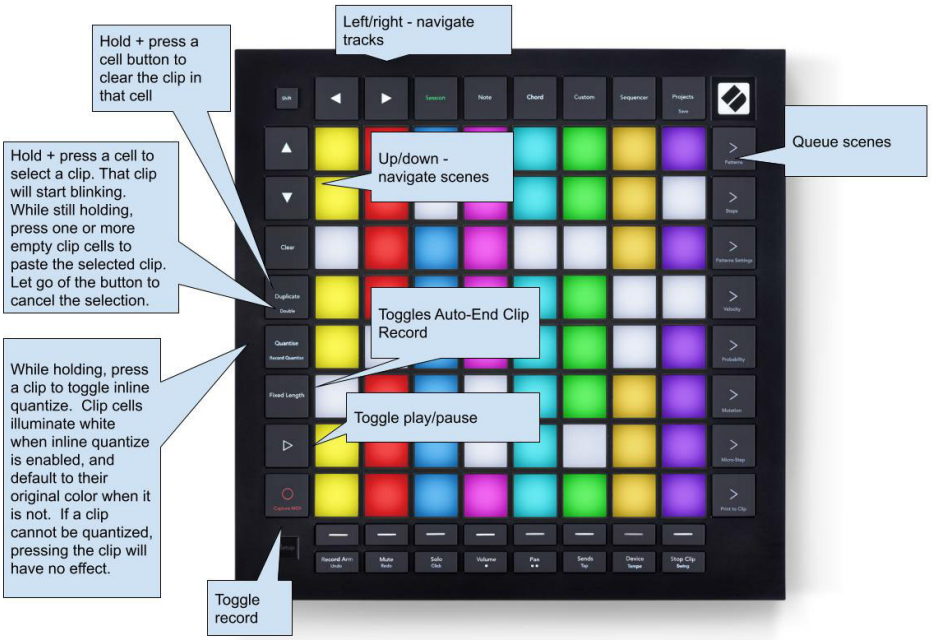
Digital Performer's Akai APC plug-in supports the APC40 mkII, APC Mini and APC Key 25. The APC40 mkII is diagrammed on the next page. The other models function similarly, but they do not support custom clip colors: only green, red, yellow, or off. Pads for queued clips flash yellow. Record-armed clips flash red and playing clips turn green.

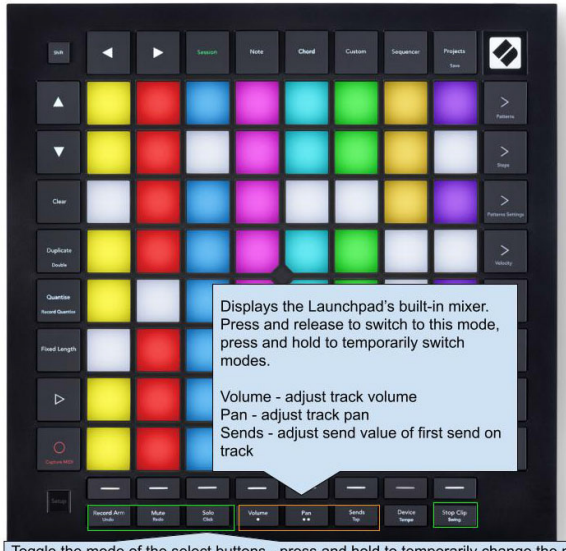
AKAI APC40 MKII





NOVATION LAUNCHPAD

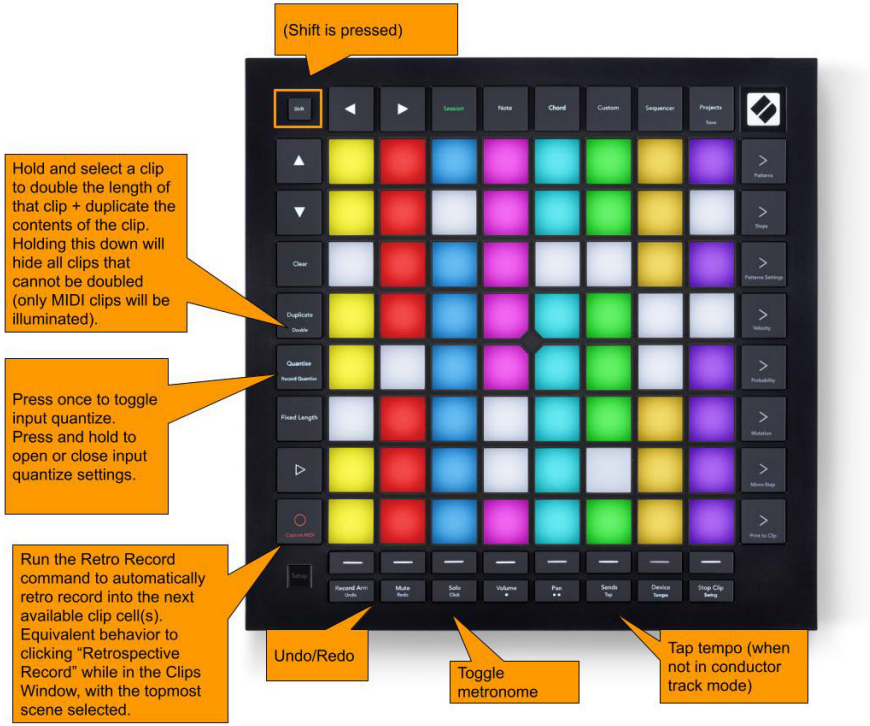




Toggle the mode of the select buttons - press and hold to temporarily change the mode, or press and release to persist the change. Buttons will only light up if the action is valid on the corresponding track. When no mode is selected, the buttons will simply select the track. When the selected track is a MIDI track, the Note grid notes will light up accordingly during playback.

Record arm - toggle record arm
Mute - toggle track mute
Solo - toggle solo on non-solo-exempted tracks
Stop Clip - Stop or dequeue a clip on a track for which a clip is currently playing or queued

NOVATION LAUNCHPAD / SHIFT



CHAPTER 22 Content Browser

OVERVIEW

The Content Browser gives you immediate access to assets that you can quickly drag and drop into your Performer Lite project. Examples include audio files, loops, plug-ins and virtual instruments.

Overview 214
Quick Reference 214
Content Browser menu 215
Opening the Content Browser 215
Opening the Content Browser as a window 215
Using the Content Browser 215
Auditioning audio clips 215
The Performer Producer Pack 215

QUICK REFERENCE

Project: Provides access to audio files, bounces, and other project-related content.

Places: Folders on your hard drive(s). Click the *Add Place* item to add a folder to the list. The folders can contain any content that is relevant to Performer Lite, including audio files, loops, etc.

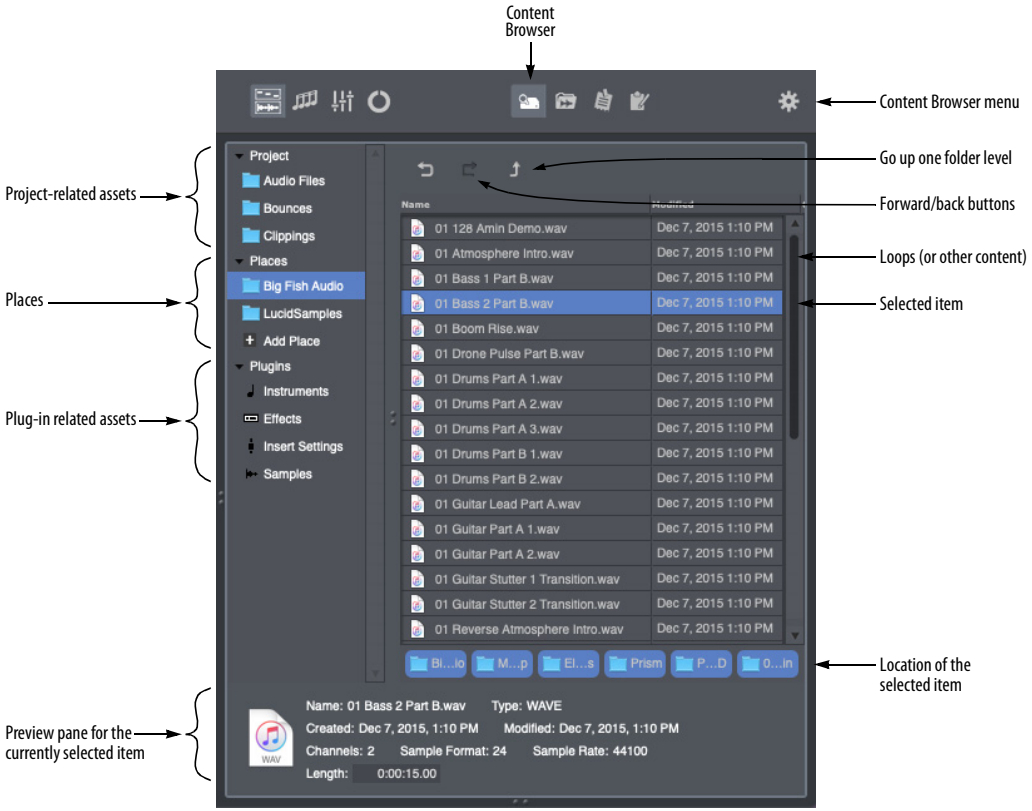


Figure 22-1: The Content Browser.

Plug-ins: This section provides access to assets that are specific to plug-in operation, such as virtual instruments and plug-ins you have installed in your system, plug-in presets and samples used by virtual instruments.

Preview pane: Shows information about the currently selected item.

Forward/backward buttons: Moves forward and backward through your browsing history.

Go up one folder level: Goes to the enclosing folder of the one you are currently viewing in the browser.

CONTENT BROWSER MENU

The Content Browser menu (Figure 22-1) only has one menu item:

Show Content Info: When checked, this command displays the Preview pane (Figure 22-1).

OPENING THE CONTENT BROWSER

To open the Content Browser, click the Content Browser button (Figure 22-1). It appears in the right-hand sidebar of the Performer Lite window (Figure 7-3 on page 43).

OPENING THE CONTENT BROWSER AS A WINDOW

The Content Browser can be popped out of the Performer Lite window to become a separate window that shows more columns of information. To do so, click anywhere on the Content Browser to make it the active cell in the Performer Lite window, and then choose *Window menu > Pop Out of Consolidated window*. To put it back in, choose *Window menu > Pop Into Consolidated window*. The keyboard shortcut for both of these commands is Ctrl-1.

USING THE CONTENT BROWSER

Use the Content Browser for quick access to assets...any items you might use as you work with Performer Lite. Use the Content Browser to navigate to a particular audio loop, plug-in, Mixing Board insert preset or any similar item and then drag and drop it into any Performer Lite window that accepts that type of item.

For example, you can drag and drop audio loops from the Content Browser into the Clips window or Sequence Editor. Or drag and drop plug-ins — or entire plug-in chains — into the insert section of the Mixing Board.

AUDITIONING AUDIO CLIPS

To audition audio clips in the Content browser, click the item you wish to audition. Note that some audio file types may not support auditioning.

THE PERFORMER PRODUCER PACK

The Performer Producer Pack appears in the *Extras* section of the Content Browser. The Performer Producer Pack is a collection of MIDI chords, audio loops and their MIDI loop equivalents. Their purpose is to get you started writing music quickly and easily, while giving you plenty of creative flexibility.

Everything in the Performer Producer Pack was curated in house, and comes automatically installed with the latest version of Performer Lite.

Visit motu.com and youtube.com/motuTV for videos on how to get the most out of the Performer Producer Pack.

CHAPTER 23 Soundbites

OVERVIEW

This chapter assumes that you are familiar with terms like *audio file*, *region, soundbite, playlist* and *audio track*. If not, review "Hard Disk Recording Concepts" on page 598.

As you work with Performer Lite, you'll create many soundbites. The Soundbite list helps you manage them. Think of the Soundbite list as your "catalog" of audio data. It lists all of the portions of audio that you are dealing with in the project. It helps you keep the ones you want and throw away the ones you don't.

Overview **216**
Quick Reference **216**
Soundbite menu **217**
Opening the Soundbite list **218**
Opening the Soundbite list as a window **218**
Soundbite Basics **222**
Mono and stereo audio **222**
Soundbite Management **223**
Dragging and dropping soundbites **226**
Working with multiple sample formats **226**
Converting sample rate/format **226**
Automatic conversions **227**
Importing and exporting audio **227**

QUICK REFERENCE

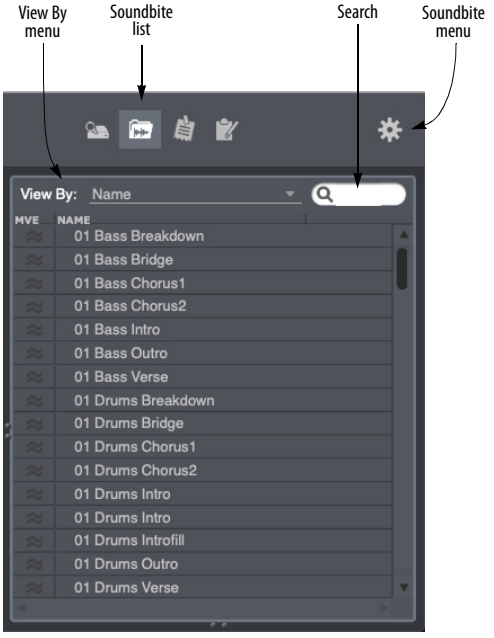


Figure 23-1: The Soundbite list serves as a catalog and "command center" for all of the audio files in a project.

Soundbite list: Click the Soundbite list button to show or hide the list.

View By menu: This controls how the soundbites how are sorted: by soundbite name, audio file name, duration, sample rate, and so on.

Search box: Searches soundbite names and audio file names for the entered text. As you type a search term, the window will update in real-time to display the relevant results.

Settings: When you click the Soundbite list to make it the active cell in the Performer Lite window, the Settings menu provides items that apply to Soundbites and the Soundbite list (Figure 23-2).

SOUNDBITE MENU

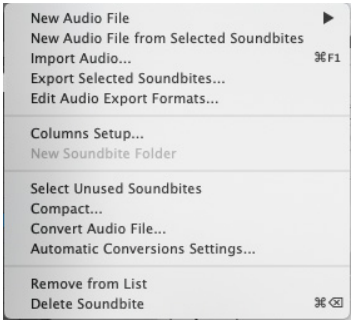


Figure 23-2: Soundbite menu.

New Audio File: Creates an empty mono, stereo or multichannel audio file on your hard drive.

New Audio File from Selected Soundbites: Creates a new, separate audio file on your hard drive based on the currently selected soundbite(s). In other words, the new audio file will contain a copy of the currently selected audio.

Import Audio: Opens a dialog box that allows you to audition and import audio files and/or individual soundbites. This is the same as the *Import Audio* command in the File menu.

Export Selected Soundbites: Lets you save the currently selected stereo soundbites in a variety of file formats, including AIFF, WAVE, Sound Designer II, and MP3.

Edit Audio Export Formats: Lets you delete and rename saved audio export formats.

Columns Setup: Lets you show and hide the columns in the Soundbite list.

New Soundbite Folder: Adds a new folder to the soundbite list. This command is only available when *Folders* is chosen in the *View by* menu at the top of the Soundbite list.

Select unused soundbites: Highlights all soundbites in the list that are not currently being used in any tracks in any sequence in the file. The highlighted soundbites can be removed from the list or deleted entirely from their parent audio file. (Note that the audio data itself is not removed by deleting. See *Compact* below.)

Compact: Caution! Unlike Delete, this command actually removes audio data from the hard disk. Compact removes all portions of the parent audio file of the currently selected soundbites which are not defined as a region in the audio file region list. This command can be used to remove unused audio data in one or more audio files to free up space on the hard disk.

Convert Audio File: Opens a dialog box that lets you change the sample rate, sample format, file format, and/or interleaved format of the currently selected soundbites in the list. Several levels of quality are provided. For complete information, see chapter 60, "Audio File Conversion" (page 540).

Automatic Conversions Settings: Opens the Automatic Conversions preferences where you configure how Performer Lite automatically converts audio data, wherever necessary, to make it conform to the current project's sample rate, file format, interleave format, and tempo.

Remove from list: Deletes the soundbite from the Soundbite list without deleting its corresponding region in the audio file region list.

Delete soundbite: Removes the selected soundbites from the list, removing Performer Lite's reference to the data from the Soundbite list. If the soundbite is the last one in the parent audio file to be deleted, Performer Lite asks if you would like to delete the parent audio file entirely.

OPENING THE SOUNDBITE LIST

To open the Soundbite list, click the Soundbite list button (Figure 23-1), or press its keyboard shortcut, Shift-B. It appears in the right-hand sidebar of the Performer Lite window (Figure 7-3 on page 43).

The Soundbite list provides a complete list of all soundbites in the Performer Lite project, along with detailed information about each soundbite.

OPENING THE SOUNDBITE LIST AS A WINDOW

The Soundbite list can be popped out of the Performer Lite window to become a separate window that shows many columns of detailed information about each soundbite, as shown in Figure 23-3.

To do so, click anywhere on the Soundbite list to make it the active cell in the Performer Lite window, and then choose *Window menu > Pop Out of Consolidated window*. To put it back in, choose *Window menu > Pop Into Consolidated window*. The keyboard shortcut for both of these commands is Ctrl-1.

Showing/hiding columns in the soundbite list

The *Columns Setup* menu item lets you show and hide columns as desired. (As a shortcut, double-click or Option/Alt-click the label at the top of one of the columns to open these preferences.) Figure 23-3 below shows all of the columns.

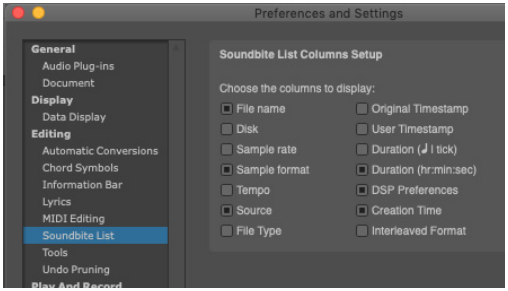


Figure 23-4: Double-click or Option/Alt-click any column title in the Soundbite list to open the Columns Setup preferences.

Rearranging soundbite list columns

To rearrange the order of the columns, drag the label at the top of a column to the left or right. Performer Lite saves your customized column arrangement in the Performer Lite preferences file, so it is remembered in all of your Performer Lite files.

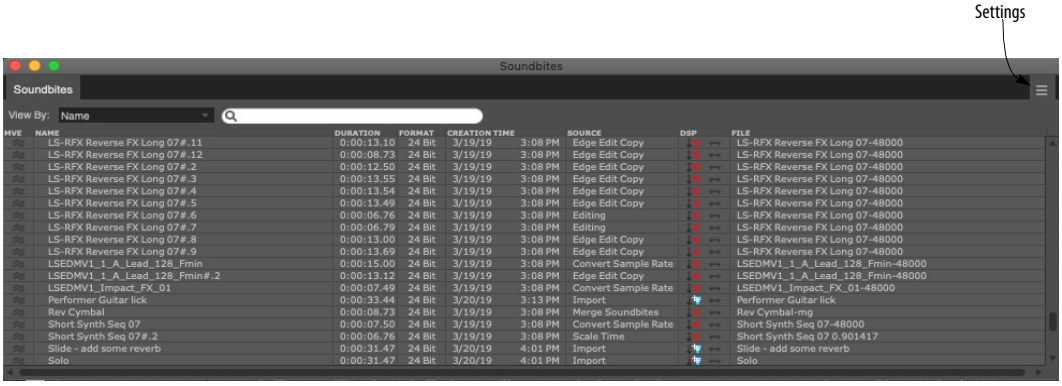


Figure 23-3: The soundbite list with all detail columns shown.

Soundbite list quick reference
Here is a brief explanation of each column in the soundbite list.

Move Handle: Drag up or down to reposition the soundbite in the list. Also use it to drag and drop the soundbite into other windows or the computer desktop. When dropping it into an audio track in the Sequence Editor, hold down the Command/Ctrl key while dragging to make it "snap" to the end of the previous soundbite in the track. A **question mark** icon on the move handle means that Performer Lite does not currently know the location of the audio file containing the soundbite. The soundbite can't be played and its waveform can't be displayed. An '**X' icon** on the move handle means that Performer Lite cannot currently play the soundbite for some reason. For example, it may not match the current sample rate setting of your audio hardware.

Name: Displays the name of the soundbite (region). Click the name to select it and hear it play back. Option/Alt-click the name to rename the soundbite.

Creation time: The time at which the soundbite was originally recorded (or created), regardless of where it currently resides. If a soundbite does not have an original time stamps, then no time is shown.

User time: Displays the soundbite's user time stamp, if it has one. A user time stamps can be applied to a soundbite at any time with the *Timestamps* command in the Audio menu. If a soundbite does not have a user timestamps, then no time is shown.

Duration (real time): Indicates the length of the soundbite in hours, minutes, seconds, and hundredths of a second.

Ticks (duration in ticks): Displays the length of the soundbite in quarter notes and ticks. If the soundbite doesn't have a tempo map, this column will be empty.

Tempo: In order to make time-scaling musically useful, Performer Lite allows Soundbites to have tempo maps. This makes it very easy for you to manipulate audio along with MIDI without worrying about the tempo, and change the tempo however and whenever you want. A soundbite does not have to have a tempo, but if it does, it is displayed here. If the tempo of the soundbite varies, the average tempo is shown (labeled "avg.") If the soundbite doesn't have a tempo map, this column will be empty. For complete information, see chapter 44, "Tempos and Audio" (page 422).

Sample Rate: Indicates the rate in samples per second at which the audio data making up the soundbite was sampled.

Format: Displays the bit depth (e.g. 16-bit, 24-bit, or 32-bit floating point) of the audio data in the soundbite.

Interleaved Format: Displays the interleaved format (mono, deinterleaved, or interleaved) of the audio file the soundbite is from.

Source: Explains briefly how the soundbite was created.

DSP: The DSP column shows the soundbite's preference settings for transposing and time scaling. These settings determine what happens (or does not happen) when you attempt to transpose to time-scale the soundbite. Each soundbite can have its own unique settings. For complete information about these preferences, how to set them, and what the results will be, see "Dragging and dropping soundbites" on page 226.

File: This is the name of the audio file that contains the soundbite. Double-click to replace or relocate the soundbite. Option/Alt-click to change the name of the audio file.

Disk: Shows the name of the disk on which the audio file resides.

View By menu

The View By menu at the top of the Soundbite list is a powerful sorting feature that allows you to view soundbites hierarchically by the characteristics shown below in Figure 23-5:

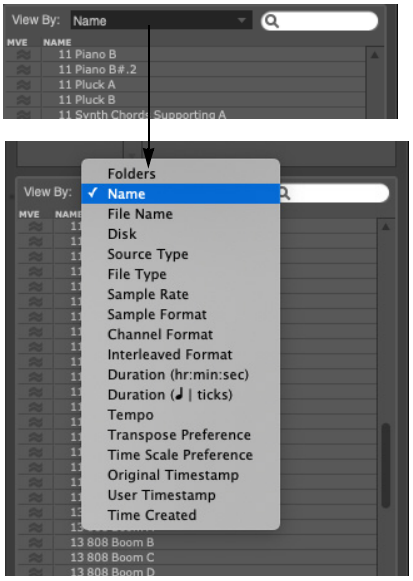


Figure 23-5: Hierarchical sorting in the Soundbite list.

When you choose an item from the View By menu, the Soundbite list sorts all soundbites alphabetically and/or numerically based on what you choose, displaying soundbites hierarchically beneath the attribute that you choose, with disclosure triangles so that you can show/hide all of the soundbites for a certain attribute. For example, if you sort by file name, audio files will be listed alphabetically with a disclosure triangle that shows the soundbites indented to the right beneath it, as demonstrated below in Figure 23-6:

Figure 23-6: Sorting by file name.

Here are a few other examples: you could sort by *Time Created* to find a soundbite you recorded during a particular recording session. Or you could sort by *Channel Format* to view all stereo soundbites currently being used.

Organizing soundbites into folders

The Soundbite list allows you to create your own folders and then view soundbites *By Folder*. To create a folder, first view *By Folder* and then choose *Create New Folder* from the Soundbite menu. A new Folder appears, either at the bottom of the list or just below the currently selected item in the list. You can then drag soundbites into it using their move handles.

☛ When creating a new folder, you may need to scroll to the bottom of the list to see the new folder.

☛ Command–double-click a folder (or any other 'view by' container) to select all soundbites within it.

Soundbite source

The Soundbite list displays the source of each soundbite (as shown in Figure 23-7), to provide you with information about where it came from. For example, the source might say "Transpose from Guitar.1" or "Bounce". This setting can often help you trace the relationships between soundbites. If you view by source type, soundbites are organized into folders for each source type, as shown in Figure 23-7.

Viewing soundbite sources hierarchically with 'By Folder' view

The *By Folder* view has one additional feature over other views: it displays the sources of soundbites and newly generated audio files hierarchically, so that you can trace their origins. For example, if you use the *Edge Edit Copy* feature to make a new soundbite from an existing soundbite, the new soundbite will be listed below the original with an indentation to the right. If you make yet a third soundbite from the second, it will be listed below the second and further indented to the right. This is demonstrated in Figure 23-8:

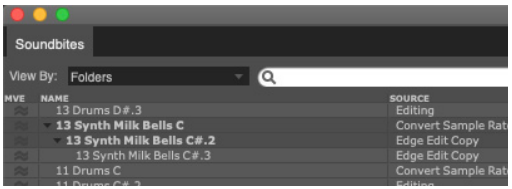


Figure 23-8: The 'By Folders' view shows the origins of soundbites by displaying them below their source soundbite or audio file. In this example, several soundbites created by edge edit copying are shown below their source soundbite.

There is no limit to the number of possible levels in the hierarchical display shown above in Figure 23-8. This sort of hierarchical grouping only occurs for audio files generated from existing files by operations (such as time-stretching, file-based plug-in processing, etc.) or from soundbite editing operations (such as Edge Edit Copy) where there is a clearly defined source soundbite.

You can separate hierarchically related items by dragging them elsewhere in the list, but the visual representation of their relation to one another cannot be later restored after you've done so.

Dragging soundbites into folders

In 'By Folder' view, there are two ways to put a soundbite into a folder:

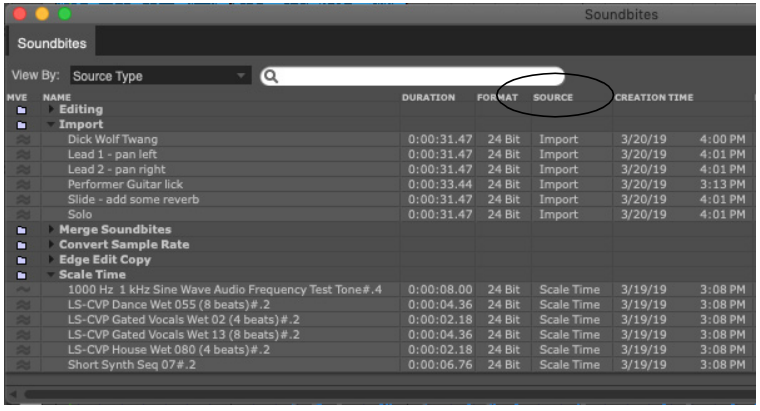


Figure 23-7: The Soundbite list displays where a soundbite came from in the Source column. In this example, the soundbite list is being sorted by source, as well.

- by dragging the soundbite's move handle into the name column to manually determine its position in the list, or

- by dragging the soundbite's move handle onto the folder name in the name column. In this case, the soundbite will be put at the top of the list inside the folder.

☛ If you drag the soundbite's move handle onto the folder icon, the soundbite will not be placed in the folder. Instead, it will be placed below the folder in the list.

Searching the Soundbite list

A search field is provided to search soundbite names and audio file names (Figure Figure 23-1 on page 216).

As you type a search term, the window will update in real-time to display the relevant results.

To clear the search results and return to the regular view, click the "x" button at the right side of the search field, or press the Escape key.

Shortcut for finding soundbites in the Soundbite list

The shortcut for selecting a soundbite in a track (in the Sequence Editor) and then viewing that soundbite in the Soundbite list is Command-Option-Control-L (Mac) or Ctrl-Alt-Win-L (Windows).

SOUNDBITE BASICS

A new soundbite is created in Performer Lite every time you record audio. For example, when you record-enable an audio track, hit the record button, play in some audio, and press stop, you have just created a soundbite in the track. In addition, the soundbite gets added to the list in the Soundbite list. New soundbites are also generated when you apply file-based DSP operations to existing soundbites, or perform a bounce to disk operation. Any time you create new audio, a soundbite is added to the soundbite list.

Generating soundbites while editing

Soundbites can also be created in Performer Lite with soundbite editing commands like Trim and Trim End. For example, when you select a portion of the existing soundbite and choose Trim, the unselected portions get stripped away, and the highlighted portion that you are left with is a new soundbite. As always, the new soundbite gets added to the list in the Soundbite list.

MONO AND STEREO AUDIO

Soundbites may be mono or stereo. Performer Lite supports both interleaved and deinterleaved audio files as native formats.

When using interleaved audio files, a stereo or multi-channel soundbite stores all of its channels in one file.

When using deinterleaved, a stereo soundbite comes from a stereo pair of files that have the same name (except that one contains '.L' and the other '.R', as in "Guitar-1.L.wav" and "Guitar-1.R.wav"), the same length, the same sample rate, and the same sample format.

When using the deinterleaved format, you can't really tell the difference from within the program. You can think of a stereo soundbite as a single soundbite that just happens to have individual channel components. But the channels are tightly linked; there is no way to accidentally shift one relative to the other. Even Performer Lite's pitch-shifting, time-scaling, and tempo-adjusting features preserve the phase relation between the left and right channels of stereo soundbites.

SOUNDBITE MANAGEMENT

As you work with Performer Lite, you'll create many soundbites. The Soundbite list helps you manage them. Think of the Soundbite list as your "catalog" of audio data. It lists all of the portions of audio that you are dealing with in the file. It helps you save the ones you want to keep and throw away the ones you don't.

Sorting the soundbites list

The View by menu at the top of the Soundbite list lets you sort soundbites by any criterion shown in the list. For details, see "View By menu" on page 220.

Auditioning soundbites

To audition a soundbite, click it.

☛ If you don't hear anything, see "Specifying audio output for auditioning" below.

To stop playback, wait for the soundbite to finish playing, or click anywhere.

Specifying audio output for auditioning

When you audition a mono soundbite, Performer Lite plays it via the first mono output bundle that it encounters in the Bundles window (i.e. the highest one in the list). Similarly, when you audition a stereo soundbite, it plays via the highest stereo bundle in the Bundles window list. To change which bundle is used, make it the highest bundle in the list using the move handle.

Renaming a soundbite

To rename a soundbite in the Soundbites list, Option/Alt-click its name.

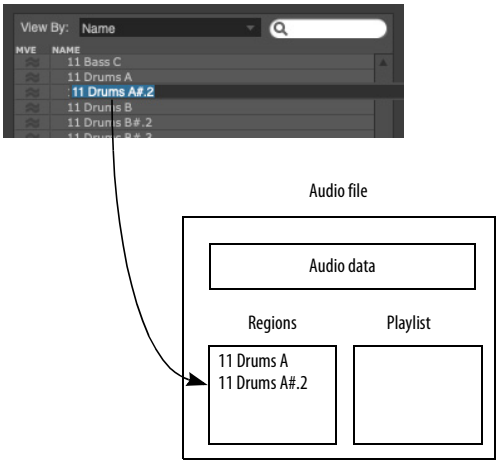


Figure 23-9: Renaming a soundbite.

When you change the name of a soundbite, Performer Lite updates the name of the corresponding region in the audio file. For example, if you use the Trim command to create a new soundbite, it appears in the Soundbite list with a name like *Soundbite.3*. Performer Lite adds a new region to the audio file region list called *Soundbite.3* as well. At this point, if you viewed the audio file's region list with third-party waveform editing software, you would see *Soundbite.3* in the audio file's region list. If you change the name of *Soundbite.3* to *Low whistle* in Performer Lite's Soundbite list, Performer Lite updates the name of *Soundbite.3* to *Low whistle* in the audio file region list as well.

Lost soundbites

At times, Performer Lite may lose track of the location of an audio file. For example, the audio file may have been dragged to the trash since the Performer Lite file was last saved. Or the hard disk on which the audio file is located may be off line at

the moment. In this case, Performer Lite displays the move handle of the soundbite with a question mark as shown below:

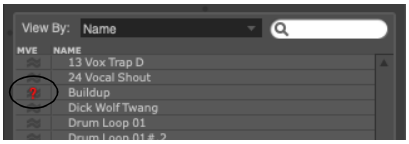


Figure 23-11: Performer Lite displays this icon when it does not currently know the location of the audio file containing the soundbite.

Soundbites that cannot be played

If a soundbite cannot be played back for some reason (perhaps its sample rate doesn't match the current sample of the project), Performer Lite displays an "X" icon as shown below:

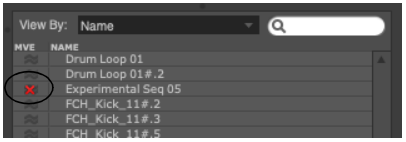


Figure 23-12: Performer Lite displays this icon when it cannot play back the soundbite for some reason.

If necessary, you can convert the soundbite's sample rate using the *Convert Audio File* menu item (Figure 23-2 on page 217).

Selecting unused soundbites

While you work with Performer Lite, you may find that you have many soundbites in the list, but some of them are not going to be used in the sequence and are no longer needed for any other purpose.

The *Select unused soundbites* command searches through every track in every sequence in the file to determine which soundbites are being used in a track and which ones are not. It then highlights all the soundbites that are not being used, and you can inspect, audition, delete, or group them as desired to clean up the list.

To select unused soundbites, choose *Select unused soundbites* from the Soundbite list menu. All soundbites that are not being used in a track become highlighted in the Soundbite list

Deleting soundbites

The *Delete Soundbite* command in the Soundbite list menu removes currently selected soundbites from the list. In addition, the soundbite's corresponding region is removed from the audio file region list as shown in Figure 23-14 below (unless the region is being used as part of a playlist in the audio file).

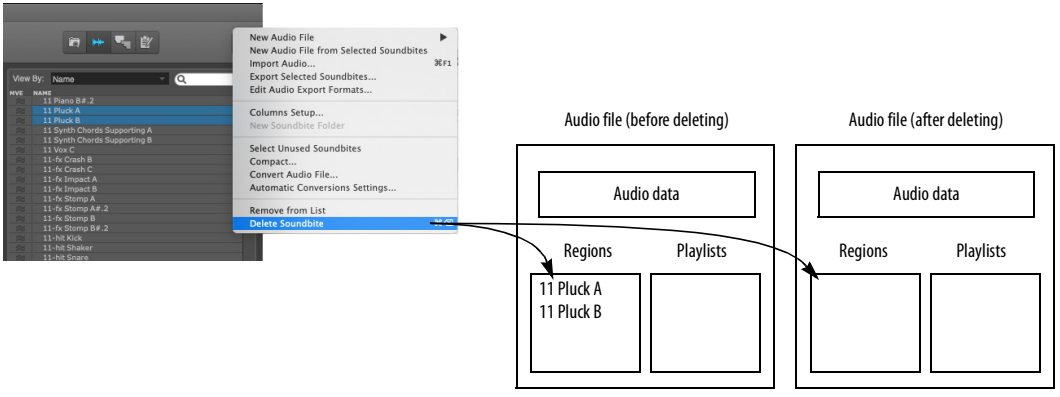


Figure 23-10: Deleting soundbites removes their corresponding region in the audio file. Just the region and its pointers are removed; not the actual audio data.

Note that the Delete command will only delete the actual audio data when the last soundbite referring to an audio file is deleted. If you want to delete just a portion of the audio data from an audio file, use the *Compact* command. See "Compacting audio files" on page 604. If you do not want Performer Lite to remove the region from the audio file region list (because it is used in another Performer Lite project, for example), use the *Remove from list* command described in the next section.

Deleting soundbites that are currently being used in a track

If a soundbite you are deleting is being used in a track, Performer Lite presents a warning box as shown below.

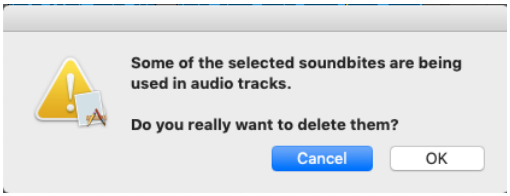


Figure 23-13: Hold down the Option/Alt key while choosing Delete from the menu to bypass this warning.

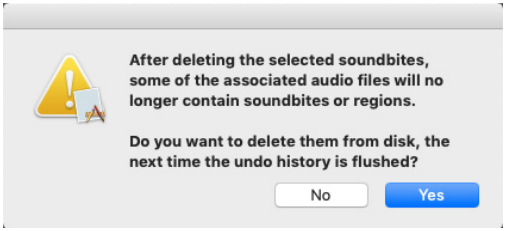
Removing soundbites from the soundbites list without deleting their corresponding region in the audio file

There may be times that you wish to delete a soundbite from the list, but you do not want to delete its corresponding region in the audio file region list as shown in Figure 23-14 on page 226. For example, the region might be part of a sequence in another Performer Lite project. In this situation, use the *Remove from list* command.

After this command severs the connection between the soundbite and the region in the audio file, you won't have access to the region unless you import it again. Also, after removing a soundbite from the list, you cannot compact its audio data without first importing it and then deleting the soundbite. (See "Compacting audio files" on page 604 for more information.)

Deleting the last soundbite in an audio file

If you delete a soundbite, and it is the last soundbite belonging to a particular audio file, Performer Lite asks you if you wish to completely remove (delete) the audio file from the hard disk:



Remember, Performer Lite is cautious about deleting audio data: it never deletes audio data that is possibly being used in other files. Therefore, if an audio file has regions in its regions list, Performer Lite won't allow you to accidentally delete it.

Bypassing warning dialogs when deleting audio files

You can bypass warning dialog boxes by holding down the Option/Alt key while you choose *Delete* or *Remove from list* from the menu. Performer Lite proceeds as if you answer Yes to the alerts.

Deleting an audio file that contains regions

If an audio file contains regions, but you are absolutely sure that you want to throw away the file, you can do so by dragging the file into the trash on the computer desktop.

Getting rid of unused soundbites after a session

After a recording session with Performer Lite, you can quickly get rid of all the soundbites that you did not use in a track as follows:

1 Choose *Select unused soundbites* from the Soundbite list menu.

This highlights all soundbites that are not being used in a track.

2 Hold down the Option/Alt key and choose *Delete* from the Soundbite list menu.

All of the highlighted soundbites are removed from the list, and their parent audio files are deleted from the hard disk.

Compacting audio files

The Compact command in the Soundbite list menu deletes portions of an audio file that are not part of a soundbite and then closes the gaps between the leftover regions. For more information, see "Compacting audio files" on page 604.

DRAGGING AND DROPPING SOUNDBITES

You can "drag and drop" soundbites into the Sequence Editor and even the computer desktop (or any desktop window). To do so, grab the move handle of the soundbite and drop it into the desired window.

In the Sequence Editor, the soundbite is placed where the cursor is located when you drop. If you hold down the Command/Ctrl key while dragging, the soundbite will "snap" to the end of the previous soundbite in the track from the drop point or the beginning of the track. For more information, see "Dragging and dropping audio into the Sequence Editor" on page 333.

You can drag and drop a soundbite into the left-hand side of the Sequence Editor where the track information panels are displayed to add a new track to the project and insert the soundbite into the new track. The soundbite is placed at its original time stamps, or, if there is none, at the beginning of the track.

WORKING WITH MULTIPLE SAMPLE FORMATS

Performer Lite can use 16-bit integer, 24-bit integer, and 32-bit floating point audio files together in the same project, without any conversions.

CONVERTING SAMPLE RATE/FORMAT

The *Convert Audio File* command in the Soundbite list menu allows you to change the sample rate, sample format (bit depth), file format (AIFF, Broadcast WAVE, or Sound Designer II), or interleave format of an audio file or soundbite. Like Performer Lite's other file-based "constructive" DSP processes, these operations can occur in the background. For complete details, see chapter 60, "Audio File Conversion" (page 540).

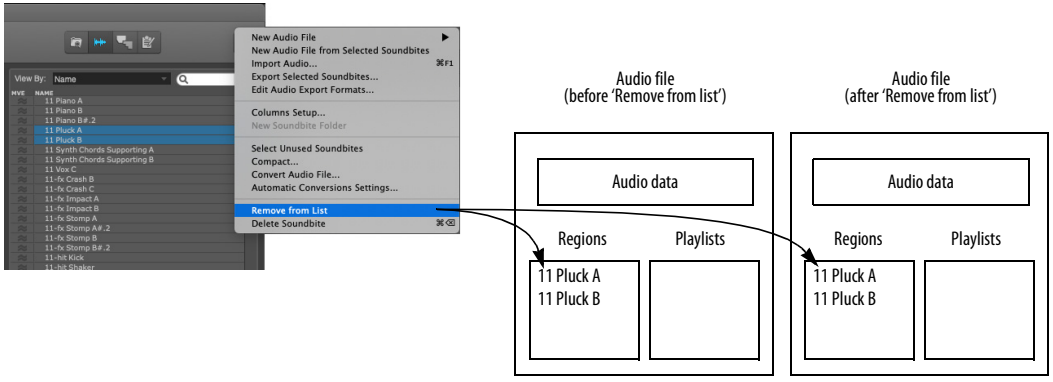


Figure 23-14: The Remove from list command leaves the region list in the audio file untouched. You can re-import the soundbites later, if desired.

AUTOMATIC CONVERSIONS

Performer Lite can automatically convert audio data wherever necessary to make it conform to the current project's sample rate, file format, interleave format and tempo. Because processing is initiated automatically and carried out via background processing (for lengthy operations), these auto-conversion features greatly streamline the process of importing audio quickly into your projects, or the process of converting the entire project to a different sample rate, bit depth or tempo. For complete details, see "Automatic Conversions" on page 252.

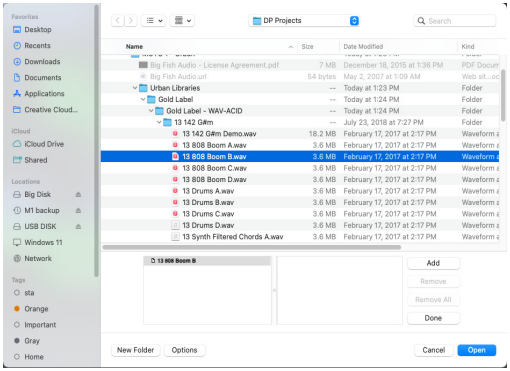
IMPORTING AND EXPORTING AUDIO

The Soundbites window provides many features for exporting and importing digital audio into and out of Performer Lite. Many audio file formats are supported.

Importing audio with the Import Audio command

The Import Audio command lets you to browse audio files and soundbites before importing.

To import using the Import Audio command, choose *Import Audio* from the Soundbites window mini-menu. You'll see the standard file window (as shown below in Figure 23-15). In this window, you can import individual regions from an audio file (unlike drag & drop into the Soundbite list, which imports all regions), and you can audition them before importing.



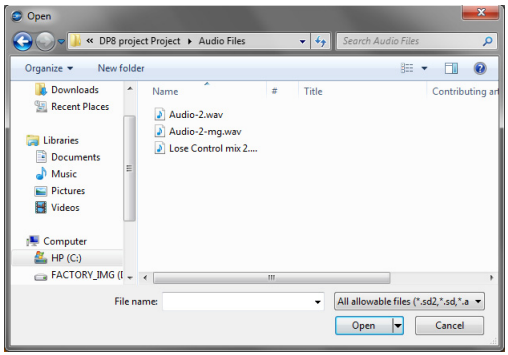


Figure 23-15: Importing audio. On macOS, press the space bar to turn on auditioning. This allows you to hear individual audio regions when you click them. Click the Add button to add them to the list of regions you would like to import. As you can see, this window lets you import individual audio regions.

Video sound tracks, MP3 files and many other types of audio files can be auditioned in the *Import Audio* dialog.

Performer Lite can natively use interleaved or deinterleaved 16-bit, 24-bit, or 32-bit floating point audio files in AIFF and WAVE formats.

Other types of audio files are converted into the project audio file format for use in Performer Lite. For a list of audio file types that can be imported, see "Audio file formats that can be imported" on page 228.

Importing and exporting audio by drag & drop

Performer Lite supports standard drag and drop techniques for importing audio files from the computer desktop into any window in Performer Lite that holds audio, such as the Soundbites window. This is true for all of the supported file formats listed in "Audio file formats that can be imported" on page 228. If the imported file does not match one of Performer Lite's supported native formats, Performer Lite can automatically convert the file for you.

Soundbites can be exported in a similar fashion by grabbing their move handle in the Soundbites window and dragging them to the computer desktop (or any window on the computer desktop).

Importing an entire audio file

The easiest way to import an entire audio file is to drag and drop it into a track in Performer Lite's Sequencer Editor. Make sure the track type (mono or stereo) matches the audio file. You can also import an entire audio file using the *Import Audio* File menu command as described in the previous few sections.

Converting soundbites that cannot be played

When you import soundbites into Performer Lite, it may be the case that they cannot be played properly. For example, the imported audio's sample rate might not match the playback sample rate currently chosen in the Configure Hardware dialog box. In this case, Performer Lite can automatically convert the audio to the project's sample rate, sample format and even tempo. For complete details, see "Automatic conversions" on page 227.

If an audio file has a sample rate that does not match the current sample rate setting in the *Configure Audio System* > *Configure Hardware Driver* command in the Setup menu, it appears with an "X" on its move handle in the Soundbites window. You can play the audio file either by changing the sample rate setting in the Configure Hardware dialog to match the audio file, or by changing the sample rate of the audio file itself with the *Convert Audio File* command in the Soundbites window mini-menu. For more information, see chapter 60, "Audio File Conversion" (page 540).

Audio file formats that can be imported

Performer Lite is able to import the following audio file formats:

- AIFF
- WAV
- Broadcast WAV (non-MPEG)
- Sound Designer II
- mp3
- Acid
- REX (and RCY)
- Apple Loops (AIFF or CAF)
- Core Audio Format (CAF)
- QuickTime movies
- AVI movies
- Audio CD files
- MuLaw files

You can import any of the file formats above by dragging the file into Performer Lite and dropping it into the Soundbites window or — in most cases — any window that holds audio.

If you drag and drop an audio file into Performer Lite's Soundbites window, all of the regions in the audio file are imported.

Importing REX files

Recycle 1.0 and 2.0 REX files can be imported into Performer Lite, either by dragging and dropping them from the computer desktop into a mono or stereo audio track, or by using the *Import Audio* command (File menu). Recycle 1.0 RCY files can also be imported.

Importing a REX file into a track

When you drag and drop a REX file into a track, be sure that the track format (mono or stereo) matches the REX loop. As shown in Figure 23-16, the individual audio slices in the REX loop are placed in the track at the appropriate measure, beat and tick location to preserve the feel of the loop at the current tempo of the sequence. After importing, each slice of the REX loop is treated as in individual soundbite, both in the track and in the Soundbites window.

If you change the tempo, the REX slices will "breath" with the tempo, staying precisely in time with the conductor track. When they are first imported, REX slice soundbites are given the *Don't time scale* attribute in the Soundbites window, so each individual slice won't be automatically time-stretched when the tempo is changed. However, you can easily change this attribute to *Time Scale* in the Soundbites window, as explained below.

Importing REX files into the Soundbites window

You can import REX files using the *Import Audio* command in the Soundbites window mini-menu (or the File menu). This opens the audio import window, in which the REX file can be auditioned before importing. Just enable auditioning by clicking the speaker button and the click on the REX file in the file list. After importing, all of the REX file's individual slices are handled as individual soundbites, with no further grouping or

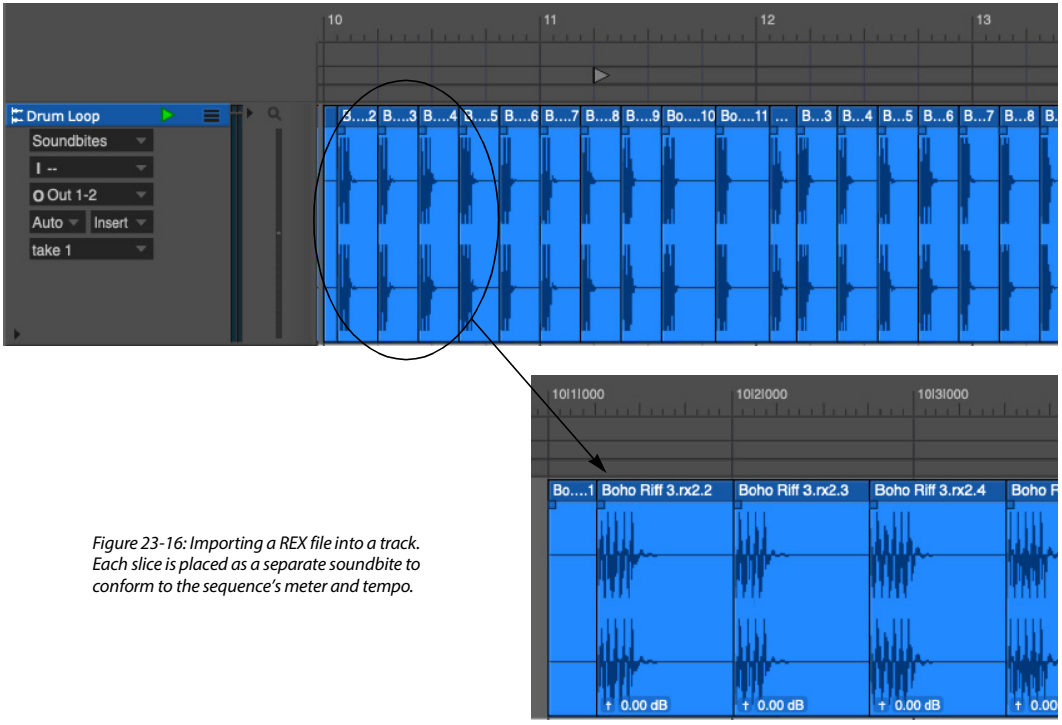


Figure 23-16: Importing a REX file into a track. Each slice is placed as a separate soundbite to conform to the sequence's meter and tempo.

association. Therefore, it is better to drag and drop a REX file into a track, where you can then loop, repeat or cut/paste it as a whole loop.

Viewing REX loop slices and changing their time-stretch attribute

You can easily view all of the soundbite slices that belong to a REX file with the Soundbite window's sorting features. Just view by file name, and the REX file will appear with a disclosure triangle next to its name that lists all slices below it. If you wish to change the time scale attribute of the slices, select them and open the Sound File Information window, and choose either *Time Scale* or *Don't Time Scale* for the *Time Compress/Expand* soundbite attribute. You can do so for multiple selected soundbites (REX slices) at one time. If you don't time scale the slices, you might (but are unlikely to) hear gaps between the slices when using the loop at a tempo that is considerably less than its original tempo. Most of the time, however, you will get better results with the *Don't Time Scale* setting, which preserves the audio slices in their original form (tempo). For more details, see "Sound File Information" on page 362.

Acid file and Apple Loop import

Performer Lite can import Acid WAV and Apple Loop AIFF files. To do so, drag and drop the Acid or Apple Loop file into the Soundbites window or into an audio track of the same format (mono or stereo). Or import them as usual using the *Import Audio* command in the Soundbites window mini-menu (or the File menu). If the file has a tempo, the tempo will be imported with the audio so that it will automatically conform to the sequence tempo when placed in a track, as long as automatic tempo conversion (as explained in "Automatic Conversions" on page 252) is enabled.

Audio file exporting

The *Export Selected Soundbites* command in the Soundbites window mini-menu can export any soundbite in the file formats shown in Figure 23-17 for Mac and Windows.

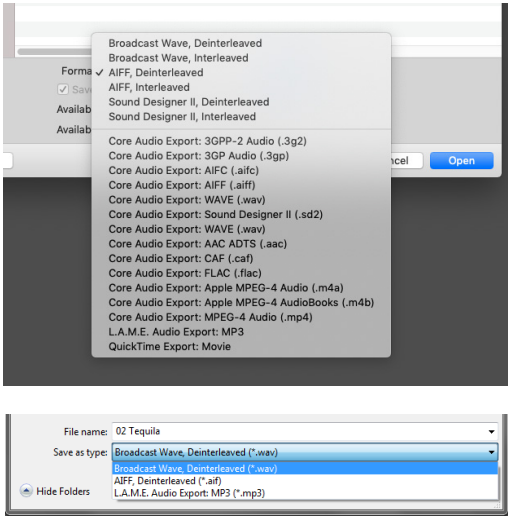


Figure 23-17: The audio export file formats.

For the macOS Core Audio Export formats, stereo soundbites are exported in the interleaved stereo version of these formats.

For further information about exporting to the MP3 file format, see "Bouncing to MP3" on page 569, as MP3 export works the same way for bouncing as it does for exporting.

Saving an audio export preset

To create and save an audio export preset, check the *Save Settings as Audio Export Format* option in the audio export dialog (Figure 23-17). If there are any additional settings required, they will appear in subsequent dialogs. Then, you'll be asked to name your export preset. After a preset has been saved, it appears in the audio export file format menu (shown in Figure 23-17) for your convenience, as well as the Bounce to Disk format menu (Figure 65-3 on page 566). To use an export

preset, simply choose it from the menu when bouncing or exporting. These presets are saved as a preference, so they are not project-specific. They are global to all projects.

CHAPTER 24 Set List

OVERVIEW

The Set List displays the sequences and V-Racks in a Performer Lite project file. A sequence is a collection of disk tracks, instrument tracks and/or aux tracks. A V-Rack™ is a collection of instrument tracks and/or aux tracks. A Performer Lite file can contain as many sequences and V-Racks as memory in your computer will allow. Sequences can be cued for playback, either automatically or manually.

V-Racks have no disk tracks and therefore do not "play back" in the same sense as sequences. Instead, they serve as a virtual "effects rack" that can also contain virtual instruments. These effect and instrument plug-ins can be accessed by any audio and/or MIDI track in the currently play-enabled sequence.

Overview **232**
Set List Quick Reference **232**
Set List basics **233**
Sequence cuing and chaining **237**

SET LIST QUICK REFERENCE

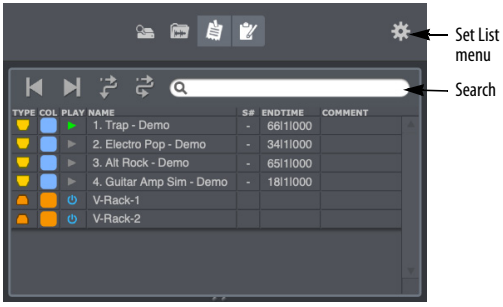


Figure 24-1: The Set List shows sequences and V-Racks in the Performer Lite project.

Type: Displays each item by icon. Drag this icon vertically to reorder items in the Set List.

Figure 24-2: The sequence and V-Rack icons.

Col (color): Click to choose a color for the sequence.

Play: Shows the play-enable button for each sequence. When a play-enable button is blue, the sequence is play-enabled. Only one sequence can be play-enabled at a time. V-Racks, on the other hand, display a blue power icon to indicate that they are active and available at any time. Click their power icon at any time to bring them on line or to take them off line.

Name: Displays the name of the sequence. Click the name to select the sequence. Option/Alt-click the name to change it. Double-click the name to open the Sequence Editor belonging to the sequence.

Because sequences can be imported into other files, use the most descriptive sequence name possible to avoid confusion.

S# (Song Select Number): Displays the song select number that will play-enable the sequence when received from a MIDI controller. Song select numbers range from 0-127. If a sequence has no song number assigned, the column displays a single dash (-). V-Racks do not have a song select number because they do not have disk tracks that play back in the conventional sense.

If Performer Lite receives a song select number that is assigned to two or more sequences, Performer Lite will cue the sequence that appears highest in the list. For this reason, it is best to assign a unique Song Select number to each sequence.

End time: Displays each sequence's End time. End time is the downbeat of the measure following the last complete measure in the sequence. When a sequence's End time is specified manually, it is bold and can be edited to be any length. V-Racks do not have an end time because they hold no audio or MIDI data.

Comments: Click to view and edit the comment for the sequence or V-Rack.

Next/Previous Sequence buttons: If you have more than one sequence in the file, these buttons skip to the next or previous one.

Cue button: When highlighted, the Cue button play-enables the next sequence in the Set List after the current playback sequence reaches its End time and stops. To begin playback of the next sequence, press the Play button (or a command for the Play button).

Chain button: When highlighted, the Chain button starts playback of the next sequence in the list after the current sequence reaches its End Time.

Search: If you have a lot of sequences in the list, type in the name of the one you are searching for.

The Set List menu

The Set List menu contains the following commands:

New Sequence: Creates a new sequence. To create several sequences at once, press the Option/Alt key while choosing New Sequence.

New V-Rack: Creates a new V-Rack. To create several V-Racks at once, press the Option/Alt key while choosing New V-Rack.

Duplicate Track Layout: Creates a new, empty sequence with the same track layout as the selected sequence. Select an existing sequence before choosing this command.

Duplicate Sequence: Creates an exact copy of the currently selected sequence.

Auto/manual end time: Toggles the Auto/manual status of the selected sequences. Automatic mode locks the sequence's End time at the downbeat of the measure following the last complete measure in the sequence. Manual mode changes the time to boldface and allows it to be edited.

Set Sequence Start: Establishes the start times of the currently selected sequences in three of Performer Lite's time formats: measures, real time, and SMPTE time. The start times are what you see in the Counter when you rewind back to the beginning of the sequence.

Delete Sequence: Deletes the selected sequences.

SET LIST BASICS

The Set List displays the sequences in a file and provides useful features to manage them, such as adding, deleting, and other operations. Sequences can also be automatically cued to playback in the order in which they are listed in the Set List. For more information about cuing, see "Sequence cuing and chaining" on page 237. Sequences can

also be cued remotely from your MIDI controller. For more information, refer to chapter 29, "Commands" (page 257).

Opening the Set List

To open the Set List, click the Set List button (Figure 7-2 on page 43). The Set List appears in the right-hand sidebar, displaying a list of all sequences and V-Racks in the open file.

Selecting Sequences

There are several methods of selecting sequences:

To select a single sequence, click on its name. The name will highlight.

To select several adjacent sequences, click a sequence name and drag over the desired names. All sequences dragged over will highlight.

To select several non-adjacent sequences, hold down the Command/Ctrl key and click on the names of the sequences you wish to select. They will highlight.

To deselect sequences when more than one are highlighted, hold down the Command/Ctrl key and click on the sequences you wish to deselect. They will unhighlight.

Creating new sequences

To create a new, empty sequence, choose *New Sequence* or *New V-Rack* from the Set List mini-menu. To add several at once, hold down the Option/Alt key while choosing *Add*. You will be prompted for the number of sequences to add.

To create a new sequence with the same track layout as an existing Sequence, highlight the existing sequence and select *Duplicate Track Layout* from the Set List mini-menu. A new sequence will be added with the same name as the sequence you highlighted, appended by the word "copy". It will have the same track layout as the original: the number of tracks, the track names, and the track output assignment will be identical to the original.

Duplicating existing sequences

Sometimes you may want to duplicate a sequence to experiment with changes or for some other reason. To duplicate a sequence:

1 Select the sequence.

2 Choose *Duplicate Sequence* from the Set List menu.

An exact copy of the sequence, including all the data in the tracks, will be placed at the end of the Set List.

Copying and pasting Sequences between projects

You can copy and paste entire sequences and/or V-Racks that have been selected in the Set List.

When copying and pasting sequences, all soundbites and sequences used in them are also copied and pasted into the destination project.

Splitting up a sequence into separate sequences

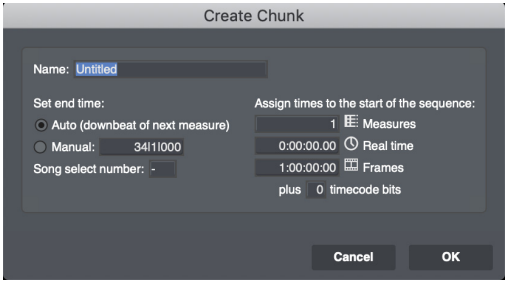
The *Copy selection to new sequence* command in the Sequence Editor menu (page 124) takes the current selection and turns it into its own sequence in the Set List window.

To create a sequence Sequence from the Sequence Editor window:

1 Make any selection that you wish.

2 Choose *Copy Selection to New Sequence* from the Sequence Editor menu.

A dialog box appears.



3 Type in a name for the sequence.

4 Type in an End Time to determine the length of the sequence.

By default, the end time is determined by the length of the selection.

5 (Optional) Type in any other information you wish.

6 Press OK to confirm your choice or Cancel to withdraw the command.

Deleting sequences

To delete a sequence, click its name to highlight it and choose *Delete* from the Set List mini-menu. To delete several sequences at once, highlight the name of each one as described in the *Selecting Sequences* section above. You can Undo this command.

Choosing the current playback sequence

At any given time, one sequence is designated for playback, and it is the only one you can play and record into. Certain functions, such as recording, are available only to the currently play-enabled sequence. For example, if a sequence is play-enabled, its tracks have record-enable buttons.

V-Racks, on the other hand, are always play-enabled, making their tracks available at all times to the currently play-enabled sequence.

You may edit any sequence in the file at any time regardless of whether it is play-enabled or not.

To play-enable a sequence:

- Click the play-enable button to the left of its name. It will turn blue. The play-enable buttons of the other sequences will be gray.

OR

- Click the Next/Previous Sequence buttons as needed until the sequence's play button turns blue.

OR

- Select the sequence from the *Sequence* sub-menu in the Settings menu.

Play-enabling by remote control

Performer Lite also provides two different methods of play-enabling sequences from a remote device.

Sequence Selection commands

The first method is with the Sequence select Commands found in the Commands window, where each Sequence is assigned a computer key binding and MIDI event. You play-enable a Sequence by pressing its corresponding computer key binding or sending its corresponding MIDI event from your MIDI keyboard (or controller). Please refer to chapter 29, "Commands" (page 257) for more information.

Song Select messages

The second method is Sequence Select, which allows you to cue sequences for playback by sending a MIDI Song Select message from a MIDI controller. The Set List column *S#* displays the Song Select number that, when received, will cue the corresponding sequence for playback. If a sequence has no Song number assigned, the *S#* column displays a single dash (-).

Most hardware sequencers and some MIDI keyboard controllers can send and receive Song Select messages. Simply send a Song Select message as instructed in that module's documentation. If the open file contains a sequence assigned to the Song number in the message, that sequence will be play-enabled. If more than one sequence has the same Song number assigned, the one highest in the Set List will be cued.

When used in combination with the Sequence Chaining buttons in the Set List, a Song Select message cues the corresponding sequence to be play-enabled or played back.

Rearranging the order of sequences

You can rearrange the Sequences in any order you wish. To change the position of a Sequence in the Set List:

1 Press the type icon of the Sequence you want to move.

The cursor changes into that sequence icon.

2 Drag and drop the mouse to the position where you want the Sequence.

If you wish to move two or more Sequences at once:

1 Shift-click or Command/Ctrl-click their names to select them.

2 Grab the type icon of one of them.

3 Drag and drop to the position in the list where you want them.

Rearranging the order of the Sequences is a useful organizational tool. In addition, it lets you determine the Sequences' default cuing order when using the Next/Previous Sequence, Cue Sequences, and Cue buttons described later in this chapter.

Changing the name of a sequence

To change the name of a Sequence:

1 Option/Alt-click the name of the sequence.

A small box will pop up.

2 Type the sequence name in the box.

3 Press the Return key or click outside the box to confirm the name or Command/Ctrl-period to cancel it.

You can use the Enter or Down Arrow key to approve the change and edit the next sequence name in the list. You can also use the Up Arrow key to approve the change and edit the previous sequence name in the list.

Entering comments

To enter or modify comments for a sequence:

1 Click in the comments field to the right of the sequence name.

A box appears. If you've already entered a comment for the sequence, the entire comment appears highlighted in the box.

2 Enter or edit the comment.

3 Click OK to confirm the changes you've made and close the comments box, or click Cancel to discard the changes.

Press the Down Arrow key or the Enter key to approve the changes you've made and move to the comment for the next Sequence. The Up Arrow key likewise moves to the comment for the previous Sequence.

When entering or editing a comment, the Return key starts a new line of text instead of approving the changes as usual in Performer Lite's user interface.

Auto versus manual end time

The Set List field *End Time* displays either the automatic, Performer Lite-generated ending time of the Sequence, or a time that you have entered manually. It's important to understand how this time affects your music.

Performer Lite can play Sequences sequentially with the Cue, Chain, and Next/Previous Sequence buttons in the Set List. When using these Sequence controls, you'll find that each Sequence's End time affects its playback length. For example, clicking Play with the Cue button enabled causes playback of one Sequence after another, each Sequence playing until the counter reaches that Sequence's End time. Phrases, even notes that normally would last through the End time will be cut off. You can avoid this by setting a Sequence's End time to be later, thereby building sustain into the Sequence's play length.

SEQUENCE CUING AND CHAINING

The Next/Previous Sequence buttons (Figure 24-3) cue up (play-enable) the next or previous Sequence in the Set List, similar to the skip buttons on your favorite music player.

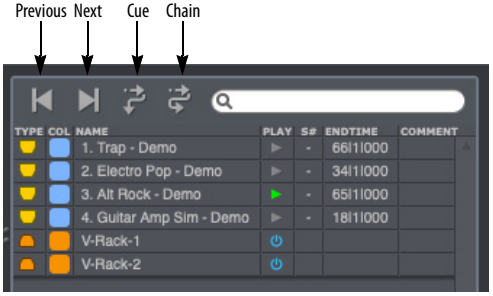


Figure 24-3: Cuing sequences in the Set List.

The Cue button

The Cue button (Figure 24-3), when highlighted, play-enables the next sequence in the Set List after the current playback sequence reaches its end time and stops.

To begin playback of the next sequence, press the Play button, or a command for the Play button.

The Chain button

The Chain button (Figure 24-3), when highlighted, starts playback of the next Sequence in the Set List after the current playback Sequence reaches its End time. This is a simple way of automatically chaining Sequences in their Set List order.

Sequence cuing is not seamless

Sequence cuing does not yield seamless transitions between Sequences. Use cuing for situations where a pause between Sequences — either brief or indefinite — is acceptable or preferred.

For example, sequence cuing is perfect for live performance. Before a set, you could organize the Set List in the order you wish for the set. To begin the set, you simply press play. When the first sequence ends, the next sequence automatically cues up, and you can trigger it at your leisure from your MIDI keyboard. Or, with the Chain button, you can have Performer Lite go right into the next sequence without waiting.

It is also possible to cue and play Sequences remotely from your MIDI controller. For more information, see chapter 29, "Commands" (page 257).

For seamless chaining, it is better to consolidate multiple sequences into a single master sequence that plays continuously from one to the next. This can be done by copying and pasting from component sequences into a master sequence.

Viewing the Sequence End Time

When the Cue or Chain button is highlighted, the end time of the sequence is graphically displayed as the end of the Memory Cycle bar.

CHAPTER 25 Sequence Basics

OVERVIEW

Performer Lite is modeled after the straightforward, conventional concept of a multitrack recorder. For a multitrack tape recorder, the basic unit of musical organization is a reel of tape. Typically, one song would be recorded on one reel of tape.

In Performer Lite, the basic unit of organization is called a *sequence* (a term that originates from Performer Lite's roots as a MIDI sequencer). A *sequence* holds a set of tracks. (Think of a sequence as a reel of tape — or one section of the tape, like the *chorus* or the *first verse*.) Each *track*, in turn, holds an individual stream of MIDI or audio data.

Every Performer Lite project must contain at least one sequence. By default, this sequence is named "Seq-1".

SEQUENCE TYPES

There are two kinds of sequences: sequences and V-Racks. Each type is described briefly below.

Sequence

A sequence is a complete performance of MIDI and/or audio consisting of any number of tracks, which are shown in the Sequence Editor, Mixing Board, and so on. Each track contains MIDI or audio data which may be assigned to a MIDI destination or audio output. A sequence also has a Conductor track, which contains meter, key, and tempo information.

V-Rack

V-Racks™ (virtual racks) are similar to sequences, except that they have no time domain and they do not hold track data or automation. The only types of tracks that you can add to them are Instrument tracks, aux tracks and master faders. As such, they are intended to be used as "effects" racks, a centralized location for effects processing and virtual instruments.

For more information, see chapter 26, "V-Racks" (page 239).

MANAGING SEQUENCES AND V-RACKS

The Set List window lets you add, duplicate, delete, rename, and otherwise manage multiple sequences and V-racks in your Performer Lite project. For complete details, see chapter 24, "Set List" (page 232).

CHAPTER 26 V-Racks

OVERVIEW

V-Racks™ (virtual racks) are similar to sequences, except that they have no time domain and they do not hold track data or automation. The only types of tracks that you can add to them are Instrument tracks, aux tracks and master fader tracks. As such, they are intended to be used as "effects" racks, a centralized location for effects processing and virtual instruments.

V-Racks can be created and managed in the Set List window. See chapter 24, "Set List" (page 232).

Overview **239**
V-Rack basics **239**
Creating a V-Rack **240**
V-Rack quick reference **240**
Working with a V-Rack **240**

V-RACK BASICS

V-Racks™ (virtual racks) are similar to regular sequences, but they are streamlined as follows:

- They have no time domain.
- They do not hold track data or automation.
- The only types of tracks that you can add are: Instrument tracks, aux tracks and master faders.
- They do not have a Sequence Editor or any other type of edit window. The only window that can be opened to modify them is the Mixing Board.

V-Racks have several significant characteristics that makes them very useful:

- They are always active, regardless of what sequence is play-enabled.
- Their track inputs and outputs are always available to all other sequences in the project.
- They provide all of the real-time processing capabilities of a regular sequence, including the ability to host virtual instruments.

A virtual effects and instrument rack

When you add up all of the above characteristics, essentially what you have is a virtual effects and instrument rack — hence the name *V-Rack*. V-Racks are ideal in situations where you are using multiple sequences in a project, as the following examples illustrate.

Virtual instruments

A very common situation is as follows: you have a project with multiple sequences that are all playing the same virtual instrument. For example, you might be working on different variations of a song (the original version plus several remixes). But they are all playing essentially the same sounds loaded into MachFive (or other multi-part virtual instrument). To work most efficiently, you can create one instance of MachFive in a V-Rack, and then access MachFive from any of the other sequences, just as if it were instantiated in each sequence individually. By instantiating it only once in the V-Rack, you save memory and computer processing resources. Samples and patches will not need to reload when switching among sequences.

Mastering

Another very common situation is this: you have multiple sequences that you want to master using the same mastering effects chain. To ensure consistency and to maximize efficiency, you can add a master fader track to a V-Rack, apply the desired effects processing and then run the master output of each individual sequence into the master fader in the V-Rack. Regardless of which sequence

is play enabled, the V-Rack master fader settings can be applied. Not only do you conserve your computer's processing resources (since you only have to create one instance of the effects), you also ensure that each individual sequence is processed with exactly the same plug-in settings in your mastering chain.

Effects loops

A another common situation is this: you have multiple sequences and you wish to use the same effect in all of them as a send/return loop. For example, suppose all your sequences contain vocal tracks that you would like to process through identical compression and reverb. To once again ensure consistency and simplify the setup of this loop across all sequences, you can add an aux track to the V-Rack and then add the desired effects chain plug-ins to it. Set the input to be a bus, and its output to be the main outs (or another bus, for added flexibility). Now, all tracks in any sequence assigned to that effect bus will receive identical effect processing.

Live effects processing

A final example for V-Racks is this: you are performing music in a live context, and you would like to have an effects chain set up that is always active, regardless of what sequence is playing back. You could set up an aux track in a V-Rack from a physical input on your audio hardware to a physical output, and add whatever processing you would like. Now Performer Lite can perform as a virtual effects rack, no matter which sequence is play enabled.

CREATING A V-RACK

You can add any number of V-Racks to a Performer Lite project in any of the following ways:

- Choose *Project menu> Sequences> New V-Rack*
- Choose *New V-Rack* from the Set List menu.
- Choose *New V-Rack* from the Sequences submenu in the Settings menu (Figure 7-3 on page 43).

Figure 26-1: A V-Rack.

V-RACK QUICK REFERENCE

Move handle: Drag this handle vertically to change its position in the list.

Enable/Disable: Brings the V-Rack on line (active and processing audio) or offline (inactive).

WORKING WITH A V-RACK

V-Racks are viewed in the Mixing Board. To view a V-Rack, do one of the following:

- Double-click it's name in the Set List
- Choose *Show V-Racks* from the Mixing Board menu (page 177)
- Choose V-Rack Edit from the Mixing Board menu

For your convenience, in the Commands window (Setup menu), there is a command called *V-Rack Edit* that switches the Mixing Board between the sequence and V-Rack that was last viewed in the Mixing Board. The default keyboard shortcut is Command/Ctrl-Shift-V.

Adding tracks to a V-Rack

After you have opened the V-Rack in the Mixing Board, you can then add aux tracks, instrument tracks and master faders to it using any of the

standard techniques for adding tracks to a sequence. For example, you could choose *Project menu> Add Track*.

Moving tracks from a sequence to a V-Rack

If you would like to move an aux track, master fader or instrument track from a regular sequence to a V-Rack:

1 Make sure the source sequence is play-enabled.

2 Select the tracks you wish to move.

3 Choose *Move Selected Tracks to V-Rack* from the Sequences sub-menu in the Settings menu (Figure 7-3 on page 43)

4 Choose the desired destination V-Rack from the resulting dialog.

The track disappears from the source sequence and is moved to the destination V-Rack.

Deleting tracks from a V-Rack

To delete tracks from a V-Rack, choose *Delete Track* from the pop-up menu at the bottom of each channel strip in the Mixing Board.

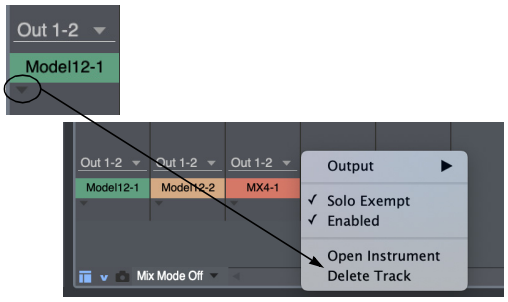


Figure 26-2: Deleting tracks from a V-Rack.

The V-Rack button

The V-Rack (V) button in the lower left corner of the Mixing Board window toggles between the last-viewed sequence and the last-viewed V-Rack.

Figure 26-3: The V-Rack button.

Displaying V-Racks alongside a sequence

To display V-Racks alongside your sequence tracks in the Mixing Board, use the *Show V-Racks* option in the Mixing Board menu.

When enabled, the V-Rack tracks will be displayed to the right of your sequence tracks (Figure 26-4) and each V-Rack is displayed as a track folder in the Mixing Board's track selector (Figure 26-4).

To hide individual tracks from the V-Racks, deselect their names in the track selector (Figure 26-4); to hide an entire V-Rack, deselect the V-Rack's folder by clicking on its name, or collapse the folder by clicking its disclosure triangle.

V-Rack tracks are visually separated from sequence tracks by divider lines as shown in Figure 26-4. Additionally, each sequence and V-Rack has a label with its name above their associated tracks.

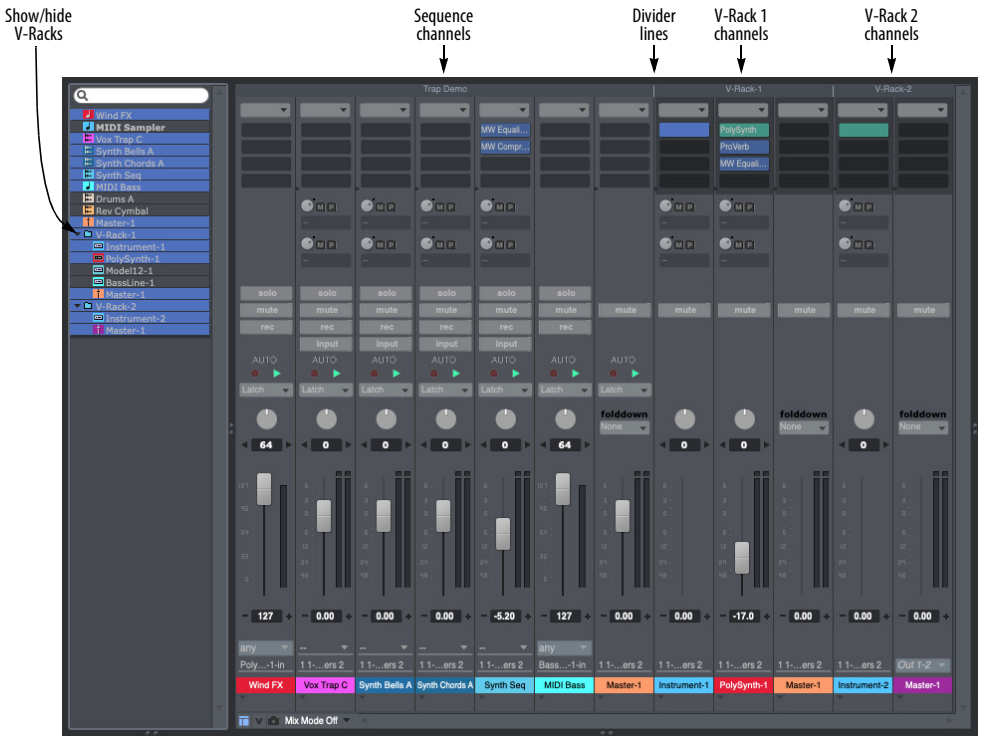


Figure 26-4: V-Rack tracks alongside sequence tracks in the Mixing Board.

CHAPTER 27 Tools

OVERVIEW

Tools are available in the Primary and Alternate Tool menus in the Control Panel (Figure 17-1 on page 106). Tools are used for inserting, selecting, editing, reshaping, zooming, looping and scrubbing data in Performer Lite's various editors.

Overview 243
Main and Alternate Tools 244
Keyboard shortcuts for tools 244
Pointer tool 244
I-Beam tool 245
Pencil tool 245
Insert/Reshape Curve 246
Reshape tool 246
Reshape Mode menu 246
Zoom tool 246
Mute tool 247
Scissors tool 247
Trim tool 248
Roll tool 249
Slip tool 249
Slide tool 249
Comp tool 249
Velocity tool 249
Hand tool 249
Scale Per Note CC Data tool 249

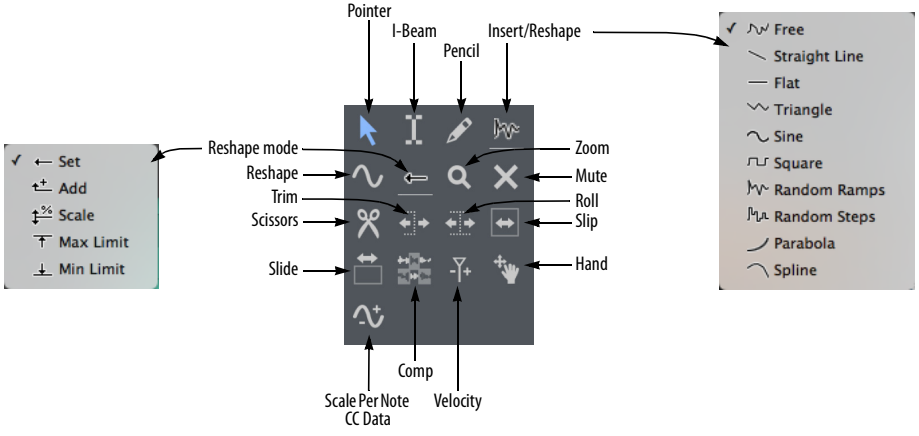


Figure 27-1: The Tool palette.

MAIN AND ALTERNATE TOOLS

The Main and Alternate Tool menus in the Control Panel (Figure 17-1 on page 106) let you choose two different tools that you can quickly switch between using a keyboard shortcut, to avoid repetitive trips to the Tool palette. See "Primary and alternate tools" on page 119.

KEYBOARD SHORTCUTS FOR TOOLS

Hold down the following keys for tool selection:

Command	Keyboard shortcut
Pointer tool	A
I-Beam tool	I
Pencil tool	P
Reshape tool	R
Zoom tool	Z
Mute tool	M
Scissor tool	C
Slip tool	, (comma)
Slide tool	. (period)
Roll tool	' (apostrophe)
Trim tool	/
Comp tool	B
Velocity tool	V
Hand tool	G

Tool shortcuts can be "sticky"

If you double-tap the keys shown in the tool shortcuts above, the tool will remain selected until you select another tool.

Cycling tools

Shift-tilde (~) cycles to the next tool.

POINTER TOOL

The Pointer tool produces the standard 'cross-hair' selection cursor for 'marquee' selections over multiple events and 'finger' selection cursor for selecting and editing individual events. For example, you could select several measures of notes by positioning the cross-hair cursor over an empty portion of the data grid and dragging out a selection box over the desired events. Here's a summary:

To do this:	Do this with the Pointer tool:
To select an event	Click it with the 'finger' cursor.
To select several events	Shift-click each one.
To select a region of events	Drag a selection box over them with the cross-hair cursor. To get the cross-hair, position the cursor over an empty cell.
To select all events within a time range	Drag in the time ruler.
To duplicate an event	Option/Alt-drag it.
To move an event	Drag it with the finger cursor.
To move several events together	Select them, grab one with the finger tool and drag.
To change the duration of a note (only available where note durations are displayed)	Position the cursor over its right edge until you see the 'hand' cursor and then drag it.

The Pointer tool can use different selection modes, which will change what kinds of selections are made in some places; see "Choosing a Pointer tool selection mode" on page 306.

I-BEAM TOOL

The I-Beam tool allows you to make time range selections in any editor, regardless of the material you are dragging over to make the selection. Time range selections in the Sequence Editor are much easier with this tool, especially when you are making selections that begin in the middle of soundbites. As usual, you can hold down the Shift key while using the I-Beam tool to extend or shorten the current selection. Shift-click other tracks to add them to the current selection without changing the start and end times. To make a time range selection that matches the duration of a soundbite or MIDI note, double-click the soundbite or note with the I-Beam. To temporarily get the I-Beam cursor when another tool is selected, hold down the " i " key.

Here are some further details about double-clicking with the I-Beam to create time range selections.

Selecting soundbites with the I-Beam tool

If, using the I-Beam tool, you double-click a portion of a soundbite that is partially covered by other soundbites, you'll select the entire soundbite, even the parts that are covered. However, if you hold down the Option/Alt key while double-clicking it with the I-Beam tool, you'll only select the portion of it that you clicked, as determined by soundbites that cover it on either side of where you click.

Selecting MIDI notes with the I-Beam tool

If you double-click a MIDI note with the I-Beam cursor, you aren't really double-clicking the note itself. Instead, you are clicking a location in time for all pitches in the track. Doing so creates a time range selection that is determined by *any* notes of any pitch whose duration crosses the time location you clicked.

Here's an example: if you double-click a MIDI note, you'll get a time range selection in the track that matches the duration of the note. If the note's duration overlaps the duration of another note (of the same pitch or a different pitch), then you can double-click it with the I-beam tool in two places: where it overlaps, or where it doesn't overlap. If you double-click where it overlaps, you'll get a time range selection that includes the durations of both notes. If you double-click where it doesn't overlap, you'll get a time range selection of just the note you clicked.

I-Beam cursor

Click the I-Beam tool at any location in any Sequence Editor to place an I-Beam cursor (flashing vertical line) wherever you click. The I-Beam cursor serves two basic purposes:

- An insertion point for a paste or merge operation
- An anchor point for selection commands

For further information about making selections with the insertion point, see "Initiating time range selections with an insertion point" on page 309 and "Modifying a time-range selection using the computer keyboard" on page 309.

PENCIL TOOL

The Pencil tool lets you insert data using the following techniques:

To do this:	Do this with the Pencil tool:
To insert an event	Click in a note grid or continuous data grid.
To remove a MIDI note	Click it on a MIDI note grid.
To insert continuous data curve (MIDI or audio)	Click the master track button for the desired track, if any, click the Pencil tool, choose the desired shape from the in the Tool palette, choose the desired data type in the continuous data grid (or make it the active layer in the Sequence Editor) and then click or drag on the grid.
To edit audio pitch automation	Click and drag on the audio pitch display.

INSERT/RESHAPE CURVE

Controls the shape or curve of continuous data when you insert it with the Pencil tool or modify it with the Reshape tool. For complete details, see “Inserting CC data in Points or Bars mode” on page 323 and “Reshape tool”, below.

RESHAPE TOOL

The Reshape tool lets you reshape a stream of continuous data. For complete details, see “Reshape Mode menu”. The techniques can be used for any continuous data, including volume data for audio and MIDI tracks in the Sequence Editor.

RESHAPE MODE MENU

Performer Lite provides several powerful ways to reshape continuous data curves.

A variety of reshape modes are available, as shown in Figure 27-1 on page 243 and summarized below:

Reshape mode	What it does
Set	Forces data values to exactly match the curve that you draw.
Add	Adds or subtracts a fixed amount to all data values based on how far above or below the origin you draw the reshape curve. Draw above the origin to add; draw below it to subtract.
Scale	Scales all data values based on how far above or below the origin you draw the reshape curve. Draw above the origin to scale up; draw below it to scale down.
Max limit	Lowers all data values that are above the reshape curve.
Min limit	Raises all data values that are below the reshape curve.

You can reshape any kind of continuous data, such as MIDI continuous controllers, audio volume automation, etc. To reshape a stream of continuous data, in this example a MIDI CC:

1 Click the Reshape tool in the Tool palette.

2 Choose the desired shape of the curve from the Pencil/Reshape Curve menu in the Tool palette (Figure 27-1 on page 243).

3 Drag over the data you wish to reshape, as demonstrated below in Figure 27-2.

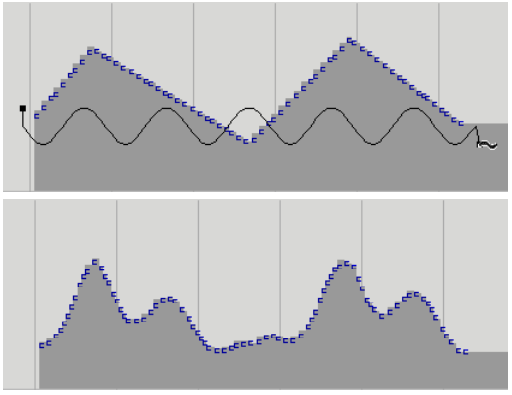


Figure 27-2: In this reshape example, a stream of volume controllers are being scaled with the sine wave reshape tool.

ZOOM TOOL

The Zoom tool (magnifying glass) in the Tool palette lets you zoom in on a portion of an editor by dragging a zoom box over it. Click to zoom in and Option/Alt-click to zoom out. In the time ruler or continuous data grid, drag horizontally to zoom the time axis only.

Zoom tool shortcuts

Here are some zooming shortcuts:

Shortcut	What it does
Click once	To zoom in horizontally.
Option/Alt-click	To zoom out horizontally.
Shift click	To zoom backward through zoom history
Shift-control click	To zoom forward through zoom history
Drag in the time ruler	To fill the window with the region you select without affecting the pitch zoom
Drag over an area in the note grid	To zoom time and pitch simultaneously
Option/Alt-click the zoom out button	To zoom all the way out
Option/Alt-click the zoom in button	To zoom all the way in
Command/Ctrl-click the zoom buttons	To toggle between the last two zoom levels

For other zooming features and shortcuts, see “Zooming” on page 298.

MUTE TOOL

The Mute tool mutes and unmutes soundbites or MIDI notes when you click them or drag over them in the Sequence Editor. The Mute tool only works when soundbites or MIDI notes are the active layer in the track. Muting occurs independently of any volume automation in the track. Muted soundbites appear with a grayed-out waveform; muted MIDI notes appear as grayed out notes.

The Mute tool is a handy way to temporarily mute soundbites or notes, but it is also great for arranging and creating interesting rhythm parts. Here’s just one example: use the Scissors tool to split an ambient pad into a rhythmic grid of slivers (explained further in the next section) and then use the Mute tool to quickly create syncopated riffs by muting various combinations of the slivers. To temporarily get the Mute tool when another tool is selected, hold down the “ M ” key. The same technique could be used on a MIDI drum loop or phrase of any kind.

SCISSORS TOOL

The Scissors tool splits a MIDI note or soundbite where you click. With the edit grid turned on, you can also drag across a note or soundbite to split it repeatedly on grid lines, as demonstrated below in Figure 27-3. To temporarily get the Scissors tool when another tool is selected, hold down the “C” key.

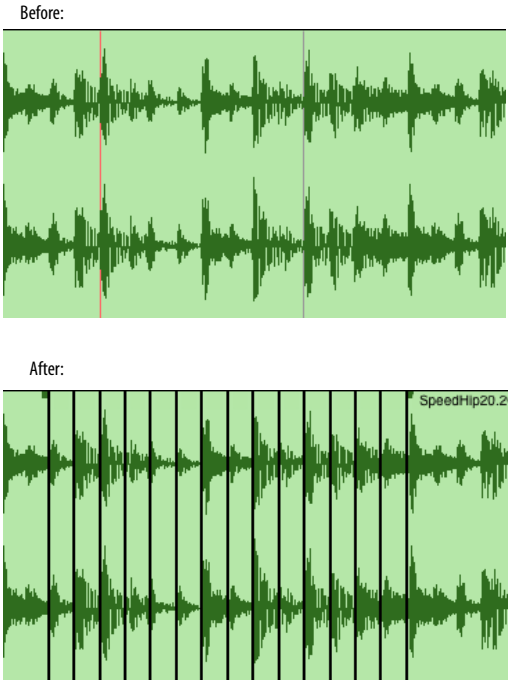


Figure 27-3: Turn on the edit grid and drag across a MIDI note or soundbite to split it repeatedly along edit grid lines.

TRIM TOOL

The *Trim tool* allows you to trim soundbites and continuous data. To temporarily get the Trim tool when another tool is selected, hold down the forward slash key (/).

Soundbites

With the Trim tool chosen, click anywhere in a soundbite to move the right edge to the location where you clicked. Hold down the Option/Alt key to move the left edge of a soundbite.

Continuous data

The Trim tool can also be used on continuous data, such as audio track volume, MIDI CCs, and pitch bend.

When the Trim tool is chosen and the mouse is directly over continuous data, the Trim tool cursor will change to a hand with a pointed finger. You can click on a data point, or on the line segment between data points, and drag it up or down to trim its value.

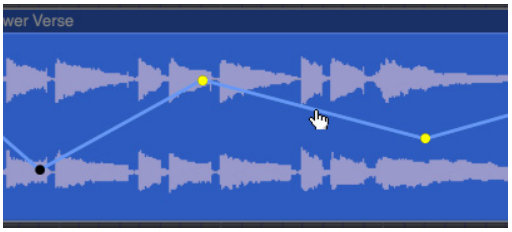


Figure 27-4: Trimming continuous data.

If there is a time range selection or event selection of continuous data, clicking and dragging on one of the selected line segments or data points will move all of the selected data.

Scaling continuous data

A selection of continuous data can also be scaled with the Trim tool. When there is a time range or event selection of continuous data, move the cursor within the selection (but not directly over a point or line segment) then click and drag up or down.

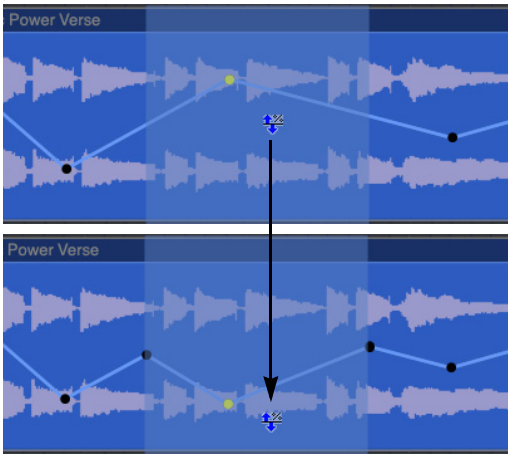


Figure 27-5: Scaling continuous data.

Points are automatically added at the boundaries of the selection to preserve the data before and after the selection.

Flattening continuous data

Holding the Option/Alt key while using the Trim tool as described above will flatten the data rather than scale it.

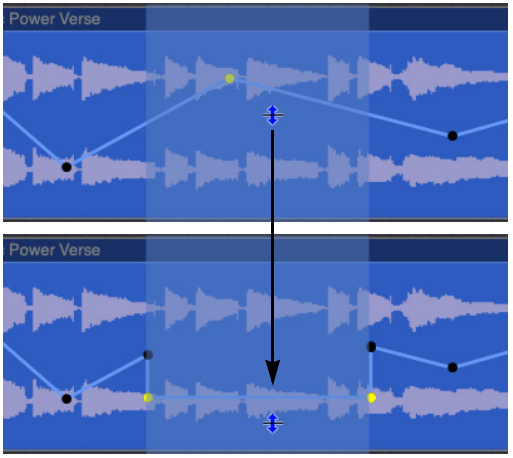


Figure 27-6: Flattening continuous data.

ROLL TOOL

The *Roll tool* allows you to edge edit the beginning of one soundbite and the end of another where they abut each other. They must be touching one another. To temporarily get the Roll tool when another tool is selected, hold down the apostrophe key (').

SLIP TOOL

The *Slip tool* allows you to edge edit the start and end of a soundbite while the soundbite remains at the same position in the track. The soundbite's length does not change. To temporarily get the Slip tool when another tool is selected, hold down the comma key (,).

SLIDE TOOL

The *Slide tool* allows you to move a soundbite in the sequence while leaving the soundbite's audio at the same playback time. This is the same as edge editing both ends by the same amount forwards or backwards. To temporarily get the Slide tool when another tool is selected, hold down the period key (.).

COMP TOOL

The *Comp tool* allows you to create a composite, or "comp," take from multiple takes in an audio track. To temporarily get the Comp tool when another tool is selected, hold down the "B" key. See chapter 43, "Takes and Comping" (page 415).

VELOCITY TOOL

The *Velocity tool* allows you to click on a MIDI note and drag up or down to adjust its velocity. You can also swipe horizontally in the Velocity Edit Layer or the note velocity lane in the Sequence Editor to adjust multiple note velocities in a single gesture.

HAND TOOL

The *Hand tool* allows you to scroll smoothly and precisely. It also lets you scroll vertically and horizontally in a single gesture. Simply click anywhere in the Sequence Editor grid and drag as desired.

SCALE PER NOTE CC DATA TOOL

The *Scale Per Note CC Data tool* scales per-note continuous controller (CC) data when you drag vertically on a note that contains it. See "Scaling per-note CC data" on page 328.

Part 5
Preferences

CHAPTER 28 Preferences and Settings

OVERVIEW

The *Preferences* command in the Performer Lite menu (Mac OS) or Edit menu (Windows) lets you further customize your Performer Lite workspace.

Overview 251
The Preferences window 251
Audio Plug-ins 252
Document 252
Data Display 252
Automatic Conversions 252
Chord Symbols 253
Information Bar 253
Lyrics 253
MIDI Editing 253
Soundbite List 254
Tools 254
Undo Pruning 254
Audio options 255
Click 255
Countoff 255
MIDI Options 255
Pitch and Stretch 255
Receive Sync 255
Transmit Sync 255
Transport 255
Scaling all windows up or down 256
Help menu 256

THE PREFERENCES WINDOW

To view a set of preferences, click their name in the list. The settings are displayed on the right.

Fly-over help is supplied in the *Description* section below: when you move the cursor over a setting, a brief explanation of it appears below.

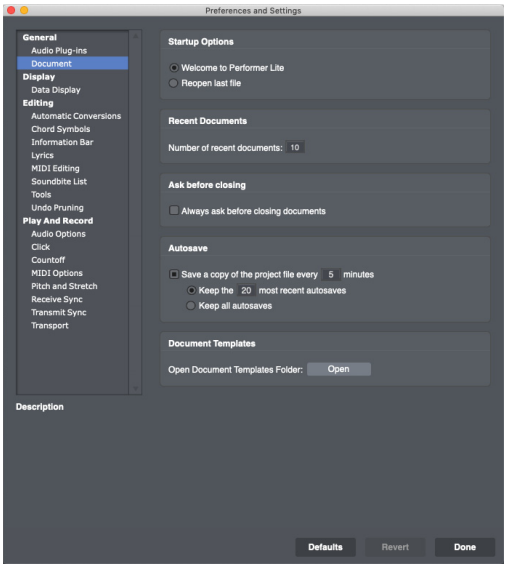


Figure 28-1: Preferences window

Restoring factory default settings

To restore factory default settings for the current preferences being displayed in the window (as indicated by what is currently selected in the list), click the *Defaults* button.

Reverting

If you have made changes to the current preferences being displayed in the window (as indicated by what is currently selected in the list), and you change your mind and wish to go back to the settings as they were before you made changes, click the *Revert* button.

Closing the Preferences window

Changes you make in the Preferences and Settings window go into effect as soon as you make them. To close the window, click its close button, or click the *Done* button.

AUDIO PLUG-INS

This preference pane allows you to manage your audio plug-ins. For details, see "Audio plug-in preferences" on page 525.

DOCUMENT

The Document preferences are shown in Figure 28-1 on page 251.

Startup Options

Choose how you would like Performer Lite to open when you first launch the application. Performer Lite can do one of three things:

- Open the *Welcome to Performer Lite* window
- Open the project you last had open

Recent Documents

Specify the number of recent documents that you want to appear under *File menu* > *Open Recent*.

Ask before closing

When the *Ask before closing* preference is enabled, Performer Lite always asks before closing the project. This is useful in situations where re-opening projects might take a long time due to virtual instrument loading.

Autosave

Autosave can be toggled on or off, and the save interval can be specified (from 1 to 60 minutes). You can keep all Autosave files or limit to a certain number of the most recent ones. Autosaved files go in an Autosave sub-folder in the project folder.

DATA DISPLAY

The Data Display Preferences give you several choices for how to display MIDI pitch info.

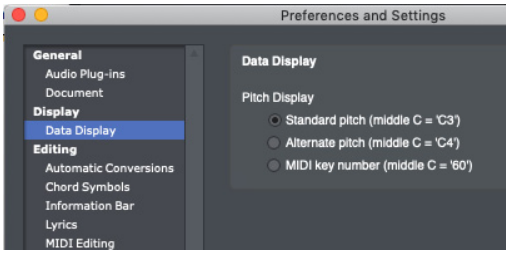


Figure 28-2: The Data Display Preferences.

AUTOMATIC CONVERSIONS

Performer Lite can automatically convert audio data wherever necessary to make it conform to the current project's sample rate, file format, interleaved format, and tempo. Because processing is initiated automatically and carried out via background processing (for lengthy operations), these auto-conversion features greatly streamline the process of importing audio quickly into your projects, or the process of converting the entire project to a different sample rate, file format, interleaved format, or tempo.

The *Automatic Conversions* preferences (Figure 28-3) provides a global switch (the *Enable Automatic Conversions* option), and it also allows you to further specify your preferences for how audio is automatically converted.

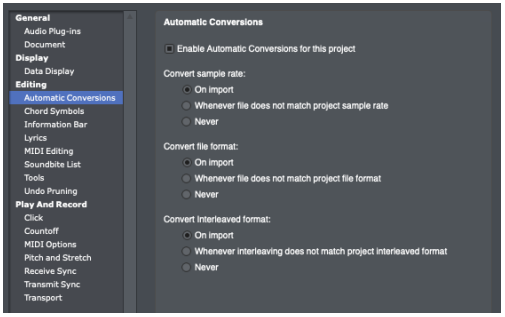


Figure 28-3: The automatic audio file conversion preferences.

Enabling and disabling automatic conversions

Use the Enable Automatic Conversions check box to turn automatic conversions on or off for the current project. This setting is saved with the project. You can also toggle this setting with a key binding.

Automatic conversion settings

The following settings let you customize how files are automatically converted. Settings are provided to handle sample rate, file format, interleaved format, and tempo.

On Import

This option, along with the *When Bite is Added to A Track* option, converts audio when it is first imported into Performer Lite, and in the case of tempo, when it is first placed in a track.

Whenever File Doesn't Match Project

These options do the same thing as the *On Import* option, plus they automatically convert audio whenever circumstances arise where the audio no longer matches the project. For example, if you change the tempo for the sequence, all audio that is affected by the new tempo will automatically be time-stretched to match the new tempo. Or if you decide to change the project's sample rate, say from 48kHz to 44.1kHz, all audio will automatically be sample rate converted. Needless to say, you need to be mindful of making changes like this, as very large amounts of audio data can be generated as a result of using these options.

Never

Choose this option when you don't want audio files to be automatically converted for this file characteristic.

CHORD SYMBOLS

For details about the Chord Symbols settings, see "Chord symbols preferences" on page 151.

INFORMATION BAR

This preference pane is used to configure how the Information Bar will appear in each edit window. For more information, see "Information Bar" on page 126.

LYRICS

For details about the Lyrics settings, see "Lyrics preferences" on page 160.

MIDI EDITING

MIDI Note Display

Show note pitch: When checked, MIDI notes display their MIDI note number inside the note bar itself, at the left edge of the note. MIDI note numbers appear when the note grid is vertically zoomed in far enough to display text inside the note.

Show velocity as bar: When checked, MIDI notes display their note-on velocity as a bar inside the note, similar to a thermometer. The higher the velocity, the longer the bar (from left to right).

Shade Notes using Velocity: When checked, MIDI notes will be shaded according to their on-velocity. The higher the velocity, the darker the note. Conversely, the lower the velocity, the lighter the note.

Show notes with gradient: When checked, MIDI notes are displayed with gradient shading to give them a more 3D appearance.

Show notes with rounded corners: When checked, MIDI notes are displayed with rounded corners.

Show notes with colored border when zoomed out: When checked, notes have a colored border instead of a black border when zoomed out.

Show Notes When Scrolling Offscreen: When this item is checked, the note grid displays a small bar at the top border or bottom border when a note resides above or below the pitch range currently being displayed.

Show Per Note Events: When enabled, MIDI notes in the MIDI Editor note grid display any per-note CC data that they contain. See "Editing per-note CC data in the Continuous Data grid" on page 328.

Double-Click

The *Double-Click* section gives you one of three choices for what happens when you double-click a note. More specifically, these options are related to per-note CC data (see "Per-note continuous controller data" on page 327). The first option always selects all notes when you double-click a note. The second option opens the per-note CC data lane(s) when double-clicking a note that has them. The third option also opens the per-note CC data lanes for notes that have them, but selects all notes instead when double-clicking notes that don't have them.

SOUNDBITE LIST

For details about the Soundbite list column setup preferences, see "Showing/hiding columns in the soundbite list" on page 218.

TOOLS

Tool Palette Options

The Tool Palette Options allow you to show and hide tools in the tool palette. Check the box next to the tools you would like to see in the Tool palette.

UNDO PRUNING

The undo history has the potential to take up large amounts of memory and disk space, depending on the type of work you are doing. In addition, you may find that you rarely go back in time more than, say, about an hour as you work. For circumstances like these, Performer can discard — or "prune" — branches according to rules that you specify and that accommodate your work style and needs, as shown below in the Undo Pruning preferences:

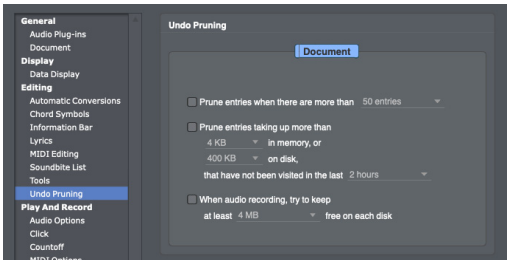


Figure 28-4: Pruning preferences.

The *Prune entries when there are more than _ entries* option lets you limit the number of undo history entries to any number that you specify from the menu provided. When an undo entry moves back in the history further than this limit, it is permanently discarded.

The *Prune Entries taking up more than* option applies to all actions, both on the main trunk and in all branches. This option can be useful during recording sessions, in which you are likely to generate and discard large amounts of audio data. But if you are the type of person who often searches back for takes you recorded way back at the beginning of your sessions, use this option with caution!

The last option, *When Audio recording try to keep…*, forces the undo history to flush items when disk space gets low. It starts with actions farthest back in the history and works its way forward as needed. What you choose here depends largely on how much disk space your system provides, and the manner in which you record.

AUDIO OPTIONS

Audition volume determines how loud various audio operations will be, such as previewing items in the Content Browser and Soundbite List or scrubbing audio.

CLICK

For details about the click preferences, see "Click Preferences" on page 115.

COUNTOFF

For details about the countoff options, see "Countoff preferences" on page 114.

MIDI OPTIONS

For details about the MIDI Patch Thru preferences, see "MIDI input monitoring" on page 277.

PITCH AND STRETCH

The *Pitch and Time Stretch Options* (Figure 28-5) provide several settings that affect the CPU load and processing time of audio time-stretching and pitch-shifting throughout Performer Lite.

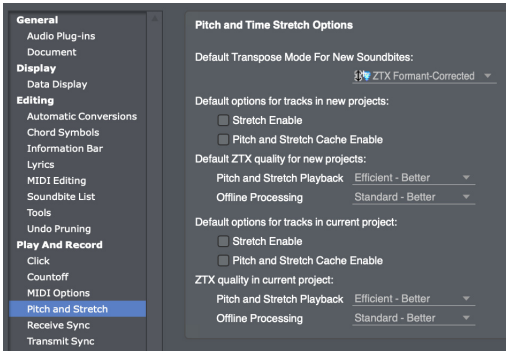


Figure 28-5: Pitch and Stretch preferences.

The *Stretch* and *Pitch and Stretch Cache* options let you choose whether these features are enabled for tracks that you add in new projects and the current project. For information about these features, see "Stretch" on page 69 and "Pitch and Stretch Cache" on page 70.

The ZTX-related settings also have an effect on the nature and quality of pitch-shifting processing, from pencil tool edits in the Sequence Editor pitch layer to wholesale transposition using the Transpose command. For details on these settings, see "ZTX Preferences" on page 545.

RECEIVE SYNC

For details about the Receive Sync settings, see "Using Receive Sync" on page 583.

TRANSMIT SYNC

For details about the Transmit Sync settings, see chapter 68, "Transmit Sync" (page 594).

TRANSPORT

The *Transport* preference controls the behavior of the Fast Forward/Rewind buttons.

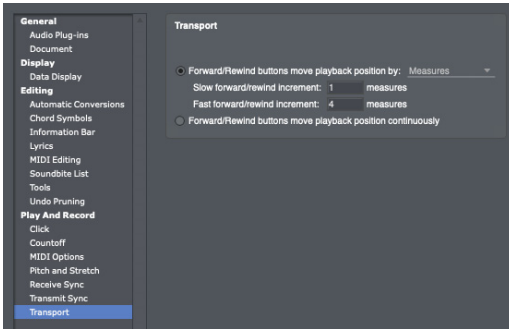


Figure 28-6: Transport preferences.

Fast Forward/Rewind buttons

Forward/Rewind buttons move playback position by

Choose this option to move the playback position by a fixed increment in one of the following formats, chosen from the menu: measures, beats, ticks, frames or seconds. You can then specify different increments for slow versus fast cueing.

Forward/Rewind buttons move playback position continuously

Choose this option to move the playback position smoothly, like an old tape recorder.

SCALING ALL WINDOWS UP OR DOWN

Performer Lite gives you the ability to scale the appearance of all windows and text larger or smaller. To do so, choose *View menu* > *Scale* > *Scale All Windows Up/Down*.

HELP MENU

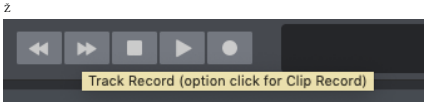
Tutorials

Choose Tutorials from the Help menu to open the Tutorials sidebar, which is a great way to learn Performer Lite quickly. See chapter 8, "Tutorials" (page 52).

Help Tags

There is a *Show Help Tags* checkable item under the Help menu.

When checked, you can hover over most items for a second or two and a "tooltip" description of the item will appear.



Checking for updates

Performer Lite can automatically check for new versions. When a new version is available, a dialog will prompt you with options to download or skip the update.

This automatic check can be disabled by deselecting *Help menu* > *Check for Updates Automatically*. To check for updates manually, choose *Help menu* > *Check for Updates Now*.

Additional Help menu resources

The help menu also provides additional resources, including a direct links to PDF files for the Performer Lite User Guide, Getting Started Guide, Plug-in Guide, and additional PDF documentation files. There are also menu items that provide direct web links for on-line product registration, technical support, and downloads.

CHAPTER 29 Commands

OVERVIEW

The Commands window lets you assign keyboard shortcuts and/or MIDI events to Performer Lite functions. This allows you to use the wide variety of MIDI controllers as well as your computer's keyboard to quickly execute Performer Lite operations. For example, a MIDI note value of C0 could operate the Stop button in the Transport; controller 64 On could operate the Skip Forward button.

Overview **257**
Opening the commands window **257**
Navigating the commands window **257**
Command groups **258**
MIDI Masters **258**
Assignments **258**
Numeric Base note **259**
Sequence remote assignment **259**
Run command **259**
Export Key Bindings **260**
Import Key Bindings **260**

OPENING THE COMMANDS WINDOW

The Commands window is opened by choosing it from the Setup menu. The window contains a list of all assignable commands in Performer Lite. It is arranged in columns that display two keyboard assignments, a MIDI event assignment and master group designation.

NAVIGATING THE COMMANDS WINDOW

There are several ways to search and browse in the Commands window.

Searching for commands

Type in a text string at the top of the window. As you type a search term, the window will update in real-time to display the relevant results.

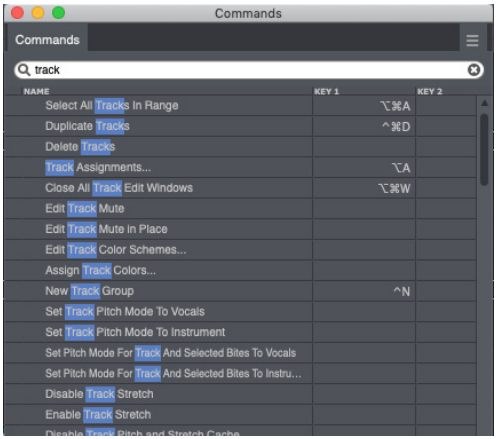


Figure 29-1: To search for a command, type in a text string and click Search.

To clear the search results and return to the regular view, click the "x" button at the right side of the search field, or press the Escape key.

Browsing with the list navigation commands

You can use the List Navigation Commands to navigate the Commands window, select any command and give it a key binding.

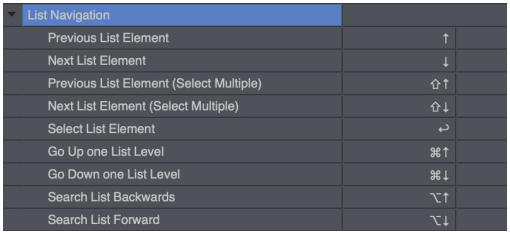
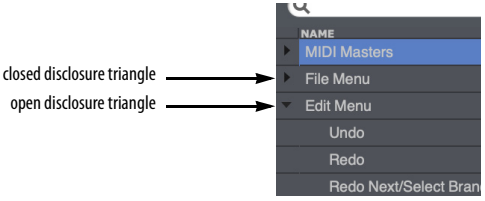


Figure 29-2: Use the List Navigation

COMMAND GROUPS

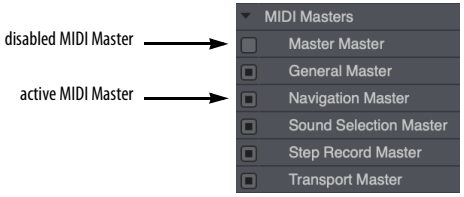
Commands are visually organized into logical groups. For example, all menu items found under the File menu are grouped together. Each group can be displayed or hidden by clicking the disclosure triangle to the left of the group name. Option/Alt-clicking a disclosure triangle will show or hide all groups.



MIDI MASTERS

The first group of commands are MIDI Master controls. MIDI Master controls enable or disable MIDI control of commands by group. Keyboard shortcut operation is unaffected. Like other commands, Masters can be assigned keyboard shortcuts or MIDI events.

Master controls have an additional check box next to their name that indicates their current status and allows you to manually enable or disable with the mouse.



The 'Master' column in the Commands window indicates which master individual commands are controlled by.

The *Master Master* is a special master control that enables or disables all master controls, effectively enabling or disabling MIDI control of all commands.

The *General Master* governs all commands that are not covered by the other master commands (Navigation, Sound Selection, etc.)

You can see which master a command is assigned to by widening the Commands window to view the master assignment column, as shown below:

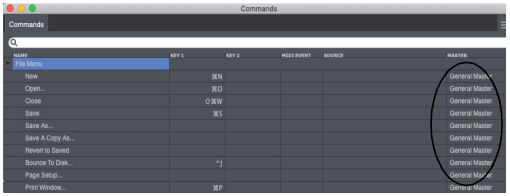


Figure 29-3: Viewing the master assignment for each command.

ASSIGNMENTS

To assign a key binding to a given Command, simply click in the 'Key' column of a command and a field will appear indicating it is ready to receive a key stroke from the keyboard. The key or combination of key and modifiers you press at this time will be entered into the field.

There are two key bindings available for any given command. For example, the *Slave to External Sync* command could be mapped to both Command/Ctrl-7 and Option/Alt-s.

You can use any key you want, except for the delete key, which removes the current key binding, if any.

For your convenience, keyboard shortcut key assignments are displayed in Performer Lite's menus.

MIDI Assignments

Any MIDI event can be mapped to a command. You can further define the MIDI event by specifying a source. Click in the source column to reveal available devices as defined in your MIDI Device configuration (Setup menu > Bundles > MIDI Devices tab). If you have multiple

controllers in your setup, you may want to dedicate a controller exclusively to executing Performer Lite commands.

NUMERIC BASE NOTE

The *Numeric Base Note* is an arbitrary MIDI note of your choice. It is used to specify numbers from your MIDI controller when using other remotes that require you to specify something by number. To designate the base note, choose *Set Numeric Base Note* from the mini-menu in the Commands window.

Figure 29-4: The Numeric Base control.

To specify a number, you count notes, going up from the *numeric base* note, until you reach the number you want, and then you play that note. For example, if your *numeric base* note is C3, you would play C3 to specify the number 1, C#3 to specify the number 2, D3 to specify the number 3, etc.

SEQUENCE REMOTE ASSIGNMENT

When you create new sequences, Performer Lite automatically gives them control assignments if *Add sequence selection commands automatically* is checked in the Commands window mini-menu. The first sequence in a file is assigned to the 'a' key on your computer keyboard. The second is assigned to the letter 'b', then 'c', and so on. Performer Lite automatically avoids all conflicts with other existing Commands, skipping letters as needed so the sequence won't have the same letter as another command. For example, the letters d, f, l, n and p are always skipped because they are used in the Notation Editor for other purposes.

RUN COMMAND

Type shift-spacebar (or choose *Setup menu* > *Run Command…*) to open the *Run Command* window (Figure 29-5), which provides a command-line style interface for quick access to commands. Essentially, it's like Spotlight (in macOS) or Windows Search (in the Start menu) for commands.

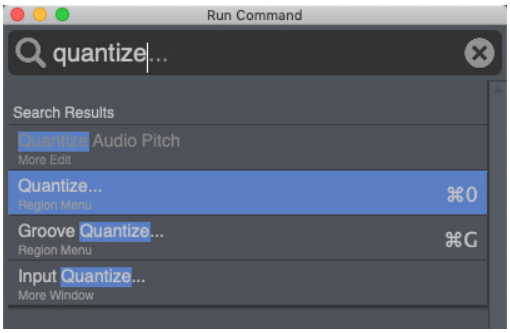


Figure 29-5: The Run Command window.

As soon as you begin typing in the Run Command window, the list immediately populates with any commands that match the text string you've typed so far. Keep typing to narrow your search. Each hit shows the command name, its group, if any, and its current key binding, if there is one.

If a hit is grayed out, it means that it cannot currently be executed, due to the current operational context (there is no current selection, for example).

Search results in the list are divided into three sections:

Section	What is displayed
Top Hits	Displays up to three of the most recently used commands that match the entered query.
Search results	Shows all commands whose titles contains text that matches to the entered query.
Relevant command groups	Shows all command from a command group whose name matches the query.

If you've saved specific Region menu command presets, you can use the command group section of the results list to recall them quickly.

EXPORT KEY BINDINGS

Commands are stored in the "Command Bindings" file inside the Performer Lite Preferences folder. Key bindings can also be exported to a file which can be imported at a later date.

This allows you to:

- Create libraries of key binding sets with different personalities.
- Back up your key bindings.
- Export your key bindings for use on another Performer Lite system.
- Save your key bindings before importing another set.

To export a set of key bindings, select *Export Key Bindings* from the Commands window mini-menu.

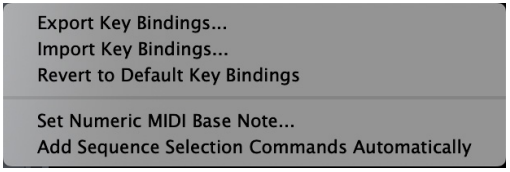


Figure 29-6: The Commands window mini-menu.

This will bring up the standard save dialog box where you can name your key bindings file and choose a location where it will be saved.

IMPORT KEY BINDINGS

Key bindings can be imported from previously exported files. Performer Lite comes with a set of key binding files that match the operation of other sequencing and digital audio packages. If you are upgrading to Performer Lite from another software package, you may find it helpful to import the key bindings from your old software to ease the transition. Be sure to check the MOTU web site (www.motu.com) for updated and additional key binding sets.

To import a set of key bindings, select *Import Key Bindings* from the Commands window mini-menu (Figure 29-6).

This will bring up the standard open dialog box where you can choose a key bindings file to import.

When importing commands, Performer Lite gives you the option of merging the new shortcuts (ones that differ from your current shortcuts) with your current set, and you can save or print a list of bindings that don't match.

CHAPTER 30 Bundles

OVERVIEW

The Bundles window (Studio menu) serves as the crucial link between the virtual mixing world in Performer Lite and the audio and MIDI hardware that is physically connected to your computer. The Bundles window provides a convenient layer between them that lets you effectively manage audio and MIDI inputs and outputs.

Overview **261**
Audio bundles **261**
Bundle types **262**
Adding and deleting bundles **262**
Renaming bundles **262**
Working with tiles on the grid **262**
Exporting and importing bundles **263**
Bundle channel formats **263**
Reassigning bundles **264**
The instruments tab **264**
The MIDI Devices tab **264**

AUDIO BUNDLES

Audio inputs, outputs and busses are all accessed via audio bundles. An *audio bundle* groups together a set of ins, outs or busses, then lets you refer to that group as a single entity. Audio bundles provide a layer of indirection between the audio assignment menus and the inputs, outputs and busses they contain. This is similar to how style sheets work in word processing programs. Instead of defining "Times, 12pt" for sections of text, you define a style called 'Body Text" whose properties are "Times, 12pt" This way, you can re-format your entire document by simply redefining what "Body Text" means.

In Performer Lite, you could have a large project consisting of many sequences with complex output and bussing assignments. Should you decide to switch a bus from an outboard reverb to

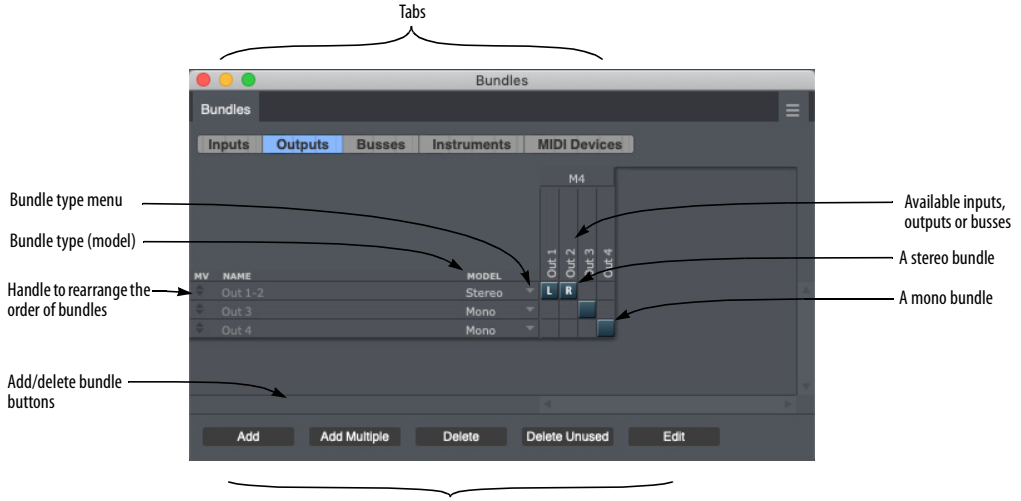


Figure 30-1: The Bundles window (Studio menu).

an internal plug-in, the Bundles window allows you to rewire your entire project in a single operation.

You can even change the behavior of existing bundles. If you decide you want to make a mono mix of your stereo project, simply change your primary output assignment from a stereo bundle to a mono bundle.

Bundles allow you to clean up your assignment menus, choosing only to display bundles that you'll actually use. For example, you might not need to look at 32 outputs from any single virtual instrument.

After a bundle is defined, it is available on the input and output assignment menus throughout Performer Lite.

BUNDLE TYPES

The Bundles window has tabs that display inputs, outputs, busses, instrument outputs, and MIDI devices. Click on a tab to view the type of bundle you wish to edit. Before adding or removing bundles, be sure you are looking at the correct tab.

ADDING AND DELETING BUNDLES

At the bottom of the bundles window, you will find five buttons (Figure 30-1). Click the Add button to add a single bundle, or if you need to create a number of bundles, click the Add multiple button. Bundles can be deleted by selecting a bundle and clicking the delete button. Use the *Del. Unused* button to get rid of all bundles shown in the list that are not currently being used in the project. The Edit button is used to modify MIDI devices, as described in "MIDI device properties" on page 265.

Creating an audio bundle from assignment menus

Anywhere in Performer Lite where you can choose an input or output assignment, such as in the Sequence Editor, you can also create a new bundle.

After a bundle is defined, it will remain available until the bundle is deleted.

RENAMING BUNDLES

By renaming a bundle, you can create your own names for audio inputs, outputs and busses. For example, instead of generic terms like "Analog 1", you could name an audio input in your system "My U87 Mic". The customized bundle name will appear in all menus that display audio inputs, outputs and/or virtual busses.

To name a bundle, double click or option click on a bundle name. When you're done, hit the return key. The enter key moves the edit field to the next bundle name.

WORKING WITH TILES ON THE GRID

The Bundles window consists of a grid where you can place and move *tiles* that connect audio bundles (rows) to their sources or destinations (columns). You make a connection by placing a tile in the grid square that intersects the bundle (row) with its source or destination (column).

Most sources or destinations are the physical inputs and outputs on an audio or MIDI interface, but they can also be busses inside of Performer Lite or connections to virtual instruments.

The sources and destinations available are displayed in the upper right corner of the Bundles window (Figure 30-1 on page 261). The are identified by device and then individual input or output. You may have to scroll left to right to see all available inputs and outputs for each device, especially if you are using multiple devices.

For examples, see “Reassigning bundles” on page 264.

EXPORTING AND IMPORTING BUNDLES

There are two options in the Bundles window mini-menu that allow you to exchange bundles between Performer Lite projects.

Import Bundles: Imports saved bundles into the current Performer Lite project.

Clear and Import Bundles: Clears the existing bundles and imports saved bundles into the current Performer Lite project.

Export Bundles: Exports all audio bundles for use in any other Performer Lite project.

BUNDLE CHANNEL FORMATS

After you’ve created a bundle, choose a channel format for it (mono or stereo) from the menu to its right, as shown below.

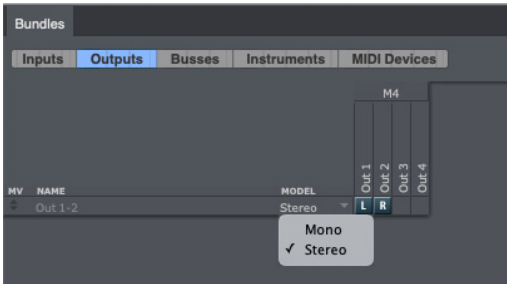


Figure 30-2: Choosing a channel format for a bundle. This determines what type of bundle it is (mono or stereo) and the number of tiles available for output and bus assignments to the right.

Audio bundle properties are bound to a hardware driver

When you create bundles, the following properties are bound to the audio hardware driver currently active in the *Configure Hardware Driver* dialog (under Setup menu> Configure Audio System):

- the bundle model (mono, stereo, 5.1, etc.)
- the bundle’s physical output assignments (the arrangement of the channel tiles in the grid)

If you switch to a different hardware driver, the bundles you’ve created remain, but you can completely reconfigure the properties listed above without disturbing these same properties for the original hardware driver. For example, if you are working with a MOTU 2408mk3 (or other PCI-424 based audio interface), and you then switch to built-in audio, you can change the physical output assignments (move the tiles) for a bundle for built-in audio without disturbing your 2408mk3 output assignments.

This same principle applies when switching between different MOTU drivers (such as from a USB to Thunderbolt driver).

Bundles and panners

The output bundle assigned to a track determines the type of panner it has. There are two types of panners: stereo and mono (direct). Stereo panners look and operate exactly like stereo pan knobs on a normal mixing console. Mono bundles remove the panner altogether, offering a direct path from the channel to the bus or output.

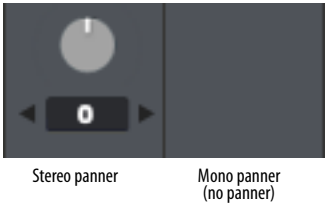


Figure 30-3: The output bundle assigned to a track determines what type of panner it has in the Mixing Board.

A mixing board can contain both mono and stereo bundles.

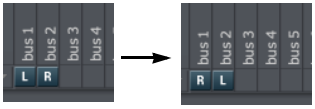
REASSIGNING BUNDLES

After a bundle is defined, you can move the assignment to another location. This is a powerful feature of bundles.

To reassign the reverb send of a an entire project to a new set of busses, simply grab the bundle tiles and move to the new assignment.

Figure 30-4: Moving a bundle to a different set of outputs.

To swap the left right output of a stereo bundle, drag the tiles to swap their positions.



Stereo bundles can be split over non-adjacent destination pairs.

You can double-click a box to move the tiles in that row directly to the box (without having to drag them).

THE INSTRUMENTS TAB

Some plug-ins provide multiple audio outputs. You can use the *Instruments* tab to route them anywhere in the Performer Lite mixing environment.

THE MIDI DEVICES TAB

Once you've connected your MIDI hardware devices, you are ready to configure them in Performer Lite for use in all of your Performer Lite projects. To do so:

1 Launch Performer Lite.

2 Create a new project from the File menu.

3 Choose *Studio menu* > *Bundles* to open the Bundles window.

4 Click the MIDI Devices tab (Figure 30-5).

The MIDI devices tab lets you create and configure MIDI devices connected to your MIDI hardware. The settings you make here will be available to all Performer Lite projects. If you transfer the project to another computer system, the devices you used will be preserved so that you can easily remap them as needed.

Making MIDI connections in the I/O grid

Any connected MIDI interfaces appear across the top of the I/O grid, with their MIDI ports shown in columns beneath the interface. Use the Add buttons to create MIDI devices, which appear in the left-hand column and represent the hardware connected to the interface. Drag the MIDI in (I) and MIDI out (O) tile for each MIDI device to the appropriate MIDI interface port column (the column that represents the physical port it is connected to on the MIDI interface). For example,

in Figure 30-5 the Roland JV-1080 is connected to MIDI IN port 1 and MIDI OUT port 1 on the micro express USB interface.

Devices connected directly with USB, etc.

If you have a controller keyboard or other MIDI device that connects directly to the computer with USB, Thunderbolt, or other standard computer peripheral connection, it will appear above the I/O grid in the same fashion as the MIDI interface shown in Figure 30-5 (as long as its drivers have been installed successfully). In this case, no additional I/O configuration is required and the device will be available as a MIDI input and/or output, as determined by its driver.

Renaming an interface or USB device

To rename an interface or USB device above the grid, double-click its name.

Deleting offline interfaces

If your USB MIDI interface or keyboard goes offline (it gets turned off or disconnected), its name appears in italics. If you wish to remove it from the Bundles window grid, click its name and click the Delete button.

MIDI device properties

Click a MIDI device in the left-hand column to select it and then click the *Edit* button to specify the manufacturer and model for the device and to make additional device property settings (Figure 30-6).

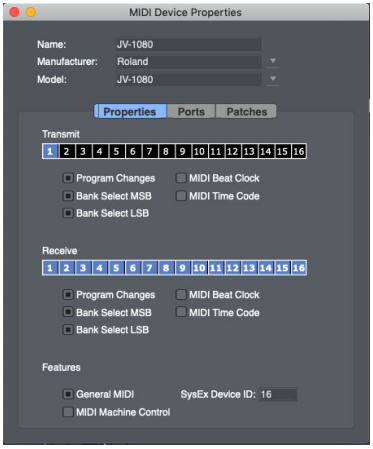


Figure 30-6: MIDI device properties.

Device

Choose the manufacturer of the device from the *Manufacturer* pop-up menu, then choose the model of the device from the *Model* pop-up menu. The *Name* field will be automatically filled in.

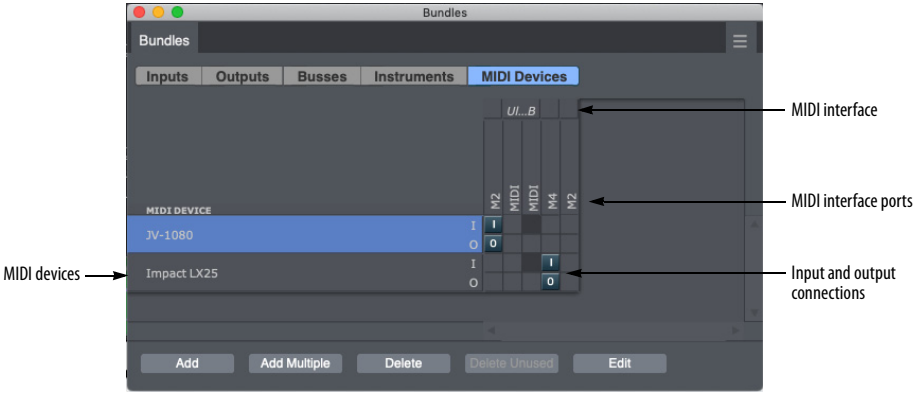
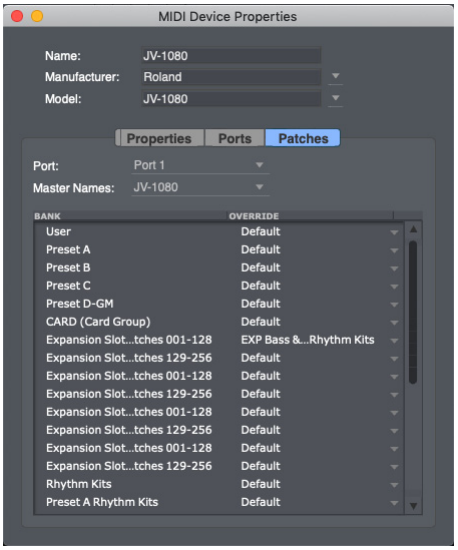


Figure 30-5: MIDI Devices tab in the Bundles window.

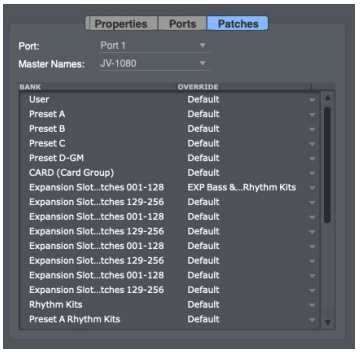
If you don't see the manufacturer or model of the device in the list, or you would like to rename it for whatever reason, you can fill in the *Name* field manually.

Properties and ports
Specify the properties that describe the device. For example, you can describe what MIDI channels it uses for transmitting and receiving MIDI data. Enable any MIDI data types that are supported. If the device has multiple sets of MIDI ports, configure them in the Ports tab.

Patches
If you have a device which supports expansion boards, such as the Roland JV-1080, use this section to configure which expansion cards are loaded in the device. This will ensure that your patch lists are displayed accurately.



Let's say you have a JV-1080 and would like to specify that you have the "Bass & Drums" expansion card installed. To configure Expansion Slot A Rhythm Kits, for example, locate Expansion Slot A Rhythm Kits in the Bank column on the left, then choose "EXP Bass & Drums Rhythm Kits" in the Override column.



Part 6
Playing and Recording

CHAPTER 31 Playback

OVERVIEW

Except where noted, this chapter applies to both MIDI and audio track playback.

Overview 268
MIDI Playback basics 268
Audio playback basics 268
How to play a sequence 268
Monitoring levels 269
Editing during playback 269
Screen re-display 269
Muting and unmuting tracks during playback 269
Soloing Tracks 269
Looping playback 270
Playing the current selection 270
Event Chasing 270
The playback wiper 272
Scrubbing multiple MIDI tracks 273
Scrubbing and grid snapping 273
Stop Sounding MIDI Devices (Panic) 273

MIDI PLAYBACK BASICS

When Performer Lite "plays" MIDI tracks, it is not playing audio of any kind. Instead, it is sending out performance information in the form of stored MIDI data to MIDI-equipped instruments. These instruments use the data as instructions for when to turn notes on and off, how loud to play them, and so on. Conceptually, Performer Lite is similar to a player piano which uses a set of recorded data (the piano roll) to control its "instrument" (the piano mechanism). The synthesizer, sound module, or virtual instrument produces the actual sound, and Performer Lite tells it when and how to do so.

AUDIO PLAYBACK BASICS

When Performer Lite plays audio tracks, it reads audio data from the hard disk and sends the digitally encoded audio signal to your audio hardware (the built-in speaker output of your computer or your MOTU audio interface, for example). The digital-to-analog (D-to-A) converters in the audio hardware then convert the digital audio signal into an analog one that plays from the speakers you have attached to the audio hardware. Because the audio data is stored on the hard disk, Performer Lite has random access to the audio and can cue virtually instantaneously to any location in the stream of audio. For more information about these basic hard disk recording concepts, see chapter 69, "Hard Disk Recording Concepts" (page 598).

HOW TO PLAY A SEQUENCE

To play a Performer Lite sequence:

1 Open a Performer Lite project.

2 If the project contains more than one sequence, open the Set List (Figure 7-2 on page 43) and play-enable the sequence that you wish to play back.

Only one sequence can play at a time.

3 Play-enable the tracks you wish to play back.

If the track is not play enabled, you will hear nothing from the track.

4 For each MIDI track, choose a MIDI output destination and patch (sound) as explained in "Choosing a MIDI output destination" on page 75 and "Choosing a default patch (sound)" on page 76.

5 For each audio track, choose an audio output destination as explained in "Choosing an audio input and output" on page 69.

6 Set the location from which you want playback to begin.

There are many ways to cue Performer Lite. Here are just a few: to simply rewind to the beginning of the sequence, click the Rewind button. To choose a general location, click the "wiper" cursor at the desired playback location in any time ruler in any window.

7 Press the Play button or press the spacebar.

The sequence will begin to play. The Counter advances.

8 When finished playing back, press the Stop button, or press the spacebar again.

MONITORING LEVELS

Long throw metering is available in the Mixing Board ("Level meters" on page 188).

EDITING DURING PLAYBACK

Many of Performer Lite's features, such as windows, dialog boxes, edit region selection, edit commands, and other features can be used during playback. For example, you can open another window or use the Transpose command while the music is playing back; you do not have to press the Stop button beforehand. As you listen to your music and find that you would like to make a change, don't reach for the Stop button. Just execute the command while the music is playing.

Here are some examples of things you can do during playback:

- Select a region for editing
- Edit a region with the Edit or Region menu commands
- Cut, copy, drag, Option/Alt-drag (copy), etc. notes and data in Sequence Editor and Notation Editor
- Choose a different output destination for a track
- Add, delete, rename, or reposition a track
- Access a mini-menu command

Some features, because of their nature, cannot be accessed during playback. These features are either greyed out (inaccessible) during playback or will have no effect unless you press the Stop button before using them.

SCREEN RE-DISPLAY

During playback, Performer Lite does its best to update items on the computer screen, such as the Counter and scrolling windows. However, audio recording and playback can often place a high demand on the computing power of the machine, and Performer Lite makes playback a much higher priority than refreshing the screen display. Therefore, you may find at times that Performer Lite must devote all of the computer's resources towards this end and thus may not be able to keep the screen display completely smooth and current. In addition, editing commands may sometimes take longer due to the amount of processor time required to deal playback. Rest assured, however, that your data is playing back accurately.

MUTING AND UNMUTING TRACKS DURING PLAYBACK

Both MIDI and audio tracks can be muted and unmuted during playback by using solo mode or by clicking their play-enable button in the Sequence Editor, or their mute button in the Mixing Board. You can also record the action of muting and unmuting tracks. For details, see chapter 55, "Mix Automation" (page 490).

When muting a track, the response is instantaneous.

SOLOING TRACKS

Soloing tracks allows you to isolate tracks for playback. This is a quick way to temporarily mute or unmute many tracks at once without having to

click on the Play-Enable buttons of each. Think of soloing as a second, independent play-enable state for all tracks. Any combination of tracks can be play-enabled when solo is turned on — even tracks that have been muted when solo is off.

The color of the play-enable button tells you its play status:

- Blue — means the track will play in the current mode (solo or not soloed)
- Gray — means the track is muted and will not play
- Orange — means that the track is muted when soloing is on but play-enabled (blue) when soloing is turned off

Click a play-enable button to change its status at any time, regardless of whether solo is turned on or off.

Solo is turned on and off by pressing the Solo Mode button (labelled "S') in the Control Panel. Solo status can be changed during playback. You may mute and unmute tracks at any time during playback.

Both the soloed play state and the un-soloed play state are remembered until you change them, and both are also saved with the project.

When tracks are muted during soloing, Performer Lite continues to process the MIDI and audio data contained in them. This allows tracks to be soloed and un-soloed during playback without pauses or glitching.

LOOPING PLAYBACK

Playback of the entire sequence can be looped seamlessly between any two points. For information see "Memory Cycle" on page 117.

PLAYING THE CURRENT SELECTION

To audition the current selection, choose *Audition Selection* from the Region menu (or press Option/Alt-spacebar).

EVENT CHASING

Event chasing addresses a common difficulty in MIDI sequencing: Since MIDI data is transmitted serially (one event at a time), events that occur early in the sequence will not change the sound of a virtual instrument plug-in or MIDI sound module when playback is started from a point later in the sequence. For instance, if a program change event (patch change) occurs in the sequence at measure five and you begin playback at measure twenty, then the program change event will not be played and the synthesizer may produce the wrong sound (such as a trumpet sound instead of a bass sound).

Event chasing prevents such discrepancies: Whenever playback is stopped, Performer Lite searches backward through each MIDI track for the previous occurrence of each type of MIDI event. When playback starts again, it transmits those events, which updates the destination instrument plug-in or MIDI sound module to the expected settings. In the previous example, this would ensure that the synthesizer changes to the bass sound (according to the previous patch change event) when playback begins from measure twenty. Event chasing is also very useful for making sure that plug-ins and sound modules are updated to the correct settings for volume, pan, and other control change data (controller data).

Enabling event chasing

To enable event chasing, choose *Event Chasing* in the Setup menu. Event chasing can be enabled or disabled for different types of MIDI events independently of each other.

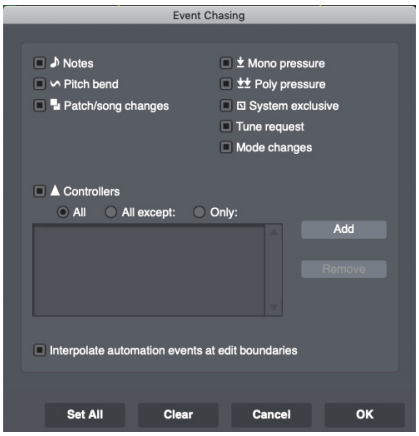


Figure 31-1: Event Chasing ensures that you get what you expect to hear from your MIDI tracks, no matter where you start playback in your sequence or song.

Enable the types of MIDI events that you want Performer Lite to chase. Click Set All to enable event chasing for all types. In some cases, you may not want certain types of MIDI events to be chased.

Event chasing in audio tracks

Audio, instrument and auxiliary tracks always chases mix automation events in those types of tracks. The same is true for the Master Fader track.

Inserting initial events in MIDI tracks

Inserting initial MIDI events such as patch change and controller values at the beginning of each track in the sequence is a useful practice in MIDI sequencing. This ensures that you hear what you expect from your instrument plug-ins and MIDI sound modules regardless of the state in which they were left when you finished working on a different sequence or playing a different part of the current sequence. It is especially useful because it ensures that there are events for Performer Lite to chase when playback is started before any notes are transmitted from a given track.

For example, you might use the same hardware synth for a drum kit patch in two different sequences. In one sequence, the drum kit part plays quietly because its controller 11 (expression) value is 20. In the second sequence, the drum kit plays louder because its controller 11 value is 100. When you stop the first sequence and begin playing back the second sequence, the sampler's volume will still be low before the higher controller 11 value is received. Placing an initial controller 11 event with value 100 at the beginning of the drum kit track in the second sequence guarantees that the sampler will play at the intended volume.

The *Automation Snapshot* button is a convenient way to insert controller events for controller 7 (volume) and controller 10 (pan). For details, see "Snapshot automation" on page 503.

Omitting initial controllers in MIDI tracks

If you don't insert initial controller events at the beginning of a track, Performer Lite transmits a default value when playback begins before the first event of a given type in a track (except for a few commonly used controllers discussed below). This only occurs for MIDI event types that are present somewhere in the track.

For example, the first pitch bend event in a track is in measure five and its value is -100. When event chasing is enabled for pitch bend and playback is started from measure one, Performer Lite will transmit a pitch bend event with value 0. When the wiper reaches measure five, a pitch bend event with value -100 will be transmitted as usual.

Forward chasing

The following commonly used controller types actually chase *forward* if there is no initial even in the track: CCs 1, 7, 10, and 11. For example, if you have CC7 in the track and the playback wiper is before the first CC7 event in the track, Performer Lite chases forward to the first event in the track to establish the current value, rather than using a default value of 127. This is similar to how Performer Lite's audio automation works.

Event chasing and audio track editing

When the *Interpolate chased automation events when editing* option is enabled (Figure 31-1 on page 271), copying audio track data selections will generate and place ramp-style automation events at the selection boundaries and include them when pasting the clipboard data. When cutting or erasing, interpolated automation events are left behind at the region boundaries.

By interpolating automation events at edit boundaries in this fashion, surrounding automation curves are preserved.

In addition, DP interpolates automation events at the paste destination boundaries to preserve automation values within the originally selected data region.

THE PLAYBACK WIPER

The playback "wiper" is a vertical line that scrolls across the Sequence Editor during playback, as shown in Figure 31-2. It indicates the current playback location (in the counter).

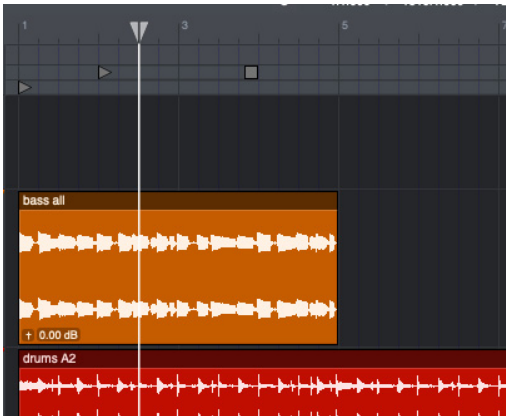


Figure 31-2: If you check the Wiper option for a window, a "wiper" appears to show the currently playback location of the sequence. This wiper can be dragged to change the playback location. You can also double-click inside the time ruler at any location to make the cursor jump to that location.

Cueing with the wiper

There are several ways to cue the current playback location with the wiper, either when Performer Lite is stopped or playing:

- Double-click any time ruler at the desired location
- Click once in the upper half of the time ruler with the "wiper" cursor
- Drag the wiper tab in the time ruler

Zooming with the wiper

You can zoom in and out by Control/Win-dragging vertically on the playback wiper handle. Control/Win-drag down to zoom in; drag up to zoom out. Release the Control/Win key to temporarily suspend wiper zooming. This allows you to continue zooming, even after you've reached the top or bottom of the computer screen. For example, if you pull down to zoom in, and you

want to zoom in further but you're getting close to the bottom of the screen, release control, move back up to the top of the wiper (doing so maintains the current zoom level), press control/Win, and then pull down to continue zooming in further.

To move horizontally while zooming, simply release the Control/Win key temporarily while continuing your drag gesture. For example, you can drag left or right and then press Control/Win again to further zero in on a particular location.

Wiper zooming is an extremely useful zooming shortcut. It works particularly well when used hand in hand with the *Zoom Back* command (command-[ ).

SCRUBBING MULTIPLE MIDI TRACKS

Scrubbing refers to the act of controlling playback manually, forwards or backwards, by dragging the Performer Lite's current playback location left or right. Scrubbing allows you to play MIDI tracks forwards or backwards in non-real time, where you control the tempo by how quickly you drag. Scrubbing is great for zeroing in on wrong notes or other artifacts that you hear during playback.

You can scrub playback by using any of the following techniques:

- Drag the playback wiper
- Drag the Notation Editor playback wiper
- Drag Movie Window slider
- Press the fast forward/rewind buttons or slow forward/rewind buttons in the Control Panel

Scrubbing respects the solo states of tracks, and in general, plays the same tracks that you would hear if you pressed the play button.

Scrubbing always chases:

- patch changes
- notes
- pitch bend
- volume controllers
- sustain pedal controllers

While scrubbing, however, only the following event types are played back:

- notes
- pitch bend
- sustain pedal

SCRUBBING AND GRID SNAPPING

If *Snap to Grid* is enabled, the wiper snaps to the grid while scrubbing. To scrub smoothly, disable the grid. See "Snap Information" on page 357.

STOP SOUNDING MIDI DEVICES (PANIC)

The *Stop Sounding MIDI Notes* command (Studio menu) is a MIDI "panic" command – it will send an "all notes off" message to all MIDI devices. This is helpful if there is a stuck note or a MIDI feedback loop.

CHAPTER 32 Recording

OVERVIEW

Except where noted, this chapter applies to both MIDI and audio track recording.

Performer Lite records very much like a multi-track tape deck: you connect inputs, specify tracks to record into and push the record button. Performer Lite, however, has a great deal more flexibility than a tape deck. There are many features you can use while recording that affect which types of data are recorded, control the time span in which recording takes place, manage multiple takes on the fly, automate loop-recording, and much more.

Overview 274
Choosing a sequence to record into 275
Setting tempo and meter 275
Recording to a click 275
Recording with a Countoff 275
Input Filter 275
Non-destructive output quantize 276
Preparing a MIDI track for recording 276
Preparing an audio track for recording 277
MIDI input monitoring 277
Audio input monitoring 280
Using the countoff 282
Start recording 282
Stop recording 283
How audio is recorded on disk 283
Undo record 283
Recording stereo audio 283
Recording several audio tracks in one pass 284
Recording audio and MIDI at the same time 284
Manual punch-in/punch-out on the fly 284
Automatic punch-in/punch-out 284
Recording multiple takes 286
Cycle-recording 286
Recording in External Sync 288
Sample Format 289
Getting an error message 289

CHOOSING A SEQUENCE TO RECORD INTO

If you have more than one sequence in the project, be sure to play-enable the one that you wish to record into. If you need to switch sequences, play-enable it in the Set List window.

SETTING TEMPO AND METER

If the material you are recording is musical in nature, then it is best to match it with the tempo and meter changes in the sequence, if any. Then it will be much easier to edit and mix the material musically with reference to measures and beats.

There are two ways to align live-recorded audio and MIDI data with the beats and barlines in Performer Lite:

- Record to existing material, such as a drum loop)

or

- Record to a click

Recording to existing material is self-explanatory. Recording to a click is covered in the next section.

Setting the tempo

To set a constant tempo, choose *Fixed Tempo* from the Tempo Control menu in the Control Panel and enter the desired tempo. If your music involves a tempo map (a series of tempo changes, including, perhaps, ones that change smoothly over time), you may prefer to set these up before actually recording any MIDI data. See chapter 47, "Conductor Track" (page 446) and chapter 49, "Change Tempo" (page 463) for details.

Programming a meter map

A meter map is a series of meter changes. To set up a meter map before recording, see chapter 50, "Change Meter" (page 471).

Recording at a slower tempo

If the MIDI or audio material you are recording is particularly challenging for you to play, try setting the tempo to a slower tempo, perhaps 10 to 20 bpm slower than normal, and record at the slower tempo. Afterwards, you can return the tempo to the correct tempo. MIDI data will be scaled to the correct tempo automatically. Audio data can be scaled to match the correct tempo in one easy step. For details, see "Stretch" on page 69.

RECORDING TO A CLICK

Performer Lite lets you record to a click. To learn more about Performer Lite's advanced click settings, see "Click" on page 115.

RECORDING WITH A COUNTOFF

Performer Lite can help you start a recording pass with a programmable countoff. For further information, see "Countoff" on page 114.

INPUT FILTER

The Input Filter (Setup menu) allows you to specify what types of MIDI data are recorded.

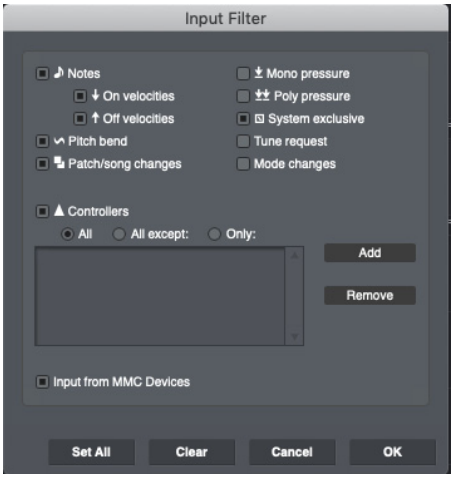


Figure 32-1: The Input Filter allows you to control what types of data Performer Lite will record.

Choose the types of data to be input by clicking on the corresponding check box(es).

☛ Please note! *The types of data you select will stay in effect until you change the filter setting*. The Input Filter setting will affect all data recorded. Be especially careful when muting types of data that you normally don't filter. If you don't remember to turn them back on afterwards, you may lose valuable data in the future during recording.

Specifying controller numbers

The buttons under the Controllers check box in the Input Filter allow you to quickly choose which controller data to record. Click in the Controllers check box, click on the type of option you wish, and then enter the controller numbers if necessary.

All: Information from all controllers will be recorded.

All except: Information from all controllers *except* the controller numbers you enter will be recorded.

Only: Only information from the controller numbers you enter will be recorded.

To add and remove controller numbers in the list for the *All except* and *Only* options, use the Add and Remove buttons to the right of the list.

NON-DESTRUCTIVE OUTPUT QUANTIZE

As an alternative to input quantizing, you can instead apply non-destructive quantizing on MIDI track playback with the Quantize MIDI plug-in. This preserves the original performance you record in the track, while at the same time playing it back quantized. The advantage to this scenario is that you can remove the quantization at any time to return to the original performance in the track, if desired.

PREPARING A MIDI TRACK FOR RECORDING

To prepare a MIDI track for recording:

1 Record-enable the MIDI track.

This can be done in several different windows in Performer Lite. In the Sequence Editor, click the Record button in the track settings panel. If the button is red, the track is record-enabled. In the Mixing Board, click the record button below the solo and mute buttons. In the Sequence Editor, click the record button next to the track name. Several MIDI tracks may be record-enabled (see "Recording several audio tracks in one pass" on page 284).

2 If you need to specify a MIDI device and channel to record from (in order to exclude data received from other input sources at the time of recording), choose the input device and channel from the track's settings panel in the Sequence Editor.

See "Choosing an input source" on page 75 for details.

3 Select the playback device for the track being recorded.

See "Choosing a MIDI output destination" on page 75 for details.

4 (Optional) Turn on MIDI Patch Thru (Studio menu) so that you'll record the track with the same sound as it will play back with.

Patch Thru echoes incoming data to the output destination device you've chosen for the track. This is essential when using a separate MIDI controller instrument: it allows you to hear what you are playing while it is being recorded. For details, see "MIDI input monitoring" on page 277.

5 (Optional) If you are using MIDI Patch Thru, choose the desired patch (sound) for the track from its *Default Patch* menu in the track settings panel. For details, see "The patch list" on page 76.

6 (Optional) Set the Input Filter, if needed.

See "Input Filter" on page 275 for details.

You are now ready to record MIDI.

PREPARING AN AUDIO TRACK FOR RECORDING

To prepare an audio track for recording:

1 Make sure that the audio hardware that you are using for recording is activated.

If you are using the MOTU Audio System, choose *Setup menu> Configure Audio System>Configure Hardware Driver* to activate the hardware driver. For details, see "Configuring the hardware driver" on page 21.

2 Choose an audio input to record from.

This is the microphone input on your computer, a physical input jack (or pair of jacks) on your recording hardware, or a virtual input from a software synthesizer or sampler. You can also choose one of Performer Lite's internal virtual busses as the input. This means that you can record output from any other track—or combination of tracks—that are assigned to the bus you choose. You can choose the track input from the Mixing Board or Sequence Editor windows (from the menu next to or below the track name).

3 Record-enable the audio track.

This can be done in several different windows in Performer Lite. In the Sequence Editor, click the Record button in the track settings panel. If the button is red, the track is record-enabled. In the Mixing Board, click the record button below the solo and mute buttons. In the Sequence Editor, click the record button next to the track name. Only one audio track can be record-enabled at a time.

☛ Record-enabling should be done before you actually begin recording; audio tracks can be record-enabled during playback or recording, but you may experience a brief pause. A better alternative is to punch in and out on the fly. See "Manual punch-in/punch-out on the fly" on page 284 and "Automatic punch-in/punch-out" on page 284 later in this chapter.

☛ If the track's record button is missing, you need to choose an input first (Step 2 above).

4 Check the audio input level.

Play the input signal at its peak levels, and watch the level meter and adjust the input so that the peaks occur as close to 0 dB as possible without triggering the Clip indicator.

Digital clipping is much harsher than analog clipping. Therefore, it's better to err on the low side.

You can monitor input levels using the meters in the Mixing Board (chapter 20, "Mixing Board" (page 174)).

MIDI INPUT MONITORING

MIDI Patch Thru (Studio menu) allows you to hear incoming MIDI data from your MIDI controller instrument played back on your output synthesizers (Figure 32-2) or virtual instruments. More technically, Patch Thru echoes MIDI data received by Performer Lite to any MIDI device in your studio that you choose. You'll want to use Patch Thru most of the time because it allows you to hear what you are playing on your MIDI sound modules while recording. Patch Thru also provides an easy way to experiment with different playback synthesizers without having to manually reconnect patch cords and change MIDI channels on the instruments.

Patch Thru works whether you are recording or not. However, MIDI data will only be patched through tracks which are record-enabled. If you don't hear anything on your synthesizer modules when playing your controller, check to be sure that the correct track or tracks are record-enabled.

Timing and synchronization data are *not* echoed in Patch Thru.

Turning on MIDI Patch Thru

To turn on MIDI Patch Thru, choose it from the Studio menu and select either *Direct Echo* or *Auto Channelize*:

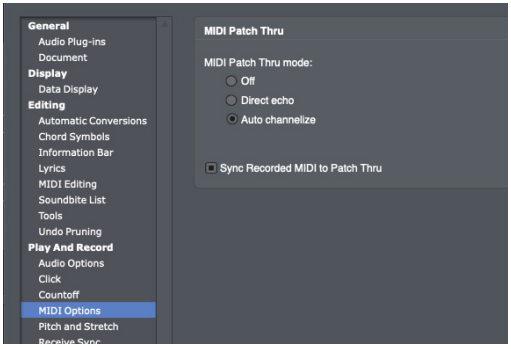


Figure 32-3: Performer Lite's MIDI Patch Thru command offers two types of patch thru: Direct Echo and Auto Channelize.

Direct echo

Direct Echo causes incoming MIDI data from your controller to be echoed back out on the same channel it was received. For example, if your MIDI controller is transmitting on channel 3, MIDI data is echoed back out on channel 3 by Performer Lite. The Input Filter settings do not affect direct-echoed data; information is simply echoed straight through, bypassing most of Performer Lite's MIDI processing.

Direct Echo is useful in situations where you want to be able to change the channel you are echoing to from your MIDI controller keyboard by simply changing its transmit channel.

Auto channelize

Auto Channelize causes incoming MIDI data from your controller to be echoed to the output device and channel for the currently record-enabled MIDI track. The following sections discuss several scenarios that affect Auto Channelize.

Auto channelizing in a sequence

When a sequence is play-enabled in the Set List, here is how Auto Channelize Patch Thru works. Only MIDI data received on the specified recording Device for a track will be echoed to the corresponding playback channels for that track.

Since Patch Thru works even when you're not recording, you can use Performer Lite as a sophisticated MIDI merger, mapper, or rechannelizer during playback, recording or when stopped. Patch Thru allows you to route MIDI

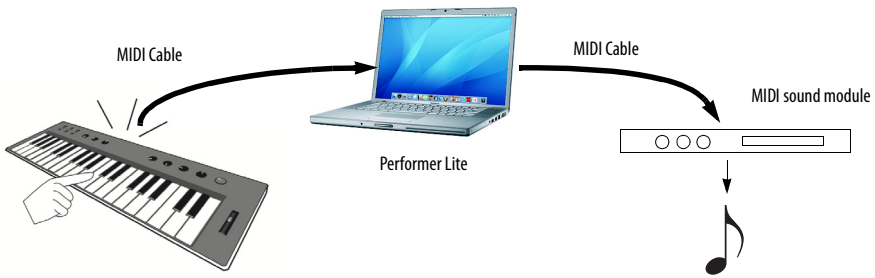


Figure 32-2: Here is an overview of how Patch Thru works. You press a key on your controller keyboard. The note gets sent to Performer Lite. Performer Lite determines which device (MIDI channel) the note will be echoed to by the track is currently record-enabled. It then sends the note to the output device assigned to that track, which plays the note using whatever sound (patch) is currently selected on that channel.

information from your controller instrument to any combination of synthesizer modules. By adding a group of tracks, each assigned to a different MIDI channel or set of channels, you can change the module configuration used for playback by simply clicking on the record-enable button for the track or tracks with the desired channel configuration. This allows you to experiment with channelization freely.

Auto channelizing with MIDI effects plug-ins
The Mixing Board allows you to apply real-time MIDI effects plug-ins to a track. For example, you could apply the Echo effect to a MIDI track to make it echo during playback.

These same effects plug-ins will affect MIDI Patch Thru as well. When you record-enable a track, and the track has MIDI effects plug-ins currently applied to it, you will hear the effects on what you play.

This allows you to apply effects — in real time — to what you are recording into (and patching thru) Performer Lite. For example, you can apply a Transpose Map that constrains all notes to within a certain scale — which automatically cleans up any wrong notes that you play! Or you can apply a MIDI echo as you record. See "Working with effects plug-ins" on page 193 for details.

Auto channelizing and the Input Filter
The Input Filter affects incoming data in MIDI Patch Thru mode. All data selected to be filtered out will not be echoed to the outputs. For example, if the pitch bend box is not checked in the Input Filter dialog box, pitch bend information will not be echoed through in MIDI Patch Thru.

Patching thru in the background
Performer Lite continues to patch thru even when it is in the background, i.e. not the active application. For example, if you bring another program to the front, you'll still be able to patch thru from your controller via Performer Lite.

MIDI beat clocks and MIDI Patch Thru
If you use MIDI Patch Thru with a drum machine or any device that outputs timing information, the timing information will not be echoed through. To echo timing information, see chapter 68, "Transmit Sync" (page 594).

MIDI patch thru via a MIDI interface
Some MIDI interfaces, such as the MIDI Express XT, have a patch thru option built into them. If you choose to use the echo feature, turn off MIDI Patch Thru on Performer Lite or incoming data will be echoed twice. If you choose to use MIDI Patch Thru in Performer Lite, turn off the echo feature on the interface for the same reason.

Sync Recorded MIDI to Patch Thru
If you have a MOTU USB MIDI interface, Performer Lite records with an extra degree of precision. When you are recording with MIDI Patch Thru turned on, Performer Lite places the events in the track so that what you heard yourself play when recording is exactly what you'll hear when you play back your performance. To do this, Performer Lite must compensate for the inherent, small amount of time it takes for the computer to receive the incoming MIDI data and send it back out to the patch thru destination. It does so by placing the event in the track a few milliseconds after the time at which it was actually received.

However, there may be times when you are not listening to your performance via Performer Lite's MIDI Patch Thru. For example, you might be playing your synthesizer with local control turned on, i.e. triggering sounds directly from its own

keyboard. In this situation, be sure to turn MIDI Patch Thru off. Or, leave MIDI Patch Thru on and disable the *Sync Recorded MIDI to Patch Thru* option in the MIDI Patch Thru dialog (Studio menu) as shown below in Figure 32-3 on page 278. Doing so ensures that events are recorded exactly when they're received (as you heard when playing them).

Patch Thru in Background

The *Patch Thru in Background* option (Figure 32-3 on page 278), when checked, lets you continue to use Performer Lite's MIDI patch thru, even when Performer Lite is not the active application. For example, you could switch to the computer desktop and still continue to play a virtual instrument from your controller.

AUDIO INPUT MONITORING

Audio input monitoring is the process of listening to the live input signal being fed to a track via its chosen hardware input (Figure 11-1 on page 68). Performer Lite lets you do this by "patching thru" the input signal to the track's output destination (see "Choosing an audio input and output" on page 69). So be sure to choose an output destination assignment that is patched to a listening device. For example, you might choose a pair of audio outputs on your audio interface that is connected to a set of speakers, or a pair of outputs that is patched to the headphone outs on your audio interface. The output assignment can also be a bus that is being routed via an aux track to your speakers.

The input monitor button

To monitor an audio track's input, click its *input monitor button* to enable it. If you don't see the Input Monitor button for a track, you need to choose an input for the track. See "Choosing an audio input and output" on page 69.

Input monitoring can be enabled or disabled independently of the track's record-enable state.

The record button

When you record-enable a track (Figure 11-1 on page 68), input monitoring is enabled and you will begin to hear the live signal being received on the track's chosen hardware input. This is true, regardless of whether or not the track's input monitor button is engaged.

☛ If you don't hear live input when the track is record-enabled, audio patch thru might be turned off, as explained in the next section.

Input monitoring modes (Audio Patch Thru)

Performer Lite provides four input monitoring modes that govern when you hear live input and how the live input signal interacts with disk audio (existing audio material in the track) during playback and Auto Record. In addition, input monitoring can be disabled entirely. To access these input monitoring modes, go to the *Studio menu> Audio Patch Thru* sub-menu:

Audio Patch Thru setting	Explanation
Off	The track input is never audible, regardless of the input monitor or record button state.
Input Only	When the track is either record-enabled or the input monitor button is enabled (or both), you hear the track input only, and you will not hear any disk audio during playback.
Auto	Same as Input Only, except that during Auto Record, when you are playing but not yet punched in, you will still hear disk audio (until punch in occurs).
Blend	When the track is either record-enabled or the input monitor button is enabled (or both), during playback, you hear both the input and the disk audio.

Monitoring input levels

In addition to the level meter in the track's settings pane (Figure 11-1 on page 68), long throw metering is available in the Mixing Board ("Level meters" on page 188).

Monitoring outside of Performer Lite

If you are using Performer Lite with an external mixer, or via the hardware-based CueMix DSP monitoring features in your MOTU audio interface, you might choose to monitor in the external hardware instead of through Performer Lite. In this scenario, or any situation in which you do not need to monitor the incoming audio via the outputs of the audio interface connected to your computer, disable Audio Patch Thru.

Applying real-time audio effects plug-ins to live audio input

You can apply effects plug-ins to the live input signal by adding effects plug-ins to the track in the Mixing Board. (See "Inserts" on page 178.) However, you should read the following sections first, which discuss several important issues regarding audio input monitoring under the MOTU Audio System.

ing latency

You might hear a slight delay when monitoring audio input. For example, if you have a sequence that already has several tracks of audio recorded, and you then try to record along with it while monitoring your input via Audio Patch Thru, you might hear a slight delay in what you are playing. This delay is commonly referred to as *monitoring latency*. Fortunately, however, the audio will be recorded into the sequence accurately and in sync with the other previously recorded audio tracks (as long as you managed to play it in sync with the sequence). But what you *hear* while you are recording will be noticeably and consistently behind. In other words, what you hear during recording will not be what you get: during recording, the input signal will sound late, but when you play it back after recording it, it will be fine (again, as long as you managed to play it in time with the sequence).

Again, *audio is always recorded accurately*. Latency is only an issue for monitoring (the live audio input that you listen to while recording).

There are several ways to minimize monitoring latency. Some of them are specific to certain hardware.

- Monitor outside of Performer Lite entirely (with a mixing console, for example).
- Use your audio hardware's direct, hardware-based monitoring feature, if any.
- For MOTU audio hardware, set input monitoring mode to 'Direct hardware playthough'. You will not be able to monitor through audio effects plug-ins, but monitoring latency will be greatly reduced or completely eliminated. See "Hardware monitoring versus monitoring with effects" below for more information.

Hardware monitoring versus monitoring with effects

When you use your audio hardware's built-in "hardware-based" monitoring feature (if any), there is little or no audible delay. However, the trade-off is that the input signal is not routed through the MOTU Audio System. This means that if you have effects such as EQ or reverb assigned to the track that is currently record-enabled, you will not hear the effects applied to the input signal.

In summary, your two choices for monitoring input are: 1) delayed input with effects, or 2) dry input with no delay.

You also have a third option: turn off your audio hardware's "hardware-based" monitoring and lower the *Buffer Size* setting. The default settings is 1024 samples. Try lowering it to 512, 256 or even 128 samples. This gives you the best of both worlds: very low monitoring latency (3-6 ms) with

effects processing. The trade-off in this scenario is that the lower buffer settings put more strain on your computer.

Setting the input monitoring mode

The two choices for input monitoring described in the previous section are provided by choosing *Configure Audio System > Input Monitoring Mode* from the Setup menu, which opens the dialog shown below in Figure 32-4.

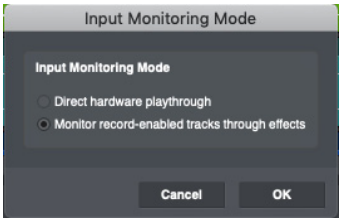


Figure 32-4: Under the MOTU Audio System, Performer Lite provides two input monitoring modes. 'Direct hardware playthrough' provides monitoring without delays, but it does not provide effects on the monitored signal. 'Monitoring record-enabled tracks through effects' lets you monitor input with effects applied to it, but there could be a noticeable delay in the signal.

Direct hardware playthrough

Direct hardware playthrough provides accurate monitoring with no delays, but if you have real time effects (EQ, reverb, etc.) assigned to the track being recorded into, you will not hear them during monitoring. Effects will, however, be applied to the recorded material during subsequent playback.

When this option is chosen, the input signal currently being monitored can always be heard, i.e. it will be patched through when Performer Lite is stopped, playing or recording.

When operating Performer Lite with a MOTU audio hardware system, this option is required to enable the Cue Mix™ monitoring feature.

Monitor record-enabled tracks through effects

Monitor record-enabled tracks through effects lets you apply effects to the input signal (via the effects inserts of the currently record-enabled track), but you might hear a delay during recording. If, however, the input signal is actually received by the computer in sync with the rest of the sequence, the input signal with be recorded properly (with no delay).

When this option is chosen, the input signal currently being monitored can always be heard when Performer Lite is either stopped or recording. During playback, however, the input signal being monitored will never be summed with existing track contents. Instead, you will hear either one or the other.

USING THE COUNTOFF

Countoff gives you a number of measures of countoff in the starting tempo before recording begins. For details, see "Click" on page 115 and "Click Preferences" on page 115.

START RECORDING

After making the preparations already discussed in this chapter, you are ready to begin recording:

1 Set the Counter to the location in the sequence at which you want to begin recording.

If you are recording into a new sequence, you'll probably want to start at the beginning of the sequence. To do so, click the Rewind button. To start at a specific location other than the beginning, type in the location in the Counter.

2 To begin recording, press the Record button in the Control Panel.

The Record button will turn red, indicating that Performer Lite is recording in real-time. You can also trigger recording by pressing the [3] key on the numeric keypad (with Num Lock engaged under Windows) or, if you have already set up a MIDI remote control, by sending a MIDI event from your controller.

☛ To achieve the fastest response possible when you begin recording, use pause-record. That is, press the pause button first and then record. Performer Lite allocates record buffers as needed and then waits for you to press pause again to begin recording.

Display update during recording

During recording, Performer Lite displays audio and MIDI data as it is being recorded. For audio, you'll see a continuously updating red bar. This bar appears temporarily during the record pass; it is for display purposes only and cannot be edited. However, as soon as recording stops, the bar is replaced by a fully editable soundbite.

Record-enabling audio tracks on the fly

You can record-enable (and disable) audio tracks while playing (but not while actually recording). In other words, you can toggle audio track record-enable buttons as long as the record button is not red or flashing red. Therefore, to change record-enabled audio tracks during a record pass, just press the record button to temporarily drop out of record, change audio track record-enables as desired, and then press record again to drop back into record. If you have already recorded some material, and you change record enables on the fly in this manner, the previous material is "put away" (the red, temporary waveform bars turn into normal, editable soundbites).

STOP RECORDING

To stop recording, stop Performer Lite by clicking the Stop button, pressing the spacebar, or pressing the [0] key on the numeric keypad (with Num Lock engaged under Windows).

Performer Lite stops recording and takes a moment to process the audio data.

For audio tracks, each record pass gets placed in the audio track as a single *soundbite*. The soundbite also gets added to the list in the Soundbites list. You can view the soundbite by opening the Sequence Editor.

HOW AUDIO IS RECORDED ON DISK

Performer Lite and other computer-based digital audio recording systems record audio data in much the same way. For a detailed explanation, see "How audio is recorded on disk" on page 598.

UNDO RECORD

Immediately after you record (before you do anything else), you can undo what you just recorded. For audio tracks, Performer Lite moves the takefile into the trash. If you then do another undoable action, the takefile is remembered in the undo history. However, at the end of the session, when you close the project, Performer Lite will alert you that there are unused record takes and ask if you want to delete them. This lets you undo and redo as much as you want without worrying about your hard drive filling up with unwanted takes.

RECORDING STEREO AUDIO

Stereo recording is done in the same fashion as already described in this chapter, except that you record into a stereo track instead of a mono track. To add a stereo track, choose *Add track > Stereo Track* from the Project menu. Then just record-enable the track and prepare for recording as usual.

- If your project interleave format is interleaved, the stereo audio will be recorded to a single file.

- If your interleave format is deinterleaved, recorded audio data is stored as two separate mono files, each with the same name and .L or .R in the file names (e.g., "Guitar-1.L.wav" and

"Guitar-1.R.wav"). The corresponding soundbites in the track will remain perfectly sample-locked, no matter what you do.

RECORDING SEVERAL AUDIO TRACKS IN ONE PASS

Performer Lite lets you record as many audio tracks at one time as your computer and audio hardware allow. Just record-enable the tracks as needed.

The total number of audio tracks you can record into at one time depends on your audio hardware.

RECORDING AUDIO AND MIDI AT THE SAME TIME

Performer Lite allows you to record audio tracks and MIDI tracks at the same time. Just record-enable all the tracks that you want to record into.

MANUAL PUNCH-IN/PUNCH-OUT ON THE FLY

For both MIDI and audio tracks (when operating Performer Lite under the MOTU Audio System), you can punch in and punch out on the fly as many times as you need during a single record pass, regardless of how many tracks are record-enabled.

To manually punch in, press play and then press the record button in the main transport at the desired time. Press record again to punch out. You can also use the [3] key on the numeric keypad (with Num Lock engaged under Windows). For MIDI tracks, you could alternatively use the track's individual record-enable button, but not for audio tracks.

AUTOMATIC PUNCH-IN/PUNCH-OUT

Performer Lite's Auto-Record feature allows you to automate recording at precise punch-in and punch-out points. This feature allows you to record without having to manually enable and disable the Record button. Automatic punch-in produces the most accurate results possible when punching in. When you punch-in manually, there may be a brief delay—on the order of a few hundred milliseconds for audio tracks—before recording actually begins.

To punch in automatically, set up Performer Lite's Auto Record feature in the Control panel.

Clicking on the Auto-Record button (below the main transport controls) enables and highlights it. Clicking on the Auto-Record button also causes the Auto Record punch in and punch out times to appear in the Status Strip. Punch in and punch out times are specified in the Auto Record Bar: *Punch in* is the time where recording begins; *Punch out* is where recording ends. Auto-Record can be used while Performer Lite is slaved to external sync; see chapter 67, "Receive Sync" (page 582) for details.

The Auto-Record button will remain on until you click on it again to disable it. Remember to disable it when you finish using it.

To use Auto-Record:

1 Arm the tracks you wish to record into.

2 Press the Auto-Record button, which is located below the transport controls.

The button highlights to signify that Auto-Record is on.

3 Enter the Punch In and Punch Out locations.

The Punch In location is where Recording will begin. The Punch Out location is where Recording will end. You can set them up graphically. See "Auto-Record" on page 118.

4 Move to a location in the sequence before the Punch In point.

This location should be a spot that will give you plenty of time to prepare to enter the new material, anywhere from a whole section to a few measures before the Punch In point.

5 Get ready to record.

6 Press the Record button.

The sequence plays from the current location in the Counter. The Record button starts flashing. When the Punch In time is reached, the record button becomes continuously highlighted. When this happens, Performer Lite is recording and you can play new material. When the Punch Out time is reached, the Record button will return to flashing.

7 Press the Stop button when you are finished.

Punch-in recording in MIDI tracks

If Performer Lite starts recording in a MIDI track while a pre-existing MIDI note is sustaining, it does not cut off that note. Only notes with attack times after the punch in time are erased. For example, in Figure 32-5 below, the two notes represented by light grey bars begin within the punch in time range, but the sustained note represented by the dark grey bar begins before the punch in point:

Figure 32-5: A passage of notes before Auto-Recording.

After recording, the notes that began before punch in remain, but the notes that begin within the recorded range are replaced by the new material:

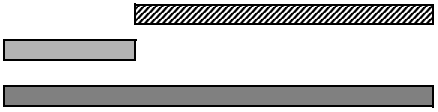


Figure 32-6: The same passage of notes after Auto-Recording, with the newly recorded material displayed as the bar with the diagonal pattern.

Anything you play while the Record button is grey is not recorded. This allows you to play along with the sequence and only record between the Punch In and Out times.Overdub recording

Overdub recording works slightly differently for MIDI tracks and audio tracks, although the basic principle is the same: existing data in the track is preserved. Overdub mode can be combined with Cycle-Recording (described later in this chapter) for drum-machine style MIDI loop recording and multi-take audio loop recording.

Figure 32-7: Performer Lite's Overdub Record mode button.

MIDI overdub recording

In MIDI tracks, overdub mode causes newly recorded MIDI notes to merge with, instead of replace, pre-existing MIDI notes on the record-selected track. The pre-existing notes on the track are not erased. It works as if you recorded one track, recorded a second track to go along with it and then merged the two.

Overdub recording and MIDI controller data

For MIDI continuous controller (CC) data, overdub record mode works differently than with notes. Newly recorded CC data *replaces* existing data of that same type in the track. In addition, if automation recording is enabled for the track (Figure 20-2 on page 180), the CC data will be recorded according to the automation mode setting for the track in the Mixing Board (see "Automation controls" on page 187). For example, with *Touch* and *Latch* modes, punch-in occurs

when the first CC event is received and continues, replacing existing data of the same type. Existing data stops being replaced when you either stop sending data (Touch mode) or when you stop the record pass (Latch mode). For details about automation modes, see "Automation modes" on page 494.

Audio overdub recording

When overdub record mode is enabled, punched-in audio is layered on top of existing audio. The existing audio remains beneath it, but only the newly overdubbed soundbite will play, i.e. what you see is what you'll hear. See "Overlapping and layering soundbites" on page 337 for more information about how multiple, overlapping soundbites play back in a track. If you change your mind about the punch-in and wish to remove it, just delete the overdubbed soundbite, which uncovers the original audio beneath.

☛ When overdub recording over existing material, *the new material is not merged with the existing material.* Instead, it is overlaid on top. To merge soundbites together into one soundbite, place them into separate tracks first and then use the *Bounce to Disk* command in the File menu.

When overdub record mode is disabled, and you punch-in over existing audio in a track, the existing audio is completely replaced by the newly recorded audio. This record behavior prevents multiple layers of soundbites from piling up on top of one another when you are overdubbing. Instead, punching in will never create overlapping soundbites. Wherever there is a punch-in, the current soundbite is trimmed and a new soundbite begins. However, only those parts of existing soundbites you recorded over are erased. For example, if you record over the beginning of a soundbite, only the portion recorded over is replaced.

If you change your mind about the punch-in and wish to remove it, go back in the Undo history.

Overdub record mode lets you choose either method (replacing or layering) for punch-in recording.

Overdub recording and the Conductor Track

Overdub does not affect the Conductor Track; specifically, recording on the Conductor Track while slaved to Tap tempo sync always erases existing tempo events.

Record With Overdub On or Off

Regardless of the current Overdub state, you can override when recording it by using the *Record With Overdub On* or *Record With Overdub Off* commands. These do not have key bindings by default, but can be assigned key bindings in the Commands window.

RECORDING MULTIPLE TAKES

A *take* stores the contents of the track. Each track can have an unlimited number of takes. Takes are an ideal way to record, store, edit, and combine multiple versions of the material in a track. For details, see chapter 43, "Takes and Comping" (page 415).

CYCLE-RECORDING

Several of Performer Lite's features can be combined to provide comprehensive cycle-recording, complete with MIDI Spot Erase and erasing the last pass.

Setting up for cycle-recording

To cycle-record:

1 Click the Memory Cycle and Overdub record buttons in the Control Panel.

The Memory Cycle button causes Performer Lite to loop a section indefinitely. To prevent accidental erasure of the previous record pass,

Performer Lite falls out of record mode when it hits the cycle end point, unless Overdub mode is enabled.

2 Set the start and end times of the time range you want to loop in the Memory bar.

For a two measure loop, make the stop time 3|1|000. For a four measure loop, make the stop time 5|1|000. Stop time is always the downbeat of the measure after the last one in the loop. You can set the loop points graphically by dragging the loop repeat barlines in the time ruler of the Sequence Editor.

3 Set the desired tempo.

4 If needed, make sure that the Click is enabled in the Studio menu.

5 Cue Performer Lite to the beginning of the Memory Cycle range.

6 Click the record button in the main transport controls and begin recording.

Cycle-recording in MIDI tracks
When you cycle-record into a MIDI track, each new pass is combined with the MIDI notes from previous passes in the same track take. For example, if the track is currently set to *Take 1*, and you first record a kick drum, the snare drum notes that you play in the second pass are combined with the kick drum notes in Take 1. You can, of course, change takes at any time.

Editing newly recorded MIDI data
In Performer Lite, recorded MIDI data and digital audio data appears immediately as you record it, before you press the Stop button. For MIDI data, this allows you to edit the data (erase, transpose, quantize, etc.) without stopping cycle-recording. Audio data, however, cannot be edited until after you press the stop button.

Erasing the last MIDI pass and MIDI Spot Erasing
You can easily accomplish common MIDI cycle-recording tasks such as erasing the last pass and Spot Erasing by opening the Drum Editor or other edit window while cycle-recording. As you record, notes appear in the window right away, so you can do whatever you want to them without having to press the stop button. You can even insert notes by hand in the looped time range, as well as continuous controllers such as volume controllers.

To quickly erase the last pass while recording a MIDI drum track, double-click the pitch key on the pitch ruler that corresponds to the note you just recorded. Doing so selects all the notes of that pitch in the track. Then hit the delete key.

To Spot Erase graphically, click the note and hit delete.

Spot Erasing from your MIDI controller
A set of cycle-record commands, including a MIDI Spot Erase function, is included in the Commands window. These controls help further provide drum-machine style loop recording by providing the ability to spot erase from your MIDI controller while cycle-recording.

After you've assigned a key to Spot Erase, hold down the Spot Erase key and play back; any notes you hold down on your MIDI controller keyboard that exist in the track are erased as the wiper passes them.

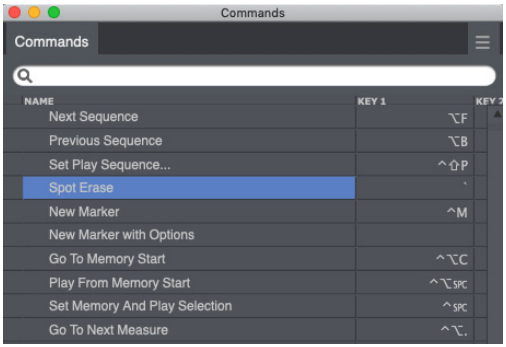


Figure 32-8: Look in the Transport commands for the Spot Erase command, and other cycle-recording shortcuts, which can all be assigned to MIDI notes for triggering directly from your MIDI controller.

Changing the MIDI channel or patch on the fly
While you are cycle-recording, you can change the device, MIDI channel, or current default patch on the fly while recording as follows:

Next/Previous item	Key to press
Device	Shift up-arrow Shift down-arrow
MIDI channel	Option/Alt up-arrow Option/Alt down-arrow
Default patch (sound)	Command/Ctrl up-arrow Command/Ctrl down-arrow

You can also map these shortcuts to MIDI keys on your MIDI controller, so that you can do everything from your MIDI controller during recording. See chapter 29, "Commands" (page 257) for details.

Cycle-recording in audio tracks
When you cycle-record into an audio track (with *Overdub Record* mode turned on, Performer Lite automatically creates a new take for each record pass. For example, if you record a bass line into Take 1, the track will automatically switch to take 2 immediately at the end of take 1. This allows you to play a second take that is completely different than the first.

Capturing the perfect take
By automatically creating takes during audio cycle-recording, Performer Lite allows you to continuously record multiple independent passes into an audio track inside the current Memory Cycle loop points. For example, you could set up the Memory Cycle points around a solo section and then continuously play in multiple passes of the solo, one after the other, without ever stopping. Performer Lite saves each pass separately during recording. When you stop recording, Performer Lite then splits each pass into its own take. You can then choose among takes, or even build a composite take based on parts from each pass using Performer Lite's powerful take comping features; see chapter 43, "Takes and Comping" (page 415).

Audio cycle-recording with punch-in/punch-out
Audio cycle-recording can also be used together with Performer Lite's Auto-Record punch in/out feature. You can set up an Auto-Record time range inside the Memory Cycle time range and perform multiple record passes in Overdub Mode as described earlier. Each pass inside the Auto-Record range is stored in a separate take. This allows you to give yourself a bit of pre-roll and post-roll when recording multiple passes.

Creating a permanent loop
After you are satisfied with the MIDI or audio loop you've created, you can make it permanent by inserting a loop into one or more tracks. Use the Loop tool in the Tool palette (Studio menu).

RECORDING IN EXTERNAL SYNC

When recording in external sync other than Tap tempo, the Record button is turned off every time the master device stops or rewinds. This is a safety precaution, to prevent accidental erasure of previously recorded data. Refer to chapter 67, "Receive Sync" (page 582) for details on recording while slaved to each type of external sync.

Recording while still-framed
If you are slaving to an external sync source, Performer Lite allows you to remain in record mode while the video parked on a SMPTE frame. To do so, check the *Record while still framed* option in the Receive Sync settings in the Setup menu.

SAMPLE FORMAT

Performer Lite supports three sample formats: 16-bit integer, 24-bit integer, and 32-bit floating point.

24-bit digital audio recording uses a 24-bit word to describe each sample recorded. 16-bit recording provides 2 to the 16th — or 65,536 — values to record the level of audio for any given sample. 24-bit recording supplies 8 more bits (2 to the 24th), providing over 16 million separate values (16,777,216 to be exact) with which to record the level of any given sample. As you can see, 24-bit recording provides 256 times the resolution — or "fineness" — of 16-bit recording.

24-bit recording has several advantages over 16-bit recording. One is signal-to-noise ratio. In digital recording, each bit provides approximately 6 dB of signal-to-noise ratio (SNR). So 16-bit recording provides a theoretical 96 dB of SNR, 20-bits provide 120 dB, and 24-bits provide 144 dB. With medium to loud audio material, such as a pop music recording, this extra 48 dB of SNR is not a significant advantage. On quiet recordings, however, with long instrument decays or reverb tails, the extra SNR can become much more of an important advantage over 16-bit recording.

The much more significant difference between 16 and 24 bit recording is the resolution, and this factor impacts sound at all levels, soft and loud, even to the untrained ear. As mentioned earlier, 24-bit recording has 256 times the resolution of 16-bit recording. You can readily hear the difference when A/B-ing material recording at the two different sample formats. 24-bit audio has a noticeably enhanced detail, tightness in the bottom end, and overall depth.

32-bit floating point audio file resolution is an emerging standard used for high-end recording, mixing and mastering applications. The advantage of floating-point representation over fixed-point representation is that it can support a much wider range of values by allowing the decimal point to "float" among the digits than store the value of each sample. For example, a fixed-point representation that has eight decimal digits, with the decimal point assumed to be positioned after the sixth digit, can represent the numbers 123456.78, 8765.43, 123.00, and so on, whereas a floating-point representation with eight decimal digits could also represent 1.2345678, 1234567.8, 0.000012345678, 12345678000000000, and so on. 32-bit resolution allows audio data to be stored with a very high precision and very wide dynamic range.

Performer Lite's mix engine employs 32-bit floating point precision throughout. Recording as 32-bit float is a good way to preserve the floating point precision employed by the Performer Lite mix engine at all stages, particularly if you will be re-recording, bouncing, or applying effects constructively or destructively to your audio.

GETTING AN ERROR MESSAGE

Performer Lite keeps close track of whether or not it had any trouble processing the audio data during recording. If conditions prevent it from successfully encoding all the digital audio information, you will be presented with an error message letting you know that an error occurred. These errors can be due to conditions such as:

- Other background software interruptions
- A highly fragmented hard disk

- A hard disk that has an access time that is too slow
- Other interruptions

See "Audio troubleshooting" on page 624 for more information about how to handle error messages.

CHAPTER 33 Movie Window

OVERVIEW

overview 291
Random access digital picture 291
Supported video formats 291
Opening movies 291
Closing movies 292
Movie control bar 292
The movie track 293
Movie window menu commands 293
Scrubbing the Movie window 294
Improving movie window performance 294
Exporting a Movie 294

RANDOM ACCESS DIGITAL PICTURE

Performer Lite's Movie Window provides synchronized playback of video clips with both MIDI and audio tracks in a sequence. Digital video provides random access to picture, just like digital audio and MIDI. For example, you can:

- Instantly locate to any spot in the movie
- Advance forwards or backwards one frame at a time through the picture and music
- Scrub forward or backward (with or without audio and MIDI scrubbing)
- Seamlessly loop both picture and music

All of this can be done without the hassles of slaving to external time code.

SUPPORTED VIDEO FORMATS

Generally speaking, Performer Lite can play any video file that is supported by your computer system. More specifically, if the video file plays successfully in macOS QuickTime Player or Windows Media Player, the it should work with Performer Lite as well.

OPENING MOVIES

Only one movie can be open at a time for a sequence. The *Movie* command in the Project menu opens a movie in Performer Lite. To open a movie for a sequence:

1 Play-enable a sequence in the Set List.

2 Choose *Project menu> Movie* to open a movie.

A standard file browser appears, allowing you to navigate to the movie file you wish to open. For a discussion of supported video formats, see "Supported video formats" above.

Working with multiple sequences

If you are working with multiple sequences, you can either use the same movie for all sequences, or use a different movie for each sequence. There is a checkable menu item in the Movie Window menu called *Use Same Movie for All Sequences*. This menu item also appears in the movie track menu in the Sequence Editor. When it is checked, you get the following behavior:

- Every sequence in the project uses the same movie.
- Each sequence can have its own unique *sequence start time*, but the *movie start time* is the same for all sequences. Changing the sequence start time will make the movie begin earlier or later in the sequence.
- The movie window is placed at the same position and size for every sequence.
- Closing the movie window closes it for all sequences.
- Choosing a new movie for one sequence chooses that same movie for all sequences.

If you have two or more sequences in the project and you wish to open a separate movie for each sequence, uncheck the *Use Same Movie for All Sequences* menu command and do the following:

1 Play-enable a sequence in the Set List.

2 Choose *Project menu*> *Movie* to open a movie for it.

3 Play-enable a different sequence in the Set List.

The movie window for the first sequence disappears at this point.

4 Choose *Project menu*> *Movie* to open a movie for the second sequence.

5 Repeat this procedure for as many sequences as you wish.

When you switch from one sequence to another (by clicking its play-enable button in the Set List), the movie window will update itself to show the movie you chose for that sequence. Each sequence also stores a separate location for the movie window on the screen. So you can reserve a different spot on screen for each movie. Or you can place them all in the same location, if you wish.

Displaying a blank movie for visual cues

You can open a blank movie (with a black background) by choosing *Project menu*> *Movie*, but then cancel the resulting dialog box. A blank movie can be used for any purpose.

CLOSING MOVIES

You may close the Movie window, and Performer Lite will still remember which movie file you opened at the time you last saved the project. To reopen the movie, just play-enable the same sequence choose *Movie* from the Project menu again. To close the movie permanently so that Performer Lite forgets about it, choose *Clear Movie* from the menu.

If you have a movie open and want to choose a different movie, choose *Open Movie* from the menu. Only one movie can open at a time for each sequence. (But each sequence can have its own movie, as explained earlier.)

MOVIE CONTROL BAR

The movie control bar (Figure 33-1) appears in the movie window when you move the mouse over the window. Drag the bar to reposition it as desired.

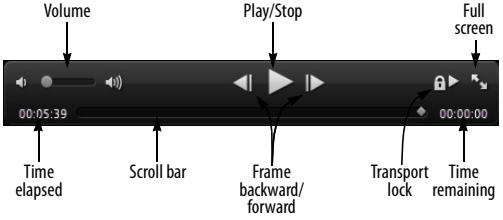


Figure 33-1: The Movie control bar.

Volume

The volume control allows you to set the playback volume for the movie's audio track.

Play/Stop

The Play/Stop button starts and stops movie playback.

Full screen

Click the full screen control to enter or exit full-screen mode. If you have multiple monitors, place the movie window on the monitor you wish to fill before entering full-screen mode. If the movie window is full screen when you save and close the file, it will reopen in full screen mode when the project is reopened. To exit, press the escape key as a shortcut.

Time elapsed/remaining
Displays the amount of time already played (elapsed) and yet to be played (remaining).

Scroll bar
The scroll bar shows where in the movie you are, and can be used to "scrub" the movie or to set your location in the movie.

Frame backward/forward
The frame backward/forward buttons move through the movie one frame at a time. Note that this means movie frames, not SMPTE frames. A movie may have 15 fps, 30 fps, or even a number which varies throughout the movie. The left/right arrow keys will also work if the window is active.

Window resizing
Drag the bottom right corner to resize the movie window, while maintaining its original aspect ratio. Shift-drag to resize and change aspect ratio of the window, which will add black bars (pillar box or letter box) above or below the movie as needed. Drag again without the shift key to remove the black bars.

Popping in and out of the Performer Lite Window
Double-click anywhere on the movie to pop it in or out of a cell in the Performer Lite Window. For example, you may want to edit with the movie displayed in a window cell, then pop it out and go full-screen to review your edits. Exit full-screen mode and double-click it again to pop it back into the original window cell.

THE MOVIE TRACK

Use the Sequence Editor track selector (see "The Track Selector" on page 125) to display the Movie track, which displays the movie you've opened in the Performer Lite project, if any. For details about the movie track, see "The movie track" on page 131. All of the controls for the Movie window, such as the movie start time, audio output settings, and menu, are available in the track setting panel to the left of the movie track, as shown in Figure 33-2.

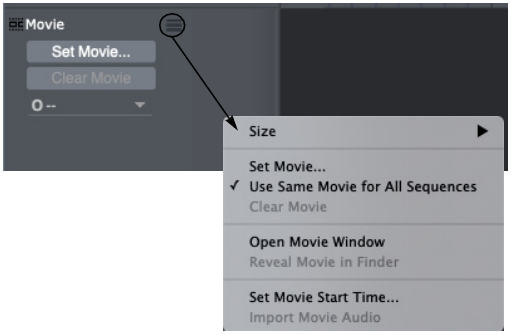


Figure 33-2: The movie track and movie window menu

MOVIE WINDOW MENU COMMANDS

The Movie window menu can be accessed by right-clicking anywhere on the movie or by going to the Movie track settings panel in the Sequence Editor (Figure 33-2).

Size: (Movie track menu only) Lets you choose how big or small the movie track is displayed in the Sequence Editor.

Set Movie: Presents you with a standard file dialog to choose the movie file you wish to open.

Use Same Movie for All Sequences: Forces all sequences in the project to use one movie.

Clear Movie: Closes the movie.

Open Movie window: (Movie track menu only) Opens the movie in a separate window.

Reveal Movie in Finder / Show Movie in Explorer: Switches out of Performer Lite and onto your computer desktop to show you the location of the movie on your computer hard drive.

Set Movie Start Time: Allows you to set the SMPTE time which corresponds to the beginning of the movie. If you want the movie to start at the beginning of the sequence, this should be set to the same time as the SMPTE sequence start time. You may need to try adjusting the start time by ±40 time code bits if you find that the frames in the movie don't precisely line up with the frame numbers in Performer Lite's counter.

Import Movie Audio: If the movie has an audio track, this command creates a new track in the current sequence and places the movie's audio into the new track. If the movie has no audio track, this command is grayed out.

SCRUBBING THE MOVIE WINDOW

You can "scrub" playback with the Movie window scroll bar. For more information, see "Scrubbing multiple MIDI tracks" on page 273.

IMPROVING MOVIE WINDOW PERFORMANCE

The following things may hinder the computer's ability to play a movie back smoothly:

- Larger movies (in pixels)
- Movies with higher frame rates
- Playing the movie from slower drives
- Resizing the window to non-optimal sizes (not double, full, or half size)

Avoiding these things will help your movies play back more smoothly.

EXPORTING A MOVIE

You can bounce an audio output bundle (mono or stereo), together with video, to a movie file. This allows you to export a complete movie from Performer Lite in one easy operation, complete with a sound track that you've created in Performer Lite. For details, see "Bouncing to a Movie" on page 575.

Part 7
Editing

CHAPTER 34 Editing Basics

OVERVIEW

Performer Lite provides unmatched features for editing MIDI data, audio data and both at the same time. This chapter provides a introduction to editing in Performer Lite and covers several general features than can be employed universally while editing.

Overview 296
Unlimited Undo/Redo 296
Editing during playback 296
Selecting and searching 296
Region editing 296
Track groups 297
View menu 297
Zooming 298
Scroll To 301
Graphic editing techniques 301
Audio editing basics 302
Sample accurate editing 303
Listening while editing 303

UNLIMITED UNDO/REDO

Performer Lite supports unlimited Undo/Redo. It can remember everything you have ever done to a project, even after you close and quit, across any number of sessions, all the way back to the moment the project was first created.

EDITING DURING PLAYBACK

Almost all edit operations in Performer Lite can be done during playing back so that you don't have to stop and start to hear the result. For example, you could Transpose while the sequence is playing and then use the Undo/Redo command as the music continues playing to compare the original and modified data.

SELECTING AND SEARCHING

To edit anything in Performer Lite, you must first select it. Performer Lite provides many useful ways to make selections, from a single event—or event parameter—to the entire project. After you've made a selection, you can apply Performer Lite's many powerful Edit menu commands to whatever is selected. Be sure to learn all of the ways to make selections by reading chapter 35, "Selecting" (page 305).

REGION EDITING

A *region* is a span of time across one or more tracks. Performer Lite's edit windows provide flexible region editing across one or more tracks, allowing you to edit data within that region with a wide range of edit operations. You can edit audio tracks, MIDI tracks, and both simultaneously. The process of region editing consists of the following basic steps:

1 Select a region.

2 Apply the desired operation from the Edit or Region menus.

These steps are discussed briefly in the following sections.

Selecting regions

There are many ways to select regions. For a summary, see "Selecting a time range" on page 308.

Applying Edit and Region menu operations

After you've selected a region, you can choose any command from the Edit or Region menu. Edit menu commands affect audio in the same way as MIDI. See chapter 40, "Edit Menu" (page 365) and

chapter 41, "Region Menu" (page 370) for details about these basic commands. Region menu commands affect audio as discussed below.

Region menu exceptions for audio

The Transpose command has the ability to transpose the pitch of audio, with or without formant correction. For details, see "Transpose" on page 371 and chapter 62, "Transposing Audio" (page 547).

Some Region menu commands that affect timing (such as Retrograde) only affect the placement of soundbites—that is, the attack time of the soundbite. They do not have an effect on the audio data within the soundbite. For example, if you use Reverse Time over a region containing a soundbite, the soundbite audio data does not play backwards like a reversed sample. Instead, the placement of the soundbite within the region is modified, along with other soundbites and MIDI note data, according to their attack times within the region. To reverse the audio in the soundbite, you would use choose *Audio menu> Plug-ins> Reverse*. For details about Reverse Time, Retrograde, and other Region menu commands for MIDI, see chapter 41, "Region Menu" (page 370).

TRACK GROUPS

Performer Lite allows you to create an unlimited number of track groups, and tracks can be linked for mixing, editing, both, or for a customized set of operations that you specify. Tracks can be a member of more than one group. Groups can also be "nested" within each other. For further details, see "Track Groups" on page 92.

VIEW MENU

The View menu provides many useful shortcuts for controlling what you see in Performer Lite's windows and how information is displayed.

Show/Hide Tracks

The View menu provides several commands for showing and hiding tracks in any Performer Lite editor that can display multiple tracks, such as the Sequence Editor, Mixing Board or Notation Editor window.

When using these commands, it can be useful to open the Track Selector to get an overview of the results.

☛ To zero in on just the tracks you want, it can be useful to start out with all tracks hidden: choose *View menu > Hide Tracks > All.*

Each Show/Hide Track command provides a sub-menu that allows you specify which tracks you wish to show or hide. For example, if you choose *Show Tracks > Play Enabled*, all currently play-enabled tracks will be shown.

Showing and hiding is a one-shot operation; in other words, these commands are not checkable (i.e. "sticky"). Instead, they produce a result for the currently active (focused) window, at the moment you choose the command. You can then further adjust what is shown or hidden using additional consecutive show/hide command(s), or by using the track selector.

When using several show/hide commands consecutively, the effect is cumulative, which allows you to fine-tune the track display.

Show Tracks

The *Show Tracks* command "unhides" the type of track you choose from the sub-menu. The visibility of any other tracks remains unchanged. This command is good for adding tracks to the display.

Show Only Tracks
The *Show Only Tracks* command "unhides" the type of track you choose from the sub-menu and hides all other tracks. This command is good for "soloing" the type of track you choose from the sub-menu.

Hide Tracks
The *Hide Tracks* command hides the type of track you choose from the sub-menu. The visibility of any other tracks remains unchanged. This command is good for hiding tracks you don't want to see, while leaving other track types visible.

Track Layouts

A *track layout* is a "snapshot" of which tracks are currently shown and hidden at the time it is created. The commands in the *Track Layouts* sub-menu let you create, name, rename and delete track layouts. To create one, show and hide tracks as desired and then choose *View menu > Track Layouts > Save Track Layout As*. The resulting track layout appears by name at the bottom of the Track Layouts sub-menu, where you can choose it to recall the layout. Saved track layouts also appear in the Commands window (Setup menu), where you can assign them to keyboard shortcuts. To view them, type *Track Layout* into the Commands window search field.

Show Only

The *Show Only…* commands in the View menu control the display of automation data and MIDI continuous controller data in the Sequence Editor.

When *Show Only the Active Edit Type* is checked, the Edit Layer menu (in the Sequence Editor track settings pane as shown in Figure 18-13 on page 129) control the type of automation data that will be visible.

To use the *Show Only Selected Types (Quick Filter)* command (to make it not grayed out), the following two conditions must be met:

- the *Show Only Active Edit Type* command is unchecked, and
- at least one MIDI controller event must be selected

If these two conditions are met, then choosing this command will "solo" the selected data type, temporarily hiding all others.

Show/Hide Lanes

The view menu provides several commands for showing and hiding automation lanes in the Sequence Editor ("Displaying automation lanes" on page 344). To activate these commands (make them not grayed out), make the Sequence Editor visible and active. Choose *Show All Lanes with Data* to expose any automation lanes that contain data of any kind. Choose *Show/Hide Lanes* to show all lanes or hide any currently visible lanes.

Grid

The commands in the Grid sub-menu show and hide various types of grid lines in the Sequence Editor.

Colors

The Colors sub-menu in the View menu lets you control track colors in Performer Lite. See "Track colors" on page 64.

ZOOMING

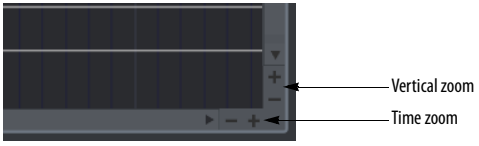
Zooming in the edit windows is similar to the zooming found in most computer graphics programs. When zooming in, objects become larger as the display magnifies a portion of the screen. When zooming out, objects shrink as the display encompasses a larger region.

There are many ways to zoom the edit windows, as explained in the following sections. Individual windows may also have additional zoom abilities; refer to the chapters on each window for more details.

Zoom buttons

The Time zoom buttons appear in the bottom right corner of the window. Zooming out (-) gives you an overview by compressing more time into the window; zooming in (+) focuses on a shorter period of time at a higher viewing resolution.

Some windows, such as the Sequence Editor, also have vertical zoom buttons to increase the height of the data you're viewing.



Zooming quickly by pressing

If you press continuously on a zoom button, the display will zoom continuously until you release the mouse.

Wiper zooming

In many windows that display the playback wiper, you can very quickly and conveniently zoom in and out by Control/Win-dragging vertically on the green playback wiper handle. For details, see "Zooming with the wiper" on page 272.

Zooming with the scroll wheel

If your mouse has a scroll wheel, you can use it to zoom. Simply position the cursor over the zoomable portion of an editor and hold down the option/alt key while spinning the scroll wheel.

Zooming with a track pad

If you have a track pad, you can use standard pinch gestures to zoom in and out.

Keyboard zooming shortcuts

Below are several keyboard shortcuts for zooming. In addition, all of the zooming shortcuts discussed in the next section ("Zoom menu shortcuts") have keyboard shortcuts, which are available in the Commands window (see chapter 29, "Commands" (page 257).

Shortcut	What it does
Command/Ctrl-left arrow	Zoom out horizontally.
Command/Ctrl-right arrow	Zoom in horizontally.
Command/Ctrl-up arrow	Zoom in vertically (track height or note grid).
Command/Ctrl-down arrow	Zoom out vertically (track height or the note grid).
Option/Alt key	When added to the above shortcuts, the Option/Alt key zooms all the way.

Zoom menu shortcuts

The *View menu* > *Zoom* sub-menu (Figure 34-1 on page 299) provides many useful options for magnifying or reducing the data displayed in graphic editors. Performer Lite offers completely unlimited zooming between the minimum and maximum horizontal zoom levels.

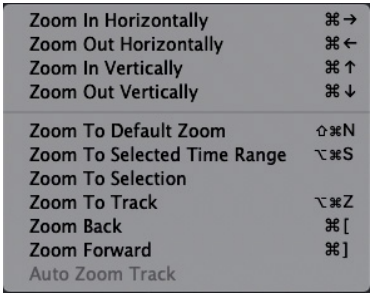


Figure 34-1: The Zoom menu in Sequence Editor mini-menus.

Zoom in/out

Zooming in (either vertically or horizontally) enlarges the data; zooming out reduces it.

Zoom To Default Zoom

Zoom To Default Zoom restores the original zoom level for the window.

Zoom to Selected Time Range
Zoom to Selected Time Range fits the current selection horizontally to the left and right edges of the window.

Zoom to Selection
Zoom to Selection fits the current selection both horizontally and vertically in the window in the Sequence Editor.

Zoom to Track
Zoom To Track fits the currently selected track in the Sequence Editor to the full height of the window.

Zoom Back and Zoom Forward
As discussed in "Zoom history and Zoom Forward/Backward" on page 300, the *Zoom Back* and *Zoom Forward* commands keep track of every zoom operation that you do since you first opened the Sequence Editor. Therefore, they allow you to step backwards and forwards through all of the different scrolling and zooming actions you've taken. Just keep choosing them over and over to work your way backwards or forwards.

Auto Zoom Track
When you select a MIDI track in the Sequence Editor and choose *Auto Zoom Track*, the vertical zoom level and vertical scroll of the track is automatically set, such that all MIDI note data in the track will be visible within the track's lane in the Sequence Editor. The track will continue to automatically zoom, even when edits are applied to the MIDI note data in the track, so that all notes always remain in view.

If, at any time, you manually zoom the track, perform pencil tool editing, or drag and drop material into the track, auto-zooming becomes disabled so that it doesn't interfere with your edits. When you are finished, you can re-enable it again by selecting the track and choosing the Auto Zoom Track command again.

Working with the zoom settings
The zoom settings let you store favorite zoom settings and easily restore them by choosing them from the menu (or pressing their key binding). To store a zoom setting:

1 Zoom the display the way you want.

2 Choose the desired *Set Zoom Setting* command in the menu.

To restore the zoom setting, choose the desired *Zoom to Setting* command.

Switching among 2 or 3 zoom settings
The zoom settings commands discussed above are ideal for zooming among several different zoom settings. For example, you might want to switch back and forth between the sample level and an overview level to consecutively make small sample edits and then audition them.

Zoom tool
The Zoom tool (magnifying glass) in the Tool palette lets you zoom in on a portion of the edit window by dragging a zoom box over it. In the time ruler or continuous data grid, drag horizontally to zoom the time axis only.

See "Zoom tool shortcuts" on page 247 for many Zoom tool shortcuts.

Zoom history and Zoom Forward/Backward
Performer Lite remembers consecutive zoom operations in a window. For example, if you zoom in three times consecutively to get a closer look at some data, Performer Lite remembers each zoom setting. You can then use Zoom Backward and Zoom Forward shortcuts to move forwards and backwards through these remembered zoom settings.

Zooming, Edit Resolution and nudging

Editing is allowed at any zoom setting. However, the current zoom level may affect the resolution at which events can be edited by dragging. For example, let's say that the Edit Resolution unit is set to 20 ticks. If you zoom way out, you will not be able to drag a note by only 20 ticks because one screen pixel, which is the smallest unit of movement on the computer screen, will equal a time value *greater* than 20 ticks. So, even if you move the note as little as possible, you will still have moved it more than 20 ticks.

In the example above, Performer Lite handles the situation by constraining location to *multiples* of 20 ticks. When you move the note, its new location will become the nearest multiple of 20 ticks, such as 80, 140, or 420 ticks.

If you need more precision, zoom in. Or, you can nudge data in precise increments at any zoom level use the arrow keys and the Nudge Amount window. See "Nudge" on page 358.

SCROLL TO

The Scroll sub-menu (View menu) provides two commands for scrolling immediately to the start or end of the current selection or file. The Scroll to File Start or End command applies to the sequence time line for edit windows.

GRAPHIC EDITING TECHNIQUES

Performer Lite has many powerful editing features. Most editing can be done with the mouse using familiar actions like clicking, dragging, and Shift-dragging. Such actions can shift data, change note pitch and duration, reshape continuous data curves, and more.

The sections below describe basic features that you will find helpful when working in Performer Lite's graphic environment.

Shift-drag to constrain

If you hold down the Shift key *before* you begin to drag a selection, the pointer's movement on the screen will be constrained to either the horizontal or vertical axis, depending on the initial direction of movement. For example, if you click the mouse, hold down the Shift key, and drag upwards, the mouse will only move up or down: it will not stray left or right.

Constraining mouse movement in this way is often extremely helpful. For example, if you want to modify just the pitch of a note without changing its location, the Shift key allows you to do so by preventing the mouse from moving left or right.

Option/Alt-drag to duplicate

Option/Alt-dragging an event (or several selected events) leaves the original data unchanged and places a copy of the data at the destination. Option/Alt-dragging is a convenient shortcut for copying and pasting.

Canceling while dragging

If you are in the middle of dragging, and you change your mind, you can press the escape key while dragging to immediately cancel the operation and restore the data to its original position, unchanged.

Shift-clicking to select non-adjacent events

Holding down the Shift key also serves as a useful way to select more than one event. For example, if you have already selected a note and you want to select another, scroll to the other note (if necessary) and Shift-click on it (but don't drag). It will highlight, and the first note will remain highlighted.

Other selection techniques

There are many other useful selection techniques. See chapter 35, "Selecting" (page 305).

Dragging multiple data types

The Shift-click method of selection allows you to simultaneously select and drag multiple data types.

For example, to move a loop containing notes, pitch bend data, and a patch change, select all four data types by Shift-clicking and drag them to a new location.

Nudging

The Nudge Amount (Snap Information window) lets you move selected data with the left and right arrow keys by any amount in any unit of measurement that you choose. See "Nudge" on page 358.

Using Edit Resolution

When the Snap to Grid check box is selected in the Snap Information window, data that is moved or inserted will 'snap' to positions corresponding to the current edit resolution setting. For example, if the current grid resolution unit is 240 ticks, events that are moved with the mouse will snap to positions at every 240 ticks on the grid. If the Snap to Grid check box is not checked, events will move freely. You can temporarily override the current grid setting by holding down the Command/Ctrl key as you drag. Snapping can occur either relative to the original position of the data event, or relative to an absolute grid based on the timeline's bars and beats. For further review, see "Snap Information" on page 357.

Using Undo

The Undo command in the Edit menu will undo the last action you executed. For example, if you move a note and then change your mind, you can choose *Undo Move* from the Edit menu and the note will return to its original position.

AUDIO EDITING BASICS

The following sections explain several important concepts to keep in mind when editing digital audio.

Soundbites in a track are 'clones' of the original

It is important to understand that soundbites in a track are "clones" of the original soundbite in the Soundbites list. They do not actually consist of the soundbite itself; they are a reference to the original soundbite. As a result, you can freely cut, copy, paste, duplicate, and re-arrange a soundbite in a track as much as you want without affecting or duplicating its original in the Soundbites list. On the other hand, if you change the soundbite's name or length, all instances will change, including the original.Interestingly, the original soundbite is itself merely a reference to something else: it is a pointer to the original audio data in the audio file. As a result, the amount of data that you generate by duplicating soundbites is insignificant, since soundbite data is merely a pointer to the actual audio data.

Non-destructive, destructive and constructive audio editing

When you edit audio, your edit operation is either non-destructive, destructive or constructive. A clear understanding of these terms will help you make better decisions about how to edit your audio. Here is a brief explanation:

Type of audio editing	Explanation
Non-destructive	Original audio data is preserved. Only pointers to the original audio data are modified. Example: trimming the edge of a soundbite in the Sequence Editor.
Destructive	Original waveform data is permanently modified. Example: normalizing audio.
Constructive	Original audio data is preserved on disk while being replaced in the Performer Lite project by new audio generated by the constructive editing operation. Example: applying an audio effect via the Audio menu.

Non-destructive Edit menu and Region menu editing

Edit menu and Region menu operations are *non-destructive* when applied to audio that has been selected in the Sequence Editor, except for the Transpose command in some cases. When using Transpose with the "Transpose audio by creating new soundbites", audio data is processed constructively, (where the original audio is replaced by newly processed audio.) See "Constructive editing" on page 543.

You can't mix audio and MIDI in the same track

In Performer Lite, you cannot mix the two data types together into one track. You can, however, edit both types of tracks simultaneously as described in the next section.

Editing audio and MIDI data simultaneously

As an integrated audio and MIDI editing environment, Performer Lite lets you to select audio tracks at the same time as MIDI tracks for simultaneous editing of audio and MIDI data. For example, you can select all tracks of an eight measure chorus, including audio tracks, to cut, copy, or paste the audio data along with the MIDI data.

Editing soundbites in the Sequence Editor

The Sequence Editor offers and advanced, graphic environment for audio editing and selection. See chapter 18, "Sequence Editor" (page 121).

SAMPLE ACCURATE EDITING

Performer Lite provides sample-accurate editing of audio and MIDI data. This capability affects Performer Lite's interface in several ways, as explained in the following sections.

The Samples time format

Performer Lite has a samples time format, which can be chosen for display in the program's main counter and auxiliary counters. It is also available as a time ruler in the editor windows.

If you display samples in the counter, it shows the number of digital audio samples from the beginning of the project. This number is, of course, dependent on the project's overall sample rate. For example, if the sample rate for the project is 44.1 kHz, and you cue the counter to 1 second, the sample counter will display 44,100 samples.

Figure 34-2: Performer Lite's sample counter.

Zooming in to the sample level for editing, trimming, nudging, etc. by sample

The Sequence Editor allows you to zoom in to the sample level to perform sample-accurate editing tasks. For example, you could place a soundbite — or even a MIDI note — at an exact sample location. (Note, however, that the *playback* of the MIDI event may not be sample accurate due to the timing resolution of MIDI hardware.) You can also trim the edges of soundbites at the sample level, or select them and nudge them one sample at a time with the arrow keys. Audio playback is sample accurate, and you can even perform sample-accurate digital transfers to other devices, such as ADATs and Tascam digital tape recorders, if your hard disk recording hardware supports this feature, such as the MOTU 2408mk3 audio interface.

LISTENING WHILE EDITING

Performer Lite allows you to see *and hear* an individual MIDI note or phrase while you are working in Performer Lite's editing windows. MIDI notes can be played back one at a time by clicking on them individually or as a phrase by highlighting a region.

If you click on a note and don't hear anything, make sure that the output assignment for the track is set up properly. If the track plays back correctly when you press the Play button in the Control Panel, it will play notes while editing.

Playing individual MIDI notes

When you click on a note, the note will simultaneously select and play back on its MIDI instrument. The note sustains for as long as you hold down the mouse.

Playing phrases

Using the *Audition Selection* command (Region menu), it is also possible to audition any selection of MIDI and/or audio data.

To audition a selection:

1 Select the data. See chapter 35, "Selecting" (page 305) for details.

2 Choose *Audition Selection* from the Region menu, or press Option/Alt-spacebar.

When you audition the current selection, the tempo of the phrase is determined by the current tempo setting in the Control Panel. Auditioning can be stopped at any time by clicking or striking a key on the computer keyboard.

Playing MIDI chords

Performer Lite allows you to hear MIDI chords one note at a time, all at once, or only with selected notes. To listen to a chord one note at a time, click each note one at a time.

To hear the entire chord at once, highlight all of the notes and choose *Audition Selection* from the Region menu. To hear only selected notes within the chord, highlight only the notes you wish to hear.

Playing MIDI data other than notes

Only notes will play back when you highlight them. Other MIDI events such as controllers or pitch bend can be played with the audition feature. For example, to send a patch change to a MIDI instrument directly from the Sequence Editor, highlight the patch change and use the Audition Selection command (Region menu). System exclusive data cannot be auditioned. To play back a system exclusive event, press the Play button in the Control Panel.

CHAPTER 35 Selecting

OVERVIEW

Before you can edit anything in Performer Lite, you must first select it. Performer Lite provides many useful and powerful ways to make selections. After you've made a selection, you can apply Performer Lite's many powerful Edit menu and Region menu commands to whatever is selected.

This chapter shows you the many convenient ways to select data in Performer Lite. Except where noted, these techniques apply to any type of data (MIDI, audio, conductor track, automation, etc.)

Overview 305
Selection basics 305
Choosing a Pointer tool selection mode 306
Selecting events 307
Selecting tracks 307
Selecting a time range 308
Smart Selection 310

SELECTION BASICS

There are three ways to make selections in Performer Lite:

- Event selection — Selects specific events
- Time range selection — Selects a region of time, regardless of what is in the region

Selecting events

Event selection involves clicking (or dragging over) events in one Performer Lite's edit windows. The events become highlighted to indicate they are selected, and they can then be edited or otherwise modified.

Selecting a time range

A *time range selection* spans a certain period of time in one or more tracks, regardless of what data is in the region. In fact, time range selections can even be empty. For example, you could select four empty measures and actually copy them into the Clipboard — perhaps to splice the empty space somewhere in a track. Or, you could select two empty measures at the beginning of a track and then use the *Snip* command to remove them and move up everything else in the track to replace them.

Time range selections are always affected by Performer Lite's Smart Selection feature, which has an important impact on what happens when you make selections. So be sure to read "'Smart' Boundaries on Time Range Selections" on page 311.

Edit operations that require time range selection

There are a few commands in the Edit menu and Region menu that require time range selection: Snip, Repeat, Paste Repeat, Merge Repeat and Retrograde. These commands wouldn't be able to do anything useful without a clearly defined end time for the selection, which event selections don't provide. Therefore, these commands are grayed out if the current selection is an event selection. To use them, make a time range selection as shown later on in "Selecting a time range" on page 308.

The 'Smart Selection' feature affects time range selections

Performer Lite's Smart Selection feature (Edit menu) has an important impact on edits that you apply to Time Range Selections. The effects are

automatic, but you should definitely know about them so that you can use them to your benefit. For a summary, see "Smart Selection" on page 310.

Selections are global
After you have made any type of selection, the selection remains in effect until you either deselect or make another selection. The current selection appears in all edit windows. For example, if you highlight a few notes in the Sequence Editor, and then open the Notation Editor, the notes will be highlighted in the Notation Editor, too.

☛ The current selection remains in effect even if you close all edit windows. So be careful not to inadvertently edit hidden data. Always be certain about what the current selection is before using Edit and Region menu operations.

Applying successive edits to the selection
Data remains selected even after you apply an edit operation to it. This lets you easily apply successive edits to the same data.

Auditioning the current selection
To play back the current selection, choose *Audition Selection* from the Region menu.

CHOOSING A POINTER TOOL SELECTION MODE

Selection operations are made with either the Pointer tool or the I-Beam tool.

All selection operations made with the Pointer tool in the Sequence Editor depend on the Cursor Selection mode (*Preferences> Editing> Tools*). These modes control what will happen when you use the Pointer tool to make selections in these multi-track windows.

'Event & Phrase Selections only' (lasso mode)
In this cursor selection mode, clicking in empty space makes a lasso selection (data only). Clicking on individual soundbites, MIDI notes, or data points (such as MIDI controllers or automation) selects them.

When dragging to make a selection, you can drag both horizontally and vertically so as to specify a specific time and value range. When you finish dragging to make your selection and let go of the mouse, only the events themselves remain selected; the time range is not selected.

- Holding down the Control/Win key forces a lasso selection, even if you click a soundbite, unless the soundbite is selected, in which case you throw the soundbite.

- Additionally, holding control will cause the selection to span the entire vertical range of the track (for example, to select all MIDI notes in a region without having to drag vertically over all of them).

- Holding down the Control/Win and Option/Alt keys performs a time range (crosshair) selection.

'Range Selections only' mode
In this cursor selection mode, clicking anywhere except a selected soundbite or note performs a time range selection (with the crosshair cursor).

- Holding the Control/Win key down allows you to make a range selection even when clicking on a selected soundbite or note. (To perform a throw operation you must hold the Control/Win key down after you click.)

- Holding down the Control/Win and Option/Alt keys performs a lasso style selection.

'All Selections' mode
In this cursor selection mode, the Pointer tool is dynamic and will change depending on where it is positioned in the window. This mode gives you

the most immediate flexibility for selection operations. Clicking on individual soundbites, MIDI notes or other events selects them. Moving the cursor over empty space turns the cursor into a cross hair and initiates a time range selection. Holding down the Control/Win key forces a time range selection, even if you click on a soundbite, unless the soundbite is already selected, in which case you throw the soundbite. Option/Alt-Control/Win-clicking performs a lasso-style (event) selection.

SELECTING EVENTS

The following sections explain how to select events. For time range selection techniques, see "Selecting a time range" on page 308. Also see "Edit operations that require time range selection" on page 305 to learn about a few commands in Performer Lite that can't be applied to event selections.

Event selections are *not* affected by the Smart Selection feature in the Edit menu, even when it is turned on. For more information, see "Smart Selection" on page 310.

Using the Pointer tool for event selection

The Pointer tool in the Tools palette (Figure 27-1 on page 243) is used for event selections. Hold down the "a" key as a temporary shortcut for enabling the Pointer tool. Or double-tap the "a" key to permanently switch to the Pointer tool. With certain windows active, such as the Notation Editor, the Pointer tool is the only available tool.

Making an event selection in the Notation Editor

For information about selecting notes in the Notation Editor, see "Selecting notes for editing" on page 148.

Making an event selection in the Sequence Editor

Use the Pointer tool to make event selections in the Sequence Editor. Be sure that the Cursor Selection Mode (*Preferences> Editing> Tools*) is set to either *Event & Phrase Selections Only* or *All Selections*.

1 Choose the Pointer tool in the Tools palette (or, as a shortcut, double-tap the "a" key).

2 Place the cursor over the item you wish to select so that the cursor turns into an arrow or a pointing finger.

3 Click the event to select it.

SELECTING TRACKS

There are many reasons for selecting tracks. For example, to select data for editing or delete a track, you must first select the track. There are several methods for selecting tracks:

To select a single track, click on its name. It will highlight.

To select several adjacent tracks, press on a track name and drag over the desired names. All tracks dragged over will highlight. You can also click on the first track, the hold down the Shift key and click on a second track to select all tracks between the first and second tracks you clicked on.

To select several non-adjacent tracks, hold down the Command/Ctrl key and click on the names of the tracks you wish to select. They will highlight.

To deselect tracks when more than one are highlighted, hold down the Command/Ctrl key and click on the tracks you wish to deselect. They will unhighlight.

Selecting tracks for editing

The track selection techniques are also used to select data inside the tracks for editing with Performer Lite's powerful Edit and Region menu commands.

SELECTING A TIME RANGE

The following topics show you the many ways to select a time range. For event selection techniques, see "Selecting events" on page 307.

Time range selections are affected by Performer Lite's Smart Selection feature, which has an important impact on what happens when you make selections. See "Smart Selection" on page 310 for more information.

Time range selections in the Sequence Editor are affected by the edit grid, if enabled. For details, see "Snap to Grid" on page 357 and the edit grid controls in Figure 18-1 on page 122.

Selecting a time range in the Selection Information window

This method of time range selection allows you to make a selection containing any combination of tracks. It lets you specify the region numerically, which gives you a high degree of precision. It works with all Edit menu and Region menu commands.

1 Open the Selection Info window by clicking the "S" icon above the Sequence Editor.

2 Enter the desired start and end times.

3 Select the track or tracks that contain the region.

You now have a time range selection that includes all of the tracks you highlighted. Notice that the Sequence Editor reflects the selection.

Notation Editor allow event selection only

The Notation Editor does not provide for time range selections because it uses non-linear, engraver spacing to display MIDI events as music notation. Therefore, the Pointer tool can be used to make "marquee" selections over notes and other events (text, etc.) on the page.

Using the Pointer and I-Beam tools to make time range selections in the Sequence Editor

The Pointer and I-Beam tools in the Tools palette (Studio menu) can both be used to make time range selections in graphic editors, as explained in the following sections.

Selecting a time range in the Sequence Editor

Make a time range selection in the Sequence Editor with the I-Beam tool as follows:

To select this	Do this with the I-Beam tool
Within a single track	Drag horizontally in the track lane.
Across several adjacent tracks	Drag diagonally across the desired tracks.
Within several non-adjacent tracks	Make a time-range selection in one of the tracks and then shift-click anywhere in the lane of each track you wish to add to the selection. To remove a selected track, Command/Ctrl-click its track name.
Across all visible tracks	Drag horizontally in the Time Ruler.

Figure 35-1: Using the I-Beam tool to select non-adjacent tracks.

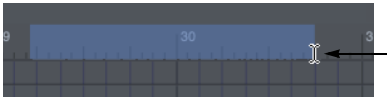
The selection modes ("Choosing a Pointer tool selection mode" on page 306) apply to Pointer tool selections, giving you quick access to a variety of selection techniques via a dynamically changing

cursor. For example, to select a soundbite, click near its (vertical) center with the pointer cursor. To initiate a time range selection in the middle of a soundbite, move the pointer to the bottom edge, where it turns into a cross hair.

Time Ruler selection techniques

There are several time-saving techniques for selecting data in the Time Ruler in the Sequence Editor:

- Drag horizontally in the lower half of the Time ruler with the I-Beam cursor. Shift-click to extend the selection. (If Snap to Grid is turned on, dragging will "snap" to the Edit Resolution grid.)



- Click one of the Memory Cycle end points (to select the time range between them).
- Click the Auto Record punch-in or punch-out end time (to select the time range between them).

Pasting into a time ruler selection

If there is data in the clipboard, you can use the Paste or Merge commands. Doing so pastes the clipboard contents into the same track (or tracks) it was copied or cut from starting at the beginning of the selected region.

Initiating time range selections with an insertion point

If you click the I-Beam tool anywhere in the Sequence Editor, an insertion point appears:

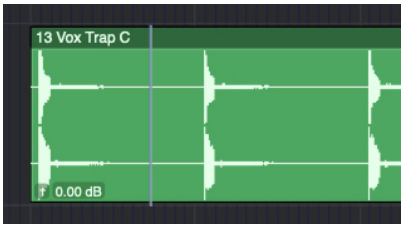


Figure 35-2: The insertion point in the Sequence Editor.

The insertion point can be placed in the Sequence Editor.

Modifying a time-range selection using the computer keyboard

The Commands window (Setup menu) has a large selection of shortcuts for manipulating selections. These commands can be used in the Sequence Editor.

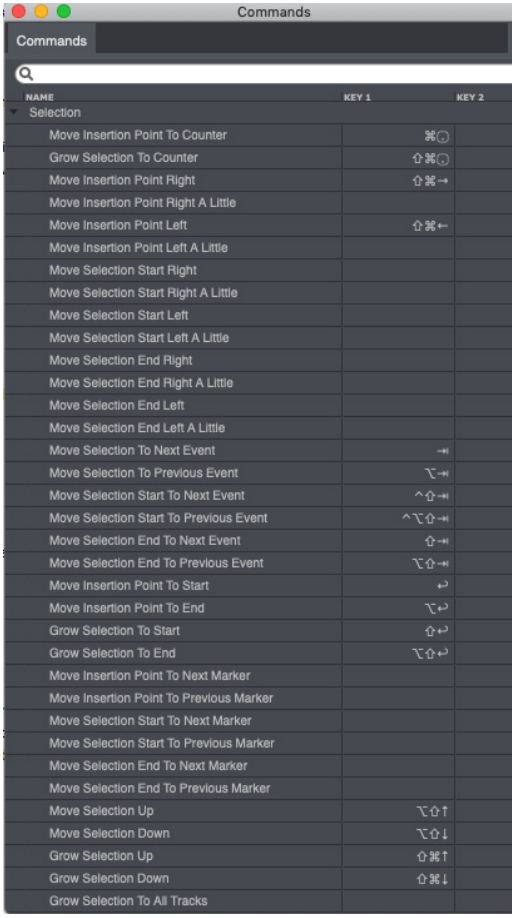


Figure 35-3: selection commands.

Modifying a time-range selection using the mouse

Shift-click (or Shift-drag) near the edge of the selection you want to adjust.

Listening to the current selection

To listen to the currently selected region, press Ctrl-spacebar. Doing so causes the selected region to play in its entirety.

The 'Remember Times' command

The Remember Times command (control-R), allows you to save a time range selection, so that you can load it into the Selection bar later on. You can also load remembered times into the Memory Bar and the Auto-Record Bar.

To use Remember Times:

1 Make any selection.

2 Press Control-R.

The start and end time of the current selection is stored by Remember Times.

To load the Remember Times into the Selection Bar, Memory Bar, or Auto-Record Bar, use the "Set to Remembered Times" command under the Selection, Memory, or Auto-Record menus.

SMART SELECTION

Performer Lite has a feature called *Smart Selection*, which affects Time Range Selections. (For an explanation of what a Time Range selection is, see "Selection basics" on page 305.)

The *Smart Selection* feature can be turned on or off in the Selections information panel (Figure 39-8 on page 360). Also see "Opening an information panel" on page 356.

What does the Smart Selection feature do when it is enabled? Generally speaking, it makes Time Range selecting and editing operations give you results that are more musical and intuitive. In a way, turning on Smart Selection is like telling Performer Lite, "Do what I *mean*, not what I *say*."

Performer Lite accomplishes this "musical intelligence" in a combination of separate, but related, ways. Below is a summary of Smart Selection features, followed by several sections explaining each feature in further detail.

- "Smart boundaries" on time range selections — this means that events that are a few ticks before or after the selection boundaries are either included or excluded, depending on what makes sense musically.

- Measure-relative pasting — allows you to place the playback wiper (or main counter) anywhere in the measure you want to paste into and data will be pasted at its original location within the measure. With Smart Selection turned off, data would be pasted at the exact tick location displayed in Performer Lite's main counter.

- Controller and pitch bend effects are maintained when cutting and pasting — this means that when controller and pitch bend data is added to or removed from a track via time range selection copying and pasting, Performer Lite maintains the effect of the controllers before and after the selected region by automatically generating and inserting new controller events into the track as needed.

- Barline placement is preserved when cutting and pasting in the Conductor track — allows you to freely cut, copy, and paste time range selections in the conductor track, even when it has lots of meter changes in it, without barlines getting out of alignment with existing music in the tracks.

'Smart' Boundaries on Time Range Selections

If *Smart Selection* is enabled, Performer Lite automatically allows for a bit of musically determined "slop" before and after the boundaries of a time range selection to account for notes and other events that occur a few ticks on either side of the selected region's boundaries (as shown in Figure 35-4 on page 311). If Smart Selection is turned off, the selection bar start and end times are hard and fast — an event that is even 1 tick outside the region is not included.

If you want precision, turn off Smart Selection. If you want musical results without fussing with details, turn on Smart Selection.

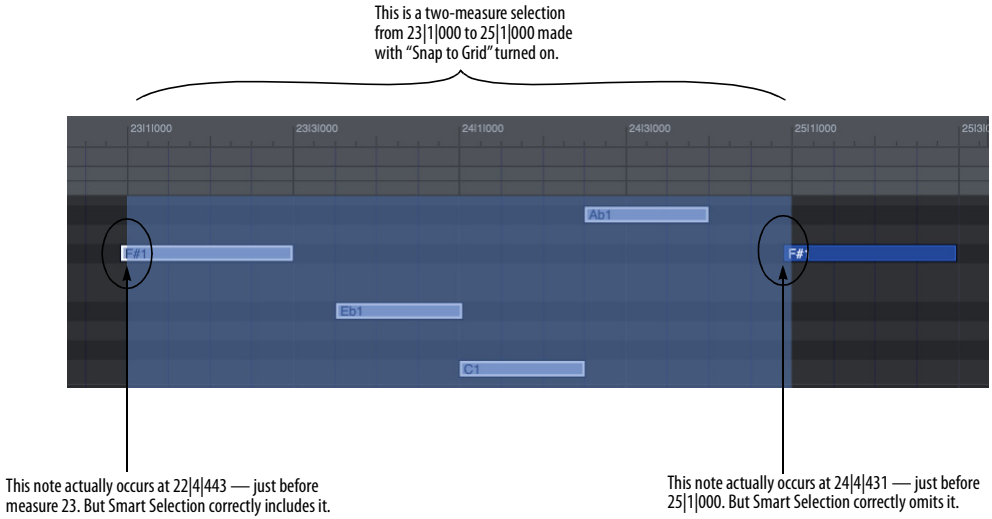


Figure 35-4: An example of how the Smart Selection feature affects time range selections.

Smart Selection must be turned on or off as desired *before* you make a selection. Turning it on or off does not affect *current* selections.

The Smart Selection feature affects all of the Time Range selection methods discussed in this chapter; it has no effect on event selections.

Measure relative pasting
In general, when you paste, Performer Lite pastes at the location currently displayed in the main counter (and also indicated by the playback wiper in windows that have it) — along with one additional condition: if Performer Lite's *Smart Selection* feature is *turned off*, material is pasted at the exact tick location shown in the counter. If Smart Selection is *turned on*, material is pasted *measure relative*, which means that it is placed in the measure at its original location within the measure, so that you don't have to worry about exact placement of the counter. Just get the counter anywhere into the measure you want and paste.

Pitch bend and controller effects are preserved
Whenever you insert a controller or pitch bend event into a track, it affects all notes after it for the rest of the track — or until the next controller in the track. Similarly, when you cut and paste pitch bend or controllers, you are removing from or adding them to the track, which will have an impact on all notes after the cut or paste area.

When Smart Selection is turned on, however, Performer Lite preserves all pitch bend and controller values after the cut or paste region, automatically adding pitch bend or controller events after the edit region as necessary to do so.

The end result is that you will never be surprised: the portion of the track *after* your edits will always sound the same as it did before your edits.

Barlines are preserved in the Conductor track
If Smart Selection is turned off, cutting and pasting time regions in the Conductor Track can get tricky — especially if you have meter changes in the area you are editing. For example, if you cut a meter change, you may find that barlines after the removed meter change are no longer correctly aligned with the notes they are supposed to be aligned with.

Smart Selection takes care of problems like these by making sure that meter changes you introduce by cutting or pasting will preserve subsequent measures and meter changes in the Conductor Track to ensure that nothing gets out of alignment by mistake. If you are cutting and pasting the Conductor Track, be sure to turn on Smart Selection.

CHAPTER 36 MIDI Editing

OVERVIEW

MIDI tracks and instrument tracks in a Performer Lite sequence can be viewed and edited in the Sequence Editor. MIDI and instrument tracks display notes, velocities, and MIDI *continuous controller* (CC) data on a scrolling, piano-roll graph that makes melodies, chords, dynamics, and tempo changes easy to recognize.

Before proceeding with this chapter, be sure to review chapter 12, "MIDI Tracks" (page 73) and chapter 13, "Instrument Tracks" (page 82).

Overview 313
Quick Reference 314
Tool palette quick reference 315
Accessing a MIDI track 315
MIDI editing basics 315
Selection techniques 315
The Edit Layer 316
The Clips and Notes edit layers 316
The MIDI note grid 316
The Pitch Ruler 317
Inserting Notes 317
Selecting Notes 318
Editing Notes 319
Editing MIDI CC data 320
Three controller display modes 321
The MIDI CC Ruler 322
Changing MIDI CC colors 322
Note velocities 323
Editing MIDI CC's in Points or Bars mode 323
Editing CC data in Lines mode 325
Per-note continuous controller data 327
Discrete MIDI events 328

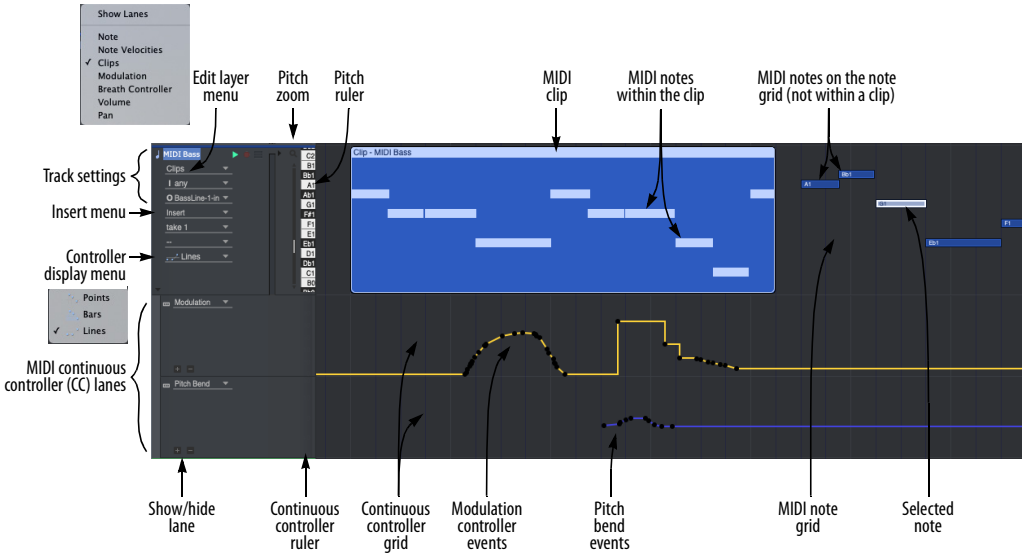


Figure 36-1: MIDI tracks provide a powerful, "piano-roll" style environment for viewing and editing your music. The tools in the Tool Palette are an important component of working with MIDI tracks.

QUICK REFERENCE

Pitch Ruler: Measures pitch along the vertical axis with a standard keyboard format. Each C-natural indicates the octave. For clarity, shaded lines extend to the right from each black key. With the Pitch Zoom menu, this ruler can zoom to increase or decrease the number of visible octaves.

Edit Layer: Lets you choose the type of data you wish to view and edit in the track lane. Option/Alt click the menu to change all tracks at once.

Pitch Zoom: Zooms the pitch ruler. Zooming out allows you to see more octaves at once. Zooming in allows you to focus on a particular pitch range.

Pitch Zoom: Zooms the pitch ruler. Zooming out allows you to see more octaves at once. Zooming in allows you to focus on a particular pitch range.

MIDI clip: MIDI notes are encapsulated within clips, which can be moved and manipulated as a single phrase. Drag the clip to move it. Double-click to open the Clip Editor. See "Clip Editor" on page 207. Also see "Working with Clips" on page 341.

MIDI notes on the note grid: If you want, you can unpack MIDI notes from their clip to view and edit them independently. See "Unpacking clips" on page 342.

Track settings: This panel displays basic settings for the MIDI track. See "MIDI track settings" on page 74.

Insert menu: Lets you choose the type of data to be inserted with the Pencil tool.

Controller display menu: This menu lets you choose among three ways to display continuous controller data: Points, Bars and Lines.

MIDI continuous controller (CC) lanes: Displays continuous controller (CC) data, such as pitch bend, key pressure and controllers. Note velocities can also be displayed. Choose the desired data type from the lane's menu.

Continuous controller ruler: Measures CC data events on one of two different scales, depending on the data type: a controller scale from 0 to 127, whose origin rests at the bottom of the lane or a pitch bend scale from -8192 to 8191, whose origin appears in the middle of the lane.

Continuous controller grid: Displays MIDI CC data on a time vs. value grid. Data appears as lines, points or bars, depending on what you've chosen in the controller display menu. An event's location is measured by the Time Ruler at the top of the window. Its value is determined by the CC data Ruler on the left.

Note Grid: Displays notes as horizontal bars on a time vs. pitch grid. Pitch is determined vertically by the pitch ruler on the left. Location and duration are measured by the Time Ruler above, with duration determined by the length of the bar. If the *Shade notes using velocity* MIDI Editing preference is checked, a note's velocity is indicated by its shading. (Darker means a higher velocity; lighter means lower.) Notes can be edited with the mouse one at a time, in a group, by region or together within a clip.

Selected Note: When a note is selected, it highlights. Complete information about the selected note appears in the Information Bar at the top of the window. Drag the end of the note to change its duration.

TOOL PALETTE QUICK REFERENCE

The following tools (Figure 27-1 on page 243) can be used for MIDI editing.

Pointer: Use the pointer to select data, move data and lengthen or shorten notes.

I-Beam: Use the I-Beam tool to make time range selections.

Pencil: Use the Pencil tool to insert data or erase existing notes.

Reshape: Use the Reshape tool to reshape existing controller data using one of the curves in the curve menu just to the left of the Reshape tool.

Pencil/Reshape Curve: Determines the shape of the CC data that you insert with the Pencil or modify with the Reshape tool.

Reshape mode: Determines what the Reshape tool does to CC data: set it to a specific value, add to it, subtract from it, scale it or limit it.

Zoom: Click or drag to enlarge the note grid. Option/Alt-click to zoom out. Option/Alt-Shift-click to zoom backwards (through previous zoom levels). Option/Alt-Control/Win-Shift click to zoom forwards.

Mute: Temporarily mutes or unmutes a note or clip.

Scissors: Click on a note or clip to split it. Click on the note grid to split all notes at that location. With the edit grid enabled, drag over a note or clip to split it into subdivisions equal to the current edit grid. Or drag across the note grid to split all notes into subdivisions.

Velocity: Click on a note and drag up or down to adjust its velocity. Swipe horizontally in the CC data grid to adjust multiple note velocities in a single gesture.

Hand: Allows you to scroll the note grid and CC data grid smoothly and precisely, vertically and horizontally in a single gesture. Simply click anywhere in the grid and drag as desired.

ACCESSING A MIDI TRACK

To access a MIDI track in the Sequence Editor, click its name in the track selector (Figure 7-3 on page 43) to highlight it.

MIDI EDITING BASICS

In a MIDI track, the piano-roll display for notes and the CC data grid for controllers and pitch bend allows you to manipulate MIDI data using many of the standard conventions established over the years by graphics programs such as clicking, dragging, and shift-dragging. For example, you can insert a note with the pencil tool or drag it with the arrow tool to change its location and lengthen it by dragging its end-point. If the Snap grid is enabled, the note, when moved, will 'snap' to a time grid. You can select a group of notes by dragging a selection marquee over them. When you release the mouse, notes inside the box will become selected.

For a summary of Performer Lite's basic graphic editing techniques, see "Graphic editing techniques" on page 301.

There are, however, many additional powerful features covered in the rest of this chapter.

SELECTION TECHNIQUES

Performer Lite offers a variety of ways to select MIDI data. After MIDI is selected, you can apply Performer Lite's many powerful editing operations. For a complete discussion of selecting techniques, see chapter 35, "Selecting" (page 305). This chapter also explains additional selection techniques specific to MIDI data.

THE EDIT LAYER

In the Sequence Editor, each type of MIDI data resides in its own edit layer (Figure 36-1 on page 313), which you can make *active* (bring to the front) while other layers remain dimmed or hidden in the background. For further information, see "The Edit Layer" on page 62.

THE CLIPS AND NOTES EDIT LAYERS

In Performer Lite, MIDI notes can be encapsulated together with other notes into singular phrases called *clips*, which are accessed in the *Clips* edit layer shown in Figure 36-1 on page 313. Alternately, they can be "unpacked" from their clip to be viewed and edited as separate notes, accessed in the *Notes* edit layer in Figure 36-1). For details about editing clips, see "Working with Clips" on page 341. The following sections in this chapter cover working with individual notes, either in the *Notes* edit layer or in the Clip Editor ("The Clip Editor" on page 206).

THE MIDI NOTE GRID

In both the *Notes* and *Clips* Edit Layers (Figure 36-1 on page 313), MIDI notes appear on the MIDI Note Grid (also shown in Figure 36-1). The grid functions like a standard graph, where time extends horizontally from left to right and pitch stands vertically. Thus, the higher the pitch of a note is, the higher it will appear on the grid. The later a note occurs, the farther to the right it will appear on the grid.

The time and pitch axes are measured with a Time Ruler at the top of the Sequence Editor and a Pitch Ruler to the left of the grid. The rulers indicate the exact location and pitch of notes. Grid hairlines extend from each ruler to aid you in determining a note's position.

The vertical scroll bar just to the left of the Pitch Ruler moves the pitch axis up and down over the entire MIDI note range. By scrolling, you can view any time range of the track at any pitch range.

Adjusting the size of the Note Grid

To adjust the size of the Note Grid, resize the track, as explained in "Resizing tracks" on page 130.

Viewing notes that are out of view

The note grid can give you a visual indication of notes that are currently above or below the pitch range currently being viewed in the note grid (Figure 36-2). To enable this feature, enable the *Show Notes When Scrolled Off-screen* MIDI Editing preference (page 253). You'll then see small notes at the top and bottom edge of the note grid at any location where notes are currently off-screen.

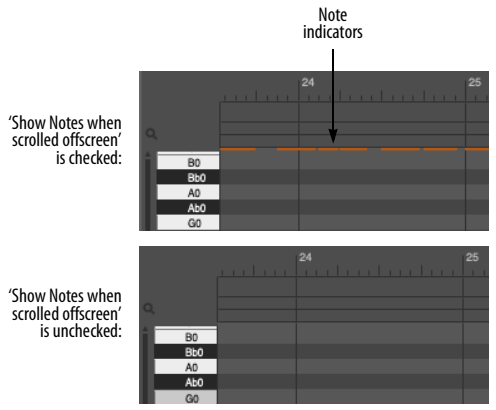


Figure 36-2: Viewing notes that are currently scrolled above or below the note grid.

Displaying notes

Notes are displayed as horizontal bars. The vertical position of the bar indicates pitch. The left end of the bar indicates where the note begins, and the right end indicates where the note releases. The length of the bar represents the note's duration. All of these characteristics can be determined by the Time Ruler above the grid and the Pitch Ruler to the left.

Note-on and note-off velocities can be displayed in one of three places: the *Note velocities* edit layer (Figure 36-1 on page 313), the *Note velocities lane*

(Figure 36-1 on page 313) or directly inside the note itself as a horizontal "velocity thermometer". See below and "Note velocities" on page 323.

MIDI note display preferences

There are several preferences for controlling how MIDI notes are displayed. For example, you can display the MIDI note number and on-velocity bar inside the note, as shown in Figure 36-3. See "MIDI Note Display" on page 253.

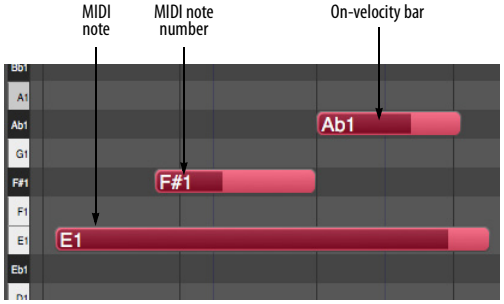


Figure 36-3: MIDI note display preferences.

THE PITCH RULER

The Pitch Ruler lies vertically to the left of the Note Grid and measures pitch. It resembles a standard piano keyboard. Because the entire ruler cannot fit in the window at once, a vertical scroll bar is provided to the left of the pitch ruler to allow you to scroll up and down through the entire MIDI pitch range. Octaves are indicated on each C-natural key.

Zooming the Pitch Ruler

To zoom the pitch ruler, use the Pitch Zoom control (Figure 36-1 on page 313) as shown below in Figure 36-4. Zooming out reduces the height of each pitch, allowing you to see more octaves at once; zooming in enlarges the height of each pitch, allowing you to focus on a particular pitch range.

Time and Pitch can be zoomed independently. For example, you can zoom out the Time Ruler to see more measures at one time, and zoom in the Pitch Ruler to focus on a specific pitch range.

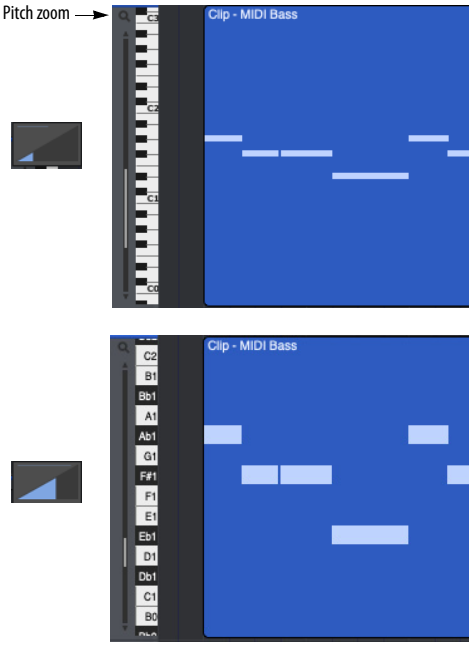


Figure 36-4: Note grid zoom control.

You can also zoom the note grid with the scroll wheel on your mouse or the track pad on your laptop. See "Zooming with the scroll wheel" on page 299 and "Zooming with a track pad" on page 299.

INSERTING NOTES

To insert a note:

1 If desired, set the Snap Grid (see "Snap Information" on page 357).

2 Click the Pencil tool in the Tool palette (Figure 36-1 on page 313), or hold down the "p" key on your computer keyboard.

3 Click in the note grid at the desired location, and then drag vertically to specify the pitch while dragging horizontally to specify the duration.

4 Repeat as desired.

Inserting two or more notes of equal duration

After specifying a duration with the first note inserted, you can insert more notes of the same duration simply by clicking.

Erasing notes with the Pencil

To erase an existing note, click it with the Pencil.

Inserting a note using a MIDI keyboard

To determine the pitch of a note by playing the note on your MIDI keyboard or pad controller when you insert it:

1 Make sure that *MIDI Edit* is checked in the Sequence Editor menu (Figure 18-4 on page 124).

2 Insert a note with the Pencil tool as described in the previous section—except that you do not need to pay attention to the pitch, just the duration.

3 With the inserted note still selected, press any key on your MIDI keyboard.

The inserted note will move to the pitch that you choose. The inserted note must still be selected from the previous step for this step to work. If you press the wrong note, try again. You can keep changing the note's pitch in this fashion as long as the note remains selected.

Inserting a chord with a MIDI keyboard

To insert a chord from your MIDI keyboard with the Pencil tool:

1 Make sure that *MIDI Edit* is checked in the Sequence Editor menu (Figure 18-4 on page 124).

2 Hold down the desired chord on your MIDI keyboard or controller.

3 While holding down the chord on your MIDI keyboard or controller, click in the note grid with the Pencil tool.

The chord is inserted where you click. You can change the notes in the chord while still holding down the mouse.

SELECTING NOTES

This section describes how to select notes individually on the Note Grid. To learn how to select an entire time range, see "Selecting a time range in the Sequence Editor" on page 308.

Selecting a note

To select a note on the Note Grid, click it with the Pointer tool (Figure 36-1 on page 313). The note becomes highlighted to indicate that it is selected.

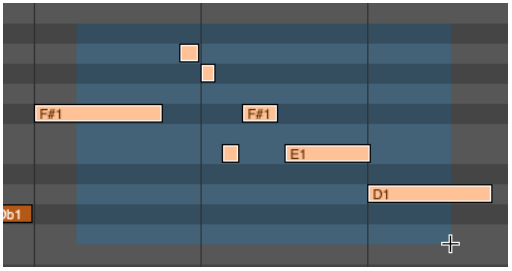
Selecting a group of notes

To select a group of events, shift click each one or drag over them as follows:

1 Click the Pointer tool in the Tool palette (Figure 36-1 on page 313).

2 Drag over the notes with the cross-hair cursor.

A highlighted box (marquee) indicates the selection area.



3 Release the mouse.

All notes within the selection box become selected, even if only a portion of the note lies within the selection box.

Using the Shift key to extend selections

You can add to the current selection by holding down Shift key when selecting individual notes or groups of notes as described in the previous two sections.

Selecting all notes of the same pitch

You can quickly select all notes of the same pitch in the note grid by double-clicking a key on the Pitch Ruler. Shift–double-click multiple keys to select discontiguous pitches. Shift–double-clicking selects or deselects without deselecting other events.

EDITING NOTES

The pitch, duration, and location of notes can be modified on the Note Grid in much the same way as objects in a graphics program. Note velocities can be edited in the CC data Grid.

Changing a note's pitch or location

To change a note's pitch or location:

1 Click the Pointer tool in the Tool palette.

2 Drag the note to the desired position.

When you begin dragging, an outline of the note will appear in place of the mouse pointer. Dragging the note vertically changes its pitch. Dragging the note horizontally changes its time location. Duration is not affected when dragging the entire note. When you release the mouse, the note will pop to the new location.

To help position the note in time, hairlines appear in the Time Ruler that show the attack and release of the selected note. In addition, the Pitch Ruler key that corresponds to the note's current pitch highlights as you move.

If you hold down the Shift key before you drag, the mouse will be constrained either vertically or horizontally, depending on which way you drag first. This allows you to change the note's pitch or location independently.

Canceling while dragging

If you are in the middle of dragging MIDI notes, and you change your mind, you can press the escape key while dragging to immediately cancel the operation and restore them to their original position, unchanged.

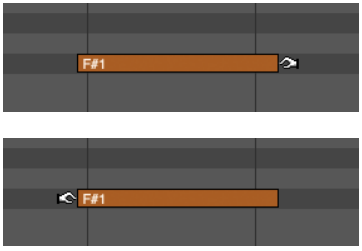
Nudging notes with the Left Arrow and Right Arrow keys

After a note or group of notes have been selected, you can nudge them earlier or later in the track using the Left Arrow and Right Arrow keys; see "Nudge" on page 358.

Changing a note's duration

To change the duration of a note:

1 Position the cursor near the right-hand tip or the left-hand tip of the note.



2 Drag left or right to shorten or lengthen the note.

Changing a note's pitch using a MIDI keyboard or controller

To change the pitch of a note with your MIDI keyboard or controller:

1 Make sure that *MIDI Edit* is checked in the Sequence Editor menu (Figure 18-4 on page 124).

2 Click the note once to select it.

3 Press any note on your MIDI keyboard or controller.

The selected note will change to the pitch you play. This can also be done with more than one note selected. This is a quick way to convert a group of different notes to the same pitch.

Editing a group of notes

Editing a group of notes is similar to editing a single note.

1 Select the notes that you wish to edit as described in "Selecting a group of notes" on page 318.

2 Click one of the notes and drag it to a new position. All of the notes will move together. When you begin dragging, an outline of the notes will appear in place of the mouse pointer.

3 To change the duration of all selected notes, drag either edge of one of the selected notes.

Changing two or more notes to the same pitch

To convert a group of selected notes to the same pitch:

1 Make sure that *MIDI Edit* is checked in the Sequence Editor menu (Figure 18-4 on page 124).

2 Select the notes as described in "Selecting a group of notes" on page 318.

3 Press any note on your MIDI keyboard or controller.

The selected notes will change to the pitch you play.

Hearing notes when editing them

When you click notes or drag them, you will hear their pitch.

Temporarily muting notes

To temporarily mute or unmute a MIDI note, click it with the Mute (X) tool (Figure 27-1 on page 243).

EDITING MIDI CC DATA

A MIDI continuous controller (CC) is a MIDI message capable of transmitting a range of values, usually 0-127. The MIDI Spec defines 128 different continuous controllers (identified by their number) per MIDI channel. CC's are commonly used for things like MIDI volume (#7), pan (#10), data slider position (#6), mod wheel (#1) and other variable parameters. A continuous stream of CC events that gradually change their value over time allows you to capture, create and fine-tune smooth, expressive changes.

Each type of MIDI CC data can be inserted and edited in its respective Edit Layer (Figure 36-1 on page 313). Each type of data has its own Edit Layer.

MIDI CC basics

The Edit Layer for MIDI CC's functions like a standard *X* and *Y* coordinate graph, in which time lies on the horizontal axis and value along the vertical axis. The higher the value of a CC data event is, the higher it will appear on the grid. The later the event occurs, the farther to the right it will appear on the grid. Grid lines extend from the Time ruler to help in determining an event's position.

Adjusting the size of the controller data grid

To adjust the size of the controller data grid, resize the track, as explained in "Resizing tracks" on page 130.

Zooming the controller data grid

See "Zooming" on page 298.

Displaying MIDI CC data lanes

To display MIDI CC data in a separate lane below its parent track, choose *Show Lanes* from the Edit Layer menu (Figure 36-1 on page 313), or click the expansion triangle at the bottom of the track settings pane (also shown in Figure 36-1). The separate lanes function in a similar fashion to the MIDI CC data Edit Layer, except that they allow you to view and edit multiple data types simultaneously, rather than one at a time.

If the track has per-note CC data (for polyphonic aftertouch or MPE data), and you wish to edit the per-note data in the lane, check the *Edit Per Note Events* box in the lane (Figure 36-16 on page 328). To view the note's per-note data, choose the data type from the lane's menu and then click a note to select it. Doing so causes the note's per-note data to appear in the lane, and the note's pitch is indicated in the menu. You can set up multiple lanes to view multiple data types simultaneously.

☛ There is a shortcut for opening per-note CC data lanes in the Sequence Editor, double-click a note that contains per-not data. However, to enable this shortcut, you need to set the MIDI Editing *Double-Click* preference (page 254).

See "Per-note continuous controller data" on page 327 for additional information about editing per-note CC data.

For further information about lanes, see "Displaying automation lanes" on page 344.

THREE CONTROLLER DISPLAY MODES

The Edit Layer for MIDI CC data provides three modes for displaying continuous controller data: Points, Bars and Lines (Figure 36-1 on page 313).

Points

In Points mode (Figure 36-5), a CC data event is displayed on the grid as a colored dot. Pitch bend data, aftertouch, velocities, and controllers each have a unique color. When they are selected, a stalk extends to the origin (zero).

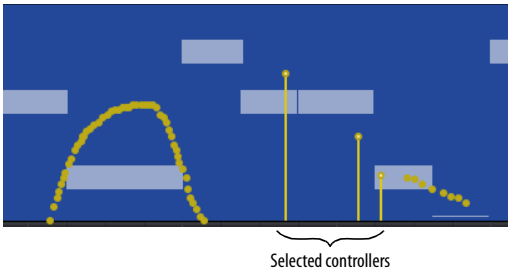


Figure 36-5: Points mode.

Bars

Bars mode (Figure 36-6) is similar to Points mode except that a colored bar extends to the right from each event, allowing you to see the current value for each type of controller, even in portions of the track where no events of that type reside. Bars mode is a more accurate representation of what will happen during playback because the current value of each type of controller is always maintained in the track, regardless of where playback begins.

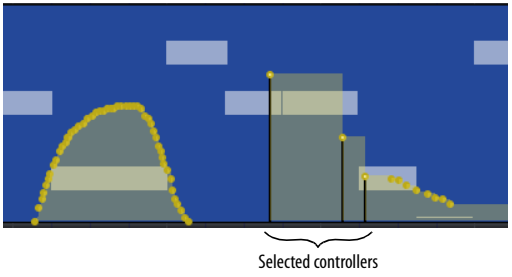


Figure 36-6: Bars mode.

Each type of CC data has its own color for the bars. See “Changing MIDI CC colors” on page 322.

Lines

In Lines mode (Figure 36-7), Performer Lite employs sophisticated interpolation to draw a line that closely approximates the contour of individual controller events.

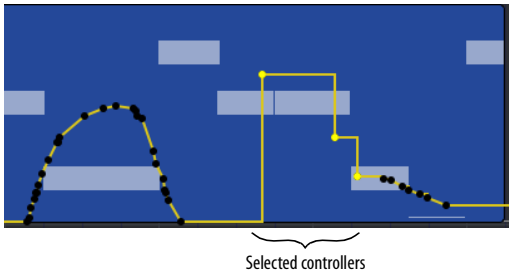


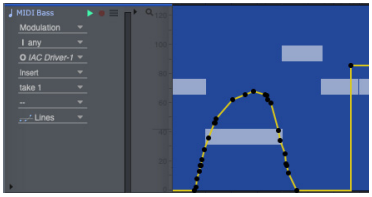
Figure 36-7: Lines mode.

THE MIDI CC RULER

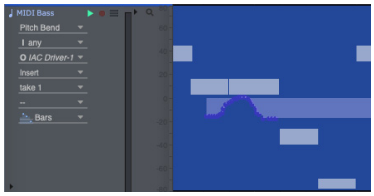
All MIDI CC data has a value range from 0 to 127 except pitch bend, which has a value range from -8192 to 8191. Therefore, two scales are provided:

- A controller scale from 0 to 127, whose origin rests at the bottom of the track.
- A pitch bend scale from -8192 to 8191, whose origin appears in the middle of the track.

1. Controller scale



2. Pitch bend scale



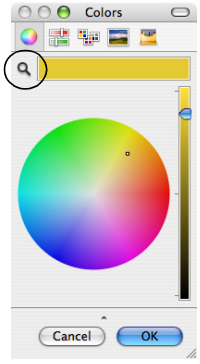
CHANGING MIDI CC COLORS

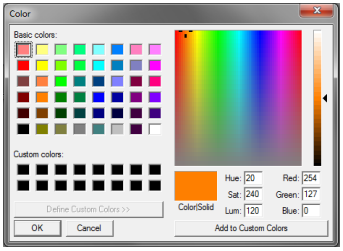
To change a MIDI CC color:

1 Select at least one event of the controller data type you wish to change.

2 From the View menu, choose *Colors>Set Continuous Data Color*.

The standard macOS or Windows color picker appears. Choose the desired color and click OK.





Clearing a continuous data color

To clear a controller data color (so that it matches the track color), select at least one event and then choose *Colors>Clear Continuous Data Color* from the View menu.

Reverting to a default color

To revert to the default color for a controller data type, select at least one event and then choose *Colors>Reset Continuous Data Color to Default* from the View menu.

NOTE VELOCITIES

Note-on velocities are displayed and edited in the *Note Velocities* layer (Figure 36-8). If a note is selected, its velocity icons will be selected with the note.

If notes are inside a clip, switch to the Clip Edit Layer and double-click the clip to open the Clip Editor, where you can edit the velocities there.

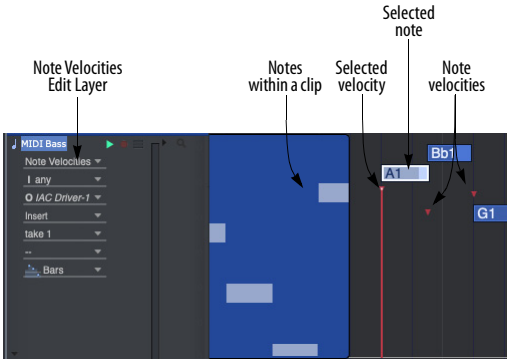


Figure 36-8: NIDI note velocities.

Displaying on-velocities in this manner allows you to edit them in the same ways as CC data. For example, you can create a crescendo or decrescendo simply by editing note velocities. See "Editing MIDI CC's in Points or Bars mode" on page 323 called for more information.

☛ Note velocities cannot be dragged horizontally (in time). To move them, drag the note itself (or its duration).

EDITING MIDI CC'S IN POINTS OR BARS MODE

The procedures for inserting, selecting and editing MIDI CC's are the same for both Points and Bars mode. Lines mode handles these operations somewhat differently, as explained later in "Editing CC data in Lines mode" on page 325.

Inserting CC data in Points or Bars mode

To insert CC data in Points or Bars mode:

1 Choose the Pencil tool in the Tool palette (Figure 27-1 on page 243), or hold down the "p" key.

2 If you will be inserting a stream of CC data events, choose the desired shape of the curve from the Pencil/Reshape Curve menu in the Tool palette (Figure 27-1 on page 243).

3 If you would like the curve shape you have selected to snap to beats or a similar metric grid, set the Edit Resolution and turn on the Edit Grid (see "Snap Information" on page 357).

Doing so constrains periodic waveshapes to the resolution of the edit grid. For example, if the Edit Grid is set to a quarter note, and you insert a sine wave, the sine wave will cycle once each quarter note.

4 Choose the desired data type from the Insert menu shown below in Figure 36-9.

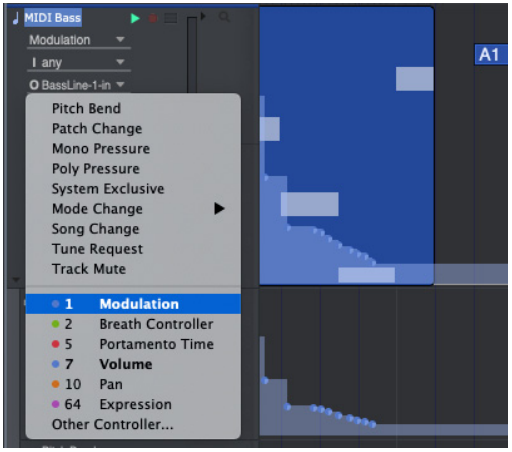


Figure 36-9: The Insert menu.

5 Insert data as follows:

To do this:	Do this:
To insert a single event	Click on the grid with the Pencil.
To insert a stream of events	Drag the Pencil. A stream of data is inserted according to the curve shape that you chose in the Tool palette. You can conform to a beat grid with Edit Resolution as explained in "Constraining a periodic waveform to beats" on page 324, and you can use the waveform modifier keys described in "Using modifier keys to control period, phase, and other waveform parameters" on page 324.

Constraining a periodic waveform to beats

To insert a CC data periodic waveform that conforms to a rhythmic grid (quarter notes, eighth notes, etc.), set the edit grid to the duration that equals one complete period of the waveform. This forces the waveform to conform to the grid duration you specify.

Using modifier keys to control period, phase, and other waveform parameters

When inserting (or reshaping) CC data using a waveform shape, you can hold down modifier keys while dragging to change waveform parameters as follows:

To control this:	Hold down this key:
Toggles grid snapping (on/off)	Command/Ctrl key
Phase	Option/Alt key
Duty cycle • Triangle wave skew • square wave pulse width • sine wave pulse width	Control/Win key
• Periodic frequency • Random curve density	Shift key
To re-use the last settings for sine, triangle, square, random steps or random ramps	Escape key

Selecting CC data in Points or Bars mode

To select CC data in Points or Bars mode:

1 Click the Pointer tool in the Tool palette (Studio menu).

2 Make a selection as follows:

To do this:	Do this:
To select a single event	Click it with the pointer cursor. A stalk is drawn from the icon to the origin of the CC data graph.
To select several events	Drag over the events in the grid with the cross-hair cursor.
To select a CC data curve	Drag over the curve with the cross-hair cursor.
To select all events of one type	Double-click one event.
To add to the current selection	Hold down the Shift key while using any of the selection techniques above.
To deselect events	Hold down the Shift key while using any of the above techniques on selected data.
To deselect all data	Choose *Deselect All* from the Edit menu or press its keyboard shortcut. Or click once in any empty area in the grid.

Dragging events in Points or Bars mode

To change the value or location of CC data events in Points or Bars mode:

1 If desired, set the Edit Resolution (see "Snap Information" on page 357).

2 Choose the desired data type from the track's Edit Layer menu (Figure 36-1 on page 313).

3 Click the Pointer tool in the Tool palette.

4 If you are modifying a single event, drag its icon to a different position or value.

Hold down the Shift key to constrain vertically or horizontally. For exact positioning, refer to the Cursor Information box and the rulers.

5 If you are modifying several events, select them first as described in the previous section, and then drag one of the selected events.

Scaling by dragging

If you hold down the Control/Win keys when dragging selected continuous controllers, they are scaled in value (vertically) and time (horizontally).

Editing the value of an event using a MIDI keyboard (or controller) in Points or Bars mode

To change the value of an event with your MIDI keyboard or controller:

1 Make sure that "MIDI Edit" is checked under the Sequence Editor mini-menu.

2 Click the event with the Pointer tool to select it.

3 Transmit a corresponding event from your MIDI keyboard (or controller).

For example, if you have selected pitch bend event, move the pitch bend wheel on your controller and the event will change to the new value you set with the wheel.

4 When you have entered the value you wish, press the Return key or the mouse to confirm the new value.

Reshaping data curves

You can modify CC data with the Reshape tool. For example, you can scale, compress or limit it.

For complete details on the Reshape tool, see "Reshape tool" on page 246.

EDITING CC DATA IN LINES MODE

Lines Mode attempts to represent a stream of CC data events as a straight line between two points, similar to the breakpoint automation display in audio tracks. This allows you to view and modify continuous MIDI data in a similar fashion as audio automation data. However, MIDI CC data is fundamentally different than audio automation data: MIDI data consists of a stream of individual events, as shown below in Figure 36-10, whereas audio automation data consists of two points that prescribe a ramp. It is very important to keep this distinction in mind when working in Lines Mode because, as explained in the next few sections, MIDI Lines Mode does not always act the same way as audio automation.

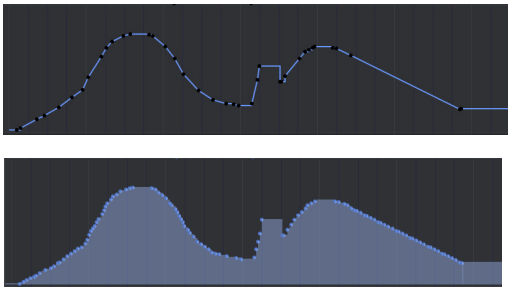


Figure 36-10: Volume controller data displayed in Lines Mode and Bars Mode. Notice the stair-steps in Bars mode—a more accurate representation of the MIDI events that underlie the points and lines in Lines Mode. Lines Mode can be convenient for inserting and editing CC data, but Bars mode tells you 'what's really going on' with the individual events.

MIDI data versus audio ramps

The lines and points in Lines Mode look very similar to ramp automation in audio tracks. Editing MIDI CC data in Lines Mode is very similar to audio track break-point automation. However, in the CC data grid, these lines are based on individual MIDI events, as you can see above in Figure 36-10. If you switch to Points or Bars mode, you can see the individual events at any time.

Because MIDI CC data is really a stream of individual events, as opposed to audio automation ramps, which are straight lines calculated with single sample-accuracy between control points, you may sometimes encounter stair-steps and other situations that do not occur in audio tracks. Again, you can always switch to Bars mode for a more clear idea of what's going on with the events that lie beneath the lines.

Points, stair-steps and ramps

Lines Mode employs three elements to represent CC data streams: ramps, points and stair-steps.

Ramps

Ramps are straight lines drawn between two points. Lines Mode draws a ramp when CC data events are close enough and straight enough to be drawn as a line.

Points

A point consists of a CC data event that falls between two ramps that have different slopes. The point consists of an actual MIDI data event; by moving it such that it falls more in line with events around it, you can actually make it 'disappear' when it crosses the threshold for being interpreted as part of the ramp.

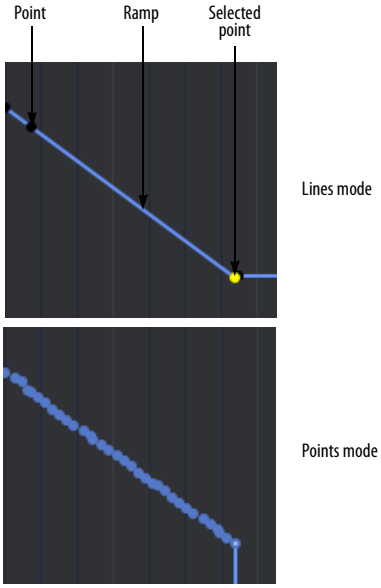


Figure 36-11: Ramps and points in Lines Mode. Notice that the selected point is actually a selected event (shown in Points mode).

Steps

Lines Mode displays a step (as shown below in Figure 36-12) when consecutive events are too far apart to be interpreted as a line. As you can see, a step gives you an accurate representation of the underlying data and the effect it will have when it is played back.

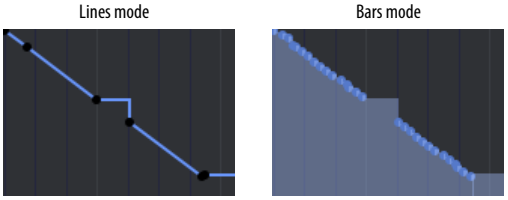


Figure 36-12: A step in Lines Mode.

Working with Lines Mode

Use the following techniques in Lines Mode:

To do this:	Do this:
To insert a point	Click with the Pencil tool.
To add a point to an existing line	Click with the Pencil tool on the line and drag a little bit. If you don't drag, the newly inserted event will be interpreted as part of the line, and it won't remain an independent point.
To move a point	Drag it with the Pointer tool.
To delete a point	Remember, underlying a point (and the lines extending from it), there is an entire stream of events. Deleting one point only deletes one event, but there are many more right next to it, so it may seem like it is not being deleted properly. Instead, try dragging an adjacent point past the one you want to delete. Or make a time range selection with the Pointer tool—and perhaps even switch to Bars Mode or Points Mode—to delete the stream of events that prescribes the point.
To remove a step	Grab the corner of the step (or anywhere on the horizontal part of it) with the Pointer tool and drag as desired.
To insert a waveform or reshape an existing line with a waveform	Choose the Pencil tool, choose a reshape curve, and then drag horizontally in the grid. You can conform to a beat grid with Edit Resolution as explained in "Constraining a periodic waveform to beats" on page 324, and you can use the waveform modifier keys described in "Using modifier keys to control period, phase, and other waveform parameters" on page 324.

Region operations in Lines Mode

Region operations, such as cut, copy, paste and change CC data do not always have the same affect on MIDI data in Lines Mode and audio

automation ramps. In the example below (Figure 36-13), both MIDI data and audio data display a single point within the time range selection. However, as you can see in Bars Mode (bottom row), there are actually many selected MIDI events, not just one. If CC data scaling is applied (second column), the single audio control point scales by itself, whereas all of the selected MIDI events scale together, producing a different final result. Note: to get the same result with MIDI as audio in this example, you could simply drag the control point in the MIDI track downwards.

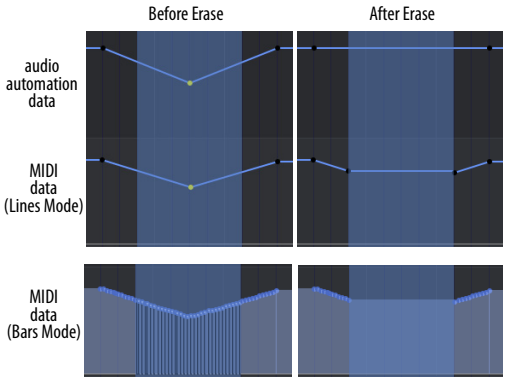


Figure 36-13: Edit operations like Erase have a different effect on MIDI data and audio automation data.

PER-NOTE CONTINUOUS CONTROLLER DATA

Continuous controller (CC) data in a track affects all notes in the track. However, there are two scenarios in which CC data is meant to affect only a specific note in the track: 1) polyphonic aftertouch CC data and 2) MIDI polyphonic expression (MPE) CC data. Polyphonic aftertouch is intended to affect only a specific note, e.g. the note triggered by the keyboard key that generated the note and the aftertouch CC data streams. The same is true when recording from an MPE controller. In both cases, Performer lets you display and edit this per-note CC data as contained within the note itself.

To record and edit polyphonic aftertouch as per-note CC data, be sure to enable the *Record Poly Touch into Notes* option (Figure 12-6 on page 79).

To record and edit per-note MPE CC data, set up the track for MPE as explained in "MIDI Polyphonic Expression (MPE)" on page 78.

Viewing and editing per-note CC data

Per-note CC data appears inside each note in the note grid, as shown in Figure 36-14. You can zoom the display of the per-note data streams vertically as shown in Figure 36-4 on page 317.

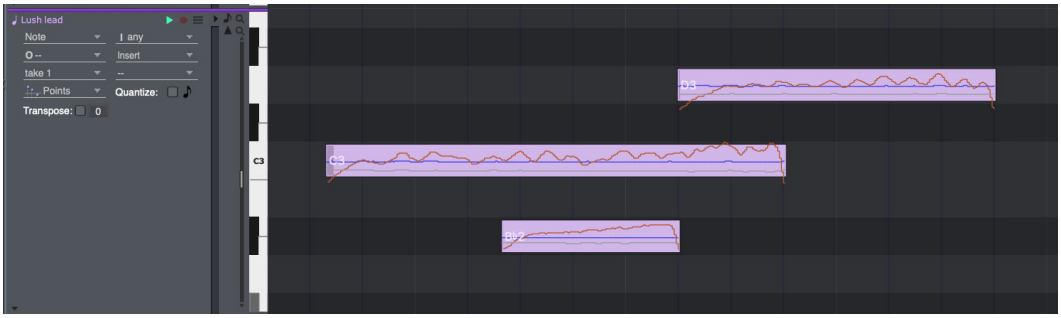


Figure 36-14: Per-note CC data in the note grid.

Show/hiding per-note CC data

You can show/hide the per-note CC data with the *Show Per Note Events* preference (page 254).

Scaling per-note CC data

To scale a note's per-note CC data, choose the *Per Note Event Scale Tool* (Figure 27-1 on page 243) and then drag vertically on the note.

Editing notes with per-note CC data

When editing the pitch, time or duration of each MIDI note, or even splitting the note in two, the per-note CC data stays with the note, maintaining its relative timing to the note itself.

Per-note controller vertical zooming

When viewing MPE controllers in the MIDI Editor, per-note controllers can be zoomed vertically with this setting (Figure 36-15). See "Per-note continuous controller data" on page 327.

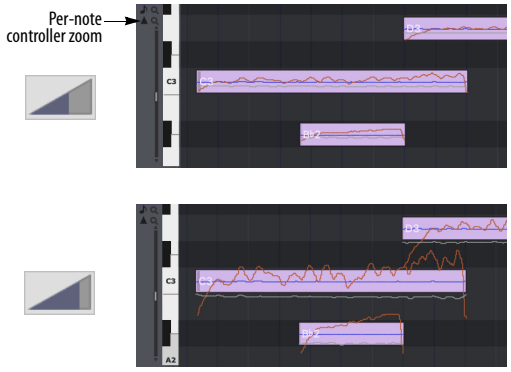


Figure 36-15: Per-note Controller Vertical Zoom control.

Editing per-note CC data in the Continuous Data grid

To edit per-note CC data in more detail in the Continuous Data grid, enable the *Edit Per-Note Event* option at the bottom of the window (Figure 36-16) and then select the note to view its CC data in the grid. You can set a preference to do this by double-clicking notes that contain per-note CC data. See "Double-Click" on page 254. When in this mode, the *Insert* menu shows only per-note data types associated with the currently selected note.

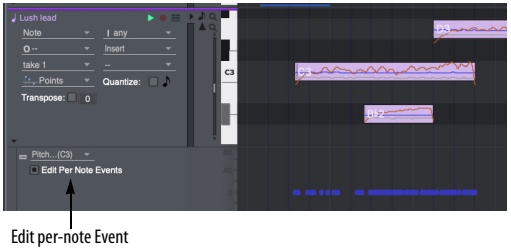


Figure 36-16: Editing per-note CC data in the Continuous Data grid.

Per Note Events can never occur before the beginning of the note they belong to, and, as such, cannot be dragged or penciled in before that time. They can, however, exist after the note ends.

DISCRETE MIDI EVENTS

Discrete MIDI events such as patch changes, mode changes, switch controllers like #64 (sustain pedal), tune requests, song changes, mute automation events and system exclusive events appear at the bottom of the MIDI track lane.

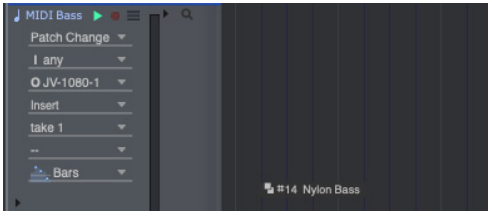


Figure 36-17: An example of a discrete MIDI event: a MIDI patch change. These are MIDI events that aren't notes and are not continuous.

Working with discrete MIDI events

Discrete MIDI events do not have durations. Each event is therefore displayed as a single item. Patch changes, system exclusive events, Mute Automation events, and controllers are displayed with a unique icon; mode changes are displayed as text, such as "Poly" or "Omni on". An event may be edited in the Information Bar as usual.

Inserting a discrete MIDI event

Discrete MIDI events that are not CC data, such as patch changes, mode changes, switch controllers like #64 (sustain pedal), and system exclusive events, can be inserted as follows:

1 If desired, set the Edit Resolution and turn on the Edit Grid (see "Snap to Grid" on page 357).

2 Choose the desired data type from the Insert menu (Figure 36-9 on page 323).

3 Click once at the desired time location in the track lane.

The event will appear where you clicked.

Editing a discrete MIDI event

To view and edit discrete MIDI events, choose their data type from the track's Edit Layer menu (Figure 36-1 on page 313).

To edit a discrete MIDI event's parameters, click it to select it and then edit its parameters in the Information Bar.

Drag a discrete MIDI event to change its location.

CHAPTER 37 Audio Editing

OVERVIEW

Audio tracks in a Performer Lite sequence can be viewed and edited in the Sequence Editor. Audio tracks contain audio data in the form of soundbites or audio clips. They can also contain automation data for volume, pan, plug-in parameters and even audio pitch shifting and beat stretching.

Before proceeding with this chapter, be sure to review chapter 11, "Audio Tracks" (page 67).

Overview 330
Quick Reference 331
Tool palette quick reference 331
Accessing an audio track 332
The Edit Layer 332
Audio editing basics 332
Inserting soundbites 333
Moving soundbites 334
Muting and unmuting soundbites 336
Bite Gain 337
Overlapping and layering soundbites 337
Trimming (edge editing) soundbites 338
Graphic time stretching of audio 340
Graphic editing techniques 340
Selection techniques 341
Working with Clips 341
Working with breakpoint mix automation 343
Soundbite volume automation 347

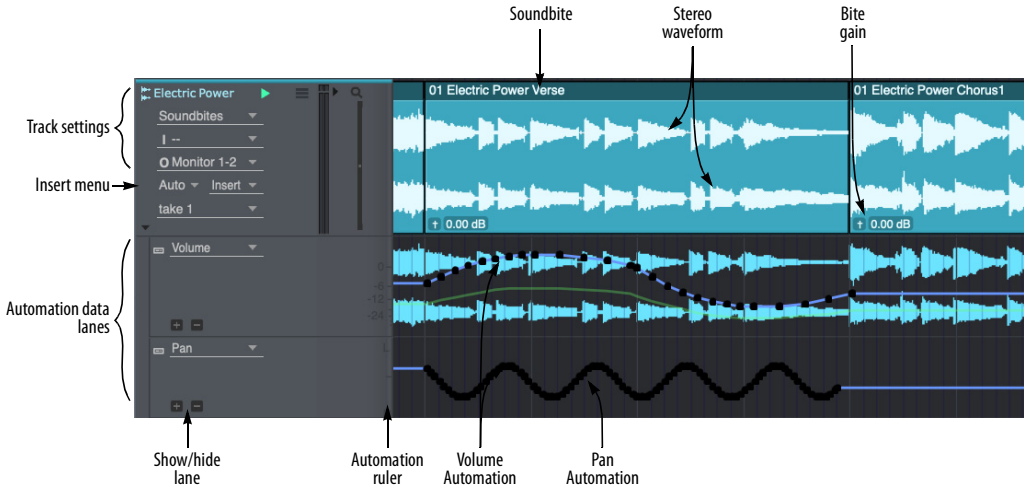


Figure 37-1: Audio tracks provide a powerful environment for viewing and editing audio. The tools in the Tool Palette are an important component of working with audio tracks.

QUICK REFERENCE

Soundbite: A region of audio. See "Soundbites" on page 216.

Stereo waveform: Soundbites can be mono (one channel) or stereo (two channels, left and right). See "Mono and stereo tracks" on page 67.

Soundbite volume: Each soundbite has its own independent *bite gain* adjustment. See "Bite volume and gain" on page 413. Also see "Soundbite volume automation" on page 347.

Track settings: This panel displays basic settings for the audio track. See "Track settings" on page 129.

Edit Layer: Lets you choose the type of data you wish to view and edit in the track lane. Option/Alt click the menu to change all tracks at once.

Insert menu: Lets you choose the type of data to be inserted with the Pencil tool.

Automation data lanes: Displays automation data, such as volume, pan, pitch and plug-in parameter automation. Choose the desired automation type from the lane's menu.

Volume and pan automation: See chapter 55, "Mix Automation" (page 490).

TOOL PALETTE QUICK REFERENCE

The following tools (Figure 27-1 on page 243) can be used for audio editing.

Pointer: Use the pointer to select audio, move soundbites and stretch them. The pointer also selects and moves automation points.

I-Beam: Use the I-Beam tool to make time range selections.

Pencil: Use the Pencil tool to insert automation in automation lanes (or edit layers).

Reshape: Use the Reshape tool to reshape existing automation data using one of the curves in the curve menu just to the left of the Reshape tool.

Pencil/Reshape Curve: Determines the shape of the automation data that you insert with the Pencil or modify with the Reshape tool.

Reshape mode: Determines what the Reshape tool does to automation data: set it to a specific value, add to it, subtract from it, scale it or limit it.

Zoom: Click or drag to zoom in on a portion of the audio track. Option/Alt-click to zoom out. Option/Alt-Shift-click to zoom backwards (through previous zoom levels). Option/Alt-Control/Win-Shift click to zoom forwards.

Mute: Temporarily mutes or unmutes a soundbite or clip.

Scissors: Click on a soundbite or clip to split it. With the edit grid enabled, drag over a soundbite or clip to split it into subdivisions equal to the current edit grid.

Trim: see "Trim tool" on page 248.

Roll: see "Roll tool" on page 249.

Slip: see "Slip tool" on page 249.

Slide: see "Slide tool" on page 249.

Hand: Allows you to scroll the audio track smoothly and precisely, vertically and horizontally in a single gesture. Simply click anywhere in the track and drag as desired.

ACCESSING AN AUDIO TRACK

To access an audio track in the Sequence Editor, click its name in the track selector (Figure 7-3 on page 43) to highlight it.

THE EDIT LAYER

In the Sequence Editor, each type of data resides in its own edit layer (Figure 10-3 on page 62), which you can make *active* (bring to the front) while other layers remain dimmed or hidden in the background. For further information, see "The Edit Layer" on page 62.

AUDIO EDITING BASICS

This section explains several important concepts to keep in mind when you work with audio tracks in the Sequence Editor.

Working with waveforms

The Sequence Editor displays soundbites — and the audio data within them — as a waveform in a standard time-versus-amplitude display as shown in Figure 37-2. The waveform shown inside soundbites is a representation of the sound in graphical form. Time is expressed on the horizontal axis. Amplitude (loudness) is expressed on the vertical axis, and the waveform oscillates up and down over a center axis which represents zero, or no sound at all. The louder the sound is at a certain point, the greater the deviation is from zero. Silence is represented by a straight line. the point at which the waveform crosses zero is called a *zero-crossing*.

A soundbite is represented as a "block" of waveform data with adjustable boundaries. The waveform inside it represents the actual audio data in the audio file on disk. This graphic display allows you to make edit decisions based on what you see, as well as what you hear.

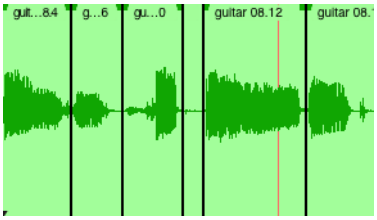


Figure 37-3: A soundbite is represented as a block of audio with a waveform inside.

Stereo versus mono waveforms

In stereo tracks, paired left/right soundbites appear in the Sequence Editor as two smaller waveforms joined together as shown in Figure 37-4. A stereo soundbite shows both

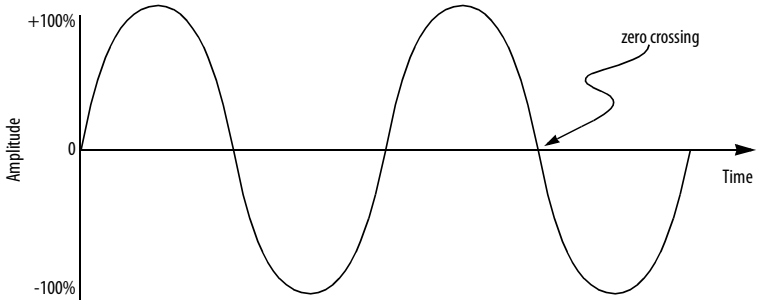


Figure 37-2: A simple audio waveform displayed on a time versus amplitude scale.

channels connected together as one unit, so that they can always be edited simultaneously, with sample-accurate phase lock between the channels.

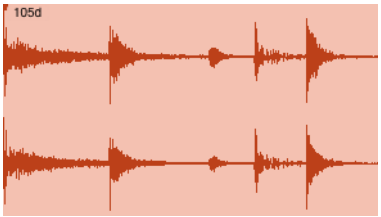


Figure 37-4: A stereo soundbite is represented as two audio channels joined together, which always remain phase-locked.

Soundbites are clones

An important thing to realize about soundbites in the Sequence Editor is that they are "clones" of their original soundbite in the Soundbites list. For further explanation, see "Soundbites in a track are 'clones' of the original" on page 302.

Graphic editing is nondestructive

All of the editing procedures described in this chapter are non-destructive. For an explanation of non-destructive editing, see "Non-destructive, destructive and constructive audio editing" on page 302.

Soundbites that cannot play

Soundbites that cannot be played (because they don't match the project's global sample rate, for example) are displayed in the Sequence Editor with a red outline and a grayed waveform, in addition to a red 'X' in their icon in the Soundbite list, to alert you to the fact that they cannot currently play back.

Viewing Sequence Editor soundbites in the Soundbites list

If you are looking at a soundbite in the Sequence Editor, and you would like to find it in the Soundbite list, use the Command in the Commands window called *Select this soundbite in the Soundbite list*. Use the search feature in the Commands window to find the command and then assign it to any desired keyboard shortcut.

Reveal In Finder/Show in Explorer command

The *Reveal In Finder/Show in Explorer* command shows you the location on your computer desktop of the parent audio file for the currently selected soundbite. By default, the keyboard shortcut for this command is Option/Alt-R.

INSERTING SOUNDBITES

The following sections explain several different ways to insert soundbites into the Sequence Editor. The soundbite must be present in the Soundbites list before doing so. If it isn't, you must import it beforehand. See "Importing and exporting audio" on page 227.

Dragging and dropping audio into the Sequence Editor

You can also place audio in the Sequence Editor by dragging soundbites from the Soundbites list or the computer desktop. In the Soundbites list, just grab the move handle of the soundbite and drop it on top of the open Sequence Editor. The soundbite is placed at the exact location displayed in the cursor information box at the moment you drop it. Control/Win-drag the soundbite to make it "snap" to the end of the previous one (or the beginning of the track if it is empty). In the Mac OS Finder or Windows Explorer, just drag the audio file icon from the desktop or any window into the Sequence Editor. The soundbite's number of channels (mono or stereo) must match the number of channels for the track you wish to insert it into.

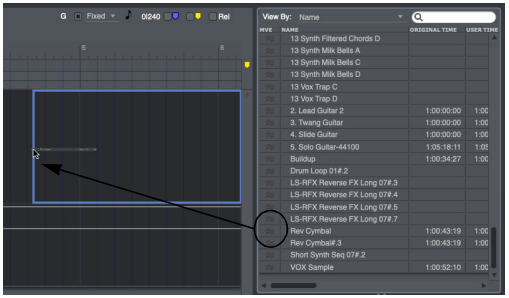


Figure 37-5: Dragging and dropping Soundbites into the Sequence Editor from the Soundbites list: grab the move handle and drop it on top of the Sequence Editor. Use the Cursor Information for precise placement. Control/Win-drag the soundbite to make it "snap" to the end of the previous one. You can also drag and drop audio into the Sequence Editor from the computer desktop.

Using the Insert Audio command

To insert a soundbite in the Sequence Editor with the *Insert Audio* command:

1 Press Shift-F1.

This is the default key binding for the *Insert Audio* command, but this may be reassigned in the Commands window.

2 Select the desired soundbite from the list that appears. The soundbite's number of channels (mono or stereo) must match the number of channels for the track you wish to insert it into.

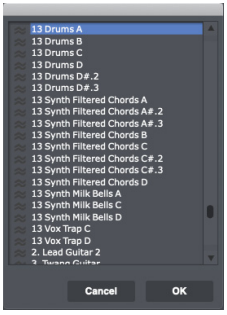


Figure 37-6: Click the soundbite name and then click OK, or—as a shortcut— simply double-click the soundbite. You can also select the desired soundbite by typing the first letter of its name. When the list disappears, the cursor turns into a cross-hair.

Click the cross-hair cursor in the Sequence Editor at the location where you want to place the soundbite, using the cursor information (see page 359) to help determine the location.

Building a playlist

You can quickly build a playlist in the Sequence Editor by Control/Win-dragging soundbites into it from the Soundbites list. Holding down the Control/Win key when you first grab the soundbite causes it to "snap" to the end of the previous soundbite when you drop it.

Changing a soundbite name

To change a soundbite name in the Sequence Editor, Option/Alt-click its name.

Replacing a soundbite with another

To replace a soundbite with a another one from the Soundbites list, click it once to select it and click its name in the Event Information window as shown in Figure 37-1 on page 330.

MOVING SOUNDBITES

Soundbites can be moved earlier or later in time by simply dragging them left or right, respectively. If the Edit Resolution check box is off, they move freely at the highest resolution allowed by the current zoom level. An information tab appears while dragging (Figure 37-7) to provide metrics regarding the drag operation (new position, offset, start time, end time, destination track, etc.)

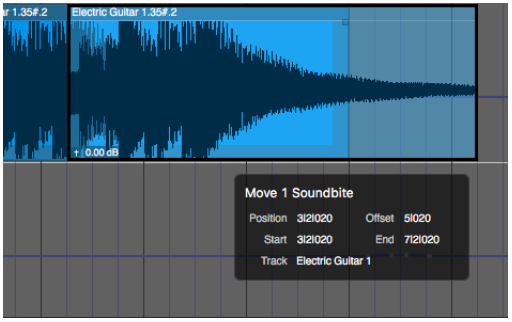


Figure 37-7: Dragging a soundbite.

Moving soundbites vertically from one track to another

You can freely drag soundbites from one track to another simply by dragging them vertically — as long as the tracks involved are currently being displayed, of course.

Constraining dragging operations

You can vertically or horizontally constrain dragging operations in the Sequence Editor by holding down the Shift key while dragging. This applies to soundbites, automation data, MIDI data and other events.

Moving multiple soundbites at the same time

You can move several soundbites together by selecting them and dragging them together as a unit. Shift-click to select multiple soundbites. Also see "Selection techniques" on page 341.

Snapping to the edit grid

When the Snap to Grid check box is checked in the Snap Information window, soundbites "snap" to the Edit Resolution grid when you drag them. Snapping can be absolute or relative. See "Snap to Grid" on page 357 and the edit grid controls in Figure 37-1 on page 330.

Canceling while dragging

If you are in the middle of dragging, and you change your mind, you can press the escape key while dragging to immediately cancel the operation and restore the data to its original position, unchanged.

Nudging soundbites with the arrow keys

Select one or more soundbites in the Sequence Editor and type the left or right arrow keys on your computer keyboard to nudge the data forward or backward in time. Use the Nudge Amount in the Snap Information window (or Information Bar) to control the resolution. See "Nudge" on page 358.

"Throwing" soundbites to the next or previous soundbite

There is a shortcut for making a soundbite "snap" to the next or previous soundbite in the window: click the soundbite first to select it, and then Control/Win-drag the soundbite in the direction you want it to snap. For example, if you want a soundbite to be placed end-to-end with the next soundbite to the right as shown below, select it and then control-drag it to the right. You only have to drag a short distance—enough to determine the direction.

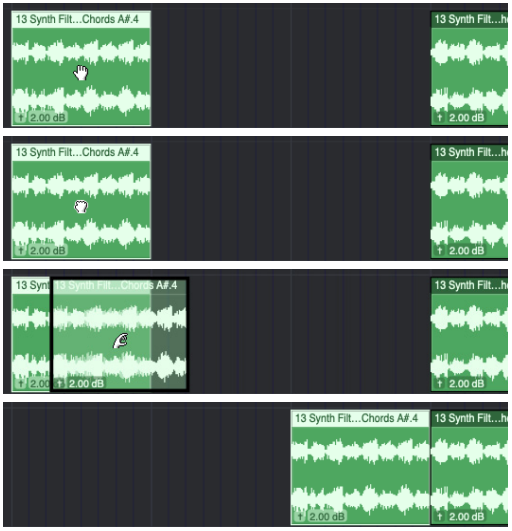


Figure 37-8: Control/Win-dragging a selected soundbite a short distance in either direction causes the soundbite to "snap" to the next or previous soundbite.

Option/Alt-dragging to make a copy

To quickly make a copy of a soundbite while dragging, Option/Alt-drag it. The new soundbite is an exact clone of the original; in other words, they both refer to the same original soundbite listed in the Soundbites list. For example, if you rename either copy, they will both change to the new name.

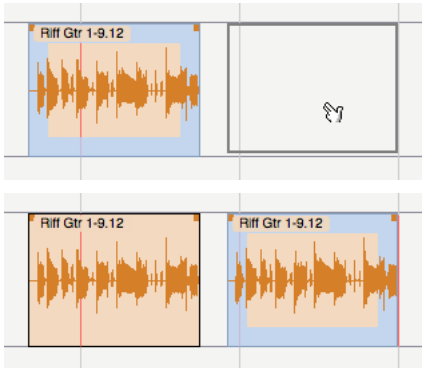


Figure 37-9: Option/Alt-dragging to make a copy of a soundbite.

Option/Alt-Control/Win-dragging to copy soundbites & place them end to end

By holding down both the Option/Alt key and the Control/Win key when dragging soundbites, you can copy and place soundbites end-to-end at the same time. This is a great shortcut for building playlists made up of many repeating soundbites, as shown in the example below.

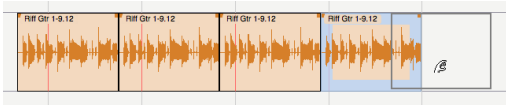


Figure 37-10: Option/Alt-Control/Win-drag soundbites to quickly place them end to end.

Creating a stutter effect

You can easily make a stutter effect by Option/Alt-dragging a soundbite several times and overlapping the copies. For rhythmic precision, it is easiest to do so with edit resolution turned on and set to a fairly small increment, such as 16th notes.

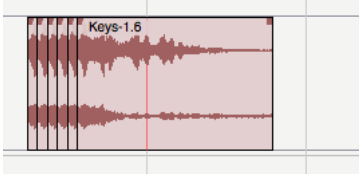


Figure 37-11: This 16th-note stutter effect was created by Option/Alt-dragging copies of a soundbite with edit resolution turned on.

MUTING AND UNMUTING SOUNDBITES

There are two ways to temporarily mute a soundbite:

- Insert mute automation
- Use the Mute tool

Inserting mute automation

To mute a soundbite using mute automation, select it and choose *Mute Region* from the Region menu. This inserts mute automation data at the beginning and end of the soundbite. To unmute, select it again and choose *Clear Mute Automation* from the Region menu.

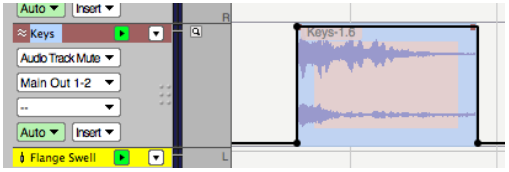


Figure 37-12: When using the Insert Mute Automation command (Region menu), mute automation data is inserted in the track.

Using the Mute tool

To mute the soundbite with the Mute tool, click it with the Mute tool. To unmute, click it again with the Mute tool. The Mute attribute for a soundbite can also be toggled in the Event Info panel. See “Event Information” on page 359.

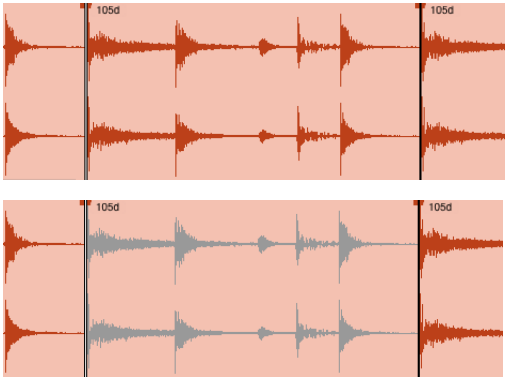


Figure 37-13: Muting a soundbite with the Mute tool.

BITE GAIN

When audio tracks are resized vertically, and expanded far enough, each soundbite displays its *Bite Gain* setting and fader in the bottom left corner as shown in Figure 37-14. Bite Gain non-destructively raises or attenuates the overall volume of the soundbite. The range is from -140 to +80 dB. Click the fader icon to adjust the Bite Gain.

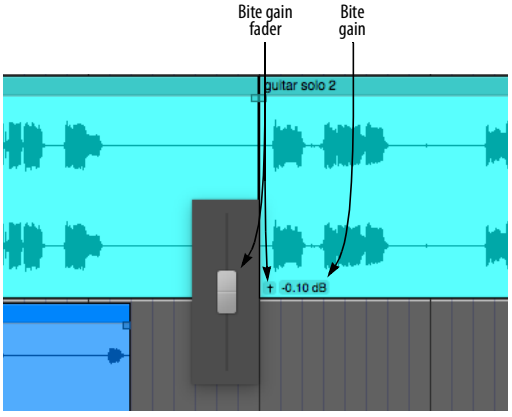


Figure 37-14: Bite Gain setting and fader.

OVERLAPPING AND LAYERING SOUNDBITES

Performer Lite allows two or more soundbites—or portions thereof—to occupy the same location in an audio track. Each soundbite is handled in a separate layer that can be manipulated independently of other soundbites. However, only the visible portion of each soundbite plays back. A simple, intuitive rule of thumb is: *what you see is what you hear*. In other words, when one soundbite covers up another, it also takes over playback in the track.

Use the Layering commands in the Audio menu (Move Forward/Backward and Move to Front/Back) to control how overlapping soundbites are layered as you edit them.

TRIMMING (EDGE EDITING) SOUNDBITES

As explained in Figure 69-4 on page 601, a soundbite represents a portion of audio from its parent audio file stored on disk. For example, a soundbite can be as short as a fraction of a second or as long as many hours. A soundbite can represent a portion of the parent audio file, or it can represent the entire file.

The Pointer, Trim, Roll, Slip and Slide tools

The Pointer, Trim, Roll, Slip and Slide tools (shown below in Figure 37-15) can be used to edit the edges of a soundbite. The current edit resolution applies.

Pointer: The *Pointer tool* allows you to trim the left or right edge of a soundbite. The arrow cursor changes to the trim cursor (Figure 37-15) when you move it near the edge of a soundbite. When trimming, you "uncover" or "cover up" the audio in the audio file as illustrated in Figure 37-15. If the edge stops when you drag it, preventing you from going any further, then you have reached the end of the audio file.

Trim: The *Trim tool* allows you to click anywhere in a soundbite to move the right edge to the location where you clicked. Hold down the Option/Alt key to move the left edge to where you click.

Roll: The *Roll tool* allows you to edge edit the beginning of one soundbite and the end of another where they abut each other. They must be touching one another.

Slip: The *Slip tool* allows you to edge edit the start and end of a soundbite while the soundbite remains at the same position in the track. The soundbite's length does not change.

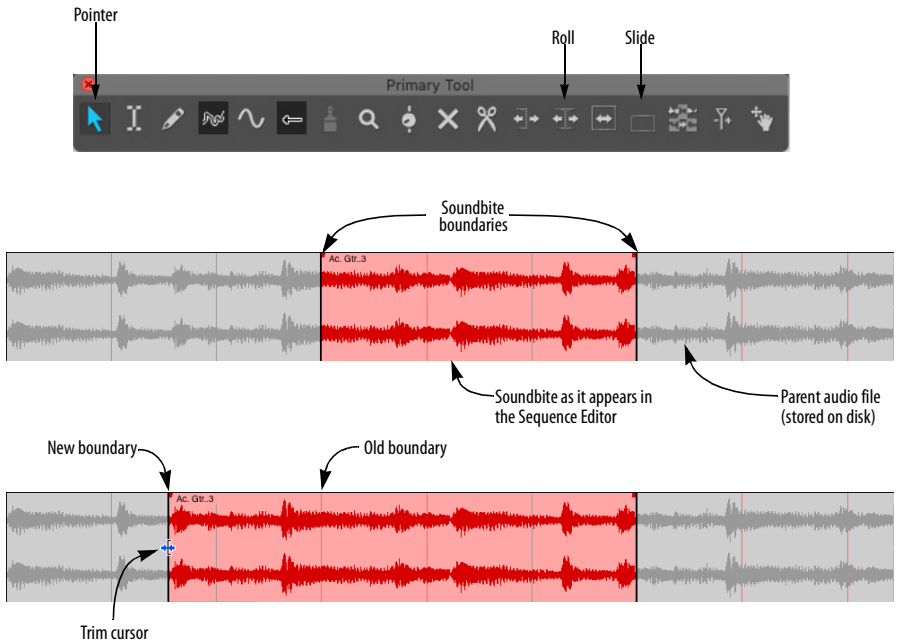


Figure 37-15: Edge editing a soundbite by dragging its boundaries.

Slide: The *Slide tool* allows you to move a soundbite in the sequence while leaving the soundbite's audio at the same playback time. This is the same as trimming both ends by the same amount forwards or backwards.

Affecting all copies of a soundbite versus one copy

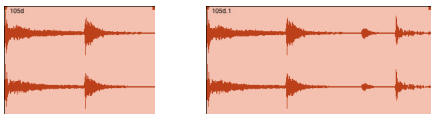
The *Edge Edit Copy* command in the Sequence Editor menu allows you to choose whether you want to modify the original soundbite you are dragging or preserve the original by making a copy of it when you drag.

Edge editing all copies

When *Edge Edit Copy* is unchecked, dragging a soundbite edge affects the original soundbite, as well as every other instance of it. For example, if you edge edit a soundbite called *Drum Fill* that has been placed many times throughout a percussion track, all copies of it in the track will change.

Edge editing one copy

When *Edge Edit Copy* is checked, it causes a soundbite to be copied when you drag one of its edges, which preserves all original copies of the soundbite. The result is a new soundbite that is identical to the original except for the new boundary and a slightly different name. You probably won't even notice that a copy is being made. Instead, it will seem like you just moved the edge of the soundbite. The only noticeable change is a number appended to the soundbite (or, if it already has a number, it will increment by 1). The new soundbite is also added to the list in the Soundbites list.



Original soundbite

New soundbite
after Option/Alt-dragging its edge

Figure 37-16: Edge Edit Copy.

Option/Alt-dragging to override Edge Edit Copy

Option/Alt-dragging a soundbite edge temporarily overrides the current setting of the *Edge Edit Copy* command. This allows you to set it the way you prefer most of the time, and the Option/Alt-drag to temporarily override it when necessary. For example, if you may want to edit all instances of a soundbite most of the time, uncheck the Edge Edit Copy command so you can simply drag soundbite boundaries, and use the Option/Alt key to override this setting when needed.

Edge editing multiple soundbites

To trim (edge edit) multiple soundbites together at the same time, select them, and then trim either the left edge or right edge of any selected soundbite.

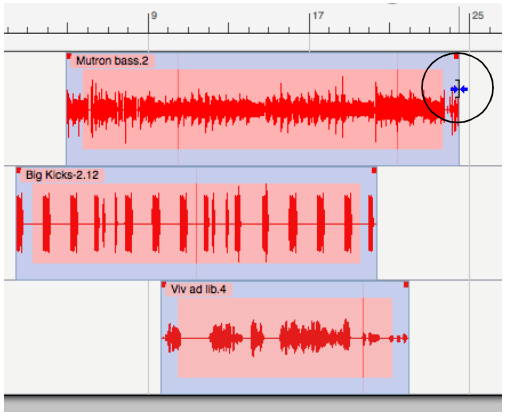


Figure 37-17: To trim multiple soundbites together in one operation, select them and drag an edge.

If you would like all edges to snap to the same location, hold down the Control/Win key while dragging an edge as shown below:

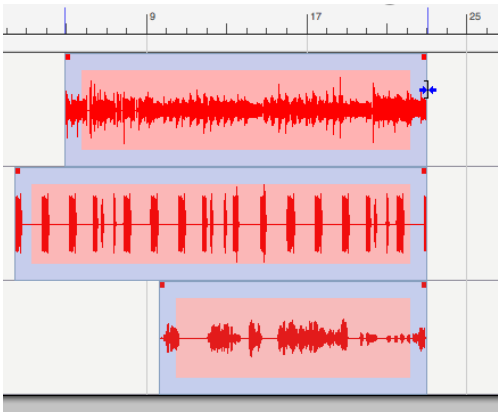


Figure 37-18: To make the edges of multiple soundbites snap to the same location, hold down the Control/Win key while trimming.

Edge editing when soundbites overlap

When soundbites overlap one another, you may not have direct access to the soundbite edge you wish to edit because it may be covered up by another soundbite, and you may not want to change how they overlap with the layering command in the Audio menu. In this situation, you can edit the hidden edge by Shift-clicking the opposite, visible edge. Doing so gives you control over the edge you *didn't* shift-click.

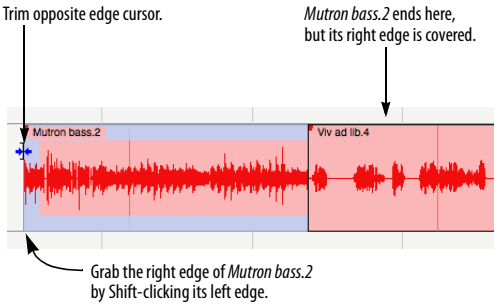


Figure 37-19: Edge editing when the edge you want to drag is covered by another soundbite.

Using the edit grid when edge editing

The edit grid does not affect edge editing. However, if you would like your edge edit to snap to the edit grid, hold down the Command/Ctrl key while clicking on the soundbite edge to move it.

Using Slip, Slide and Roll on multiple soundbites

You can use the Slip, Slide and Roll tools (as described earlier on page 338) on multiple selected soundbites.

GRAPHIC TIME STRETCHING OF AUDIO

You can time-stretch audio graphically by grabbing the edge of a soundbite with the hand tool and dragging it to the desired length. To get the hand tool, position the cursor over the edge of the soundbite, just below the crossfade handle as shown in Figure 37-20.

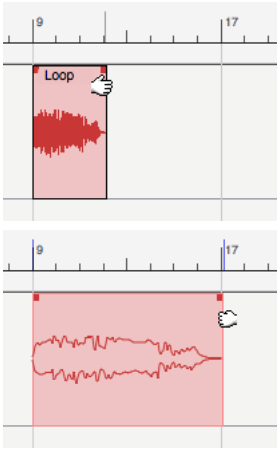


Figure 37-20: To graphically time-stretch a soundbite, position the cursor over the edge of the soundbite just below the crossfade handle and grab it with the hand cursor.

GRAPHIC EDITING TECHNIQUES

All of Performer Lite's powerful editing features are available in the Sequence Editor. Most editing can be done with the mouse using familiar actions like clicking, dragging, and Shift-dragging. Such actions can shift data, change note pitch and duration, reshape mix automation data curves, and more. For a summary of Performer Lite's basic graphic editing techniques, see "Graphic editing techniques" on page 301.

SELECTION TECHNIQUES

Performer Lite offers a variety of ways to select audio and MIDI data in the Sequence Editor. After audio is selected, you can apply one of Performer Lite's many powerful editing operations. For a complete discussion of selecting techniques in the Sequence Editor, see chapter 35, "Selecting" (page 305).

WORKING WITH CLIPS

In the Sequence Editor, clips are viewed and edited in a fashion similar to soundbites, as explained earlier in this chapter. The following sections cover details that are specific to clips.

Clip basics

A clip is a container for a single track's worth of data. Think of it as a small slice of a track that you can manipulate as a single object. (See "What is a clip?" on page 201.) Clips also have object properties, such as a start time, duration and looping (on or off). (See "Clip settings" on page 206.) Clips can be identified by their rounded corners.

The Clip edit layer

Each audio and MIDI track provides an edit layer for Clips (Figure 37-21 on page 341) where clips can be managed and edited. Audio and MIDI tracks also have edit layers for soundbites and MIDI notes, respectively, allowing you to work seamlessly with clips and other data in the same track. Figure 37-21 shows an example of MIDI notes side by side with a MIDI clip in the same track. The same goes for soundbites, which can coexist side by side with audio clips in an audio track.

Click a clip in an audio or MIDI track to quickly switch to the Clips layer. Similarly, click a soundbite or MIDI note to quickly switch to the soundbite or notes layer.

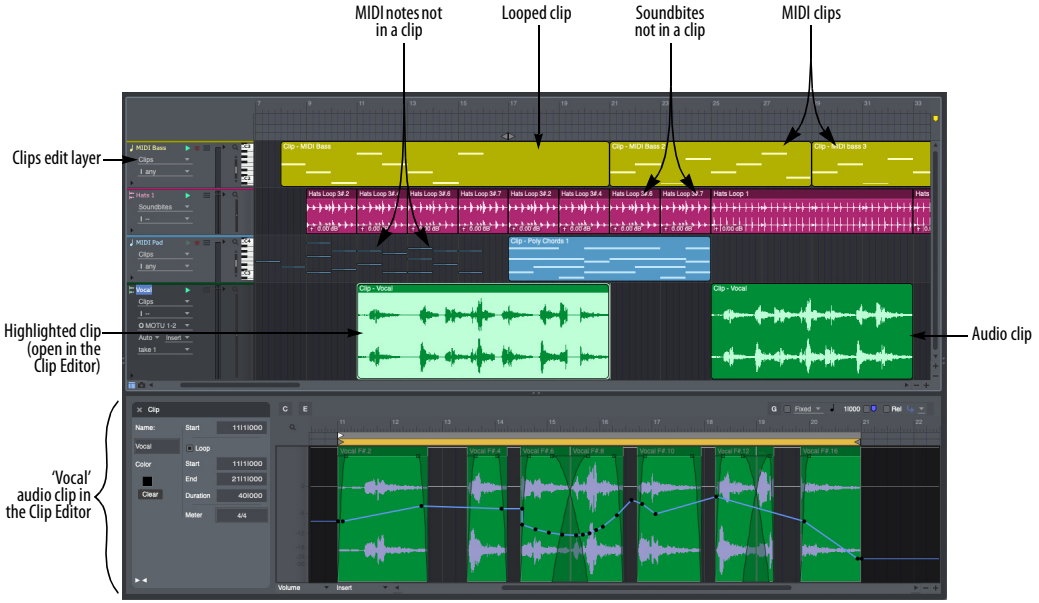


Figure 37-21: Clips in the Sequence Editor.

Creating a clip

Here are some ways to create clip in a track:

- Use the *Pack Into Clips* command (see below)
- Drag and drop a clip from the Clips window into a track
- Record clips as you trigger them from the Clips window (see "Clip Record mode" on page 208)

Recording MIDI into track clips

When you record into a MIDI track, Performer packs the data into a clip for you.

Packing track data into clips

To make a clip out of existing data in a track:

1 Make a selection (either an object selection or time-range selection) in one or more tracks.

2 Choose *Region menu* > *Pack Into Clips*.

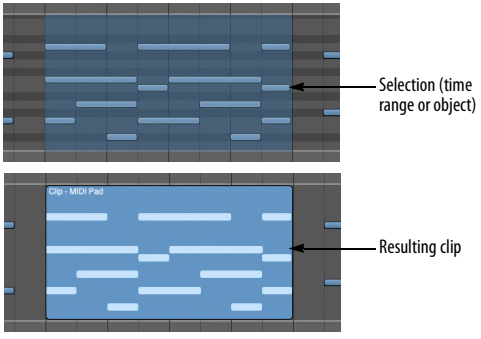


Figure 37-22: Packing data into a clip.

If you make a multi-track selection, a separate clip is created in each track, since clips are a single-track objects by nature.

Unpacking clips

When unpacking data from a clip, the data remains behind, at its original location in the track, and the clip is removed:

1 Select one or more clips.

2 Choose *Region menu* > *Unpack Clips*.

Clip layering

Clips can overlap one another, just like soundbites. The front-most clip is what you hear. Use the layering commands (Edit menu) to manage layering. See "Overlapping and layering soundbites" on page 337. However, since clips can contain multiple types of data (unlike soundbites), layering them has further subtleties.

When the counter reaches a clip event during playback, that clip becomes the sole source of musical events for all the event types it contains. If there are any of the same event types in the track itself or in other clips layered behind the front-most clip, they are suppressed for the duration of that clip event. Types not contained in the front-most clip event are not suppressed by that clip, and will come from whichever source is closest to the front, either another clip event or the track itself. Track data not contained in clips is always considered to be in the back-most layer.

The same concept applies when launching clips in the Clips Window, except only one clip can play per track at any given time, so there are only two possible layers to consider: the *track layer* and the *clip layer*. For clip events that are stored directly in tracks (and can be viewed in the Tracks Overview and Sequence Editor) there are as many layers as there are clip events in the track (just like soundbites).

As an example, automation in the track plays while looping a clip that contains only soundbites. However, you also have the flexibility to explicitly override parts of the mix automation, if desired. For example, you might create a one-bar clip that automates the Multimode Filter's center frequency parameter. Since this clip only contains automation data for a single plug-in parameter, it will not suppress soundbites in the underlying track data. It can then be launched and looped in

the Clips window at will, repeatedly applying the filter sweep to whatever soundbites are playing back in the track.

Edge-editing a clip

When you edge-edit a clip, you are changing its start time or end time ("Clip settings" on page 206). To edge edit, position the cursor over the left or right edge of the clip and drag it. If the clip's loop setting is enabled, position the cursor over *the bottom half* of edge, as shown in Figure 37-23, to get the edge-edit cursor. The top half produces the loop cursor.

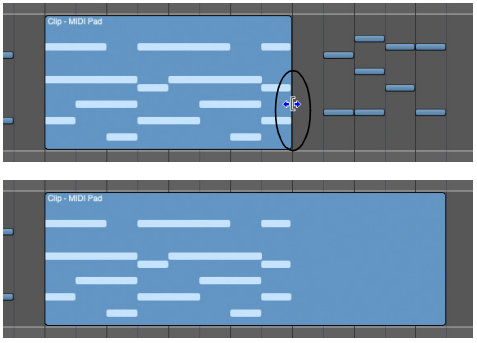


Figure 37-23: Edge-editing a clip.

Looping a clip

To loop a clip, double-click it to open the Clip Editor, and then enable its *Loop* setting in the settings panel. Once you've done so, position the cursor over *the top half* of the left or right edge of the clip (as shown in Figure 37-24) and drag it. In this example, looping has been extended both before and after the original clip. Each full iteration of the loop is indicated by boundary markers, as shown.

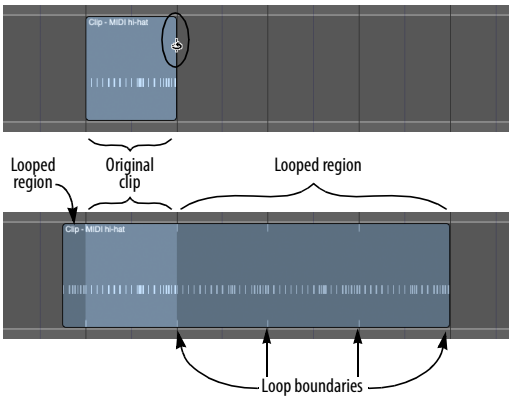


Figure 37-24: Looping a clip.

Muting/unmuting clips

To mute or unmute a clip, click it with the Mute tool (Figure 27-1 on page 243).

Other clip editing techniques

Clips can be edited with many of the same techniques as soundbites. See:

Moving soundbites 334
Muting and unmuting soundbites 336
Overlapping and layering soundbites 337
The Pointer, Trim, Roll, Slip and Slide tools 338
Edge editing multiple soundbites 339
Edge editing when soundbites overlap 340
Using the edit grid when edge editing 340

Opening the Clip Editor

To open the Clip Editor for a clip (as shown in Figure 37-21 on page 341), double-click the clip. When a clip is being displayed in the Clip Editor, it is highlighted in its track (as shown in Figure 37-21), so that you can clearly see which clip you are editing.

WORKING WITH BREAKPOINT MIX AUTOMATION

The Sequence Editor lets you display, insert, and edit volume, pan, plug-in parameters, send levels, track mutes and other mix automation data in the form of *breakpoints* (dots) on a continuous line. In audio tracks, mix automation data is stored in the form of sample-accurate control points that

generate sample-accurate ramps during playback. In MIDI tracks, mix automation data is stored in the form of MIDI continuous controller data. For seamless, side-by-side operation of MIDI and audio tracks, the Sequence Editor displays both forms of automation with the same style of lines and points. The following sections discuss the specific techniques of working with breakpoint-style automation lines and points. Unless otherwise noted, the techniques are the same for both MIDI and audio tracks.

Choosing the active data layer

To view, insert or edit mix automation data in a track, you must first choose it as the current Edit Layer as explained in "The Edit Layer" on page 332. Alternately, you can choose to show a separate automation lane as described below.

Displaying automation lanes

To display automation data in a separate lane below its parent track, choose *Show Lanes* from the Edit Layer menu (Figure 10-2 on page 59), or click the expansion triangle at the bottom of the track settings pane. Click the plus (+) and minus (-) buttons, as shown below in Figure 37-25, to add and remove additional lanes. Use the lane menu to choose the data type for the lane. To hide all lanes for a track, choose *Hide Lanes* from its Edit Layer menu.

☛ The View menu provides shortcuts for showing and hiding automation lanes. See "Show/Hide Lanes" on page 298.

Figure 37-25: Automation lanes.

Zooming for a better resolution

When inserting controllers, it helps to get a zoom level that best suits what you are doing. For example, if you are making fine adjustments to the track level, use a large vertical zoom level for better resolution. If you need to check out the overall level throughout a track, zoom out.

Inserting mix automation data

To insert mix automation data in the Sequence Editor:

1 Choose the data type you wish to insert from the Edit Layer menu (Figure 10-2 on page 59) and then click the Pencil tool in the Tool palette (Studio menu).

2 If the desired data type does not yet have a layer, choose the desired automation data type from the track's insert menu. This creates a layer and turns the cursor into the Pencil tool.

3 Choose the desired shape of the curve you wish to insert from the Pencil/Reshape Curve menu in the Tool palette. If you wish to insert just a single point, the curve doesn't matter.

4 If you would like the curve shape you have selected to snap to beats or a similar metric grid, set the Edit Resolution and turn on the Edit Grid (see "Snap to Grid" on page 357).

Doing so constrains periodic waveshapes to the resolution of the edit grid. For example, if the Edit Grid is set to a quarter note, and you insert a sine wave, the sine wave will cycle once each quarter note.

Hold down the Command/Ctrl key to override grid snapping.

5 Insert data as follows:

To do this:	Do this:
To insert a single event	Click in the track with the Pencil.
To insert a stream of events	Drag the Pencil. A stream of data is inserted according to the curve shape that you chose in the Tool palette. You can conform to a beat grid with Edit Resolution as explained in "Constraining a periodic waveform to beats" below, and you can use the waveform modifier keys described in "Using modifier keys to control period, phase, and other waveform parameters" on page 345.

Constraining a periodic waveform to beats

To insert a continuous data periodic waveform that conforms to a rhythmic grid (quarter notes, eighth notes, etc.), set the edit grid to the duration that equals one complete period of the waveform. This forces the waveform to conform to the grid duration you specify.

Using modifier keys to control period, phase, and other waveform parameters

When inserting (or reshaping) continuous data using a waveform shape, you can hold down modifier keys while dragging to change waveform parameters as follows:

To control this:	Hold down this key:
Toggles grid snapping (on/off)	Command/Ctrl key
Phase	Option/Alt key
Duty cycle • Triangle wave skew • square wave pulse width • sine wave pulse width	Control/Win key
• Periodic frequency • Random curve density	Shift key
To re-use the last settings for sine, triangle, square, random steps or random ramps	Escape key

Using the spline curve

The spline curve provides three handles that can be adjusted for the desired shape during insertion. Just place the handles as demonstrated below in Figure 37-26 and then click anywhere off of the spline to complete the insertion.

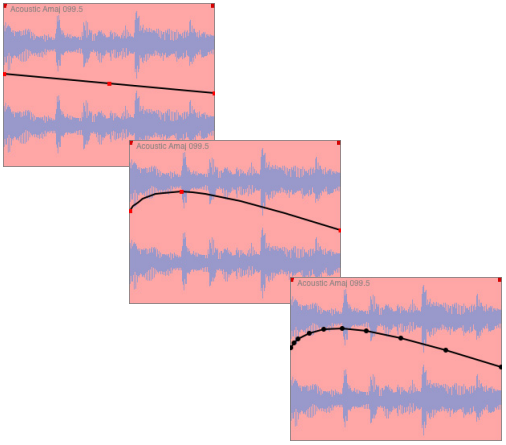


Figure 37-26: Inserting a mix automation curve with the spline tool.

Reshaping an existing curve

Use the same procedure as in the previous section to reshape an existing line or curve. Just drag over the existing data with the Reshape tool.

Selecting mix automation data control points

To select mix automation data:

1 Click the Pointer tool in the Tool palette (Studio menu).

2 Make a selection as follows:

To do this:	Do this:
To select a single event	Click it with the finger cursor.
To select several events	Drag over the events in the grid with the lasso cursor.
To select a continuous data curve	Drag over the curve with the lasso cursor.
To select all events of a data type	Double-click a control point of that type.
To add to the current selection	Hold down the Shift key while using any of the selection techniques above.
To deselect events	Hold down the Shift key while using any of the above techniques on selected data.
To deselect all data	Choose *Deselect All* from the Edit menu or press its keyboard shortcut. Or click once in any empty area in the Sequence Editor.

Dragging control points

You can drag any control point on a line anywhere within the track strip. Notice that you can even drag it *past events on either side of it* as shown below. When you do, you delete the events that you drag over. This is a convenient shortcut for removing a curve.

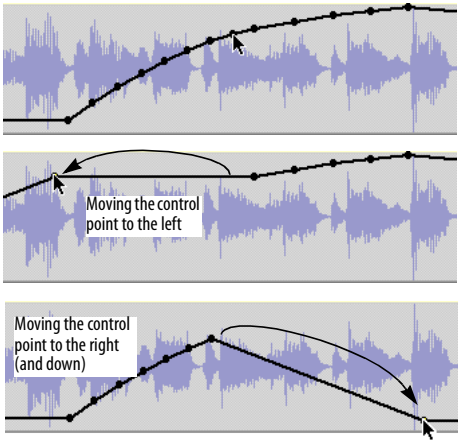


Figure 37-27: Dragging control points.

Selecting multiple data types at one time

To select several data types at one time:

1 Click the Pointer tool in the Tool palette (Studio menu).

2 Hold down the Option/Alt and Control/Win keys to get the cross-hair cursor and then drag over the desired time range in the track. Time range selections select all data within selected area, including audio and other types of automation data. (Lasso selection with the Pointer tool by itself only selects the active data type.)

In audio tracks, another way to make time range selections is to switch the Edit Layer to *Soundbites* first, and then simply drag horizontally with the cross-hair cursor.

Selecting control points with soundbites (or MIDI notes)

Use the procedure described in the previous section.

Removing control points

To remove a single control point, click it to select it and the press the delete key. To remove a curve, drag over it horizontally in the track to select all of the points and then press the delete key.

Cutting, copying, and pasting control points

To cut, copy and paste audio mix automation or MIDI controller data in the Sequence Editor, select it first (as described earlier in "Selecting mix automation data control points" on page 346), and then cut, copy and paste them as usual. When pasting, you might find it useful to insert a control point at the location you wish to paste. Be sure it is selected before you paste. If you wish to preserve soundbites at the location where you are pasting, use Merge instead of Paste.

Disabling automation temporarily

To temporarily disable the automation data in an audio track, turn off automation playback as explained in "Global automation enable/disable" on page 491.

SOUNDBITE VOLUME AUTOMATION

Performer Lite provides an additional level of flexibility with regard to volume automation: *soundbite volume automation,* also referred to as *bite volume*. This is a non-destructive volume automation curve that you can apply directly to a soundbite. This volume curve then stays with the soundbite, in effect becoming part of the soundbite.

Accessing bite volume automation

Bite volume automation works similarly to the pitch automation layer described in "Pitch automation" on page 548. In the Sequence Editor Edit Layer menu (Figure 10-2 on page 59), there is a menu item called *Bite volume*. When you choose the soundbite volume automation layer, you have access to soundbite volume automation data with each soundbite.

Working with soundbite volume automation

By default, the bite volume automation data in each soundbite is set to zero dB. The range is the same as track volume: -× to +6.02dB. In all other respects, bite volume data can be viewed, inserted, edited and otherwise handled in the same manner as track volume automation. The only difference is that bite volume automation always stays with the soundbite. You can also use the dedicated bite volume commands in the Audio menu. See "Bite volume and gain" on page 413. Bite volume is supported by the Change Continuous Data command (Region menu).

CHAPTER 38 Fades and Crossfades

OVERVIEW

Performer Lite allows you to apply fades and crossfades to the edges of soundbites.

Overview 348
What is a crossfade? 348
Creating a single fade or crossfade 348
Types of crossfades 351
Fade curves 352
How fades are generated 353
Fades are anchored to their splice 353
Applying multiple fades in one operation 353
Reapplying the last fade settings 354
Deleting fades 354
Editing existing fades 354
Fades that cannot be fully computed 355
Trimming soundbites that have a fade or crossfade 355
Clipping when crossfades are calculated 355

WHAT IS A CROSSFADE?

A *crossfade* occurs at the boundary — what we'll call the *splice point* — between two soundbites. It fades out the volume of the first soundbite while fading in the volume of the second. A crossfade's main purpose is to produce a smooth transition between the soundbites, preventing clicks and pops and other undesirable artifacts that can sometimes occur. Crossfades are general in nature, however, and they can also be used for volume effects and other purposes.

A *fade* is similar to a cross fade, except that it occurs at the start or end of a single soundbite, and it fades between the soundbite and silence.

Fades and crossfades do not modify the original audio in any way, and you can remove the fade or crossfade at any time.

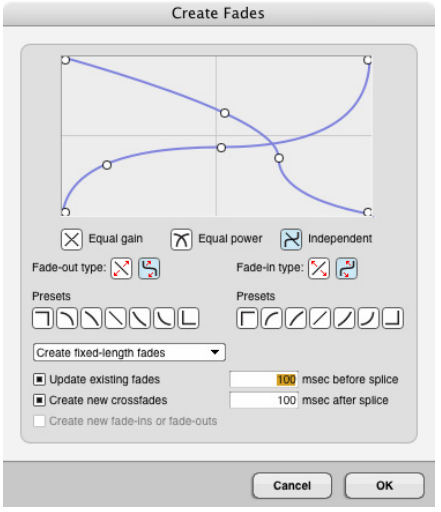


Figure 38-1: To create a fade or crossfade, select one or more soundbite boundaries and choose Fade from the Audio menu.

CREATING A SINGLE FADE OR CROSSFADE

There are two ways to create a fade or crossfade:

- Drag the fade/crossfade handles on a soundbite
- Make a selection and apply a fade with the *Fade* command (Audio menu).

Creating a fade/crossfade with fade handles

Fades and crossfades can be applied directly to soundbites by pulling fade or crossfade handles directly on the soundbites, as shown below in Figure 38-2:

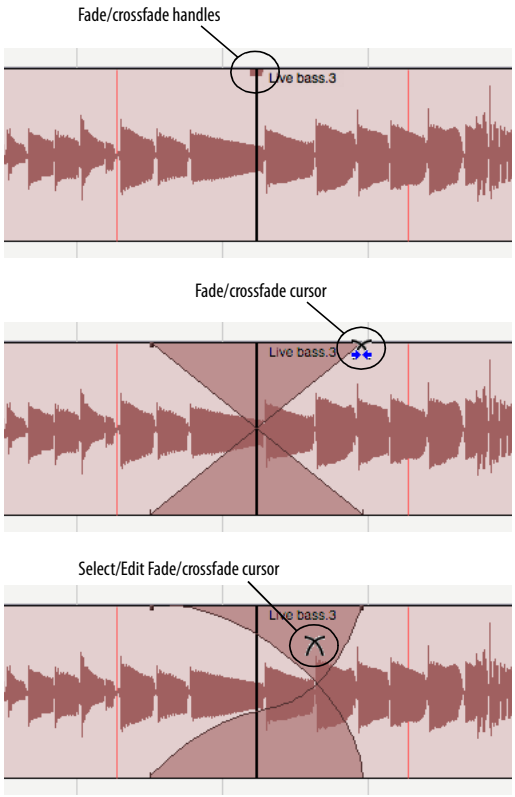


Figure 38-2: Position the cursor over a fade or crossfade handle until you see the fade/crossfade cursor shown above. Then just pull out a fade of the desired length. Double-click the fade or crossfade to edit its shape further.

To create a fade at the boundary of two soundbites that are touching, hold down the Command/Ctrl key while dragging one handle or the other:

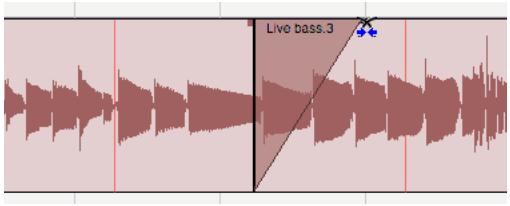


Figure 38-3: Hold down the Command/Ctrl key to create a fade (instead of a crossfade) where two soundbites touch.

Fades and crossfades are inserted with the shape most recently specified in the Fade dialog (Audio menu).

By default, fades and crossfades are inserted and edited symmetrically. To shorten or lengthen just one side of a crossfade while pinning the other side where it is, hold down the Option/Alt key while dragging the fade handle as shown below:

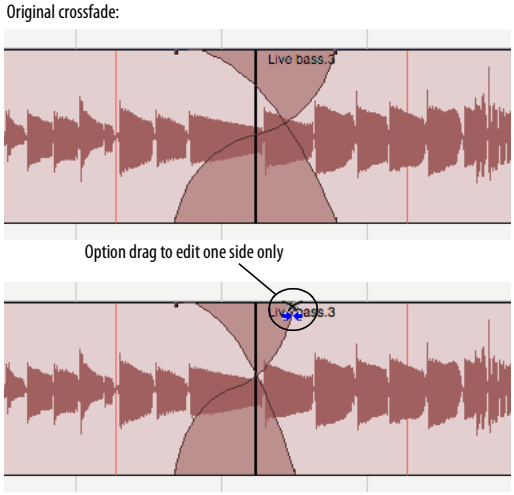
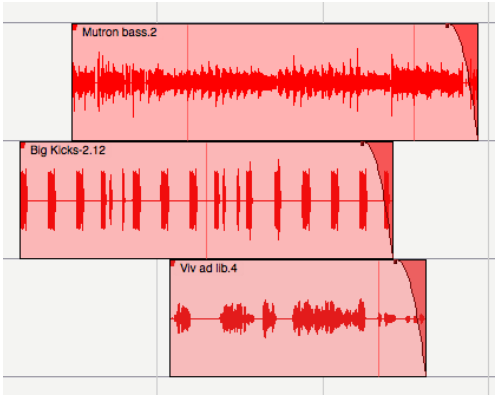


Figure 38-4: Option drag to move just one side of the fade. The other handle remains pinned to its original location.

To edit multiple fades together in one operation, select the soundbites that contain the fades, and then grab the fade handle of one of the selected soundbites:

Before:



After:

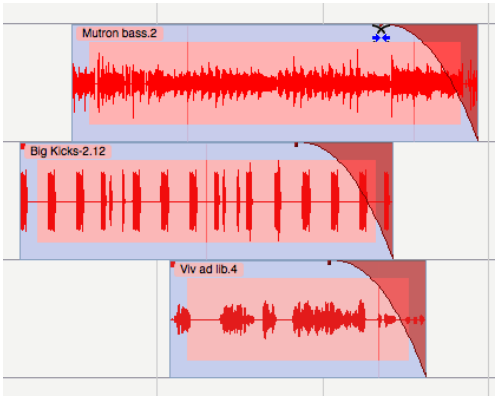


Figure 38-5: Editing multiple fades in one operation.

For example, if you needed to make all fades in a track a little longer, you can select all soundbites and then grab one fade to change them all.

Applying a fade/crossfade to a selection

To apply a single fade or cross fade to a selection:

1 In the Sequence Editor, make a selection over a splice point (the soundbite boundary that defines the fade or crossfade you wish to create).

You can use your selection to define the length of the crossfade, or you can create a fixed-length fade that is different from your selection.

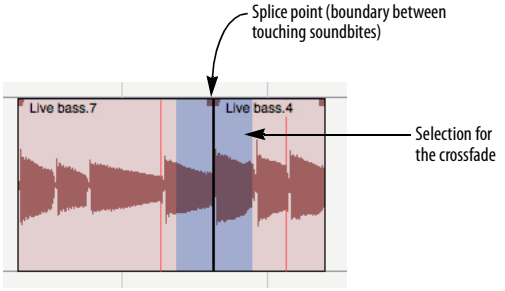


Figure 38-6: Making a selection over a soundbite boundary to apply a fade.

2 Choose *Fade* from the Audio menu to open the *Create Fades* dialog, as shown in Figure 38-1.

3 Set the fade-out and fade-in curves as desired. These curves are explained later in the chapter.

4 To create a fade over the exact length of your original selection, choose the *Fade selected time ranges* option from the menu at the bottom of the dialog. To create a fade of a specific length, choose *Create fixed-length fades* and then enter the desired length for the fade (in milliseconds) in the *before splice* and *after splice* text boxes.

5 Click OK to apply the fade.

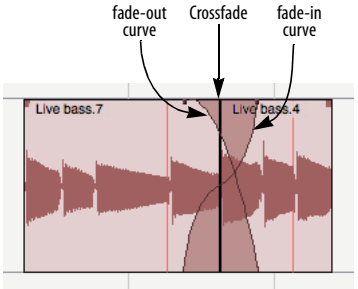


Figure 38-7: A crossfade.

TYPES OF CROSSFADES

When you apply a crossfade, the selection you make relative to the splice point determines the type of crossfade. If you make a selection with the splice point somewhere in the middle, you will create a standard, centered crossfade as shown below in Figure 38-8.

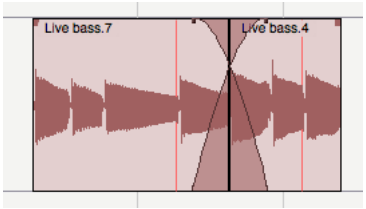


Figure 38-8: A centered crossfade.

If you make a selection to the left of the splice point, you create a pre-crossfade before the splice point as shown below in Figure 38-9. This will let you maintain the volume of the beginning of Soundbite 2 without fading across it. This is especially useful if there is a percussive downbeat at the beginning of Soundbite 2 that you want to preserve.

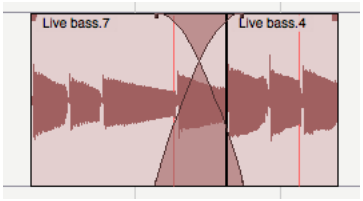


Figure 38-9: A pre-crossfade.

If you make a selection to the right of the splice point, you create a post-crossfade as shown below. This is useful if you want to maintain the volume of Soundbite 1 right up to the splice point.

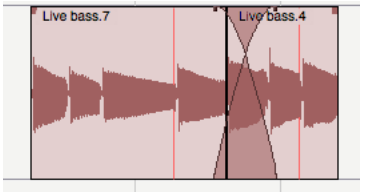


Figure 38-10: A post-crossfade.

Crossfades use material beyond the splice

All three types of crossfade discussed in the previous section use "hidden" material in each region beyond the splice point. In the centered crossfade shown below, the fade-out starts in 'Bass riff 1' and extends into the beginning of 'Bass riff 2'; the portion of the fade-out to the right of the splice point is actually calculated from material in Bass riff's parent audio file — material that is currently not visible.

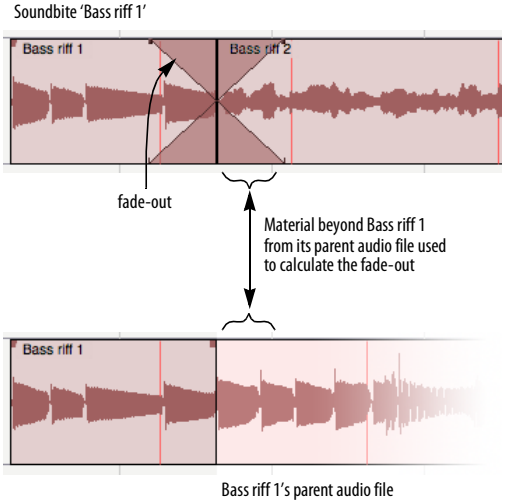


Figure 38-11: The area beyond 'Bass riff 1' in its parent audio file is used to calculate the fade-out curve of the crossfade. The same is also true for the area preceding 'Bass riff 2' in its parent audio file.

If there isn't enough additional material in the parent audio file for the fade-out (or fade-in) calculation, the fade will drop to zero at that point.

Fades mix with silence

Fades, on the other hand, do not use material beyond the edges of the soundbite from the parent audio file. Instead, they mix with silence to create a smooth transition to (or from) zero volume.

Fade types

The fade dialog box offers three types of crossfades and two types of fades:

Equal gain crossfades are recommended for material that is phase coherent or nearly phase-coherent, as in crossfades between soundbites from the same audio source material (the same instrument, for example). Equal gain crossfades help avoid clipping that can occur when using equal power crossfades (described below). Equal gain fades are available for both fades and crossfades.

Equal power crossfades are recommended for material that is not phase coherent, such as completely different musical instruments. Equal power crossfades help you to avoid the volume drop that can sometimes occur with equal gain crossfades. Equal gain fades are available for both fades and crossfades.

Independent crossfades are recommended for special circumstances in which you cannot achieve the desired results with the equal gain or equal power curves — or when you specifically need to create entirely different fade-out and fade-in curves. This option only applies to crossfades; it is not available for fades (since a fade consists of only one curve).

FADE CURVES

For all of the fade types discussed in the previous section, you can choose between a standard fade curve or an S-shaped curve. If you are using an equal power or equal gain crossfade, both the fade-in and fade-out curve must be the same curve type. (The curve buttons in the window enforce this for you.) However, if you are using independent curves, you can choose a different curve type for the fade-in and fade-out.

Regardless of which fade type you create, you are given handles on the curves in the diagram to further adjust the curve. The standard fade curve offers a single handle; it creates a smooth, continuous general-purpose fade. The one exception to this is when you are using independent curves, in which the standard curve also gives you two end points that let you modify where the curve starts and ends.

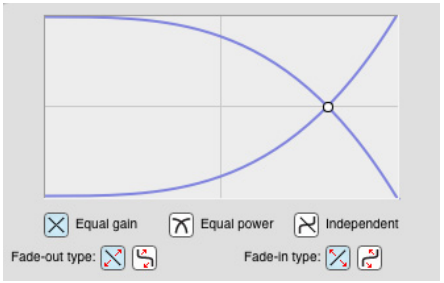


Figure 38-12: Here is an example of an equal gain crossfade with a standard curve.

S-shaped curves give you several handles, including one at the crossover point where it inverts its shape. S-curves are particularly useful for material that is hard to crossfade with a standard curve.

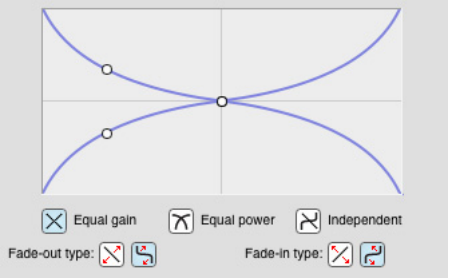


Figure 38-13: Here is the same equal gain crossfade shown in Figure 38-12 with an S-shaped curve instead of a standard curve.

When you choose independent S-shaped curves, you can get as elaborate as you need.

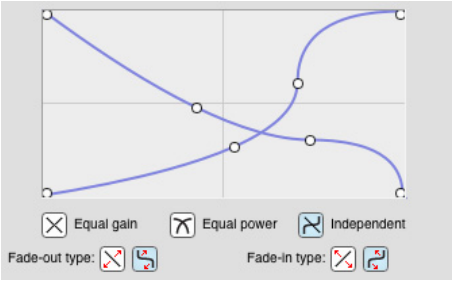


Figure 38-14: Here is a crossfade with independent S-shaped curves.

Fade curve presets

On each side of the Fades dialog, below the fade-out and fade-in sections, there is a row of buttons that provides you with several useful fade curve presets. These presets are commonly useful curves provided as a convenience to you. They are by no means "magical" in any way. These curves will cover most of the situations you encounter. You can also use them as a starting point and then further tweak them with the handles in the curve diagram.

For the most part, the icons on the buttons give you a pretty good idea of the shape of the curve and the effect it will have on your audio. The "square corner" presets are notable because the keep the volume of the fade-in or fade-out constant — either full volume or zero volume — for the entire length of the fade.

HOW FADES ARE GENERATED

When you make a fade (or crossfade), Performer Lite computes the fade on-the-fly — no files are created on disk. Fades are applied non-destructively, just as with volume automation or real-time effect inserts.

FADES ARE ANCHORED TO THEIR SPLICE

In general, fades and crossfades are preserved during editing operations such as dragging, shifting, compacting or setting the soundbite start time. For example, if you trim the edge of a soundbite, and it has a fade on it, the fade will remain after the trim operation. If the audio data within the range of the fade or crossfade changes, it will be recomputed automatically.

There are a few situations in which crossfades cannot be preserved, due to their nature. Crossfades are defined by the splice to which they were applied. If the splice point changes, the fade may no longer be valid because the original arrangement of audio data from which the fade was computed no longer exists. As a result, crossfades always remain anchored to the soundbite edge (or boundary between two soundbites) to which they were originally applied. They cannot be moved independently of their splice point — although they can move *with* their splice point (as long as it doesn't change in the process). For example, if you move one of the two soundbites that define a crossfade, the crossfade will disappear. If you move them together, the crossfade will move with them.

APPLYING MULTIPLE FADES IN ONE OPERATION

Often, you'll need to apply several — and possibly many — crossfades at one time. Rather than having to painstakingly apply them one at a time,

Performer Lite allows you to apply as many fades as you want in one operation. One way to do this is to use the Shift key to select several splice points at one time before entering the Fades dialog. You can then apply the same fade to all of them, using your selections to define the length of each fade. Or you can apply fixed-length fades.

Another way to apply multiple fades at one time is to make one large selection that contains any number of splice points and then apply fixed-length fades to all of them in one operation. This technique is especially useful when you've made many detailed edits — perhaps dozens or even hundreds — and you need to apply crossfades to all of them.

To apply fixed-length fades and/or crossfades to many splice points in one operation:

1 In the Sequence Editor, select the region that contains the splice points you would like to fade and/or crossfade. For example, if you want to apply fades and crossfades to all soundbite boundaries in the entire sequence, display all tracks in the Sequence Editor and *Select All*.

2 Choose *Fade* from the Audio menu to open the Fades dialog.

3 Choose *Create fixed-length fades* from the menu at the bottom of the window.

4 If the region you selected contains existing fades, and you would like to replace them with new fades, check the *Update existing fades* option. If you want to preserve existing fades, leave it unchecked.

5 If you would like to apply crossfades to all eligible splice points (ones that consist of boundaries between two touching soundbites), check the *Create new crossfades* option. If you don't want to create any crossfades where soundbites touch, leave it unchecked.

6 If you would like to apply fades to all soundbite edges (e.g. edges that are not touching another soundbite), check the *Create new fade-ins or fade-outs* option. If not, leave it unchecked.

7 Enter the length of the fade by entering times in the *before splice* and *after splice* value boxes provided. Values are in milliseconds (100 = one tenth of a second).

8 Click OK to generate the fades.

When you click OK, Performer Lite's applies the fades. You can, of course, proceed with other work when the fades are being processed, if you like. Fades that are not calculated yet are displayed in gray; fades that are done appear in the same color as the soundbite.

REAPPLYING THE LAST FADE SETTINGS

To apply another fade using the same settings you last used, hold down the Option/Alt key while choosing *Fade* from the audio menu.

DELETING FADES

To delete a single fade, click it and choose *Delete Fades* from the Audio menu.

To delete all fades within a region, select the region and choose *Delete Fades* from the Audio menu.

To delete all fades in the entire sequence, use *Select All* in the Tracks window (or the Sequence Editor with all tracks showing) and choose *Delete Fades* from the Audio menu.

EDITING EXISTING FADES

To modify an existing fade, double-click it.

To modify several existing fades at one time, select them and choose *Fade* from the Audio menu.

In either case, after you've made the changes you would like in the Fades dialog, make sure that the *Update existing fades* option is checked before clicking OK.

FADES THAT CANNOT BE FULLY COMPUTED

If Performer Lite computes a fade or crossfade and the level of the mixed audio in it exceeds unity gain (0 dB), the fade appears bright red to alert you to the fact that it is clipping.

If, for some reason, a fade or crossfade doesn't have enough audio for Performer Lite to compute the complete fade, it appears bright blue. For example, you might draw a crossfade that is two seconds long, but one of the soundbites involved may not have a full extra second of audio in the parent audio file beyond the edge of the soundbite. In this case, the crossfade appears bright blue to indicate that it cannot be fully computed.

TRIMMING SOUNDBITES THAT HAVE A FADE OR CROSSFADE

If a soundbite edge has a fade or crossfade on it, you have to delete the crossfade in order to change it. This makes sense because as soon as you change it, the crossfade is no longer valid anyway (since the splice point has changed). You can reapply the crossfade after you modify the soundbite edge.

CLIPPING WHEN CROSSFADES ARE CALCULATED

If clipping occurs when Performer Lite calculates a crossfade, the crossfade is drawn in red instead of the soundbite's color. In this case, you will probably want to re-apply the crossfade, adjusting the curves. Try using the equal gain curves (since it is impossible for clipping to occur when using equal gain).

CHAPTER 39 Information Panels

OVERVIEW

Information panels provide feedback about a wealth of parameters, events, controls, and more. Each Information panel has its own particular display or purpose, but they all behave similarly in several ways:

- The contents of the Information panels update to the current selection, cursor position, etc. while you work; in this way, they serve as central locations for feedback about your project.
- Information panels "float".

Overview 356
Opening an information panel 356
Floating windows or sidebar cells 356
The Information Bar 356
Snap Information 357
Cursor Information 359
Event Information 359
Selection Information 360
Sound File Information 362
Track Inspector 364
Channel Strip 364
Track Selector 364

OPENING AN INFORMATION PANEL

To open an Information panel from the Information Bar (Figure 18-1 on page 122), click the letter at the left of the section, as shown in Figure 18-6 on page 126.

To open an Information panel by name from the Run command, press shift-spacebar and type its name.

You can also open an Information panel from an assigned keystroke in the Commands window (Setup menu). The key command associated with each Information panel is a show/hide toggle: press the key command once to show the panel, then press it again to hide the panel.

FLOATING WINDOWS OR SIDEBAR CELLS

When an Information panel is open, it can be displayed either as a sidebar cell or as a separate floating window. If it's a sidebar cell, and you wish to make it a floating window, click it to make it the focused cell and then choose *Windows menu > Pop Out of Consolidated window*. To move the floating window back into the sidebar, make it the active window and choose *Windows menu > Pop In to Consolidated window.*

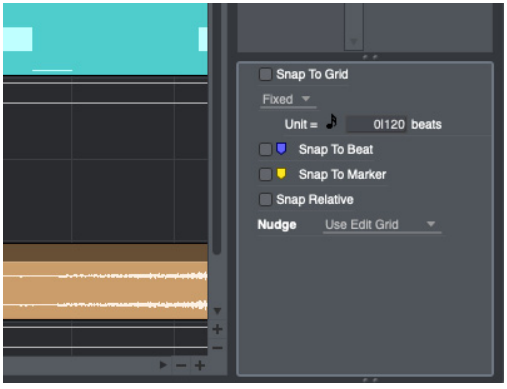


Figure 39-1: The Snap Information panel as a sidebar cell.

THE INFORMATION BAR

The settings in Information panels can be displayed in the Sequence Editor and Notation Editor Information Bars. You can even choose which settings to display. For details, see "Information Bar" on page 126.

SNAP INFORMATION

The Snap Information panel contains information pertaining to snapping and nudging.

Figure 39-2: The Snap Information panel (as a floating window).

Snap to Grid

The *Snap to Grid* feature can be enabled or disabled with the check box provided. If the Snap to Grid box is turned on, data snaps to the edit grid. If it is turned off, data doesn't snap to grid. Choose the desired *Snap to Grid* mode from the menu (Figure 39-2): *Fixed* or *Auto*.

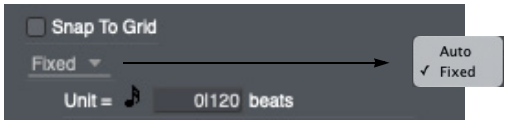


Figure 39-3: Snap to Grid.

Auto mode

In *Auto* mode, Performer Lite chooses a reasonable grid size, based on the time format of the time line and the zoom level of the edit window you are working in. For example, if you are zoomed in quite a bit for detailed editing, the Auto grid might snap to 32nd notes. If you zoom out, it will snap to 16th or 8th notes.

Fixed mode

In *Fixed* mode, the *Unit* = setting (Figure 39-2) determines the minimum time unit for editing, which is shown as a note duration and a number of beats and ticks, such as 240 ticks. The Edit Grid Resolution (*Unit* =) determines the amount of time between grid points. MIDI events, note durations, soundbites, loops, region boundaries, automation data, Memory Cycle repeat barlines, or any event that can be dragged horizontally will snap to time increments in the time line equal to the value of the edit grid unit. For example, if the Unit is set to 120 ticks, events will snap to 000, 120, 240 and 360 ticks.

Using Snap to Grid

Press the D key on your keyboard to toggle quickly between Fixed and Auto modes.

Snap to Grid's on/off state, the edit grid resolution and Snap Relative's on/off state can be set independently for each edit window.

If you wish to maintain an event's original, unquantized position relative to the time line's absolute grid, use the *Snap Relative* option. See "Snap Relative" on page 358.

Setting the Edit Grid Resolution

To change the Edit Grid Resolution, first make sure that *Fixed* mode is chosen from the menu and then use the value field provided to type in the desired grid duration, or choose a preset length from the *Unit*= menu.

When you type in a value, the note displayed next to the ticks box will grey out (or text will be displayed in italics) if the tick value does not equal one of the presets in the menu.

Triplet and dotted triplet grid editing

The edit grid menu also provides choices for triplet and dotted triplet values.

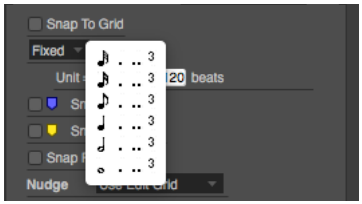


Figure 39-4: The edit grid menu for measures and beats provides triplet and dotted triplet values.

Snap to Grid and selecting
Snap to Grid applies to selection, too, so it is an effective way to constrain selection operations.

Edit resolution when the grid is turned off
When Snap to Grid is turned off, data can be dragged freely. The smallest unit of resolution is one screen pixel, the exact resolution of which is determined by the current zoom level.

Temporarily overriding Snap to Grid
The Command/Ctrl key temporarily overrides the current Snap to Grid enable/disable state. For example, if Snap to Grid is currently enabled, the holding down the Command/Ctrl key while dragging overrides the current edit grid. Conversely, if Snap to Grid is currently disabled, the Command/Ctrl key forces dragging to snap to the current Snap to Grid grid setting. The same is true for selection operations.

Don't let the edit grid fool you
When you zoom in, the edit grid (in *Fixed* mode) may cause data to seem like it is "stuck"; that is, data will not move when you try to drag it. This is because the fixed-size edit grid is larger than the distance you are dragging. To "unstick" the data, deselect the Snap to Grid check box, or hold down the Command/Ctrl key while dragging. Doing so overrides the edit grid temporarily. Alternately, you can use "Auto mode" on page 357.

Snap to Grid and nudging with the arrow keys
Snap to Grid only affects dragging operations. It is independent of nudging data with the arrow keys (except when Nudge is set to *Use Edit Grid* – see "Nudge" below).

Snap to Beat
Snap to Beat (Figure 39-2 on page 357) snaps actions to the beats within the waveform. This is active only when in the Sequence Editor or Waveform Editor. See "Using the beat grid" on page 434.

Snap to Markers
When *Snap to Markers* is checked (Figure 39-2 on page 357), dragged events snap to markers. The edges of soundbites and MIDI notes dragged close to a marker location also snap to the marker's time. For example, the left edge or right edge of a soundbite or MIDI note will snap. Snapping also occurs when spotting soundbites by dragging them from the Soundbites list into the Sequence Editor.

Hold down the Command/Ctrl key to toggle the current setting.

Snap Relative
When *Snap Relative* (Figure 39-2 on page 357) is checked, an event moves relative to its original position, rather than snapping to the time line's absolute grid. For example, if the grid unit is set to 120 ticks, and the original event is located at 013 ticks, it will snap to 133, 253, and 373 (which are all 13 ticks after 000, 120, 240 and 360).

Nudge
The *Nudge* amount (Figure 39-2 on page 357) lets you to choose the unit of time by which you can nudge any selected data with the arrow keys. Many different time formats are supported, including SMPTE frames, SMPTE sub-frames, samples, and milliseconds. Choose the desired time format from the menu and then enter the amount of time. You can change the nudge amount at any time.

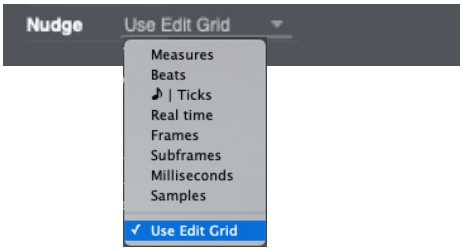


Figure 39-5: Setting the Nudge Amount.

When you choose a mensural time format (one that involves measures, beats and/or ticks), data is nudged in the same manner as using the Shift command (Edit menu) with the *Preserve Real-time Performance* option unchecked. This means that the data being nudged maintains its metrical relationship to the sequence, changing the way it plays back, if necessary, to respect any tempo changes that may be programmed in the conductor track in the area in which the data is being nudged.

When you choose any other time format (real time, SMPTE frames, sub-frames, milliseconds, or samples), the real time performance of the data is preserved, regardless of any tempo changes.

When you choose the *Use Edit Grid* menu item, the nudge amount is determined by the edit grid setting above. If the edit grid is currently disabled, then nudging occurs in the same manner as in the window itself (by one screen pixel).

CURSOR INFORMATION

The Cursor Information panel displays the current location of the mouse cursor with respect to the horizontal and vertical axis in the edit windows. Values in this box are continually updated as the mouse cursor moves around the edit window, giving you immediate, numerical accuracy when inserting and manipulating data with the mouse.

Figure 39-6: The Cursor Information panel.

Time

The pointer's horizontal coordinate, Time, displays the time of the current cursor location.

Value

The cursor's vertical coordinate, Value, depends on its location in the Sequence Editor and the active layer. It will display MIDI note values when the cursor is over a MIDI note grid, controller values when over a continuous data grid, audio volume when over audio track volume automation, soundbite names when over soundbites, and so on.

EVENT INFORMATION

The Event Information panel displays numerical details about a single event that has been selected. For example, a selected note appears with its location, pitch, on velocity, off velocity, and duration.

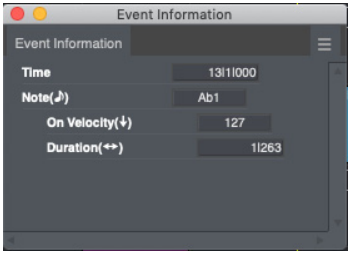
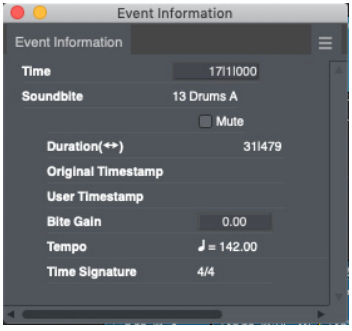


Figure 39-7: When you click a note, its numerical information can be displayed and edited in the Event Information panel.

When a soundbite is selected, additional information is displayed: soundbite mute, original timestamp, user timestamp, bite gain, tempo, and time signature.



Information displayed in the Event Information section can be edited by clicking it (with the exception of some soundbite attributes). The usual editing conventions apply, such as using the Tab key and arrow keys to move from field to field and press return to confirm any changes you have made. The event's graphic display will change to reflect the modifications.

SELECTION INFORMATION

The *Selection Information* panel holds the start and end times for any region that you wish to edit in any currently highlighted tracks. If the Performer project file contains multiple sequences, separate Selection Information is stored for each sequence.

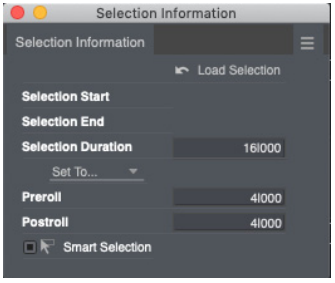


Figure 39-8: The Selection Information panel.

You can set these times by:

- making a time range selection in the Sequence Editor
- typing (use the Tab key as usual)
- dragging on the numbers vertically to change them
- choosing the desired command from the Set To menu
- using several clicking shortcuts
- using several keyboard shortcuts
- loading them with the *Remember Times* Command

These techniques are discussed in the following sections.

Editing the selection bar numbers directly

To enter a start or end time, click in a field and enter a value. You can use the Tab key (or decimal point key on the keypad) to cycle through the measure|beat|tick fields. Or you can simply press on any field and drag up or down to change its value.

Using the Set To menu shortcuts

The Set To menu holds several great shortcuts for loading times into the Selection Information panel:

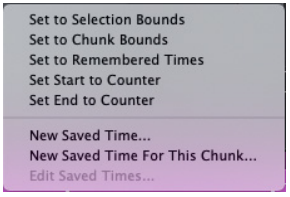


Figure 39-9: The Set To menu provides several useful shortcuts for entering start and end times in the Selection Info panel.

Command	What it does
Set to Selection Bounds	Loads the beginning and end of the currently selected region into the Selection Information panel.
Set to Sequence Bounds	Loads the very beginning and end of the entire sequence.
Set to Remembered Times	Loads the times currently stored by the Remember Times feature.
Set Start to Counter	Loads the current counter location into the start time.
Set End to Counter	Loads the current counter location into the end time.

For the last two commands, Performer loads the counter location *at the time you click the menu*, not when you actually choose the command. This helps you load start and end times on the fly during playback. Click the menu at the desired instant, and then take as much time as you need to choose either *Set Start* or *Set End*.

Clicking the start and end buttons

The buttons to the right of the Selection Start and Selection End values let you load times as follows:

Click the button to load the current counter location – even on the fly during playback.

Command/Ctrl-click the button to load the beginning or end of the sequence into the start time or end time, respectively.

Control/Win-click the button to load the beginning or end of the Remembered Times (previously retrieved from a selection with the Remembered Times command) into the start time or end time, respectively.

The selection bar shortcuts

There are two shortcuts for loading the current counter location into the Selection start and end times. By default, they are assigned to the F5 and F6 keys on your computer keyboard. You can change these key assignments if you like. You can also program these key commands to respond to any MIDI device, so that you can actually load counter times from an external MIDI device. See chapter 29, "Commands" (page 257) for details.

The "Remember Times" command

The Remember Times command (control-R), allows you to save any time range selection, so that you can load it into the Selection Information panel later on. You can also load remembered times into the Memory Bar and the Auto-Record Bar. For complete information, see "The 'Remember Times' command" on page 310.

Load Selection

The *Load Selection* button provides additional shortcuts. Click the *Load Selection* button once to Set Selection to Remembered Times, or double-click the button to Set Selection to Sequence Bounds.

Making a selection in an edit window

You can make a time range selection in an edit window to set the Selection times. For example, you could click one of the Memory Cycle markers in the Sequence Editor to select the Memory Cycle range. The selection is automatically loaded into the Selection Information panel.

Preroll and Postroll

These text fields set the Preroll and Postroll for *Auto Record* mode.

Smart Selection

A check box is provided as a convenient shortcut to enable or disable *Smart Selection*. For more information, see "Smart Selection" on page 310.

SOUND FILE INFORMATION

Sound File Information window gives you detailed information about the currently selected soundbite.

Figure 39-10: The Sound File Information window shows information about the currently selected soundbite, its parent sound file, and any sampler loops in the file, if any.

Opening the Sound File Info window

To open the Sound File Information window, right-click an audio clip and choose *Sound File Information* from the menu.

The Sound File section

The *Sound File* section at the top of the window shows information about the soundbite's parent sound file, such as its location, sample rate, length and the date it was created and last modified.

You can type in comments about the sound file that are stored with the file itself (so they will appear in this window when you import the audio file into other Digital Performer projects). The menu at the top of the section allows you to switch to a different sound file, if you like.

Soundbite preferences for transposing and time-stretching

The menus in the status area at the top of the Soundbites window show the Transpose preference and the Time Compress/Expand preference for the selected soundbite or soundbites. Each soundbite can be assigned its own preference.

To assign the transpose and time-compress/expand preferences to multiple soundbites at a time, select them in the Soundbite list or Sequence Editor and change their setting in the Sound File Info pane.

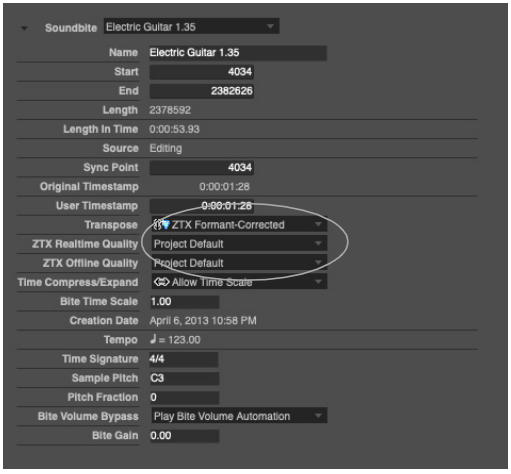


Figure 39-11: Pitch-shifting and time-stretching preferences are found in the Info pane for each soundbite.

Transpose

The Transpose preference determines the pitch-shifting algorithm that will be employed when transposing the sound file, whenever audio transposing is employed. For more information about transposing, see chapter 62, "Transposing Audio" (page 547).

ZTX Realtime and Offline Quality

The ZTX-related settings also have an effect on the nature and quality of pitch-shifting processing, from pencil tool edits in the Sequence Editor pitch layer to wholesale transposition using the Transpose command or Track Transpose setting. For details on these settings, see "ZTX Preferences" on page 545. If you choose the *Project Default* setting, then the soundbite takes its value from the *ZTX quality in current project* setting in the preferences (see "Pitch and Stretch" on page 255).

Time scale versus don't time scale

There are only two options for the Time Compress/Expand preference: *Allow Time Scale* and *Don't Time Scale*. This determines the behavior of the Scale Time, Adjust Soundbites to Sequence Tempo and Stretch commands, as well as beat-based operations such as quantizing beats within soundbites. You may want to mark soundbites that contain a single note or sound effect, for instance, as Don't Time Scale. A soundbite that contains multiple notes, such as a two-measure drum loop, would typically be set to Allow Time Scale, so that its tempo will always match that of the rest of the sequence.

Setting sound file prefs for multiple soundbites

To set the sound file preferences for two or more soundbites at one time:

1 Select the soundbites.

2 Open the Sound File Information window. The Sound File menu will now say "Selected files".

3 Choose the desired preferences in the Soundbite section. If the Soundbite section's details are not visible, click the triangle next to the Soundbite section to expand it.

The Soundbite section

The *Soundbite* section (Figure 39-11) shows details about the currently selected soundbite, such as its start time, end time and length (in samples).

The menu at the top of the *Soundbite* section lets you display the information for any soundbite you wish.

The Audio Loop section

The *Audio Loop* section at the bottom of the Info pane provides details about any sample loops in the audio file. Sample loops are the loop points created by samplers (or sampler editors).

TRACK INSPECTOR

The Track Inspector shows track settings such as color, input, output, play-enable status, record-enable status, Pitch mode, Stretch mode, and so on. For further information, see "Track Inspector" on page 45.

CHANNEL STRIP

The Channel Strip panel shows the Mixing Board channel strip controls for a single track. The Channel Strip panel updates to focus on the current track at hand. For further information, see "Channel Strip" on page 46.

TRACK SELECTOR

The Track Selector lets you show and hide tracks in the Sequence Editor, Mixing Board and Notation Editor. For further information, see "Track Selector" on page 44.

CHAPTER 40 Edit Menu

OVERVIEW

For a general explanation of how to use Edit menu operations, see chapter 34, "Editing Basics" (page 296). All Edit menu commands can be applied to MIDI data, audio data or both:

Overview **365**
Undo **365**
Redo **365**
Cut **365**
Copy **365**
Paste **366**
Other Paste commands **366**
Erase **367**
Duplicate **367**
Repeat **367**
Paste and Merge **367**
Other Merge commands **368**
Trim **368**
Trim Audio **368**
Trim End / Trim Start **368**
Select All **368**
Select All Tracks in Range **368**
Deselect All **369**

UNDO

The Undo command will undo the effects of most commands and actions that add, delete, move, or otherwise modify data. Undo will also undo the effects of recording. Undo is unlimited. This means that if you invoke it repeatedly, you can essentially step backwards through your previous actions. For example, if you choose *Undo* three times, you'll go back three actions. Undo can be used together with Redo to step forwards and backwards through your document's Undo history.

REDO

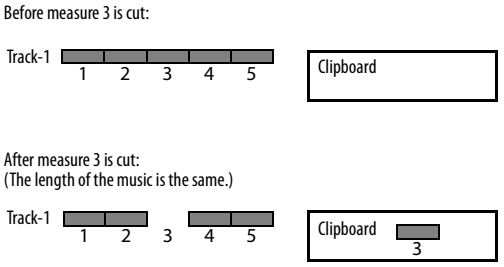
The Redo command restores the action that was just undone. Like Undo, Redo is also unlimited. This means you can restore undone actions until you reach the most recent action you've taken in your project.

Together, Undo and Redo allow you to step repeatedly backwards and forwards through the project's current history of actions.

Both Undo and Redo give you a brief description of the action they are undoing or restoring, such as *Undo drag note* or *Redo paste into track 'Lead Guitar'*.

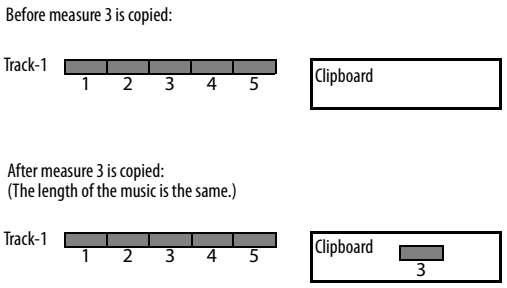
CUT

The Cut command removes data in the selected region and places it on the Clipboard. This does not remove the time region specified; instead, it leaves the measures blank (silent). The Cut command is undoable.



COPY

The Copy command copies the data from the selected region and places it on the Clipboard. The original data is not affected at all. The Copy command is undoable.



PASTE

The Paste command inserts the contents of the Clipboard (i.e. whatever was most recently cut or copied) into a track at the location that you specify. When you paste, you need to tell Performer Lite *where* you want the Clipboard data to go. Performer Lite needs to know:

- What track (or tracks)
- What time in the track (or tracks)

Choosing a track (or tracks) to paste into
To choose *the track* you want to paste into, click the track's name in the Sequence Editor to highlight it. To paste into several tracks at once, highlight their names (see "Selecting tracks" on page 307).

Indicating the time at which you want to paste
There are several useful ways to choose *the time* at which you want to paste:

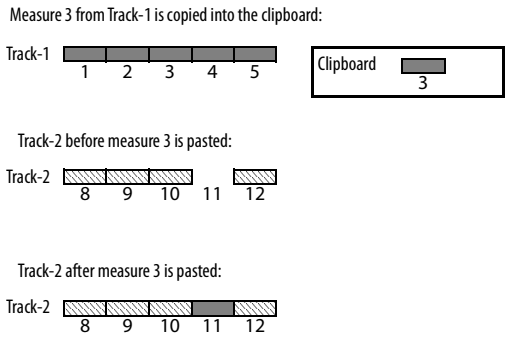
- If there is already *a current selection* in any track, Performer Lite will use the beginning of the selection (either the first event of an event selection or the start time of a time range selection) to determine where it pastes.

- If there is no current selection, Performer Lite pastes into the measure currently displayed in the main counter (and also indicated by the playback wiper in windows that have it) — along with one additional condition: if Performer Lite's *Smart Selections* feature is *turned off*, material is pasted at the exact tick location shown in the counter. If Smart Selections is *turned on*, material is pasted *measure relative*, which means that it is placed in the measure at its original location within the measure so that you don't have to worry about exact placement of the counter. Just get the counter anywhere into the measure you want and paste. For more information, see "Smart Selection" on page 310.

Choosing tracks and location at the same time
You can use any of the selection techniques in the Sequence Editor to choose the track and the location at which you want to paste with one easy selection.

What happens when you paste
The length of the pasted region is exactly that of the data in the Clipboard (including any blank space at the beginning and end of the region that was placed on the Clipboard).

Pasting data always replaces what was previously there. The Paste command is undoable.

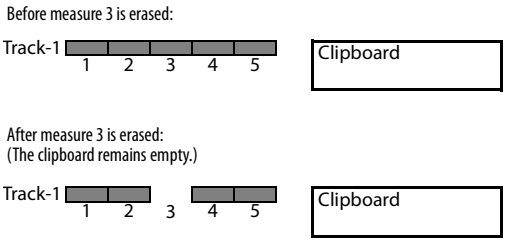


OTHER PASTE COMMANDS

Several additional variations on the Paste command can be found in the Commands window (Figure 29-1 on page 257). If you search the Commands list for the word *Paste*, you can find them and assign your own custom keystrokes to them. Included are *Paste At Wiper*, *Paste At Wiper Multiple*, *Paste At Original Time*, and *Paste At Original Time Multiple*.

ERASE

The Erase command works like the Cut command except that no data is put on the Clipboard: all data in the selected region is removed and the region is left blank. The Erase command is undoable.



DUPLICATE

The Duplicate command makes an internal copy (which does *not* go on the Clipboard) of the current selection (either a time-range selection or an object selection), then pastes a copy of this data immediately following the selected region. The resulting copy is selected, so that you can immediately use the Duplicate command again repeatedly to quickly create consecutive copies of the data.

REPEAT

The Repeat command makes an internal copy (which does *not* go on the Clipboard) of the data in the selected region, then pastes, splices or merges this data repetitively, immediately following the selected region. For example, repeating measures 1-3 three times places a copy of measures 1-3 in measures 4-6, 7-9, and 10-12. Regardless of the events in the region, *the entire selected region is repeated.* In the above example, the start and end locations in the Selection bar would be set to 1|1|000 and 4|1|000, respectively. The entire three measure region is repeated, with each repetition starting on the down beat of the following measure. In most cases, it is best to select entire measures or groups of measures to repeat; this ensures that the repetitions will line up correctly with measure boundaries.

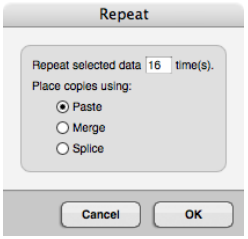


Figure 40-1: The Repeat command.

The Repeat command requires a time range selection instead of an event selection. For a further explanation, see "Edit operations that require time range selection" on page 305.

Using the Paste option in the Repeat dialog box, the repeated data replaces the data in the repeated region: the pre-existing data is erased. Using the Merge option in the Repeat dialog box, the repeated data is merged with the data in the repeated region. Using the Splice option in the Repeat dialog box, the repeated data moves the pre-existing data to a later time in order to make room for the data in the repeated region.

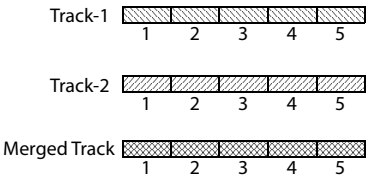
PASTE AND MERGE

The Paste and Merge command combines the contents of the clipboard with pre-existing data in the selected tracks. The new data is mixed together with the data already in the region. In the case of audio, the merged audio is layered on top of any existing audio at that time, but the actual waveform data is not merged. Instead, the result is two soundbites layered on top of one another.

You need only specify a Start time when merging; the End time has no effect. The Merge command is undoable.

Since Performer Lite allows unlimited tracks assigned to one channel, the Merge command isn't always necessary. You should use it only when you are certain that data in two tracks should be merged together (this is often true when you create a track during editing for the express

purpose of merging it with another track later). After tracks are merged, they cannot be separated later.



OTHER MERGE COMMANDS

Several additional variations on the Merge command can be found in the Commands window (Figure 29-1 on page 257). If you search the Commands list for the word *Merge*, you can find them and assign your own custom keystrokes to them. Included are *Merge At Wiper*, *Merge At Wiper Multiple*, *Merge At Original Time*, and *Merge At Original Time Multiple*.

TRIM

Trim allows you to select a portion of a soundbite and remove the parts of it that are not selected. For example, you might want to extract a single measure from a soundbite that is 8 measures long. It is also very useful for removing silence at the beginning and/or end of a recorded soundbite.

TRIM AUDIO

This variation of the Trim command can be accessed by holding down the Option/Alt key while accessing the Edit menu. *Trim Audio* does the exact same thing as Trim except that it only affects audio data (and *not* MIDI data).

TRIM END / TRIM START

The *Trim End* command (Edit menu) removes any portion of a soundbite between what is currently selected and the end of the soundbite, if any. To change this menu command to *Trim Start*, hold down the Shift key while accessing the Edit menu. Trim Start removes any portion of the soundbite between what is selected and the beginning of the soundbite.

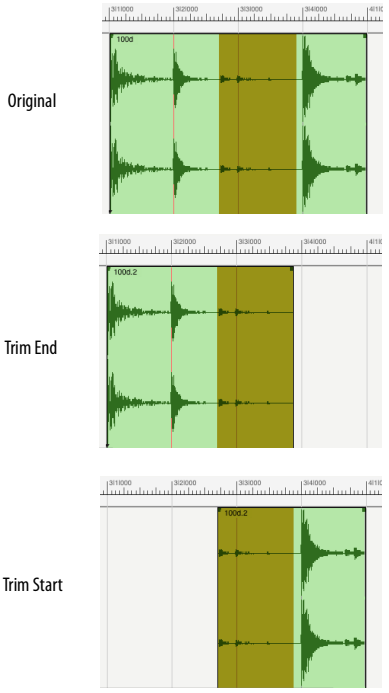


Figure 40-2: Trim End and Trim Start.

SELECT ALL

The Select All command generally selects all items in the active window. If the Sequence Editor is active, choosing Select All will select all the tracks (thus highlighting all track names).

SELECT ALL TRACKS IN RANGE

To access the *Select All Tracks in Range* command, hold down the Option/Alt key while accessing the Edit menu, or press Command/Ctrl-Option/Alt-A.

The *Select All Tracks in Range* command selects all tracks, as its name implies, but it only selects a certain time range, rather than the entire length of the sequence. The time range is determined either

by the selection start and end times currently chosen in the Selection Information window, or by the current selection, if any.

DESELECT ALL

The *Deselect All* command makes all currently selected data not selected.

CHAPTER 41 Region Menu

OVERVIEW

For a general explanation of how to use Region menu operations, see chapter 34, "Editing Basics" (page 296). Region menu commands can be applied to MIDI data, audio data or both, with a few exceptions for audio as noted in "Region menu exceptions for audio" on page 297.

Overview 370
Region command windows 370
Previewing 371
Transpose 371
Quantize 379
Groove Quantize 386
Create (Extract) Groove 391
DeFlam 394
Change Velocity 395
Change Duration 398
Split Notes 401
Invert Pitch 404
Change MIDI Channel 405
MIDI Effects Plug-ins 405
Reverse Time and Retrograde 406
Scale Time 407
Scale Tempo 408
Audition Selection 410

REGION COMMAND WINDOWS

All of the Region menu commands open as a window that can stay open, unlike Edit menu commands, which are dialog boxes that must be okayed or cancelled before you can do anything else. By staying open, Region menu commands let you apply their effect without revisiting the menu each time. For example, if you are quantizing a number of tracks, you can leave the Quantize window open while you successively select different tracks and apply different quantize settings to them.

Because of the way Region menu windows interact with global selection, only one Region menu window can be open at a time. If you have one already open, and you choose a different command from the Region menu, the current window is replaced with the new one.

When you open a Region menu window, its location on your computer screen is remembered when you close it and reopen it. In addition, all Region menu windows share this location, so they will always open in the same spot.

Region command window mini-menus

Region command windows have a mini-menu with several items.

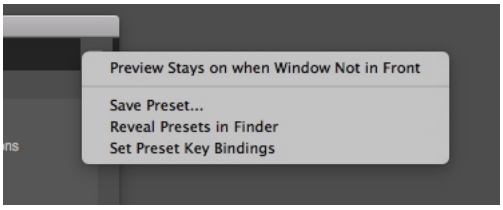


Figure 41-1: Region command window mini-menu.

Preview Stays on when Window Not in Front: This menu item is available for any Region commands that have previewing, such as the Quantize commands, as explained below in "Previewing". When checked, previewing continues (before actually applying the effect) even when the Region command window is not the front-most window.

Save Preset: Let's you name and save the current settings in the window as a preset. Saved presets appear by name at the bottom of the menu for that same Region command (Quantize, Transpose, etc.) . They are also added to the Commands window (Setup menu), where you can assign shortcuts to them. This is a great way to save frequently used Region menu operations. If the Region command has a matching real-time MIDI plug-in, saved settings also appear in the Effect window mini-menu as presets for the corresponding real-time MIDI plug-in.

Reveal Presets in Finder/Explorer: Opens the macOS or Windows Explorer window where the preset files are located, where you can rename or delete them.

Set Preset Key Bindings: Opens the Commands window, where you can assign shortcuts to your presets. See chapter 29, "Commands" (page 257).

PREVIEWING

Some Region menu commands have a preview check box to the left of the Apply button:

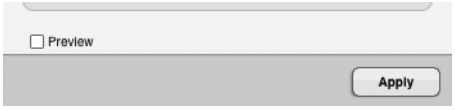


Figure 41-2: Previewing a Region command.

The preview check box provides real-time previewing, which allows you to hear the results of the Region operation in real time (as the sequence plays) before you actually apply it permanently with the Apply button. Data remains unaffected until you click the Apply button.

TRANSPOSE

Performer Lite's Transpose command, found in the Region menu, transposes the pitches of all MIDI notes in a selected region. It can also transpose the pitch of audio data with either formant-corrected pitch-shifting or conventional pitch-shifting, using Performer Lite's non-destructive pitch automation or by producing new audio files.

The Transpose command can transpose both audio and MIDI notes in many ways:

- transpose by interval
- transpose diatonically
- change key from any root to any other
- change key from any mode to any other
- map each pitch to any other pitch
- transpose using scale sizes larger or smaller than 12 notes
- transpose up or down, by any number of octaves
- create and save custom transpose maps
- create and save custom scales or keys
- Create harmonies

When performing the above operations, you can:

- play in pitches or entire scales from your MIDI keyboard when setting up the transposition
- Undo and Redo the Transpose command

The Transpose window provides several ways of transposing, options for each type, a Transpose Map that shows you how each pitch will be changed, and a Custom Maps list which can save transposition maps.

MIDI transpose options

The following options are provided for MIDI transposition only.

Harmonizing instead of transposing

The Transpose window allows you to either transpose or harmonize. The Harmonize option copies the original notes, transposes the copied notes, and the merges them together with the original notes. This allows you to build harmonies quickly.

Transposing poly pressure and/or portamento

The *Transpose poly pressure* option transposes poly pressure (aftertouch data) along with the notes that it modifies.

The *Transpose portamento controller (#84)* option transposes portamento controllers.

Audio transpose options

The following options are provided for audio transposition only.

Transpose audio by adjusting pitch automation

Choose *Transpose audio by adjusting pitch automation* if you would like to transpose the audio by affecting Performer Lite's non-destructive, real-time pitch automation data for the selected audio. The audio data must already have pitch data to transpose; therefore, pitch analysis is required before you can use this option. For complete details, see chapter 62, "Transposing Audio" (page 547).

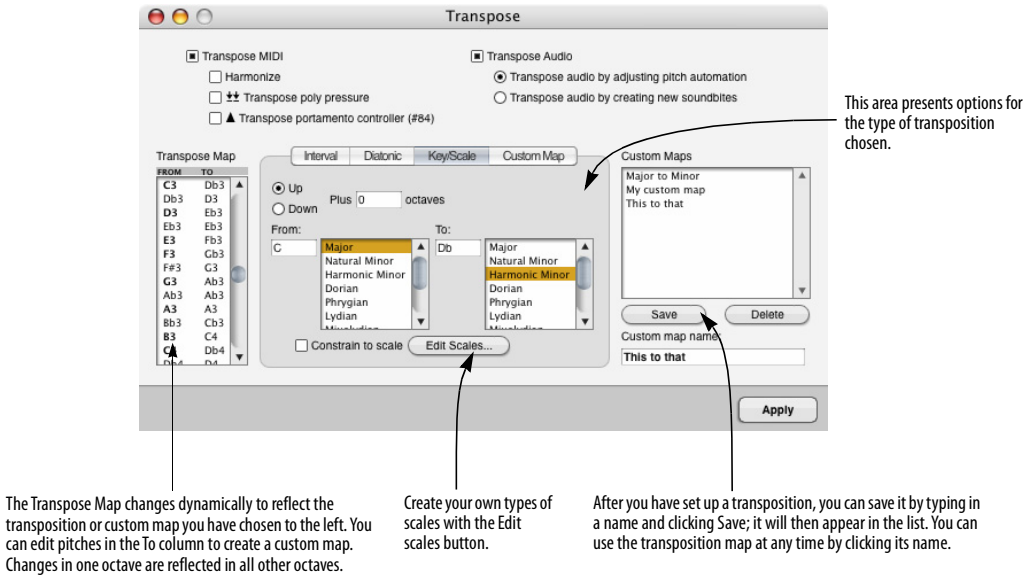
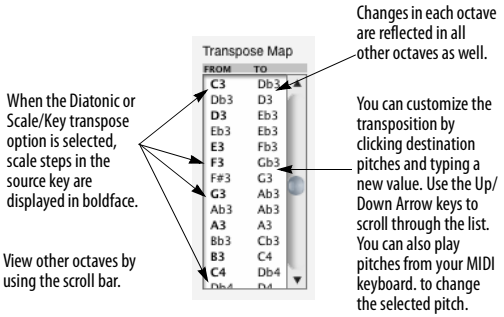


Figure 41-3: The Transpose command.

Transpose audio by creating new soundbites
Choose *Transpose audio by creating new soundbites* if you would like to transpose the audio by creating a new audio file that is the transposed form of the original file (leaving the original file in tact).

The Transpose Map

The Transpose Map displays a scrolling list of all 128 MIDI notes in a column on the left and the pitch to which each will be transposed in a column on the right. Notes and spellings in the map change dynamically according to the transposition options that you choose. In addition, you can edit values directly in the Transpose Map list to further modify the map, as shown below. Changes in one octave are reflected in all other octaves.



As soon as you edit a pitch in the Transpose Map, thus modifying it from they way it was originally set up by the transpose options, the Custom Map transpose option will then become automatically selected to indicate that the transpose map is now a custom map.

Playing in pitches from your MIDI controller
When editing the Transpose Map, you can play individual pitches or an entire scale from your MIDI controller. To play a scale, double-click the first pitch to edit it and then play the scale. As you play, each pitch gets entered into the current box, which then automatically scrolls down to the next note in the list and enters the next pitch you play. If you make a mistake, use the Up Arrow and Down Arrow keys to change the selected pitch.

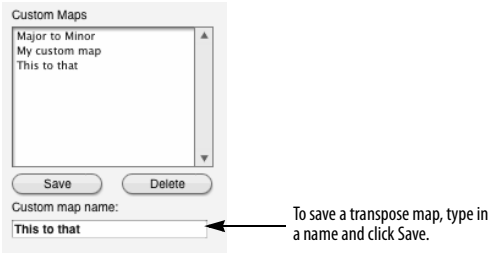
When you are using the Custom Map option, Performer Lite provides another intuitive way for you to play in pitches from your MIDI controller:

1 Select the Custom Map option.

2 Hold down the pitch you wish to transpose, and while holding it down, play the pitch you wish to transpose it to.

You do not need to select any values with the mouse or computer keyboard to use this method.

Saving a Transpose Map
If you would like to save a transpose map, type in a name for it and click Save as shown below. Custom maps are saved with the project.



Using Transpose Maps
To recall the map, select its name in the list. To remove a Custom Map from the list, click its name and click Delete.

To make changes to an existing map:

1 Select the existing map in the list.

2 Make your changes to the Transpose Map.

3 Click Save.

The changes you made will be saved to the map.

To create a new map based on an existing map:

1 Select the existing map in the list.

2 Type in a new name.

3 Click Save.

The new map will appear in the list.

4 Edit the Transpose Map to make your changes.

5 Click Save to save the changes you have made.

Transposing by interval

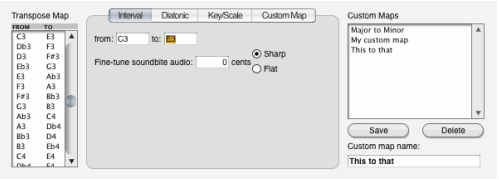


Figure 41-4: Transposing by interval.

Transposing by *Interval* is a chromatic, exact transposition: pitches are shifted by the number of semitones in the interval that you choose. Literally, it causes a mass shift of all pitch values in the selected region, just like dragging MIDI notes up or down in the MIDI Editing or Notation Editors. For example, chromatically transposing from C3 to E3 causes all pitches to shift up a major third (four semitones).

The *from* and *to* pitches define the interval. The notes that you enter to define the interval are not important: only the interval between them matters. For example, instead of entering C3 to E3 to shift notes up a major third, you could enter F3 to A3.

The two pitches entered also define the direction of transposition. If the second pitch is above the first pitch, pitches will be transposed up. If the second pitch is below the first, pitches will be transposed down.

Adjusting the MIDI transpose map

Having chosen an interval, you can edit the transpose map to make modifications to it if you like. As soon as you edit a pitch in the Transpose Map, thus modifying it from they way it was originally set up by the *Interval* transpose options, the *Custom Map* transpose option will then become automatically selected to indicate that the transpose map is now a custom map.

Transposing audio by interval

If you've selected soundbites, and you'd like to include them in the transpose operation, check the *Transpose audio* check box (as shown in Figure 41-4 on page 374) and type in a number of cents, if desired, for fine-tuning the audio transposition. (There are 100 cents per half-tone.) To choose whether the soundbite is transposed using Performer Lite's formant-corrected pitch-shifting or conventional pitch-shifting, set the soundbite's transpose attribute beforehand as explained in "Dragging and dropping soundbites" on page 226.

Transposing diatonically

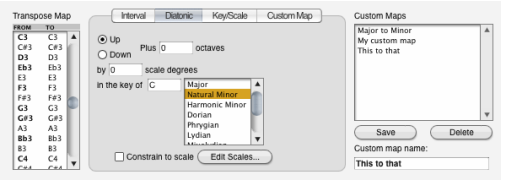


Figure 41-5: Transposing diatonically.

Diatonic transposition transposes MIDI notes by a number of scale steps within the type of scale that you choose. For example, if you transpose up 2 scale steps in the key of C minor as shown in the above example, all C naturals (the root) will be transposed up two steps to E flat (a minor third). Notice that the number of scale degrees, 2 in this example, refers to *the number of scale steps to change by;* it does not refer to the destination scale step.

This is extremely useful for quickly creating harmonies. For example, as shown above you can copy and paste a melody line into another track and transpose it diatonically up a third (two scales degrees) to harmonize with the melody. Scale tones in the key you choose are displayed in boldface in the transpose map column.

To Transpose diatonically:

1 Choose the Diatonic option.

2 Choose the direction (Up or Down) and number of octaves.

3 Type or play in the key root pitch and select a mode from the list.

This sets up the Transpose Map. You can play in the root pitch from your MIDI keyboard if you place the insertion point in the From text box.

4 If you would like to transpose all non-scale pitches into the nearest scale pitch, select the Constrain to scale option.

5 If you would like to customize the transposition, edit the pitch values in the Transpose map.

As soon as you edit a pitch in the Transpose Map, thus modifying it from they way it was originally set up by the *Diatonic* transpose options, the *Custom Map* transpose option will then become automatically selected to indicate that the transpose map is now a custom map.

6 Click Apply.

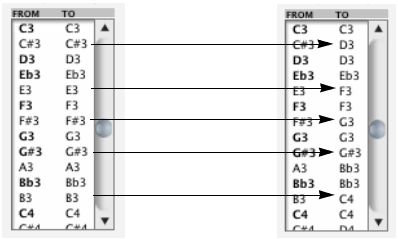
The Up and Down options determine the direction of transposition, and the Plus *n* octaves option allows you to transpose by intervals greater than one octave.

Remember that the key you choose is a way of setting up the diatonic transposition in the Transpose Map. Performer Lite doesn't really "know" what key the actual data is in. In fact, just about any musical phrase can be described in musical terms as being in one of several different, but related, keys. So, when transposing diatonically, it is up to you to know which key to choose to get the results that you want.

The above also holds true for how notes get spelled. The key that you choose only affects the spellings in the Transpose Map: it will not change the spellings of the actual track data. Track note data spellings are controlled by the current key signature in the Conductor track.

The Constrain to Scale option

The Constrain to scale option is available with the Diatonic and Key/Scale transpose options. If enabled, it causes all non-scale tones to be transposed to the nearest appropriate scale tone, as shown below:



Transposing by key/scale

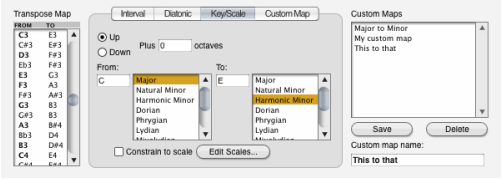


Figure 41-6: Transposing by key/scale.

Transposing by *Key/Scale* transposes MIDI notes from one key to another. For example, you can change music that is currently in a major key to its

corresponding minor key. In the above example, notes in the key of C major are being transposed down to a entirely different root and key: E Harmonic Minor. The Transpose Map shows each note in the key of C Major on the left, and on the right, the pitch each note will be transposed to (in the key of E Harmonic Minor).

To Transpose by key:

1 Choose the Key/Scale option.

2 Choose the direction (Up or Down) and number of octaves.

3 Type or play in the source key root pitch and select a mode from the top list.

This sets up the From column in the Transpose Map. You can play in the root pitch from your MIDI keyboard if you place the insertion point in the From text box.

4 Type or play in the destination key root pitch and select a mode from the bottom list.

This sets up the To column in the Transpose Map.

5 If you would like to transpose all non-scale pitches into the nearest scale pitch, select the Constrain to scale option.

6 If you would like to customize the transposition, edit the pitch values in the Transpose map.

As soon as you edit a pitch in the Transpose Map, thus modifying it from they way it was originally set up by the *Key/Scale* transpose options, the *Custom Map* transpose option will then become automatically selected to indicate that the transpose map is now a custom map.

7 Click Apply.

The Up and Down options determine the direction of transposition, and the Plus ___ octaves option allows you to transpose by intervals greater than one octave.

Remember that the source and destination keys that you choose are a way of setting up the diatonic transposition in the Transpose Map. Performer Lite doesn't really "know" what key the actual data is in. In fact, just about any musical phrase can be described in musical terms as being in one of several different, but related, keys. So, when transposing by key, it is up to you to know which key to choose to get the results that you want.

The above also holds true for how notes get spelled. The key that you choose only affects the spellings in the Transpose Map: it will not change the spellings of the actual track data. Track note data spellings are controlled by the current key signature in the Conductor track.

Transposing using a custom map

The Custom Map option allows you to do several things. You can:

- create a customized map that is based on one of the other transpose options
- transpose using octave ranges other than 12 halftones
- map each note to any other note
- map all notes to a single pitch

Each of these operations are discussed below.

Custom transposing based on another transposition

Often you may want to slightly modify a transposition set up by one of the first three transpose options. For example, you may want to transpose diatonically up two scales steps except for each A-flat, which you would like to maintain as an A-flat. In this case, you can set up the

Diatonic transposition and then edit the destination pitch for A-flat so that it doesn't change pitch.

To create a customized map that is based on the Interval, Diatonic, or Key/Scale Transpose options:

1 Choose the Transpose option you would like to base your custom map on.

Set up the parameters for the option as necessary.

2 To customize the transposition, edit values in the Transpose map as needed.

As soon as you edit a pitch in the Transpose Map, thus modifying it from they way it was originally set up by the transpose options, the *Custom Map* transpose option will then become automatically selected to indicate that the transpose map is now a custom map.

3 If you would like to save the map, type in a name and click Save.

The map will appear in the Custom Maps list.

4 Click Apply to execute the transposition.

Custom transposing with a non-standard octave range

Interval, Diatonic, and Key/Scale transpose options all set up the transpose map in 12 note octaves. Changes in one octave are reflected in all other octaves. The Custom Map option can set up the transpose map in octaves that are more or less than 12 notes. For example, if you have a sampler that has drum pitched drum sounds like tom-tom drums every 6 notes, you can transpose that 6-note range to the 10-note range of another sampler. Or, you can transpose music from a 12-tone synth to a synth that is tuned in quarter-tones.

The Custom Transpose option frees you from the octave and diatonic restrictions of the other transpose options.

To transpose using an custom octave range:

1 Select the Custom Map transpose option.

The Custom Transpose options will appear.

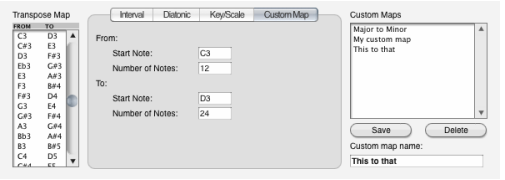


Figure 41-7: Transposing with a non-standard octave range.

2 Type in the number of notes in the source and destination octaves and a root pitch for the initial octave.

In the example above, a standard 12-note octave is being mapped to a 24-note octave. The scale sizes can be any number between 1 and 128. The root pitches can be any note. Notice that the source octave from C3 to C4 gets mapped to the destination two-octave range of D3 to D5. Also notice that the root pitches do not need to be the same. All other octaves above and below become mapped in the same fashion as the one you define. If notes in other octaves get transposed to pitches outside the 128 note MIDI range, they are substituted with pitches inside the range.

3 If you would like to save the map, type in a name and click Save.

The map will appear in the Custom Maps list.

4 Click Apply to execute the transposition.

Transposing all notes to a single pitch

To map all 128 MIDI notes to a single pitch:

1 Select the Custom Map transpose option.

The Custom Transpose options will appear.

2 Type in 128 in the From: option.

This includes all notes into one, large octave.

3 Type in 1 in the To: option.

This maps all note in the 128-note octave to a single note.

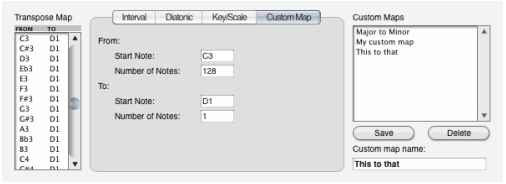


Figure 41-8: Transposing all notes to a single pitch.

4 Type in or play in a pitch in the To: option.

In the above example, all notes are being mapped to C1.

5 If you would like to save the map, type in a name and click Save.

The map will appear in the Custom Maps list.

6 Click Apply to execute the transposition.

Transposing each pitch to any other pitch

The Custom Map option can also map each pitch to any other pitch, completely independently from the same pitch in other octaves. This allows you to create a transpose map to easily change drum tracks from one drum machine to another.

To set up a drum machine transpose map:

1 Select the Custom Map transpose option.

The Custom Transpose options will appear.

2 Type in 128 in both the From: and To: options.

Since there is only one source and destination octave, each change you make in the Transpose Map's To column will not be carried through to any other octaves.

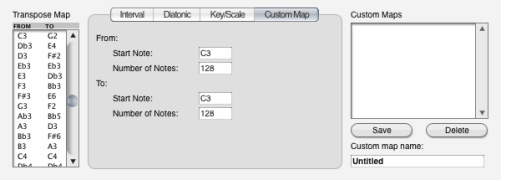


Figure 41-9: Transposing each pitch to any other pitch.

3 Edit the pitches in the Transpose Map's To column.

Notice that each pitch treated individually and does not affect surrounding pitches or octaves. Notice in the above example that a same destination pitch, like Db3, can be used more than once, such as when several pitched tom-tom sounds are being mapped to a single tom sound.

4 If you would like to save the map, type in a name and click Save.

The map will appear in the Custom Maps list.

5 Click Apply to execute the transposition.

Creating a custom scale

The Custom Scale option allows you to create your own scale. To do so, you select which pitches are diatonic and which ones are not.

After you create a custom scale, it appears in the list of keys/scales for the Diatonic and Key/Scale transposition options, allowing you to transpose diatonically using your own scale and any root pitch.

To create a custom scale:

1 Click the *Edit Scales* button.

The Create Scale dialog box appears.

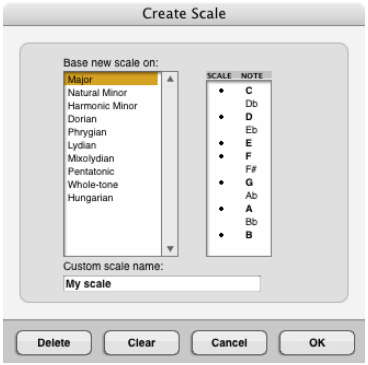


Figure 41-10: Edit Scale.

2 Select the pitches you wish to be diatonic pitches.

You can have as many or as few diatonic notes as you wish. You can also select the diatonic pitches by playing them on your MIDI controller. A pitch turns into boldface to indicate that it is diatonic.

3 Click OK to create the scale.

Your custom scale appears in the key/scale list for the Diatonic or Key/Scale transpose options.

Deleting a custom scale

To remove a custom scale from the list:

1 Click the *Edit Scales* button in the Transpose window.

2 In the list of scales, click the name of the scale you want to delete.

3 Click Delete.

QUANTIZE

Quantizing changes the attack and release times of MIDI note events and audio soundbites to make them more rhythmically precise. It can also modify beats within soundbites that have been analyzed with Performer Lite's Beat Detection Engine (chapter 45, "Audio Beats and Tempo Detection" (page 428)). Attacks, releases and beats within soundbites are aligned with a *grid*, a set of locations that occur on the beat and its subdivisions. Quantize is useful in correcting perceived rhythmic inaccuracies after your sequence is recorded. It does a rhythmic "cleaning up" based upon your specifications.

Figure 41-11: You can quantize just about everything with the 'what to quantize' options.

What to quantize

Quantize will only alter the locations and durations of the types of data you choose in the *What to quantize* section. All other data in the selected region will be unmodified. The *What to quantize* section gives you the following choices for what you can quantize:

- Attacks

- Releases
- Don't change note durations
- Soundbites
- Beats within soundbites
- Exclude soundbites
- Custom edit filter

The *Custom edit filter* option, shown in Figure 41-11, gives you complete control over what you wish to quantize, including markers, patch changes, and tempo events in the conductor track. You can quantize anything except loops.

Some inaccuracy is good

Quantizing is, in its simplest form, a way to make all note events and/or audio beats in your sequence occur on a beat or one of its subdivisions, eliminating inaccuracies. But inaccuracy is far from undesirable. In fact, inaccuracy is what gives a piece of music its "feel", its particular rhythmic profile. If you always aligned all attacks and releases with grid locations, your music might have a mechanical, inhuman quality to it. You'll find that you'll often want to preserve some of the rhythmic nuances of your playing. Therefore, Performer Lite allows you to quantize selectively and specify the degree of quantizing you want. The Sensitivity and Strength options accomplish this. In addition, you might want to shift the occurrences of the beat slightly ahead or behind the metronome beats in a particular track or section. The Grid Offset option allows you to do this.

Quantizing MIDI notes

When MIDI notes are quantized, they are moved from their original locations to the nearest grid location.

You can choose to change the attack times and/or release times of notes. There is an added option to leave the note durations unaltered. Choosing to change attack times causes them to be moved to the nearest grid location; release times are left unchanged. Choosing to change release times causes them to be moved to the nearest grid location; attack times are left unchanged. Both of these operations cause an automatic change in note durations.

Figure 41-12: An example of quantizing with and without quantizing the releases.

You can choose not to change the original durations. This prevents durations from being truncated, which may cause the notes to sound chopped.

Note that if you choose to change both the attack and release times, the *Don't change note durations* option is automatically disabled. This is due to the nature of the operation: if you change both the attack and release times of a note, the durations will automatically be modified.

Quantizing soundbites

When quantizing soundbites, only their location is adjusted: their duration, and the beats within the soundbite, are not affected.

Quantizing beats within soundbites

For audio that has been beat-analyzed by Performer Lite's Beat Detection Engine, quantizing beats within soundbites affects the beats without splitting up the soundbite into

smaller soundbites. Instead, time-stretching is applied between beats to stretch and shrink them as necessary to move the beat to the nearest quantize grid location. For further details, see "Quantizing beats within soundbites" on page 436.

Excluding soundbites

If you don't wish to affect soundbites at all with the Quantize operation, use the *Exclude Soundbites* option (Figure 41-11 on page 379).

Custom edit filter

Check the *Custom edit filter* option to display the additional options shown in Figure 41-11 on page 379.

Including audio automation data

If you wish audio effect plug-in automation data to move along with its associated soundbite when the soundbite gets quantized, check the *Move audio effect plug-in automation with soundbites option* (Figure 41-11 on page 379). This preserves the timing between a soundbite and any simultaneously occurring automation data affecting it.

This option also applies when quantizing beats within a soundbite: automation data affecting a certain beat will move with the beat when it is quantized.

Quantizing MIDI controllers

When quantizing MIDI controller data, you have two options:

Move MIDI controller events with notes

With this option, MIDI controller data moves along with its associated note when the note gets quantized. This preserves the timing between a note and any simultaneously occurring controller data affecting it.

Quantize MIDI controller events to grid

With this option, controllers shift their position to the nearest grid location, according to quantize options such as Sensitivity and Offset, just like MIDI note attacks. Since controllers have no duration or release times, these options have no effect on controllers.

Specifying the controllers to quantize

When either of the two options for quantizing controllers are chosen, the filter check boxes shown in Figure 41-11 on page 379 let you choose which controllers to include and exclude. The *MIDI Controllers and Track Automation* list lets you further specify which types of controller and automation data you wish to include in the Quantize operation.

Quantizing Conductor Track events

When you choose the *Quantize MIDI controller events to grid* option (Figure 41-13), options for quantizing markers, tempo changes and key changes appear as shown. (Meter changes cannot be quantized because they define the grid itself by determining where the downbeat is.)

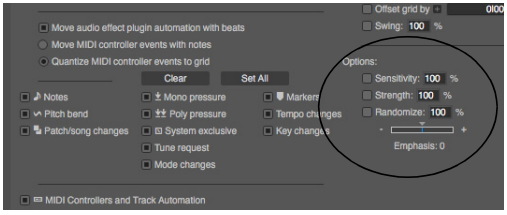


Figure 41-13: Quantizing Conductor Track events.

Choosing the grid's duration value

The grid value is the distance between grid locations. For example, if you select an eighth note as the grid value, each grid location is an eighth note apart. This means that the note attacks and/or releases will be moved to the nearest eighth note location.

The grid is aligned such that it begins on the first beat of the first measure of the selected region. If a meter change occurs in the selected region, the grid is realigned at the point of the meter change to begin on the first beat of the meter change.

Generally, you should choose a grid value that is the smallest note value in the region. For instance, if you are quantizing a region with lots of sixteenth notes and a few quarter notes, choose a grid value of a sixteenth note.

The grid value can be modified with the dot and/or tuplet boxes. When the dot is selected, it adds one half of the selected duration to the grid value. For example, if the quarter note and dot are selected, the grid value is a dotted quarter, equivalent to three eighths. If the tuplet box is selected, the tuplet specification is applied to the selected duration. Example: you have three eighth notes in the time of two specified and the tuplet box is checked.

The quantize grid will be set to triplet eighth notes. Each triplet grid location will have a duration of 160 ticks, which is equal to a third of a quarter note (480 ticks). To specify a tuplet grid value:

1 Select the base duration you want.

Click on one of the note symbols.

2 Check the tuplet check box.

3 Enter the number of tuplets in the left text box.

4 Enter the number of regular note values that the tuplet replaces in the right text box.

Quantizing to SMPTE frames, real time or samples

By clicking the time format button in the grid section (Figure 41-14), you can change the quantize grid to any time format, including SMPTE frames, real-time or samples. (This feature is available in many other MIDI effects, too.) In the example below, the grid has been set to one SMPTE time code frame:

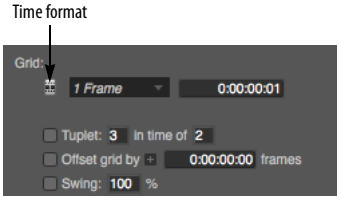


Figure 41-14: Quantizing to a SMPTE grid, or any time format, including real-time or samples.

Grid offset

The start of the grid may be offset from its standard position on the first beat of the selected region by a number of ticks. This is done by clicking in the check box next to *Offset by n ticks* and entering a number of ticks to offset the grid by. Positive values offset the grid forward in time (after the beat), negative values offset it backward (before the beat).

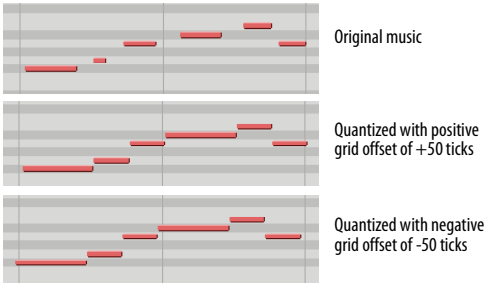


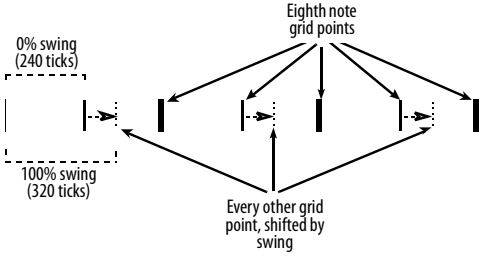
Figure 41-15: An example of quantizing with a positive or negative grid offset.

If you enter an offset greater than the distance (in ticks) between grid locations, the number will be scaled down to be less than the distance of the grid value. For example, if you are using a grid value of a quarter note (480 ticks at 480 ppq resolution) and you enter an offset of 500 ticks, it will be reduced to an offset of 20 ticks, that is 500 minus 480. Offset values range from -9999 to 9999.

Swing

The *Swing* option delays every other grid point to create a swing feel.

The Swing option defaults to 100%, which produces straight swing. For example, an eighth note grid produces a grid point every 240 ticks. The swing option, at 100%, will delay every other grid point 80 ticks to 320, which is the attack time of the third eighth note in an eighth note triplet.



A larger percentage such as 120% would delay every other grid point to 336 ticks, creating a "loose" swing feel. A smaller percentage such as 80% would advance every other grid point to 304 ticks, creating more of a straight swing feel. The percentage can be any value between 0% and 300%. 0% does nothing and is the same as quantizing without the swing option. 300% delays every other offbeat all the way to the next grid point.

Sensitivity

Each grid location has a "field of effectiveness" in which note events can be moved by the Quantize command. Normally, this field extends from one grid location halfway to the next, affecting all note events. The center of each field is the grid location: each field actually extends out in either direction from the grid location.

Figure 41-16: 100% Sensitivity reaches all the way from one grid location to the next, as shown here by the gray background.

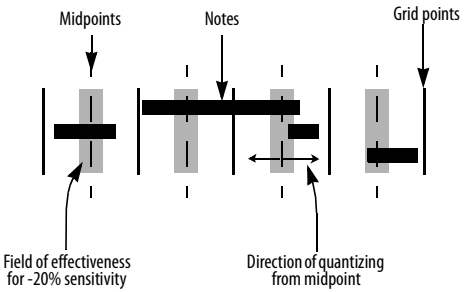
Sensitivity is the size of this field. The default sensitivity (without the Sensitivity options selected) is 100%, i.e. extending continuously between grid locations. This field is actually split into *50% before* the grid location and *50% after* the grid location. If you select Sensitivity and enter a value of 50%, the quantizing field will be reduced:

Figure 41-17: 50% Sensitivity reaches only part way (25%) on both sides of each grid location, as shown here by the gray regions.

Note that 50% means 25% before the grid location and 25% after it (i.e. 50% of the way to the midpoint between grid locations). Any notes not in the field would *not* be quantized.

As illustrated, a positive Sensitivity value quantizes notes surrounding a grid location. In contrast, negative Sensitivity values quantize notes surrounding the *midpoints* between grid locations.

With positive Sensitivity values, the field of effectiveness extends outward from the grid location. In the case of negative sensitivity, the field extends inward from the midpoints on either side of the grid location. As with positive sensitivity, the field is split on either side of the midpoint. So if you enter a Sensitivity value of negative 20%, notes from about 41 to 50% before the grid location and about 41 to 50% after would be moved to the grid location:



What's most important is the effect that different Sensitivity values will have on your music. To summarize:

- Positive sensitivities clean up the down beats without affecting 'swung' or freely played notes in between.
- Negative sensitivities catch major inaccuracies while retaining the music's 'feel'.

To use the Sensitivity option:

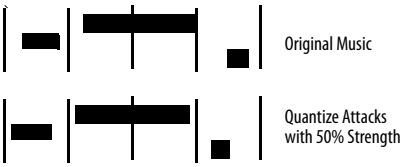
1 Check the check box next to the Sensitivity option.

2 Enter a number between -100 and 100 for the Sensitivity value.

Strength

Another way to preserve some of the rhythmic character of your music while making it more rhythmically accurate is to use the Strength option. Without any options chosen, Quantize will move all note events so that they align perfectly with grid locations. Since this can result in an overly precise effect, you might want to leave some of the original inaccuracy in the passage. The Strength option does this by not moving the note events all the way to the grid locations. Rather, they are moved a percentage of the way toward the grid points. Use the Strength option to tighten up a passage without losing its "feel".

The Strength value specifies the amount that note events move toward grid locations when quantized. A Strength value of 100% (the default) moves them all the way to the nearest grid locations. A value of 0% leaves them where they are. A value of 50% moves them halfway to the grid locations.



Consider this example: there is a note event occurring at 10|3|450. The grid duration is a quarter note (at 480 ticks per quarter note), the Strength option is selected and a value of 40% is entered. When Quantize is okayed, the note will move to 10|3|462. If no strength option were selected, it would have moved to 10|4|000, a distance of 30 ticks. A Strength value of 40% moved it that percentage of the distance (40% of 30 ticks = 12 ticks) to 10|3|462.

To use the Strength option:

1 Click in the check box next to the Strength option.

2 Enter a number between 0 and 100 for the Strength value.

Randomize

Unlike all of the other Quantize options, which try to make notes more rhythmically precise, the Randomize option does just the opposite: it modifies the quantization randomly to make the notes as rhythmically imprecise as you like. 100% randomization causes note attacks (and/or releases) to be placed entirely randomly. A value of less that 100% reduces the range over which the notes will be randomized, and the grid point sits in the middle of the range. For example, if you

choose a 16th note grid (a grid point every 120 ticks), and a randomize value of 50%, the range is 60 ticks, extending 30 ticks before and after each grid point. Thus, a note attack (and/or release) would be randomly placed within 30 ticks of its nearest grid point.

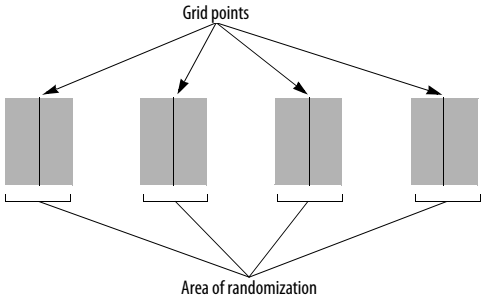


Figure 41-18: 50% Randomization on a 16th note grid produces a region of 30 ticks on either side of each grid point: notes will be placed randomly within this region around each grid point.

Emphasis
This sub-option causes the tendency of the randomization to be earlier or later within the specified range. Thus, if you wish to randomize the note placement within a certain range, but you wish to push the beat by tending to make the notes occur a little bit early, use a negative emphasis; use a positive emphasis if you wish them to tend to be laid back—that is, after the beat. A value of zero equals no emphasis, which causes the randomization to occur evenly within the range.

Hints for quantizing

If you're trying to simply line up all notes with the beat and its subdivisions, selecting *Attacks* and *Don't change note durations* will most likely yield the results you want. If you select both Attacks and Releases, all notes will begin and end at grid locations. This may make them *too* precise, sounding chopped, inhuman, or just wrong.

If you are trying to get the notes of a chord to line up to make the attack precise, consider using the DeFlam command on the Region menu instead of Quantize. It will line up the attacks but will not move the notes to a grid location.

If you want to quantize a region containing a mixture of sixteenth, eighth, and quarter notes which contains just two or three thirty-second notes, set the grid value to sixteenths for quantizing. You can subsequently change the thirty-seconds back individually. Otherwise, if you choose too small a duration value, many notes may move to undesirable locations. Choose a grid value that reflects the general rhythmic profile of the region in its most active, complex areas.

Performer Lite is very capable, but it can't read your mind; you'll find that there are some notes that just don't get moved to the locations you want them to be. This is due to the original location of the note not being within the quantize field for the desired grid location. The quickest way to fix this is to change them individually in the Sequence Editor.

You can use the Offset command to do some very fancy quantizing that may not, at first glance, even seem like quantizing. For example, suppose you've just entered your sequence in 4/4 time and you decided that you'd like to make notes that fall on the third beat of every measure slightly late. First, set the grid value to the whole note. Grid locations will occur only once per measure, on the first beat. Choose the Offset option and enter a value of 980 ticks. Since 960 ticks constitute one half note (at 480 ppq), 980 ticks is 20 ticks after the third beat. Now choose the Sensitivity option and enter a value of 20%. This limits quantization to those notes near the third beat already (if you didn't use the Sensitivity option, *all* notes would end up quantized to the third beat). You may have to experiment with the percentage. Use a larger

percentage if some notes don't get quantized that should; use a smaller percentage if some notes get quantized that shouldn't.

The Offset option was not designed for the mass shifting of notes in a region. If you want to move a section of your sequence forward or backward in time, use the Shift command on the Edit menu.

GROOVE QUANTIZE

Performer Lite's Groove Quantize feature is easy to use and — from a creative standpoint — one of Performer Lite's most enjoyable features.

This section tells you how you can do the following:

- Use the Groove Quantize command to control the rhythmic depth and "feel" of your music
- Dynamically adjust the feel of grooves with faders while applying them
- Use Groove Quantize to apply the rhythmic feel of audio or MIDI tracks to other audio or MIDI tracks
- Create your own grooves, of any length, from any music you have recorded into Performer Lite or loaded from a standard MIDI file
- Extract grooves from audio files that have been beat-analyzed with Performer Lite's Beat Detection Engine and then apply it to other audio or MIDI tracks
- Extract a groove from MIDI data and apply it to other audio or MIDI tracks
- Build a groove database from which you can instantly call up any groove you have created

Groove Quantizing audio

Groove quantizing has the ability to affect the timing of beats within soundbites for any audio that has been beat-analyzed with Performer Lite's Beat Detection Engine. For details, see "Applying a groove to beats within soundbites" on page 437 and "Extracting a groove from audio" on page 437.

What is a groove?

In musical terms, a *groove* is a unique rhythmic feel. Many artists are famous for a certain *feel*—or groove—in their music that makes their sound unique.

Performer Lite's Groove Quantize feature gives you complete reign over this important aspect of your music.

The effect of adding a groove to an otherwise mundane track can be stunning: the music instantly feels like it has a third dimension, and the sensation can be similar to that moment when you put on 3-D glasses in an old 3-D movie. Sometimes, the effect is subtle. Often, however, you'll find that a groove completely transforms music, making it sound totally different from its original form.

The elements of a groove

To master grooves, it is important to recognize the musical elements of a groove. A groove is generated by variations in the timing, accent, and duration of the notes being played. This is true for either MIDI data or audio data. In Performer Lite, a groove consists of a combination of the following elements:

- A quantize grid that affects the *timing* of notes (attacks only)
- A note-on velocity map
- A note duration map
- A meter
- A length (in measures)
- An overall beat subdivision

For example, a swing groove is usually based on a swung 8th note beat subdivision. If it's a hard swing, the eighth-note offbeats may be played quite late. The durations of the notes in such a groove tend to be longer, and the velocities emphasize the offbeats. The length of the groove is usually two measures, and it is often in 4/4 time.

When you apply a groove to some MIDI data in a track, the selected notes are modified according to these groove parameters.

Applying a groove

To apply an existing groove:

1 Use Performer Lite's Memory Cycle feature to cycle playback over the region you wish to apply the groove to.

2 Start playback.

3 Select the data you wish to apply the groove to.

Make sure that what you select is within the region Performer Lite is currently looping. If you don't, you won't be able to audition the groove before applying it. Use any method of selection that you prefer. You can select individual notes or an entire region of data. The groove will be applied at the measure boundaries of the region you select.

4 Choose Groove Quantize from the Region menu, or press command-G.

The Groove Quantize window appears.

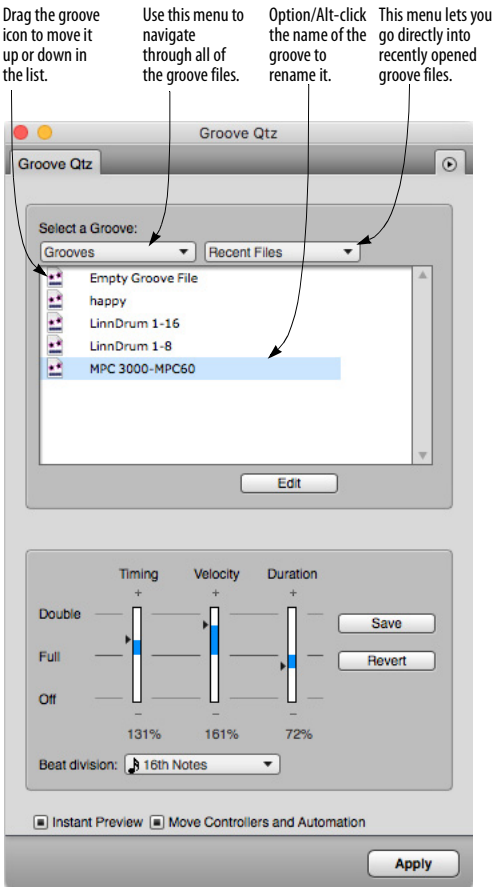


Figure 41-19: Groove Quantize.

5 Open one of the Groove files (or folders) in the list by either double-clicking its name or by clicking its name once and clicking the open button.

You now see a list of grooves stored in that groove file.

6 Select the desired groove by clicking its name.

If the *Instant Preview* button is checked and Performer Lite is playing back the region you selected, you'll hear the effect of the groove right away. You can audition as many grooves as you want without permanently applying one.

☛ Instant preview does not affect beats within soundbites when Groove Quantizing audio.

7 If you'd like to adjust the feel of the groove, click the *Edit* button.

This option is discussed further later on in this chapter.

8 If you'd like MIDI controllers and audio automation data to move with its associated MIDI notes or audio beats, click the *Move Controllers and Automation* button.

This option is discussed below.

9 To apply the groove, click Apply.

Instant preview

When the Instant Preview button in the Groove Quantize window is checked, you can preview grooves being applied to MIDI data without having to click Apply to apply them. This lets you quickly scan through a list of grooves, auditioning each one until you find one you like. To apply it, click Apply. When Instant Preview is unchecked, you won't hear the groove until after you click Apply.

☛ Instant preview does not affect beats within soundbites when Groove Quantizing audio.

Move Controllers and Automation

When the *Move Controllers and Automation* option is enabled, MIDI controller data or audio automation data will move together with its associated MIDI notes or audio beats when they are moved by the Groove Quantize command. This helps preserve the effect the controller and automation data has on the notes and audio beats.

The Recent Files menu

The Recent Files menu is provided for your convenience. It lets you go directly into recently opened groove files.

The groove quantize sliders

A unique and powerful feature, the groove quantize sliders (Figure 41-19 on page 387) let you adjust the degree to which the groove is applied—in essence, they let you "turn up" or "turn down" the groove. For more information, see "Adjusting groove parameters when applying a groove" on page 389.

Locating a groove

The groove list works like a standard open dialog box. Use it as usual to locate grooves.

Renaming grooves

To rename a groove, option/Alt-click its name in the Groove list to edit the name.

Deleting, moving, and duplicating grooves

Grooves can be cut, copied, and pasted in the Groove Quantize window. This allows you to delete them, move them from one file to another, and duplicate them.

Duplicating is useful because you can make a copy of a groove and then make adjustments to the copy, which preserves the original.

To do any of these operations, you first open the Groove Quantize window. To do so, select some data or a region and choose Groove Quantize from the Region menu. Locate the groove, and then do one of the following desired operations:

Operation	How to do it
To delete a groove	Click it in the list to select it and choose Cut from the Edit menu.
To move a groove from one file to another	Cut it (as described above), open another groove file using the menu above the list, and the choose Paste from the Edit menu.
To duplicate a groove	Click it to select it and choose Copy from the Edit menu. Then choose Paste from the Edit menu. After pasting, rename the copy to differentiate them.

Where grooves are stored

Grooves are stored in Performer Lite groove files. You can store as many grooves as you want in a groove file. You can create as many groove files as you want. The only requirement is that groove files must be placed in a folder called "Grooves", and this folder must be placed here:

Platform	Path
Mac OS	/Library/Application Support/MOTU/ Performer Lite/Grooves
Windows	C:\ProgramData\MOTU\ Performer Lite\Grooves\

This is all taken care of for you when you first install Performer Lite, so, unless you have moved the folder, you don't need to worry about it.

When you create your own groove files (discussed later), we recommend that you organize them by category as shown above. This will make it easier to locate grooves.

Notice that you can further organize your groove files by placing them in folders (as long as they remain inside the Grooves folder). You can even place Mac alias files or Windows shortcuts in the Grooves folder and place the actual groove files somewhere else on your hard disk.

Adjusting groove parameters when applying a groove

When you apply a groove, Performer Lite allows you to adjust groove parameters without permanently altering the groove itself. For example, you can "turn up" the degree to which velocities are affected without changing the original velocity map in the groove. To permanently edit the groove see "Modifying grooves" on page 393.

To adjust groove parameters while applying a groove:

1 Use Performer Lite's Memory Cycle feature to cycle playback over the region you wish to apply the groove to.

2 Start playback.

3 Select the data you wish to apply the groove to.

Make sure that what you select is within the region Performer Lite is currently looping. If you don't, you won't be able to audition the groove before applying it. Use any method of selection that you prefer. You can select individual notes or an entire region of data. The groove will be applied at the measure boundaries of the region you select.

4 Choose Groove Quantize from the Region menu.

5 Select the groove you wish to apply from the list.

6 Make sure the Instant Preview check box is checked so you get instant feedback while adjusting the groove.

7 Adjust the groove as desired with the sliders.

These sliders are discussed in the following section.

☛ Instant preview does not affect beats within soundbites when Groove Quantizing audio.

8 If desired, try different beat divisions by choosing them from the beat division menu.

Changing the beat division often has a dramatic effect on the feel of the groove. This is discussed further in a following section.

9 When you like the groove, click Apply.

Using the groove adjustment sliders

The three groove adjustment sliders give you complete control over the feel of a groove. They let you dynamically control the degree to which the timing, note-on velocities, and durations are affected. All three sliders apply to both MIDI data and beats within soundbites.

☛ When you move a slider, the change occurs when you let go of the slider (as long as the Instant Preview check box is checked). No changes occur while you move the slider.

In essence, these sliders let you control the extent to which you are applying the original feel of the groove. You can either "turn up" or "turn down" its effect. We urge you to experiment with them because they produce interesting effects. The sliders perform as follows:

Groove slider setting	Result
Off (0%)	Velocities and durations are unchanged. For timing, a straight grid quantize is applied.
Full (100%)	Applies the exact feeling of the groove.
Double (200%)	Groove feeling is exaggerated by a factor of 2.

You can clearly hear the effect of one slider by setting the other two sliders to their *off* position and then trying different strengths on the remaining slider.

One effective approach with these sliders is to set them all to off (0%) and then increase each one in small increments. Use the up (+) and down (-) arrow buttons to make small adjustments. This lets you gradually apply the groove to a point that sounds best.

Auditioning groove settings

Groove Quantize lets you adjust the sliders without affecting the settings that are currently saved with the slider. The same goes for the Beat Division menu. In addition, you can quickly audition a number of different grooves with the same settings (because the settings won't change when you select a new groove). For example, if you like the degree of groove you've set with the sliders, but you aren't quite satisfied with the type of groove yet, you can try several other grooves with the same slider settings.

If you've auditioned sliders settings and wish to now save them, click *Save*.

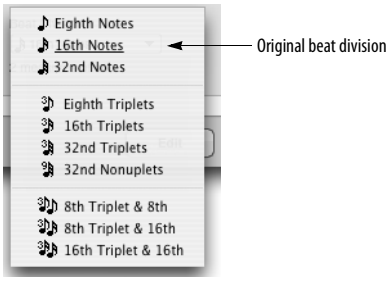
Saving groove settings with a groove

Click *Save* to apply the current slider and beat division settings with the currently selected groove. Click *Revert* to restore the grooves default settings.

Using different beat divisions

The beat division menu lets you choose an underlying quantize grid for the groove. Divisions range from eighth notes to 32nd notes in both straight and triplet time; several combination grids are also provided. See "Choosing a beat division" on page 392 for more information.

This menu allows you to try different beat divisions without losing the original beat division in the groove. For example, you can try applying an 8th-note division to a groove with a 16th triplet beat division. The original beat division is displayed as shown below:



Notice that a groove can have more than one original beat division, and each original beat division can have its own unique settings. This can be accomplished by editing the groove. See "Adding an additional default beat division to a groove" on page 393 for more information.

The beat division menu is governed by auditioning and saving (See "Saving groove settings with a groove" on page 390.) For example, if you have a bunch of grooves that were created in 16th note divisions, but the particular section you are applying the groove to right now is in triplets, you can set the beat division menu to triplets, and leave it there as you audition groove after groove.

The beat subdivision has a dramatic impact on the groove. Try experimenting with different choices.

Grooves usually sound closest to their original feel with the beat division at which they were created.

CREATE (EXTRACT) GROOVE

The *Create Groove* command lets you create your own Grooves from MIDI note data in any track, or beats within soundbites that have been beat-analyzed by Performer Lite's Beat Detection Engine. The source material can come from any Performer Lite file, any standard MIDI file or any beat-analyzed audio file or loop. Grooves can be any length.

Extracting grooves from audio

Audio data must be beat-analyzed before you can create a groove from it. For details, see "Extracting a groove from audio" on page 437. After audio has beats, the procedures below can be used to create grooves from the audio.

Creating a groove

To create a groove:

1 Select the MIDI or audio data you wish to use as source material for the groove.

The groove will start at the beginning of the first measure of your selection, and its length will be a whole number of measures.

☛ When you choose MIDI data for a groove, the data must be aligned with Performer Lite's metronome (main counter). For example, you can't use a rubato passage, unless you first use the Record Beats feature to align Performer Lite's measure and beat boundaries with the music. For audio data, however, the groove can be extracted from any audio file that has been beat- and tempo-analyzed, even if it does not currently match Performer Lite's main time ruler.

2 Choose Create Groove from the Region menu.

The Create Groove window appears.

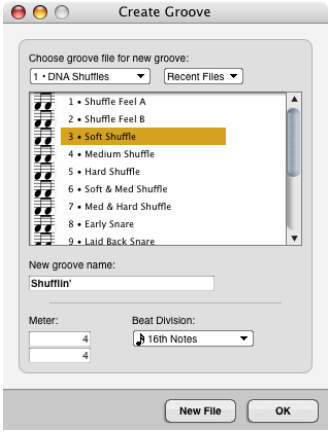


Figure 41-20: Create Groove.

3 Open a groove file in which to save the groove, or create a new groove file with the New File button.

4 Type in a name for the groove.

5 If desired, change the meter for the groove.

This setting affects the overall length of the groove, and it also affects how many beats are in each measure. Try to choose a meter that most closely resembles the beat structure of the groove you are creating.

6 Choose a default beat division for the groove from the menu.

See "Choosing a beat division" below regarding this option.

7 Click OK to save the groove.

The new groove gets added at the bottom of the groove list.

Choosing a beat division

The choice you make for a beat division when creating a groove is an important one, for it governs the underlying resolution of the quantization that occurs when you apply the groove. The choices range from eighth notes to 32nd notes in both straight and triplet time; several combination grids are also provided.

As a rule of thumb, when you choose a beat division, think of how the music is notated, and use the shortest note duration that would be used to notate it. For example, a swing feel is customarily written as straight eighth notes. So when you are choosing a beat division for a swing groove, use a straight eighth note grid.

If the groove style you are defining has both a straight and triplet feel, use the appropriate *combination* grid (the straight and triplet options at the bottom of the menu, as shown below). For example, swung music often includes straight sixteenths, so you'd choose a triplet eight/sixteenth combination.

Keep in mind, however, that the combination grid has beat divisions for both straight time and triplet time, so there are more grid points. If the music you apply the groove to is not rhythmically accurate to begin with, there is more of a chance that notes will gravitate to the wrong grid point. For this reason, use discretion when applying combination grids. In some cases, it might be better to use a non-combination grid. When in doubt, you can make two versions of the groove: one with a combination grid and another with a straight or triplet grid.

Modifying grooves

Performer Lite provides you with the ability to modify the timing, velocity, and duration information in the groove itself. Fortunately, you can do so quickly and easily, without having to switch files. To modify a groove, click the groove name in the Groove Quantize window and click the Edit button to open the Groove Editor shown below in Figure 41-21.

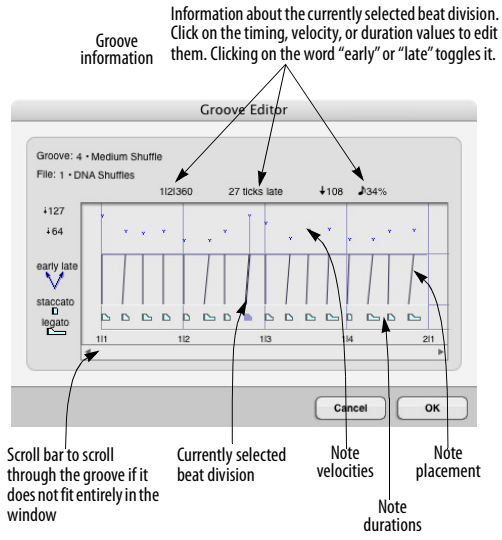


Figure 41-21: The Groove Editor.

Edit each beat division as desired. If Instant Preview is enabled, and you are looping a section to hear your changes, you'll hear them right away as you make them. Here is a summary of what to do in this window.

To do this	Do this
Increase or decrease a velocity	Drag it up or down
Adjust note placement earlier or later	Drag the note placement bar to the left or right
Increase or decrease a duration	Drag the right side of the duration icon left or right (0 - 200%)

Duplicating a groove before modifying it to preserve the original

The groove editor makes permanent changes to the groove (unlike adjusting the groove sliders, which doesn't affect the groove data itself). As a result, if you want to modify a groove but preserve the original, duplicate the groove and then edit the copy. To duplicate a groove, see "Deleting, moving, and duplicating grooves" on page 388.

Adding an additional default beat division to a groove

A groove can have several default beat divisions (as shown in the menu on page 391). This lets you produce several permanent variations of the groove within the groove itself. To do so, select a non-default beat division from the beat division menu in the Groove Quantize window right before you click the Edit button. Doing so lets you modify the groove based on the newly selected beat division. The modifications you make to the groove in the editor will be unique to that beat division; you won't affect the groove with its original beat division setting. When you click OK, the beat division you chose will become outlined, and you'll be able to freely change between the two groove variations simply by selecting the outlined beat divisions in the beat division menu.

Obtaining grooves

There are many ways to obtain grooves. You can:

- Use the stock grooves provided with Performer Lite
- Create new grooves from scratch in Performer Lite
- "Cop" grooves from any Performer Lite file, standard MIDI file, audio file or audio loop
- Purchase commercially available loop libraries (such as REX files, ACID files, Apple Loops, etc.) and create grooves from the audio in them
- Purchase commercially available groove libraries

Commercially available MIDI groove libraries are similar to sample libraries; they have been painstakingly produced in the recording studio.

MIDI grooves are similar to digital sampling in the sense that they present us with similar copyright issues. If you cop someone's groove using Performer Lite's Create Groove feature, consider handling it in the same fashion as you would for samples.

Cubase grooves

Performer Lite can read Cubase groove files if they are placed in Performer Lite's Grooves folder. They appear in the Groove Quantize list with a different icon along with all of your Performer Lite groove files. They can be used in the same fashion as Performer Lite grooves.

Cubase grooves can be viewed in Performer Lite's Groove Editor, but they cannot be edited directly. To edit them, first move them into a Performer Lite groove file using the Copy and Paste commands in the Edit menu (see "Deleting, moving, and duplicating grooves" on page 388).

Applying the groove from one track to another

To apply a groove from one track to another, create a new groove based on the original track. After you have created the groove, you can apply it to any other track you wish using the Groove Quantize command. The Groove you create can be of any length.

DEFLAM

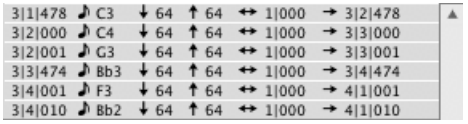
The DeFlam command looks for groups of MIDI notes that are very close together. When such a group is found, the average attack time of the group of notes is computed. All notes in the group are moved such that their attack times are aligned exactly to the average time.

Figure 41-22: DeFlam.

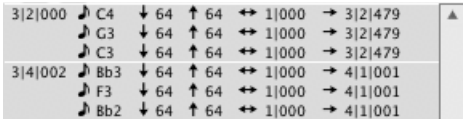
The group of notes that is deflammed is determined by the tick value you specify. This creates a "window" of effectiveness. Groups of notes within that window will be deflammed.

DeFlam basics

When chords are played in real time, the attacks of individual notes are often splayed as in the example below, which shows two four-note chords:



DeFlam is useful for consolidating the attacks of the notes in such chords. The following is the result of using DeFlam with a tick value of 50 on the above passage:



The quarter notes are now grouped into two precise chords.

DeFlam averages the attack times of the groups of notes; there is no grid involved as there is with the Quantize command. In the above example, the resulting attack time of each chord is the average of the attack times of the four original notes. The durations of the notes are left unchanged.

DeFlam attempts to detect grace notes and rolled chords and, if found, will leave them as such.

Using DeFlam

If DeFlam leaves some notes out, try using a larger tick value; if it includes too many notes, try decreasing the tick value. (Remember, you can Undo and Redo the DeFlam command.) The correct tick value depends greatly on the particular passage you are working with. It may take several attempts to determine the correct value.

CHANGE VELOCITY

Change Velocity is a powerful command that lets you modify the velocities of all MIDI notes in a region on a scale from 0-127. You can remove irregularities, make passages louder or softer and create crescendos, diminuendos and other similar effects. Note that not all MIDI instruments respond to velocity data, and those that do may need to be set up to respond correctly to this information. Consult your owner's manuals for details.

The Change Velocity window provides a menu with numerous options. These options are explained briefly in the following sections.

☛ Change Velocity has no effect on audio.

On velocities or off velocities

On velocities control the speed at which a note is attacked. This affects the note's loudness most dramatically, but on velocities can also affect other aspects of the note event such as its timbre (e.g. the harder the note is struck, the brighter it sounds). Off velocities control the speed of the release of the note and are sometimes used to control its decay rate. Not all MIDI instruments utilize off velocity information.

The Change Velocity command can be applied to either on or off velocities: choose the type you wish at the top of the window. The default setting changes the on velocities.

Set

This option sets all velocities in the selected region to a single value. Enter a value between 1 and 127. A result of this option is that all note events in the region will be played back at a constant volume.

Add

This option adds the value you enter to all velocities in the selected region. The value must be in the range -127 to 127. Velocities that end up less than 0 or greater than 127 will be set to zero or 127, respectively. A result of this option is a uniform increase or decrease in volume of all notes in the region, within the zero to 127 range.

Scale

This option scales all velocities by the percentage value you enter. Percentage values must be between 1 and 999. For example, if all notes in the region have a velocity of 120 and you enter a percentage value of 50%, the velocities will be set to 60. Thus, to halve velocities, use a value of 50%. To double them, use 200%. Velocities that end up less than 0 or greater than 127 will be set to zero or 127, respectively.

Scaling by a percentage may give you better results than using the *Add ___ to all velocities* option above since the original velocity contours are preserved. Try both to discover which gives you the results you want.

Limit

This option modifies all velocities in the selected region that have a velocity greater than the value you enter, by changing them to that value. Enter a value between 1 and 127. This option imposes a maximum volume level on all notes in the region. You can use it to change the velocities of notes that "stick out".

Compress/Expand

This option works just like an audio compressor or expander: it reduces or expands the velocities above the threshold you specify by the compression ratio you specify, and then adds any gain that you specify with the gain control. The graph shows a visual display of the current compression settings on a 128 x 128 grid, so you can see exactly how velocities from 0 to 127 will be affected.

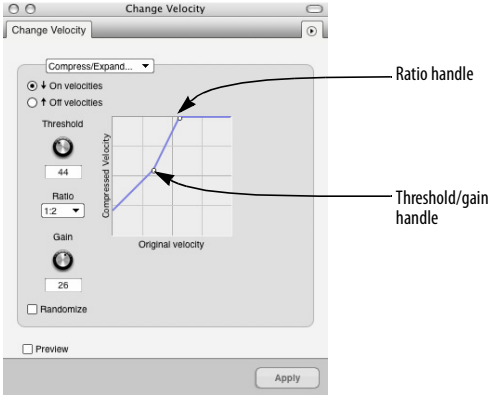


Figure 41-23: Graphic control over compression and expansion settings.

Expansion multiplies velocities by the ratio that you choose. Compression divides them. Velocity expansion or compression can be useful in many situations. For example, if you change the patch for a track, the new patch may have different velocity response characteristics than the original patch, and as a result, the track may not sound as expressive. By applying expansion to the note velocities, you can restore—or even magnify—the original expressiveness of the track. Ratios up to 1:8 are offered.

Smooth

This option has two basic sub-options: *___% to ___% of current value* and *___ to ___*. Each gives you a different way to specify the smooth velocity changes. The first changes by percentages, creating a smooth velocity change for notes in the selected region while preserving some of the original velocity characteristics (most notably the accents); the second creates a smooth change with no fluctuations. You can specify a curvature for the change, which determines its contour.

___% to ___% of current value: This sub-option changes velocities similarly to the *Scale* option described above. The difference is that the percentage value *changes* from the first to the second entered value: the first value applies to the beginning of the region, the second to the end. Enter a value from 1 to 999 in each box. The curvature (see below) controls the contour of the change.

___ to ___: This sub-option assigns the first entered value to the first note velocity in the selected region and the second entered value to the last note velocity in the region. All other velocities are calculated to make a smooth transition between the first and last ones. The curvature (see below) controls the contour of the change over the region.

Curvature: This sub-option controls the contour of the smooth change. With a curvature of zero, the change is linear from the first to the second entered value. As you increase the value positively

(with values from 1 to 99), more of the change will take place towards the end of the region. As you increase the value negatively (with values from -1 to -99), more of the change will take place towards the beginning of the region.

Here are a few examples to clarify this option:

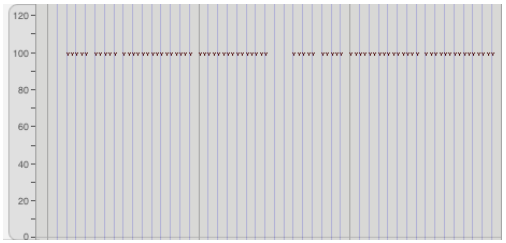


Figure 41-24: Change smoothly from 1 to 90, curvature 0. This results in a linear increase. One effect of this is a gradual, even crescendo.

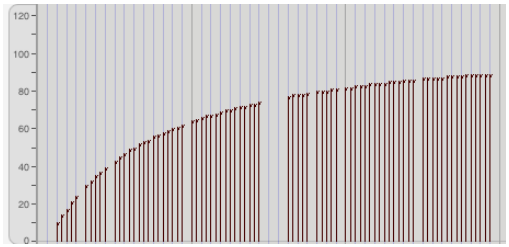


Figure 41-25: Change smoothly from 10 to 90, curvature -50. This results in a pronounced upward curve with most of the changes happening at the beginning. One effect of this is a crescendo that occurs more rapidly at the beginning.

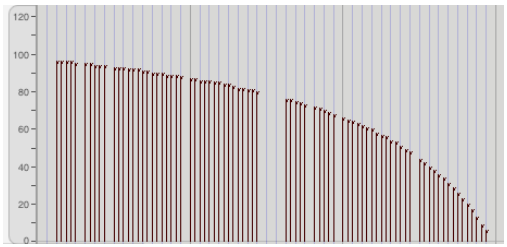
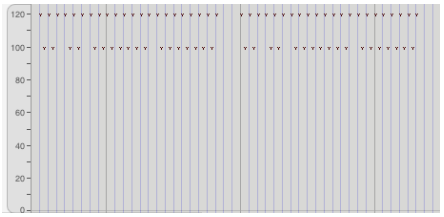
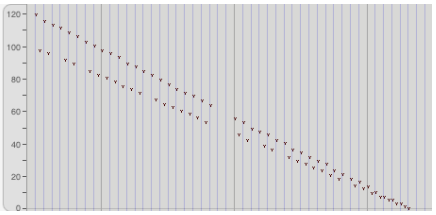


Figure 41-26: Change smoothly from 96 to 5, curvature 45. This results in a downward curve which is more pronounced at its end, e.g. a diminuendo that speeds up toward its end.



Original velocities



Scale smoothly from 100% to 1% with 0 curvature

Figure 41-27: Scale smoothly from 100% to 1%, curvature 0. When applied to a region in which there are several notes accented, this results in a downward "curve", which retains the accent structure of the original.

The velocity values assigned to notes by this option are calculated based on the distance of the note from the beginning or end of the selected region. If the first note in the region is after the start time, for instance, it will be assigned a velocity value somewhere between the values entered. Notes in a chord (with simultaneous attacks) are assigned the same velocity. If a specific change sounds too abrupt, it is probably due to the position of the note in the region. For instance, if notes occur at irregular times (e.g. bunched together followed by a sparse section), velocities will be assigned on the basis of note placement. The result may not seem smooth on a per-note basis.

Randomize

The randomize option allows you to randomize the velocities within a range of the current value, which you specify in the box provided. The emphasis sub-option causes the tendency of the randomization to be higher or lower within the specified range. Thus, if you wish to randomize the velocities within a certain range, but you wish

them to tend to be higher, use a positive emphasis; use a negative emphasis if you wish them to tend to be towards the lower end of the range. A value of zero equals no emphasis, which causes the randomization to occur evenly within the range.

Note that the randomize option is a check box, which means that it can be selected together with one of the radio button options above. This allows you to randomize at the same time as executing one of the other Change Velocity options.

The effect of velocity is instrument-dependent

MIDI instruments vary widely in their response to velocity information. Some do not respond at all to any velocity information; many do not respond to off velocities. Some patches sound very different when large on velocity values are used. Some patches do not respond at all to velocity information, even when the instrument as a whole does.

Most often, you can be assured that if your instrument does respond to velocity information, you can control the loudness of note events. You should be able to create effective crescendos and diminuendos. This will work well for short-range dynamic effects. For longer effects (a 30 second fade, for instance), you might notice a "staircase" effect, i.e. discrete changes in the volume level.

Alternative methods for volume changes

Some MIDI instruments define one of the MIDI controllers as the volume control. If so, you might be able to use the Insert Continuous Data command to create smooth volume changes with a controller. Some instruments have only a few discrete volume levels, making it hard to create smooth changes.

It is also possible with some instruments to control volume directly from an assignable controller. A patch may use the breath controller to control its volume, for instance. By sending this controller data through Performer Lite, you can control volume changes.

There is no single solution for making volume changes effectively with every patch on every instrument. You must find the best way for each given situation and use the appropriate command (Change Velocity or Insert Continuous Data) to create the kind of volume changes you want.

CHANGE DURATION

The Change Duration command modifies the duration of all MIDI notes in the selected region without changing the placement of attack times. This means that the amount of time a note is "on" or sounding can be changed without affecting its actual rhythmic placement in relation to other notes and events. The Change Duration command is useful for changing the articulation or space between notes. You can make note events sound connected or separate in relation to each other, for example.

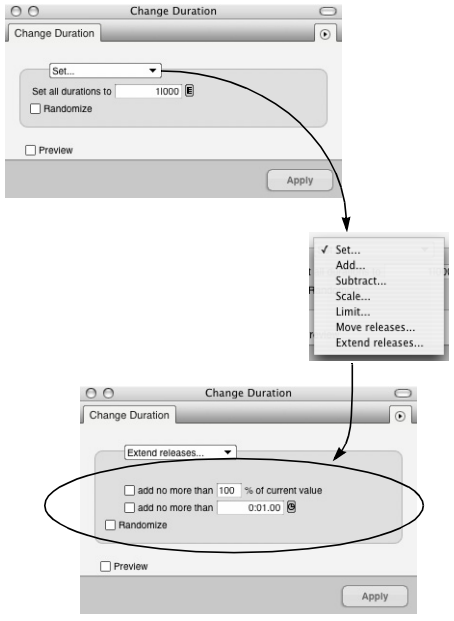


Figure 41-28: Change Duration.

Changing the duration of soundbites
The Change Duration command does not affect soundbites. To change the duration of a soundbite, trim it as explained in "Trimming (edge editing) soundbites" on page 338. To stretch it, see "Graphic time stretching of audio" on page 340 or "Scale Time" on page 407.

Change Duration basics
Duration is the length of a note, i.e. the time between its attack and release. Durations are specified in quarter notes and ticks (e.g. a half note would be 2|000 or two quarter notes). A note must have a duration of at least one tick (0|001).

A note's duration may be misleading in some cases: what you see might not be what you hear. The actual duration of a note event is dependent upon the MIDI instrument and patch used. The attack and release sent by Performer Lite are equivalent to manually pressing and releasing a key on the instrument. Also, some instruments have a sustain pedal that can be used to hold notes, extending the effective duration of notes far beyond the time when the release has been sent to the instrument.

Set
All durations in the selected region will be changed to the entered value. The value entered must be between 0|001 and 9999|999.

Add
The value entered will be added to all durations in the selected region. The value entered must be between 0|001 and 9999|999.

Subtract
The value entered will be subtracted from all durations in the selected region. The value range is 0|001 and 9999|999. Notes which would have a duration of less than one tick after the subtraction are given a duration of one tick.

Scale
The durations of notes in the selected region are scaled by the entered percentage value. The relative lengths of the notes are preserved and their overall length is modified. The percentage value entered must be between 1 and 999. To halve durations, enter a percentage value of 50%; to double durations, use 200%. Using this option may yield more of the results you want than using the *Add __ to all* option; durations are scaled proportionally instead of uniformly lengthened. Try both to see which you like best.

Limit
Any notes in the selected region which have a duration greater or less than the values entered will be assigned to the longest and shortest value you specify, respectively. The value entered must be between 0|001 and 9999|999.

Move releases (to closest attack)
The release of each note in the selected region is modified to occur just before the attack of the nearest note following it in time. The duration of the note may increase or diminish depending on when the next note occurs. If the next note occurs before the release of the current one, the release of the current note will be moved back in time, making the duration shorter. If the next note occurs after the release of the current one, the release of the current one will be moved forward in time, making the duration longer. If the note release is after the end of the selected region, the note is left unmodified. This option creates a legato effect, where the notes follow each other smoothly and without a gap.

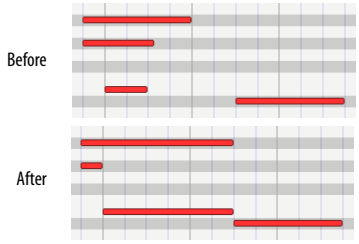


Figure 41-29: Move releases to closest attack.

Extend releases (to the closest attack)

The duration of each note in the selected region is extended until it ends at the same time as the next note begins. This is very similar to the *Move releases to the closest attack* option but the durations of all notes are guaranteed to increase since the release is always moved forward in time. Any notes which end after the last note in the selected region begins are left unmodified.

This option creates a legato effect, where the notes follow each other smoothly and without a gap.

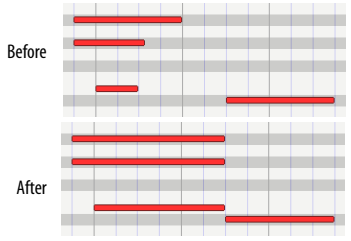


Figure 41-30: Extend releases to closest attack.

Extend Releases sub-options

Use these sub-options to extend releases and still preserve rests in a region. If both sub-options are checked, each note in the region is analyzed and the option that results in the smallest duration increase is used. Try using these options after quantizing attacks and releases to improve the notational display of the notes. Doing so adjusts the durations of notes that were not played in a legato style. For best results, experiment with different values. A good setting to start with is 100%.

Randomize

The randomize option allows you to randomize durations within a range of the current duration, which you specify in the box provided. This range can be specified as an absolute number of ticks, or by a percentage of the current duration. The emphasis sub-option causes the tendency of the randomization to be higher or lower within the specified range. Thus, if you wish to randomize the durations within a certain range, but you wish them to tend to be longer, use a positive emphasis; use a negative emphasis if you wish them to tend to be shorter. A value of zero equals no emphasis, which causes the randomization to occur evenly within the range.

Note that the randomize option is a check box, which means that it can be selected together with one of the radio button options above. This allows you to randomize at the same time as executing one of the other Change Duration options.

Hints

Some drum machines cannot receive dense bursts of MIDI data; they will often miss data altogether, causing drop-outs and other perplexing problems. Since the durations of drum machine events tend to be very short, the note releases tend to follow the attacks very quickly resulting in a very high data density. One way to improve the situation is to delay the note releases (most drum machines ignore these anyway since their note events have such short decays) by making the note durations longer. Use the Change Duration command to set the durations of these note events to a value somewhere around 10 to 20 ticks.

Using Change Duration to control articulation

The Change Duration command is very good for adjusting the articulation of note events. Rendering a passage legato or staccato is simple: for a legato effect (each note releasing just before the next one is attacked):

1 Select the region.

2 Choose *Change Duration* from the Region menu.

3 Choose the *Set* option.

4 Enter a value of 1 tick (0|001) and press Apply.

This insures that durations are uniform for the next step.

5 Choose *Change Duration* from the Region menu.

6 Choose the *Extend releases* option and press the Apply button.

This is useful for removing any rests or gaps between notes.

For a staccato effect (each note releasing well before the next, giving the passage a rhythmically sharp, incisive character):

1 Select the region.

2 Choose Change Duration from the Region menu.

3 Choose the *Scale* option.

4 Enter a value of 50% and press the Apply button.

SPLIT NOTES

The Split Notes command lets you selectively cut or copy notes in the selected region. The selection is based upon pitch, velocity and/or duration. This means that only notes with specific pitches, ranges, durations and velocities from the selected region are cut or copied. For example, all notes between A3 and C#3 with velocities greater than 100 and with durations above a half note can be extracted from a region. Here are some additional things you can do with Split Notes:

- Use an on-screen graphic keyboard to specify the pitches of notes you wish to split. This keyboard allows you to pick a non-contiguous range of pitches for splitting.
- Automatically Paste or Merge the split notes to a pre-existing track.
- Automatically create a new track and Paste the split notes to it.
- Automatically create a set of new tracks and paste the split notes to each track according to pitch.

Split Notes can be used to split a drum track into separate tracks, extract or double a melody line, separate one keyboard part into two parts to segregate right and left hand activity, pick out and double accented or long tones, and much more.

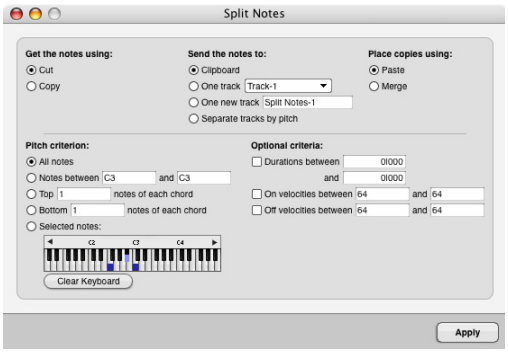


Figure 41-31: split Notes.

Split Notes basics
Split Notes is a highly specialized version of the Cut and Copy commands on the Edit menu. Only notes in the selected region and with specific properties are affected, other events are not affected. Each note is tested to see if it meets the requirements you specify, including velocity, pitch, and duration. They are then placed in a destination you select, such as the Clipboard or a new track. If cut, they are removed from the selected region.

☛ The Split Notes window remembers the settings you last chose.

Cut or Copy
If you choose the Cut option, the Split Notes command will place the selected notes on the Clipboard and remove them from the selected region. If you choose the Copy option, the Split Notes command will place the selected notes on the Clipboard without removing them from the selected region.

Send notes to
You have several choices here. Select the *Clipboard* option to place notes on the Clipboard (for the purpose of pasting afterwards). Select the *One track* option and select a track name from the menu to send the notes to one existing track. Select the *One new track* option and type in a name or use the default name to send the notes to a new track that will be added to the bottom of the Sequence Editor. Select the *Separate tracks by pitch* option to remove the notes by pitch and place them into new, individual tracks. Each new track will contain the pitch name in parentheses after the track name. The track name used for this option can be entered in the *One new track* option text entry box above. This last option is ideal for splitting up a drum track into separate tracks.

Paste or Merge
These options let you choose whether you would like the split notes to be pasted at their destination, which replaces what is already there, or merged together with what is already there.

All Notes
All notes will be cut or copied unless excluded by velocity or duration selections. Use this mode when you wish to cut or copy notes based solely on velocity or duration criteria.

Range of Pitches
All notes between the two entered pitch values will be cut or copied. The pitch range is inclusive (it includes the two entered pitch values and all notes between them). You must enter a pitch in each box for this option.

You can enter pitch and velocity values directly from your MIDI keyboard. The note you play will be entered directly into the value box which contains the flashing text cursor or is highlighted.

Top ___ notes
The specified number of notes from the top of each chord are cut or copied. A chord is defined as two or more notes which have the same attack times. If single notes are encountered (i.e. not in chords), they alone are copied to the Clipboard. It is useful to use the DeFlam command on the Region menu to make sure that attack times of all chords line up before using this option. Enter the number of notes to be cut or copied from the top of each chord in the box for this option.

Bottom ___ notes
This option is similar to *Top ___ notes* except that the notes are cut or copied from the bottom of each chord.

Select notes
Click keys on the keyboard to select and deselect specific pitches. Click Clear Keyboard to clear the currently selected pitches on the keyboard. Use

the scroll bar and scroll arrows to select pitches that are above or below those pitches which are currently displayed. You can also play keys on your MIDI keyboard (or other controller) to select and deselect specific pitches.

☛ The *Select notes* keyboard remembers the selected notes even when those notes are scrolled to the left or right and are not displaying. When you open the dialog and want to select some pitches on the keyboard and are not sure if there are selected notes above or below the pitches that are currently displayed, click Clear Keyboard to be sure that notes that are not displayed are also not selected.

The following are velocity and duration options that can be selected *in addition* to pitch options.

Durations
Notes in the selected region with durations within the specified range are cut or copied. You must enter two durations in the boxes from 0|001 to 9999|999. The duration range is inclusive (it includes the two entered duration values and all those between them).

On velocities
This option, when selected, allows only notes with the specified velocity range to be cut or copied from the selected region. You must enter two velocities (between 1 and 127) in the two boxes. The velocity range is inclusive (it includes the two entered values and all those between them).

Off velocities
This mode is similar to the On velocities mode except that notes with off velocities in the specified range are cut or copied.

Hints for using Split Notes
The Split Notes command by itself is not always completely useful: it can be used in conjunction with other region commands and operations to fully accomplish an editing task. We therefore have included some effective ways to use the Split Notes command as part of more complex operations.

Splitting up a drum part into separate tracks
You can use the *Separate tracks by pitch* option in combination with the *Select notes* option to quickly explode tracks such as drum parts into separate tracks so that each pitch can be treated uniquely. This is great for being able to shift, quantize and otherwise edit a certain percussion instrument without affecting others.

Using a temporary track
You can process data independently that is cut or copied with the Split Notes by pasting it into another track. You can perform various operations on the data in the temporary track (transpose, velocity editing, etc.), then merge it back into the original track and delete the extra track.

Extracting a lead line
Extracting the lead line from a passage (perhaps from block chords where the top notes of each chord form a melody) can be easily done with the Split Notes command. After the lead line is separated from the chords, it can be modified (doubled, accented or otherwise enhanced) in an extra track.

Enhancing a lead line
After you have the lead line separated out, you can change it in useful ways. Two suggested enhancements are doubling it an octave higher and increasing its velocity values. After you have made the modifications, you can merge the enhanced lead line back with the original material.

A variation on the operation to double the lead line an octave higher is to double the bass line an octave lower. Use the *Bottom ___ notes* option and transpose it down an octave with the Transpose command.

Some variations on the operation to increase the velocity values of the lead line are as follows:

Make the notes of the chords softer (by decreasing their velocities) instead of the making the lead line louder. This would involve modifying the notes of the chords after you extracted the lead line from them and merging the (unaltered) lead line back with the modified chords.

Use the *Change to ___% of current value* option in the Change Velocity window rather than adding a constant value to the lead line. This better preserves the dynamic contour of the lead line.

Leave the lead line on a separate track and play it back through another MIDI instrument as well as on the instrument playing back the chords. This highlights the lead line through timbral or tone color means.

Doubling accented notes
Another procedure is to split out only those notes which have a higher velocity in order to accent them. After extracting them with Split Notes, use other Region commands (such as Transpose) to enhance the accented notes. Alternatively, you can simply assign the track with only the accented notes to be played back on a separate channel by another MIDI instrument.

Dividing a keyboard part into its right and Left hand components
Sometimes, it is useful to be able to treat the left-hand and right-hand parts of a keyboard track separately. Performer Lite does this automatically in the Notation Editor. If you want, you can do it manually by following the earlier procedure for extracting a lead line but use the *Notes with pitches between ___ and ___* option. The pitches you enter should correspond with the range of either the right or left hand. Since this range is rarely consistent, you will probably have to organize your sequence into sections according to one hand's pitch range and use Split Notes on each section. You can then add a new track and paste the notes you've cut into it.

INVERT PITCH

Figure 41-32: Invert Pitch

The Invert Pitch command inverts or flips MIDI notes around a specified axis. The inversion is chromatic, that is, exact. For example, if the following E major scale (starting on E3),

is inverted around an axis of D3, the following will result:

Basics
Inversion is an operation in which the interval between a note and the inversion axis pitch is measured and the note is transposed the same interval on the opposite side of the axis pitch. Two examples are shown below: If the note to be inverted is F4 and the axis pitch is C4, the interval between them is a perfect fourth. Since F4 is above C4, it will be transposed down by the same interval, a perfect fourth, resulting in a G3. If the note to be inverted is C#3 and the axis pitch is A3, the resulting pitch would be F4. In the following picture, the axis pitch in each measure is represented by a diamond:

The inversion is always exact, transposing the note the same chromatic interval above or below the axis pitch.

Hints

You can invert a region of notes around a pair of axis pitches. Follow the above procedure for normal inversion specifying the lower of the two pitches in the Invert Pitch window. Then use the Transpose command on the Region menu to transpose the region by the interval between the two axis pitches.

Example: You wish to transpose the following passage around the axis pitch pair C3 and E flat 3.

Use Invert Pitch on the passage specifying C3. The following is the result:

Select the region containing the passage and use the Transpose command on the Region menu transposing from C3 to E flat 3 (a minor third, the interval between the two axis pitches).

This is the final result, inverted correctly around the pair of axis pitches:

CHANGE MIDI CHANNEL

Use the *Change MIDI Channel* command to set the currently selected MIDI events to the desired channel.

MIDI EFFECTS PLUG-INS

The *MIDI Effects Plug-ins* hierarchical menu supplies "special effects" processing to your MIDI tracks. These are plug-ins that can be applied to your MIDI tracks in the same fashion as Performer Lite's standard Region menu operations.

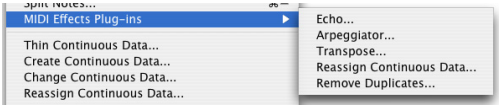


Figure 41-33: MIDI Effects plug-ins in the Region menu. These first few effects (Echo, Arpeggiate, etc.) are not actually plug-ins. They are special effects made available as Region operations. Therefore, you will not see them in Performer Lite's 'Plug-ins' Folder.

Using MIDI Effects plug-ins

MIDI Effects plug-in windows look very similar to Performer Lite's other Region menu commands. In fact, some — like the Transpose and Shift plug-ins — are virtually identical to Performer Lite's corresponding Region and Edit menu commands.

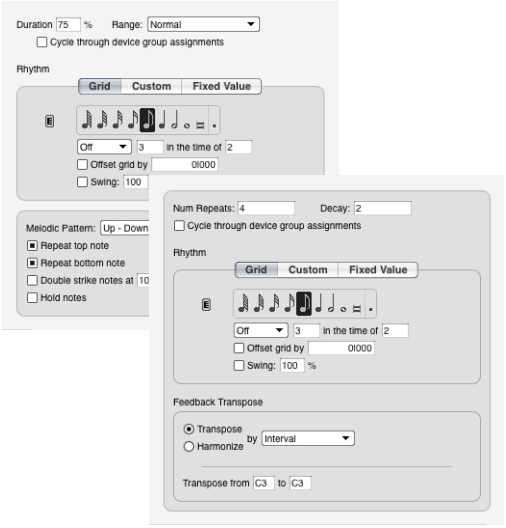


Figure 41-34: Examples of Performer Lite's MIDI effects plug-ins.

Apply the MIDI effects plug-ins in the same fashion as other Region menu commands.

For details regarding the options in the Transpose plug-in window, see "Transpose" on page 371.

For details regarding the options in the Echo and Arpeggiate effects, see "Echo and Arpeggiator" on page 533.

For details regarding the options in the Remove Duplicates effect, see "Remove Duplicates" on page 539.

For details regarding the options in the Reassign Continuous Data effect, see "Reassign Continuous Data" on page 539.

Real-time MIDI effects processing

MIDI Effects plug-ins can also support Performer Lite's real-time MIDI effects processing in the Mixing Board. If the plug-in supports real-time processing, it will automatically appear in the effects inserts of MIDI tracks in the Mixing Board window. If the plug-in appears in the Region menu, but not in the Mixing Board inserts, then it doesn't support real-time operation. Real-time operation has the advantage of not permanently altering the data in the track. It only alters the data during playback.

REVERSE TIME AND RETROGRADE

The Reverse Time and Retrograde commands reverse the order of MIDI events in a selected region. However, each command reverses notes in a slightly different way, producing much different results.

Reverse Time

Reverse Time reverses the order of notes' attack times in a region. A note whose attack occurs two beats from the beginning of the region is moved so that its attack occurs two beats before the end of the region. In doing so, Performer Lite either maintains the note's duration or ends the duration just before the next attack. Notice in the example below that Reverse Time places the attack of the first note exactly at the end of the region, extending the duration into the next measure.

Retrograde

Retrograde inversion simply reverses the order of notes within the region: the first note becomes the last note, the last note becomes the first note, and so on. This is analogous to playing a tape backwards and recording the result.

☛ Note: for clarity, we have shortened the durations in the Reverse Time example so that they don't extend beyond the next attack. In actuality, the notes maintain their original durations after being reversed.

To get an exact reversal of the notes, you must select a *region of time* rather than specific events. In addition, the region of time must include the duration of the last note in the region. In the example above, the last note is the sixteenth note, G4. To obtain the results shown on the bottom staff, you would have to select the region from 1|1|000 to 2|1|000, where 2|1|000 takes into account the duration of the G4 sixteenth note.

To specify a region of time that includes the final duration, select the region using the Selection Information window, or by dragging in the Time Ruler Sequence Editor. Selecting specific events won't work because the duration of the final note is not included.

Using Retrograde

When using the Retrograde command, you must select a time range. The Retrograde command will have no effect on event selections. For details, see "Selecting a time range" on page 305 and "Edit operations that require time range selection" on page 305 for details.

SCALE TIME

The Scale Time command expands or compresses the duration of MIDI and audio events in the selected region by the length, end time, percentage or ratio (e.g. 2:3) that you specify. This effectively changes the distance between MIDI notes and soundbites, making them closer together or farther apart. Since the actual duration of events changes, the region will become smaller or larger after this command is invoked. If you check the Time-scale audio check box, then the actual waveform data inside the soundbites is "constructively" time-stretched, too. For details about constructive soundbite time stretching, see "Constructive editing" on page 543. For more information about time-scaling audio, see chapter 64, "Scale Time" (page 561).

The Scale Time command does not affect loops or any event in the Conductor track.

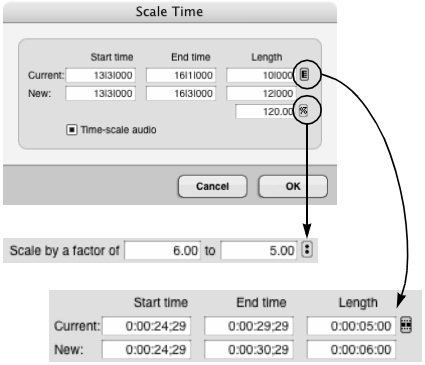


Figure 41-35: Scale Time.

Specifying the scale amount

To specify the amount of time by which to scale, you can type in the desired:

- End time
- Length
- Percentage
- Ratio

Entering a value in one of these fields automatically updates the three other fields.

When entering a ratio, if the first number in the ratio is larger than the second, the region is expanded; if the first number is smaller than the second, the region is compressed. A ratio of 2:1 doubles the duration of all events in the region (and doubles the length of the entire region as well); a ratio of 1:2 halves the duration of all events in the region. You can enter integer ratios with up to two decimal places.

Events at the Start time of the region will remain in place. Since the overall length of the region changes, events at the end will be moved. If the end of the region expands, events in it will be merged with data already there.

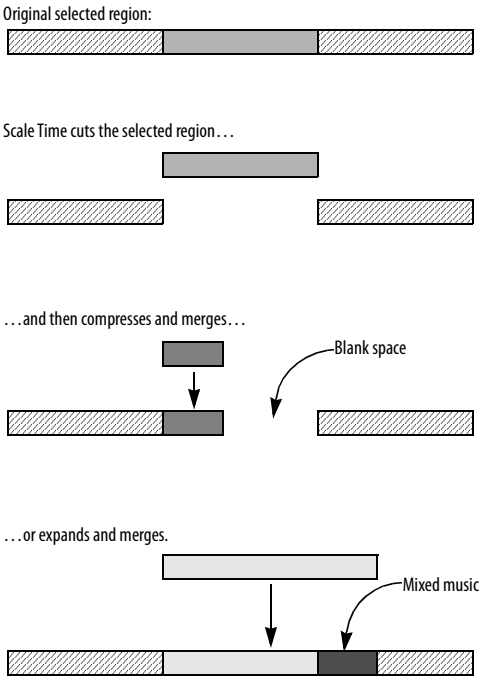


Figure 41-36: How Scale Time compresses or expands and then merges data.

Scale time examples

Here are three examples to give you a better idea of the use of Scale Time:

You've entered a melody in eighths but decided it would sound better in sixteenths. Select the region of the melody and use Scale Time with a ratio of 1:2.

Your sequence is in 4/4 time with lots of triplets, and you want to modify it to be in 12/8, converting the triplets to regular eighths. Select the entire sequence. Use Scale Time with a ratio of 3:2. Afterwards, change the meter and tempo appropriately.

You've entered a melodic idea in quarter notes and decide that it should actually be the bass line for the sequence — and all notes should be whole notes. Select the region with the melody and use Scale Time with a ratio of 4:1. Then transpose it down to the correct octave.

SCALE TEMPO

The *Scale Tempo* command provides several ways to modify existing tempos within a selected region in the Conductor track of a sequence. It modifies existing tempo events within the region, but it does not generate new tempo events. (To do so, use Project menu>Conductor Track>Change Tempo.) The Scale Tempo command is ideal for making global changes to an existing tempo map that you have already created with the Change Tempo command. For example, you might have created an elaborate tempo map with many tempo nuances, and you would like to increase the overall tempo while maintaining the nuances.

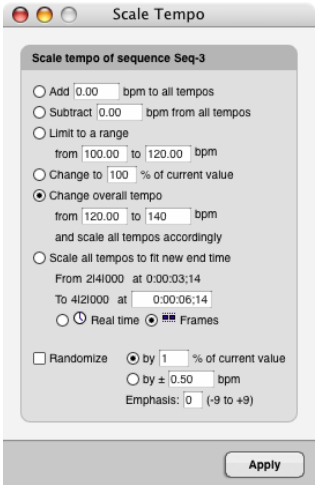


Figure 41-37: Scale Tempo.

Selecting a region to scale

The Scale Tempo command requires that you select the tempo events you wish to scale in the Conductor track before you select the command from the Region menu.

☛ Note that the Scale Tempo command only affects tempo events that already exist in the Conductor track. If the region you select has no tempo events in it, this command will have no effect. If so, use the Change Tempo command in the Project menu (in the Conductor Track submenu) to generate tempo events.

There are several ways to select a region in the Conductor track. For more information, see chapter 35, "Selecting".

Add ___ bpm to all tempos
This option adds the number of beats per minute (bpm) you enter to each tempo event within the selected region.

Subtract ____ bpm from all tempos
This option subtracts the number of beats per minute (bpm) you enter from each tempo event within the selected region.

Limit to a range from ___ to ___
This option searches for tempo events above or below the specified range. When it finds one, it changes the tempo to fall within the range. For example, if the tempo range is from 200 to 300, a tempo of 351 would be changed to 300 and a tempo of 60 would be changed to 200.

Change to ___% of current value
This option increases or decreases each tempo event by a percent of its current value, where the current value is 100%. Use a percentage lower than 100% to slow down the tempo; use a value above 100% to raise it. Use this option when you wish to maintain the degree of change between tempos within the tempo map when you raise or lower it.

Change overall tempo from ___ to ___ and scale accordingly
This option scales the tempo events by a percentage, just like the option above it. However, it lets you specify the change in beats per minute (bpm) rather than as a percentage. For example, suppose you have a piece of music with varying tempos, but whose approximate tempo is 80 bpm. You simply wish to change it's overall tempo from around 80 bpm to around 96 bpm. Rather than figuring out what percent to type in the percentage option to achieve this change, you can use this option to type in the original approximate tempo of 80 bpm and the desired increased tempo of 96 bpm, and let Performer Lite figure out the percent increase for you. All in all, this option provides a more musical way of specifying a percent by which you wish to scale the tempos, even though it accomplishes the same thing as the "scale by percent" option.

Scale all tempos to fit new end time
This option scales all existing tempo events to increase or decrease the overall elapsed time of the selected region. The start time of the region is fixed, and the end time can be made earlier or later. Times can be expressed in real time or SMPTE frame time. Here is an example: suppose that you have created a sequence with many tempo changes, and it is around 3 minutes long. But you would like to make it 3 and a half minutes long. This option lets you select the three minute region and scale all the tempos so that it stretches out evenly to 3 1/2 minutes.

Here's another example: suppose you are locking a sequence to picture via SMPTE time code. You have composed a section of music, and you've programmed all of the tempo changes. You've got the section starting at the correct frame time, but it ends with a hit that is off by several frames. With the *Scale all tempos to fit new end time* option, you can select the region with the hit as the end time of the region and type in the new end time where the hit should occur. This changes the elapsed time such that the hit lands at the correct frame.

Randomize
The randomize option is a check box option that works in conjunction with the radio button option selected above.

By ___% of current value
This option randomizes the tempo of each selected tempo event within a range that is expressed as a percentage of the tempo value. For example, if the tempo is 100 bpm, and you enter 10 percent, the tempo will be randomized within a range between 90 to 110 bpm (±10 bpm).

By ± _____ bpm
This option randomizes the tempo of each selected tempo event within a range of beats per minute.

Emphasis
This sub-option causes the tendency of the randomization to be higher or lower within the specified range. Thus, if you wish to randomize the tempos within a certain range, but you wish them to tend to be higher, use a positive emphasis; use a negative emphasis if you wish them to tend to be towards the lower end of the range. A value of zero equals no emphasis, which causes the randomization to occur evenly within the range.

AUDITION SELECTION

The *Audition Selection* command lets you audition a selection of MIDI and/or audio data. For details, see "Playing phrases" on page 304.

CHAPTER 42 Audio Menu

OVERVIEW

The Audio menu is, in part, an extension of the Edit menu and Region menu, providing further editing operations that apply to audio data only. The Audio menu has a combination of non-destructive, destructive and constructive editing operations. (See "Non-destructive, destructive and constructive audio editing" on page 302.) In general, the non-destructive commands (such as Fade) can be applied to audio that has been selected in any editor window. The Spectral Effects command can be applied constructively in all windows, including the Soundbites list. For details about selecting soundbites in editors, see chapter 35, "Selecting" (page 305).

The Audio menu also contains soundbite management features and other audio-related operations and settings.

Overview **411**
Fade **411**
Delete fades **411**
Merge Soundbites **411**
Smooth Audio Edits **411**
Smooth Audio Edits Again **413**
Spectral Effects **413**
Bite volume and gain **413**
Pitch and Stretch **413**
Apply Plug-in **414**
Audio Beats **414**
Soundbite Tempo **414**

FADE

The Fade command lets you create fades and crossfades at the boundaries of soundbites to eliminate undesirable artifacts. For complete details, see "Fades and Crossfades" on page 348.

DELETE FADES

See "Deleting fades" on page 354.

MERGE SOUNDBITES

Use *Merge Soundbites* to quickly create a single, new soundbite out of several adjacent soundbites. To do so, select the adjacent soundbites and choose *Merge Soundbites* from the Audio menu. This operation creates a new audio file, sort of like a "mini-bounce". But it does not include any volume, pan or other automation data. It is meant for joining audio regions on a small, local scale.

If you use the Merge Soundbites command when there is a time range selection that extends beyond the selected soundbites, the resulting soundbite extends to the beginning and end of the selection.

SMOOTH AUDIO EDITS

Audio edits often produce gaps between soundbites. This is especially true when editing dialog, or splitting soundbites into small slices using the *New Soundbites from Beats* command (*Audio menu > Audio Beats*). Gaps of silence between soundbites can be audible and usually sound unnatural. The *Smooth Audio Edits* feature fills these gaps with "room tone" to mask them.

Room tone

Room tone is Performer Lite's term for a small portion of ambient sound from the original audio file (or possibly another audio file). Performer Lite can automatically search the parent audio file for a small portion of the waveform that consists of *noise floor*: consistent, low-level background noise that can fill silence between soundbites and crossfade seamlessly with the beginning and end of each soundbite. Or you can manually specify a room tone audio file. In either case, Performer Lite then fills the gaps between soundbites with the

room tone "silence", which matches the noise floor in the soundbites enough to provide a smooth, unnoticeable transition from one soundbite to the next.

At times, the gap to be filled may sit between soundbites that are from different recording sessions with completely different noise floor characteristics. If so, Performer Lite still tries to make the transition as smooth as possible. To do so, it finds noise from each parent audio file and creates a new soundbite to fill the gap that consists of a crossfade blend from one file's noise to the other file's noise.

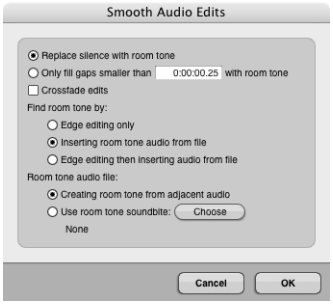


Figure 42-2: Smooth Audio Edits.

To apply Smooth Audio Edits, make a time range selection over the area that contains the gaps between soundbites that you wish to fill. Then choose *Audio menu> Smooth Audio Edits*. A window appears (Figure 42-2) with the several options discussed below.

Specifying what gaps to fill

To fill *all* gaps of silence, choose *Replace Silence with Room Tone*.

To specify the size of the gaps to be filled, choose *Only Fill Gaps smaller than _ with Room Tone*.

If you wish to automatically generate crossfades between soundbites and the newly created room tone soundbites between them, check the *Crossfade Edits* check box.

Specifying how to fill gaps

The *Find Room Tone By* options let you decide how the gaps will be filled. There are essentially two basic techniques for doing so: edge edit (trim) the edges of the existing soundbites to "uncover" room tone that is just past the edge of the soundbite, or insert new room tone soundbites. Or, you can do both by trimming soundbites as far as possible until they run out of audio (or run into other portions of the waveform that rise above the noise floor), and then inserting room tone soundbites to fill any remaining gaps. This last approach usually produces the most natural sounding and complete results. To employ it,

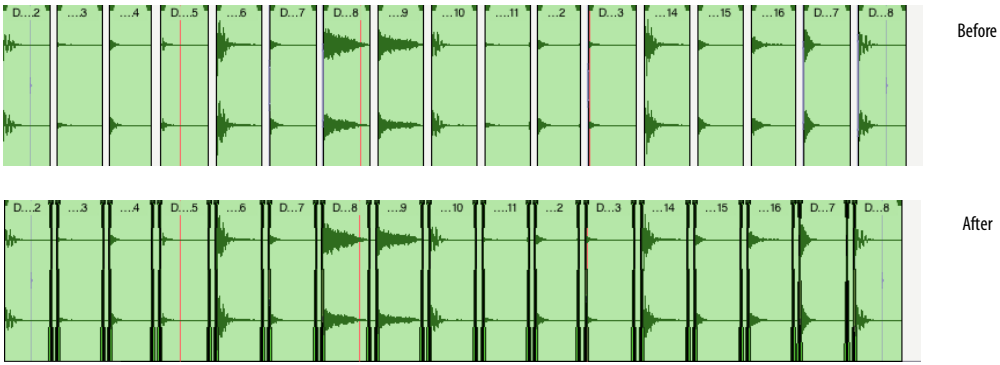


Figure 42-1: The effect of applying Smooth Audio Edits.

choose *Edge Editing then Inserting Audio From File*. If you wish to edge edit only or insert room tone only, choose either *Edge Editing Only* or *Inserting Room Tone Audio From File*.

Specifying how room tone is generated

The final options in the Smooth Audio Edits dialog let you choose how room tone is generated. If you want Performer Lite to automatically generate room tone by searching for it near the soundbites in their parent audio file, choose *Creating Room Tone from Adjacent Audio*. If you would like to create your own room tone audio file and use that instead, choose *Use Room Tone Soundbite* and click the *Choose* button to specify the file.

SMOOTH AUDIO EDITS AGAIN

If you wish to apply the same smoothing settings as were just used, hold down the Command/Ctrl key and choose *Audio menu> Smooth Audio Edits Again*. Doing so applies the same settings last used by this command to the current selection, as a convenient shortcut.

SPECTRAL EFFECTS

The Spectral Effects command allows you to apply Performer Lite's formant-corrected pitch-shifting, time stretching and "gender-bending" to monophonic digital audio. For details, see chapter 63, "Spectral Effects" (page 558).

BITE VOLUME AND GAIN

There is a soundbite attribute, accessed in the Sequence Editor ("Bite Gain" on page 337), called *Bite Gain*. It non-destructively raises or attenuates the overall volume of the soundbite. The range is from -140 to +80 dB. There is an additional soundbite attribute that temporarily bypasses both soundbite gain and soundbite volume automation. When bypass is engaged, the soundbite plays at its original volume. The commands in the *Bite Volume and Gain* sub-menu control these settings for individual soundbites. To use them, select a soundbite (in the Sequence Editor) and choose the desired command below:

Soundbite volume submenu item	What it does
Set Bite Gain	Sets the selected soundbite's gain to the value entered in the dialog.
Clear Bite Gain	Sets the selected soundbite's gain to 0.0dB
Toggle Bite Volume Bypass	Toggles the gain/volume bypass setting for the selected soundbites
Adjust Bite Volume +0.5dB	Adds a half a dB to any soundbite volume within the current selection.
Adjust Bite Volume -0.5dB	Subtracts a half a dB from any soundbite volume within the current selection.
Clear Bite Volume	Clears the selected range in the soundbite volume curve.

For breakpoint editing of soundbite volume automation in the Sequence Editor, see "Soundbite volume automation" on page 347.

PITCH AND STRETCH

The commands in the Pitch and Stretch sub-menu let you control Performer Lite's real-time pitch automation data. For complete information, see

chapter 62, “Transposing Audio” (page 547). Here is a brief summary of the commands in this sub-menu:

Pitch mode command	What it does
Clear Pitch	Returns a pitch segment to its original pitch. See “Pitch curve control points” on page 550.
Clear Pitch Control Points	Removes any control points in the currently selected portion of a pitch curve. See “Pitch curve control points” on page 550.
Quantize Pitch	Centers any currently selected pitch segments, so that they are tuned exactly to their relative root pitch (to fix any notes that are a little sharp or flat). See “Quantizing pitch” on page 554.
Scale Expression	Accentuates or flattens the currently selected pitch curve. See “Scaling the pitch curve” on page 551.
Adjust Pitch Segmentation	Raises or lowers the number of pitch segments used to manipulate audio pitch. See “Adjusting pitch segmentation” on page 552.
Set Track Pitch Mode	Sets the default pitch mode for any audio material newly recorded into that track. It does NOT affect existing soundbites already in the track, or soundbites dragged into the track. See “Setting the pitch mode” on page 552.
Set Pitch Mode for Selected Bites	Sets the pitch mode and modifies the pitch segments accordingly for the currently selected audio in the Soundbites list or in any tracks. See “Setting the pitch mode” on page 552.
Set Pitch Mode for Track and Selected Bites	Applies the pitch mode to both the track and any currently selected soundbites as described above in one operation. See “Setting the pitch mode” on page 552.

APPLY PLUG-IN

The Apply Plug-in sub-menu holds non-real-time versions of your MAS, VST and AU plug-ins, allowing you to apply them constructively as region operations on audio selected in any window. For more information, see “File-based plug-in processing” on page 523.

AUDIO BEATS

The Audio Beats sub-menu lets you manage Performer Lite’s extensive audio beat detection features.

Audio beats menu item	What it does
Find Beats...	Triggers Beat Detection on selected audio files in the Sequence Editor with the user-set detector sensitivity setting. See “Find Beats” on page 430.
Clear Beats	Removes all the beats from the selected audio files.
Disable Beats under Strength Threshold…	Controls how many beats are enabled or disabled in a soundbite based on their velocity threshold. See “Disable Beats under Strength Threshold” on page 430.
New Soundbites From Beats…	Lets you split up a soundbite into pieces at beat boundaries. See “New Soundbites from Beats” on page 431.
Copy Beats…	Copies beats from one track to another. See “Copy Beats” on page 433.

SOUNDBITE TEMPO

Performer Lite provides many advanced features for managing audio tempos. For complete information about the soundbite tempo commands in the Audio menu, see “Tempos and Audio” on page 422 and chapter 45, “Audio Beats and Tempo Detection” (page 428).

CHAPTER 43 Takes and Comping

OVERVIEW

A *take* stores the contents of the track. Each track can have an unlimited number of different takes. If you want to keep what is already in a track, but you want to try an alternative version of it (either recorded from scratch or based on the current take), choose *New Take* or *Duplicate Take* from the Take menu. The original data is preserved in its own take, which you can always return to by choosing it by name from the Take menu.

Takes are great for cycle-recording. If you'd like to try recording again the next time through the loop, just choose *New Take* from the menu. Your previous take is saved, and a new, empty take is ready to be recorded into. After you are done, you can either choose the best take, or quickly build a final composite track made of the best parts of several takes using the Comp tool.

Takes can be used with all track types. When used with audio tracks in the Sequence Editor, you can use Performer Lite's powerful comping features to quickly create a comp take from multiple takes.

Overview 415
Take menu 415
Indication of multiple takes 416
Comp takes 416
Comp tool 418
Takes and key commands 420
Conductor track takes 421
Takes interact with multiple mixdowns 421

TAKE MENU

The Take menu (Figure 43-1), found in the Sequence Editor info panel as shown below, has several commands to help you manage takes.

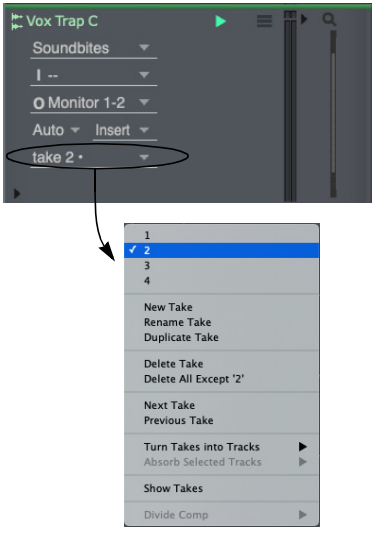


Figure 43-1: The Take menu.

New Take

New Take (Figure 43-1) creates a new, empty take for the track.

Rename Take

Rename Take (Figure 43-1) lets you rename the current take. The current take is the one with the check mark next to it in the top portion of the menu.

Duplicate Take

Duplicate Take (Figure 43-1) creates an exact duplicate of the current take, including all of the data in the track. The current take is the one with the check mark next to it in the top portion of the menu.

Delete Take

Delete Take (Figure 43-1) gets rid of the current take.

Delete all except 'current take'

Delete all except 'current take' (Figure 43-1) gets rid of all takes except the current take.

Next/Previous Take

The *Next/Previous Take* commands make the next or previous take in the list the current take.

Turn Takes into Tracks

Turn Takes into Tracks (Figure 43-1) removes takes from the track and turns them into separate tracks. The *Current Take* sub-menu option is only available when there are two or more takes, and it operates on the current take. The *All Takes* option removes each take and turns it into a separate track containing a single take.

Absorb Selected Tracks

Absorb Selected Tracks (Figure 43-1) lets you collect takes from other tracks into the track from which you choose this command. To do so, select the tracks you wish to "absorb", then choose this command from the take menu of the track you wish to absorb them into. The selected tracks are deleted. The *Current Takes* sub-menu option only absorbs the current take of the selected tracks, whereas the *All Takes* option absorbs all takes from the selected tracks.

For audio tracks in the Sequence Editor, there are some additional commands for take comping. See "Comp takes" below.

Show Takes

The *Show Takes* command displays each take as a separate lane in the Sequence Editor. See "Creating a comp take" below.

INDICATION OF MULTIPLE TAKES

When a track contains multiple takes, a bullet (•) is displayed to the right of the take name.

COMP TAKES

Compositing ("comping") is the process of building a composite take — *comp take* — from portions of several regular takes. For example, you might record five or six guitar overdubs as separate regular takes and then take the best parts of each one to build a comp take that plays smoothly and seamlessly through the chosen portions from each take. Comp takes are different from regular takes in that they are built from portions of regular takes, although they also operate in many ways just like regular takes. For example, they appear in the Takes sub-menu side by side with regular takes, and you can record new material into them, just like a regular take. You can also use a comp take to build other comp takes. But comp takes differ from regular takes in that they remain connected to the component takes used to build them.

Creating a comp take

Choose *Show Takes* (Figure 43-2) to create a new comp take for the track (*Comp 1* in Figure 43-2) and also open a scrolling *take grid* that displays all other takes in the track (Takes *1-5* in Figure 43-2).

When a comp take is first created, it contains a copy of contents of the current take at the time the Show Takes command is invoked. In the example shown in Figure 43-2, *Take 1* was the current take at the time Show Takes was chosen, so its contents appear in the *Comp 1* take, as indicated by the Take 1's shading in the take grid.

If you want to start with an empty comp take, create a new empty regular take first (with the New Take command) and then choose *Show Takes*.

You can create as many comp takes as you wish. To create a second, third, fourth, etc. comp take for a track, first choose a regular take from the *Takes* sub-menu (instead of an existing comp take) and then choose *Show Takes*.

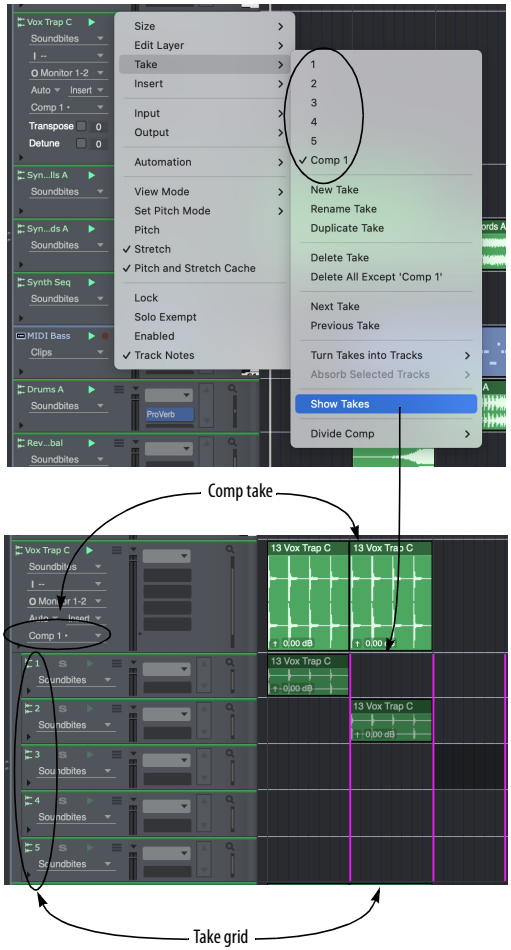


Figure 43-2: Show Takes.

The take grid

To view the take grid for an existing comp take, choose the comp take from the Take menu and then choose *Show Takes* from the Take menu. The take grid (Figure 43-2) displays all takes for the track below the track. Shaded areas (Figure 43-5 on page 419) indicate portions of each take that are being used in the track's current comp take (the comp take currently chosen in the takes menu).

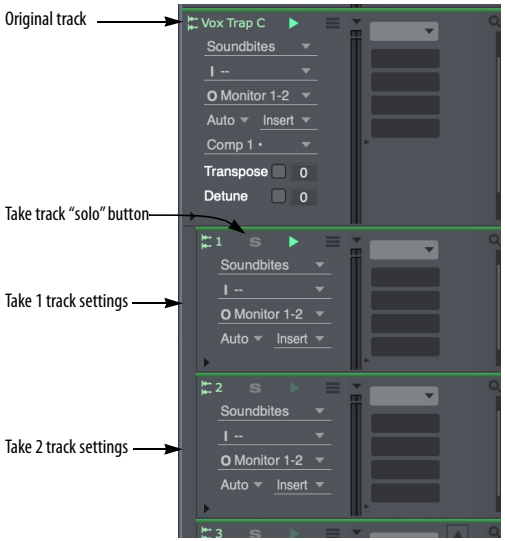


Figure 43-3: Take grid.

Working with take tracks within the take grid

Takes appear in the take grid list in a fashion very similar to regular tracks. They are slightly indented below their parent track. You can resize them and reorder them vertically within the take grid, just like regular tracks. (For example, option drag to resize them all to the same height.) You can show and hide take tracks within the take grid using the Sequence Editor's track selector.

Take track settings

Take tracks have many settings similar to normal audio tracks (Figure 43-3), such as play-enable, record-enable and input monitoring buttons. They can also have their own independent audio input and output assignments, automation mode settings, etc. These track settings take affect when the take grid is visible. As soon as you collapse the take grid using the *Hide Takes* command (explained below), the track settings no longer apply; instead, the parent track settings take effect over the currently selected take or comp take.

"Soloing" a take track

The take track solo button (Figure 43-3) works slightly differently than a normal track solo button. Click it to temporarily change the parent comp take to a complete copy of that take. Usually, the only thing that plays back while the take grid is showing is the parent comp take (the current comp take in the main track strip). Therefore, if you want to temporarily hear a single take in its entirety instead, the easiest way is to use the take track solo button to temporarily copy all of that take's data into the comp take. Click it again to restore the comp take to its previous state. As you can see, this is a special kind of "soloing" that is not related to the solo button in the Mixing Board.

Editing take tracks

Take tracks in the take grid are fully editable, just like normal tracks.

Switching takes when the take grid is open

If you switch the current take on the track while it is showing takes, the take grid will remain open if you switch to another comp take. If you switch to a normal take, or choose *New Take*, the take grid will close and the track will display the normal take. If you duplicate a comp take, the take grid will remain open and display the duplicated comp take.

Hide takes

After you use the *Show Takes* command, its text in the Take sub-menu changes to *Hide Takes*.

Choosing *Hide Takes* hides the Take grid and its take tracks. If a new comp take was created when you chose *Show Takes*, but you did not edit that comp take in any way, then the new comp take is discarded when you choose *Hide Takes* and the original current take is restored. However, if you did edit the comp take, it is saved and added to the Takes sub-menu (Figure 43-4):

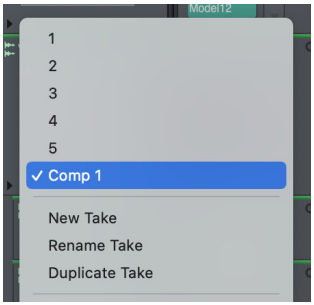


Figure 43-4: A comp take in the Takes sub-menu.

After the *Hide Takes* command is invoked, its text in the Take sub-menu item changes to *Show Takes*.

Working with comp takes

When you use *Hide Takes* after creating and modifying a comp take, the comp take appears in the Takes menu (Figure 43-4) and behaves just like a regular take. You can make it the current take in the track and then edit it in the main track strip just like a regular take. You can even use it as a regular take track for other comp takes.

Viewing and modifying a comp take

To view and modify the take tracks for a comp take, choose it from the Takes menu to make it the track's current take, and then choose *Show Takes*. The take grid reappears and shows you via shading how the comp take was originally constructed from its component takes (Figure 43-5).

COMP TOOL

Use the *Comp tool* to construct a comp take from portions of its take tracks (Figure 43-5). Use the Comp tool to create vertical red dividers across all take tracks and then build the comp take by selecting different take sections prescribed by the dividers. Only one take track at a time can be chosen for any given region between dividers. After you create dividers, use the Comp tool to click the sections you wish to

include in the comp take. Here is a summary of Comp tool techniques you can use to build comp takes:

To do this	Do this
To create a divider at the current cursor location	Option click.
To add a take section between dividers to the comp take	Click it.
To create a take section and add it to the comp take in one gesture	Drag over the desired take track section.
To move a divider line	Drag it left or right. (See note below.)
To select a divider line	Click it. It turns white.
To delete a selected divider line	Press the delete key.
To nudge a selected divider line	Press left/right arrow key.
To create silence in the comp take	Control/Win-drag a divider

When dragging a comp divider line, the snapping behavior is the same as when edge editing: dragging is unconstrained by default. Snapping will occur if it is enabled and you hold down the Command/Ctrl key while dragging.

Re-applying track takes after making changes

If you make changes to track takes used in a comp take, the comp take will not inherit those changes unless you click on those portions of the take grid with the Comp tool to "re-apply" them to the comp take. Only those portions of the take grid that you click will be re-applied to the comp take. If you made any changes or edits directly to the comp take itself within the re-applied time range, they will be lost and replaced by the re-applied material.

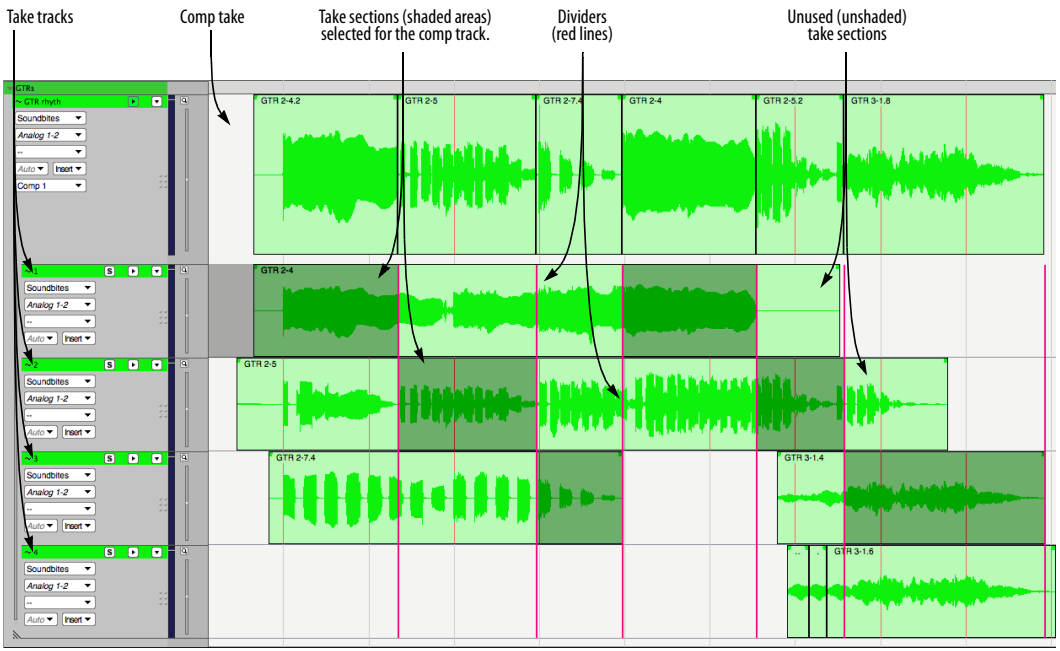


Figure 43-5: Building a comp take.

Divide Comp commands

The *Divide Comp* sub-menu in the Takes menu (Figure 43-6) provides several convenient shortcuts for creating comp divider lines.

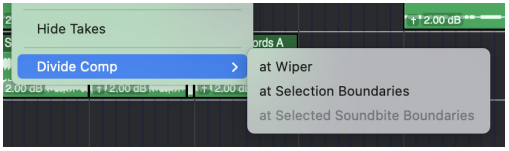


Figure 43-6: The Divide Comp sub-menu.

At wiper

The *at Wiper* command (Figure 43-6) creates a divider line in the Take grid at the current playback wiper time.

At selection boundaries

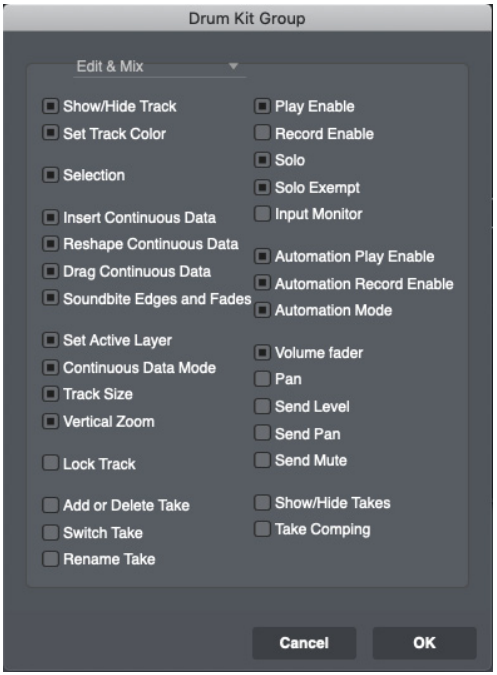
If the current selection is an insert point, the *at Selection Boundaries* command (Figure 43-6) creates a single comp divider line in the Take grid at that insert point. If the current selection is a time range selection, this command creates two divider lines in the Take grid: one at the start of the selection range and one at the end of the selection range. For example, you could use the Scrub tool in a take track to zero in on the desired time range selection that you want, then choose *Divide Comp at Selection Boundaries* to create a comp region.

At selected soundbite boundaries

The *At Selected Soundbite Boundaries* command (Figure 43-6) creates a comp divider line at the beginning and end of each selected soundbite.

Comping Multiple Tracks Simultaneously

There are some cases where you might want to simultaneously comp two or more grouped tracks. For example, you might want to comp multi-tracked drums, or a bass/guitar track that you recorded direct on one track and amped on another.



In cases like these, you can collect the related tracks into a track group and use the "Show/Hide Takes" track group option to show and hide takes for all tracks in the group at the same time. Use the "Take comping" track group option if you also want to apply comping operations to all tracks in the track group simultaneously. That way, you can define comp regions and select takes in just one open take grid and have those choices take effect for all tracks in the track group. (Obviously, this is desirable only if each track in the track group has the same number of takes, and if the *n*th take on each track corresponds to elements of the same *n*th performance.)

TAKES AND KEY COMMANDS

There are key bindings for the items in the Take menu, as well as additional commands like *Next Take* and *Previous Take*. When invoked, these commands will affect all record-enabled tracks; if there are none, they will affect the selected tracks.

CONDUCTOR TRACK TAKES

The Conductor track holds tempo changes, meter changes, key changes and markers. However, switching takes on the Conductor track only affects tempo data. Meter changes, key changes, and markers are not affected by takes. For example, if you have a meter change at measure 3, as well as a number of tempo change events, and you choose New Take from the Conductor Track take menu, the tempo events will disappear from the track (as part of Take 1, which is being replaced by Take 2), but the meter change at measure 3 will remain.

Also, as there can be only one Conductor Track in a sequence, the *Turn Takes into Tracks* and *Absorb Selected Tracks* commands are not available for the Conductor Track.

TAKES INTERACT WITH MULTIPLE MIXDOWNS

See "How mix mode impacts your sequencing" on page 196 for an important discussion about how working with multiple mixdowns in the Mixing Board interacts with takes.

CHAPTER 44 Tempos and Audio

OVERVIEW

This chapter explains how to:

- Apply tempo maps to soundbites
- Extract tempo maps from soundbites that already have them
- Make soundbites follow the tempo of a sequence, including tempo maps with ritards, accelerandi, and rubato
- Make a sequence follow the tempo of a soundbite
- View and edit embedded soundbite tempo maps

For information about a related feature, see chapter 45, "Audio Beats and Tempo Detection" (page 428) and chapter 64, "Scale Time" (page 561).

Overview 422
Soundbite Tempo Maps 422
The track Stretch layer 423
Audio menu > Soundbite Tempo 424
Analyze Soundbite Tempo 424
Set Soundbite Tempo 424
Clear Soundbite Tempo 425
Halve/Double Soundbite Tempo 425
Find Tempo Factor Near Sequence Tempo 425
Copy Sequence Tempo to Soundbite 425
Adjust Soundbites to Sequence Tempo 426
Adjust Sequence To Soundbite Tempo 426

SOUNDBITE TEMPO MAPS

In order to make time-scaling musically useful, Performer Lite allows soundbites to have tempo maps. This makes it very easy for you to manipulate audio along with MIDI without worrying about the tempo, and change the tempo however and whenever you want.

When you record audio in time with the project time line, the new soundbite "knows" about the tempo map in effect at the time it was recorded, whether in manual tempo mode, or using a conductor track with tempo changes. Then, you may modify the tempo changes in the conductor track any way you like — manually with the Sequence Editor or by calculation with the *Scale Tempos* or *Change Tempo* commands. At this point, the audio will no longer be lined up properly with any MIDI data in your sequence. All you need to do is enable *the Stretch layer* ("Stretch" on page 69) for the track and everything is perfectly aligned again! Performer Lite time-scales the soundbites, conforming their embedded tempo map with any tempo changes in the conductor track.

Audio beats and tempo detection

For audio that is not originally recorded in Performer Lite (in time with the project time line), Performer Lite can analyze the audio to detect beats and extrapolate the audio's tempo with a great deal of precision, even for long, complex tempo maps. See the next chapter, "Audio Beats and Tempo Detection" on page 428.

Working with soundbite tempo maps

This chapter explains how you can manually specify a soundbite's tempo, modify soundbite tempo maps and adjust the sequence to match the audio tempo, or vice versa.

An example of a soundbite tempo map

For now let's just consider the simplest case: a soundbite with a fixed tempo. The most common example of this case is a soundbite that was recorded to a click with a fixed tempo. If Performer Lite knows the tempo of a soundbite, it can compute the exact duration, in beats and ticks. If you have configured the Soundbites list to show the "Duration (beat|ticks)" and "Tempo" columns, you will see this, as shown below in Figure 44-1.

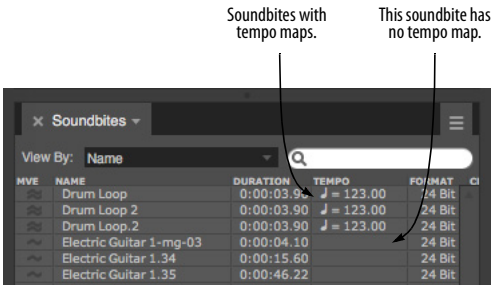


Figure 44-1: The Soundbites list has two columns that show information about a soundbite's tempo map, if it has one: the TEMPO column, which shows the constant or average tempo, and the QUARTER | TICKS column, which shows its duration in quarter notes and ticks. You can show and hide these columns by double-clicking one of the column titles.

Viewing soundbite tempo maps in the Sequence Editor

In the Sequence Editor, Soundbites with tempo maps are drawn with gray lines on them, corresponding to the grid lines in the time ruler, as shown below in Figure 44-2.

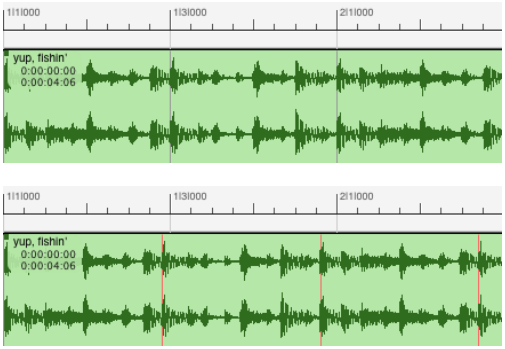


Figure 44-2: A soundbite recorded at 120 bpm in a 120bpm sequence (above), and the same soundbite placed in a 114 bpm sequence (below). Notice how the grid lines inside the soundbite no longer line up with the grid lines in the ruler to alert you to the fact that the soundbite tempo map doesn't currently match the sequence's tempo.

If a soundbite has a tempo map, the time ruler grid lines inside the soundbite stick to the audio data, not to the sequence. As a result, if a soundbite was recorded at 120 bpm, and you place it in a sequence with a tempo of 114 bpm, its gridlines won't line up with the time ruler grid lines to alert you that soundbite currently has a different tempo than the sequence. When this happens, the lines inside the soundbite are drawn in red, to further alert you to the discrepancy.

Ritards, accelerandi, and rubato tempos

Soundbites will usually have a constant tempo, but they are not required to. Each soundbite can essentially have an entire conductor track inside it! If you set up a conductor track with ritards and accelerandi, and record a soundbite, the soundbite automatically gets a copy of the current tempo map. If you later decide to change the conductor track, Performer Lite remembers the original tempo map with which the soundbite was recorded, and the audio will be stretched to remain in time with the new tempo (when the *Stretch* layer is enabled).

THE TRACK STRETCH LAYER

When the track *Stretch* layer is enabled for an audio track (Figure 10-2 on page 59), soundbites in the track will always remain conformed to the

measures and beats of the project time line, as long as the soundbites have a tempo map that accurately reflects their tempo. The Stretch layer can be enabled on a per-track basis, so you can disable it for things like movie dialog tracks or sound effects tracks. For details, see "Stretch" on page 69.

AUDIO MENU > SOUNDBITE TEMPO

In addition to the automatic beat detection and tempo analysis features discussed in the next chapter, Performer Lite has several commands for manually creating or modifying a soundbite tempo map, as discussed in the following sections. These commands are found in the *Audio menu > Soundbite Tempo* sub-menu.

Selecting audio to apply tempo commands

Most of the Audio Tempo commands work on selected soundbites or selections within pop-edited soundbites. For time-ruler selections, they affect all soundbites that start within the selection.

ANALYZE SOUNDBITE TEMPO

The *Analyze Soundbite Tempo* command engages Performer Lite's automatic tempo analysis features to generate a tempo map for a soundbite. This can be applied to any audio that has been beat-analyzed by Performer Lite's Beat Detection Engine; ensuring the audio file's beats are optimal before choosing this command can improve results. See "Editing beats to improve tempo detection" on page 438.

SET SOUNDBITE TEMPO

The Set Soundbite Tempo command (in the Soundbite Tempo sub-menu in the Audio menu) allows you to define a constant tempo for a soundbite or a portion of a soundbite. This is particularly useful with audio that was not recorded to the click, or that was obtained from a sample library, for instance. You can also make a selection within a soundbite while snapping to beats (see "Using the beat grid" on page 434) and quickly set the tempo based on the number of beats you have selected — very quick and easy.

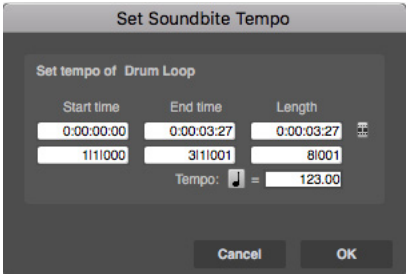


Figure 44-3: The Set Soundbite Tempo command lets you define a constant tempo for a soundbite or a portion of a soundbite.

Make your audio selection (in any window) and choose *Audio menu> Soundbite Tempo> Set Soundbite Tempo*. The dialog shows the start and end times and length of the soundbite in real time (you may toggle between min:sec and SMPTE time). You may edit the end time in measures, beats, and ticks, or the duration in quarter notes and ticks. For instance, if you know the soundbite is two measures long in 4/4 time, just enter 8|000 — eight quarter notes exactly — into the duration box. Performer Lite instantly calculates the correct tempo. Alternatively, you may type in the tempo in beats per minute.

You may also use this command on a selection within a pop-edited soundbite. This comes in handy if you do not know the length of the whole soundbite, but it may be very easy to select two measures, or four measures — especially with beat grid snapping turned on as described in "Using the beat grid" on page 434.

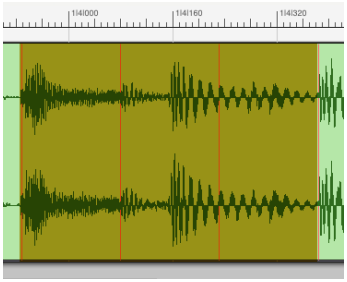


Figure 44-4: If you know the tempo of a portion of the soundbite, you can select just that portion and use Set Soundbite Tempo to apply a tempo.

What happens depends on whether the soundbite already has a tempo map or not. If the soundbite doesn't have a tempo map yet, a new tempo map is created using a fixed tempo for the whole soundbite. But if the soundbite already has a tempo map, *only the tempo of the selected part* of the soundbite is changed. This is one way of defining a varying tempo map for a soundbite.

The Set Soundbite Tempo command also works on selections in the Soundbites list. Note that in all cases, though, it only works on a single soundbite at a time.

☛ This command has no effect on the audio data itself; it only affects the tempo map stored with the soundbite.

CLEAR SOUNDBITE TEMPO

The Clear Soundbite Tempo command (in the *Audio menu> Soundbite Tempo* sub-menu) removes the tempo maps from any selected soundbites.

HALVE/DOUBLE SOUNDBITE TEMPO

These commands (in the *Audio menu> Soundbite Tempo* sub-menu) divide or multiply an existing soundbite tempo map by a factor of two.

Sometimes, audio material can be misleading enough that Performer Lite's tempo analyzer chooses a tempo that is actually twice or half the actual tempo. For example, a very fast jungle/drum 'n bass break beat loop that is 170 BPM might be incorrectly detected at 85 BPM. To quickly correct errors like these, choose *Audio menu > Soundbite Tempo > Double Soundbite Tempo* or *Halve Soundbite Tempo*.

The audio in the file does not change (no time stretching occurs); just the tempo map is changed.

This command is also useful if you simply wish to play back the soundbite at twice or half its original tempo (in an audio track with *Stretch* enabled).

FIND TEMPO FACTOR NEAR SEQUENCE TEMPO

The *Find Tempo Factor Near Sequence Tempo* command (in the *Audio menu> Soundbite Tempo* sub-menu) scales the tempo map in the soundbite to match the sequence tempo as closely as possible. For example, if tempo analysis produces a tempo that is double or half the actual tempo of the audio, and you know that the soundbite's actual tempo is very close to the sequence tempo, this command will multiply or divide the tempo map by 1.5 (or 2, 3, 3.5, etc.) as needed to match the sequence tempo as closely as possible.

COPY SEQUENCE TEMPO TO SOUNDBITE

The *Copy Sequence Tempo to Soundbite* command (in the *Audio menu> Soundbite Tempo* sub-menu) copies tempo information from the sequence into any selected soundbites, replacing their existing tempo maps, if any.

Manual tempo mode vs. conductor track

If the sequence is in Fixed Tempo mode, it is the value of the tempo that is copied into the soundbites, not tempo changes from the conductor track. This command (as well as the ones described in the next two sections) always pays attention to the tempo that is actually being used by the sequence, whether it is the fixed tempo or the conductor track.

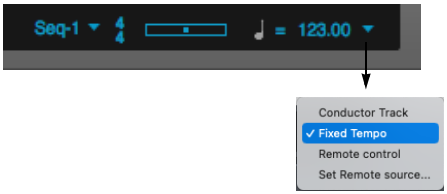


Figure 44-5: When copying the sequence tempo to a soundbite, Performer Lite takes into account the current tempo control setting. If it is set to Fixed Tempo, the current tempo setting is mapped to the soundbite. If it is set to Conductor Track, the tempos in the conductor track are mapped to the soundbite.

This command does not work on selections in the Soundbites list.

ADJUST SOUNDBITES TO SEQUENCE TEMPO

Select a soundbite that is out of alignment with the sequence tempo (one with red lines in the Sequence Editor), and choose *Audio menu> Soundbite Tempo> Adjust Soundbites to Sequence Tempo*. Performer Lite time-scales the soundbite to make it line up exactly with the sequence tempo. This may require compressing some parts of the soundbite and expanding others. It may require dozens or hundreds of different time scale factors. It doesn't matter, just choose this command, and Performer Lite does the rest.

☛ If you would like soundbites in a track to always remain conformed to the sequence tempo, so that you don't have to take the time to do it manually with this command, see "Stretch" on page 69.

Only soundbites with tempo maps are affected. Also, any soundbites whose Time Compress/Expand preference in the Soundbites list is set to Don't Time Scale will be left alone. Furthermore, any selected soundbites that match the sequence tempo are left alone.

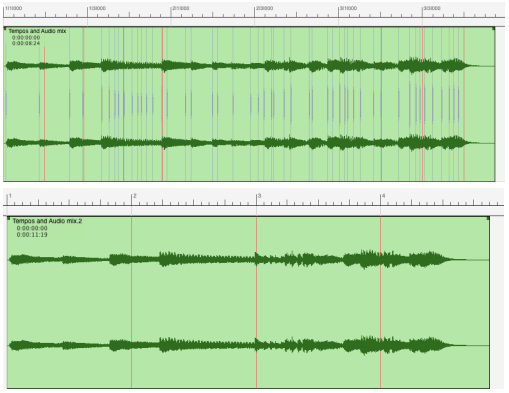


Figure 44-6: In this example, the soundbite "Rubato Piano" has a varying tempo map that does not match the sequence, as indicated by the uneven spacing of its grid lines (above). It is then shown mapped to the sequence, which has a constant tempo (below).

ADJUST SEQUENCE TO SOUNDBITE TEMPO

This command does the opposite of *Adjust Soundbites to Sequence Tempo*. It copies the tempo map from any selected soundbites into the sequence. If you are in Conductor Track mode, this modifies the conductor track. In Fixed Tempo mode, it sets the tempo to the average tempo from the selected soundbites.

This is useful when creating a new sequence from an existing soundbite. For example, if you have a drum loop from a sample library, you can give it a tempo map with the *Set Soundbite Tempo* command, or use the tempo map created by Performer Lite's Beat Detection Engine and automatic tempo analysis, and then copy that tempo into the sequence with Adjust Sequence To Soundbite Tempo.

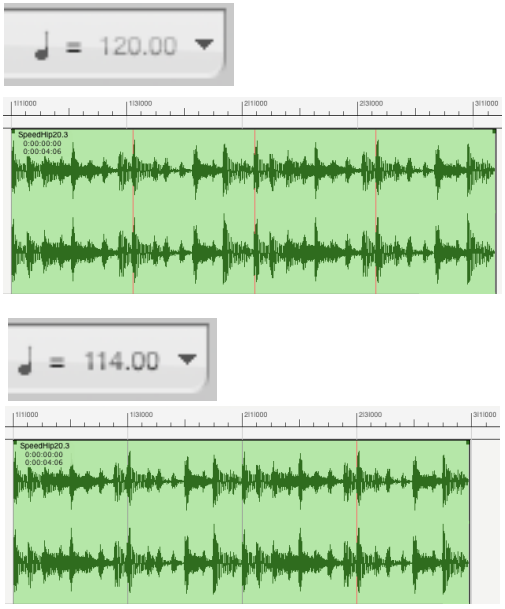


Figure 44-7: In this example, a 114 bpm Drum Loop has been placed in a new sequence set to 120 bpm as shown by the tempo indication (above). After selecting the soundbite and choosing Adjust Sequence to Soundbite Tempo, the sequence tempo now exactly matches the tempo of the soundbite, as indicated by the time ruler grid lines, which now match up (below).

As another example, you could import a full mix, or drum track stems for an entire song, and then make the sequence tempo map exactly match the imported audio. The basic procedure to do this would be:

1 Select the imported audio and choose *Audio menu > Soundbite Tempo > Analyze Soundbite Tempo*.

2 Nudge all of the audio so that the first downbeat of the audio aligns with a measure downbeat.

3 Set the sequence to Conductor Track tempo mode.

4 Select the audio and choose *Audio menu > Soundbite Tempo > Adjust Sequence to Soundbite Tempo*.

CHAPTER 45 Audio Beats and Tempo Detection

OVERVIEW

This chapter gives you a brief overview of Performer Lite's beat detection and tempo analysis features, which give you unprecedented rhythmic and tempo control over your audio.

Overview **428**
The Beat Detection Engine **428**
What works and doesn't work **429**
Manually applying beat and tempo detection **429**
Where beats and tempo maps are stored **430**
Audio menu > Audio Beats **430**
Using the beat grid **434**
Stretching audio beats **435**
Quantizing beats within soundbites **436**
Applying a groove to beats within soundbites **437**
Extracting a groove from audio **437**
Ideas for quantizing audio **437**
Beats determine tempo detection **437**
Editing beats to improve tempo detection **438**
Reanalyzing tempo after editing beats **438**
Adjusting soundbite tempo maps **438**

THE BEAT DETECTION ENGINE

Using sophisticated transient detection algorithms, Performer Lite's *Beat Detection Engine* can analyze any audio loop or audio file that contains rhythmic music and determine where the beats are in the music. After the beat locations have been determined, a wide variety of beat-related operations can be performed on the audio, giving you unprecedented rhythmic control over your music. For example, you can quantize — or apply a groove to — the audio without breaking it up into separate soundbites. Instead, Performer Lite applies time-stretching between beats. As another example, you can snap edits and selections directly to beats for quickly making beat-accurate loops, beat-relative split points, and much more.

After the Beat Detection Engine analyzes an audio file for beats, state-of-the-art tempo analysis technology can then be applied to determine the overall tempo of the file. After a tempo map has been determined, a wide variety of tempo-related features can be applied, such as conforming the audio to the sequence tempo, or generating a conductor track tempo map that precisely matches the audio file's tempo.

The Beat Detection Engine can be highly accurate, depending on the nature of the audio material being analyzed. In most cases where a correct beat is found, the beat detection is sample accurate: it finds the exact sample where the beat transient begins. As a result, rhythmic manipulation, such as quantizing, groove extraction and groove application, will feel very accurate — or as they say, "in the pocket".

Performer Lite's beat detection features are designed to be smoothly integrated into the overall operation of the program. You can set up beat and tempo analysis preferences and then take advantage of Performer Lite's powerful rhythmic editing and tempo-based processing during the course of your uninterrupted workflow.

WHAT WORKS AND DOESN'T WORK

Performer Lite's Beat Detection Engine and Tempo Analyzer are highly developed technologies. However, they have their limits. If an audio file has no rhythmic information in it whatsoever, then clearly beats and tempos won't be found. Examples of such audio include:

- Ambient pads with smooth changes between chords
- Percussion tracks with intermittent bursts of playing, separated by long silences (like a crash cymbal track)
- Non-musical sound effects
- Dialogue tracks

These are extreme examples, but they serve to illustrate one extreme: material that has no beats at all — or any sense of musical pulse.

Audio files with embedded beat and tempo information

What's the other extreme? There are many cases where audio files already have embedded tempo information. Below are a few examples:

- Audio recorded directly in Performer Lite (and played to a click or other tempo reference to match Performer Lite's beats and barlines)
- ACID WAVE files
- REX (Recycle) files
- Apple Loops

If an audio file has an embedded tempo map, then it won't require tempo analysis in order for you to make it conform to the tempo of your Performer Lite project. Performer Lite simply uses the existing tempo map. However, if you wish to quantize the audio or perform other beat-related operations, you will still need to analyze it for beats (even if it is a REX file or Apple Loop).

Rhythmic audio with no embedded tempo information

Performer Lite's Beat Detection Engine and Tempo Analyzer are intended for the middle ground between the two extremes just discussed and work best on audio files that have the following characteristics:

- The audio file has no embedded tempo information already.
- The audio material in the file has a perceptible rhythmic pulse.
- The audio file represents a single instrument or drum track.
- The audio material is not a full stereo mix.

The Beat Detection Engine is primarily designed for individual instrument parts that are rhythmic in nature and have a relatively steady tempo. It can often do a good job on complete mixes, but it is not fine-tuned for such material. However, you can often get great results, even on complete mixes, with a little bit of tweaking — far less work than would be needed using other much more painstaking techniques. For details, see "Editing beats to improve tempo detection" on page 438.

MANUALLY APPLYING BEAT AND TEMPO DETECTION

You may encounter situations where you need to manually apply beat and tempo analysis to soundbites or audio files.

To manually initiate beat analysis on individual soundbites, first select them in the Sequence Editor and then choose the Find Beats command (*Audio menu* > *Audio Beats*). This command opens a window that allows you to preview the beats found within the selected soundbites before applying them to the soundbite, with a slider to vary the analysis sensitivity setting of the beat detector. See "Find Beats" on page 430 for more information.

Similarly, if beats are present in an audio file and you would like to manually initiate a tempo analysis, first select the soundbites in the Sequence Editor or Soundbite List and then choose *Analyze Soundbite Tempo* (Audio menu > Soundbite Tempo).

Tempo analysis results depend on the quality of the beats detected in the audio file.

WHERE BEATS AND TEMPO MAPS ARE STORED

Beat information is stored with the Performer Lite project and therefore does not transfer from one project to another.

The audio file's tempo map is stored with the audio file itself. Therefore, if the audio file is imported into another Performer Lite project, the tempo map is also imported and can be used to make the audio conform to the tempo map in the new project.

AUDIO MENU > AUDIO BEATS

The Audio Beats sub-menu (in the Audio menu) has several commands for managing audio beats. You can apply them to selected soundbites in the Sequence Editor or Soundbites list.

Find Beats

The *Find Beats* command opens a window that allows you to add beats to selected soundbites, detected using Digital Performer's beat detection algorithm. Once a soundbite has been selected, the algorithm will find the beats and display a preview. Click *Apply* to save these beats to the soundbite.

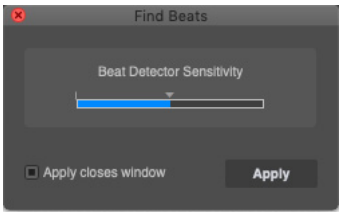


Figure 45-1: Find Beats.

The slider in the window adjusts the sensitivity setting, which alters how sensitive the beat detection algorithm is when finding beats in audio. A low sensitivity setting means the beat detector will detect fewer beats, and a high sensitivity setting will lead to more beats being found. Move the slider to the right to increase the sensitivity setting, or move it to the left to lower it: the preview will update the results accordingly. After clicking *Apply* the new sensitivity setting will be remembered so that any future beat detection on that audio file will use the updated sensitivity level by default.

There are situations in which it is useful to alter this setting. For example, in a live recording, audience noise or chatter could be mistaken for beats. In this case a lower sensitivity would remove these false positives. As another example, increasing the sensitivity would yield better results in recordings with very quiet transients.

In general, lowering the sensitivity setting reduces the detection of false positives while increasing the sensitivity will find more beats.

The Find Beats command is also available in the Audio menu so that you can use it on selected soundbites in the Sequence Editor, too.

Clear Beats

The *Clear Beats* command (*Audio menu > Audio Beats*) removes all the beats from selected audio files.

Disable Beats under Strength Threshold

Choose *Disable Beats under Strength Threshold* to open a window with a slider that lets you enable or disable beats based on a strength threshold.

This window applies to the beats within the current selection; you can make a selection before or after you open this window (with the window

open). If there is no selection, it applies to all the beats in the file. No changes are made to beats until you click the Apply button.

Move the slider towards the right to disable more beats; move it to the left to disable fewer beats. Click Apply when you have the desired result. You can quickly disable or enable a large number beats in one operation using this command.

The *Disable Beats under Strength Threshold* command is also available in the Audio menu so that you can use it on soundbites in the Sequence Editor, as well as audio being displayed in the Waveform Editor.

New Soundbites from Beats

The *New Soundbites from Beats* command (*Audio menu > Audio Beats*) lets you split up a soundbite into pieces at beat boundaries. This can be useful when making drastic tempo changes that would

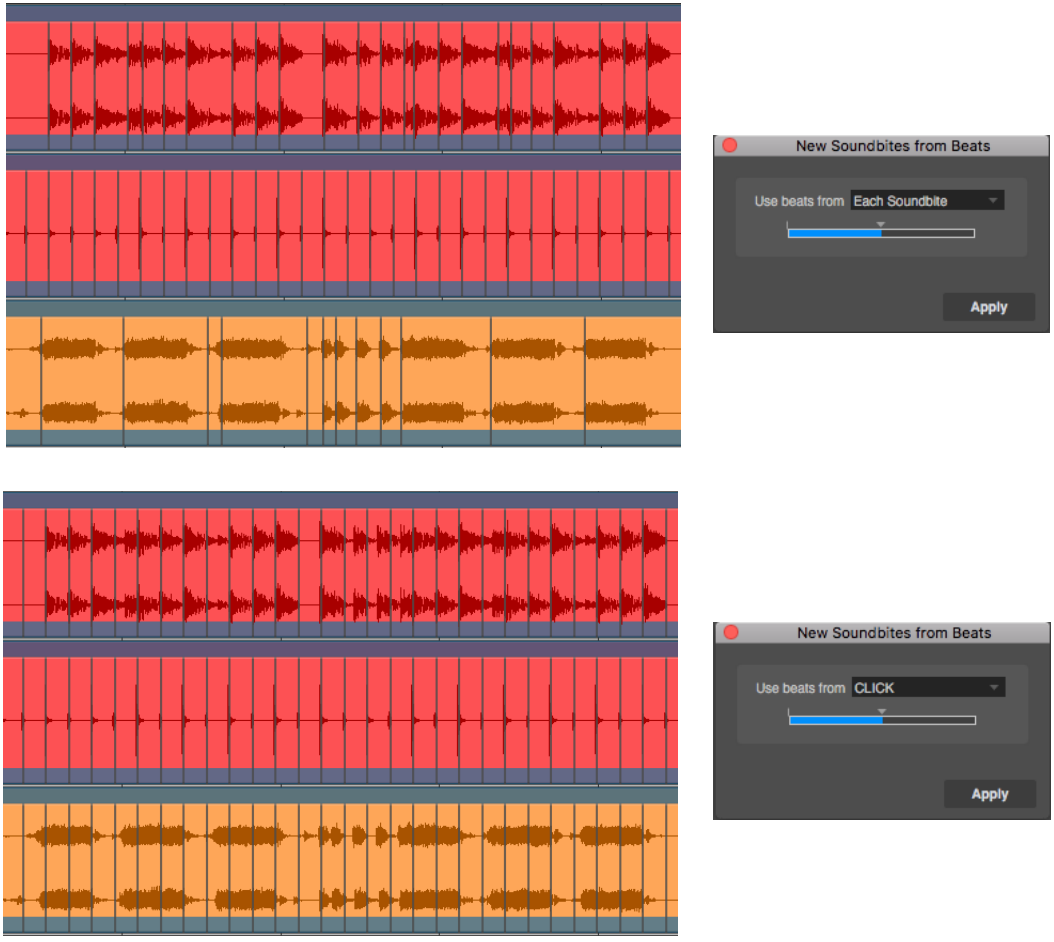


Figure 45-2: Using the 'Each Soundbite' setting versus using a guide track

not be suitable for time stretching beats within a soundbite. In addition, there may be other circumstances where smaller split up regions can be more useful than whole soundbites.

When you choose the *New Soundbites from Beats* command, a window appears with a slider in it:

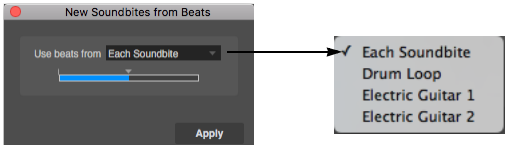


Figure 45-3: Creating soundbites from beats.

Select the soundbites you wish to split up (or make a time range selection) in the Sequence Editor. You can select the audio you wish to split up either before or after you open the *New Soundbites from Beats* window, and you can change your selection at any time before you click the *Apply* button. Before you click *Apply*, you'll see a preview of where the splits will take place:

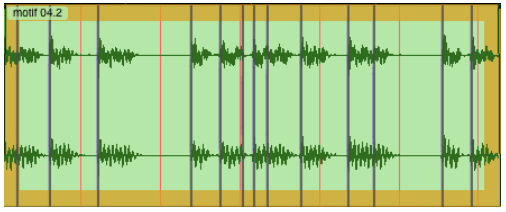


Figure 45-4: A selected soundbite with preview slices for the New Soundbites from Beats command.

Controlling the frequency of the splits

Move the slider to control how frequently the soundbite will be split up. Split points are added or removed from the operation based on their associated beat velocity. As you move the slider, beat velocities fall either above or below the threshold, to be included or excluded, respectively.

Splitting audio across multiple tracks

If you are splitting a single soundbite, or several soundbites that are all in the same track, choose *Each Soundbite* from *Use Beats From* menu.

If you are splitting audio in multiple tracks across the same time range, the *Use Beats From* menu gives you two basic choices:

To do this	What to choose from the Use Beats From menu
To split each track independently	Choose *Each Soundbite*
To split all tracks at the same locations, based on a guide track	Choose the track that you wish to use as a guide track

Figure 45-2 below demonstrates the difference between using the *Each Soundbite* setting and using a guide track. Using a guide track can be useful when you need to edit consistently across all of the tracks involved. If they all share the same split points, this will help your edits remain consistent, especially with regard to maintaining phase coherence. This can be especially critical when editing drum tracks that were recorded simultaneously from different mic positions.

Using Smooth Audio Edits after creating soundbites from beats

A common application for the New Soundbites from Beats operation is to split up a drum track or percussion track and then slow down the tempo of the sequence. Typically, time-stretching audio to slow it down can produce artifacts. By splitting up the audio beforehand, a minimum of time stretching occurs, and instead, gaps appear between the individual drum track slices as they are moved further from one another by the slower playback tempo. This technique is good because it minimizes audio time stretching artifacts. However, the trade-off is that the gaps of silence between the slices are audible and sound unnatural. The *Smooth Audio Edits* feature can be a huge help in this situation by filling the gaps with room tone or other ambient noise that fills and completely masks the gaps between the slices. Numerous options are provided to produce the best results, based on the audio material. For details, see "Smooth Audio Edits" and "Smooth Audio Edits Again" on page 413.

Copy Beats

In multitrack audio recording projects, it is often useful to take the beats from a guide track and apply them to other tracks so that their beats match the guide track. You can then apply beat-based edits or processing consistently across the tracks.

For example, you might have a kick and snare track that represent the beat structure of your music perfectly, and you might wish to apply it to a highly syncopated conga track so that its beat-based edits are more consistent and in line with the overall music.

The *Copy Beats* command (*Audio menu > Audio Beats*) lets you copy beats from one track to another. When you choose the *Copy Beats* command, a window appears:

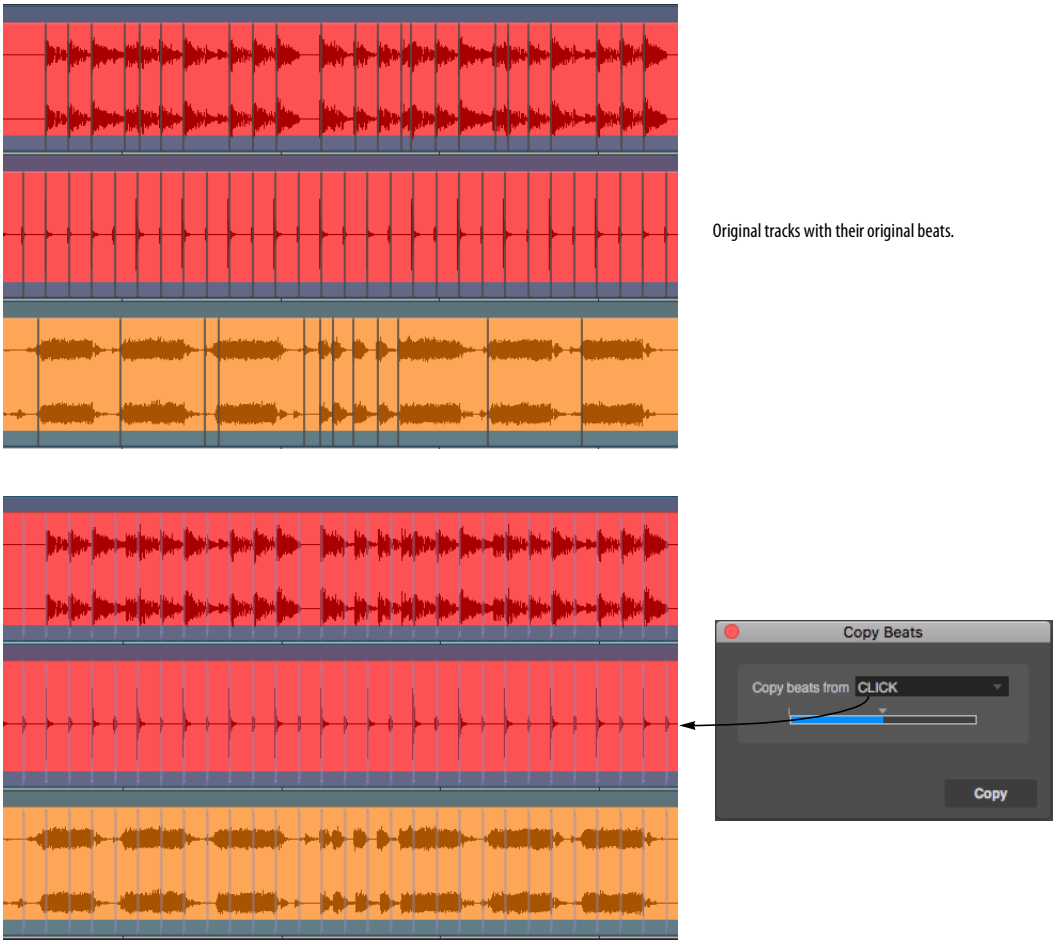


Figure 45-5: In this example, beats are being copied from the click track to the guitar and drum tracks.

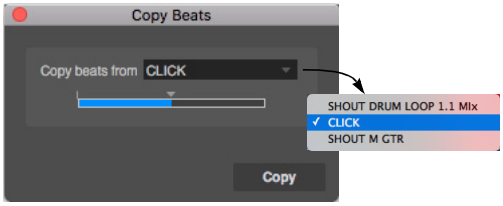


Figure 45-6: The Copy Beats command.

Select *both* the source and destination soundbites or tracks. You can select them either before or after you open the *Copy Beats* window, and you can change your selection at any time before you click the *Copy* button. Before you click *Copy*, you'll see a preview of the beats that will be copied, as shown in Figure 45-5 on page 433.

Choosing the source track and beat frequency

Choose the desired source track from the *Copy beats from* menu, as demonstrated in Figure 45-5. Move the slider to control the frequency of the beats to be copied. Beats are added or removed from the operation based on their associated beat velocity. As you move the slider, beat velocities fall either above or below the threshold, to be included or excluded, respectively. After you have the beat slider set as desired, click *Apply*.

Copy Beats As MIDI

Choose *Copy Beats as MIDI* to create a MIDI data stream with a MIDI note corresponding to each beat; each note's start time is the relevant beat's start time, and the note's velocity is that beat's strength. The end time of each note is set just before the following note's start time. This MIDI data will then be placed in the Clipboard and, like all copied MIDI data, it can be pasted to any MIDI track.

USING THE BEAT GRID

The *Beat Grid* option in the Snap Information panel (Figure 39-2 on page 357) snaps your selection and edit operations to the beats within the waveform. Editing to the Beat Grid is different than editing to the time ruler Edit Grid. With the Edit Grid, your actions snap to the specified beat resolution at regularly spaced intervals that are prescribed by Performer Lite's time ruler. But with the Beat Grid, your actions snap to actual beats within the waveform, as specified by the beat locations in the waveform, even if they don't match up with beats in the time ruler.

Essentially, the Beat Grid allows you to edit to the audio data, instead of to the project's time ruler. This is very powerful, especially when making edits that must remain faithful to the feel or "groove" of the audio, as this would not be reflected in the time ruler grid. Further, Performer Lite's Beat Detection Engine goes to great lengths to place beats at exact transient onsets, usually down to the sample. This makes beat editing extremely accurate.

Beat Grid snapping works similarly to marker snapping: when you drag close to a beat, it snaps. But if you are not close to a beat, it won't snap.

The Beat Grid can be enabled with the *Snap to Beats* checkbox in the Snap Information window. In the Sequence Editor, you can extend the selection across multiple audio tracks. In this case, your actions snap to the beats in the track under the cursor, so move the cursor over the track that contains the beat you wish to snap to.

If the Beat Grid is currently turned on, hold down the Command/Ctrl key to temporarily turn it off.

You can enable the Edit Grid, the Beat Grid and marker snapping at the same time, if you wish. In this case, your actions will snap to all three.

STRETCHING AUDIO BEATS

You can use beat markers to move — or stretch — their corresponding audio beat earlier or later in time, relative to the surrounding beats. This lets you seamlessly tweak the timing of individual beats in your audio.

In the Sequence Editor, choose the *Stretch* edit layer, as shown in Figure 45-7. Also be sure that Stretch mode is enabled for the track (see "Stretch" on page 69). Grab the beat you wish and drag it left or right. Use the *Snap to Grid* setting to determine the *anchor points* on either side of the beat you wish to drag, represented by purple lines. You might need to experiment a little bit to find the right grid setting, depending on the material. You can include surrounding beats if you wish, but if you only want to stretch the beat you are grabbing, choose a grid setting small enough that the surrounding beats don't move when you drag the beat.

You can stretch as many audio beats as you wish in the Stretch layer.

Adjusting anchor points

If needed, you can drag the anchor points themselves using the arrow cursor shown in Figure 45-7. This gives you more control over the span of the audio affected by your adjustment. Often, anchor points have an initial position on an beat marker. Simply move the cursor over the purple line until it appears as an arrow cursor (rather than the hand cursor, which drags the beat itself). The arrow cursor moves the anchor point.

Clearing stretch edits

To clear a stretch edit, click the beat marker to select it (it turns yellow) and either hit the backspace key or choose *Edit menu* > *Erase*. You can also make a time range selection to clear multiple stretch edits in one operation. To clear all stretch edits in a soundbite, select it and choose *Audio menu* > *Pitch and Stretch* > *Clear Bite Stretch*.

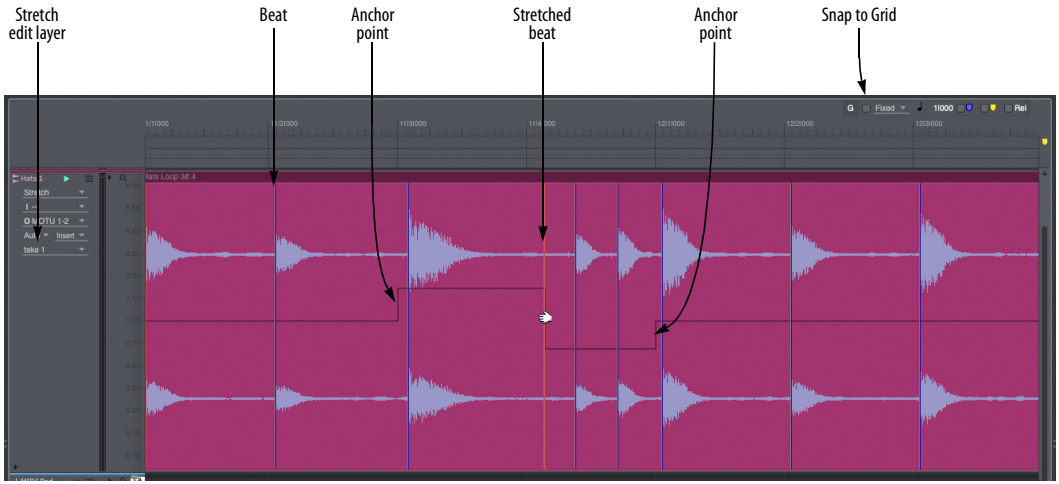


Figure 45-7: The Stretch layer in the Sequence Editor. The Snap to Grid setting determines the anchor points surrounding the beat you drag.

Quantize, Groove Quantize and beat stretching

If you quantize or groove quantize beats within audio (as explained in the next few sections), those operations will override any manual beat stretching you've done to the audio. Conversely, however, you can certainly make manual tweaks to beats *after* applying Quantize or Groove Quantize, to further tweak the feel of the audio beats post quantizing.

QUANTIZING BEATS WITHIN SOUNDBITES

Soundbites that have been beat-analyzed (and have beats) can be quantized, without the need for splitting them into smaller soundbites first. Instead, the beats within the soundbite are quantized by many small time-stretching operations between each beat. Audio quality is preserved, and each beat is moved, just like MIDI notes, according to the settings in the Quantize dialog.

In general, quantizing beats within soundbites will produce best results when the soundbite has already been tempo-analyzed (as described later in this chapter) and has been adjusted to match the tempo of the sequence. Quantizing then fine-tunes beat placement with respect to the project's time ruler grid.

To quantize the beats within a soundbite:

1 Select the soundbite and choose *Region menu> Quantize* (Figure 41-11 on page 379).

2 From the *What to quantize* menu, choose *Beats within Soundbites* and *Attacks* (if you are quantizing both audio and MIDI notes).

3 Choose the other settings in the Quantize dialog as desired.

When quantizing beats within audio, the *Attacks*, *Releases* and *Don't change note durations* options are ignored, as these three options apply to MIDI notes only. The rest of the settings in the Quantize dialog apply to both MIDI and audio, including tuplet quantization, grid offset, swing, sensitivity, strength and randomize.

4 Click Apply.

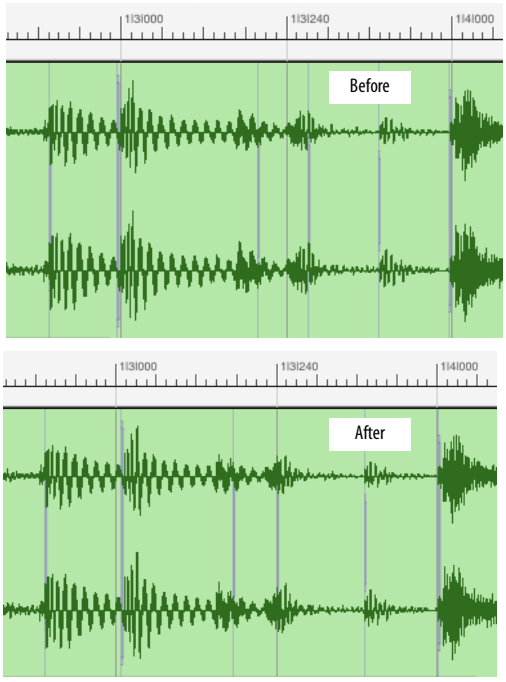


Figure 45-8: Quantizing beats within audio.

Beats within audio quantize differently than MIDI notes

Beats within audio quantize slightly differently than MIDI notes. When you quantize MIDI notes, every single note moves to the nearest grid point (subject to the other settings you may have specified, such as strength, etc.) However, this is not the case for beats within audio. Instead, Performer Lite employs a more useful algorithm, which moves only the beat closest to each grid point and then smoothly scales all others between them. This produces much more useful results for audio, as it time-stretches the audio as little as possible while still achieving the desired

quantizing results. As long as you choose a grid resolution that is appropriate for the audio (e.g. a 16th note grid for audio that has a 16th note subdivision pulse), then you'll get great results.

Previewing

The real-time *Preview* button in the Quantize window (Figure 41-11 on page 379) only previews the quantize effect for MIDI data. It does not provide a real-time preview for beats within audio.

Audio stretch and quantizing

The *Stretch* audio track setting ("Stretch" on page 69) has an impact on quantizing beats within audio. If it is enabled, quantizing occurs in the Stretch layer of the track. This means that any stretch edits you've previously made to the material being quantized will be replaced by the quantize operation. In addition, you can go into the Stretch layer after quantizing and view the results of the quantizing, as explained in "Stretching audio beats" on page 435. You can even further hand-tweak beat locations, if you wish.

APPLYING A GROOVE TO BEATS WITHIN SOUNDBITES

Applying a groove to beats within soundbites works in a similar fashion as described above for quantizing. Select the soundbite and choose *Region menu> Groove Quantize*. In the case of Groove Quantize, however, there is no *What to Quantize* setting. The groove is applied to any selected MIDI notes and any beats within selected soundbites. All settings in the Groove Quantize window are applied to audio. The *velocity* slider applies the appropriate value to beat velocities. If the Stretch layer is enabled, you can further hand-tweak individual beats in the Stretch layer afterwards.

EXTRACTING A GROOVE FROM AUDIO

To extract a groove from audio, select the audio in any window and choose *Region menu> Create Groove*. Choose a groove file to save the new groove to, or create a new groove file. Name the groove and then click OK. Beat timing, velocities and duration are saved in the groove. You can then apply the groove to MIDI data and/or audio data.

IDEAS FOR QUANTIZING AUDIO

Performer Lite's audio quantize, groove quantize and groove extraction features are very powerful and offer many creative opportunities. Here are a few things you can do when quantizing or groove quantizing audio:

- Take an existing audio recording with sloppy timing and quantize it to clean up the timing.
- Extract the rhythmic feel of an audio recording and then apply it to other audio tracks and/or MIDI tracks.
- Turn a loop with a straight feel into a shuffle feel, using one of the MPC shuffles - or any other shuffle groove.
- Tighten the timing of several rhythm section tracks (keys, bass, drum, rhythm guitar, etc.) by quantizing them with varying degrees of quantize strength.
- Take an existing audio recording with slight tempo changes in it make it a constant tempo throughout.

BEATS DETERMINE TEMPO DETECTION

Performer Lite uses beats to determine tempo. Even if beats are found at somewhat irregular intervals, the tempo analysis can, in most cases, still discern the correct tempo.

The tempo analyzer builds a tempo map by determining which beats represent the music's barlines. Using this technique, the tempo analyzer is capable of creating sophisticated tempo maps

that track long passages of recorded music. The tempo analyzer can save hours of painstaking tempo adjustments by tracking the tempo of your recordings automatically.

Since Performer Lite's beat detection is sample accurate, the tempo analyzer is capable of determining very precise tempos for audio. It works best on steady, rhythmic, monophonic audio, but it is capable of tracking complex music with multiple instruments or live recordings with room noise. In most cases it determines the correct tempo, but there are some audio files, particularly long files of mixed music with varying tempo, where it can chooses the wrong tempo for sections of the music.

EDITING BEATS TO IMPROVE TEMPO DETECTION

Understanding how the tempo analyzer chooses tempos will allow you to guide its tempo detection. Often, only one or two adjustments to the beats in an audio file are needed in order for the tempo analyzer to compute the correct tempo throughout the file. By moving, enabling or disabling beats (as discussed earlier in this chapter) and reanalyzing the file's tempo, you can effect the decisions that the tempo analyzer will make.

The tempo analyzer will only place tempo changes directly on beats with the goal of choosing which beats to align with measure boundaries. When it chooses the wrong tempo, it has likely chosen a beat *near* a barline but one that is slightly ahead of or behind the barline. This causes the resulting tempo at that location in the file to be incorrect.

In this case, you can try moving the offending beat to the correct position, and then reanalyzing the file.

Other common cases are melody lines or vocals that are not precisely aligned with the barlines to which they were performed. For example, the singer might come in just a little early, before the beat. These vocalizations can be louder than other beats that would make better guides for the tempo analyzer. Disabling these beats will often produce more accurate tempos.

Here's another common case: often the rhythmic elements of the music are represented by the loudest beats. If so, you can use *Disable Beats under Strength Threshold* (page 430) to disable quieter beats.

REANALYZING TEMPO AFTER EDITING BEATS

In all cases, you can freely experiment with beat adjustments. Just reanalyze the tempo again. You can reanalyze tempo as many times as you wish.

ADJUSTING SOUNDBITE TEMPO MAPS

The Soundbite Tempo sub-menu (Audio menu) provides several useful commands for further adjusting soundbite tempo maps. See "Audio menu > Soundbite Tempo" on page 424.

CHAPTER 46 System Exclusive

Performer Lite allows you to record, playback, and edit MIDI System Exclusive (SysEx) messages. Common types of System Exclusive messages include patch dumps, preset selections, editing parameters, etc. Performer Lite can thus store patches, samples, and other important information from your MIDI equipment in system exclusive form. Patches, edit parameters, and other special commands can be incorporated into musical sequences, greatly expanding the resources of your MIDI sound modules.

Basics **439**
Recording and playing SysEx messages **439**
Viewing and editing SysEx data **440**
Editing data in the system exclusive window **441**
Inserting SysEx data **442**
Editing SysEx data with the Edit Menu **442**
Transmitting a SysEx message **442**
Recording SysEx into the Editor Window **443**
Recording SysEx into a track **443**
Hints **443**
Be Careful **444**

BASICS

System Exclusive messages are a special type of MIDI data. A System Exclusive message consists of a header, body, and an 'end of message' byte. (A byte is a unit of digital information, roughly equivalent to a single character or letter.)

The header labels the following data as System Exclusive information, and includes a code identifying the manufacturer of the equipment transmitting the data.

The body of the message contains the actual data being sent. This data may take any form the manufacturer desires. There are some standards for the format of System Exclusive information, but for the most part *a System Exclusive message is only understood by the type of equipment that generated it*. As a result, recording a patch dump from one synthesizer and sending it to another will generally not produce useful results. Performer Lite does not respond to or interpret System Exclusive data; any analysis or editing of the body of the message is the user's responsibility.

Finally, the end of message byte, F7, marks the end of the System Exclusive data, and signals Performer Lite to interpret subsequent information as standard MIDI data.

As defined in the MIDI specification, a System Exclusive message must begin and end with an F0 and F7 byte, respectively. In addition, only hexadecimal values of 7F (127 in base ten) or less are allowed. When you click the OK button after inserting or editing the contents of a System Exclusive event, Performer Lite will scroll to and highlight any bytes that violate the conditions just stated.

RECORDING AND PLAYING SYSEX MESSAGES

System Exclusive messages are recorded and played back like any other MIDI data. These messages vary in size; information for a bank of patches, for instance, may be 10-20K or more. No matter how long a message is, it is treated as a single event by Performer Lite. Note that a long System Exclusive message can briefly halt recording or playback as Performer Lite processes the data; it is best to place larger System Exclusive events like patch or bank dumps in separate sequences, or at the start of a sequence before the actual music begins.

Because System Exclusive messages have no channel assignment, they are sent to every MIDI device connected to a port. If you have several devices of the same model or brand connected to the same port they may all respond to a message sent to or from just one of them. Conversely, some manufacturers encode channel assignments into the body of the System Exclusive message. Performer Lite is unable to access or rechannelize such an assignment.

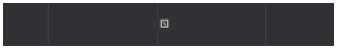
For example, if the playback assignment for a track is channel 1, but a System Exclusive message full of patches intended for that synth includes an encoded assignment to channel 16, the synth won't receive the patches.

Find out if any of your equipment encodes channel assignments in its System Exclusive messages, and be careful about changing channel assignments on equipment to which you intend to send System Exclusive. If you encounter difficulty when working with System Exclusive data, try patching the MIDI device directly to your MIDI interface to prevent interaction with other equipment.

Note that the Input Filter, found in Performer Lite's Setup menu, defaults to System Exclusive unchecked. Unless you explicitly check the box next to System Exclusive, you will be unable to record System Exclusive messages.

VIEWING AND EDITING SYSEX DATA

System Exclusive data can be viewed and edited as a singular event in System Exclusive edit layer in MIDI tracks or clips:



To see the entire message, Option/Alt-click or double-click on the System Exclusive event. A window appears:

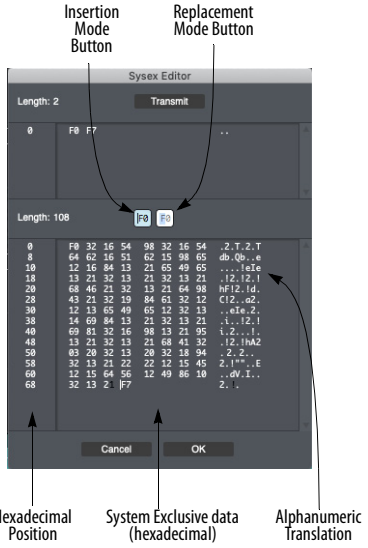


Figure 46-1: Performer Lite's system exclusive editor. The Transmit button transmits the message currently displayed in the upper portion of the display. Use it to send a SysEx request message to a device. The SysEx message the device sends in response will appear in the lower portion of the window.

The window is divided into a top and bottom portion. The bottom portion displays the system exclusive data contained in the event. The top portion is used to type in and transmit short system exclusive "request" messages, which can be sent to a synthesizer that requires a short system exclusive bulk dump request message to initiate a bulk dump to be recorded into the lower portion of the window.

The System Exclusive data is displayed in hexadecimal (base 16) numbering. Each pair of hexadecimal digits, which include the numerals 0-9 and the letters A-F, represents a byte of data. Each line contains eight pairs of digits. To the left of each line of data is a two-digit hexadecimal number indicating the position of the first byte of data in that row. The first row starts at position 00, the next at 08, the third at 10 (this equals 16 in hexadecimal), and so forth. To the right of each row of data is its translation into alphanumeric

characters (using the ASCII standard). Most of the time this translation will be garbled and useless, but patch names and other text in the System Exclusive message may be visible.

The length of the System Exclusive message is displayed at the top left. This is the number of bytes of data in the message.

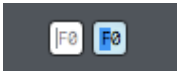
The scroll bars let you scroll through long messages. The Grow box in the lower right corner lets you adjust the size of the window. When you press the OK button, Performer Lite checks the changes you have made to the data and will scroll to and highlight any byte that does not conform to the MIDI specification. After confirming your changes, Performer Lite closes the window. Pressing the Cancel button closes the window without making any changes to the data.

EDITING DATA IN THE SYSTEM EXCLUSIVE WINDOW

You can directly edit the hexadecimal data in the System Exclusive window using the mouse and computer keyboard. There are two basic editing modes: Insertion mode and Replacement mode. The editing mode is selected by clicking on the appropriate button at the top center of the window; the currently selected mode is indicated with a darkened border.

Insertion mode: This mode is similar to standard computer text entry. To insert new values, click the mouse to position the insertion point, and type in new values. Use the delete key to delete previous digits. You may edit only in the hexadecimal portion of the display.

Replacement mode: In this mode, one character is always highlighted. Typing a new character replaces the current highlighted character, and then highlights the next character. Use this mode if you are just changing a few bytes in a system exclusive message.



To edit a System Exclusive event:

1 Double-click on the System Exclusive event.

The System Exclusive window appears.

2 Select the editing mode.

Click on the appropriate button. If just a few bytes need to be edited, use Replacement mode. Otherwise, use Insertion mode.

3 Edit the data.

In Insertion mode, delete the incorrect bytes and type in new data. In Replacement mode, click on the first digit of data to be replaced and type in the new data. The old data is written over.

4 Press OK to confirm your changes and close the window, or Cancel to close the window without making any changes to the data.

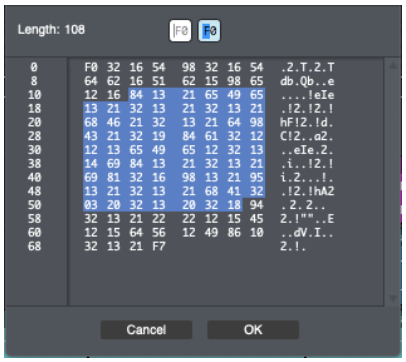
If you press OK, Performer Lite will scroll to and highlight any byte that does not conform to MIDI specification requirements.

Cutting, Copying, and Pasting

To Cut, Copy, or Paste a selection of hex data in *replacement* mode:

1 Select the data.

To do so, drag over it with the mouse.



2 Cut, copy, or replace the selection.

To Cut or Copy, press Command/Ctrl-X or Command/Ctrl-C respectively. The selected data will be placed in the Clipboard. To replace the selected data, type in or paste new data, which will replace the highlighted data.

INSERTING SYSEX DATA

You can insert system exclusive data into a track or clip. This is handy for inserting a short system exclusive message, like a parameter change or dump request, without having to record it.

To insert a System Exclusive event into a track or clip:

1 Display the target track in the Sequence Editor or the target clip in the Clip Editor.

2 Choose System Exclusive from the Insert menu.

3 Click at the desired location in the track.

The System Exclusive window appears.

4 Select Insertion mode.

Click on the Insertion mode button at the center of the window.

5 Type in the data.

In Insertion mode, you can delete the incorrect bytes and type in new data. See the above section on editing System Exclusive data for more information.

6 Press OK to confirm the insert and close the window, or Cancel to cancel the insert and close the window.

When confirming your insert, Performer Lite will scroll to and highlight any byte that does not conform to MIDI specification requirements.

EDITING SYSEX DATA WITH THE EDIT MENU

The commands on the Edit menu work as normal on System Exclusive events; these events can be cut, pasted, shifted, etc. within a file or between files just like any other Performer Lite event. The only way to alter the body of a System Exclusive message is to use the System Exclusive window as described above. In all other cases, Performer Lite treats the message as a single event.

TRANSMITTING A SYSEX MESSAGE

To transmit a system exclusive message from the system exclusive editor window:

1 Click the insertion mode button.

2 Click between the F0 and F7 in the top portion of the window.

3 Type in the system exclusive data.

4 Click Transmit.

RECORDING SYSEX INTO THE EDITOR WINDOW

To record system exclusive into the system exclusive editor window:

1 Be sure that your MIDI hardware and cables are set up properly.

Make sure there is a MIDI cable from the MIDI OUT on the device you will be recording from to the MIDI IN on your interface.

2 Insert a sysex event as described earlier in "Inserting SysEx data" on page 442.

The system exclusive editor window will appear.

3 If necessary, type in a bulk dump request message in the top portion of the window.

This is only necessary if your synth requires it. Many synths allow you to initiate the transfer by pressing a button on the synth itself.

4 Initiate the system exclusive data transfer from your MIDI device.

To do so, press the button on the device—or whatever is needed—to cause it to transmit the desired system exclusive dump. If you typed in a bulk dump request message, click the Transmit button. If all is well, the system exclusive data will appear in the lower portion of the window.

5 Click OK to save the system exclusive data or cancel to discard it.

It is not necessary to enable system exclusive data in the Input Filter when recording data into the system exclusive editor window.

RECORDING SYSEX INTO A TRACK

To record a system exclusive message into a track:

1 Be sure that your MIDI hardware and cables are set up properly.

Make sure there is a MIDI cable from the MIDI OUT on the device you will be recording from to the MIDI IN on your interface.

2 Record-enable a track.

3 Start recording.

4 Send the system exclusive data from your MIDI device.

To do so, press the button on the device—or whatever is needed—to cause it to transmit the desired system exclusive dump.

5 Wait a few seconds, longer if it is a large bulk dump, and then stop recording.

6 Look in the track in the Sequence Editor.

If you do not see a System Exclusive event, check the cable connections and try again.

HINTS

Most synthesizers and many other MIDI devices allow you to dump patch settings as System Exclusive messages. You can use Performer Lite to store and organize these messages, creating a library of patches and presets. Store each patch or bank of patches as a separate sequence in one or more files. This way you can use the name and comment fields to label your presets.

You can paste System Exclusive dumps of sounds and settings at the start of a sequence. This lets you use patches or settings that can't fit into your MIDI devices' preset storage, and ensures that the right sounds are loaded for the sequence. Use the standard Copy and Paste commands to place the system exclusive events at the start of the sequence. It is best to leave a measure or two of space after the system exclusive messages and the start of the music, to allow your equipment to process the data. Use the comments fields in the Set List to describe the system exclusive data

you've pasted into your sequence; system exclusive messages are hard to identify from their appearance.

Some manufacturers allow you to edit patch parameters over MIDI, using short system exclusive messages. This can add a great deal of expression to a sequence. For example, the attack of a filter envelope could be controlled with system exclusive and controller data, creating different bowing effects for a violin patch.

Some instruments must receive a handshake message before they will transmit a System Exclusive message. If this is the case with one of your MIDI instruments, first consult the user's manual for the instrument (or if necessary, the manufacturer) to find out the hexadecimal string that comprises the handshake message. Type this message into a Performer Lite track using the System Exclusive editing window as described above, then copy the track and paste it to a 'library' sequence for backup purposes. Back in the original sequence, play-enable the track containing the handshake message and record-enable an empty track. Upon playback, the handshake will be transmitted to the instrument, which will respond by dumping to the record-enabled track.

BE CAREFUL

System exclusive data is not associated with a channel, as defined in the MIDI specification. System exclusive data in a track is merely sent to the port you specify for playback; no channel number can be attached. Some manufacturers have decided to include a channel number in some of their system exclusive messages. This number cannot be changed. Therefore, even if data is being sent to channel 3, for example, system exclusive messages contained in that data might be sent to a channel other than 3.

System exclusive data is complex, and varies greatly from device to device. If you are uncertain about your equipment's system exclusive implementation, you should be very careful in using or editing system exclusive data. Most of the time, turning a piece of equipment off and then on again will clear any strange behavior caused by incorrect system exclusive data; however, incorrect use of system exclusive data could permanently erase presets from a synthesizer or other MIDI device.

Part 8
Arranging

CHAPTER 47 Conductor Track

OVERVIEW

The Conductor track is a special track containing markers, meter, tempo and key change information. Every sequence has a Conductor track; it cannot be deleted. You may use the commands from the Edit menu in the Conductor track to Cut, Paste, Repeat, Shift, and otherwise edit tempo, meter, and key maps, as well as markers. In addition, the Conductor track can be used to directly insert simple tempo, meter, and key changes, as well as to 'record' a tempo map entered in real time using Tap tempo synchronization. The Conductor Track can be edited in the Sequence Editor.

Overview **446**
Conductor track basics **446**
Types of Conductor track events **446**
Editing in the Conductor Track **449**

CONDUCTOR TRACK BASICS

The Conductor track automatically appears in the Sequence Editor for each sequence. The Conductor track cannot be deleted or renamed; it can be moved like a standard track. The Conductor track has a record-enable button for use with Tap tempo synchronization, described in "Receive Sync" on page 582.

TYPES OF CONDUCTOR TRACK EVENTS

The Conductor track contains the following types of events:

- Tempo changes
- Meter changes
- Key changes
- Markers
- Click changes

These events are not MIDI data; instead, they control or conduct your music's performance during playback. These events can, however, be edited like standard MIDI events, either with the commands on the edit menu or directly in the Sequence Editor. Markers, click changes and film cue events may be edited in the Conductor Track with edit menu commands such as Cut, Copy and Paste.

The following sections describe each type of event in some detail; for more information on the Change Key, Change Meter, and Change Tempo commands, the Markers window, or film cue events, see their respective chapters.

Key changes

Key change events display the name of the key. User-defined key signatures are displayed as 'Custom'. See chapter 51, "Change Key" (page 476) for a full description of key signatures in Performer Lite.

Meter changes

Meter change events display the time signature (the number of beats per measure, over the duration value which gets the beat) and the click value, (the duration value between metronome clicks). See chapter 50, "Change Meter" (page 471) for more information about these values. Moving meter change events, or inserting them using the Insert button, can cause partial measures. See "Meter changes and partial measures" on page 451 before attempting to move or insert a meter change.

Tempo changes

Tempo change events display the duration value for the tempo marking, i.e. the note value of the basic beat, and the tempo value itself, as a certain number of beats per minute. Tempo changes can appear as a single event, indicating an abrupt change in tempo, or as a series of events, approximating a smooth increase or decrease in tempo. In this regard they resemble continuous controller data. For more information on tempo events, see chapter 49, "Change Tempo" (page 463).

Tempo changes can be inserted graphically in the Conductor Track with the Pencil tool. See "Inserting CC data in Points or Bars mode" on page 323.

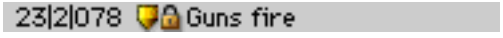
For information on recording a tempo map in real time, see "Tap Tempo" on page 588. Recording in Tap Tempo creates normal tempo events.

See "Editing in the Conductor Track" on page 449 for information on editing tempo changes graphically.

Viewing and typing in frame click tempos

If you write music for film, you might be accustomed to expressing tempos in frame-clicks as well as beats per minute. In Performer Lite, you can type in tempos using either format. You can also display tempos throughout the program, including the Change Tempo dialog, in frame click tempos (e.g. 12-6 or 13/4).

Markers



Markers can be edited with Edit menu commands such as Cut, Copy and Paste. To add a new marker, use the Markers window *New Marker* mini-menu command.

Click Changes

You can insert click change events in the Conductor track. There are three types of click change events: *beat click*, *tacet click*, and *pattern click*. Together, these click change events give you complete flexibility in programming even the most elaborate click tracks. For example, conductors of film cues can customize the click for each cue in ways that are commonly used on sound stages when recording music for films.

Beat click

A *beat click* event creates clicks on an even subdivision of the current beat. They are identical to the beat click that is part of a meter change event, except that they are independent of any meter change events. For example, you could insert a meter change event that clicks every quarter note, but then insert a beat click event a few measures later that clicks every eighth note.

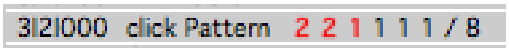
Changing the beat sub-division of the click in this manner can be useful in a wide variety of situations. For example, clicking on quarter note downbeats might work at a medium tempo, but if the tempo then slows down due to a tempo change, then switching to eighth note clicks might work better.

Beat click events allow you to program any click pattern you wish by inserting a new beat click event whenever you wish to change the click.

Tacet click

A *tacet click* event silences the click until the next (non-tacet) click event in the Conductor track. For example, you might create a countoff in which the last two clicks before the downbeat are silent.

Pattern click



A *pattern click* is a customized click pattern that you program. Pattern clicks use an editable text code field for programming the pattern. You can easily program and audition different patterns in the Countoff or Click Defaults preferences windows (see "Click Preferences" on page 115), where you can choose *Pattern* for the click style and then type in different text codes and listen to the audition of the click to hear what they create. The syntax is as follows:

What you type	What it means
1 1 1 1 / 4	Four quarter notes
2 2 1 1 1 1 / 8	Two quarter notes followed by four 8th notes
3 3 1 1 1 3 / 8d	Two dotted eighths, three 16th notes, then another dotted eighth

Somewhere in the string there is usually a number followed by a slash followed by a note type indicator, such as the "1 / 4" in the first example, above. The note type indicator must be one of the following:

Indicator	Note type
1	Whole note
2	Half note
2t	Half note triplet
2d	Dotted half note
4	Quarter note
4t	Quarter note triplet
4d	Dotted quarter note
8	Eighth note
8t	Eighth note triplet
8d	Dotted eighth note
16	16th note
16t	16th note triplet
16d	Dotted 16th note
32	32nd note
32t	32nd note triplet
32d	Dotted 32nd note

The number before the slash determines what numeric value is associated with the given note type indicator. So, "2 / 4" means "everywhere a 2 appears in this string, interpret that 2 as a quarter note." If 2 means a quarter note, then 4 (twice as big as 2) means half note, and 1 (half as big as 2) means 8th note.

Often the slash will appear at the end of the string, but it can appear anywhere in the string. For example, the string " 3 / 4 3 3 1 1 1 " means that 3 equals a quarter note, making the pattern three quarter notes followed by three eighth note triplets.

If you don't use the slash anywhere in the string, then the number 1 is assumed to mean an 8th note, and all other numbers a multiple of 8th notes. Therefore, the string " 1 1 1 1 ", with no slashes anywhere, means four 8th notes and the string
" 2 2 2 2 ", with no slashes anywhere, means four quarter notes.

You can use any character you like to separate the numbers in the pattern code string. Spaces work well because they help keep the expression simple and clear. But you can also use the plus or period characters, which are handy in the number keypad, or any other non-digit. The parser just

looks for the next digit, slash, or non-digit, and understands that digits right next to each other make up a single multi-digit number.

So, if you want to be obscure, you could type:

256+256*256@256 ~~ / ===== 4

The above expression would mean four quarter notes, because the computer sees:

256 256 256 256 / 4

As a practical example, you could use the plus or the period key as a separator, making it quick and easy to type in the expression using just the numeric keypad.

Accenting a click

To accent a click in a pattern click, highlight the number you want to accent in the pattern code text and type Command/Ctrl-B. That makes it bold and red. Bold and red clicks are accented, plain black ones are not. Select an accented click and type Command/Ctrl-B again to remove the accent.

Saving custom click patterns

When you access the click type menu on a click change event, there are additional items at the bottom of the menu that let you create and save click patterns by name using the Save Pattern menu command (Figure 47-1).

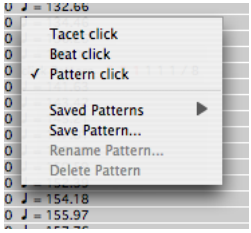


Figure 47-1: Creating and saving custom click patterns.

EDITING IN THE CONDUCTOR TRACK

Conductor Track editing is similar to a regular MIDI track but has several differences. It does not have a Note Grid because the Conductor Track cannot contain notes. In addition, the Conductor Track has a Tempo Change Grid similar to the CC data Grid that displays tempo changes only.

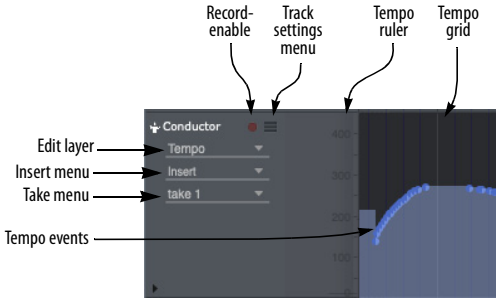


Figure 47-2: The Conductor Track.

Working with meter and key changes

Working with meter and key changes in the Conductor Track is similar to working with discrete MIDI events: first select the desired data type from the Conductor Track's Edit Layer menu (Figure 47-2 on page 449).

To edit the settings of a meter or key change, click it to select it and then edit its values in the Information Bar.

To move a meter or key change, drag it left or right to change its location. Moving meter changes can produce partial measures and other situations that require an in-depth knowledge of how meter changes work. Before dragging meter changes, be sure to review chapter 50, "Change Meter" (page 471).

Inserting a meter/ or key change

To insert a meter change or key change:

1 If desired, set the Edit Resolution and turn on Snap to Grid (see "Snap to Grid" on page 357).

2 Choose either Meter Change or Key Change from the Conductor Track's Insert menu (Figure 47-2 on page 449).

3 Click once at the desired time location in the track lane.

The meter or key change event will appear where you clicked. You can then modify its settings in the Information Bar.

Working with markers

Choose Markers from the Conductor Track Edit Layer menu (Figure 47-2 on page 449). Double-click a marker to change its name. Drag it to move it. Select it hand hit the delete key to remove it. You can also cut, copy and paste markers. To insert markers, drag and drop them from the marker well into the marker strip (see "Markers" on page 128).

The Tempo Change Grid

Tempo changes are displayed and edited on the Tempo Change grid (Figure 47-2 on page 449) in the same fashion as CC data, except that the Tempo Grid is displayed in Bars mode only. Each tempo change event is displayed on the grid as a dot with a colored bar extending to its right until the next tempo event. When the tempo change event is selected, a line extends from its icon to the origin at the bottom of the grid. A tempo change ruler on the left measures events on the grid. Tempo changes can be selected and edited in the same way as a selected CC data type. For more information, "Editing MIDI CC's in Points or Bars mode" on page 323.

Inserting tempo changes

Follow the same procedure for inserting CC data. See "Inserting CC data in Points or Bars mode" on page 323.

Getting Performer Lite to follow tempo changes

Performer Lite follows tempo changes when it is placed in *Conductor Track* tempo mode. For details, see chapter 49, "Change Tempo" (page 463).

Zooming the Tempo Ruler

The Tempo ruler in the Conductor track can be zoomed in for more precise tempo editing. Clicking the Tempo ruler toggles quickly between your custom zoom scale and the normal scale.

To zoom the Tempo ruler, drag over the range of values you wish to zoom. The Tempo ruler will zoom in on the range that you select. Then click the Tempo ruler to toggle between your custom zoom scale and the normal scale.

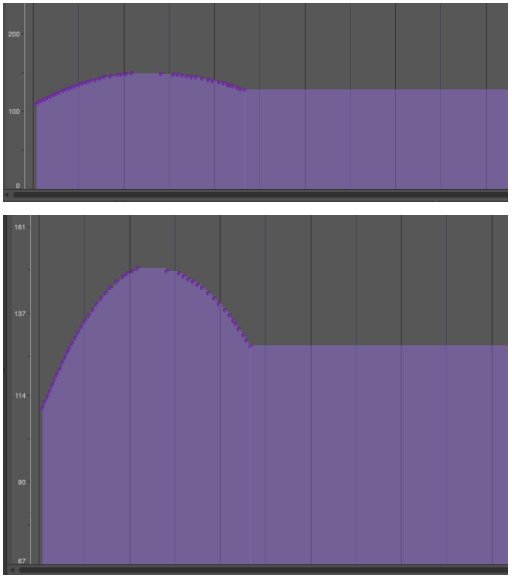


Figure 47-3: You can zoom in the Tempo Ruler to get better resolution when editing tempos. Just drag over the range you want to zoom in on, and then click the ruler to toggle between the zoomed in range and the normal range.

Using Edit menu commands on the Conductor Track

The Edit commands Cut, Copy, Paste, Erase, Duplicate, Repeat, and Paste and merge all function on the events in the Conductor track.

You can use them to move tempo and meter changes together with other tracks in a sequence, shift tempo maps for precise alignment with synchronized video or audio, or to repeat tempo, meter, and key changes in looped sections. You can insert and edit tempos in the Conductor track without stopping playback.

Be sure to learn how Performer Lite's Smart Selections feature affects Conductor Track editing by reading "Barlines are preserved in the Conductor track" on page 312.

To use the Edit commands on the Conductor track of a sequence:

1 Highlight the Conductor track name in the Sequence Editor and make a time range selection in the Conductor track.

2 Select the desired command from the Edit menu.

The Edit menu commands affect events in the Conductor track in the same way as normal MIDI data. See chapter 35, "Selecting" (page 305) and chapter 34, "Editing Basics" (page 296) for more on how to select regions and use these commands.

When a region is cut or copied from the Conductor track, meter and tempo events representing the current meter and tempo values are automatically inserted at the beginning of the region in the clipboard. This guarantees that the region will keep its original meter and tempo when pasted elsewhere in the sequence. These automatically created meter and tempo change events may be edited normally after the region is pasted back into the Conductor track.

Note that editing meter changes can cause partial measures. See "Meter changes and partial measures" on page 451.

Meter changes and partial measures

Performer Lite lets you place a Meter change event anywhere in a sequence. This allows a great deal of flexibility in laying out your music, but can produce unexpected results. For example, it is possible to place a Meter change in the middle of a measure, but this measure will be truncated at the location you specify for the new meter. This location becomes the downbeat of the first measure in the new meter.

The following simple rule should help clarify what happens in such situations:

☛ *A Meter change event* always *starts a new measure.*

For example, if you insert a meter at 3|1|240, the meter change location will change to 3|1|000. This is because a meter must begin a new measure, and all measures begin at zero (000) ticks.

Here's another example: if you insert a 3/4 meter at the third beat of a 4/4 measure, the result is a two beat measure (still marked as 4/4!) followed by a whole 3/4 measure. Inserting the Meter change results in a *partial measure*, that is, a measure lacking its full duration.

Such partial measures are not always useful, but they can be handy in lining up cues for film and video work, since they let you start a measure precisely at a SMPTE time by creating a meter change at the right spot.

Partial measures may also result from using the Edit commands to Paste, Merge, or Repeat meter changes in the middle of existing measures. Once again, each new meter change event will begin a new measure.

You can help avoid partial measures by leaving the *Smart Selections* command in the Edit menu checked when you are editing the Conductor track.

Correcting unwanted partial measures

It is important to remember that meter changes only affect the way data is displayed; they never affect the MIDI data itself or the way it sounds when it is played back. If the meter map for a sequence becomes complex or confusing during editing, simply erase the meter changes and re-enter them from the start of the region.

Looping and the Conductor track

The Conductor track cannot be looped. If you need to repeat tempo or meter changes in a looped region, use the Repeat command from the Edit menu to make consecutive copies of the Conductor track over that region.

When using the Memory Cycle feature to play a section repeatedly, meter and tempo changes in the conductor track will play as usual. When doing so, it is often useful to switch tempo control in the Control Panel to Fixed Tempo mode. Doing so temporarily disables tempo changes so that they don't complicate recording.

CHAPTER 48 Markers

OVERVIEW

The Markers window allows you to display and edit the markers for a sequence. A marker is a name attached to a particular location. The Markers window can be used as a sophisticated autolocator, allowing you to move to a location instantly. The Markers window provides an easy way to organize your music; markers are visible in edit windows and are useful in quickly specifying editing regions. Markers are particularly useful when working with film and video; you can record them in real time to mark hit points, then use the Markers window as an intelligent cue sheet. With the commands in the Conductor Track sub-menu (in the Project menu) you can then adjust meters and tempos to automatically align musical cues to the hit points.

Overview 453
Markers window quick reference 454
Markers window menu 455
Basics 455
Opening a Markers Window 456
Switching between sequences and songs 456
Scrolling during playback 456
Creating new markers 456
Changing the name of a marker 456
Changing a marker time location 457
Marker streamer, punch & Flutter settings 457
Custom pre-gap for CD Burn 457
Setting the counter to a marker location 457
Marker locate numbers 457
Jumping to a marker with a shortcut 458
Selecting markers 458
Using markers to define an edit region 458
Selecting with markers 459
Markers in edit windows 459
Markers in the Song window 459
Editing markers in the conductor track 459
Locking and unlocking markers 460
Shifting locked markers in time 460
Locked markers and the sequence start time 460
Locked markers and changing meter 460
Recording hits 460
Using markers to find a tempo 461
Streamers 461
Marker hints 461

MARKERS WINDOW QUICK REFERENCE

Position indicator: Displays the current location in the Chunk. Drag on the indicator to move it. Click anywhere in this area to move the indicator to a marker. Moving the indicator changes the current location in the Chunk.

Marker name: Click on a marker's name to select it. Option/Alt-click on the name to change it. Drag over several names to select several markers. Use Command/Ctrl-click to select or deselect several non-contiguous markers.

Search: Type in a marker name to search for it.

Marker location: Displays the marker locations in your choice of Performer's various time formats, including SMPTE time code. Click on a location to change it. Select the formats you wish to see in the Time Formats window (Setup menu).

Locked indicator: Indicates that the marker is locked to SMPTE frame time. Toggle from locked to unlocked and back by clicking in the lock column next to the marker name. Drag vertically to toggle multiple markers in a single gesture.

NUM (locate number): Lets you assign a locate number to each marker. When you invoke the *Go To Marker* command (found in the Commands window in the Setup menu), you can type in a marker's locate number and press return (or enter) to go to that Marker.

Find Tempo settings: These settings (*Find, Weight* and *Hit Range before/after*) allow you to configure each marker for inclusion in Performer's powerful tempo searching features (via the Find Tempo mini-menu command). For complete details, see chapter 54, "Find Tempo" (page 483).

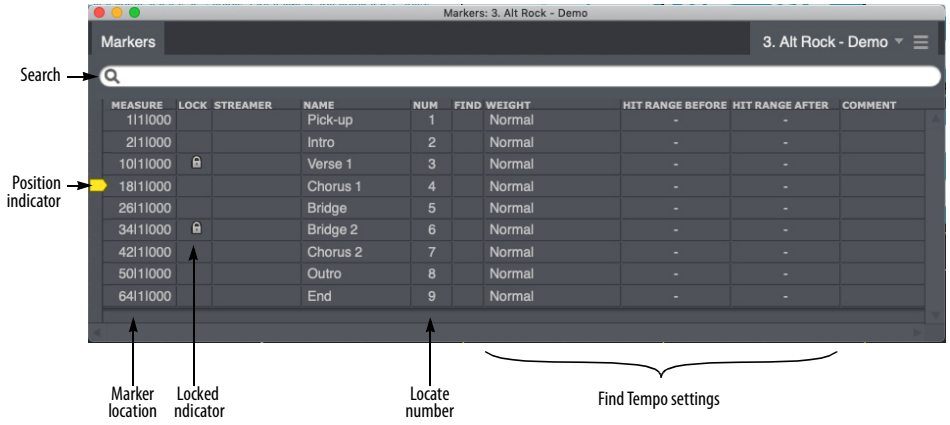


Figure 48-1: The Markers window.

MARKERS WINDOW MENU

New Marker: Adds a new marker at the current location. Hold down the Option/Alt key while choosing Add to add several markers at once.

New Marker with Options: Adds a new marker at the current location, but first opens a dialog that lets you first access the marker's settings.

Record hits: Enables a special mode such that during playback, every time you hit a key on your controller instrument, a marker will be added at that location.

Lock Marker: Locks the highlighted markers to real/frame time. A small lock icon appears by the marker's location to indicate that it is locked.

Unlock Marker: Unlocks the highlighted markers.

Shift locked markers: Shifts all highlighted locked markers by a time offset.

Show Streamers: Shows or hides the streamer column in the Markers window.

Toggle Streamer On/Off: Toggles the streamer for the currently selected markers in the list on or off. This is the same as clicking the streamer's icon in the streamer column. When the icon is hidden, the streamer is temporarily turned off.

Set Marker/Streamer Options: Opens the marker/streamer options dialog for the currently selected markers in the list.

Generate Streamer Track For: Creates a new MIDI track with the MIDI data necessary to recreate the current streamer settings for the hardware device that you choose from the sub-menu. The resulting MIDI track can be exported as a Standard MIDI File for file transfer to other MIDI software.

Find Tempo for Locked Markers: Opens the Find Tempo window.

Include in Find Tempo Range: Puts a check mark in the Find column for all currently selected markers in the list.

Remove from Find Tempo Range: Clears the check mark in the Find column for all currently selected markers in the list.

Set Hit Range: Lets you assign a hit range (in the Hit Range column) for all currently selected markers in the list.

Next/Prev follows Marker Nums: Check this menu item to follow markers by locate number (instead of their order in the sequence) when using the *Next Marker* or *Previous Marker* command.

Renumber by Time: Sets locate numbers for the selected markers (or all markers when none are currently selected) in ascending order from top to bottom in the Markers window.

Renumber by Name: Scans the names of the selected markers (or all markers if none are selected) and extracts the last number that appears in each name to determine the marker's locate number.

Delete: Deletes the highlighted markers.

BASICS

The Markers window is used to display and manipulate markers. Each chunk listed in the Chunks window has its own set of markers. The Window Target tab in the title bar of the Markers window displays the sequence or song to which the markers belong. Each marker consists of a name and a time location it is associated with. Markers are listed in chronological order. You can

display the location of a marker in any combination of measure time, real time, frame time and samples.

Measure location versus SMPTE location
Normally a marker remains at the same measure location when you change the tempo of the sequence. In this case, changes in tempo or structure will affect the SMPTE frame location of the marker. However, when working with film or video, it is useful to assign a marker to a certain event in the action (termed a "hit point"). Such markers are intended to remain anchored to a SMPTE frame location. Since the location of the event in the film or video will not change, the location of the marker must not change either, even if you change the tempo of the music. Performer Lite lets you 'lock' markers to a SMPTE frame location. When you change tempos or make edits, the SMPTE frame location of locked markers will not change and, instead, the measure location will change to reflect the new tempo or edit.

OPENING A MARKERS WINDOW

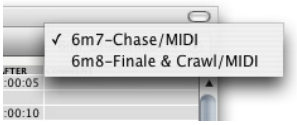
To open the Markers window, choose *Markers* from the Project menu.

If the project contains multiple sequences and songs, each sequence and song has its own set of markers, and the Markers window displays markers that belong to the currently play-enabled sequence or song. In addition, the Window Target tab displays the name of the chunk to which the markers belong.

SWITCHING BETWEEN SEQUENCES AND SONGS

The Markers window shows the markers for an individual sequence or song. If you are working with multiple sequences in a Performer Lite project, you may often work with just one Tracks window and one Markers window open at a time. If you switch the sequence being viewed in the Tracks window (by clicking on the sequence name in the Window Target menu), the Markers window automatically switches to show the markers of the newly chosen sequence. The result is that the markers being shown in the Markers window match the sequence being viewed in the Tracks window. This only happens when one Markers window is open.

You can manually switch the Markers window from one sequence to another by clicking the name of the sequence in the Window Target tab as shown below:



SCROLLING DURING PLAYBACK

The *Auto Scroll* command (View menu > Scroll) can make the Markers window scroll during playback. In addition, the window will automatically open to the current playback location of the sequence.

CREATING NEW MARKERS

To add a new marker, choose *New Marker* or *New Marker with Options* from the Markers window mini-menu, or press their keyboard shortcut (assigned in the Commands window). The marker's location will be the same as that showing in the Counter. To add several markers at once, hold down the Option/Alt key while choosing *New Marker* from the mini-menu. *New Marker with Options* lets you make marker settings while adding them.

CHANGING THE NAME OF A MARKER

To rename a marker, Option/Alt-click the marker name. Use the Enter or the Down Arrow key to approve the entry and move to the next marker name, or the Up Arrow key to approve the entry and move to the previous marker name.

CHANGING A MARKER TIME LOCATION

To change the time location of a marker, click the time location and type a new value. Use the Tab key to move between time fields. You can use the Enter or Down Arrow key to approve the change and move to the time location of the next marker; use the Up Arrow key to approve the change and move to the time location of the previous marker.

If you change the measure time of a marker, even a locked marker, the real and frame times will also change. Changing the real or frame time of a marker will cause the measure time location to change.

Since the markers are listed in chronological order, a marker may seem to vanish when you edit its location. In such cases, the marker has simply been moved out of the visible portion of the marker list.

Moving markers by dragging

You can drag markers in the Track Overview, Conductor Track Editor, and the Sequence Editor to reposition them.

MARKER STREAMER, PUNCH & FLUTTER SETTINGS

To access the streamer, punch & flutter settings for a marker, click it to highlight it and choose *Set Marker/Streamer Options* from the mini-menu.

CUSTOM PRE-GAP FOR CD BURN

This option can be used when burning a mix to a CD and tracks are based on markers. For more details, see "Track Pre-gap" on page 573.

SETTING THE COUNTER TO A MARKER LOCATION

You can easily set the current location displayed in the counter to the location of a marker. This lets you move to a location by its name instead of time, making it unnecessary for you to keep track of a number of arbitrary measures and times.

To move to the location of a marker, press on the position indicator and drag it to the marker you want. You can scroll the list up or down by dragging the position indicator slightly past the top or bottom of the marker list.

You can also jump to markers using the Marker menu in the Tracks window or Control Panel. See "Marker counter" on page 109.

MARKER LOCATE NUMBERS

The Markers window has a "NUM" (locate number) column. This lets you assign a locate number to each marker.

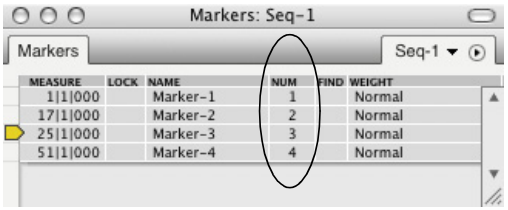


Figure 48-2: Marker locate numbers.

When you invoke the *Go To Marker* command (found in the Commands window in the Setup menu), you can type in a marker's locate number and press return (or enter) to go to that Marker:

Figure 48-3: The 'Go To Marker' command.

Marker numbers are flexible and convenient because they are not tied to the marker's order in the marker list. Instead, you can assign any locate number to any marker you wish, regardless of their order in the Markers window. By default, each new marker that you add will receive the next highest locate number for that sequence.

For example, you could create marker 1 and marker 2, but then add marker 3 *between* markers 1 and 2. In doing so, marker 1 and 2 can maintain their original locate numbers, and marker 3 can be assigned a unique locate number (such as 3). This saves you from having to relearn all of the locate points in your song, every time you add a marker somewhere in the middle of the sequence. You have complete control over where each locate number takes you in the sequence.

Renumbering markers

You can edit a marker's number by double-clicking in the "Num" column in the Markers window.

There are also two mini-menu commands which can be used to renumber multiple markers:

- *Renumber by Time*: Sets locate numbers for the selected markers (or all markers when none are currently selected) in ascending order from top to bottom in the Markers window.
- *Renumber by Name*: Scans the names of the selected markers (or all markers if none are selected) and extracts the last number that appears in each name to determine the marker's locate number.

JUMPING TO A MARKER WITH A SHORTCUT

In the Commands window (Setup menu), there is a command called *Go To Marker* (in the Transport commands group). By default, the keyboard shortcut for this command is Shift-Control-M, but you can reassign it to any key you wish (that doesn't conflict with another assignment, of course).

After invoking the *Go To Marker* command, either type in the desired marker number, or press a MIDI note on your MIDI controller that corresponds with the desired marker number, as specified by the Numeric Base Note. For details, see "Numeric Base note" on page 259.

There are also commands for *Go to Previous Marker* and *Go to Next Marker*. These commands move the counter to the next or previous marker in the sequence from the current counter location.

If you enable the *Next/Prev follows Marker Nums* mini-menu item, the *Go to Previous Marker* and *Go to Next Marker* commands will follow markers by locate number (instead of their order in the sequence).

SELECTING MARKERS

To select a marker in the Markers window list, highlight it by clicking on its name. There are several methods for selecting several markers at once:

To select several adjacent markers, press on a marker name and drag over the desired names. All markers dragged over will highlight.

To select several non-adjacent markers, hold down the Command/Ctrl key and click on the names of the markers you wish to select. They will highlight.

To deselect markers when more than one are highlighted, hold down the Command/Ctrl key and click on the markers you wish to deselect. They will unhighlight.

To extend the currently selected region, Shift-drag over the desired end location, or Shift-click on the desired end location.

USING MARKERS TO DEFINE AN EDIT REGION

You can use markers to define a region to be edited: instead of typing the Start and End locations in the Selection Information window, you can use the Markers window and the Selection Set To menu.

To define a region using the Markers window:

1 Select a group of markers such that the beginning and end marker of the group are at the starting and end times of the region to be edited.

If the marker with the start time you want for the edit region and the marker with the end time for the region are not adjacent, you must select all markers in between. Click on the starting marker and drag down until you reach the ending one.

2 Choose *Set to Selection Bounds* from the Set To menu in the Selection Information window.

You can now use one of the commands from the Edit or Region menus. You can also use this procedure to transfer marker times to the Memory and Auto Record bars in the Control Panel.

SELECTING WITH MARKERS

When you click a marker in a non-conductor track editor, it creates a time-range selection in that track that extends to the next marker or end-of-sequence, just like in the overview.

MARKERS IN EDIT WINDOWS

Markers appear in the edit windows, where they can be renamed (by Option/Alt-clicking) or relocated (by dragging). However, commands on the Edit menu may be applied to markers only in the Conductor track edit windows.

MARKERS IN THE SONG WINDOW

Markers in a song are displayed in the Markers Strip in the song window. Performer Lite automatically generates a column in the Song window for each marker.

Markers can be of great help when building a song or score because you can use the Song's Markers window to create a list of section markers, which will become Chunk placement columns in the Song window. Marker-generated columns are particularly useful for placing Chunks at hit points, which can be created during playback using the *Record Hits* command.

Merging markers in the Song window

You'll often find when you place a Chunk into a song that it would be useful to see the Chunk's markers in the context of the whole song. The *Merge Markers* command in the Song window mini-menu lets you do just that. Simply select all the component Chunks whose markers you'd like to copy into the song, and choose *Merge Markers.* All unlocked markers in the selected Chunks now exist in the Song, and are displayed in the Song's marker strip and Markers window.

Removing merged markers from a song

You can just as easily delete a Chunk's markers from a song. Select the Chunks whose markers should be removed from the song and choose *Delete Markers*. Performer Lite compares the song's markers to those of the selected Chunks, and removes any that match up by both name and location. The markers in the Chunk are not affected. Keep in mind that after you merge markers of a Chunk into a song, dragging the Chunk to a different location will not move the markers. Further, selecting the relocated Chunk and choosing *Delete Markers* will not have any effect, as the markers in the song no longer match the markers in the Chunk.

EDITING MARKERS IN THE CONDUCTOR TRACK

You may apply any of the Edit menu commands (Cut, Copy, Paste, etc.) to markers only in the Conductor track for the sequence. Select the Conductor track in the Sequence Editor, or make a selection in the Conductor Track in the Sequence Editor, and set the Start and End times in the Selection Information window before invoking one of the Edit commands. See chapter 34, "Editing Basics" (page 296) for more information.

LOCKING AND UNLOCKING MARKERS

Markers can be connected to a SMPTE frame location such that they will retain that location if the tempo is changed: they can be "locked" to the location. If the tempo is changed, the measure time location of the marker will change.

When a marker is unlocked, it remains anchored to a specific *measure/beat/tick*, and its SMPTE frame location is flexible.

To toggle a single marker between locked and unlocked states, click in the lock column next to the marker's name. To lock or unlock several markers at once, select them and choose Lock or Unlock from the Markers window mini-menu.

SHIFTING LOCKED MARKERS IN TIME

The *Shift Locked Markers* command on the Markers window mini-menu lets you shift the times of highlighted locked markers by the amount you specify. Unlocked markers which are selected are unaffected by this command.

This feature can be useful if the film or video you are working with has been recut and the locations of the events have moved slightly. It is generally useful when changing the SMPTE frame locations of markers by a uniform amount.

To shift the times of locked markers, select them and choose *Shift Locked Markers* from the Markers window mini-menu.

LOCKED MARKERS AND THE SEQUENCE START TIME

There are several options in the Set Chunk Start dialog that affect the location of locked markers when changing the sequence start time.

The *Preserve current frame time* option, when checked, lets you preserve the absolute frame location of locked markers when changing the SMPTE start time of the sequence. In other words, locked markers won't move; they will remain anchored to their SMPTE time code frame.

If the new SMPTE start time causes a locked marker to shift before the beginning of the sequence, the marker will be placed at the beginning of the sequence. If you would rather get rid of such markers altogether, check the *Delete if before start of chunk* option.

If you wish to leave locked markers in the same position relative to the start of the sequence, use the *Preserve length of time from start of chunk* option.

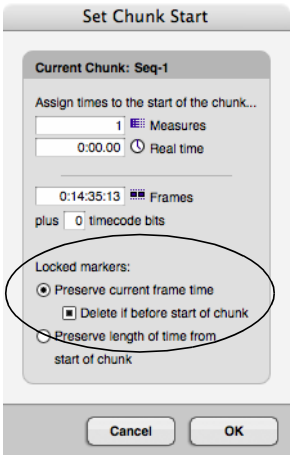


Figure 48-4: These Set Chunk Start options either preserve locked markers or shift them relative to the beginning of the sequence when changing the SMPTE time code start frame.

LOCKED MARKERS AND CHANGING METER

When the *Don't move locked markers* option in the Change Meter dialog (Figure 50-1 on page 471) is checked, locked markers are not moved by the change meter operation and remain anchored to their SMPTE time code frame position.

RECORDING HITS

New markers can be entered in a sequence during playback by striking a key on your MIDI controller instrument. The time location of each

marker corresponds with the time in the Counter when the key is struck. This is a very useful feature for recording cue points or hits while viewing film or video.

To create markers during playback:

1 Move to the location at which you wish to start playback.

If slaved to an external master device, this step is not necessary: Performer Lite will locate automatically when you start the master.

2 Choose Record Hits from the Markers window mini-menu.

A dialog box will appear.

3 Specify whether you want the markers to be locked or unlocked.

4 Press OK to confirm your choice or Cancel to cancel it.

After you press OK, Performer Lite will start playback. If in external sync mode, the Play button will flash until the master device is started.

5 Press a key on your MIDI controller every time you wish to enter a marker.

A marker will be entered at the current time in the Counter.

6 To stop entering markers in this way, press the Stop button in the main transport controls.

Using the Auto Stop feature in the Control Panel will also stop this type of marker entry. If you are in external sync, note that stopping the master device does not take Performer Lite out of the Record Hits mode; you must press stop in Performer Lite to end recording hits.

USING MARKERS TO FIND A TEMPO

The Markers window Find Tempo mini-menu command provides advanced tempo searching capabilities. For complete details, see chapter 54, "Find Tempo" (page 483).

STREAMERS

Streamers are visual cues superimposed on a film or video screen to assist composers, conductors, directors and producers in writing, recording and producing music and soundtracks for picture.

MARKER HINTS

Below are some helpful hints for using Markers.

Composing and arranging

Markers provide a useful tool for labeling structural sections of a piece of music. The music can be recorded first and markers added afterwards or markers can be entered first to lay out the structure of the sequence before recording. In the latter case, markers can be used as a kind of musical outline for the structure of the piece.

Markers can be used to quickly rewind to the beginning of a section. They can also be used as structural place holders to mark the ends of unfinished sections.

Since markers can be cut, pasted, merged, etc., in the Conductor Track, they can be moved around with the rest of the data as a sequence grows and changes. You can move them separately from the rest of the data if you wish.

Use the View Filter to specify if markers can be affected by Edit menu commands.

If you are not working with time code, you will probably not need to display real or frame time in the Markers window.

Film and video scoring

Markers make an excellent cue sheet for planning out or displaying the structure of your score. They can show you the relationship between time locations in the film and measure locations in the music. You can then use the Find Tempo window to find the tempo that best lines up metrical beats of the sequence with important visual events. This can all be done before recording a note of music.

In addition to using markers to define the structure and tempo of your score, you may want to add markers for visual cues and hit points. The Record Hits feature is especially suited for this. These markers should be locked since their time location corresponds to a frame location. When locked, the measure time location of the marker will be updated if you change the tempo and meter. The frame location will not change.

Markers can be an indispensable tool for triggering visual cues (streamers, punches and flutters).

CHAPTER 49 Change Tempo

OVERVIEW

Tempo is very flexible in Performer Lite. Not only can there be several tempos in a sequence but they can change dynamically, resulting in accelerandos, ritards other programmed tempo effects.

In Performer Lite, tempo is controlled by the Tempo Control in the Control Panel. There are four possible settings for tempo control:

- The Tempo slider
- The Conductor track
- The Tap Pad
- An external device, such as a mod wheel on a keyboard controller

Only one of these sources can be chosen at a time.

When Tempo Control is set to the Conductor track, you program all the tempo changes into the Conductor track. Collectively, these tempo changes are called the *tempo map*, and they occur automatically when you play the Sequence under Conductor track tempo control.

Tempo maps can be programmed using the Change Tempo command as described in this chapter. Alternatively, you can create a tempo map in real time by slaving Performer Lite to Tap tempo synchronization. See chapter 67, "Receive Sync" (page 582).

Overview **463**
Change Tempo quick reference **463**
Change Tempo basics **464**
Using Change Tempo **465**
Viewing and editing tempo changes **470**
Tempo editing resolution **470**
Changing tempo on-the-fly during playback **470**

CHANGE TEMPO QUICK REFERENCE

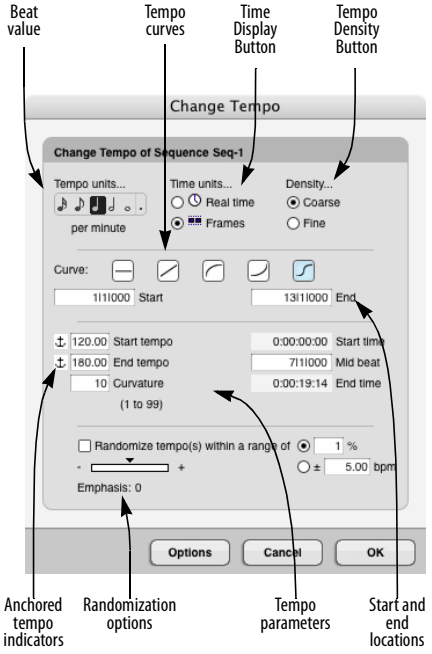


Figure 49-1: Change Tempo (Project menu>Conductor Track>Change Tempo).

Beat Value: Displays the note value on which the tempo is based. Click on the desired note to choose it. Click on the dot to make the beat value a dotted duration (i.e. one and one half of the chosen note's duration).

Start and End locations: Displays the time range over which the tempo change will take effect. Click on the box and type in the desired values. Use the Tab key to move from field to field.

Anchored Tempo Indicators: Click on the anchor icon to toggle a starting or ending tempo between anchored and unanchored. Anchored tempos are automatically set to the current tempo in the region, preventing unwanted jumps in tempo.

Time Display Buttons: Click on the appropriate radio button to select real or frame time for the tempo parameters.

Tempo Density Buttons: Click on the appropriate radio button to choose between Coarse and Fine tempo event densities. The Fine setting generates 12 tempo events a beat; the Coarse setting generates far fewer events.

Tempo Curves: Click on the desired curve button to select the type of tempo change desired. Each curve has a set of parameters and options which control the shape and range of the tempo change.

Tempo Parameters: The number and type of parameters depends on the Tempo Curve selected. Parameters outlined by a box can be set by the user; other parameters are computed and verified by Performer Lite as soon as you change any parameter. Values that are incalculable or out of range will highlight and cause the computer to beep (or the menu bar to flash). Press the Option button to change the parameters that can be edited.

Randomize tempos: Check this box to randomize tempos within a specified range, expressed as a percent or as a number of beats per minute (bpm).

Emphasis: Move the slider between -9 and +9 to weight the randomization either lower or higher.

The Options Button: Click on this button to select which parameters are user-definable.

CHANGE TEMPO BASICS

The Change Tempo command (Project menu>Conductor Track>Change Tempo) is used to create tempo changes. You can specify a static tempo change (i.e. a constant tempo) or a dynamic one (a smooth change) via a curve. A constant tempo contains no variation of the tempo for its duration; it is merely a change from one tempo to another. A smooth change contains varying tempo values. The way that these values change is specified by one of four curves. An accelerando, for example, is a smooth change with a linear curve in which the tempo gradually increases. When a smooth change is specified with a curve, Performer Lite approximates the smooth change with a large number of discrete tempo changes in quick succession.

When you use Change Tempo, any existing tempo data in the specified time range is erased and replaced by the new data generated by the command.

Creating a tempo map

A *tempo map* is simply the complete set of programmed tempo changes for an entire sequence. These changes are displayed in the Conductor track.

☛ The tempo changes for a sequence can only be edited in its Conductor track.

To get a clear picture of the tempo map of a sequence, view it in the Conductor Track Editor.

When you change the tempo map, the real time location of all markers and events (viewed in edit windows) are updated. The real time locations of locked markers do *not* change in this case. Rather, their measure times change.

Tempo resolution

Performer Lite's tempo capabilities were designed to be very effective in film and video applications. Tempo calculations are very accurate resulting in very precise location abilities. Finding a frame time location will bring you to the exact measure time location consistently. Real time locations of events and markers are completely reliable and give an accurate representation of the timing of the music.

This precision is possible because Performer Lite maintains a very high degree of internal tempo resolution, much greater than the two decimal places that you can enter. This resolution allows you to set the tempo for a region by specifying its length in real or frame time: Performer Lite will calculate the correct tempo to make the end of the region occur at the time you specify.

Switching between a tempo map and manual tempo control

When you set the tempo control to the Tempo Slider, the programmed tempo map is temporarily disabled by the current metronome slider tempo setting. When you switch back tempo control to the Conductor track, the programmed tempo map is re-enabled.

USING CHANGE TEMPO

The Change Tempo command (Project menu>Conductor Track>Change Tempo) lets you create smooth tempo changes in a defined region of time. The start and end of the region are defined by measure locations. With this command, you can calculate a tempo for a region by giving a real time length for it.

Choosing the sequence in which to change tempo

If the Sequence Editor is active, the tempo change will apply to that sequence. If the Set List is active, the tempo change will apply to the highlighted sequence or, if no sequence is highlighted, to the current play-enabled sequence. If an edit window is active, the tempo change will apply to whatever sequence it belongs to.

When you open the Change Tempo dialog, the name of the selected sequence is displayed after the words "Change tempo of sequence" at the top of the dialog box.

Selecting a tempo beat value

Tempos are measured in beats per minute. You can select any beat value for the tempo from a sixteenth note to a whole note. The beat value can be dotted. The number of beats per minute can be between 20 and 400. At very slow tempos, you may want to use smaller beat values such as an eighth note. At fast tempos, you may want to use larger values such as a half note. Your choice of beat value does not affect the frequency of the Click. This is set separately with the Change Meter command.

When you type in a number of beats per minute in Performer Lite (in the Metronome, in a tempo event in the Conductor Track, or in the Change Tempo window), you can type in a timing resolution of up to a hundredth of a beat per minute (136.45, for example).

Viewing and typing in frame click tempos

If you write music for film, you might be accustomed to expressing tempos in frame-clicks as well as beats per minute. In Performer Lite, you can type in tempos using either format. You can also display tempos throughout the program, including the Change Tempo dialog, in frame click tempos (e.g. 12-6 or 13/4).

Selecting a time display

You can choose whether to display start and end times in real or frame time. This is very useful for calculating timings in film and video work.

Setting the start and end points

The measure time locations entered in the Start and End boxes in the Change Tempo dialog (Figure 49-1 on page 463) delineate the region in which the tempo change occurs. New tempo data will be inserted into this region according to your specifications.

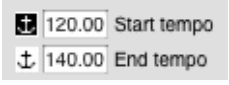
Using the fine and coarse options

The Fine and Coarse options determine the density of tempo change data generated. Selecting the Fine option causes tempo changes to be generated 12 times per beat. This creates the smoothest changes but generates lots of data. This option is best used over regions of only a few measures. With the Coarse option, fewer tempo changes per beat are generated. This is the best option to use in a large region.

In most situations, the tempo changes generated by the Coarse option will sound completely smooth. The rule of thumb here is to use the Coarse option unless the tempo changes are not smooth enough: in this case, the Fine option can be used.

Anchoring the start and end tempos

The Start and End tempo parameters have an anchor icon next to them. When the anchor icon is highlighted, the tempo is anchored. If the anchor icon is unhighlighted, the tempo is not anchored.



To anchor or unanchor a tempo, click on the anchor icon next to it.

When a tempo is anchored, the current tempo at that location in the sequence is used. For example, if you anchor the Start tempo parameter, the value used for that parameter will be the pre-existing tempo at the Start location.

The anchoring option is used to make sure that tempos just before and just after the region are matched exactly. This insures that there are no sudden jumps in tempo at the start or end of the region. It is best to anchor tempos when you want this continuous tempo effect; you cannot achieve the same degree of accuracy when entering tempos manually.

Using tempo curves

The tempo curve buttons specify the values for the individual tempo change events created by the Change Tempo dialog box. Rather than inserting each tempo change manually, you can select a curve and set a few parameters; Performer Lite will calculate the tempo changes necessary to create the desired effect. The flat, straight line (the constant curve) generates just one tempo change at the beginning of the region. The other curves—linear, logarithmic, exponential and polynomial—generate a number of tempo changes which approximate the shape of chosen curve. These curve types are described in detail below.

To select a curve, click its button. The currently selected curve is highlighted. When a curve is selected, the associated parameter fields are displayed in the lower section of the dialog box.

The curves are all displayed as increasing values. However, if you specify an End tempo that is less than the Start tempo, the tempo changes generated will decrease over time according to the chosen curve. In effect, this flips the curve upside down. For example, if you wanted to program a ritard (slowing down), you'd choose the linear curve and enter a lower ending value. This would "flip" the effect of the curve from up to down.

Curve parameters

Each curve has unique parameters. These parameters are the specifications for the tempo change data to be generated: starting time, ending time, etc. In addition, these parameters can be

combined in several different ways for each curve. For example, the linear curve allows you to set different combinations of the Start tempo, End tempo and End time. After selecting a curve, pressing the Options button cycles through the various combinations of parameters possible for that curve. Parameters that you can enter are in boldface type and are enclosed in a box; parameters that Performer Lite will compute (and that you cannot enter) are in plain type without the box.

As soon as you change any parameter, Performer Lite instantly calculates other parameters on the fly that are affected by your change.

Each curve displays its Start time parameter. *This value is not user-changeable;* it is always computed from the starting measure time location. It is provided as a reference for viewing the length of the region.

The following paragraphs describe the effects of each curve on the specified region and the parameter options for each.

The constant curve

The constant curve sets the region to a constant tempo by inserting only one tempo change at the beginning of the region.

Parameters:

Tempo: This is the tempo for the entire region in beats per minute. You can use two decimal place values if you wish, e.g. 89.74. If you anchor the tempo, it will be the same as the pre-existing tempo at the Start location of the region.

End Time: This is the time at which the end measure location will occur.

The linear curve

The linear curve creates a smooth tempo change with no fluctuations in the specified region.

Parameters:

Start Tempo: This is the tempo at the Start location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the Start location.

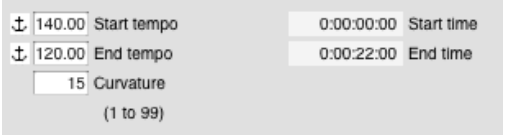
End Tempo: This is the tempo at the End location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the End location.

End time: This is the time at which the End location occurs.

The logarithmic and exponential curves

These two curves are similar: they both create a smooth change in the specified region. The logarithmic curve changes tempo more rapidly at the beginning of the region; the exponential curve changes tempo more rapidly at the end.

Parameters:



Start Tempo: This is the tempo at the Start location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the Start location.

End Tempo: This is the tempo at the End location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the End location.

End time: This is the time at which the End location occurs.

Curvature: This is a value that controls the degree of curve in the smooth change (i.e. its non-linearity). Enter a value between 1 and 99. Low curvature values flatten the curve and produce a more even rate of change. For example, a value of 1 results in a near-linear change that is similar to the linear curve. High curvature values round out the curve and result in more change at the beginning or end of the region depending on the button selected. For example, a value of 99 will cause much of the tempo change to occur at either the beginning (for the logarithmic curve) or the end (for the exponential curve). The higher the curvature value, the more pronounced the curve shape.

The polynomial curve

The polynomial curve creates a change in the specified region which starts smoothly at the beginning of the region, changes most rapidly in the middle and ends smoothly. Note that the unique parameter *Mid Beat* is included with this curve, allowing you to control aspects of the middle of the curve.

Parameters:

Start Tempo: This is the tempo at the Start location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the Start location.

End Tempo: This is the tempo at the End location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the End location.

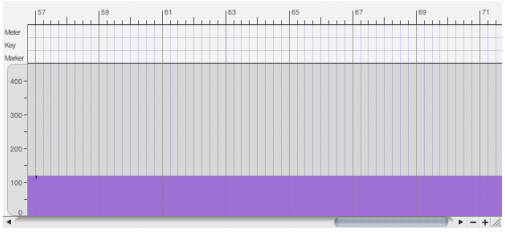
Curvature: Allows values between 1 and 99. Low curvature values flatten the curve; high values round it. Values of 30 to 60 work particularly well with this curve.

Mid Beat: This is the measure time location at which the Mid Tempo value occurs. This is the point at which the most rapid tempo change occurs. This location can be any time between the Start and End times and allows you to control where most of the changing will occur.

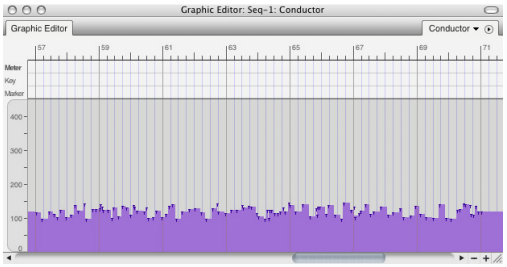
End time: This is the time at which the End location occurs.

The Randomize option

The Randomize option causes the tempo or tempos being generated by one of the selected curves to be randomized within a range for the entire region over which the tempo change is being made. For example, if you are inserting a constant tempo of 120 bpm *without randomization*, the result is a single tempo event at the beginning of the region as shown below:

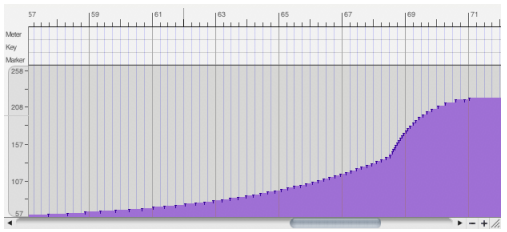


However, with the Randomize option checked and the range set to ±25 bpm, the result is a tempo map that constantly and randomly changes between 95 and 145 bpm:

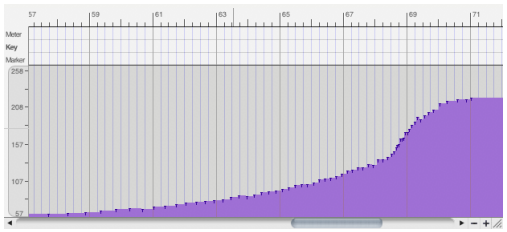


Randomization can be used in conjunction with any curve

Randomization option is a check box option, which means that it can be used in conjunction with any of the tempo curves:



A polynomial tempo curve with no randomization.



The same curve with randomization set to 2%.

Controlling the degree of randomization

The Randomize option is ideal for adding "human feel" to the tempos of a sequence. By controlling the range over which the randomizing occurs, you control the degree of that feel. You can specify the range either as a percentage or as a range of bpm. In either case, each tempo event generated is placed randomly within the range.

Emphasis

This sub-option causes the tendency of the randomization to be higher or lower within the specified range. Thus, if you wish to randomize the tempos within a certain range, but you wish them to tend to be higher, use a positive emphasis; use a negative emphasis if you wish them to tend to be towards the lower end of the range. A value of zero equals no emphasis, which causes the randomization to occur evenly within the range.

The effect of Density on randomization

A *Fine* density setting causes tempo events to be generated more frequently than a *Course* density setting. Notice that these two settings have an effect on the constant tempo curve, which normally only produce a single tempo event.

The Options button

Pressing the Options button cycles through the different combinations of entered/computed parameters for the selected curve. This allows you to specify the curve in a variety of manners. For example, if you select a constant curve, you can specify just the tempo or you can specify the End time, in which case the tempo will be calculated to make the end measure location occur at the end time.

If you are not working with externally imposed timings, as required in film and video work, you will probably not need to use the Options button.

VIEWING AND EDITING TEMPO CHANGES

Tempo change data is stored in the Conductor track for the sequence. Tempo changes look like—and can be edited similarly to—continuous MIDI data (such as pitch bend or controller information) in the Conductor track editor windows.

Each tempo change has a time and a tempo value. The tempo has two parts, the tempo value in beats per minute and the beat value (e.g. 1/4 note, 1/8 note, etc.)

Editing tempo changes can be done in the Sequence Editor. You can apply all the commands on the Edit menu to tempo changes.

TEMPO EDITING RESOLUTION

Tempos can be manually edited to a resolution of a hundredth of a beat per minute. When you use the settings in the Change Tempo window, tempos are calculated to a much higher degree of accuracy.

CHANGING TEMPO ON-THE-FLY DURING PLAYBACK

You can use the Change Tempo command without stopping playback.

CHAPTER 50 Change Meter

OVERVIEW

Meters specify the way musical time is counted and measured. In Performer Lite, meters affect the way measure|beat|tick locations are displayed. Meters also affect the Click and countoff. In addition, they impact the way information is displayed in Performer Lite's Notation Editor. The Change Meter command (*Project menu>Conductor Track>Change Meter*) allows you to enter any number of meter changes in a sequence.

Overview **471**
Change Meter quick reference **471**
Change meter basics **471**
Using the Change Meter window **472**
Viewing meter changes **474**
Editing meter changes in the Conductor track **474**
Hints and examples **475**

CHANGE METER QUICK REFERENCE

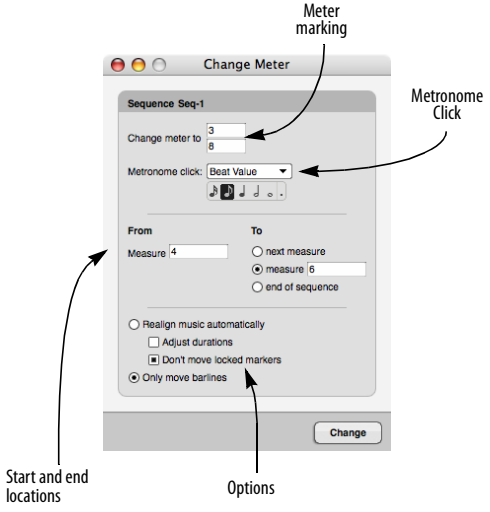


Figure 50-1: The Change Meter window.

Meter marking: Displays the meter in standard musical format. Click on the numerator and/or denominator and type in new values to change it.

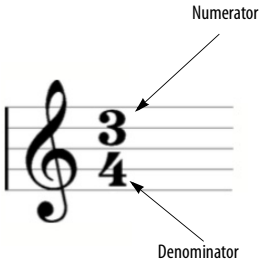
Start and End Locations: Displays the region over which the meter change takes effect. Click in the From box to set the starting location. Click in the To box to set the ending location. Click on the *end of sequence* button to extend the region to the end on the sequence.

Options: The *Only move barlines* option does not affect the actual events in the sequence. The *Realign music automatically* and *Adjust durations* options erase or change events to fit the meter.

Metronome Click value: Displays click associated with the meter change.

CHANGE METER BASICS

A meter consists of a *beat value* and the number of beats per measure. The beat value is generally the rhythmic pulse or beat of the music; a measure consists of a certain number of these beats. Performer Lite displays meters in the standard musical fashion as a fraction, with the beat value in the denominator (on the bottom) and the number of beats per measure in the numerator (on top). In Performer Lite, the numerator can be a value between 1 and 99. The denominator must be a power of 2 (1, 2, 4, 8, 16, 32, or 64).



A Meter Change event in Performer Lite consists of a meter displayed in this way, along with a metronome click setting, which determines how the click will behave. It also determines how often the Counter is updated during playback or recording.

The meter's denominator value, the beat value of the current tempo and the click settings are all related, though they need not be set to the same value. You may wish to have a meter of 4/4 with a tempo of half note = 180 with the metronome clicking every eighth note. The ability to use separate values allows a great deal of flexibility and accuracy during recording. In addition, the click can be fully, independently customized. You can even specify default click behavior for specific meters and tempo ranges. See "Click Changes" on page 447.

If a sequence contains several meters, the resulting configuration of meters is termed a *meter map*. This map is simply the complete set of programmed meter changes for an entire sequence. These changes are displayed and edited in the Conductor track.

It is often useful to set up the meter map before recording the music, this way the measure locations of the events you record will stay consistent through the recording and editing process. If you change the meter after recording a track or tracks, the measure|beat|tick locations of the events may change.

Inserting a new meter may or may not have an audible effect on the music. Depending on the options you select for inserting a new meter, note events may be excluded and durations may change. These options are explained in detail below.

Performer Lite starts a new measure at every meter change. Thus, if a meter change is inserted in the middle of a measure, that measure will terminate early, and a new one will begin with the meter change event. See "Meter changes and partial measures" on page 451.

USING THE CHANGE METER WINDOW

Use these general guidelines for changing meter.

Specifying the sequence to insert meters into

If the Sequence Editor is active, the meter insertion will apply to that sequence. If the Set List is active, the meter insertion will apply to the highlighted sequence or, if no sequence is highlighted, to the current play-enabled sequence. If an edit window is active, the meter insertion will apply to whatever sequence it belongs to.

When you open the Change Meter window (Project menu>Conductor Track>Change Meter), the name of the sequence in which the meter insertion will be placed is displayed at the top of the Change Meter window.

Entering the meter

Click in each box and type in the numbers. The numerator must be a value between 1 and 99. The denominator must be a standard note value: 1, 2, 4, 8, 16, 32 or 64.

Specifying the *From* and *To* locations

These locations specify the starting and ending locations for the meter change. Click on the fields and enter the desired measure|beat|tick values. If you have just entered a meter change, the From location is automatically set to the previous To

location. Click on the *end of sequence* button to change meter from the From location to the end of the sequence.

Entering meters quickly one measure at a time

If you are going to be entering a series of meter changes quickly, choose the *Next Measure* option. This option lets you press the enter key once for each measure. If you have several measures in a row in the same meter, just press the enter key once for each measure. The "from" measure is automatically updated as you do so. This lets you enter meter changes efficiently for an entire sequence by quickly pressing the enter key repeatedly as many times as necessary for measures with the same meter. When you need to change meter, type in the new meter and press enter again as many times as necessary for the new meter. Keep going as long as necessary.

The metronome click

Each meter change can have its own unique metronome click setting. There are four choices for a meter change metronome click:

Metronome click	For more information
Default	"Default for Meter" on page 115.
Tacet	"Tacet click" on page 447.
Beat value	"Beat Value" on page 115.
Pattern	"Pattern click" on page 448.

The measure range

When you enter a range of measures, Performer Lite will change the meter up to but not including the *to measure*. The *to measure* does not change; it remains in the same meter as before the operation. This is very similar to the way most edit/region operations work; events at the end time are not affected. If you choose the *end of sequence* option, the meter change will continue to the end of the sequence, no matter how the sequence may change.

For example, assume a sequence is completely in 4/4. Entering a change to 3/4 from measure 8 to measure 12 will place a 3/4 meter change in measure 8, and a 4/4 meter change in measure 12. The result is that measures 8 through 11 are now in 3/4, and measure 12 remains in 4/4.

Realign music automatically

This option allows you to maintain the metrical structure of each measure by deleting some note events and changing the durations of others. There is a sub-option, *Adjust durations*, which is discussed below. The following assumes that the *Adjust durations* box is *not* checked. When you change the meter of a measure that contains note events with this option on, beats are either added or removed according to the new meter you specify. If beats are added, rests are inserted for the new beats. If beats are removed, any note event occurring in the removed beat will be removed as well. The durations of note events that start before the deleted beats are preserved. For example, suppose you have the following two measure passage in 4/4 time:

Graphically, the durations would be represented like this:

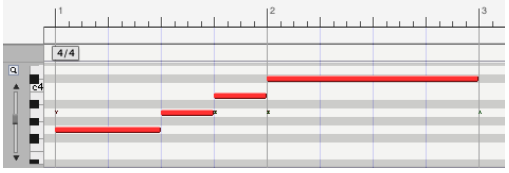


Figure 50-2: Original music, before changing meter.

Changing the meter to 3/4 and using the Realign music automatically without adjusting durations, the fourth beats would be removed. This would

remove the quarter note in the first measure but not the whole note since it began before the deleted (fourth) beat:

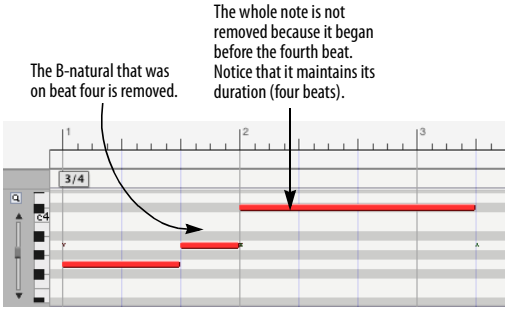


Figure 50-3: Realign music automatically.

Adjust durations

The Adjust durations sub-option can only be used when the Realign music automatically option is selected. The Adjust durations sub-option alters the durations of notes that begin before the removed or added beats. The durations are altered to conform to the new measure boundaries. In the example above, the original version in 4/4 has a note lasting the whole second measure. With the Adjust durations option on, the duration of this note is altered such that the note will last for the entire measure in the new meter:

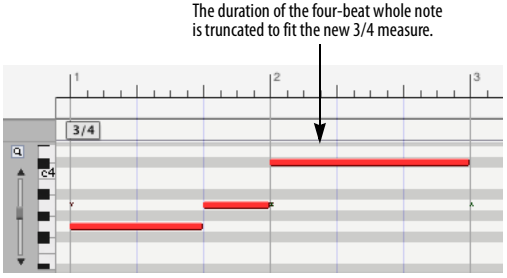


Figure 50-4: Adjust durations option.

Don't move locked markers

When the *Don't move locked markers* option in the Change Meter dialog (Figure 50-1 on page 471) is checked, locked markers are not moved by the change meter operation and remain anchored to their SMPTE time code frame position.

Only move barlines

This option does not change any durations. It imposes the new barline structure over the music, keeping all durations the same. The above original 4/4 passage would look like this with the Only move barlines option:

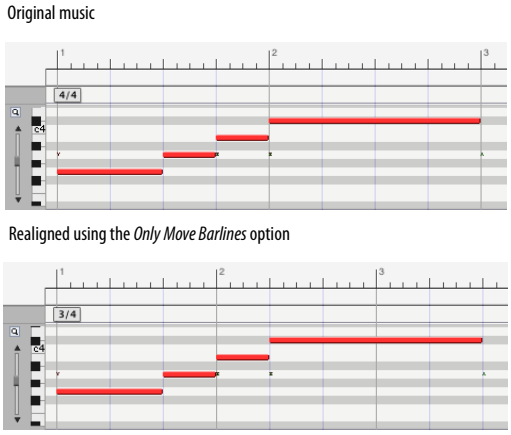


Figure 50-5: Only move barlines option.

VIEWING METER CHANGES

The meter changes in a sequence can be viewed in the Sequence Editor and Notation Editor. Meter changes can be edited only in the Conductor track; they cannot be modified in MIDI and audio tracks.

EDITING METER CHANGES IN THE CONDUCTOR TRACK

Meter changes can be edited directly in the Conductor track. See "Editing in the Conductor Track" on page 449 for details.

Using edit menu commands with meter changes

You can apply any editing command to meters in the Conductor track: they can be cut, copied, pasted, spliced, etc., just like other events. You can do so using all of the same techniques for editing MIDI and audio events. You can even edit meter changes along with MIDI data in other tracks by selecting the Conductor track along with the other tracks.

☛ When cutting, copying, and pasting meter changes, it is strongly advised that you leave the *Fix partial measures automatically* preference (Performer Lite menu) checked. This preference helps avoid partial measures, which in most cases you do not want to create with editing operations.

HINTS AND EXAMPLES

Editing meter changes can be confusing, especially if you create partial measures by unknowingly putting a meter change in the middle of an existing measure. Another way to avoid partial measures is to turn on (check) the *Smart Selections* command in the Edit menu. Smart Selections helps to avoid partial measures. Also see "Correcting unwanted partial measures" on page 452

CHAPTER 51 Change Key

OVERVIEW

Key signatures provide a way to interpret MIDI note data. In music notation, there are several ways to write every pitch. For example, although G sharp and A flat sound the same and describe the same pitch, a G sharp would make less sense in the key of E flat than an A flat would. Performer Lite allows you to specify key signatures in your sequences, making the naming and display of notes clear and musically accurate. Key signatures are also extremely important when viewing a sequence in music notation with Performer Lite's Notation Editor; setting the correct key signatures ensures that the music will be properly notated.

Overview **476**
Change key Quick Reference **476**
Change Key basics **476**
Types of key signatures **477**
Inserting key signatures **477**
Viewing and editing key changes **478**

CHANGE KEY QUICK REFERENCE

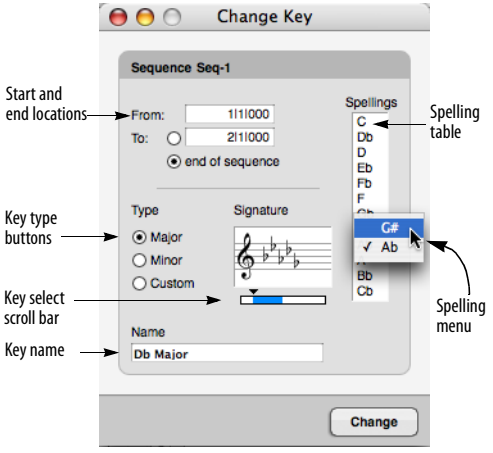


Figure 51-1: Change Key (Project menu>Conductor Track>Change Key).

Start and End Locations: Displays the region over which the key change occurs. Click on a value to highlight it, and type the desired starting and ending measure locations. After each change is made, the From location is set to the previous To location. Click on the *end of sequence* button to change key from the From location to the end of the sequence.

Key type: Click on the appropriate radio button to select a Major, Minor, or user-defined Custom key.

Key Signature Scroll Box: Use the scroll bar and arrows to select the desired key signature. Changing the key in this box automatically updates the key name and spelling table.

Key Name: Displays the name of the key signature. The name is set automatically when the Major or Minor key types are chosen. Click the name and type to change it.

Spelling Table: Displays the spelling of the twelve chromatic notes for the currently selected key. Change a spelling by pressing on the note letter and selecting the desired spelling from the menu that appears.

CHANGE KEY BASICS

Key signatures in the Conductor track of a sequence apply to all the tracks in the sequence. At any given location, there can be only one key signature for all tracks. You can have as many key changes as you like in a sequence.

Key changes appear for reference in all windows. They may be edited only in the Conductor track. Each key change affects the spelling of notes to just before the beginning of the next key change. *Key*

changes only affect the display of note pitches; they do not change the actual MIDI data in your sequence.

If there is no key signature entered at the beginning of the sequence, the default key is C major (no sharps or flats).

TYPES OF KEY SIGNATURES

Key signatures in Performer Lite actually have two components: the standard key signature (up to seven sharps or seven flats), and note-spelling assignments for non-diatonic notes (notes not in the basic scale of the key). A key has five non-diatonic notes; Performer Lite allows you to decide how each of them will be spelled. In the key of D, for instance, you can name the note that lies between B and C sharp either B sharp or C natural.

You can choose from three types of key signatures:

- *Major:* Any key from C sharp major (7 sharps) to C flat major (7 flats)
- *Minor:* Any key from A sharp minor (7 sharps) to A flat minor (7 flats)
- *Custom:* You can choose a signature with 7 sharps to 7 flats and call it what you wish. This is useful for modal key signatures: C Phrygian, for example, has 4 flats. The key signature name is only for your reference: only the key signature itself is displayed on the staff in the Notation Editor.

INSERTING KEY SIGNATURES

To insert a key signature or add a key change, keep these guidelines in mind when using the Change Key window (Project menu>Conductor Track>Change Key).

Specifying the sequence to insert a key change into

If the Sequence Editor is active, the key insertion will apply to that sequence. If the Set List is active, the key insertion will apply to the highlighted sequence or, if no sequence is highlighted, to the current play-enabled sequence. If an edit window is active, the key insertion will apply to whatever sequence it belongs to.

When you open the Change Key window (Project menu>Conductor Track>Change Key), the name of the sequence in which the key change will be placed is displayed at the top of the dialog box.

Specifying the *From* and *To* locations

These locations specify the starting and ending locations for the key change. Click on the fields and enter the desired measure|beat|tick values. If you have just entered a key change, the From location is automatically set to the previous To location. Click on the *end of sequence* button to change key from the From location to the end of the sequence.

Choosing note spellings

Click on each note in the spellings list to select it and choose the desired spelling from the available ones displayed.

VIEWING AND EDITING KEY CHANGES

The key changes in a sequence can be viewed in all editor windows. Key changes can be edited in the Conductor track.

In the Conductor Track, the location of a key change can be edited by dragging it to move it or by altering its starting time in the Event Info bar. The key change itself may be modified by clicking it in the Event Info bar. The Change Key dialog box appears in which you can enter the modification (Figure 51-2 below). The box that appears is slightly different than the one chosen with the Change Key command: the Change button is replaced by OK and Cancel buttons, and the sequence name and From and To location fields are missing. Otherwise, this box works exactly as described above.

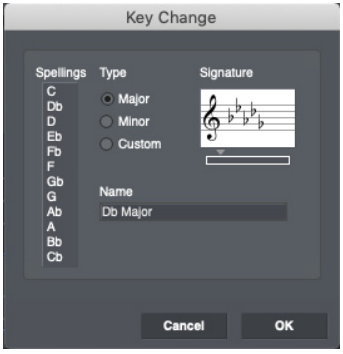


Figure 51-2: When you double-click on a key change event in the Event Info bar, the Change Key dialog box appears. These settings are the same as the Change Key window (Figure 51-1 on page 476).

Using the edit commands with key changes

You can apply the commands from the Edit menu to key changes in the Conductor track: key signatures can be cut, copied, pasted, spliced, etc., just like other events. The region to edit in the Conductor track may be selected by using the I-Beam cursor. Key change information can be included in an edit operation involving note and other MIDI events by including the Conductor track along with the selected tracks.

CHAPTER 52 Insert Measures

OVERVIEW

The *Insert Measures* command (Project menu>Conductor Track>Insert Measures) lets you add any number of new, empty measures at any point in the sequence. This features has an option that preserves all subsequent SMPTE locations after the insertion, if desired. For example, if you were working on a film cue, and you needed to add ten measures of extra music before the current start time of the cue, the Insert Measures command lets you insert 10 empty measures at the beginning of the sequence, while at the same time preserving all your existing material's relationship to SMPTE time code.

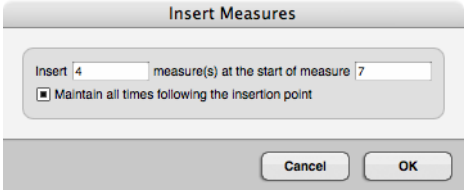


Figure 52-1: Insert Measures.

BEFORE YOU USE INSERT MEASURES

The Insert Measures command automatically splits audio regions at the point of insertion. But it does not split MIDI notes. If MIDI notes extend through the insertion point, such as sustained chords, and you would like to split them, do the following before using the Insert Measures command: make a selection in the desired tracks with one edge of the selection at the split point. Then use the Split command in the Edit menu to split the MIDI notes.

USING THE INSERT MEASURES COMMAND

You don't need to select anything before using the Insert Measures command. Just choose it from the Conductor Track sub-menu in the Project menu, type in the number of measures you want to insert and the downbeat where you wish to insert them. If you wish to preserve the SMPTE times of all events *after* the insertion point, check the option called *Maintain all times following the insert point*.

CHAPTER 53 Adjust Beats

OVERVIEW

Adjust Beats (Project menu>Conductor Track>Adjust Beats) lets you align Performer Lite's time ruler to music (either MIDI or audio) in cases where the Beat Detection Engine and tempo analysis features are not suited for the material. For example, you might be importing a full mix of a rubato performance for which the Beat Detection Engine cannot accurately detect beats and tempo.

Overview **480**
The problem **480**
Using Adjust Beats **480**

THE PROBLEM

Adjust Beats addresses the following problem: you've just imported an audio file into Performer Lite — or you recorded it without listening to Performer Lite's metronome — and the audio is completely out of sync with the sequence's tempo, beats and barlines. In addition, it cannot be accurately processed by the Beat Detection Engine or tempo analysis features because of the nature of the material.

How do you get Performer Lite's measures and beats to line up with the audio?

USING ADJUST BEATS

The audio used in this example (Figure 53-1) is a simplified example for the purposes of demonstrating the Adjust Beats command. Note, however, that audio of this nature (monophonic audio with clearly defined transients) can be quite successfully analyzed with the Beat Detection Engine and should be aligned to the sequence tempo using beats and tempo analysis.

To use the Adjust Beats command to get Performer Lite's beats and barlines to line up with audio:

1 Place the soundbite in a track.

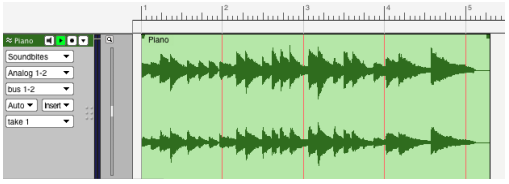
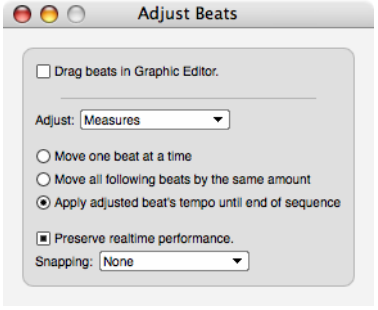


Figure 53-1: A rubato soundbite imported into a new sequence in Performer Lite. Notice that the measures and beats don't line up with the beat spikes in the audio waveform because their tempos do not match. (The sequence currently has a constant tempo; the soundbite has a changing tempo.)

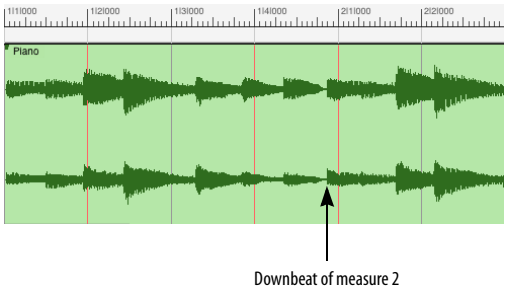
2 Choose *Project menu>Conductor Track>Adjust Beats*.

3 Turn on Adjust Beats (check the box).

4 Adjust beats lets you adjust entire measures or specific beats. In this example, we'll start adjusting the first measure and then fine-tune the beats, so for now, the *Adjust* menu is set to measures, and we'll set the other options as shown below for now.



5 Zoom the Sequence Editor so you can easily see the beats in the waveform (you can even use the Zoom tool in the time ruler).



6 In this simplified example, the downbeat of measure two is shown above. With Adjust Beats, we can simply drag the downbeat of measure 2 in the time ruler over to the downbeat in the waveform. You can grab measure two by either clicking on the time ruler or clicking directly on the waveform below it.

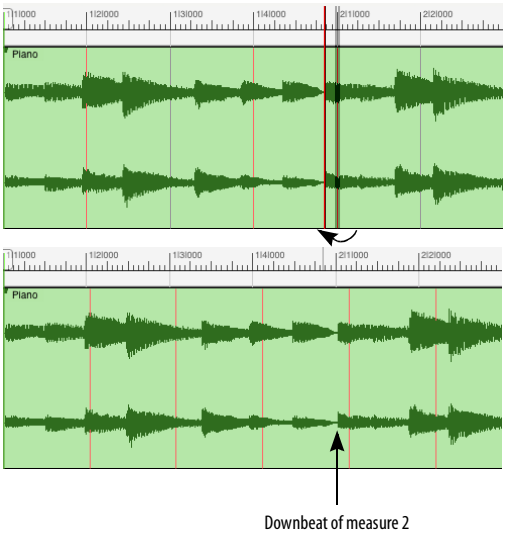


Figure 53-2: Using Adjust Beats to line up time ruler (the sequence's measures and beats) with audio. After dragging the down beat of measure 2 in the time ruler, it now matches the audio.

7 Since the audio does not have a constant tempo, we now need to use the same technique to line up the beats in measure 1. First, we'll switch the Adjust pop-up menu in the Adjust Beats window to *Beats* and choose the *Move one beat at a time* option.

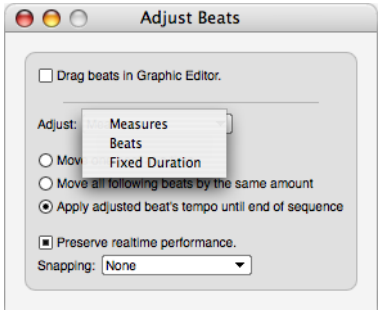


Figure 53-3: Switching to beat adjustment, moving one beat at a time.

8 Now we can line up the beats in measure one by dragging them in the time ruler to match the beat spikes in the audio waveform.

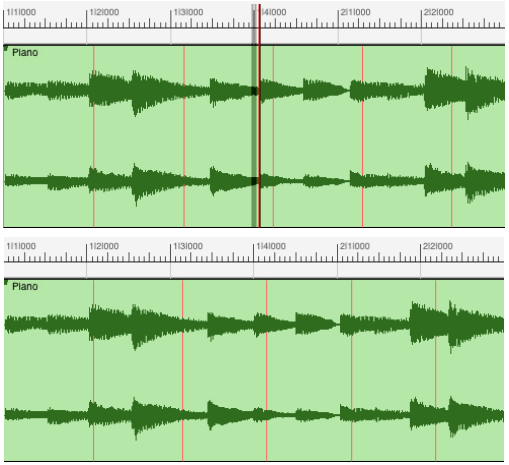


Figure 53-4: Adjusting the beats in measure 1. Above, beat four is being adjusted, and below, the final results.

You can continue this process for any portion of the audio, adjusting measures for larger scale changes and using beat adjustment for fine-tuning.

The end result of this simple procedure is that the audio sounds the same: it plays exactly as it did originally. But now, the sequence has a rubato tempo map that was generated by your graphic adjustments — and its changing tempos will exactly match the changing tempos of the audio.

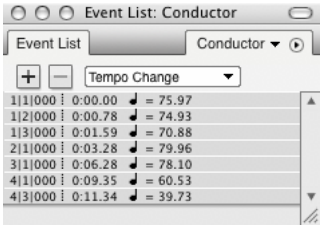


Figure 53-5: This is the tempo map that was generated by beat adjustments made in example. These tempo changes make the sequence play along exactly with the rubato audio passage. (And the beats and barlines match up, too.)

Adjust Beats and grid lines

Adjust Beats displays grid lines as follows:

- If the time ruler is displaying measures only, no grid lines are displayed.
- If an auxiliary time ruler is being displayed, Adjust Beats displays grid lines for the aux ruler.

Grid lines for a mensural auxiliary ruler are shown every measure.

Grid lines for real-time aux rulers (real time, SMPTE or samples) are shown at intervals representing the primary unit of measurement being displayed in the ruler (such as one-second intervals, for example).

Adjust beats and snapping

Adjust Beats can snap to audio beats and MIDI notes, if any, in the track you are dragging in. They can also snap to markers.

In the Sequence Editor, your cursor actions snap to the MIDI notes or audio beats in the track currently beneath the cursor. Just move the cursor over the track you wish to snap to.

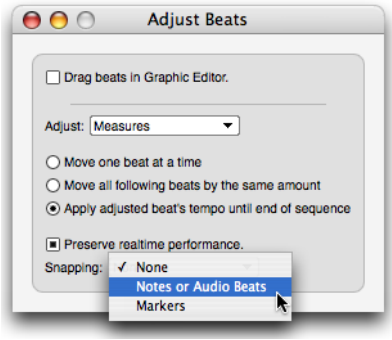


Figure 53-6: Adjust Beats can now snap to audio beats as well as MIDI notes.

CHAPTER 54 Find Tempo

The Find Tempo feature helps you find the tempo that best matches a list of locked markers ("hits"), with as many hits as possible falling on beats.

When Find Tempo works best 483
Preparing markers 484
Opening Find Tempo 484
Entering search parameters 484
Processing the results 485
Browsing the tempo search results 486
Auditioning a specific tempo 487
Viewing the results of a specific tempo 487
Applying the tempo to your sequence 487
Copy and move locked markers 487
Locking tracks before applying a new tempo 488

WHEN FIND TEMPO WORKS BEST

Find Tempo works best at the beginning of the scoring process, when you've got an EDL (Edit Decision List) or hit list, before you've written any music (although you can certainly experiment with it on existing material). If you do try it with existing material, it works better with music that is already a constant tempo. Lots of existing tempo changes in the conductor track do not generally produce good results.

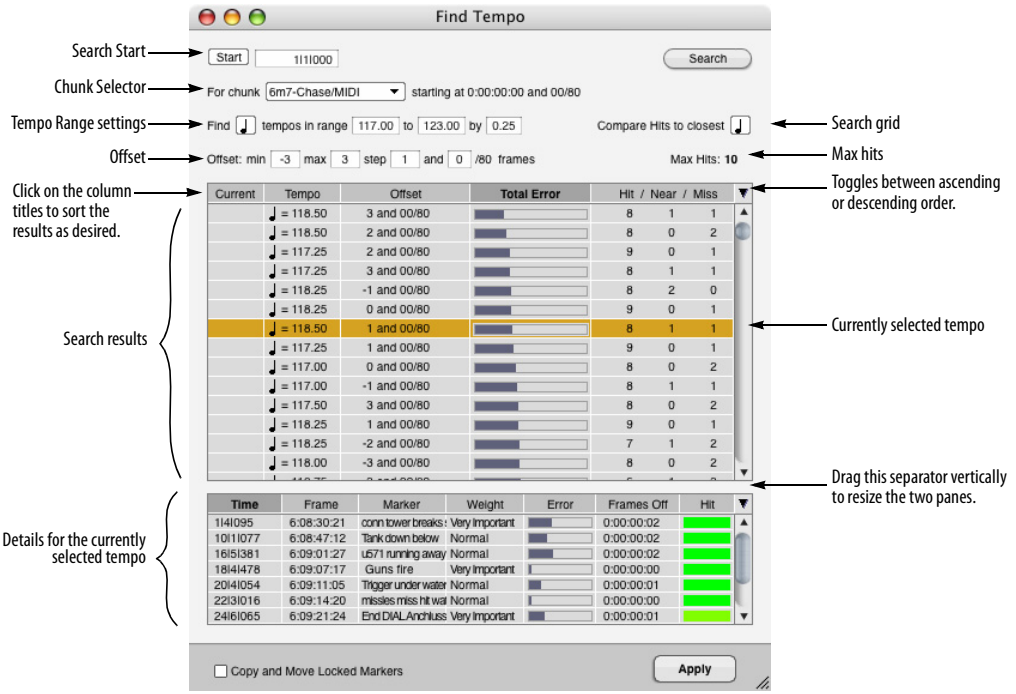


Figure 54-1: The Find Tempo window.

PREPARING MARKERS

Use the Markers window to prepare your markers for effective tempo searches. Find Tempo only searches on locked markers, so be sure to lock any markers you wish to include in the search.

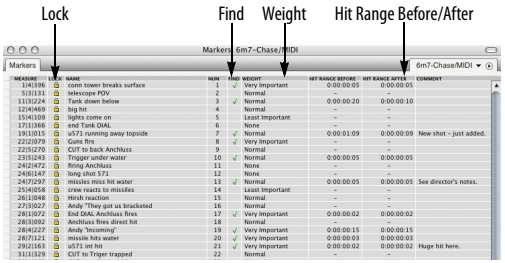


Figure 54-2: Preparing locked markers for Find Tempo.

Choosing which locked markers to include

For any locked markers you wish to include as "hits" in the search, place a check mark in the *Find* column next to the marker name. To check or uncheck several (or all) markers at one time, select them and use *Include in Find Tempo Range* and *Remove from Find Tempo Range* in the Markers window mini-menu. Unlocked markers cannot be checked (because they would move when the tempo changes); lock them first and then check them.

Dragging in the Lock and Find columns

In the Markers window, you can vertically drag across multiple markers in the *Lock* and *Find* columns to enable them in one gesture.

Assigning weight (importance)

You can assign a degree of importance to each marker by choosing it from the menu in the *weight* column. Four weight settings are provided: *none*, *least important*, *normal*, and *very important*.

Assigning a hit range

In the *Hit range before* and *Hit range after* columns, you can enter a number of SMPTE frames before and after the marker that constitutes a hit. To assign a range to several markers at one time, select them and use the *Set Hit Range* mini-menu command.

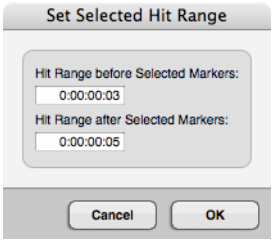


Figure 54-3: Setting a hit range for one or more markers.

OPENING FIND TEMPO

After you've prepared your list of locked markers, you're ready to search for tempos. To open Find Tempo, choose *Find Tempo for Locked Markers* from the Markers window mini-menu.

ENTERING SEARCH PARAMETERS

As shown in Figure 54-1, use the area at the top of the window to enter basic guidelines for the search.

Search Start

Use the *Search Start* (Figure 54-1) to enter a measure|beat|tick where you want to start the tempo search. Applied tempos will be inserted at this point in the sequence. Click the *Start* button as a shortcut for entering the current counter time in the start field.

Chunk Selector

The *Chunk Selector* (Figure 54-1) lets you choose which cue (sequence) you are searching in. It also displays the start time of the chunk to the right of the selector popup. (Time code bits are displayed as 80ths of a frame.) This chunk start time will immediately update if you choose to apply a tempo with an offset, to show you what effect the offset had on the chunk start time. Therefore, it is

not necessary to go to the Chunks window mini-menu to open the *Set Chunk Start* dialog to verify what happened to the chunk start time.

Tempo Range settings

The *Tempo Range* settings (Figure 54-1) let you choose the metric division (quarter note, eighth note, etc.), the range of tempos in which you'd like to search, and the frequency of different tempos you'd like to try within that range.

The default frequency is 0.25 of a bpm, which means that every tempo, in quarter bpm increments, will be searched within the range you specify. Smaller frequency values produce more resulting tempos and increase the chances of finding the most hits. But they also take longer. Lower frequency produces fewer tempos and shorter calculation times.

Note that the BPM (*Beats Per Minute*) note value for the tempo is independent of the resolution setting for the *search grid* setting (shown in Figure 54-1 and explained in the next section).

Search Grid

The *Search Grid* note value menu (Figure 54-1) lets you set the beat resolution grid on which you would like to search for hits. Because this is separate from the tempo specification, you can search, for example, for quarter note tempos but evaluate hits according to the closest eighth note.

Offset

The *Offset* settings (Figure 54-1) allow you to specify how much of an offset (in frames) you wish to consider from the chunk's current SMPTE start time, and how many different offsets to check. The offset settings shown in the example in Figure 54-1 would check the results of every tempo with offsets ranging between –3 and 3 frames. The *Step* setting specifies how many offsets to check between the minimum and maximum frame numbers. The Step setting in this example will test offsets at intervals of one and one-half frames. Therefore, the set of offsets that will be considered is { -3.0, -1.5, 0, 1.5, 3.0 }.

If you choose to search for tempos using a range of offsets, every offset within the range is shown in the list of results, regardless of the number of hits and misses it contains. This allows you to inspect the complete set of search results.

Search button

The Find Tempo window automatically re-calculates the tempo search results whenever a search parameter changes. But if you want to manually force Digital Performer to re-calculate the tempo search results for some reason, click the *Search* button (Figure 54-1).

Max Hits

The *Max Hits* (Figure 54-1) indicator is a static text readout that tells you how many searchable markers you have (the maximum possible number of hits). This is a convenient reference for evaluating the number of hits and near hits. In this example, if you get 10 hits, you'll know that you got 10 out of 100. The Max Hits indicator counts only those markers that occur after the search start time.

PROCESSING THE RESULTS

As soon as you finish entering a new set of search parameters, an animated processing symbol appears in the upper right corner of the window to indicate that tempos are currently being searched. Find Tempo always begins searching automatically, as soon as you enter new parameters, change the existing parameters or even make changes to the locked markers in the sequence. But you can always initiate searching again by clicking the Search button.

Searching before the beginning of the sequence

If you've chosen to include a locked marker in your search that occurs at or before the sequence start frame, offsets cannot be applied. As a result, you will see a red warning message at the top of the Find Tempo dialog that warns you that a locked marker at or before the sequence start time prevents use of offsets.

BROWSING THE TEMPO SEARCH RESULTS

After a search is complete (when the processing symbol disappears), all of the tempos you specified (as prescribed by the tempo range) appear in the list, along with their *Offset*, *total error*, and their *hits/near/misses* count. You can sort the list in ascending or descending order by any one of these characteristics by simply clicking the title of the column. The list will immediately be resorted according to the column title you click. Use the triangle on the far right (as shown in Figure 54-1 on page 483) to toggle the list between ascending or descending order. For the sake of comparison, the sequence's current tempo is also calculated and included in the list.

The following sections provide a brief explanation of each column in the Search Results list. You can sort the list by the values displayed in each column by clicking the column title.

Current

The *Current* column identifies the search results entry for the current sequence tempo (either a fixed tempo or the sequence's tempo map). If the sequence is in Conductor Track tempo mode, then the current tempo displayed in this column is the average tempo for the sequence. The average tempo is shown in italic text.

Click the column title and use the ascending or descending order triangle (above the vertical scroll bar) to sort the list such that the current tempo is listed first, at the top.

Tempo

The *Tempo* column displays each tempo (in beats per minute) for which hits have been calculated. The number of tempos in the list is determined by the tempo range you specify, along with the frequency of tempos you've chosen to try within that range (as explained earlier in "Entering search parameters" on page 484). Click the column title and use the ascending or descending order triangle (above the vertical scroll bar) to sort the list by tempo.

Offset

The *Offset* column (Figure 54-1) shows you the offset (in frames and 80ths of a frame) that is associated with the tempo for this search result. A search result is the combination of a tempo and an offset. If you apply a tempo, its offset (if non-zero) will be added to the current chunk start time.

Negative offsets

Offsets can be either positive or negative, although negative offsets are limited so they can never shift the chunk start time to a value that is less than zero.

Partial frame offsets

Partial frame offsets are explicitly shown, rather than hidden (as in previous versions of Digital Performer). If you click the Tempo column heading to sort the results list by tempo, then each tempo is shown with all of its possible offsets before the next tempo is shown.

Total Error

The *Total Error* column gives you a bar graph representation of how well or poorly the tempo matches your hits. This measurement takes into account how close each locked marker is to the nearest beat, and then averages the total. Each marker's weight is also factored into the total error, with important markers influencing the total error score more heavily than less important ones.

Hit / Near / Miss column
The *Hit/Near/Miss* column (Figure 54-1) shows three numbers: the number of hits, the number of markers that are within 1 frame of being a hit, and the number of misses. This is valuable information for honing in on tempo choices, and you can conveniently compare these numbers with the total possible number of hits (*Max Hits*) displayed just above this column. If you click the heading of the *Hits/Near/Miss* column to sort the tempo results list, it orders the results first by number of hits, and secondly by number of near misses.

AUDITIONING A SPECIFIC TEMPO

If Audible Mode is on and a tempo in the list is selected, the metronome will click at that tempo. You can turn Audible Mode on or off with the speaker button in the Control Panel.

VIEWING THE RESULTS OF A SPECIFIC TEMPO

To get a closer look at the results for a certain tempo, click the tempo in the list to highlight it. When you do, the list in the lower portion of the window shows details about every marker for that tempo, including the number of *frames off* it falls from a beat and the total amount of *error* for that marker. In addition, the closeness of the hit is indicated by color in the Hit column as a general reference. Green means a direct hit; yellow means it is close, and red means there was no direct hit.

The following sections provide a brief explanation of each column in the Find window marker list. Once again, you can sort the list by the values displayed in each column by clicking the column title.

Time
This is the location of the marker in measures|beats|ticks (as entered in the Markers window).

Frame
This is the marker's SMPTE frame location (as entered in the Markers window).

Marker
This is the Marker name (as entered in the Markers window).

Weight
This is the Marker weight as specified in the Markers window. See "Preparing markers" on page 484.

Error
This is a bar graph representation of how far away the marker is from the nearest beat.

Frames off
This column tells you how many frames the marker is from the nearest beat.

Hit
This column gives you a visual indication of how close the marker is to a hit (beat). Green is a good hit (near the center of the marker's hit range). Yellow is a near miss; red is a complete miss.

APPLYING THE TEMPO TO YOUR SEQUENCE

The *Apply* button writes the currently selected tempo to the sequence specified at the top of the Find Tempo window, starting at the *Start Search* location (Figure 54-1 on page 483).

COPY AND MOVE LOCKED MARKERS

The *Copy and move locked markers* option helps you if you are finding a tempo after you have written music. It creates an unlocked copy of each locked marker so that when you apply your tempo, the unlocked markers shift with the music, allowing you to see where your music data has moved after applying the tempo.

LOCKING TRACKS BEFORE APPLYING A NEW TEMPO

If you have data that you don't want to move when applying a tempo to a sequence, then lock that track before applying the tempo.

Part 9

Mixing

CHAPTER 55 Mix Automation

OVERVIEW

Performer Lite's mixing environment offers complete automation of effects plug-in parameters, track muting/unmuting, effects send levels, send mutes/unmutes and more.

Overview 490
Automated mixing for MIDI and audio 490
Mix automation setup 491
Global automation enable/disable 491
Automation setup for each track 492
Automation settings in other windows 493
Reasons to disable automation 494
Automation modes 494
Recording automation 499
Inserting and editing automation 499
Insert and clear Mute Automation 502
Tempo locked, beat-based automation 503
Snapshot automation 503
Automation preferences 507
Removing and restoring plug-ins 508
VCA track automation 508
Automation and system resources 508

AUTOMATED MIXING FOR MIDI AND AUDIO

The mix automation features discussed in this chapter apply to both MIDI and audio tracks, except as noted below.

Mix automation in MIDI tracks

Only the following mix automation parameters can be automated in a MIDI track:

- Volume and pan
- Track mute/unmute
- Any form of MIDI continuous data

Mix automation in audio tracks

Audio tracks can automate every mix parameter, including:

- Volume and pan
- Track mute/unmute
- Plug-in automation
- Plug-in bypass/unbypass
- All other mix parameters
- Pitch automation
- Soundbite volume

Mix automation in virtual instrument tracks

Virtual instrument tracks can automate every mix parameter, as above for audio tracks, but there is varying support among virtual instruments for audio track automation. Many virtual instrument products rely on MIDI controller data for automation. Digital Performer supports both. For details, see "Instrument track automation" on page 87.

MIDI volume and pan automation

Performer Lite automates MIDI track volume and pan using MIDI controller data (#7 for volume and #10 for pan) to create sudden or smooth volume changes, crossfade effects and panning effects in MIDI tracks. MIDI volume controllers have a range from zero to 127. Unlike note-on velocities, which only affect the initial volume of the note, volume controllers affect volume at any time while a note is playing. Controllers can be inserted, generated, drawn, reshaped, recorded and otherwise handled using the Mixing Board and Sequence Editor as described in the rest of this chapter.

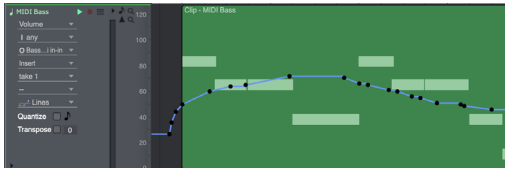


Figure 55-1: MIDI volume controllers.

Audio mix automation

Performer Lite provides continuous break-point automation for all audio mixing parameters, including volume, pan, and plug-in parameters. Audio mix automation data can be inserted, generated, drawn and reshaped. Unlike MIDI events, which create discrete changes in MIDI volume, audio automation events actually calculate a smooth, sample-accurate ramp from one event to the next. This effect is often referred to as "ramp" automation because graphically, audio volume events produce lines that ramp from one event to the next, as shown below in Figure 55-2. Several volume events can be used together to create volume curves, as shown.

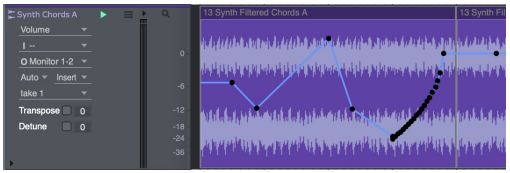


Figure 55-2: Performer Lite's ramp automation features are depicted as sloping lines connecting volume, pan and effects events.

Pitch automation

For complete details on Performer Lite's real-time pitch automation layer, see chapter 62, "Transposing Audio" (page 547).

MIX AUTOMATION SETUP

The *Automation Setup* window (Setup menu) provides dynamic control over automation, from a global level to the most detailed level in specific tracks. The Automation Setup window stays open so that you can easily access its features as you work.

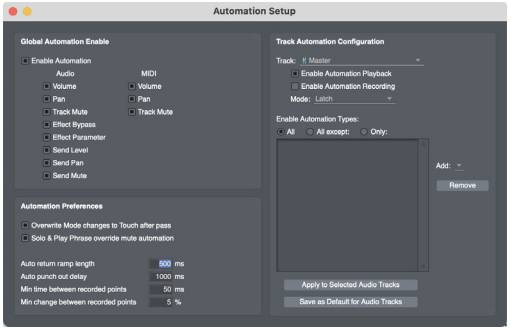


Figure 55-3: Automation Setup window (Setup menu).

GLOBAL AUTOMATION ENABLE/DISABLE

As you work with automation, there will be times when you want to temporarily disable automation and later re-enable it. Automation features can be enabled and disabled at any time on several levels:

- Globally (all automation)
- Globally by type of automation
- Per track
- Per individual effect parameters in a track

The global automation settings let you enable or disable automation altogether, or individually by several types of automation.

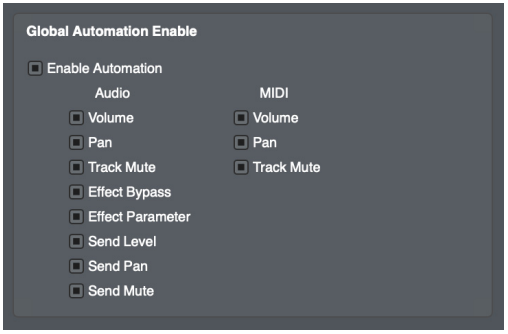


Figure 55-4: The global automation enable/disable settings.

To temporarily disable automation altogether, uncheck the *Enable Automation* check box. Doing so disables the playback or recording of all automation data (including volume and pan), although the data in each track remains unchanged (Figure 55-5), ready for reactivation. To re-enable automation, check the Global Automation check box.

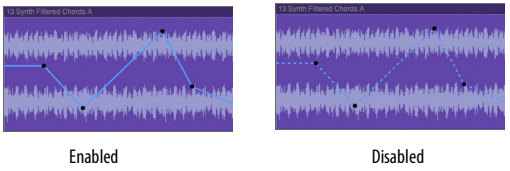


Figure 55-5: When you disable automation data, it appears as a dashed line in the Sequence Editor.

Enabling/disabling globally by data type

Similarly, the Global Automation section (Figure 55-4) has individual enable/disable check boxes for categories of automation data (for both audio and MIDI tracks), including mute, volume, pan, send mutes, send levels, and plug-in effects parameters. For example, you might want to temporarily disable plug-in automation, while maintaining volume and pan automation.

AUTOMATION SETUP FOR EACH TRACK

The Automation Setup window (Figure 55-3) also provides independent automation settings for each track (Figure 55-6). You can enable/disable automation recording, playback, and even individual plug-in parameters. In addition, you can choose one of the different automation recording modes. For convenience, some of these settings are duplicated in each track's channel strip in the Mixing Board, as well as the track settings section in the Sequence Editor (Figure 55-7).

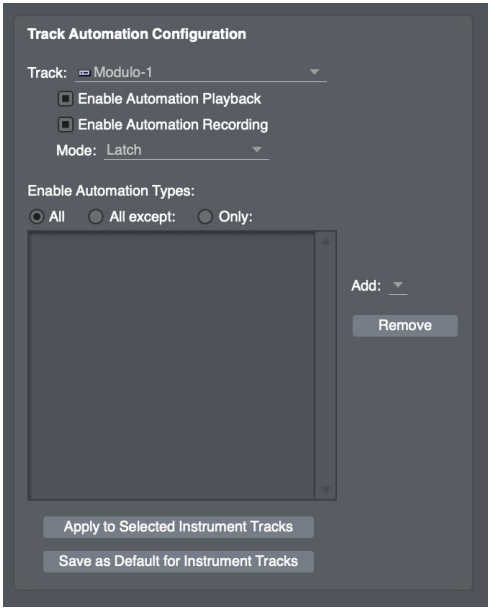


Figure 55-6: Automation setup for an individual track.

The track menu

Use this menu to choose the track for which you wish to make automation settings. All of the settings below this menu apply to the track currently chosen in the menu.

Enable automation playback

Check this box to enable automation during playback. Uncheck it to disable automation during playback. This option is a great way to temporarily

listen to the material in a track without its automation data, while the rest of the mix is still fully automated.

Enable automation recording
Check this box to allow the recording of automation data during playback. This is an important control because when it is enabled, *any* changes you make to enabled automation parameters in the track — plug-in settings, panning, volume, etc. — will be recorded. So pay careful attention to this button and only enable it when you're sure you want to record your moves.

Automation record mode
The *mode* menu lets you choose one of the different ways to record automation data into the track. You can change the mode at any time from the Automation Setup window, the track's channel strip in the Mixing Board or the track settings in the Sequence Editor. For details, see "Automation modes" on page 494.

Enabling automation by data type
Initially, any plug-in parameter can be automated as soon as you begin using the plug-in.

However, you can be very specific regarding the types of data you wish to automate for each track, as shown previously in Figure 55-6. This allows you to automate certain controls, while leaving others 'free' to be tweaked at will. In the example shown in Figure 55-6, The 'Gtr Leads' track currently has three plug-ins assigned to it in the mixing board (as inserts): Echo, Reverb and PreAmp-1. These plug-ins appear in the *Add* menu, along with Volume, Pan, Send Level, Send Mute, and track Mute. Each plug-in displays a sub-menu for each one of its automatable parameters. Use the Add menu to add automatable parameters to the list, and then use the radio buttons above the list to specify *All Except* (what's in the list), or *Only* (what's in the list). To remove items from the list, click them to select them and click *Remove*. Choosing *All* enables all plug-in parameters, regardless of what is currently displayed in the list.

'Apply to selected audio/MIDI tracks' button
If you'd like to apply the automation types you've specified in the list to other tracks, select the desired tracks first and then click the *Apply to All selected audio/MIDI Tracks* button. This operation applies the current track settings to all currently selected audio or MIDI tracks (depending on what type of track is currently being displayed).

'Save as Default for Audio/MIDI tracks' button
If you'd like to apply the automation types you've specified in the list to new tracks automatically when you add them, click the *Save as Default for Audio/MIDI Tracks* button. There is a separate default state for MIDI and audio tracks. The button changes its wording (audio vs. MIDI) depending on what type of track is currently being displayed.

AUTOMATION SETTINGS IN OTHER WINDOWS

The Mixing Board displays several track-based automation settings directly in the channel strip for each track, just above the pan pot. These settings match the corresponding track settings in the Automation Setup window, the Sequence Editor and the Effects window, as shown in Figure 55-7. If you change them in one location, they'll change in the others as well.

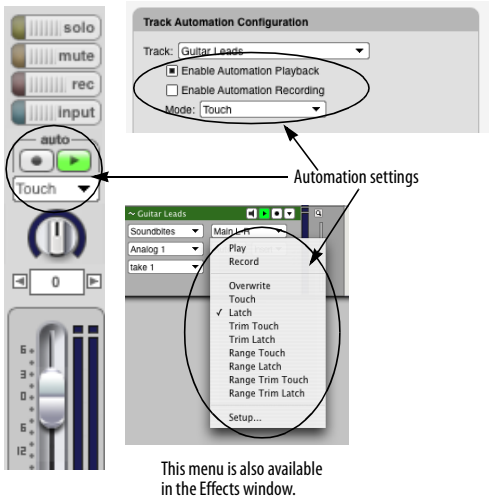


Figure 55-7: Each track has its own controls for enabling/disabling automation recording and playback. These settings are available in a variety of windows, shown here.

In the Mixing Board, the same Option/Alt-click and Command/Ctrl-click conventions apply to the automation play-enable buttons as for track play-enables. You can also 'glide' over the automation play-enable and record-enable buttons to quickly toggle a series of adjacent tracks.

The 'Auto' menu (automation menu)

As shown in Figure 55-7, the automation menu in the Sequence Editor contains the same basic automation mode settings as the Mixing Board and Automation Setup window. In addition, the 'Auto' menu changes color to further indicate the current automation record and playback settings as follows:

'Auto' menu color	What it means
Clear	Automation playback and recording are both disabled.
Green	Automation playback is enabled.
Red	Automation playback and recording are both enabled.

REASONS TO DISABLE AUTOMATION

Why would you ever want to disable automation, either globally, per track or even on the basis of individual plug-in parameters? Here are a few common reasons.

One of the main reasons to disable automation, or to enable only a particular plug-in parameter, is that often you are only automating one or two controls in a plug-in. You don't want to worry about accidentally recording changes you make to other controls that you are not automating. By not activating them for automation in the first place, this will never happen, regardless of the track's record mode setting.

Sometimes, you'll want to temporarily experiment with automatable parameters, such as plug-in controls, without accidentally recording your moves as you experiment. For example, you might want to adjust the EQ for a track to get it just right, but you don't want to record your moves as you're doing so. You can use the Automation Setup window to temporarily disable plug-in automation — or even just the EQ control you are adjusting — while you experiment.

Here's another case where you might want to temporarily disable automation: when you need to do A/B comparisons with and without it. For example, you might want to listen to a passage without the automation you've programmed for it, and then listen to it again with the automation re-enabled.

AUTOMATION MODES

Performer Lite's automation modes provide different ways to record automation. For example, *Overwrite* mode starts recording immediately when playback begins, overwriting any existing automation in the track. *Touch* mode, on the other hand, waits for you to grab a knob or fader before it begins recording.

Each track in the Mixing Board can be independently assigned to one of the modes. The automation mode menu for each track is located just above the fader as shown below.

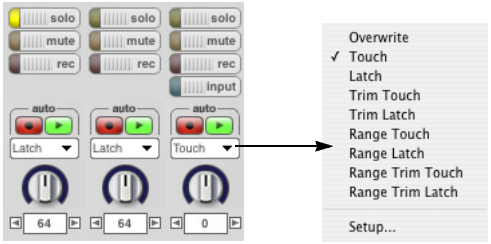


Figure 55-8: The automation modes for each track.

The automation modes are summarized below:

Automation mode	When it punches in	When it punches out
Overwrite	As soon as playback begins	Never (When playback stops)*
Touch	As soon as you grab the fader or knob	As soon as you release the fader or knob
Latch	As soon as you grab the fader or knob	Never (when playback stops)*
Trim Touch	----- Same as Touch ------	
Trim Latch	----- Same as Latch ------	
Range Touch	-- See "The Range modes" on page 498--	
Range Latch	-- See "The Range modes" on page 498--	
Range Trim Touch	-- See "The Range modes" on page 498--	
Range Trim Latch	-- See "The Range modes" on page 498--	

*In Overwrite or Latch modes, there are actually two ways you can punch out of recording on the fly:

- Disable automation recording (using any available method for disabling it)

OR

- Switch to a different automation mode

Playing versus recording

For all automation modes, the track can be either play-enabled for automation or record-enabled for automation. Except for *Overwrite* mode, the behavior of the controls you modify during playback is the same either way. The only difference is that automation data is or is not written into the track. For example, let's say that a track is play-enabled for automation (but not record-enabled). If you place the track in *Touch* mode, and you move its volume fader, the fader will return to tracking any existing automated volume levels in the track as soon as you let go of it. On the other hand, if the track is in *Latch* mode, the fader will remain where you leave it until playback stops. The next time playback begins, the fader will then return to tracking any existing automated volume levels in the track. Since the track is not record-enabled, no automation data would be written in either case.

Scaling volume data with the Trim modes

Trimming is the process of scaling existing volume or send level automation data in the track, instead of overwriting it entirely. This process is explained in further detail later in "The Trim modes" on page 497.

Overwrite, Latch and Touch modes overwrite existing automation data in the track, whereas *Trim Touch* and *Trim Latch* scale existing data. Only track volume and send levels can be

trimmed. Other types of automation data are overwritten according to the mode chosen. Here's a summary:

Automation mode	Overwrite or scale?	Data that's affected
Overwrite	Overwrites	All parameters currently being automated in the track (except those that you've temporarily disabled).
Touch	Overwrites	Only the parameter currently being adjusted.
Latch	Overwrites	Only the parameter currently being adjusted.
Trim Touch	Scales existing data	Track volume or a send level (whichever item is currently being adjusted).
Trim Latch	Scales existing data	Track volume or a send level (whichever item is currently being adjusted).

Overwrite mode

As shown by the table above, *Overwrite* mode is special because it overwrites all of the parameters currently being automated in the track. In a sense, this a way of 'wiping over' them all at once with the settings that you choose before you begin playback.

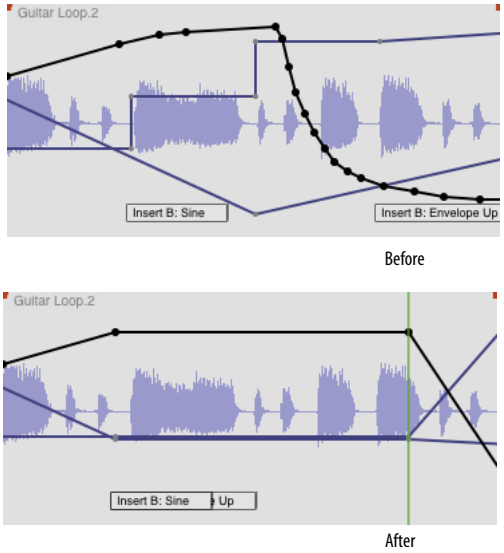


Figure 55-9: Overwrite mode 'wipes over' all currently enabled automation data in the track. The current data is replaced by data that reflects the current knob, fader or other control setting for each parameter. So be sure to set every control you are overwriting to the desired setting before overwriting.

Selective overwriting

You can selectively overwrite automation data while preserving other data by temporarily disabling certain effects parameters in the track beforehand. The disabled parameters will not be overwritten, as shown below in Figure 55-10.

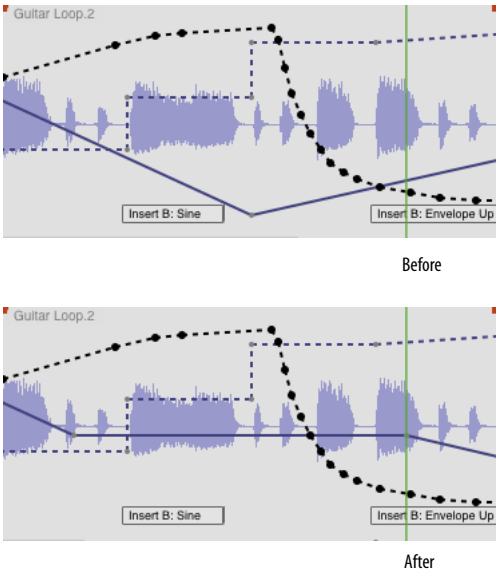


Figure 55-10: In this example, everything except volume automation has been temporarily disabled. In Overwrite mode, volume data is overwritten with the current positions of the fader.

Switching to Touch mode after overwriting

Overwrite mode is generally used once in one pass, usually at the start of the mixing stage of your project, or perhaps to wipe over a section that you want to remix entirely. After overwriting, you generally want to touch up the mix from there with the other automation modes (Touch, Latch, etc.) For your convenience, the Automation Setup window (Figure 55-3) has a check box option called *Overwrite mode changes to touch after pass*. Check this option if you'd like tracks currently in Overwrite mode to automatically switch back to Touch mode after you do an overwrite record pass, so that you don't keep overwriting again and again.

Touch and Latch modes

With the Touch, Latch, Trim Touch and Trim Latch modes, only the parameter you are adjusting is overwritten (or scaled, in the case of the two trim modes). In addition, recording only takes place when you adjust the knob, fader or other control item for the parameter. These modes are the safest because you won't accidentally overwrite existing automation data; they'll only record when you deliberately adjust a control. Just be careful not to record adjustments during playback that are not meant to be inserted. See "Reasons to disable automation" on page 494.

The Trim modes

Trim Touch and Trim Latch modes scale existing volume data or send level data in the track, rather than overwriting it. The two trim modes allow you to increase or decrease volume or send level while maintaining the existing contour in the track. For example, you might painstakingly program a detailed, dynamic volume mix for a track, but later decide that you want to raise the whole thing by 1 dB.

Accordingly, when you switch from a non-trim mode to a trim mode, the scale of the volume fader for the track changes from the normal scale where zero dB is unity gain to a relative scale where zero is the current volume level in the track, whatever it may be at any given moment. The two scales are shown below in Figure 55-11:

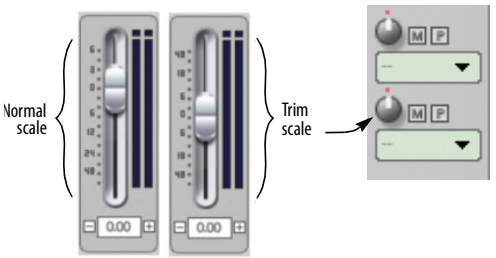


Figure 55-11: Latch mode displays the usual volume scale, where 0 dB is unity gain. Trim Latch mode (and Trim Touch) show a relative scale where zero dB is the current automation level in the track at any given location. The send knobs also go into trim mode, as shown.

In Figure 55-12 below, the volume curve is being scaled up by 8 dB using Trim Touch mode.

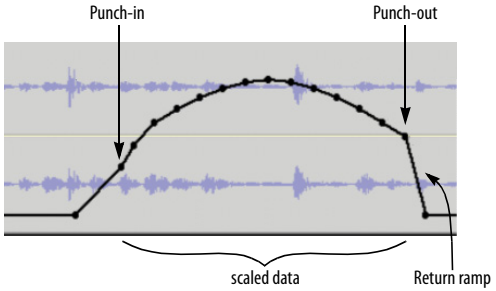


Figure 55-12: Trim Touch and Trim Latch modes scale existing automation data in the track, maintaining its original contour. The return ramp after punch-out is automatically inserted by Performer Lite to produce a smooth transition between the punch-out level and the remaining automation data.

The Range modes

The *Range Touch, Range Latch*, *Range Trim Touch*, and *Range Trim Latch* modes behave similarly to the regular Touch, Latch, Trim Touch, and Trim Latch modes, but when recording automation using the Range modes, moving controls will change automation data only within a defined time range. The settings for the data on either side of the affected time range will be preserved.

Determining a time range

To specify a time range for the range automation modes, use one of the following methods, which are listed in order of their priority:

1 an event or time range selection in the track

2 a time range selection in another track

3 the Memory Cycle range

Range Latch and Range Touch

With the Range Latch and Range Touch modes, the value of the automation data within the defined time range will become constant according to the setting of the control. Therefore, these modes are useful for adjusting automation data that is already flat, or for leveling a data curve that you wish to flatten.

Range Trim Latch and Range Trim Touch

With the Range Trim latch and Range Trim Touch modes, the current shape of the automation data curve within the time range (if any) is preserved, and the *entire curve* is moved up or down. Therefore, these two trim modes are ideal when there is already a shape to the automation data within the time range, and you wish to preserve that shape and simply raise it or lower it altogether.

Using the range automation modes

All four range automation modes are useful when mixing groups of tracks, such as background vocals or horn sections, within a specific time range, where you want to jump in and change the mix just for that range without changing it before or after.

These modes provide the following additional benefits:

- The range automation modes allow you to use the same control for modifying the data as you did for entering it. For example, if you automated a plug-in filter sweep using the knob in the plug-in window, you can use that same knob to adjust your original sweep, without having to do by some other means (such as editing the automation data in the track).

The range automation modes allow you to make changes to automation data without having to switch edit windows to display the automation data. Instead, you can continue viewing the data you are currently viewing, such as soundbites (or automation data of another type).

Return ramps

A *return ramp* (Figure 55-12) is an automation ramp automatically inserted by Performer Lite after you punch out from an automation edit. The

return ramp makes a smooth transition between the level you were at when you punched out and the level of the any existing automation in the track just after the point where you punched out.

The default length for return ramps is 500 milliseconds (half a second). You can change it to any length you prefer in the Automation Setup window (Figure 55-3 on page 491), and you can change it at any time.

RECORDING AUTOMATION

Automation data can be recorded in real time during playback. To do so, enable the automation record button for the track you wish to record (as shown in Figure 55-7), and choose the desired mode (Overwrite, Touch, Latch, etc.) You do not need to put Performer Lite into record mode to record automation. Just start playback and adjust volume, pan, plug-in settings, send levels, and mutes as desired during playback.

The automation data is recorded directly into the track, replacing existing automation data of the same kind, if any.

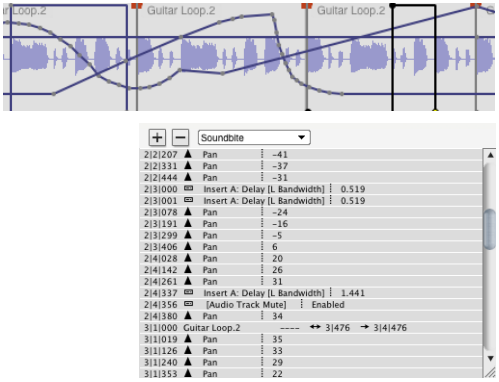


Figure 55-13: Automation data can be recorded or inserted directly into each audio track.

Controlling MIDI data density

The *Min Time and Value Range* mini-menu command in the Mixing Board window lets you control the density of the MIDI controller events generated by the Mixing Board faders and knobs in MIDI tracks. Higher minimum values produce lower density, which generally ensures smoother playback performance. But densities that are too low can cause zipper noise or "stair-stepping". When experimenting with data density, factors such as playback tempo also come into play.

INSERTING AND EDITING AUTOMATION

All of the various types of automation data (plug-in automation, mute automation, send levels, etc.) can be inserted and edited in the Sequence Editor for both MIDI and audio tracks. Use the Insert menus in the Sequence Editor to insert and edit automation data. For complete details, see:

- "Editing MIDI CC's in Points or Bars mode" on page 323
- "Editing CC data in Lines mode" on page 325
- "Working with breakpoint mix automation" on page 343.

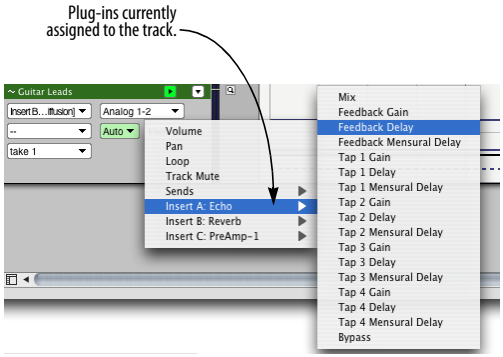


Figure 55-14: In these examples, automation data is being inserted in the Sequence Editor.

Generating automation curves

You can generate volume curves using the Insert Continuous Data command in the Region menu. Be sure to select the region over which you'd like to generate the events first. This method gives you precise numerical control over the curve.

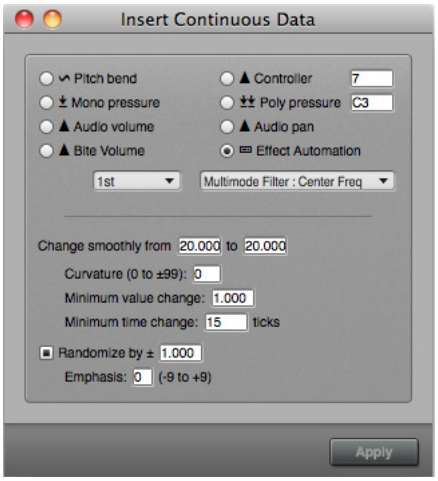


Figure 55-15: You can create numerically precise automation changes with the Insert Continuous Data command.

Viewing automation in the Sequence Editor

To view automation data in the Sequence Editor, choose the desired type of automation from the Edit Layer menu as shown below in Figure 55-16. When you do, every type of automation data that currently exists in the track will be displayed together, superimposed over the audio waveform. The specific type of data that you chose from the menu will be *activated* (its ramps and control points will appear in bold). When activated, a parameter's control points can be edited, and new points can be added by clicking anywhere on its line. In addition, some parameters display guides (faint horizontal lines) that indicate values of interest. For example, when you activate Volume, you'll see a guide at unity gain (0 dB) and the top of the scale (6.02 dB). When you activate pan, you'll see guides at pan center and pan hard left/right. For complete details, see "Working with automation control points" on page 502.

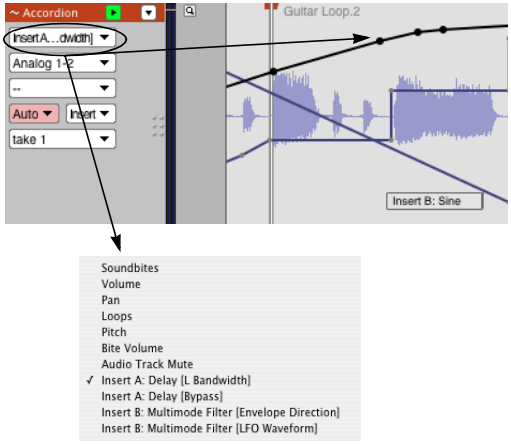


Figure 55-16: Choose any form of automation data from the Edit Layer menu to display all automation data that currently exists in the track, superimposed over the waveform. To 'activate' (make bold) a particular data parameter, choose it from the Edit Layer menu or click one of its control points.

The three types of plug-in automation data

Plug-ins have a wide variety of controls that fall into three general types of data:

Automation type	What it does	Examples
Ramp	Produces a smooth change between control points.	• Volume • Pan • Send level • Mix gain
Stair-step	Produces sudden changes among several possible states.	• LFO phase • Mute/unmute • Bypass/unbypass
Single event	Changes the setting of a parameter that has only a few settings or non-numeric settings	• LFO waveform type (sine, sawtooth, etc.) • Note values for beat-based effects.

All three types of automation are displayed together in the Sequence Editor as shown below in Figure 55-17.

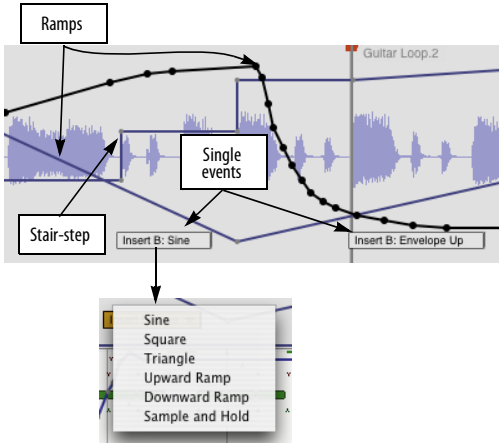


Figure 55-17: The three kinds of automation data: ramps, stair-steps, and single events. Click on a single event to access a menu of settings.

Sample-accurate ramps

Performer Lite's ramp automation produces a smooth change from one control point to the next. Ramps are calculated with sample-accurate, 32-bit floating point processing. Sample-accurate processing ensures that the ramp will be perfectly smooth, with no zipper noise or other unwanted artifacts.

Stair steps

Stair-step automation produces a sudden change at each control point. Stair-step automation is used for plug-in parameters that by nature don't call for smooth changes but instead provide discrete changes among several various states. A good example is the LFO phase controls in Sonic Modulator, which provide eight phase settings in 45-degree increments. Stair steps are also used for parameters that would be too "expensive" from a DSP bandwidth standpoint for calculating ramps. A good example of this is LFO rate.

Discrete events

Discrete events are used for any parameter that consists of two or more non-numeric settings (or just a few numeric ones). A good example is the waveform for an LFO: it could be a sine wave, square wave, sawtooth, triangle, etc. Depending on the number of possible settings for the event, Performer Lite displays the event either as a single automation event box, as shown in Figure 55-17, or as a stair-step event, with the possible values for the event shown in the ruler.

In the case of the single event box, here is a summary of what you can do with single automation events like these:

To do this:	Do this:
Insert an event	Choose it from the insert menu as shown in Figure 55-14 on page 499 and click at the desired location.
To delete an event	Click it to select it and press delete.
To change its setting	Press on its menu triangle and choose the desired setting from the menu as shown in Figure 55-17.
To move an event	Drag it.

One important thing to realize about discrete parameter boxes is that they don't display their current value continuously throughout the track the way that ramps and stair steps do. To determine the current setting for a discrete parameter, you need to scroll backwards in the track to find the last discrete event of the type you're concerned with, and then look at its setting there.

Units of measurement

In Performer Lite's included plug-ins, the numeric value for each plug-in effect parameter (displayed in the Cursor Information and Event Information bar) is displayed with the appropriate format (percent, milliseconds, etc.) for the parameter. This is also true for most third-party plug-ins. Some third-party plug-ins, however, may have their own schemes for displaying parameter values. Check their documentation for details.

Working with automation control points

Here's a summary of techniques for inserting and editing automation control points in the Sequence Editor, including a new techniques for selecting and dragging multiple control points at one time:

To do this:	Do this:
To activate a data type* (make it bold) Note: activating is necessary for all of the following techniques.	Click one of its control points or choose it from the Edit Layer menu (Figure 55-16).
To insert a control point	Activate the desired data type and then click anywhere.
To insert a ramp	Activate the desired data type. Then click anywhere on the line as many times as needed to create two or more control points, positioning the control points as needed to make the ramp.
To insert a curve	Activate the desired data type. Select Pencil tool and the desired waveform shape from the Tool palette and insert. For more information see "Inserting CC data in Points or Bars mode" on page 323.
To remove a control point	Click it to select it and press delete.
To remove a curve (multiple control points)	Select the control points (as described below) and press the delete key.
To select a curve (multiple control points)	Activate it and then drag horizontally over its control points.
To move a curve (multiple control points)	Select them as described above and drag one of the selected control points.

☛ *To activate any type of data other than volume and pan, you must first insert some data (via the Insert menu or by recording) in order for the data to appear in the Edit Layer menu (and be available for activation).

INSERT AND CLEAR MUTE AUTOMATION

The *Insert Mute Automation* and *Clear Mute Automation* commands in the Region menu allow you to quickly apply and clear mute automation on a region by region basis in the Sequence Editor. Just make a selection, such as an individual soundbite or any time range selection over any combination of MIDI and/or audio tracks, and then choose of these two commands from the Region menu to mute or unmute the selection.

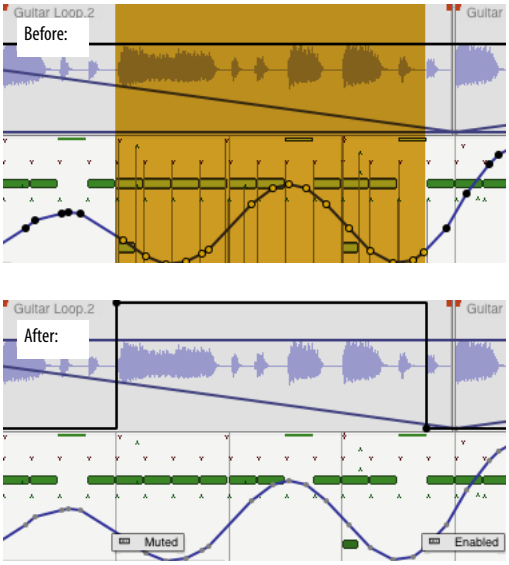


Figure 55-18: Muting a region with the Insert Mute Automation command. Note that two mute automation events are inserted at the beginning of the region to produce the proper stair-step effect.

TEMPO LOCKED, BEAT-BASED AUTOMATION

Some plug-ins allow you to lock certain parameters, such as an LFO, to the tempo of your sequence. This allows the effect to stay in sync with the beat of your music.

For details on tempo-locking effects included with Performer Lite, see "Tempo lock" on page 8 in the *DP Plug-in Guide*. For details on tempo-locking third-party effects, refer to their documentation.

SNAPSHOT AUTOMATION

An automation *snapshot* is the process of inserting automation data for multiple mix parameters in one step at a particular location — or over a specified time range. For example, you might want to set initial values at the very beginning the project (e.g. bar 1) for all mix parameters you'll be automating. Or, you might like to reset all values for an entire section of a mix, regardless of the automation data currently there. Performer Lite lets you take a snapshot at a particular point in time or apply it to any time range of your choice. You also have complete control over which parameters to include in a snapshot. Snapshot automation can be applied from the Mixing Board, Sequence Editor, Effects window or other windows. Different default settings can be stored for taking snapshots from these different windows.

Taking a snapshot

To take a snapshot:

1 Prepare for the snapshot as discussed in the next few sections.

2 Click the Snapshot button in the Sequence Editor, Mixing Board, or Effects window.

Doing so opens the *Automation Snapshot* dialog shown below in Figure 55-19:

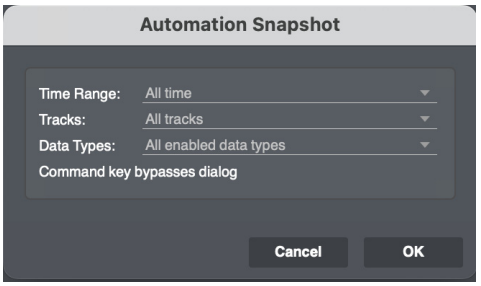


Figure 55-19: Taking an automation snapshot.

3 Choose the desired settings and click OK.

Preparing for a snapshot

Before you take a snapshot, there are several preparations to make that determine the following characteristics of the snapshot:

- The *time range* to be affected
- The *tracks* to be included
- The automation *data types* to be included

Specifying a location or a time range

Even though automation data consists of discrete events (control points in audio tracks and MIDI controller events in MIDI tracks), it is important to realize that they actually affect your mix over a range of time. For example, if you click on a volume automation line in an audio track to insert a volume control point, ramps are created between the new point and the two points before it and after it. So you've actually affected the entire time range between all three points.

Similarly, when working with automation snapshots, you need to think about the time range that the snapshot will affect and specify it before inserting the snapshot. Performer Lite lets you specify a snapshot's time range in two ways:

- by positioning the playback wiper (the current counter location)
- by making a time range selection

The options in the *Time Range* menu (shown below in Figure 55-20) determine which method to use. Performer Lite then applies the snapshot by placing automation control points (or MIDI controller events) at the start *and end* of the time range (to maintain the existing automation levels beyond the time range).

When applying a snapshot to all time or a selected range, any existing automation data within the time range is removed.

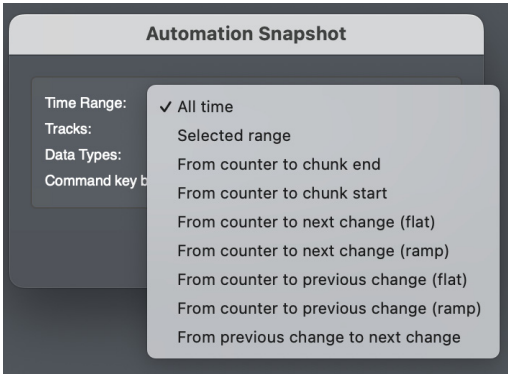


Figure 55-20: Specifying a time range for the snapshot.

All Time
Use *All Time* if you wish to apply the snapshot to your entire mix, start to finish. The current counter location or current selection does not matter for this option.

Selected Range
If you would like to apply the snapshot to a particular range of time, make a time range selection in any Performer Lite window before you take the snapshot and then choose the *Selected Range* option in the Automation Snapshot dialog (Figure 55-20).

From Counter to Sequence End/Start
This option applies the snapshot from the current counter location all the way to the end or start of the sequence. To use this option, place the playback wiper at the desired location, or type it into the main counter, before taking the snapshot.

From Counter to Next/Previous Change (Flat or Ramp)
This option applies the snapshot to the range of time from the current counter location to the next or previous automation control point (or MIDI controller). It does so independently for each parameter being included in the snapshot. The *Flat* option produces a constant parameter value throughout the time range being affected by the snapshot; the *Ramp* option produces a standard automation ramp from the control point inserted at the wiper location to the next or previous control point for each automation parameter. Note that the Ramp option only applies to ramp-style data types, such as volume and pan. See "'Morphing' between presets" on page 506 for an interesting way to use this option.

From Previous Change to Next Change
Use this option to apply the snapshot to the entire range of time between two existing snapshots (or any other arrangement of consecutive automation control points). Just place the playback wiper (or counter location) anywhere between them. Use this option to quickly adjust an existing snapshot by placing the wiper anywhere just to the right of it, rather than tediously attempting to place the wiper directly at the location of existing automation data.

If you situate control points at the beginning and end of a section, this option gives you a way to alter the automation in the section in one step.

Specifying tracks

The *Tracks* menu in the Automation Snapshot dialog gives you several convenient options (Figure 55-21 below) for choosing which tracks to

include in the snapshot. If you wish to use the *Selected Tracks* option, select the desired tracks before taking the snapshot. If you wish to use one of the window display options, be sure to show and hide tracks as desired before taking the snapshot. When using the *Edit Window* and *Mixing Board* options, all tracks currently highlighted in the track selector list are included in the snapshot, even if they are not currently visible in the window itself.

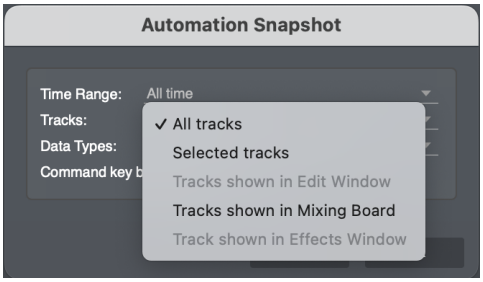


Figure 55-21: Specifying the tracks to be included in the snapshot.

Specifying data types

The *Data Types* menu in the Automation Snapshot dialog gives you several convenient ways (Figure 55-22 below) for determining which types of automation data to write to each track with the snapshot operation.

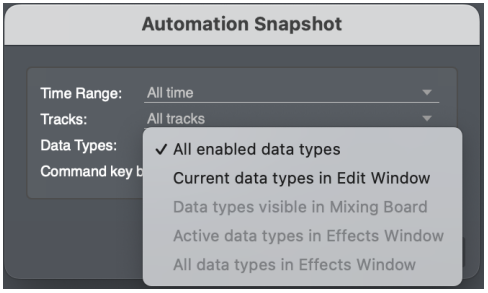


Figure 55-22: Specifying the data types to be included in the snapshot.

All Enabled Data Types
This option causes the snapshot to write all of the automation data types that are currently enabled in the Automation Setup window (Setup menu). This includes the global enables and the automation enable/disable settings for each individual track. Be sure to enable and disable automation as desired before taking a snapshot using this option.

Current Data Types in Edit Window
This option inserts automation data being displayed in the Sequence Editor window. More specifically, the snapshot only writes automation data that is currently 'active' (as demonstrated in Figure 55-16 on page 500) for each included audio track. Notice that only one data type can be active at a time. This option is good for quickly inserting snapshots for the data you are currently viewing in the Sequence Editor. For example, if you are currently displaying volume automation in all audio tracks (volume automation is the active data type for all tracks), use this option to quickly insert a volume-only snapshot.

Data Types Visible in Mixing Board
This option inserts automation data for all automatable controls currently visible in the Mixing Board window. For example, if the Inserts section is currently hidden, no insert level or pan data will be inserted by the snapshot. If you wish to use this option, be sure to use the Mixing Board window mini-menu to show/hide each section as desired before taking the snapshot.

Data types for Current Effect in Effects Window
This option inserts automation data for all automatable parameters of the plug-in currently being shown in the Effects window. This is a great way to automate plug-in presets (by inserting them as snapshots). Also see "'Morphing' between presets" on page 506.

Using snapshots to capture automation and apply it elsewhere

You can use Performer Lite's snapshot feature to capture automation settings from one part of your mix and apply them somewhere else. To do so:

1 In the Automation Setup window (Setup menu), enable all automation types you wish to include in the operation.

2 Position the playback wiper (or main counter) at the location in the mix you wish to capture. Doing so causes all automation-enabled knobs, faders and other settings in the Mixing Board to update to their correct values at that point in the mix.

3 Back in the Automation Setup window, globally disable all automation by unchecking the global automation check box. Doing so 'freezes' all knob and fader settings in the Mixing Board, so that they will not move when you change the current playback location.

4 Scroll to the location in the mix at which you'd like to apply the Mixing Board's current automation settings.

5 In the Automation Setup window, check the global automation check box to re-enable automation globally.

☛ At this point, make absolutely sure that the current playback location does not change. Otherwise, the current settings in the Mixing Board will be lost.

6 Take an automation snapshot as usual.

'Morphing' between presets

The *Ramp* option in the Automation Snapshot *Time Range* menu (Figure 55-20 on page 504) is a great way to "morph" from one plug-in preset to another as follows:

1 Position the playback wiper (or main counter).

2 Choose a plug-in preset.

3 Take a snapshot of the plug-in parameters.

4 Move the playback wiper forward to the next location at which you'd like to insert a preset.

5 Choose the next preset.

6 Take a snapshot of the plug-in parameters using the *From Counter to Previous Change (Ramp)* Time Range option.

7 Repeat as desired.

Alternatively, you could start with the final preset in the series you are inserting and work backwards with the *From Counter to Next Change (Ramp)* Time Range option.

Snapshot settings are remembered

You can take a snapshot from within the following windows (when the window is the front-most, active window):

- Sequence Editor
- Mixing Board
- Effects window

Performer Lite remembers the snapshot settings you last used in each context. For example, you might only include visible mix parameters when taking a snapshot in the Sequence Editor, but include only plug-in parameters when taking a snapshot from the Effects window. In addition, you might like to always include *all* mix parameters when taking a snapshot from the Mixing Board. You can specify snapshot settings for each window the first time you take a snapshot from within the window. Performer Lite then remembers the settings and will use them the next time you take a snapshot from the window.

To reinforce this concept visually, the Automation Snapshot window (Figure 55-19 on page 503) opens directly on top of the window from which it is being invoked.

Performer Lite also stores a generic set of snapshot settings for all other windows. As a result, if you take a snapshot with the *Take Automation Snapshot* command in the Region menu when the Sequence Editor, Mixing Board or Effects window is *not* the front-most active window, the settings you see in the Automation Snapshot dialog (Figure 55-19 on page 503) will be remembered independently from the settings for those three windows.

A shortcut for taking snapshots

To take a snapshot from within a window with same settings last used for that window, press Command–Control–single quote ('). Alternatively, you can hold down the Command/Ctrl key while choosing *Take Automation Snapshot* from the Region menu. Doing so changes the menu command into *Take Automation Snapshot Again*.

Making the transition to an automated mix

When you first begin working on a Performer Lite project, there is no existing automation data in each track until you record it, insert it by hand or insert it via a snapshot. Beforehand, your mix simply consists of the current fader, knob and insert settings in the Mixing Board. If you record or insert an automation control point for the first time in an audio track, somewhere in the middle of the sequence, Performer Lite automatically extends a line from the control point back to the beginning of the sequence to maintain the initial setting for that parameter in the mixing board. As a result, you get what you would expect: the initial setting you had made in the mixing board (before automation), followed by the automation data you recorded or inserted.

The above behavior does not apply to MIDI tracks. When you insert MIDI controllers for volume, pan or other mix-related parameters, Performer Lite does not automatically insert an initial value for them at the beginning of the sequence. Doing so is up to you.

Before you begin to automate the mix, you might want to insert initial values for all mix parameters you'll be automating so that you have a convenient reference point to start from. This step is not necessary, but it you might find it helpful to have initial values before you begin automating, especially for MIDI tracks. You can always go back and change the initial values at any time, either by tweaking them individually in the edit window of your choice or by retaking the snapshot at the beginning of the sequence.

AUTOMATION PREFERENCES

The Automation Setup window (Setup menu) offers several preferences.

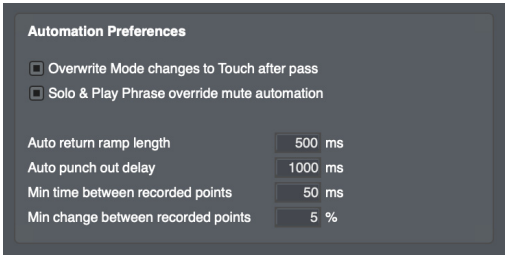


Figure 55-23: Automation Setup

Overwrite mode changes to touch after pass

This automation preference, when checked, causes tracks in Overwrite mode to automatically change over to Touch mode after you record a pass in Overwrite mode. This option helps you to avoid unnecessary or unwanted consecutive overwriting. For details, see "Switching to Touch mode after overwriting" on page 497.

Solo & Play Phrase override mute automation

When this option is checked, soloing a track causes mute automation in the track to be ignored, allowing you to always hear the audio in the track. Similarly, if you press Option/Alt-spacebar to audition some audio, it will play, even if it is currently being muted by mute automation data. If

instead, you would like soloing and auditioning to reflect the track's current mute automation, uncheck this option.

Auto return ramp length
At the end of an automation record pass, when you punch out by either releasing the fader or stopping recording altogether, Performer Lite automatically inserts a *return ramp* at the punch-out point. This ramp produces a smooth transition from the level you were at when you punched out and the existing data in the track at the punch out point. The *Auto return ramp length* preference determines the length of this ramp. For further details and an example, see "Return ramps" on page 498 and Figure 55-12 on page 498.

Auto punch out delay
This automation preference is useful when you are controlling Performer Lite automation parameters from an external control surface, such as a control surface or a MIDI fader box of some kind. The *Auto punch out delay* is the amount of time (in milliseconds) after the last event is received from the external knob or fader and the instant when Performer Lite drops out of record (stops recording moves from the external device).

Control surfaces send data with different degrees of sensitivity. With some, you may find that punch out occurs too frequently; with others, you might find that punch-out takes too long. To avoid punch outs that stutter, raise the punch-out delay. To reduce punch-outs that take too long, lower it (but be careful not to lower it so much that it begins to stutter).

Minimum time between recorded points
This automation preference determines how frequently control points will be generated during real-time recording. Lower settings generate more control points that result in finer tracking of your moves. Higher settings produce fewer control points that result in courser tracking of your moves.

Minimum change between recorded points
This automation preference determines how frequently control points will be generated during real-time recording. Lower percentages generate more control points that result in finer tracking of your moves. Higher percentages produce fewer control points that result in courser tracking of your moves.

REMOVING AND RESTORING PLUG-INS

If you remove a plug-in from a track entirely, its automation data remains in the track, and it can still be edited. If you later restore the plug-in (on any insert), the automation data will once again automate the plug-in. Orphaned automation data is displayed in the Track Display menu with italic text, along with the word *missing*, as demonstrated earlier in Figure 55-16 on page 500.

VCA TRACK AUTOMATION

VCA tracks can be automated, just like audio tracks. Two types of automation data are supported: volume and track mute. Automation is handled in the same fashion as audio tracks. However, there are several unique ways that VCA automation interacts with VCA group tracks. See "VCA tracks and mix automation" on page 511.

AUTOMATION AND SYSTEM RESOURCES

Automation adds to overall CPU processing overhead. If your mix is taxing your computer, you can conserve CPU overhead by enabling automation only for data types and plug-in parameters that you need. For example, don't enable automation for an effect parameter and then insert only one setting for the parameter in the track. Only enable automation for parameters that need to change over time.

CHAPTER 56 VCA Tracks

OVERVIEW

On large-format analog mixing consoles, a VCA (*Voltage Controlled Amplifier*) is a channel gain control used to adjust the volume faders of multiple tracks simultaneously. In Performer Lite, a VCA track does the same thing: after being assigned to a track group, it controls the relative volume of all the tracks in the group. It also controls the Solo, Mute and Record-enable status for all tracks in the group. In addition, VCA tracks can be automated, as explained later in this chapter. VCA tracks can be assigned to any track group, even groups that contain other VCA tracks.

VCA tracks and track groups 509
Creating a VCA track 509
VCA control 510
Shared tracks and nested VCA groups 510
VCA tracks and mix automation 511
Releasing a VCA track from its group 512
MIDI tracks and VCA tracks 512
Exporting to earlier versions of DP 513

VCA TRACKS AND TRACK GROUPS

VCA tracks depend on track groups, so be sure to familiarize yourself with this feature before using VCA tracks. See “Track Groups” on page 92.

CREATING A VCA TRACK

To create a VCA track, choose *Project menu* > *Add Track* > *VCA Track*. The new VCA track appears in the Track List, Sequence Editor, Mixing Board, etc. as usual. From it’s output menu, choose the desired track group that you wish to control with it.

As a shortcut, you can create both the VCA track and its track group together in one operation. First, in the Track List or Sequence Editor, select the tracks you wish to include in the group, and then Choose *Project menu* > *Add Track* > *VCA Track And Group*. A dialog appears for naming the group and choosing the placement for the VCA track. Click OK and a new VCA track is created, assigned to a new VCA track group consisting of the tracks selected.

Figure 56-1: VCA tracks in the Mixing Board, along with their assigned track groups.

VCA track settings

Each VCA track has the following universal track settings (“Track settings” on page 59):

- Name
- Track type icon
- Play/mute
- Level meter
- Record-enable
- Input monitoring
- Output (see below)
- Take
- Automation settings
- Lock

- Color

The VCA track output menu
For VCA tracks, the output menu shows available track groups that the VCA track can be assigned to control. If two or more tracks are selected when you access the output menu, choosing *Make New Group* from the menu creates a new group consisting of the selected tracks, and the VCA track is assigned to the new group. If you wish to disconnect a VCA track from its currently assigned group, choose *None* from its output menu. See "Releasing a VCA track from its group" on page 512.

Assigning VCA tracks to non-VCA groups
You can assign a VCA track to any type of group, even non-VCA groups: *Edit, Mix*, *Edit & Mix*, or *Custom*. When doing so, the group converts to *Custom* with inherited settings from its previous group type, which you can further customize as desired. The *Volume Fader* setting becomes grayed out to indicate that the group is under VCA control. See "Custom group" on page 94.

VCA track level meter
The level meter in a VCA channel strip in the Mixing Board (Figure 56-1) shows the current peak level of all tracks in the VCA track group.

VCA CONTROL
VCA tracks control the following channel settings of the tracks in its assigned group.

Volume fader
Drag the VCA track's volume fader to control all the track faders in its assigned group. The grouped faders scale their position relative to the VCA fader. To adjust their faders relative to the VCA, simply move their faders. Unlike mix groups, VCA controlled faders don't affect other faders in the group. Also note that a fader can't be raised above its +6 dB max level, as scaled by its VCA fader. If you try to do so, it will snap back down to its scaled +6 dB level. VCA faders can also be automated. See "VCA tracks and mix automation" below.

Mute/Solo/Record-enable/Input monitoring
VCA track channel strips in the Mixing Board display Mute, Solo, Record-enable and Input Monitoring enable switches above the fader (Figure 56-1). These switches toggle the corresponding setting for all tracks in the group.

SHARED TRACKS AND NESTED VCA GROUPS
Tracks can be freely shared among VCA-controlled groups, so a single track could be controlled by several different VCA tracks. Similarly, you can nest VCA tracks within VCA-controlled groups, allowing you to control VCA tracks with other VCA tracks. This gives you a great deal of flexibility when setting up control of your mixes. For example, you could create several VCA groups for multi-track drum mics:

- Kit
- Toms
- Overheads
- Room

Then you could combine the VCA tracks for these four groups into another VCA group called *Drums*.

You could then combine the VCA track for the *Drums* group with VCA tracks for *Bass,* and *Guitar* groups to create another VCA group called *Rhythm Section,* as shown in Figure 56-2.

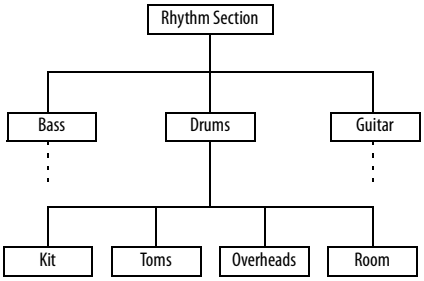


Figure 56-2: An example of nested VCA groups.

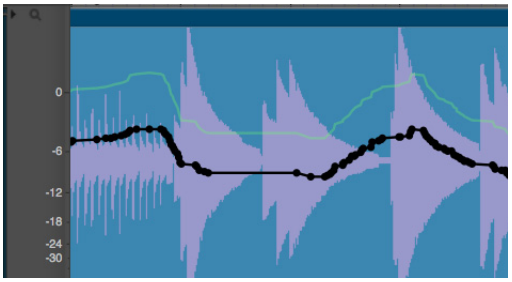


Figure 56-4: In this example, the VCA fader controlling this track is set to +5 dB, so the track automation is scaled up by 5 dB (green line).

VCA TRACKS AND MIX AUTOMATION

If a VCA group track contains volume automation, the group's VCA track fader will affect that automation. In the VCA group track, the modified automation is represented by a green line, while the original automation appears as the usual black line (Figure 56-4). The green line represents what is actually played, based on the effect of the VCA fader.

VCA track automation

VCA tracks can be automated, just like audio tracks. Two types of automation data are supported: volume and track mute. Automation is handled in the same fashion as audio tracks. See chapter 55, "Mix Automation" (page 490).

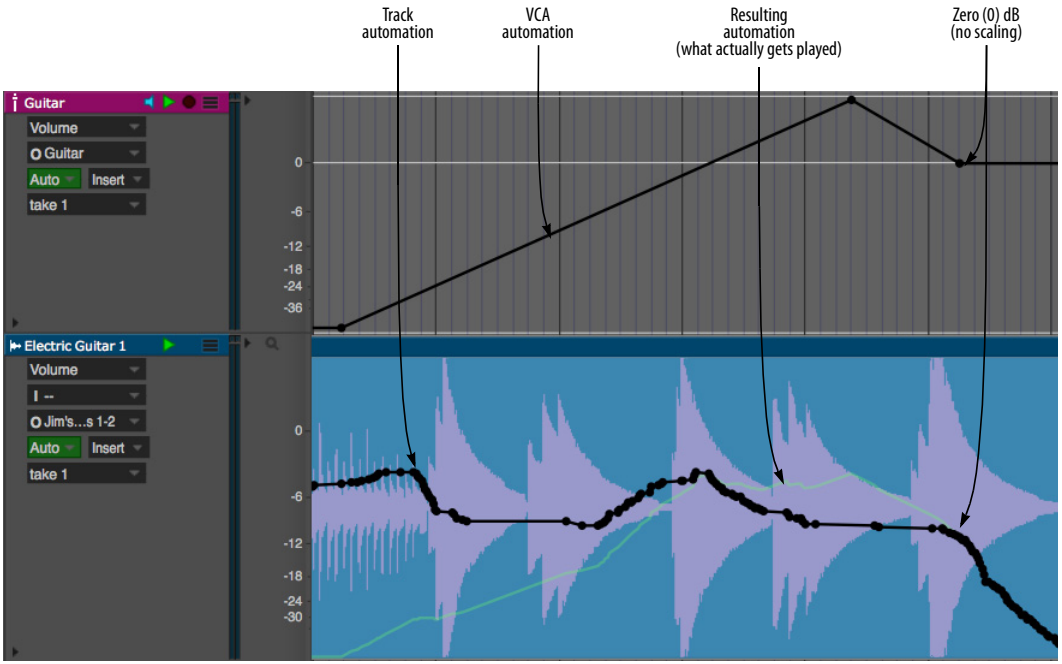


Figure 56-3: Volume automation in the VCA track scales any automation in the VCA group tracks it controls. The resulting scaled automation is shown as a green line. This is what actually gets played. Notice how the green line meets back up with the regular track automation (black line) when the VCA automation returns to zero (0) dB (no scaling).

VCA volume automation

VCA volume automation scales any volume automation in the VCA group tracks it controls. In the VCA group track, two automation curves are displayed: the original (black) and the scaled curve (green), which represents the effect of the VCA automation on the track automation. Therefore, you can always clearly see the effect that the VCA automation is having on the track automation, as shown in Figure 56-3. If multiple VCA tracks are controlling a VCA group track, their automation curves are combined in the group track to produce the resulting green line (what actually gets played).

VCA track mute automation

VCA track mute automation overrides any track mute automation in the grouped tracks controlled by the VCA track. Similar to volume automation, green lines in the group track indicate the effect of the VCA mute automation.

Setting the colors for VCA volume and mute automation

To customize the colors for VCA volume and mute automation, choose *View menu* > *Colors* > *Set VCA Volume Color* and *View menu* > *Colors* > *Set VCA Mute Color*. A standard macOS or Windows color picker appears, allow you to set the color.

To reset the colors, choose *Reset VCA Colors to Default* from the same sub-menu.

RELEASING A VCA TRACK FROM ITS GROUP

If you wish to disconnect a VCA track from its currently assigned group, choose *None* from its output menu. When you do so, you will see the alert shown in Figure 56-5.

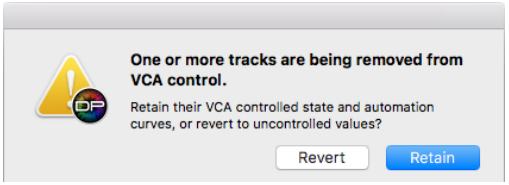


Figure 56-5: Disconnecting a VCA track from one or more tracks.

As explained earlier, VCA tracks scale the volume fader and and any volume automation of the tracks they control. If you want to retain that scaled result, even after the VCA is disconnected, click *Retain*. If you want the track to revert to its volume setting and/or original automation data, unaffected by the VCA, choose *Revert*.

MIDI TRACKS AND VCA TRACKS

MIDI tracks can be controlled by a VCA track in similar fashion to audio tracks. Automation data is displayed in green, as with audio tracks, in points, bars and lines mode, as shown in Figure 56-6. VCA mute events appear in the median strip.

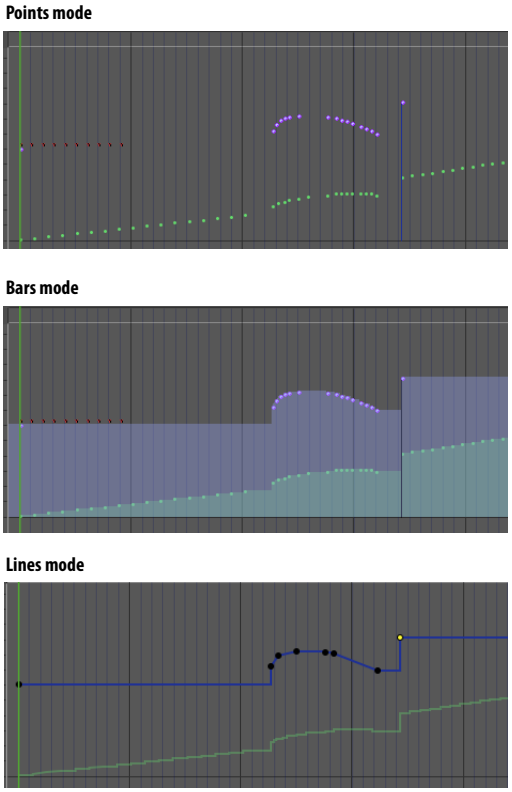


Figure 56-6: Similar to audio tracks, MIDI volume controllers scaled by VCA faders display their scaled value in green.

EXPORTING TO EARLIER VERSIONS OF DP

If you use the Save As command to save your project as a Digital Performer Version 9 project (or earlier), which does not support VCA tracks, VCA tracks will disappear from the project. In addition, group tracks with automation data being scaled by a VCA track will retain the VCA scaling, similar to clicking the *Retain* button in Figure 56-5. This means that the track will sound the same, even after being exported to an earlier version.

Part 10

Processing

CHAPTER 57 Effects Window

OVERVIEW

The Effects window is a like a virtual effects rack for real-time, non-destructive MIDI and audio effects and virtual instruments. It displays all of the controls for a given effect on a given insert on a certain track. You can quickly and easily switch the effect, insert, and track you are viewing in the Effects window at any time.

The Effects window settings modify the track's playback only. The original data in the track is not changed. As a result, effects settings can be adjusted or turned off (bypassed) at any time.

This chapter provides general information about the Effects window. For details on using audio effects, MIDI effects, and virtual instruments, see chapter 58, "Audio Effects Plug-ins" (page 521), chapter 59, "MIDI Effects Plug-ins" (page 532), and chapter 13, "Instrument Tracks" (page 82).

Overview **516**
Effects Window Quick reference **516**
Opening and Closing the Effects window **518**
Bypassing an effect **518**
Saving, loading, and editing presets **518**
Editing Effects **520**

EFFECTS WINDOW QUICK REFERENCE

Below are the basic controls in the Effects window. The controls for each specific effect will, of course, vary.

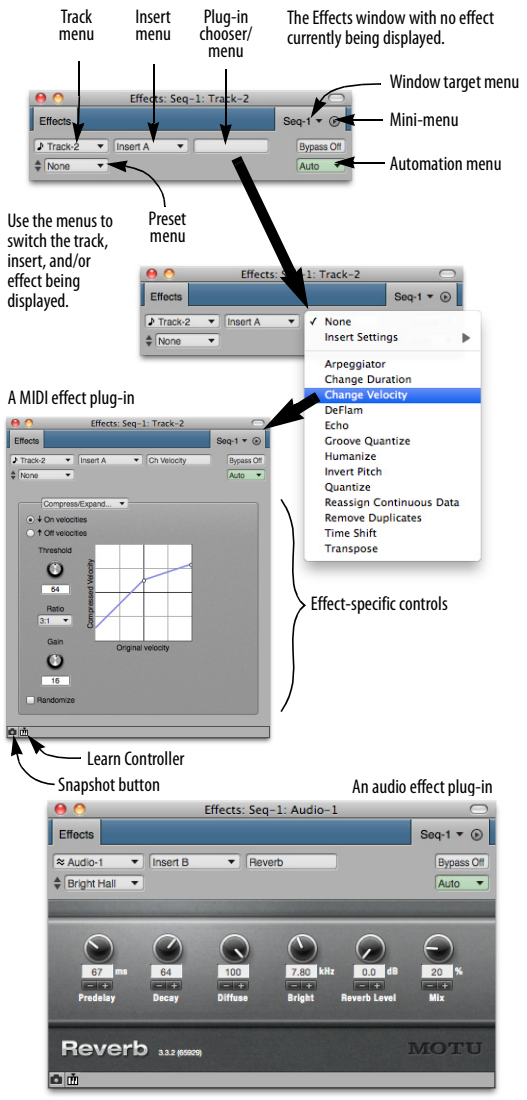


Figure 57-1: The Effects window.

Window Target menu: This menu is used to change the sequence or V-Rack that the Effects window is showing. The name of the selected sequence or V-Rack is displayed.

Track menu: This menu is used to change the track that the Effects window is showing. The name and track type icon of the selected track is displayed.

Insert menu: This menu is used to change the insert that the Effects window is showing. The name of the selected insert is displayed.

When the Insert menu is open, all inserts for the track are shown, with each occupied insert also including the name of plug-in loaded in that insert.

Plug-in chooser/menu: The Plug-in chooser/menu is used to change the plug-in for the selected insert. The name of the selected plug-in is displayed.

Bypass: Temporarily disables the plug-in.

Automation menu: This menu is used to change the automation play-enable/record-enable state and automation mode for the track the effect is on.

Preset menu: This menu is used to save and recall presets. The name of the currently loaded preset is displayed. If you have made changes to the plug-in after loading a preset, the name becomes italicized to indicate that the preset's settings have been altered.

Learn Controller: Lets you assign a knob, slider or button from an external MIDI controller to a parameter in the plug-in window for MIDI remote control ("MIDI Learn"). See "Attaching a MIDI controller to plug-in parameters" on page 529.

Snapshot button: Takes an automation snapshot of the settings in the plug-in window. See "Taking an automation snapshot of plug-in parameters" on page 529.

Effect-specific controls: Controls for the specific plug-in are displayed here. These will be different, depending on the selected plug-in.

Effects window mini-menu

The Effects window mini-menu contains the following commands:

Floating: When checked, this menu item causes the window to stay in front of all other windows.

Float Effects by Default: When checked, plug-in windows are set to float when they are first opened. This is the same setting as the global preference ("Plug-in windows float above other windows by default" on page 528).

V-Rack Edit: Use the *V-Rack Edit* command to toggle between the current sequence and the last viewed V-Rack. You can also use its default key binding, Command/Ctrl-Shift-V.

OPENING AND CLOSING THE EFFECTS WINDOW

Opening the Effects window

There are several ways to open the effects window:

- In the Mixing Board, choose an effect from any insert menu, or double-click an insert that already has an effect
- For virtual instruments, double-click the track name in the Sequence Editor.

You can have many Effects windows open at once, if you'd like.

Choosing a new effect for an insert

To choose an effect for an insert, select the desired effect from the Mixing Board insert. (See "Choosing a plug-in for an insert" on page 179). When creating a new effect, Performer Lite uses the most recent settings for that effect. For example, if you tweak quantize parameters on one track until they are just right, adding the quantize effect to another track will initially apply the same settings.

Floating effects windows

Effects windows can be made to "float" (stay in front of) other windows. This can be done on a per-window basis by checking the *Floating* mini-menu item of the Effects window itself. There is also a global preference to make all newly opened effects windows float. See "Plug-in windows float above other windows by default" on page 528.

Closing the Effects window

You can close the Effects window by:

- Clicking its close button
- With the standard 'Close window' key binding (Command/Ctrl-W)
- With the *Window menu* > *Close* command

Hold Shift and Option while closing an Effect window in any of those ways to close all open Effect windows.

BYPASSING AN EFFECT

An effect can be bypassed by clicking the Bypass button in the Effect window. As a shortcut, you can bypass an effect directly in the Mixing Board by Option/Alt-clicking the effect insert with the finger cursor.

SAVING, LOADING, AND EDITING PRESETS

Presets are found in the Preset menu in the Effects window when the desired effect is being displayed in the window. For example, when the Effects window is showing the Reverb plug-in, you'll see Reverb presets in the Preset menu.

The current preset

When you choose a plug-in preset from the Preset menu, the preset name is displayed in the Preset menu, as shown in Figure 57-2. It also gets a check mark next to the name when the menu is open. If no preset has been loaded, "None" is displayed.

If you modify the settings, the name of the preset will become italic to let you know that you are now working with a modified preset. If you like, you can save the modified preset as a new preset with the *Save Settings* Preset menu command.

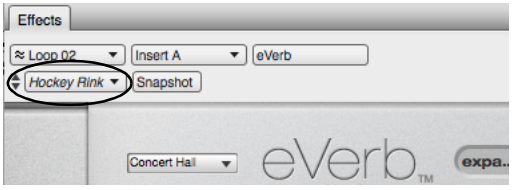


Figure 57-2: The current preset being used is displayed in the Preset menu. If you modify the settings of the effect, the preset name becomes italic to indicate that it is now modified.

Where presets are stored

Plug-in 'factory' presets are stored with the plug-in itself, so they are always available in any Performer Lite project.

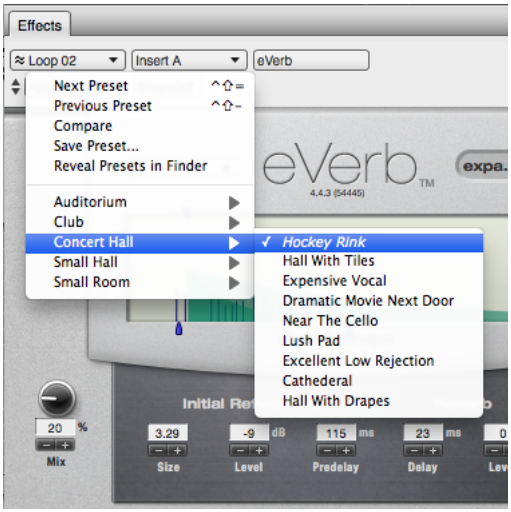


Figure 57-3: Effects presets are located in the Effects window Preset menu. The menu only displays presets for the type of effect currently displayed in the Effects window. This example shows the eVerb plug-in and eVerb effects presets in the menu.

User presets are stored in separate folders for each plug-in, with each preset saved as a separate file. See "Saving plug-in settings as a user preset" below.

Saving plug-in settings as a user preset

To save the current plug-in settings as a preset, choose *Save Settings* from the Preset menu and type in the desired name. You can save the settings anywhere you wish on disk, but if you would like them to appear in the User Presets sub-menu, save them in the plug-in's presets folder. For example, presets for the Chorus plug-in would be stored here:

macOS	/Library/Audio/Presets/Performer Lite/Chorus
Windows	User\Documents\MAS Presets\MOTU\Chorus

If it is saved in this location, the new preset appears in the User Presets sub-menu.

Use the *Show Presets in Finder/Explorer* mini-menu command to go to the folder where user presets are stored for a plug-in. There, you can rename, duplicate, delete, etc. your preset files.

VST and Audio Unit presets

Some VST and Audio Unit plug-ins have the ability to save presets as a standard preset file on disk. Performer Lite supports these preset files. You can save them and load them in the same way as MAS plug-in presets, including the ability to drag and drop them to inserts in the Mixing Board.

Loading plug-in user presets

To load a user preset, choose it from the *User Presets* sub-menu in the Presets menu. User presets can be dragged and dropped from the Finder or Explorer directly to inserts in the Mixing Board.

Changing a preset

To change an existing preset:

1 Choose the preset.

2 Modify it as desired.

3 Choose *Save Preset* from the Presets.

4 Save it with the same name. An alert dialog will confirm that you wish to change the existing preset.

Accessing user presets in other projects

Because user presets are stored independently from Performer Lite documents or the Performer Lite application itself, they automatically appear in projects other than the one in which you created the preset. You can also drag and drop them from their folder into any project at any time.

Next/Previous Preset

You can quickly cycle through the available presets by:

- Click the *Next Preset*/*Previous Preset* buttons (Figure 57-1 on page 516)
- Choosing *Next Preset*/*Previous Preset* from the Preset menu
- Using the *Next Preset*/*Previous Preset* key commands (Shift-Control/Win-equal and Shift-Control/Win-minus)

'Compare' Preset menu item

The *Compare* Preset menu item lets you compare a modified preset with the original, unmodified preset. You can freely switch back and forth between them to make a thorough A/B comparison.

When you first call up a preset from the Effects window Presets menu (either a factory preset or a user preset you created), the Compare menu item is grayed to indicate that the preset is currently unmodified.

As soon as you modify a plug-in parameter, the *Compare* menu item becomes ungrayed, indicating that the preset has been modified.

If you now choose Compare, it becomes checked, and the original preset settings are restored. In addition, your modified settings are stored by the Compare feature, ready for recall.

If you choose the Compare menu item again, it becomes unchecked, and your modified preset is restored. You can then freely switch back and forth between the original preset (checked) and the modified preset (unchecked).

Here is a summary of the compare feature:

Compare mini-menu item:	Meaning:
Grayed	Unmodified preset (or no preset)
Active (not grayed)	Modified preset is active.
Checked	Original preset is active.

EDITING EFFECTS

The controls provided for the effect itself depend on the plug-in. Refer to the documentation included with the plug-in for information on how to edit the plug-in. For information on automation plug-ins, see chapter 55, "Mix Automation" (page 490).

CHAPTER 58 Audio Effects Plug-ins

OVERVIEW

An *audio effects plug-in* is a piece of peripheral software (developed by MOTU or another company) that can be used from within Performer Lite. Performer Lite serves as a *host* program for the plug-in, allowing you to apply its processing to your audio. Depending on the type of plug-in, you can either use the plug-in as an offline operation, selecting individual soundbites and then choosing the plug-in from the Audio menu, or you can apply it to an entire track as a real-time insert for the track in the Mixing Board.

Overview 521
Native plug-in processing 521
Real-time versus rendered effects 522
Live Performance Mode 522
File-based plug-in processing 523
Working with MAS plug-ins 523
Working with VST and Audio Unit plug-ins 524
Organizing plug-ins 525
Audio plug-in preferences 525
Using effect presets 528
Busing, master faders & aux tracks 528
Copying and pasting effect settings 528
Plug-ins from other companies 528
Plug-in automation 529
Taking an automation snapshot of plug-in parameters 529
Attaching a MIDI controller to plug-in parameters 529
Tempo-locked effects 529
Channel configurations 529
Side chain inputs 529
Multiple audio outputs 530
Making a real-time plug-in effect permanent 530
Performer Lite plug-ins 530
Performer Lite virtual instruments 530

NATIVE PLUG-IN PROCESSING

Almost all MOTU Audio System plug-in effects can be processed dynamically during playback. They do not require extra hardware installed inside your computer because their processing is handled by the computer itself (referred to as *native* processing). Performer Lite includes dozens of MOTU Audio System plug-ins, from basics (such as 8-band parametric EQ, reverb, and dynamics) to vintage gear emulations to exotic forms of processing that are unique to Performer Lite. Performer Lite also includes virtual instruments. See "Performer Lite plug-ins" on page 530 for a list, and consult the separate Performer Lite plug-ins guide PDF in the Help menu for complete information about each plug-in.

Many third-party plug-ins are also available.

The amount of effects processing you can apply at one time has no inherent limit in Performer Lite. Instead, it depends on how fast your computer is: the faster the computer, the more real time effects you can use simultaneously.

Using effects plug-ins

Applying audio effects plug-ins to your audio tracks is straightforward: just choose the desired plug-in from one of the inserts for the track in the Mixing Board as shown in Figure 58-1 on page 522. Once you choose the effect (either from the plug-in chooser window or the menu provided), the Effects window appears with the settings for the plug-in. If the Effects window is already open, you can choose the effect from the menu provided at the top of the window.

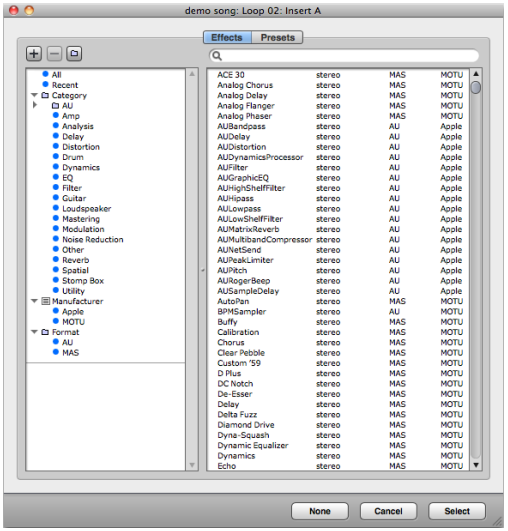


Figure 58-1: Performer Lite provides real time effects plug-ins for audio tracks.

All of the features in the Effects window apply to audio effects, including using the Bypass button to temporarily remove the effect. See chapter 57, "Effects Window" (page 516) for details about the Effects window.

Automatic latency (delay) compensation

Performer Lite provides automatic latency compensation for all real-time audio plug-ins and virtual instruments. For details, see "Automatic plug-in latency (delay) compensation" on page 25.

REAL-TIME VERSUS RENDERED EFFECTS

By default, Performer Lite transparently pre-renders audio output from virtual instrument tracks and audio tracks with plug-ins instantiated on them to dramatically reduce their CPU load. This is called *pre-generation*, and it greatly enhances Performer Lite's CPU performance, allowing you to instantiate many times the number of instruments and plug-ins that you would be able to run in real time.

Performer Lite seamlessly manages transitions between pre-generated audio and live audio as needed (such as when you record a virtual instrument live). In addition, virtual instruments are always available for preview activities, such as editing notes in the Sequence Editor or using a VI's on-screen keyboard.

To fine-tune the responsiveness of plug-ins and virtual instruments, go to Setup menu > Configure Audio System > Configure Studio Settings and adjust the *Prime Milliseconds* setting (see "Prime Milliseconds" on page 25).

Pre-gen operation with 3rd-party plug-ins

MOTU works hard to ensure a high level of compatibility with 3rd-party virtual instruments and effects. There may be cases where pre-generation may not work as expected with a given 3rd-party plug-in. These cases should be reported to MOTU and the plug-in vendor so that compatibility can be fully established. In the meantime, you can run the plug-in or instrument in real time. To force a virtual instrument track into real-time operation, record-enable it (or any MIDI track that targets the instrument). To force an audio track's effects into real time, the track can either be record-enabled or monitor-enabled. Alternately, the effect can be placed on an aux track, either in a chunk or a V-rack, with busing used to access the effect. Aux track effects are always rendered in real-time.

LIVE PERFORMANCE MODE

To disable pre-gen operation, enable (check) *Live Performance Mode* (Setup menu). Doing so causes Digital Performer to perform all audio processing in real time, without pre-generation. However, depending on the circumstances (your computer's processing power, the plug-ins you are running, etc.), you may experience better performance by disabling this feature.

FILE-BASED PLUG-IN PROCESSING

File-based processing does not occur in real time. Instead, it is applied similarly to Performer Lite's time-stretching features: you select soundbites to be processed (using one of Performer Lite's many methods for selecting soundbites), and then you apply the plug-in by choosing it from the Audio menu. A window appears for the plug-in, you make settings, preview the settings (if previewing is available), and then click OK. When you do, a new audio file is created on your hard drive that consists of the original soundbites with the effect applied to them (plus any bite gain, if any has been applied to the original soundbite). Processing occurs in the background. All MAS plug-ins can be applied as file-based processing.

Reverse

There is one plug-in that is provided as a file-based plug-in only (in the Audio menu only): Reverse.

Previewing a file-based plug-in

When applying audio plug-ins from the *Audio menu> Apply Plug-in* sub-menu, you can preview the effect before applying it permanently:

Figure 58-2: When you apply a plug-in as a n offline operation from the Audio menu Plug-ins sub-menu, use the controls at the bottom of the window to preview the effect before applying it.

When you click the Preview button, the currently selected region loops continuously until you click the Stop button (or click anywhere outside the effect window). Parameter adjustments can be heard in real time as you change them. A preroll and postroll amount can be added to the beginning and end of the currently selected region for previewing purposes.

These previewing features can also be used for VSTs and Audio Units being applied as region operations.

WORKING WITH MAS PLUG-INS

Performer Lite can host MOTU Audio System (MAS) plug-ins. The MAS specification is a plug-in standard developed by MOTU that has been adopted by audio plug-in developers to optimize their products for use with Performer Lite. You can install MAS plug-ins on your computer and use them from within Performer Lite. The plug-in may also be supplied and installed in other plug-in formats as well for use with other host applications.

Installing MAS plug-ins

Performer Lite looks for MAS plug-ins in these locations on your computer's hard drive:

Platform	Path
macOS	startup disk/users/current user/library/audio/plug-ins/MAS and startup disk/library/audio/plug-ins/MAS
Windows*	C:\Program Files\Common Files\MOTU\Plug-ins\MAS

*If you are running the 32-bit version of Performer Lite on a 64-bit Windows system, the root of the path is: *C:\Program Files (x86)*.

MAS plug-ins in MacOS

For MacOS, the user library directory refers to the user who is currently logged in to Mac OS X.

Depending on how they were installed, plug-ins for Performer Lite are placed in one of the two locations shown above. If plug-ins are installed

into the user library directory, they are installed for the user who is currently logged in to Mac OS X at the time of installation.

Organizing MAS plug-ins in MacOS
You can organize the plug-ins across the system and user library directory locations as you prefer, with the following rules in mind:

- Plug-ins are bound to log-in access. For example, plug-ins that are placed in a user directory are available only when that user is logged in. This allows you to maintain different sets of Performer Lite plug-ins in multi-user environments.
- Never duplicate a plug-in across the system and user directories (although you could duplicate a plug-in across multiple user directories, since only one user directory is active at a time).
- You can organize plug-ins into folders, as explained in the next section.

WORKING WITH VST AND AUDIO UNIT PLUG-INS

Performer Lite can host VST plug-ins (VST2 or VST3) on both Mac and Windows, and Audio Unit (AU) plug-ins on MacOS. The VST and AU specifications are a plug-in standards that are widely adopted by music and audio software developers. You can install VSTs and AUs on your computer, and use them from within Performer Lite or other host applications that support them.

Installing VSTs and AUs

Performer Lite looks for VST and AU plug-ins in these locations on your computer's hard drive:

Platform	Format	Path
MacOS	AU	Startup disk/Users/Current user/ Library/Audio/Plug-ins/Components and Startup disk/Library/Audio/ Plug-ins/Components
MacOS	VST2 VST3	Startup disk/Users/Current user/ Library/Audio/Plug-ins/VST and Startup disk/Library/Audio/Plug-ins/VST
Windows*	VST2 VST3	C:\Program files\Vstplug-ins\ and C:\Program files\Steinberg\VstPlugins\ and C:\Program files\Common Files\VST2 or C:\Program files\Common Files\VST3

*If you are running the 32-bit version of Performer Lite on a 64-bit Windows system, the root of the path is: *C:\Program Files (x86)*.

For MacOS, the user library directory refers to the user who is currently logged in to Mac OS X. If AU plug-ins are installed into the user library directory, they are installed for the user who is currently logged in to Mac OS X at the time of installation.

Third-party plug-in compatibility

Audio plug-in specifications continue to evolve, and developers are modifying and improving their plug-ins on an on-going basis to conform to each specification as it develops. MOTU has worked closely with many developers to ensure

compatibility and smooth performance. Always try to stay current with the latest versions of the plug-ins you use.

Plug-in examination

When you run Performer Lite for the first time, or after installing one or more new plug-ins, Performer Lite examines them during the loading process, checking them for problems. On MacOS, Performer Lite will first ask you to choose a primary external plug-in format (VST2, VST3 or AU) to examine and use as your preferred format (see "Primary external plug-in format (Mac only)" on page 528). This process may take a few minutes, depending on the nature and quantity of the plug-ins installed in your system. Each plug-in is examined only once, the first time it is loaded by Performer Lite. On subsequent launches, plug-ins that have already been examined will not be examined again. If a problem is detected with a particular plug-in, it will not be loaded for use in Performer Lite to prevent crashing and other serious problems.

You can choose to skip the examination of a particular plug-in, in which case it is not loaded and will not be available for use in that particular session. Skipped plug-ins can be examined later, the next time you launch Performer Lite or in the Plug-in Manager (see below).

If you wish to completely remove a plug-in so that it will not be examined or loaded, simply remove it from the folder where it is installed.

If a problem is detected with a particular plug-in, it will not be loaded for use in Performer Lite to prevent crashing and other serious problems. In the event that problems are found, the plug-in will be disabled and will not be loaded by Performer Lite. Contact the developer for information about updates for the plug-in.

For more information on managing third-party plug-ins, see "Audio plug-in preferences" below.

Using VSTs and AUs

Performer Lite supports two basic varieties of VSTs and AUs: effects plug-ins and virtual instruments. The effects plug-ins operate as described in this chapter. Just choose them from the desired effect insert and you are ready to go.

AU virtual instruments work as described in chapter 13, "Instrument Tracks" (page 82).

For details about using plug-in presets, see "VST and Audio Unit presets" on page 519.

ORGANIZING PLUG-INS

Performer Lite's plug-in chooser provides flexible and convenient plug-in organization and browsing. For details, see "Choosing a plug-in for an insert" on page 179.

AUDIO PLUG-IN PREFERENCES

To access Performer Lite's audio plug-in preferences (Figure 58-3), go to *Preferences* in the Performer Lite menu (Mac OS) or Edit menu (Windows) and click *Audio Plug-ins* in the list. These settings allow you inspect, enable, disable and otherwise manage the audio plug-ins installed in your system.

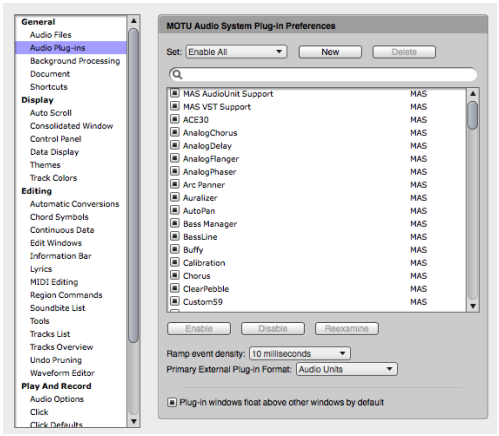
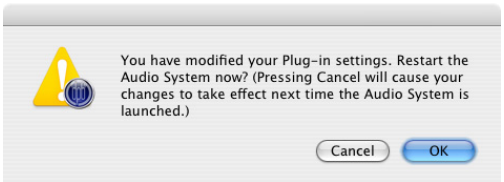


Figure 58-3: Audio plug-in preferences.

When you change any settings in the audio plug-in preferences pane (except for the *Ramp event density* setting, see below), the MOTU Audio System must restart to apply your changes. You will be prompted to do so when closing the Preferences window, or when switching to another preference pane.



☛ The plug-in preferences only apply to operation under the MOTU Audio System; when Performer Lite is operating under MIDI Only mode, the plug-ins list display will be empty.

Plug-ins list

All MAS, VST and Audio Unit plug-ins installed in your system and available to Performer Lite will be listed in this preference pane, with the plug-in format shown to the right of each plug-in. Use the search field to quickly locate a particular plug-in.

Each plug-in has a checkbox next to it. When the box is checked, the plug-in is enabled; when unchecked, the plug-in is disabled. Disabled plug-ins will not be loaded and will not appear in your audio plug-in lists in the Mixing Board or *Audio menu* > *Apply Plug-in* sub-menu (or in the case of instrument plug-ins, under the *Project menu* > *Add Track* > *Instrument Track* sub-menu).

You can also enable or disable multiple plug-ins simultaneously by selecting them and using the *Enable* and *Disable* buttons. Shift-click in the plug-in list to select a range of plug-ins, or Command/Ctrl-click to select non-contiguous plug-ins.

Examining VSTs and Audio Units

As explained earlier in "Plug-in examination" on page 525, VSTs and Audio Units will be automatically examined the first time Performer Lite is launched after they are installed. The result of the examination is listed next to each plug-in. The possible results are:

- **Passed:** The plug-in passed examination and is available for use.
- **Failed:** The plug-in did not pass examination and will not be loaded.
- **Skipped:** Examination of the plug-in was skipped and will be automatically reexamined the next time the MOTU Audio System is restarted.
- **Duplicate:** Multiple versions of the plug-in exist; for example, both a VST and MAS version exist. The MAS version is loaded.
- **Non-primary:** Indicates that the plug-in is not the primary format chosen in the preferences (Figure 58-3). See "Primary external plug-in format (Mac only)" on page 528.

If you wish to reexamine a plug-in or plug-ins, select the desired plug-ins and press the *Reexamine* button.

Plug-ins with multiple versions (formats)

Some plug-ins are supplied (and installed into your system) in several plug-in formats. For example, you might see both a VST and AU (or MAS) version of the same plug-in in the list. By default, one of the formats is enabled and the other is disabled and labeled either *Duplicate* or *Non-primary*. You can manually switch formats by unchecking and checking the boxes next to each plug-in as needed.

☛ Performer Lite allows both AU and VST versions of the same plug-in to be activated at the same time. While this may be useful in some circumstances, it may make it hard to tell which format you are using. In the case of some plug-ins, activating both formats can cause problems with their operation. To avoid confusion or operational issues, only enable one format or the other.

Plug-in sets

Plug-in sets (Figure 58-4) are custom collections of enabled audio plug-ins. Loading a plug-in set will enable only a specific subset of your plug-ins.

To choose a plug-in set, select it from the plug-in set menu. The chosen plug-in set will be displayed, but its plug-ins will not be loaded until you restart the MOTU Audio System.

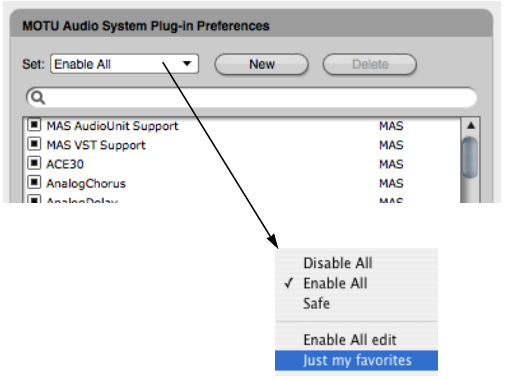


Figure 58-4: plug-in sets.

Enable All

When you choose the *Enable All* plug-in set (Figure 58-4), all plug-ins (except ones that did not pass examination) are enabled. This is the default plug-in set.

Disable All

When you choose the *Disable All* plug-in set (Figure 58-4), all plug-ins will be disabled.

Safe

When you choose the *Safe* plug-in set (Figure 58-4), only the plug-ins which are included with Performer Lite are enabled; all other plug-ins will be disabled.

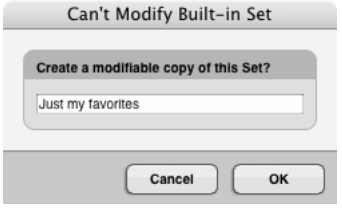
Creating and deleting plug-in sets

To create a new plug-in set, click the *New* button, enter a name, and click OK. To delete a plug-in set, choose it from the plug-in set menu and click the *Delete* button. When *Enable All*, *Disable All* or *Safe* is chosen, the *Delete* button will be grayed out as these plug-in sets cannot be deleted.

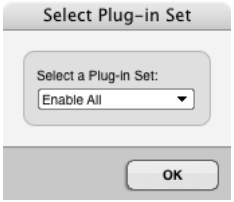
Editing plug-in sets

To edit a plug-in set, choose it from the plug-in set menu, then enable or disable the desired plug-ins.

The *Enable All*, *Disable All* or *Safe* plug-in sets cannot be modified. If you attempt to enable or disable any plug-ins while one of them is selected, you will be prompted to create a new set. You can then edit the new plug-in set just as you would any other.



Selecting a plug-in set at startup
Hold the Option/Alt key while launching Performer Lite to bring up a dialog which allows you to choose the plug-in set which will be loaded:



Ramp event density
The *Ramp event density* option (Figure 58-3) sets the default density when writing ramp automation for plug-ins.

Primary external plug-in format (Mac only)
The *Primary external plug-in format* option is for MacOS only and determines the format of the plug-ins that Performer Lite will examine and enable by default. Choose *Audio Units* if you have a large number of existing Performer Lite projects that use AUs, and you don't need to transfer Performer Lite projects to and from Windows systems. Choose VST2 or VST3 to increase the cross-platform compatibility of your projects. This setting can be changed at any time.

Plug-in windows float above other windows by default
When checked, the *Plug-in windows float above other windows by default* preference causes newly opened plug-in windows to appear in front of all other windows. This allows you to work in other Performer Lite windows without plug-in windows disappearing behind them. This preference only affects new plug-in windows when they are first opened. Once a plug-in window is open, it can float or not, as determined by its *Floating* mini-menu setting (see "Effects window mini-menu" on page 517).

USING EFFECT PRESETS

Many audio effect plug-ins provide factory presets, and you can also save and recall your own presets. This works in the same way as it does with MIDI effects and virtual instruments. See "Saving, loading, and editing presets" on page 518.

BUSING, MASTER FADERS & AUX TRACKS

The MOTU Audio System provides a flexible virtual mixing environment. You can take advantage of features like the internal audio buses to apply effects as needed and even conserve your computer's processing power by busing multiple tracks to the same effect insert. You can also apply effects to aux tracks and master faders as pre or post fader effects. For details, see chapter 20, "Mixing Board" (page 174) for more ideas about how to work with real time audio effects within Performer Lite's virtual mixing environment.

COPYING AND PASTING EFFECT SETTINGS

As with MIDI effects, you can copy and paste audio effect parameters from one insert to another. Just choose *Copy* from the Edit menu while a specific insert's effect is being displayed, switch to a different insert with another effect, and choose *Paste*. Even if the destination plug-in is completely different, any parameters of the same kind are pasted.

PLUG-INS FROM OTHER COMPANIES

The three plug-in architectures (MAS, VST and AU) are open systems. Many other companies have developed plug-ins that are compatible with these plug-in formats, running in real time on your computer with no extra hardware required.

PLUG-IN AUTOMATION

Plug-ins can be automated in real time. For complete information, see chapter 55, "Mix Automation" (page 490).

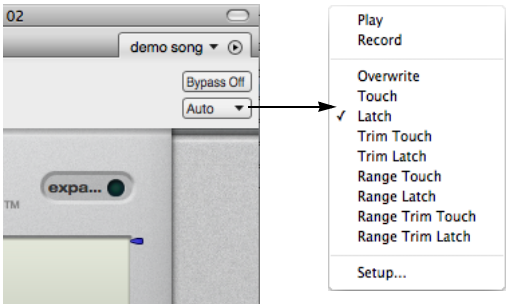


Figure 58-5: Click the Auto (automation) button to access the automation settings menu for this track. The menu has checkable items that enable/disable automation playback and recording. It also lets you choose the current automation mode for the track.

TAKING AN AUTOMATION SNAPSHOT OF PLUG-IN PARAMETERS

Use the automation snapshot button (Figure 57-1 on page 516) to capture the current settings of the plug-in in the track at the current playback location. For more information about snapshots and automation, see "Snapshot automation" on page 503.

ATTACHING A MIDI CONTROLLER TO PLUG-IN PARAMETERS

The *Learn Controller* command (*Project menu> Consoles*) allows you to map controls on your MIDI controller to plug-in parameters.

☛ *Learn Controller* can also be used to map your MIDI controller to Mixing Board sends and send pan, as explained in "Attaching a MIDI controller to sends or send pan" on page 193.

To attach a MIDI controller:

1 Choose *Project menu> Consoles> Learn Controller*, or click the Learn Controller icon at the bottom of the plug-in window (Figure 57-1 on page 516).

2 Click the desired plug-in parameter.

3 Move, turn or press the desired control on your MIDI device. To cancel the operation before completing it, choose Learn Controller (or click the icon) again at any time during the process.

TEMPO-LOCKED EFFECTS

Many plug-ins allow you to lock certain parameters, like their LFOs, to the tempo of your sequence. This allows the effect to stay in sync with the beat of your music, even if there are tempo changes.

For details on tempo-locking effects included with Performer Lite, see "Tempo lock" on page 8 in the *DP Plug-in Guide*. For details on tempo-locking third-party effects, refer to their documentation.

CHANNEL CONFIGURATIONS

Performer Lite allows you to configure your system with a combination of mono and stereo signal paths. For more details, see "Channel configurations" on page 7 in the *DP Plug-in Guide*.

SIDE CHAIN INPUTS

A *side chain input* allows you to route any audio directly into the plug-in itself to control a parameter with the side chain input signal. It appears in a plug-in window as a menu that shows a list of Performer Lite's virtual busses. For many MAS plug-ins, the menu appears within the plug-in itself:

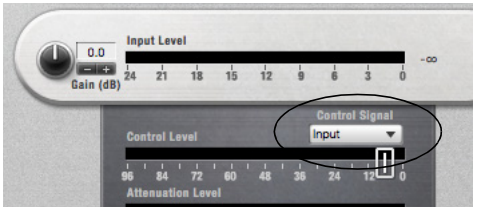


Figure 58-6: The side chain input in a MAS plug-in (Dynamics).

For some plug-ins, the side chain input menu appears in the Effects window:

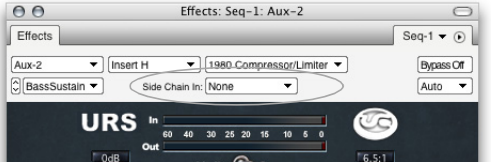


Figure 58-7: The side chain input in the Effects window.

To use the side chain input, choose an audio input or bus from the menu and then route a signal to the bus from any source you want in Performer Lite's mixing environment (a track, a live aux input, etc.). Several included plug-ins have side chain inputs, including Dynamics, Ring Modulator, and Multimode Filter. Refer to chapter 1, "Audio Effects Plug-ins" (page 7) in the *DP Plug-ins Guide*.

MULTIPLE AUDIO OUTPUTS

Some effects plug-ins provide multiple audio outputs. You can access them in the *Instruments* tab in the Bundles window, just as with virtual instruments. For details, see "Multiple audio outputs" on page 88.

MAKING A REAL-TIME PLUG-IN EFFECT PERMANENT

All real-time plug-ins that appear in the Mixing Board window effects inserts also appear in the *Audio menu* > *Plug-ins* sub-menu. To apply them, you can select audio in any window you prefer.

PERFORMER LITE PLUG-INS

For details on the following plug-ins included with Performer Lite, see chapter 1, "Audio Effects Plug-ins" (page 7) in the *DP Plug-ins Guide* (Help menu).

- ACE-30
- Analog Chorus
- Analog Delay
- Analog Phaser
- Custom '59
- Delay
- Delta Fuzz
- Diamond Drive
- Hardware Insert
- Intelligent Noise Gate
- Invert Phase
- Live Room B
- Live Room G
- Live Stage
- MasterWorks Compressor
- MasterWorks EQ
- MasterWorks Gate
- MasterWorks Limiter
- Pattern Gate
- ProVerb
- RXT
- Soloist
- Trim
- Tuner

PERFORMER LITE VIRTUAL INSTRUMENTS

For details on the following virtual instrument plug-ins included with Performer Lite, see chapter 2, "Instrument Plug-ins" (page 53) in the *DP Plug-ins Guide* (Help menu).

- Bassline
- PolySynth
- Nanosampler
- Modulo

- Model 12
- Proton

CHAPTER 59 MIDI Effects Plug-ins

OVERVIEW

Performer Lite provides many real-time, non-destructive MIDI effects plug-ins. This chapter discusses the specifics of each MIDI plug-in.

For general information about the Effects window, see chapter 57, "Effects Window" (page 516). For general information about using plug-ins, organizing them, creating and managing user presets, and other related topics, see chapter 58, "Audio Effects Plug-ins" (page 521).

Overview **532**
Change duration **532**
Change velocity **532**
DeFlam **533**
Echo and Arpeggiator **533**
Groove Quantize **537**
Humanize **538**
Invert Pitch **538**
Quantize **538**
Reassign Continuous Data **539**
Remove Duplicates **539**
Time Shift **539**
Transpose **539**

CHANGE DURATION

The Change Duration plug-in can non-destructively modify the durations of MIDI notes during playback. It has the same settings as the Change Duration command in the Region menu (page 398).

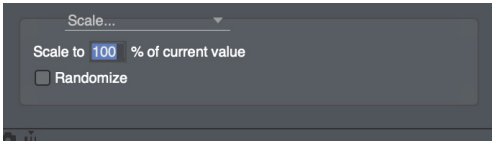


Figure 59-1: The Change Duration effects processor.

Change Duration modifies the duration without changing the placement of attack times. This means that the amount of time a note is "on" or sounding can be changed without affecting its actual rhythmic placement in relation to other notes and events. The Change Duration command is useful for changing the articulation or space between notes. You can make note events sound connected or separate in relation to each other, for example. It also provides some useful utility functions.

For more information, see "Change Duration" on page 398.

CHANGE VELOCITY

The Change Velocity plug-in can non-destructively modify the on and/or off velocities of MIDI notes during playback. It has the same settings as the Change Velocity command in the Region menu (page 395).

For the Compress/Expand option, the graph shows the result of the compression/expansion settings. A diagonal line from lower left to upper right represents no compression or expansion. Drag the Threshold, Ratio and Gain handles to change their settings. The higher the ratio, the higher compression; ratios below 1 produce expansion. Gain allows you to raise or lower the overall level. Threshold sets a cutoff value, below which no compression or expansion will occur.

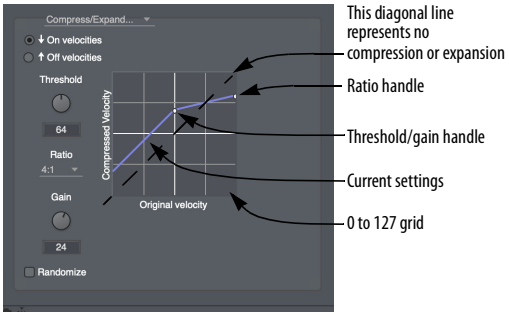


Figure 59-2: The Change velocity effects processor. Drag the handles to change the Threshold, Ratio and Gain settings.

DEFLAM

The DeFlam MIDI effects plug-in is a non-destructive version of the DeFlam region operation found under the Region menu (page 394).

DeFlam looks for groups of note that are very close together. When such a group is found, the average attack time of the group of notes is computed. All notes in the group are moved such that their attack times are aligned exactly to the average time.

The group of notes that is deflammed is determined by the tick value you specify. This creates a "window" of effectiveness. Groups of notes within that window will be deflammed.

For more information, see "DeFlam" on page 394.

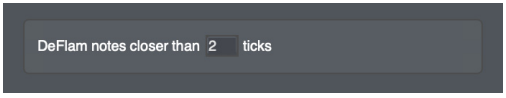


Figure 59-3: The DeFlam effects processor.

ECHO AND ARPEGGIATOR

The *Echo* effect is similar to a traditional digital delay. It remembers material played in, then repeats it later on. There are some interesting differences, though. You are not restricted to simple fixed delays. In fact the "rhythmic pattern" used by the Echo for regenerating the material is completely customizable. Additionally, each repetition of the material can be sent to a different output assignment. Furthermore, a transpose effect is hooked into the Echo's feedback loop, allowing you to transpose on each repetition.

The *Arpeggiator* watches what notes are sounding (being held) and then arpeggiates them (plays them one at a time). The Arpeggiator gives you complete control over the rhythm and order in which the notes are played back. In addition, each arpeggiated note can be sent to a different output assignment.

Rhythmic patterns

Both the Echo and Arpeggiator effects are built around a flexible rhythmic architecture. In the Echo effect the Rhythm section determines how each event will be delayed. In the Arpeggiator it determines the rhythm that will be used for each arpeggiated note. Rhythms can be set up using one of three modes: Grid, Custom and Raw Ticks.

Grid: You will notice that the Grid mode settings are almost identical to the Quantize effects grid settings. They function in a similar fashion. You can set up rhythms consisting of any metric subdivision. You can "swing" the grid, and you can offset the entire grid by an arbitrary number of ticks. (For more info, see the section on the Quantize effect.) Rather than a check box for "Tuplets", there is a popup menu. This menu lets you turn off the tuplet feature, turn it on (select Tuplet) or put the grid into "poly rhythm" mode (select Poly). The "Off" and "Tuplet" settings are identical in effect to checking or un-checking the Tuplet box in the Quantize effect. The Poly mode combines both sides of the tuplet expression (you will notice that the words "in the time of" change to "against") to create a standard rhythmic interference pattern. For example if you pick Poly and choose 3 against 2 (eighth notes) you will hear both a straight eighth note pulse and a "3 in the

time of 2" pulse. Try different values to create interesting textures (5 against 3 is an interesting one).

Custom: This setting lets you define your own rhythmic patterns based on selected notes. You can make "Groove Echos", arpeggiations based on melodic patterns, bizarre multi-tap echo effects — the sky's the limit. To create a rhythmic pattern, just select some notes in a single track, enter a name, and press Learn.

When a pattern is learned, it is the time between note events that is remembered. Thus, if you select 4 notes, only 3 grid spaces will be learned (the distance from note 1 to note 2, 2 to 3 and 3 to 4). With this in mind, you may need to add an extra note at the end of your selection to delineate the final grid span.

☛ Rhythmic patterns created in the Echo effect can also be used with the Arpeggiator effect. Rhythms can be loaded into Performer Lite from other files.

Raw Ticks: Simply lets you specify the echo or arpeggiation in raw ticks. This is handy for creating rhythms that are "off" from the main pulse of the music.

Echo Settings

Here is a brief explanation of each setting for the Echo effect:

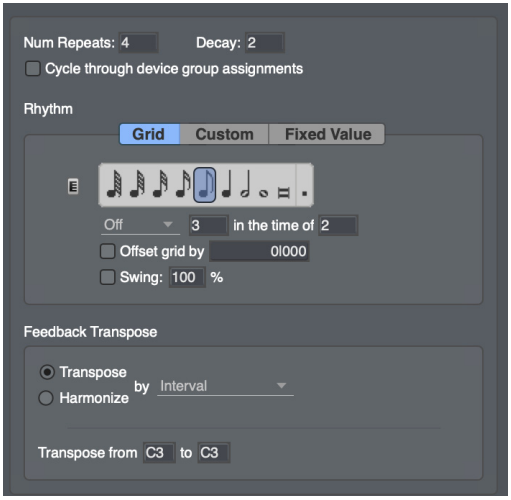


Figure 59-4: The Echo effects processor.

Num Repeats: Sets how many times each event will be repeated. The number includes the first time you hear the note. (If you enter 4, and play a note, you will here that note a total of 4 times.)

Decay: An amount that will be subtracted from the velocities of note events each time they are regenerated. This lets you create echos that sound like they are fading out. You should coordinate this setting with Num Repeats so that the note stops repeating around the same time it finally fades out, otherwise you will be echoing almost silent notes.

Cycle through device group assignments: If you check this box and assign the track's output to a MIDI device group, each repetition of each event will be sent to a different assignment in the MIDI device group. For example, let's say that you have a track assigned to a MIDI device group with two devices in it (SC7 channel 1 and SC7 channel 2) and you have "Num Repeats" set to 4. When you play a note, the first repeat will go to SC7 channel

1, the second will go to SC7 channel 2, the third will go to SC7 channel 1, and the fourth will go to SC7 channel 2. There are many ways to use this feature. Here are a few examples.

Create true echos including controller data. Normally, controllers and pitch bend are not echoed. This is because overlapping streams of controller data almost always lead to unpleasant results. "Cycle through device group assignments", however, lets you send each instance of the echo to a different MIDI channel, circumventing this problem. To use the echo in this way, set up a MIDI device group containing the same number of assignments (on the same device) as number of repeats. (For example, if you wanted a 4-repeat echo, you could make a MIDI device group on your SC7 on channels 1, 2, 3 and 4.) Each assignment should have the same patch set as its default. (You can create panning echo effects by setting the pan differently on each channel in the group. To do this, add a track assigned to each channel in the group (SC7 1, SC7 2, etc.), open the Mixing Board, show only those tracks, set the pan knobs appropriately, rewind to measure 1 and take a snapshot.) In this way, each echo goes to a different channel, and none of the controller information collides with previous data.

Create weird rhythmic and "cannon" effects by setting things up the same way as above, but then give each device in the group a different patch. You can have a Sax echo your piano line or a murky voice echo your synth lead. Adding percussion assignments creates interesting rhythmic accents to your echos. Experiment!

Feedback Transpose: Each time the echo processor regenerates a note event, it passes it through the Feedback Transpose effect. (If the Transpose Effect is set to "unity transpose", i.e. C3 to C3, it has no affect.) You can use this to create all sorts of cascading note effects. Since the Transpose effect can use arbitrary Custom Maps, any sort of transpose is possible. For example, you could have your echos cascade up, while remaining in key. Or have each repetition of the echo jump to any arbitrary pitch. (Twisted!) Watch out for the Harmonize option, though. It can really chew through your polyphony in a hurry; it is best used only with short delays. See "Transpose" on page 539 for more info.

Arpeggiator Settings

Here is a brief explanation of each setting for the Arpeggiator:

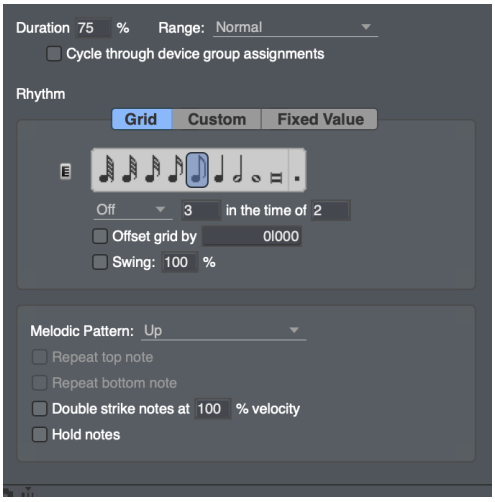


Figure 59-5: The Arpeggiator effects processor.

Duration: This sets the length of each arpeggiated note as a percentage of time until the next note. 100% makes each note last until the next note begins. 1% makes each note very short. Try using sustain pedal for legato effects.

Range: This lets you arpeggiate across a specified number of extra octaves. You can choose *Normal* (no additional octaves) or +1, +2, or +3 octaves.

Cycle through device group assignments: This is similar to the Echo effect setting, but it has no affect over controllers. The Arpeggiator always sends all controllers to all output assignments in

the MIDI device group. When this option is checked, each arpeggiated note will be sent to a different output assign. You can create all sorts of interesting effects with this. The tricks with panning mentioned in the Echo section also apply here. Try a MIDI device group with several slightly different guitar patches for a "League of Crafty Guitarists" in a box. Try a group consisting of several different horn patches, or percussion instruments. Great fun.

Melodic Pattern: This setting determines the order in which the held notes are played back. There are several built-in patterns. You can also define your own custom patterns.

Built-in patterns: In each of the following examples, assume a 6 note chord, with each note numbered 1 to 6, 1 being the lowest and 6 being the highest.

Up: plays the notes in order, starting with the lowest, and moving to the highest. Note order: 1,2,3,4,5,6.

Down: Plays the notes in order, starting with the highest and moving to the lowest. Note order: 6,5,4,3,2,1.

Up - Down: First plays Up, then plays Down: Note order 1,2,3,4,5,6,6,5,4,3,2,1

Down - Up: First plays Down, then plays Up: Note order 6,5,4,3,2,1,1,2,3,4,5,6

Staircase Up: Walks up the notes in a zig-zag pattern: Note order 1,3,2,4,3,5,4,6

Staircase Down: Walks down the notes in a zig-zag pattern: Note order 6,4,5,3,4,2,3,1.

Staircase Up - Down, Staircase Down - Up: Same idea as Up - Down and Down - Up.

Spiral In: Starting at the outside edges alternately walks into the center. Note order 1,6,2,5,3,4.

Spiral Out: Starting in the middle, alternately walks to the edges. Note order 4,3,5,2,6,1.

Spiral In and Out, Spiral Out and In You get the idea.

Random: Randomly picks the note order.

As Played: This option takes into account the order in which you play the notes of a chord and plays them back in the same order as played. The pattern is repeated for each additional octave (if any) specified by the *Range* option.

Chord Play: This option plays notes as repeated chords instead of arpeggios.

Custom Melodic Patterns: When *custom* is selected, the window expands to show controls similar to those for creating and picking Custom Rhythmic Patterns. To create a Custom Melodic Pattern, select some notes in a single track, enter a name, and press "Learn". The Arpeggiator analyzes the selected note data and remembers the order that the pitches are in. This order is then applied to the notes that you hold down. Note that the built in patterns work well no matter how many notes you are holding down. This is not as true of Custom Melodic Patterns. Custom patterns work best if you play the same number of notes as were in the learned pattern. (Note: There currently is no way to edit or retrieve the patterns after-the-fact, so you should save your source notes somewhere so you can tweak and relearn later on.) You can use Custom Melodic Patterns to mimic all sorts of finger picking, and even strumming styles.

Repeat bottom/top note: These check boxes only apply to the following melodic patterns: Up-Down, Down-Up, Staircase Up-Down, Staircase Down-Up, Spiral In and Out, and Spiral

Out and In. Therefore, these new check boxes are grayed out unless one of these patterns is chosen in the *Melodic Pattern* menu.

Double strike notes at __% velocity: This option causes each note to be played twice. The on-velocity of the second note can be specified from 0-200% of the first note's velocity.

Hold Notes: This option causes notes to be held even after you release them. They remain held (and will continue to arpeggiate) until you release all notes and play a new note.

Applying the echo and arpeggiator effects as Region menu commands

Both the Echo and Arpeggiator effects are available as MIDI effects plug-ins in the Region menu, which allows you to render the effect permanently to a track. This is great for editing the effect further. For details, see "MIDI Effects Plug-ins" on page 405.

Fun things to do with the Echo and Arpeggiator effects

Add a Transpose effect before the Arp effect. (Apply Transpose in Insert A and Arpeggiator in Insert B). Set the Transpose effect to Harmonize and transpose an octave up or down. This doubles the notes sent to the Arp effect, and gives it more notes to play with.

Learn bits of your song, both as melodic patterns, and as rhythmic patterns. Mix and match for Arpeggiator and Echo effects that compliment the rhythm and melodies of your music.

Use the Arpeggiator with a drum kit. Set the rhythm to a Poly 3 against 2. Hold down a big clump of drum note. Try using different melodic patterns. (Random works great.)

Echo your Arpeggiator. Add an Echo effect after the Arpeggiator, and set it for a long delay. Set the Arpeggiator to play with a grid that has an interesting rhythmic relationship to the echo. For example, set the Arpeggiator to a straight eighth note grid an the Echo to Tuplets, 3 in the time of 2 [quarter note]. Now, set the Echo effect to 2 repeats, and transpose up an octave (C3 to C4) with the Feedback Transpose section.

The Arpeggiator effect uses the velocities of the notes that you played in its arpeggiation. This can be used to great effect. Play a clump of notes with a medium velocity, then strike a new note with force. The new note will stand out in the arpeggiation in an interesting fashion. If desired, add a Change velocity effect after it to keep the velocities in a normalized range.

GROOVE QUANTIZE

Groove Quantize is a real-time version of the Groove Quantize region operation found under the Region menu. For more information, see "Groove Quantize" on page 386.

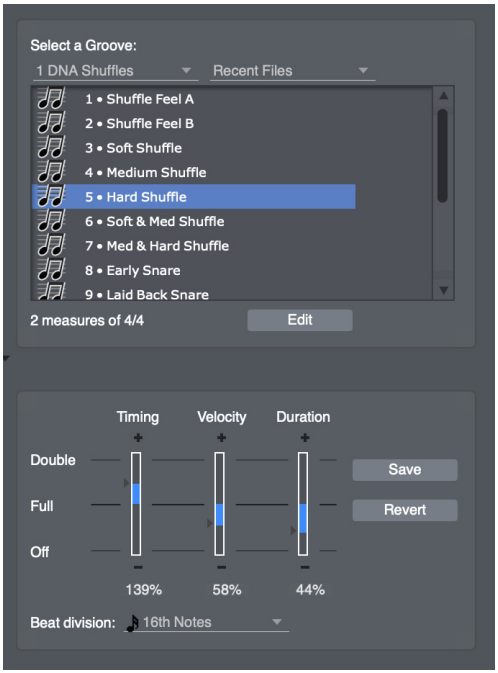


Figure 59-6: The Groove Quantize effects processor.

HUMANIZE

Humanize is a real-time version of the Humanize Region command found under the Region menu.

The Humanize command lets you add a "random" element—or "humanized" feel—to your music. With this command, you can randomize any combination of the following elements of your music:

- Note placement
- Note durations
- Velocities
- Pitches
- Tempo

In addition, you can create a unique blend of these *humanize* elements and save it as a humanize style, which you can recall and use at any time. You can use the Humanize command to create arpeggiation effects, hi-hat (or other percussion instrument) grooves, and other dramatic musical effects.

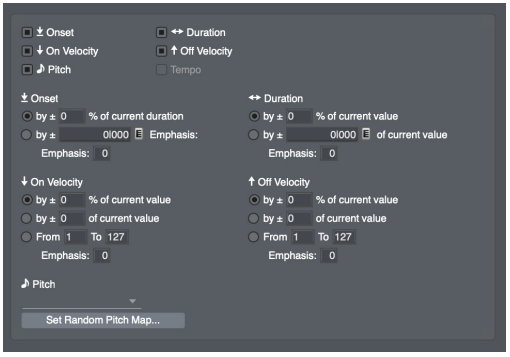


Figure 59-7: The Humanize effects processor.

INVERT PITCH

The Invert pitch processor allows you to specify an axis point around which your MIDI note data will be inverted. For example, if C3 is specified as the center pitch, C#3 will sound as B3 and B3 will sound as C#3. The Invert Pitch MIDI plug-in functions as a non-destructive version of the Invert Pitch region operation detailed in "Invert Pitch" on page 404.

Figure 59-8: The Invert Pitch effects processor.

QUANTIZE

The Quantize effects processor is identical to the Quantize command in the Region menu, except, of course, that it has no permanent effect on the data in the track. Since it only affects data upon playback, it can be adjusted and even turned off (bypassed) at any time. For details on Quantize options, see "Quantize" on page 379.

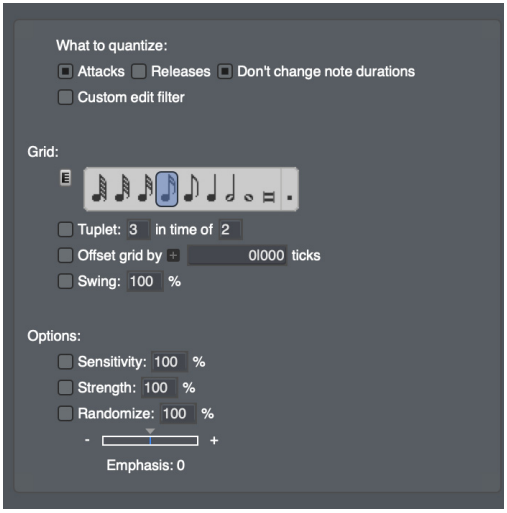


Figure 59-9: The Quantize effects processor.

REASSIGN CONTINUOUS DATA

This real-time effect modifies only MIDI continuous data (but not audio volume, audio pan or audio plug-in automation).

As shown in Figure 59-10 below, notice that this plug-in can also generate registered and assignable controllers (RPN's and NRPN's).

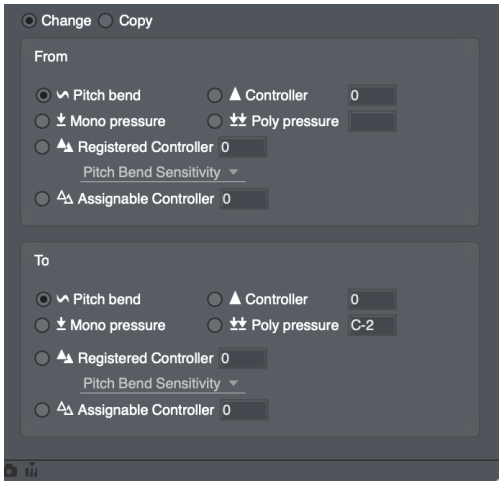


Figure 59-10: The Reassign Continuous Data MIDI plug-in, which can generate RPN and NRPN data.

REMOVE DUPLICATES

Remove Duplicates is a real-time plug-in that eliminates duplicate notes on the fly. This is useful for situations when quantization creates a 'chord' consisting of the exact MIDI note. Placing Remove Duplicates in line after Quantize helps eliminate this problem.

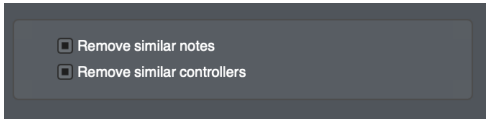


Figure 59-11: The Remove Duplicates effects processor.

TIME SHIFT

The Time Shift moves the playback of data earlier or later than its location in the track. It has no permanent effect on the data in the track. Since it only affects data upon playback, it can be adjusted and even turned off (bypassed) at any time.

Figure 59-12: The Time Shift effects processor. Click the button circled above to change the time format used to specify the amount of time.

TRANSPOSE

Choose the type of transposition you would like: either by a single interval or using a custom transpose map you have created with Transpose command in the Region menu (page 371). With interval transposition, enter any interval you like in the value boxes provided by editing the pitch text box (type, drag up/down, or use MIDI entry). The specific pitches do not matter: the interval between them determines the degree of transposition. For example, to transpose an octave up or down, choose C4 or C2, respectively.

The Harmonize option causes the newly transposed data to be combined with the original data, so that they both play simultaneously.

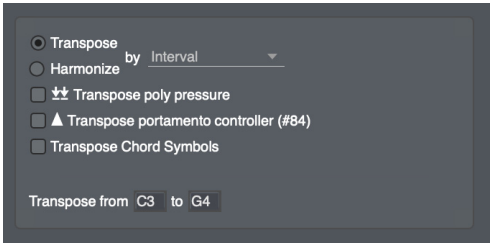


Figure 59-13: The Transpose effects processor.

CHAPTER 60 Audio File Conversion

OVERVIEW

The *Convert Audio File* command in the Soundbites menu allows you to change the sample rate, sample format (bit depth), file format, and interleave format of an audio file or soundbite.

You can change:

- sample rate: any sample rate between 1 kHz and 200 kHz
- sample format: 16-bit integer, 24-bit integer, or 32-bit floating point
- file format: Broadcast WAVE, AIFF, or Sound Designer II
- interleave format: interleaved or deinterleaved

Like Performer Lite's other "constructive" DSP processes, these conversions can occur in the background.

Overview **540**
Performing conversions **540**
Converting the sample rate **540**
Converting the sample format **541**
Converting the file format **541**
Converting the interleave format **541**
Converting entire audio files **541**
Soundbite replacement options **541**
Automatic Conversions **541**

PERFORMING CONVERSIONS

To open the Audio File Conversion window, select a soundbite or audio file and choose *Convert Audio File* from the Soundbite window mini-menu.

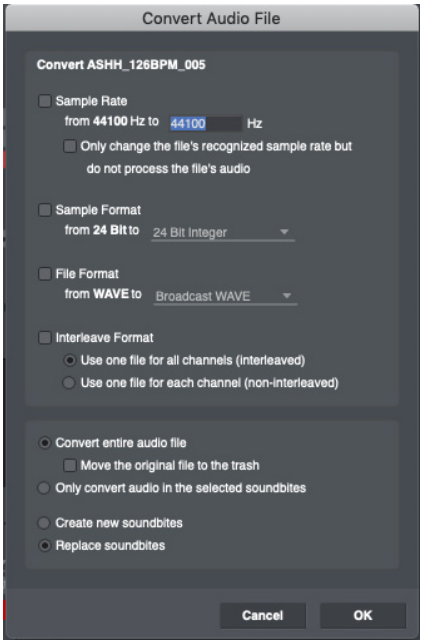


Figure 60-1: The Audio File Conversion dialog

Using the checkbox next to each section, each conversion operation can be turned on or off to perform any combination of operations.

CONVERTING THE SAMPLE RATE

Performer Lite uses a highly precise, efficient, and transparent sample rate conversion algorithm, with a 138 dB signal-to-noise ratio.

To sample rate convert some audio, select one or more soundbites in the Soundbites list and choose *Convert Audio File* from the Soundbites list mini-menu. The Audio File Conversion dialog appears.

Changing the recognized sample rate for an audio file

When checked, the *Only change the file's recognized sample rate but do not process the file's audio* option changes the sample rate attribute for the audio file, but it does not actually process or otherwise alter the audio data in the file. Use this command in situations where the sample rate being reported by the file (as listed in Performer Lite's Soundbites list, or the info window in other audio applications) erroneously does not match the actual sample rate of the audio contained in the file.

CONVERTING THE SAMPLE FORMAT

The *Convert Sample Format* section of the Audio File Conversion, as shown below in Figure 60-1, allows you to change the sample format of an audio file or soundbite. You can change to 16 bit integer, 24 bit integer, or 32 bit floating point. Like Performer Lite's other file-based "constructive" DSP processes, sample format conversion can occur in the background.

Dither

Performer Lite incorporates dither when converting to a lower bit depth— rather than truncating the extra bits — to ensure the smoothest possible conversion.

CONVERTING THE FILE FORMAT

In the *File Format* section of the Audio File Conversion window, you can convert the file format of your audio files between Broadcast WAVE, AIFF, and Sound Designer II. You can convert from any format to any other.

Note that if a file's sample format is 32-bit floating point, when converting the file format to Sound Designer II the resulting file's sample format will be converted to 24-bit integer (32-bit floating point is not supported with Sound Designer II files).

CONVERTING THE INTERLEAVE FORMAT

Interleaved audio uses one file for all channels, whereas deinterleaved uses one file for each channel. In the *Interleave Format* section of the Audio File Conversion window, you can convert the interleave format of your audio files between interleaved and deinterleaved.

CONVERTING ENTIRE AUDIO FILES

When you choose a soundbite for conversion, you can choose between converting only the soundbite itself (the portion of the audio file that falls within the soundbite) or the entire parent audio file. If you will need to use other parts of a audio file (edge editing the converted soundbites, for example), you should choose to convert the whole file.

SOUNDBITE REPLACEMENT OPTIONS

In Performer Lite, sample rate and sample format conversion is a "constructive" editing process, which means that it always generates new audio files and preserves the original ones. Several options are provided to specify what to do with the old audio, and how to replace existing soundbites.

If the *Replace soundbites* and *Convert entire audio file* options are chosen, you may also enable the *Move the original file to the trash* option.

AUTOMATIC CONVERSIONS

Performer Lite can perform certain conversions automatically. For more information, see "Automatic conversions" on page 227.

CHAPTER 61 Time-stretching and pitch-shifting

OVERVIEW

This chapter gives you a brief overview of Performer Lite's audio time-scaling and pitch-shifting capabilities. It then discusses the following important topics that are common to all of Performer Lite's Digital Signal Processing (DSP) tasks:

Overview **542**
ZTX™ audio processing **542**
Selecting audio for processing **542**
Editing MIDI and audio together **543**
Constructive editing **543**
Audio quality is preserved **543**
Handling lengthy processing tasks **544**
ZTX Preferences **545**

ZTX™ AUDIO PROCESSING

Performer Lite's ZTX™ time-stretching and pitch-shifting technology has been developed by (and licensed from) Zynaptiq GmbH (zynaptiq.com). ZTX represents cutting edge, state-of-the-art audio time-stretching and pitch-shifting DSP technology developed and refined through years of advanced research and development by the renowned audio DSP engineering team at Zynaptiq.

With very high quality results, Performer Lite's ZTX capabilities give you the ability to:

- Change the pitch of audio without changing its tempo
- Change the length or tempo of audio without affecting the pitch
- Change the tonal quality (the formants) of audio without affecting pitch or tempo
- Transpose pitched audio with or without the traditional "sampler" effect

Performer Lite can use these basic abilities to make it easier for you to do more complicated things:

- Apply a tempo map (*e.g.,* ritards and rubato) to audio that was recorded at a fixed tempo
- Change audio that was recorded with a tempo map to play back at a constant tempo, or with a new tempo map
- Easily make the sequence play at the tempo of imported audio
- Quantize or groove-quantize audio
- Transpose audio and MIDI together in a single operation
- Quantize or groove-quantize audio and MIDI in a single operation

These operations are discussed in detail in the next few chapters. The rest of this chapter explains several important things you should know that are common to all DSP operations.

SELECTING AUDIO FOR PROCESSING

Most of the DSP commands allow you to select audio data in all of the usual ways. Unless stated otherwise in the chapters that follow, all commands work with all these types of selections:

- Selections of whole soundbites in the Sequence Editor.
- Time-range selections in the time ruler of the Sequence Editor. If a soundbite crosses the start or end of the selection time range, only the part of the soundbite within the selection is affected.

- Selections within a pop-edited soundbite in the Sequence Editor.
- Soundbites selected in the Soundbites list.

You are not limited to thinking about your edits one soundbite at a time. If you want to transpose a whole track, or even your entire sequence, it's no problem. On the other hand, if you just want to correct the pitch in a small section of a soundbite, make a pop-edit selection. If a soundbite appears in many different places in several tracks or even several sequences, and you want it transposed or time-scaled in all those instances, just select it in the Soundbites list and make the edit there.

All of Performer Lite's DSP commands make sure they don't create any more new audio files than they need to. If you transpose a selection that includes the same soundbite 10 times, Performer Lite only transposes the soundbite once, and replaces all 10 occurrences with the new soundbite. Or if you have selected several soundbites that come from neighboring or overlapping parts of the same audio file, they are all processed together, and only a single new audio file is created.

On the other hand, if you are applying a *rubato* tempo map to 40 repetitions of a drum loop, Performer Lite is perfectly happy to create how ever many new soundbites are necessary – whether it's 2, 10, or 40 – as a result of a single command.

EDITING MIDI AND AUDIO TOGETHER

As a digital audio sequencer, Performer Lite is designed to give you a seamless, integrated environment in which to create music using both digital audio and MIDI data. Accordingly, most of Performer Lite's DSP operations can be applied to MIDI data in the same operation, so that you do not necessarily need to be concerned with the type of data being edited, and so that you do not have to do two separate operations to achieve a single effect. For example, if you want to transpose your entire piece of music up a whole step, you can select all tracks, MIDI and audio, and choose Transpose from the Region menu.

CONSTRUCTIVE EDITING

All of Performer Lite's DSP functions are "constructive" edits. Performer Lite never modifies your original audio files. When you transpose, time-scale, spectral-shift, or tempo-adjust an audio selection, Performer Lite creates new audio files to hold the new audio data (except when using the Transpose window's "Transpose audio by adjusting pitch automation" option – see "Transpose audio by adjusting pitch automation" on page 372). This means you can always go back to the original if need be; it's always your decision, if you want to delete original source material.

In order to help you work faster, Performer Lite doesn't waste your time with dialog boxes asking you where you want to put the new files, and what you want to call them. Audio files are automatically created in the same folder as the original, with a name that indicates which soundbite or audio file it is based on. If you want to rename or move the file, you can feel free to do so at your leisure.

AUDIO QUALITY IS PRESERVED

Performer Lite keeps track of where a soundbite came from. For example, if you time-stretch a soundbite, creating a new audio file at the new tempo, Performer Lite remembers its original soundbite. If you then time-stretch the already stretched soundbite, instead of just stretching the already-stretched soundbite again, Performer Lite refers back to the original soundbite to create the very latest version. The same is true for pitch-shifting. This allows you to freely time-stretch and pitch-shift audio consecutively as many times as you like without worry about artifacts that may arise due to multiple time-stretch or pitch-shift

operations applied to the same audio. The results will always be the same as if you time-stretched or pitch-shifted the original soundbite.

The link between soundbites and their original source soundbites can be viewed in the Soundbites list. For details, see "Viewing soundbite sources hierarchically with 'By Folder' view" on page 221.

HANDLING LENGTHY PROCESSING TASKS

Performer Lite's DSP processing requires a great deal of computation, and may be applied to audio files containing millions of samples, so it may take many seconds or even minutes to complete a single command. However, to prevent you from staring at progress bars, Performer Lite has features that allow you to be as productive as possible during lengthy processing tasks:

- Background processing
- Audio file analysis that is done separately before the actual processing and saved on disk so that it does not need to be recalculated every time you invoke a DSP task

The following sections further discuss these features.

Background Processing

Because audio processing can take time, Performer Lite does all of its file-based processing in the background, allowing you to continue editing, playing, or even recording while it's working.

When you use one of the commands that initiates background processing, such as Transpose or Scale Time, Performer Lite immediately creates new Soundbites for the resulting audio. As long as the new soundbites are "under construction," their waveforms appear as an empty outline in the Sequence Editor as shown in Figure 61-1, so you can tell at a glance when they have finished being constructed.

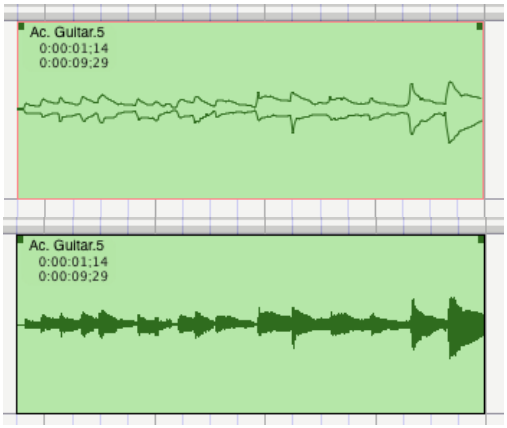


Figure 61-1: Audio that is being processed in the background is drawn with a hollow waveform.

When processing is complete, the waveform fills in solid to indicate that it is finished and ready to be played back. You can do just about any type of editing on a hollow waveform, such as cut, copy, paste, split, and even edge editing.

Editing audio that is "under construction"

After the new constructed soundbites appear, you do not need to wait; you can continue editing, recording (audio or MIDI), playing back, or whatever. It is perfectly fine to move, duplicate, split, trim, or even edge edit these unfinished soundbites.

Audio file analysis

Before pitch-shifting or time-scaling a soundbite, Performer Lite needs to perform a sophisticated analysis of the audio data. The actual pitch-shifting or time-scaling is relatively fast, but the analysis can take a while. Therefore, Performer Lite saves the results of the analysis in an *analysis file*, so that any given audio file only needs to be analyzed once. Analysis files are created automatically, and are kept in a folder called "Analysis Files" in the project folder.

Automatic background analysis
By default, Performer Lite will analyze audio only when needed. However, analysis can be set to automatically analyze any audio files used by your project that have not been analyzed yet. This analysis goes on in the background, so it does not interfere with your work. By the time you need to pitch-shift or time-scale a soundbite, it will probably already be analyzed, so the processing will take a fraction of the time.

Analysis Files
For the most part, you don't need to think much about analysis files. Performer Lite creates them automatically, and uses them to do DSP functions. They are stored in a folder called Analysis Files in your project folder.

If you use the same audio file in multiple projects, you should be aware that Performer Lite knows not to create multiple analyses for the same audio file.

Performer Lite attempts to delete the analysis file when you delete a audio file. However, if you delete audio files in the Finder or Explorer, rather than with the Delete command in the Soundbites list, Performer Lite has no way of knowing this. In this case, you will probably want to delete the analysis file yourself. Since Performer Lite can always reanalyze an audio file, there is no harm in throwing out an analysis file, except that you may need to wait for the audio file to be analyzed again later.

ZTX PREFERENCES

In *Preferences* > *Pitch and Stretch* (Figure 28-5 on page 255), you can choose the quality of the ZTX processing, which in turn impacts your computer's CPU performance during playback (for real-time processing) or the time it takes to complete the processing (for offline tasks). Generally speaking, higher quality settings take more time and more CPU load.

Separate settings can be made for new projects and the current project you have open.

Pitch Automation Playback

The *Pitch Automation Playback* setting (Figure 28-5 on page 255) controls the ZTX playback quality level for any pitch automation edits you make in the Sequence Editor pitch editing layer (Figure 62-2 on page 549 and Figure 62-4 on page 550). Pitch layer edits are always rendered in real time (not written to disk), so this setting can have a fairly dramatic impact on the CPU load of your computer. If you find that making pitch edits causes your computer to have difficulty during playback, try choosing a lower quality setting (*Better* or *Good*). This setting pertains only to pitch layer edits and has no effect on the quality of time-stretching edits.

Offline Processing

The *Offline Processing* setting controls the ZTX time stretching and pitch shifting quality level for new audio files created by offline audio processing operations such as Time Scaling, Tempo Adjustments, Spectral Effects and Transpose (when creating new soundbites). In other words, any time new audio is written to disk as a result of time stretching or pitch shifting, this settings controls the quality of the operation. Higher quality settings increase the amount of time the operation takes. Other factors that impact how long it takes include the length of audio selected and the CPU power of your computer.

ZTX quality settings

The ZTX quality settings (Figure 61-2) appear at the bottom of the pitch mode menu (Figure 62-1 on page 547). They also appear in the ZTX quality menus in the *Audio Options* preferences (Figure 28-5 on page 255).

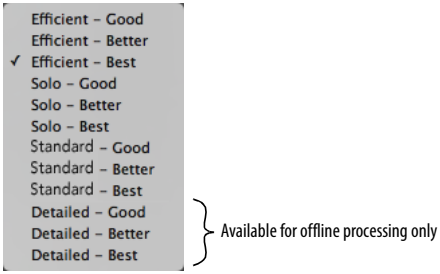


Figure 61-2: ZTX quality settings.

The categories (*Efficient, Solo, Standard* and *Detailed*) are meant to serve as general guidelines: *Efficient* for fast processing, *Solo* for monophonic audio material, *Standard* for normal quality and *Detailed* for higher quality, CPU-intensive processing. Results, however, can vary significantly depending on the audio material. Don't hesitate to experiment. For example, the *Standard* setting may produce better results than *Detailed* on a certain polyphonic audio clip.

Efficient (Good, Better, Best)
These three modes require the least amount of CPU power. They are recommended if you desire quick audio rendering times.

Solo (Good, Better, Best)
Zynaptiq describes this algorithm as "full time localization". This mode is recommended for dry monophonic audio material or dry percussive audio material.

Standard (good, better, best)
Zynaptiq describes this algorithm as "50% time localization and 50% frequency localization". This mode is recommended for polyphonic audio material and will yield satisfactory results on most audio material.

Detailed (good, better, best)
Zynaptiq describes this algorithm as "full frequency localization". This mode is recommended for complex full mixes and will require the most CPU power. This mode may not produce the best results for solo voice or rhythmic audio material. See "CPU strain" below.

For best results, experiment with the settings
There is no setting that will automatically yield the best results for all audio material. It is recommended that you spend a moment to experiment with the different settings to find the most desirable result.

Best mode
Best mode may not always produce the best results, depending on the audio material. If you are not fully satisfied with the quality of the results you are getting when applying pitch-shifting or time-stretching in a particular case, undo and try again with *Good* or *Better*, which may produce better results. You can change the settings on the fly at any time, as you work.

Time versus frequency localization
Technically speaking, *Solo* mode employs maximum ZTX time localization, *Standard* mode employs equal time and frequency localization, and *Detailed* mode employs maximum frequency localization. *Efficient* mode employs variable time and frequency localization, depending on the material, which can sometimes produce the best results (in addition to being the most CPU efficient).

CPU strain
Generally speaking, processing gets more intensive as you go down the list from *Efficient* to *Detailed*. Due to their intensive CPU processing requirements, the *Detailed* settings (Figure 61-2) are only available for file-based processing, as explained earlier in "Offline Processing".

CHAPTER 62 Transposing Audio

OVERVIEW

Overview 547
Pitch Shifting mode 547
Pitch automation 548
Using the Transpose command 555
Transposing audio and MIDI together 555
Temporarily disabling pitch modifications 555
Converting audio pitch to MIDI data 556
ZTX processing preferences 557
Background processing 557

PITCH SHIFTING MODE

When transposing audio in Performer Lite, there are four possible modes to choose from:

- ZTX Formant-Corrected
- ZTX Standard
- PureDSP Solo Vocal
- No Pitch Shift

The Pitch shifting mode is chosen in a menu on the soundbite title bar (Figure 62-1). Each soundbite can be assigned its own mode. You can also access this menu by right-clicking on the soundbite. To assign multiple soundbites to the same setting at one time, select them and then do one of the following:

- press option/alt while accessing the pitch-shift mode menu (Figure 62-1) on one of the selected bites, or
- press option/alt while right-clicking one of the selected bites (in any edit layer).

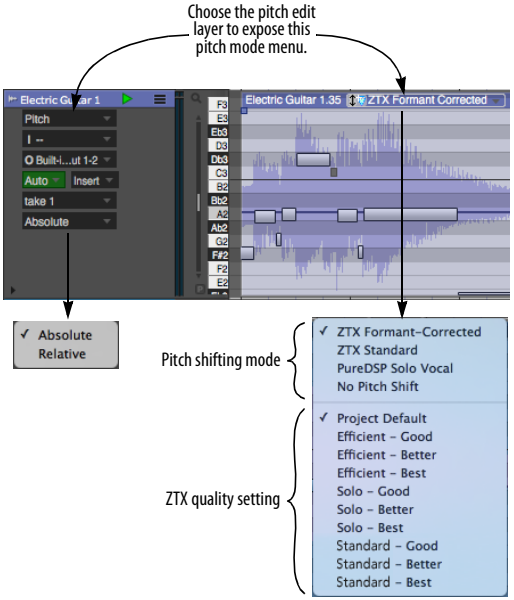


Figure 62-1: Choosing the pitch-shifting mode for a soundbite.

ZTX Formant-Corrected

Formant-corrected pitch shifting preserves the original character of the sound by separately transposing the pitch and formants (resonant frequencies) by different amounts. This type of pitch shifting avoids the classic "sampler" effect. For example, vocals transposed up will not get the "chipmunk" effect or, when transposed down, the "Darth Vader" effect. Instead, the quality remains the same and just sounds higher or lower. The advantage of formant-corrected shifting is that results are more true to the original audio's tone or timbre.

ZTX formant-corrected pitch shifting works well on just about any material, including polyphonic material, such as keyboard tracks, and even full mixes.

ZTX Standard

Standard pitch-shifting transposes pitch and formants by the same amount, producing the classic "sampler" effect described above. It can be applied as desired to any audio material.

PureDSP Solo Vocal

Performer Lite's PureDSP Solo Vocal formant-corrected pitch shifting (carried forward from earlier versions of Performer Lite) often works exceptionally well on solo vocal material. If you are transposing or pitch-correcting solo vocals, try this mode (instead of ZTX Formant-Corrected) to see if it produces the best results.

☛ *Pure DSP Solo Vocal* does not work on polyphonic material. Use one of the ZTX modes instead for polyphonic material.

When tuning monophonic audio, you may find that PureDSP Solo Vocal often works better than ZTX, especially when fine-tuning vocals.

No Pitch Shift

Us the *No Pitch Shift* setting for any audio that you would never want to pitch-shift. For example, you would likely not want to transpose audio in dialog tracks, sound effects tracks or percussion tracks. This setting ensures that you won't accidentally transpose the audio (when making multi-track time range selections, for example).

ZTX quality setting

For information about the ZTX quality setting (Figure 62-1 on page 547), see "ZTX Preferences" on page 545 and "ZTX quality setting" on page 548.

PITCH AUTOMATION

Performer Lite allows you to manipulate the pitch of audio material in the form of pitch automation data that can be edited directly in the track where the audio resides. Like volume and pan, pitch automation is applied non-destructively to track output in real-time during playback.

A wide variety of pitch-related operations can be performed on audio data, from simple pitch correction using the Pencil tool, to individual note transposition, to wholesale transposing of an entire track from one mode or key to another using the Transpose command. The success of these operations depends highly on the nature of the audio material itself.

Pitch automation can be applied to mono and stereo audio files, and it can be applied to any pitched audio material, including the spoken human voice.

Latency compensation

Pitch automation requires Performer Lite's latency compensation features, so be sure that the *Automatic Plug-in Latency Compensation* option is enabled in the *Setup menu> Configure Audio System> Configure Studio Settings* dialog. See "Automatic plug-in latency (delay) compensation" on page 25.

Pitch automation note range

Pitch automation edits are limited to the note range C0 through C6.

Pitch edits are bound to soundbites

Even though they look just like volume, pan and other track-based automation data types, pitch automation edits are bound to the specific soundbite on which you perform the edit. This means that if you then move the soundbite, the pitch edits move with it. In addition, all instances of the soundbite in the project are affected. Conversely, you can create harmonies from the same source audio by creating different soundbites from the same parent audio file region. Each separate soundbite can have unique pitch edits.

Pitch adjustments are non-destructive

Any adjustments that you make to the pitch of audio are *non-destructive* and *non-constructive*. In other words, the original audio data is not

modified in any way, nor is any new audio data generated on disk. Instead, pitch modifications are rendered in real-time by Performer Lite's processing engine. Therefore, they can be quickly applied, modified and removed, even during playback. In fact, you might find it most useful to keep playback going — and even loop sections — when you are editing pitch, as you will enjoy the benefit of instant feedback as you work. Pitch adjustments can, however, be permanently applied to audio by merging the soundbite or (unlike other forms of automation) exporting the soundbite.

Viewing pitch automation

To access pitch automation, choose *Pitch* from the Sequence Editor track layer menu (Figure 62-2).

The pitch layer represents the pitch of the audio in two forms, superimposed on top of the waveform: 1) as a blue line (the *pitch curve*) and 2) as bars or *pitch segments*. Both are measured by the pitch ruler along the left edge of the track. You can expand the vertical size of the track, zoom the vertical resolution and scroll the vertical position of the pitch layer information, all independently of the waveform display. This allows you, for example, to position the pitch information above or below the actual waveform, rather than directly on top of it.

Absolute vs. relative pitch editing

There are two modes for editing pitch: *Absolute* and *Relative,* chosen from the *Pitch layer mode* menu (Figure 62-2). These two modes do not change how the audio plays back, just how it is viewed and edited.

Absolute

Absolute mode displays pitches as directly editable bars in a piano roll style edit layer with a vertical, multi-octave pitch ruler along left edge of the track lane (as shown in Figure 62-2). This mode is best for tuning monophonic audio (i.e. solo vocals, solo instruments, etc.)

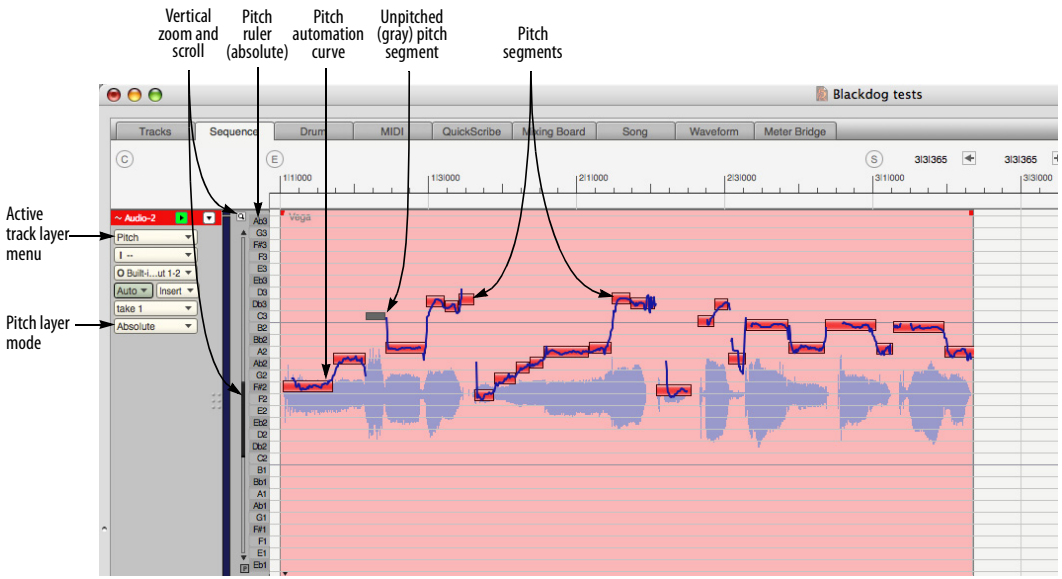


Figure 62-2: Pitch automation.

Relative

Editing in *Relative* mode simply allows pitch to be offset by some amount. The pitch ruler keyboard shows interval offsets, mirrored above and below a center (root) line, rather than absolute pitches from top to bottom (Figure 62-3). The root pitch in the pitch ruler is indicated by the track color.

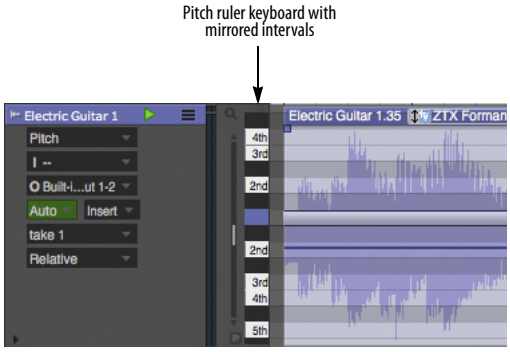


Figure 62-3: Relative pitch editing mode.

Initially, Relative mode displays a single bar for the entire soundbite (Figure 62-3), which you can drag up and down. Use the scissor tool to split the bar into segments, which can then be individually dragged up or down (Figure 62-4), similar to Absolute mode. The scissor tool responds to grid snapping, if enabled. When dragged vertically, pitch bars snap to the chromatic scale in the pitch ruler. For fine-tuned adjustments, hold down command/ctrl to override pitch snapping while dragging vertically.

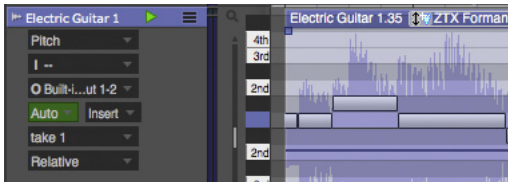


Figure 62-4: Use the scissor tool to create and drag pitch segments.

Relative mode can be used for monophonic material, but it also works well for full mixes and polyphonic audio, which cannot be represented with single pitch bars.

The pitch curve

The *blue pitch curve* (Figure 62-2) represents the original pitch. If you modify the pitch curve in any way, the modified portions of the curve are displayed in red. You can select and edit the pitch curve directly using the Arrow tool and the Pencil tool, as follows:

To do this to the pitch curve	Do this
To redraw the pitch curve	Set the Pencil/Reshape curve menu in the Tool palette to *Free* and drag over the pitch curve with the Pencil tool.
To select the pitch curve	Drag over it with the Arrow tool (lasso cursor), or click a pitch segment to select the part of the curve that it represents.
To get rid of any red portions (modifications)	Select the curve and hit delete, or choose *Audio menu> Pitch and Stretch > Clear Pitch.*
To scale the existing curve	Option/Alt-click the curve and then drag vertically. See "Scaling the pitch curve" below for further details.
To reshape the curve	Choose the desired shape from the Pencil/Reshape curve menu in the Tool palette, set the edit grid resolution (if desired) and drag over the pitch curve with the Pencil tool.

Pitch curve control points

Control points can be added to the pitch curve to modify it as follows:

To do this	Do this
To add a control point	Double-click the pitch curve with the Arrow tool.
To modify the pitch curve with the control point	Drag the control point with the Arrow tool.
To anchor the pitch curve on either side of a control point when you drag it	Add control points on either side of it at the locations where you want to anchor the curve.
To select a control point	Drag over it with the Arrow tool (lasso cursor).
To delete a control point	Select the portion of the pitch curve and choose *Audio menu> Pitch and Stretch > Clear Pitch Control Points*.

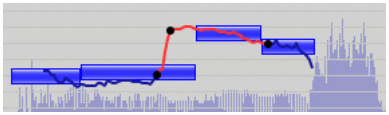


Figure 62-5: Pitch curve control points.

For best results

Although you can make precise pitch adjustments on the pitch curve with the Pencil tool and control points, often you will achieve more natural results by simply transposing and scaling the original curve as described in the following sections.

Scaling the pitch curve

Option/Alt-drag vertically on the pitch curve to scale it. Dragging upwards accentuates the existing curve; dragging down flattens it. The portion of the curve that is affected by the scaling operation is determined by:

- the end points of the pitch segment at the location where you click, or
- the currently selected portion of the pitch curve, if any.

You can also scale the pitch curve by selecting the portion you wish to scale and choosing *Audio menu> Pitch and Stretch > Scale Expression*.

Scaling the pitch curve can be used for a variety of applications. Here are a few examples:

- To produce more or less vibrato in audio that already has some vibrato
- To reduce unwanted variations in pitch
- To enhance variations in pitch

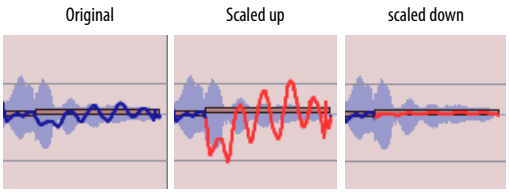


Figure 62-6: Option/Alt-drag vertically to scale the existing pitch curve. In this example, vibrato is being reduced and increased.

Editing the pitch curve in relative mode

You can edit the pitch curve in both absolute and relative modes. If you don't see the pitch curve, try zooming in horizontally. Keep in mind that Absolute and Relative modes are different views of the same pitch curve. If edits are made in Absolute mode, Relative mode's pitch bar(s) will move accordingly (and vice versa).

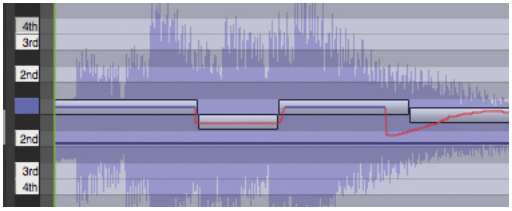


Figure 62-7: Editing the pitch curve in Relative mode.

Pitch segments

In Absolute mode, *Pitch segments* (Figure 62-2) represent the detected average root pitch of each note in the audio. In *Relative* mode (Figure 62-4), they represent deviations from the original pitch. They are displayed in the color assigned to the track. These segments can be fine-tuned in a variety of ways to accurately represent individual notes in the audio — without changing the audio itself. You can then use the pitch segments to modify the pitch of the audio in a wide variety of ways, from micro-tonal tuning adjustments to wholesale transposition and key changes. You can even copy and paste pitch segments into a MIDI track to create MIDI notes that match the source audio.

Fine-tuning pitch segments

In Absolute mode, pitch segments are most useful when they accurately represent the pitch and duration of each individual note in the audio. Performer Lite does its best to detect the root pitch, beginning and end of each note. But further adjustment may be necessary. For example, a singer may bend the pitch of a held note, causing Performer Lite to represent the audio as two

different pitch segments. To accurately represent them as one continuous segment, you can go in by hand to merge them together into a single pitch segment. As another example, you might want to slightly adjust where the transition from one segment to another occurs.

Fine-tuning pitch segments does not affect audio

It is crucial to understand that the types of changes to the pitch segments being discussed so far have no effect whatsoever on the audio signal itself. Instead, the purpose of these changes is to represent as accurately as possible the notes in the original audio signal itself. The more accurate the pitch segment representation, the more successfully you will be able to modify the pitch of the audio using the pitch segments (via several techniques discussed later).

Setting the pitch mode

Before you make individual adjustments to pitch segments, you should first choose an overall pitch mode for the audio. There are two different pitch modes: *vocals* and *instruments*. Choosing the appropriate pitch mode for the audio material you are working with can dramatically improve the initial representation of the pitch segments, so that you'll have much less tweaking to do by hand, if any. To set the pitch mode for a track or soundbite, select it (in the Sequence Editor) and then choose *Audio menu> Pitch and Stretch*, and then choose the desired sub-menu command:

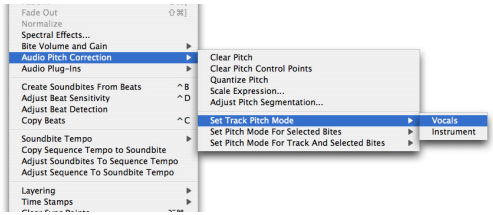


Figure 62-8: Setting the pitch mode for a soundbite or track.

Here is a summary of how these three pitch mode commands affect pitch segments:

Pitch mode command	What it does
Set Track Pitch Mode	Sets the default pitch mode for any audio material newly recorded into that track. It does NOT affect existing soundbites already in the track, or soundbites dragged into the track.
Set Pitch Mode for Selected Bites	Sets the pitch mode and modifies the pitch segments accordingly for the currently selected audio in the Soundbites list or in any tracks.
Set Pitch Mode for Track and Selected Bites	Applies the pitch mode to both the track and any currently selected soundbites as described above in one operation.

Adjusting pitch segmentation

Another way to control overall pitch segmentation accuracy is to select the desired audio and then choose *Audio menu> Pitch and Stretch > Adjust Pitch Segmentation:*

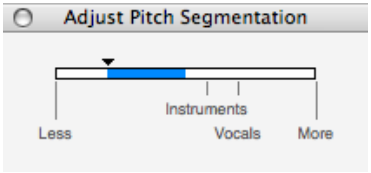


Figure 62-9: Adjust Pitch Segmentation.

Move the slider to the right for more detailed segmentation; move it left for less detail. The *Instruments* and *Vocals* settings along the slider match their corresponding menu settings shown in Figure 62-8 on page 552 and produce the same results and the respective menu setting.

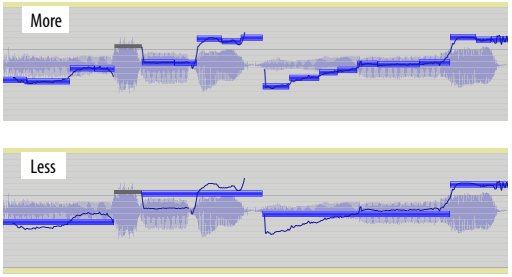


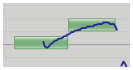
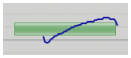
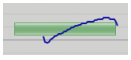
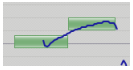
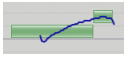
Figure 62-10: Adjusting pitch segmentation.

Adjusting pitch segments while playing back

It can help to loop a section and make pitch segment adjustments during playback to match what you are seeing with what you are hearing. This goes for all pitch segment editing.

Editing pitch segments

After you've chosen the pitch mode for the track or soundbite, you can further modify the pitch segments to more accurately reflect the notes in the audio as follows:

To do this	Do this	Example
To join adjacent segments	Click between them with the Mute tool.	Before  After 
To split adjacent segments	Click with the Scissor tool.	Before  After 
To move the boundary between two segments	Drag one of the adjacent segment edges with the Arrow tool (using the trim cursor shown below)	Before After 

Trimming pitch segments

As noted above, you can position the Arrow tool over the edge of a pitch segment to get the trim cursor (shown in the table). Drag horizontally with the trim cursor to move the edge of the segment. If the pitch segment you are trimming lies adjacent to silence (at the beginning or end of the audio signal), you are not allowed to extend the segment into the silence, as segments only represent portions of the soundbite that have audio signal of some kind.

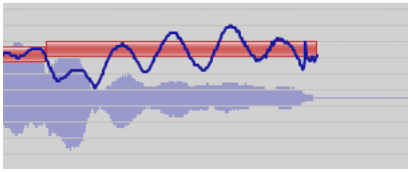


Figure 62-11: The right edge of this pitch segment cannot be dragged to the right because there is silence there.

Gray pitch segments

Gray pitch segments represent portions of the audio signal that have no detectable pitch. For example, a percussive drum sound, such as a cymbal, has no clearly defined root pitch. Another example are the *sibilants* found in vocal tracks: these are sounds such as "s" or "ch" that do not have pitch to them.

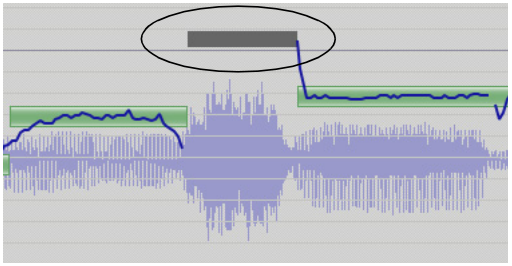


Figure 62-12: Gray (unpitched) segments.

Gray segments are displayed to indicate that there is signal present in the audio, but that the signal has no detectable pitch. Gray segments cannot be modified (since there is no pitch information to transpose).

Dangling segments

A *dangling segment* is a portion of a segment for which there is no pitch curve. This is most often the result of unpitched material that is not yet split into its own gray segment. In the example below, the dangling segment on the left has been split into a gray segment using the Scissor and Trim tools. There may be situations, however, where dangling segments are preferred, such as when you convert pitch segments into MIDI notes ("Converting audio pitch to MIDI data" on page 556).

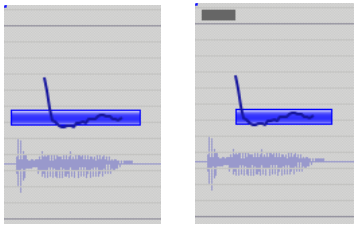


Figure 62-13: A dangling segment that has been converted to an unpitched gray segment via segment editing.

Reverting to the default pitch segmentation

If you edit the pitch segments and then decide you want to start over, select the soundbite and choose *Audio menu> Pitch and Stretch > Set Pitch Mode for Selected Bites>* and then choose either *vocals* or *instruments.* Doing so recomputes the pitch segments and restores them to their original state, before any modifications.

Modifying pitch using pitch segments

After the pitch segments accurately reflect the notes in the audio, as explained in the previous sections, you can use the pitch segments to transpose the audio as follows:

To do this	Do this
To transpose a note chromatically	Drag its pitch segment vertically. The note snaps to the root pitches in the pitch ruler, but also maintains its relative position to the root pitch (if its a little sharp or flat).
To correct the pitch slightly or perform other micro-tonal adjustments	Command/Ctrl-drag the pitch segment vertically.
To select the pitch segment (and the portion of the pitch curve that it represents)	Click the pitch segment with the Arrow (finger) tool.
To select multiple pitch segments	Shift-click them or drag over them with the Arrow (lasso) tool.
To drag multiple pitch segments	Select them first and then drag them.
To return a pitch segment to its original pitch	Select it and hit delete, or choose *Audio menu> Pitch and Stretch > Clear Pitch.*

When you modify pitch segments, the pitch curve reflects those changes. In fact, the pitch segments are essentially "note-bound" handles for the pitch curve itself, so when you edit the segments, you are really editing the pitch curve. The segments merely provide a musical way to manipulate the curve, including smooth pitch transitions between notes when transposing individual notes.

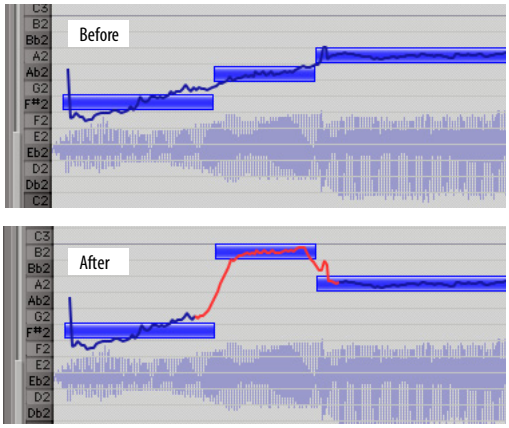


Figure 62-14: Editing pitch by dragging a pitch segment.

Quantizing pitch

If you would like to "center" one or more pitch segments, so that they are tuned exactly to their relative root pitch (to fix any notes that are a little sharp or flat), select their pitch segments and choose *Audio menu> Pitch and Stretch > Quantize Pitch.* Doing so centers each pitch segment with its corresponding root pitch (or relative interval) in the pitch ruler. In general, you achieve best results from this operation if you first edit pitch segments with the Mute and Scissor tools, as explained in "Editing pitch segments" on page 553.

The pitch reference

By default, pitch editing is based on the standard "A 440" tuning reference, where the A above middle C is 440 Hz.

USING THE TRANSPOSE COMMAND

You can use Performer Lite's standard Transpose command (Region menu) to apply a wide variety of transpose operations on the pitch segments and the audio data they represent. Select the pitch segments you wish to transpose (using any of the techniques discussed in the previous section) — or just select the audio itself — and choose *Region menu> Transpose*. Make sure the *Transpose audio* check box is checked, and the *Transpose audio by adjusting pitch automation* option is chosen, as demonstrated in Figure 62-15 below:

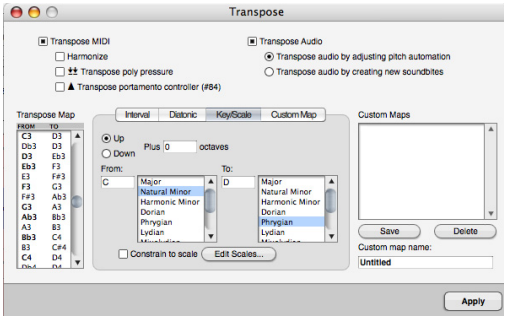


Figure 62-15: Check the 'Transpose audio' check box to transpose audio data.

You can then choose any form of transposition option you wish, including *Interval*, *Diatonic*, *Key/Scale* and even *Custom Map*. This is a very powerful feature because it gives you the same level of complete control when transposing audio as you do when transposing MIDI data. Keep in mind, however, that the success of audio transposition operations like this, as with all pitch-shifting, depends on the size of the intervals involved and the nature of the audio material being transposed. Some types of audio material transpose better than others.

Another important factor for successful transposition is the accuracy with which the pitch segments in the pitch layer of the track represent the actual notes in the audio, as explained in the previous sections. So before using the Transpose command to transpose audio, it is a good idea to spend some time reviewing the pitch segments for accuracy.

In the example above (Figure 62-15), audio is being transposed from one key and mode (C minor) to an entirely different key and mode (D Phrygian).

TRANSPOSING AUDIO AND MIDI TOGETHER

When using the Transpose command (Figure 62-15), you can of course select both audio and MIDI tracks together to transpose them in one operation. Just be sure to check both the MIDI and audio check boxes as shown in Figure 62-15.

TEMPORARILY DISABLING PITCH MODIFICATIONS

Any modifications you make to the pitch of audio in the Pitch Layer of an audio track can be temporarily disabled using the techniques described below. When you disable pitch modification in this way, all pitch edits are fully preserved, and you can re-enable them at any time:

To do this	Do this
To temporarily disable all pitch modifications in the entire track	Click the 'P' button at the bottom of the track's pitch ruler in the Sequence Editor. You can also use Performer Lite's Option/Alt-click and Command/Ctrl-click shortcuts. Or choose *Pitch* from the track settings menu.
To temporarily disable a specific soundbite's pitch modifications	In the Sound File Info window, set the soundbite's Transpose attribute to *Don't Pitch Shift*.

When pitch edits are disabled, you cannot edit the track pitch layer information.

When pitch automation is bypassed using the 'P' button, the data is still processed in real-time so that you can immediately hear the results when

you unbypass. In this case, the bypassed pitch automation takes up just as much computer processing resources as when it is unbypassed (playing).

When pitch automation is bypassed via the *Don't Pitch Shift* soundbite setting, the pitch data is completely ignored, therefore conserving your computer's processing resources.

CONVERTING AUDIO PITCH TO MIDI DATA

Pitch segments (Figure 62-2) can be copied and pasted into MIDI tracks, essentially allowing you to convert the pitch information in the audio into MIDI data. This powerful feature can be used for a wide variety of applications. For example, you could layer a vocal part with MIDI parts, or sing a melody and then convert it to MIDI data for further development. The possibilities are endless.

The accuracy of the MIDI transcription is entirely dependent on the accuracy with which the pitch segments represent the notes in the audio. The more accurately the pitch segments represent the actual audio, the more accurate the MIDI transcription.

Preparing for MIDI pitch transcription

Pitch segments are copied and pasted as is, so if you have made any modifications to the pitch segments — or changes to the pitch curve that are reflected by the pitch segments — the changes will be carried over into the MIDI track.

For best results, try these preparations on the pitch segments before you copy and paste them:

- Quantize pitch (*Audio menu> Pitch and Stretch > Quantize Pitch*) to ensure that each note is centered on its root pitch.
- Make sure there is a one-to-one correspondence between each pitch segment and each note that you hear in the audio.
- Review the timing of the pitch segments — where they start and end — to accurately reflect the full duration of each note.

These preparations will help a lot, but it is important that you realize that the resulting MIDI notes will not match the pitch segments exactly. See "What you see is not what you'll necessarily get" below.

Copying and pasting pitch segments

After making the preparations listed above, copy and paste pitch segments as follows. This procedure assumes that you want the resulting MIDI notes to play in time with the original audio, so you will be pasting the MIDI data at the location where the first pitch segment begins:

1 Select the pitch segments with the Arrow tool (lasso cursor).

2 Choose *Copy* from the Edit menu.

To paste the resulting MIDI notes so that they play in time with the original audio, leave the pitch segments selected and continue with the following steps:

3 Press shift-spacebar to invoke Run Command.

4 Type in *Selection Information* to open the Selection Information window (Figure 62-16).

5 Choose *Set to Selection Bounds* from the Selection Information window's Set To menu as shown in Figure 62-16.

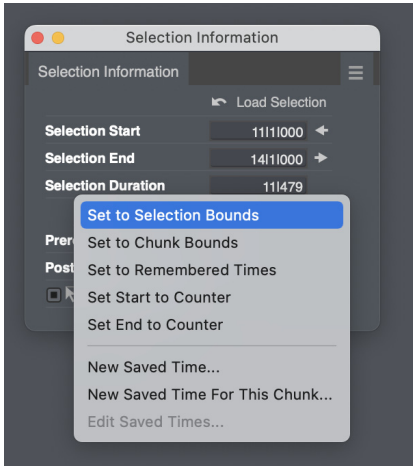


Figure 62-16: Setting the selection to match the currently selected pitch segments.

6 Click the name of the MIDI track you wish to paste into to create a time range selection in the destination track that matches the current selection start time (which now matches the start time of the first pitch segment you copied).

7 Choose *Paste* from the Edit menu.

What you see is not what you'll necessarily get

When you copy pitch segments and paste them into a MIDI track, the resulting MIDI notes will likely not exactly match the original pitch segments. This is because Performer Lite interprets the pitch segments with respect to the waveform to create a MIDI performance that matches the audio as closely as possible.

To further refine the timing of the resulting MIDI notes, try quantizing them. Best results are often achieved by quantizing both attacks and releases of the MIDI notes.

ZTX PROCESSING PREFERENCES

In Preferences > Audio Options (Figure 28-5 on page 255), the *Pitch and Time Stretch Options* let you adjust the quality and speed of the ZTX processing. Try experimenting with different settings here for best results. You can change the settings on the fly at any time.

BACKGROUND PROCESSING

As soon as you OK the Transpose dialog, the selected soundbites (or pieces of soundbites, for a time-ruler selection) are replaced with new soundbites, which are analyzed and processed in the background as described in "Background Processing" on page 544.

CHAPTER 63 Spectral Effects

OVERVIEW

Performer Lite combines formant-corrected pitch shifting, standard pitch shifting, and time scaling to allow some rather surprising effects. The Spectral Effects command (Audio menu) allows you to shift the formants of a audio independently from its pitch. This effect lets you turn a female voice into a male one or vice versa. It also can be used more subtly, to make a soprano sound more like an alto while singing the same pitches, for instance. Spectral Effects can be applied to any pitched monophonic or polyphonic audio material.

The Spectral Effects command **558**
What is a formant? **558**
What does Spectral Effects do? **559**
Gender-bending **559**
Special effects such as "chipmunking" **559**
Any pitched audio can be used **559**
Spectral Effects dialog controls **559**
Spectral Effects presets **559**
Applying Spectral Effects to audio **560**

THE SPECTRAL EFFECTS COMMAND

The Spectral Effects command lets you independently modify the pitch, *formants*, and tempo of selected soundbites (or parts of soundbites).

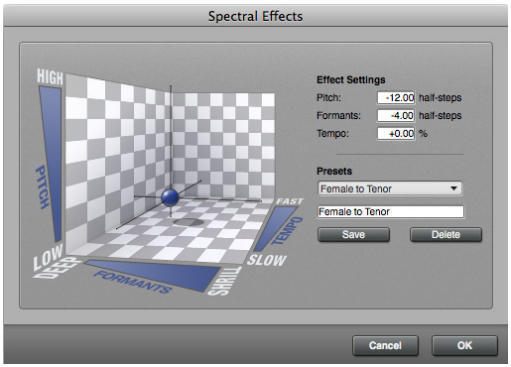


Figure 63-1: The Spectral Effects dialog (in the Audio menu) lets you transpose, time-scale, and gender-bend audio all in one operation. Just drag the globe to the desired position within the space, or type in values as desired. You can save favorite settings for future recall.

WHAT IS A FORMANT?

When you speak (or sing), there are two factors that combine to give your voice its sound. Your vocal cords vibrate at some frequency, and this determines the pitch of the sound. If your vocal cords could somehow vibrate in free space, they would have a buzzy, sawtooth-wave sound to them. The sound contains the fundamental frequency, as well as all of its harmonics, or overtones.

However, your vocal tract (mouth, tongue, and lips) also has a very significant effect on the sound of your voice. Depending on what you are saying, there are different resonant frequencies that are boosted, and other frequencies that are damped. These resonant frequencies are called formants. There are typically three or four formants, which

are constantly changing, depending on whether you are saying "ee," or "oo," or "ah," et cetera. These formants are what determine the vowel or consonant sound that is perceived.

As you can see, the voice is very much like an analog synthesizer. The vocal cords are a sawtooth oscillator, whose output is fed through a series of filters. The words you are speaking determine the resonant frequencies of those filters, *i.e.,* the formants.

WHAT DOES SPECTRAL EFFECTS DO?

The Spectral Effects command lets you change the pitch of a sound and its formants independently. Changing the pitch and the formants by the same amount is identical to Standard pitch shifting. Changing just the pitch is identical to formant-corrected pitch-shifting. Changing both by different amounts produces results that are, to say the least, even more interesting.

GENDER-BENDING

For example, if you leave pitch and tempo alone, and only change the formants by a half-step or two, you can make a soprano sound more like an alto, or make an adult have a more child-like voice. More dramatically, lower the pitch by an octave and the formants by a third or a fourth, and a female voice sounds remarkably like a male voice. This can be a very useful effect for creating a chorus of different sounding voices.

SPECIAL EFFECTS SUCH AS "CHIPMUNKING"

The Spectral Effects command also allows you to get more carried away. If you shift the formants up an octave without changing the pitch or the tempo, you get the famous "chipmunk" effect, without having to sing an octave lower! Obviously this isn't something you want to do all the time, but it's there if you need it.

ANY PITCHED AUDIO CAN BE USED

Spectral shifting works best on pitched sounds. (Note that the spoken voice falls within this category.) Our explanation this far has dealt with voice only, but the concept carries through to other sounds. Many sounds are formed by applying resonances to a pitched source. For example, the strings and fretting of a guitar determine the pitch, but the shape of the body gives it its resonances. You can use Spectral Effects to change the tone of a guitar recording without transposing it.

SPECTRAL EFFECTS DIALOG CONTROLS

As shown in Figure 63-1 on page 558, the Spectral Effects window has a 3-D controller that lets you see at one glance the effect you are applying to all three parameters: pitch, formants, and tempo. The position of the ball within the space provided shows the current setting. You can drag it up and down to change the pitch, left and right to change formants (left is lower), and front and back to change the tempo (front is slower). There are also boxes showing the current settings, and you may type in new values (or drag vertically in the text box to change them).

SPECTRAL EFFECTS PRESETS

The controls are useful for fine-tuning an effect, or trying something brand new, but in general you will probably want to use the presets. The preset menu has a number of built-in "factory" presets, with fairly descriptive names. Just choose one from the menu, and it will set the controls. You will probably want to try out some of these presets first to get a feeling for how the controls work.

If you come up with a new setting you'd like to use again, you may save it as a new preset. Just type in a name for it, and hit Save. If you want to delete a preset, select it from the menu, and then hit Delete. Presets are saved in your Preferences file.

APPLYING SPECTRAL EFFECTS TO AUDIO

Like Transpose and Scale Time, the Spectral Effects command works with all the different ways of selecting audio as summarized in "Selecting audio for processing" on page 542. Unlike these other commands, however, Spectral Effects is an Audio-only command; it has no effect on selected MIDI data. Also, unlike the other commands, it is not affected by the settings of the DSP preferences in the Soundbites window. Spectral Effects always processes all selected soundbites.

CHAPTER 64 Scale Time

TIME SCALING

Time scaling means you can change the length of recorded digital audio without changing the frequency. As with pitch-shifting, there are limits as to how far you can shift and still have a musically useful result. The limits are not hard and fast, however. They depend on the audio, and on the intended use (*e.g.*, soloed versus buried in a mix). Some audio sounds fine after its tempo has been halved or doubled, but most will start sounding a little unusual before such an extreme compression or expansion is reached.

THE SCALE TIME COMMAND

The Scale Time command (in the Region menu) now allows you to compress or expand soundbites. It also has an improved, more flexible interface.

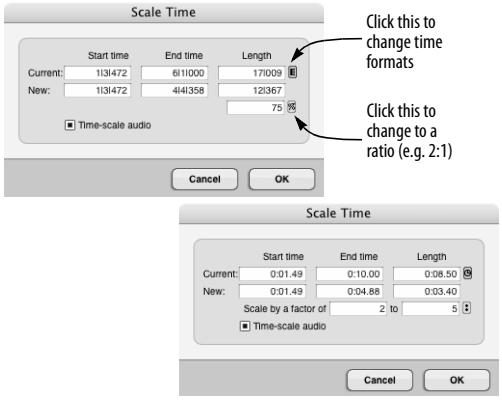


Figure 64-1: The Scale Time command supports MIDI data, audio data, and both at the same time. Two examples are pictured: scaling by SMPTE frame times and by measures, beats, and ticks. Note that you can also enter the amount as a percentage, or as a ratio (by clicking the scale factor button).

The Scale Time dialog shows the current start and end times and duration of the selection. Below that are values for the new start and end times and duration. A button to the right lets you choose whether to display these times as measures, real time, or SMPTE time. If you know the new duration or end time, you can just type in either field and hit OK. If you'd rather enter the scale factor as a ratio or a percentage, you may do that as well, as shown in Figure 64-1.

The Scale Audio checkbox determines whether selected soundbites (or pieces of soundbites) should be time-scaled. If it is not checked, only the start times are changed. When scaling audio, you may not expand by a factor of more than 10 to 1, or compress by more than 1 to 10. (This is not much of a practical limitation — very few soundbites will sound good when stretched by a factor of 2, let alone 10.) If the Scale Audio checkbox is not checked, you may scale by up to a factor of 100.

SELECTING A REGION TO TIME SCALE

As with Transpose, the Scale Time command works with any of the methods of selection discussed in "Selecting audio for processing" on page 542, and it allows you to scale audio and MIDI data together. It can also be used to change the duration of a single soundbite, selected in the Sequence Editor or Soundbites list.

AUDIO AND TEMPO

See chapter 44, "Tempos and Audio" (page 422).

GRAPHICALLY TIME-SCALING AUDIO

See "Graphic time stretching of audio" on page 340.

Part 11

Bouncing & Mastering

CHAPTER 65 Bounce To Disk

OVERVIEW

Bounce to Disk lets you mix down an output (or outputs) to an audio file (or set of audio files). Original tracks are preserved and new audio files are created. A bounce operation can be done offline (faster than real-time) or in real-time (so you can listen to audio playback of your mix during the bounce process).

Bouncing is commonly used for creating a final mix of a project for mastering and delivery. Bouncing can also be used:

- to create a single, contiguous audio file out of a track composed of many smaller ones
- to temporarily bounce down multiple tracks to conserve CPU resources
- to export a project as multiple "stems" (separate audio files) for import into other audio apps

Since bouncing occurs in the digital realm, no noise or sonic degradation is introduced. You can bounce as many times as you like without introducing any artifacts as a result of bouncing.

When bouncing, you can choose to create a single resulting audio file or multiple separate files (*stems*) generated from multiple tracks or audio outputs in your system.

You can also use the Bounce to Disk feature to burn a CD, create a disk image or to export a movie with your Performer Lite sound track.

Overview **564**
Previewing **564**
Bouncing to Disk **564**
Bounce to Disk settings **565**
Bouncing to MP3 ..... **569**
Bouncing to a CD or disk image (Mac only) **570**
Bouncing to a Movie **575**
Bouncing stems **576**

PREVIEWING

When bouncing, what you hear on each output when you play back the sequence is what you will get in the resulting mixdown of that output. To preview the results of the bounce, solo the tracks you wish to include in the bounce and play back the sequence.

BOUNCING TO DISK

Bouncing to disk is a simple three step process:

1 Select any portion of one or more audio tracks.

2 Choose Bounce to Disk from the File menu.

3 Adjust the settings in the Bounce to Disk dialog as desired (Figure 65-1 on page 564) and click OK.

You'll then see the progress window shown below.

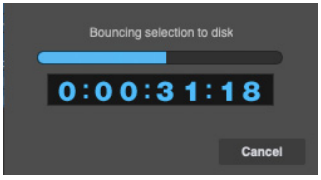


Figure 65-1: The progress window for the Bounce command.

The resulting audio file will sound exactly the same as the output of the track(s) you selected, including volume/pan automation, mute/solo settings, real time MAS, VST and AU effects, EQ and any other real time processing that is applied to the selected output. Here is a summary of what is included:

Audible tracks

All audible tracks that are routed to the output which is selected as the source of the bounce are included in the bounce. Muted tracks are not included. If you solo one or more tracks, only the soloed tracks are included in the bounced mix.

Automation

All enabled automation is played back and incorporated in the bounced mix.

Inserts and sends

All active inserts, including real-time plug-ins and hardware inserts, are applied to the bounced mix.

Selection length

The bounced mix will be the length of the selection you made before initiating Bounce to Disk.

Time stamps

Bounced material is automatically time stamped so that you can drag it into a track and place it at the same location as the original material.

Delay compensation

Bounce to Disk compensates for any bus and plug-in delays. If a bounced file is imported back into a session and aligned with the source mix, it will be correctly aligned with the original source mix.

BOUNCE TO DISK SETTINGS

The Bounce to Disk dialog (Figure 65-2) provides the following settings.

File Format

The File Format menu (Figure 65-2) lets you bounce to variety of file formats or destinations (Figure 65-3).

To use the project's current file format and interleaved format, choose *Project Format*.

For details about bouncing to an audio CD or audio CD disk image, see "Bouncing to a CD or disk image (Mac only)" on page 570.

The Core Audio file formats, which are supplied by macOS, always create interleaved files.

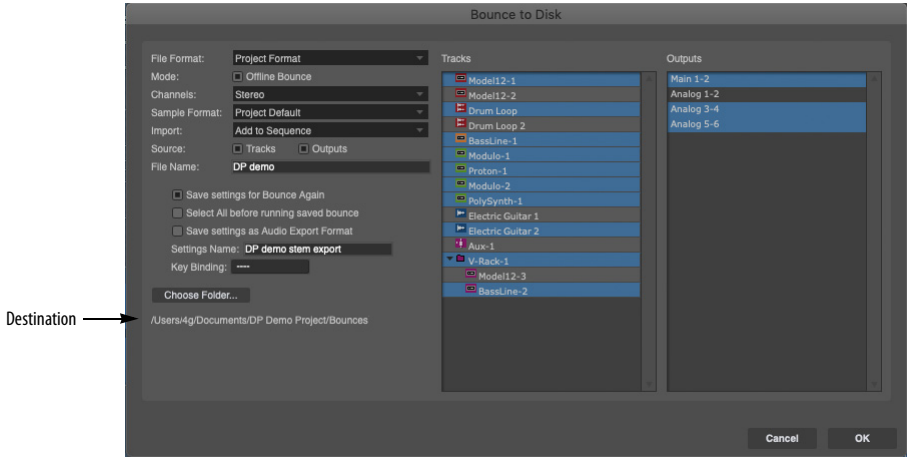


Figure 65-2: Performer Lite's Bounce to Disk feature (File menu).

For details about bouncing to the MP3 format, see “Bouncing to MP3” on page 569.

For details about bouncing to a QuickTime movie (on macOS), see “Bouncing to a Movie” on page 575.

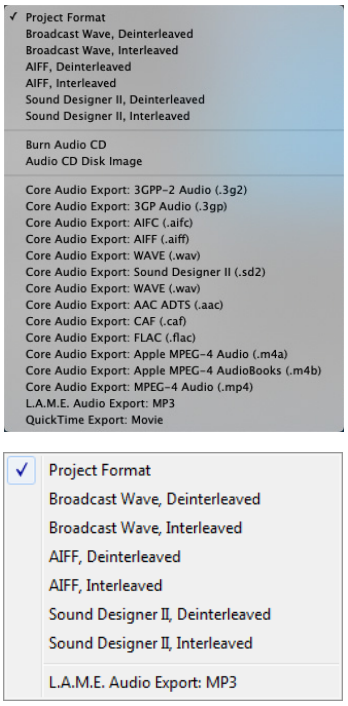


Figure 65-3: The Bounce to Disk File Format menu.

Offline Bounce

When *Offline Bounce* is enabled, processing occurs faster than real time. Therefore, there is no playback during the bounce operation. Factors that affect the speed of offline bouncing include:

- **The speed of your computer’s CPU** — The faster your computer is, the faster the offline bounce.
- **The number of tracks selected** — If what you have selected can be played by your computer in real time, then offline bouncing will probably occur faster than real time. If you have selected more tracks than you can play at one time, then the operation may not occur faster than real time.
- **Disk speed** — Potentially large amounts of audio data are pulled from your hard drive during offline bouncing. The performance of your storage device can therefore impact offline speed.
- **Third-party plug-ins** —Some third-party plug-ins may slow down offline bounce operations due to their CPU requirements.

☛ If you experience issues with third-party plug-ins during bounce operations, first try doing a real-time bounce (with Offline Bounce disabled).

Limitations of Offline Bounce

When using Offline Bounce, the following are not included in the resulting mixdown:

- Hardware inserts
- External audio sources monitored by aux tracks
- Any audio source that is synchronized externally

Real-time bounce (Offline bounce disabled)

When Offline Bounce is turned off, the bounce operation proceeds exactly as if it were playing back in real time. This offers several advantages:

- You can listen to the results of the bounce as it processes.
- You can include hardware inserts.

Channels

The *Channels* menu (Figure 65-2) lets you choose the channel format for the bounced material with four choices (*Figure 65-4*):

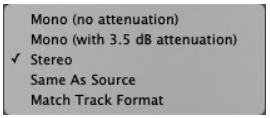


Figure 65-4: The Bounce to Disk Channels menu.

Mono (no attenuation)
Mono (Figure 65-4) creates a single monophonic audio file. Performer Lite simply sums the left and right channels of the outputs of the source tracks, so there is a possibility that the resulting mono mix might clip, even when the source material does not. If this is the case, undo the bounce operation, adjust the levels of the source tracks and bounce again.

Mono (with 3.5 dB attenuation)
When bouncing to mono, the *with 3.5 dB attenuation* option (Figure 65-4) preserves the level when bouncing a signal that is panned center. The attenuation compensates for the 3.5 dB boost you get from summing the left and right channels of a centered signal with equal-power panning.

Stereo
The *Stereo* option (Figure 65-4) creates a stereo file. If you've chosen a multi-channel bundle as the source, it will be folded down to stereo.

If an interleaved format is chosen, *Stereo* creates an interleaved stereo file. If a deinterleaved format is chosen, *Stereo* creates two mono audio files with the same file name, but with ".L" or ".R" appended to the end of the file names.

Same as Source
The *Same as Source* option (Figure 65-4) creates a file with the same channelization as the Source bundle (see "Source" below). The resulting file can be interleaved or deinterleaved, depending on the format chosen.

Match Track Format
The number of channels for a track's output may not match the track's channel format. For example, a mono track might be assigned to a stereo output, so the track output is stereo, even though the track format is mono. When you choose the *Match Track Format* option (Figure 65-4), the resulting bounce mix is folded down to match the track channel format, such that mono tracks will result in mono files, even if they are assigned to stereo outputs.

Sample Format

The *Sample Format* menu (Figure 65-2) lets you choose the bit depth for the bounced audio (Figure 65-5):

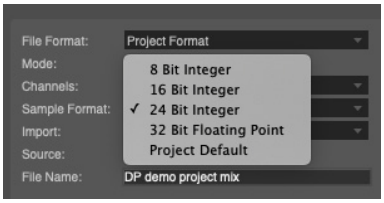


Figure 65-5: The Bounce to Disk Sample Format menu.

Supported fixed bit depths include 8, 16 or 24 bit integer. You can also choose *32 bit Floating Point*, if the format you've chosen (Figure 65-3) supports this resolution. If not, this menu choice is grayed out.

Choose *Project Default* to use the current project sample format. If you choose 8 bits (a sample format not supported by Performer Lite for playback), the *Import* option below will force you to choose the *Do not import* setting.

Supported resolutions
8-bit resolution it typically applied to audio that will be used in multimedia and internet applications because it significantly reduces the size of the audio files, halving the bandwidth required to deliver the sound. When you are bouncing down to 8-bit audio, you may want to

apply Performer Lite's MasterWorks Compressor (or a third-party dynamics plug-in of your choice) to the mix to counteract the effect of halving the dynamic range that results from going to 8 bits.

16-bit resolution is the standard resolution for compact disc audio.

24-bit audio provides greater resolution and headroom and is used by many mastering systems.

32-bit floating point audio file resolution is an emerging standard used for high-end recording, mixing and mastering applications. Performer Lite's mix engine employs 32-bit floating point precision throughout, as do other advanced digital audio workstation systems. If you plan to use the bounced material with Performer Lite or another system that supports 32-bit floating point processing, this option is a good way to preserve and carry over the floating point precision employed by these systems.

Import

The *Import* menu (Figure 65-2) lets you choose what to do with the audio files generated by the bounce operation. If you choose *Do not import*, the file will be created on the hard drive but it will not be imported into Performer Lite. Otherwise, you can import the audio file into the Soundbites list or into the current sequence as a new audio track. If you have chosen a format not supported by Performer Lite, you will not be allowed to choose either of these import options.

Source

There are two types of sources you can select to capture in a bounce: *Tracks* and *Outputs*. Multiple tracks and outputs can be selected, resulting in multiple mixdown files (to export stems, for example). Selecting an output captures the audio from that output in the resulting mixdown file. Selecting a track captures the audio from the track's output.

When more than one source is selected, each resulting mixdown audio file is given a unique name as follows: the base name entered in the File Name field (Figure 65-2 on page 565), plus the name of the track or output appended to the end of the file name.

Source tracks
Disk tracks, instrument tracks and aux tracks appear in the Sequence Editor as possible sources. Master faders do not: choose their corresponding outputs instead. For instrument tracks, be sure their corresponding MIDI track is play-enabled during the bounce operation.

Source outputs
Any outputs or busses available in your project (in the Bundles window Outputs tab) are available as source outputs.

External sources
External audio sources, such as hardware synthesizers or outboard processors, can be included in real-time bounce operations. For offline bounces, record the external source to a disk track beforehand (because its real-time performance cannot be faithfully reproduced in the faster-than-realtime offline mixdown).

If an external source is being monitored through an aux track, make sure that the aux track (or the output it is assigned to) is selected as a source

File name

In the *File Name* field (Figure 65-2), type in the desired name for the resulting audio files. If multiple files are generated (due to a deinterleaved stereo bounce operation), appropriate extensions will be appended to the end of each file name to indicate its channel (".L", ".R", etc.)

Destination

The destination (Figure 65-2) displays the disk location for the resulting audio files created by the bounce operation. Click the *Choose* button to change it.

Overwrite Existing Files

Normally when you Bounce to Disk, Performer Lite generates a new file name — one that does not conflict with existing files on your disk. However, if you check the *Overwrite Existing Files* option (Figure 65-2), then Performer Lite will overwrite any file (or set of files for split stereo files) of the same name.

This option can be especially useful in the final stages of mastering. Suppose you have several sequences that go into making an album, where each sequence represents one track. You can then create a separate Performer Lite project that is the "album master" project, which includes the final bounce of each component track sequence (track). With the *Overwrite Existing Files* option unchecked, you would need to re-create the "album master" project each time you performed a bounce on any of the component track sequences, since the bounce results would go into new (different) files. However, if *Overwrite Existing Files* is checked, the existing files are overwritten, and the album master project file references will therefore remain in tact, as they will still point to the latest exported data with the same name (and file path).

If the "Import" option on page 568 is currently set to *Add to sequence* or *Add to soundbites window*, then the OverWrite Existing Files option is grayed out.

BOUNCING TO MP3

As shown in the menus in Figure 65-3 on page 566 and Figure 23-17 on page 230, Performer Lite can export audio to the MP3 audio file format, either using the *Bounce to Disk* command or the *Export Selected Soundbites* command in the Soundbites list mini-menu.

MP3 export options

To bounce or export an MP3, choose the *L.A.M.E. audio export: MP3* format, as shown in Figure 65-3 and Figure 23-17 on page 230. When you choose this format, you will see the following MP3 export options:

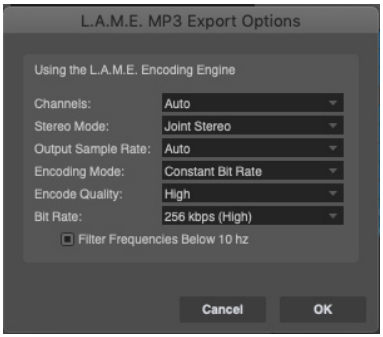


Figure 65-6: The MP3 export options.

If you don't have any specific needs or requirements for your MP3 file, the default settings in the MP3 export options window will give you very good results. If you have specific needs, the export options give you the following choices:

Channels: The choices here are *Mono, Stereo* or *Auto*. This option lets you force the MP3 to be either Mono or Stereo. If you want the MP3 to automatically match the channel format (mono or stereo) of the source material, use the Auto setting. Mono files are about half the size of stereo files. Mono is appropriate if you don't have stereo speakers or if your audio files are monaural. If you'll be listening to your MP3 files using your stereo system, choose Stereo or Auto.

Stereo mode: The two choices here are *Normal* and *Joint Stereo*. In Normal mode, your MP3 files contain one track for the right stereo channel and

one track for the left. In many cases, the two channels contain related information. In Joint Stereo mode, one channel carries the information that is identical on both channels, and the other channel carries the unique information. At bit rates of 128 kbps and below, this can improve the sound quality of your converted audio. Generally, Joint Stereo mode is the best choice.

Output Sample Rate: The choices here are *Auto*, and a list of specific bit rates. The best choice is usually the *Auto* setting, which makes the MP3 match the source material sample rate automatically. The *sample rate* is the number of times per second that the music waveforms are captured digitally. The higher the sample rate, the higher the quality and the larger the file size. Be sure to choose a sample rate that is no higher than the rate used to originally store the music, or you'll waste disk space and streaming bandwidth. CD quality, for example, is 44.1 kHz, so choosing a higher rate when you're encoding from a CD is unnecessary.

Encoding mode: This option lets you specify the bit rate (number of bits per second). This is an important setting because it has a high degree of impact on both the file size and quality of the sound. The four choices are summarized below:

Encoding mode	What it does	Explanation
Variable Bit Rate (VBR) Standard	Varies the bit rate as needed, depending on the material.	In general, you'll get the best results with this option (the best sound and the smallest file).
Variable Bit Rate (VBR) Fast	Same as above, except that the encoding process will be faster.	The results will still be good, but perhaps not quite as good as the standard VBR above.
Average Bit Rate	The bit rate is still variable, but the encoder restricts the overall average bit rate of the entire file to the specific value chosen in the Bit Rate menu.	Use this encoding method if you need to restrict the file size or overall bandwidth.
Constant Bit Rate	Forces the same bit rate throughout the file, regardless of the material.	This gives you the most control over the file size and streaming bandwidth.

VBR (variable bit rate) quality: This option appears if you've chosen one of the two VBR encoding modes above. If so, this option lets you control the quality of VBR encoding on a scale from 10 (good) to 100 (best).

Bit Rate: This option appears if you've chosen either the *average* or *constant* bit rate encoding modes above. If so, this option lets you specify the desired bit rate in kilo bits per second (kbps). The range is from 16 kbps (lowest quality but smallest file size) to 320 kbps (best quality but largest file size). For internet distribution of reasonably high-quality music, 128-160 kbps are common bit rates.

Filter frequencies below 10 hz: Humans can't hear frequencies below 10 hertz (cycles per second). But these inaudible frequencies can unnecessarily increase the file size and adversely affect quality, so you'll get better results when these frequencies are filtered out.

BOUNCING TO A CD OR DISK IMAGE (MAC ONLY)

The Bounce to Disk window lets you bounce directly to an audio CD (or and audio CD disk image) in one convenient operation. This feature can be used to burn a quick reference CD for one track or to master a complex, full-length CD with many tracks.

Preparing material for a multi-track CD

If you are creating a CD with just one track — perhaps as a quick reference disc to play in the car — then all you need to do is select the material you wish to "bounce and burn".

If you are going to create a CD with multiple tracks, however, you may want to assemble them together into a separate Performer Lite project that serves as your "CD master" project. This project can be very simple: one stereo track, with the

desired gap between each track. Here is a suggested quick way to assemble a CD master sequence:

1 Bounce each song to disk to create a master stereo mix for each song.

2 Create a new Performer Lite project with one stereo track.

3 Select all your master stereo mix audio files and drag them together into the new project sequence while holding the Control/Win key. Doing so places them end to end with no gaps.

4 Choose *Edit menu> Select All* and then choose *Region menu> Set Gap Between Soundbites* to set the desired gap between the soundbites. (Note that this command does not place a gap in front of the very first audio file at the beginning of the sequence.)

This procedure produces a typical CD with individual tracks and a gap between them. You'll learn more about positioning track start times, applying crossfades, if desired, and other additional CD mastering techniques later in this chapter.

If you are likely to continue making changes to the material on the CD as you refine it, be sure to enable the *Overwrite Existing Files* option (Figure 65-2) when bouncing each song to disk. This will maintain the link between the bounced song files and the master CD project you've created. For a further explanation, see "Overwrite Existing Files" on page 569.

The bounce and burn procedure

To bounce and burn an audio CD:

1 Make sure the tracks you wish to include are assigned to the same output bundle.

2 Make a selection over all the material you wish to include on the CD.

3 Choose *File menu> Bounce to Disk.*

4 Choose *Burn Audio CD* from the Format menu:

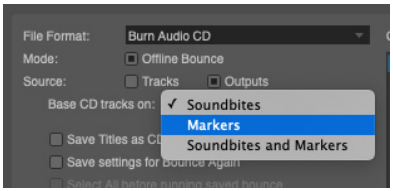


Figure 65-7: Burning and audio CD.

5 See "Base CD Tracks on" on page 572 and "CD Text" on page 573 for further information about these two audio CD burning options.

6 After you've set the CD burning options as desired, click OK to initiate the bounce and burn.

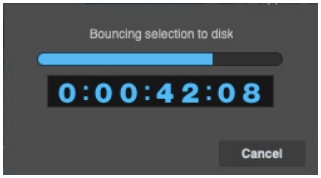


Figure 65-9: The audio CD disk image is bounced first.

7 Next, you'll see the macOS "burn disc" dialog:

Figure 65-10: Burning the audio CD.

8 Insert a blank disc and click *Burn*.

CD track info panels

When you first choose the *Burn Audio CD* option (Figure 65-7), you will see shaded areas in the Sequence Editor (behind the Bounce to Disk window), as shown in Figure 65-8. These shaded

areas indicate the gaps between tracks. You will also see a CD track info panel at the beginning of each track (Figure 65-8) to visually indicate where the track boundaries will occur on the audio CD. Each info panel displays the CD track's name, pre-gap, start time and duration.

Base CD Tracks on

In the Bounce to Disk window, the *Base CD Track On* menu (Figure 65-7) determines where the start of each track will occur on the resulting audio CD. This menu provides three choices: *Soundbites*, *Markers*, or *Soundbites and Markers*.

Soundbites

In *Soundbite* mode (Figure 65-7), a CD track start will be placed at the beginning of each soundbite encountered in the selection, as long as it is not connected to the previous soundbite with a crossfade. Using crossfades allows you to "stitch together" several soundbites into a single track.

Markers

In *Markers* mode (Figure 65-7), a CD track start will be placed at each marker encountered in the selection.

If you have a complex sequence in which the soundbite boundaries have nothing to do with how you want the audio to be divided into tracks, enter a marker at each point where a track should begin and use *Markers* mode. A new track will begin at each marker location, and the soundbite boundaries will be ignored.

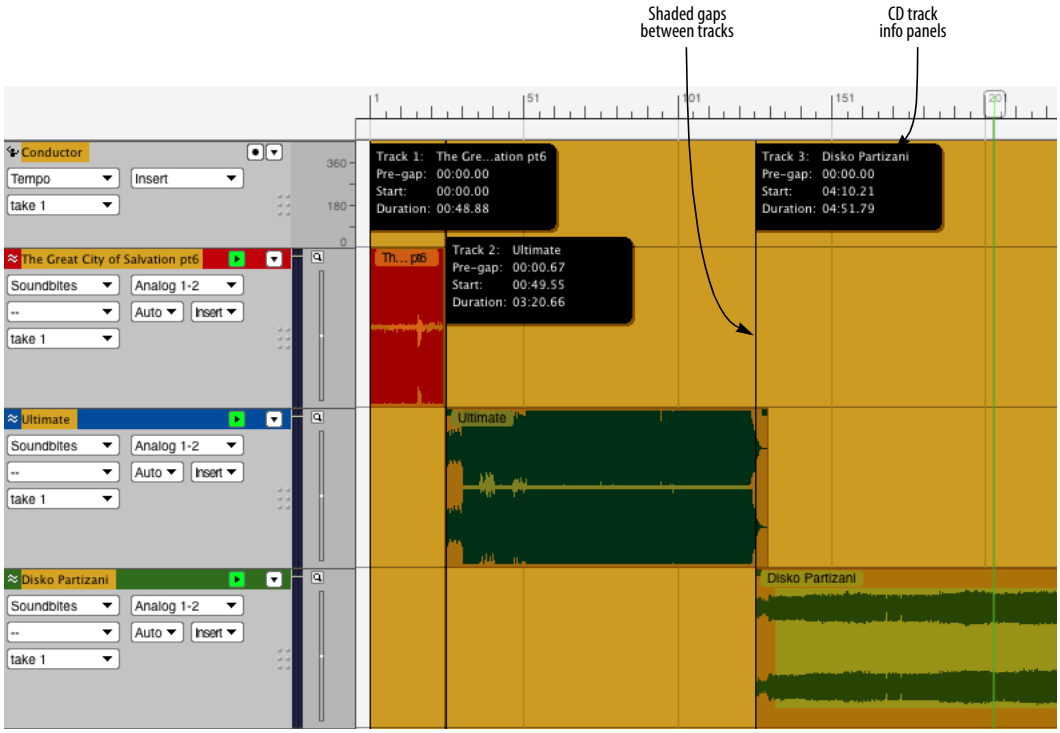


Figure 65-8: When you choose Burn Audio CD or Audio CD Disk Image from the Bounce to Disk window Format menu (Figure 65-7)

Soundbites and Markers
In *Soundbites and Markers* mode (Figure 65-7), a CD track start will be placed at each soundbite and marker encountered in the selection, as long as the soundbites are not connected to the previous soundbite with a cross fade.

Suppose you have two or more soundbites that you have faded into one another, but you want them to show up as separate tracks. Simply add a marker where you want the new CD track to begin, and select *Soundbites and Markers* mode.

Track Pre-gap

A subtle yet important feature of an audio CD is the notion of *pre-gap*. This is audio that plays before a track begins, but it is not part of the previous track. For example, you could have one track that ends with some echo spill-over, creating a short period of additional ambient noise, and then the next track begins. You might not want that short period of ambient noise to be part of either the previous song or the next song. This material can be categorized as pre-gap. In many audio CD players, the track number will increment while the pre-gap is being played, and you will see negative times in the "time remaining" display to indicate that the next track has yet to begin.

How Performer Lite determines track pre-gap
If a Soundbite was used to determine a CD track start, then the pre-gap amount is simply the space between the last soundbite's end and the new soundbite. (So, if you use *Region menu > Set Gap Between Soundbites*, you will notice the pre-gap in the track boundary display is the same as you just applied.)

If a marker is used to determine a CD track start, the default pre-gap is zero (since markers are used in situations where the audio is continuous). You can override the default pre-gap time for a marker (or more than one marker) by selecting them in the Markers window, and choosing *Set Marker/ Streamer options*. In the dialog that appears, choose *Custom pre-gap for CD burn* and enter the pre-gap amount (as minutes:seconds: hundredths of a second).

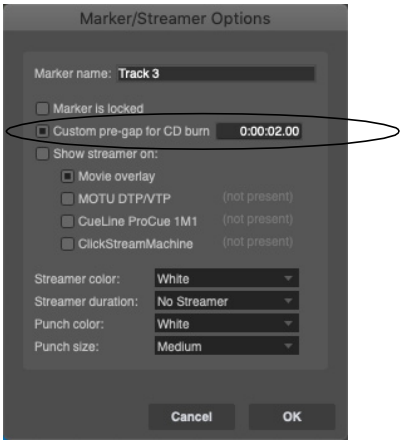


Figure 65-11: Setting the pre-gap for a marker.

CD Text

Although the original audio CD specification did not allow for the inclusion of track names or other information in the data on the disk, a mechanism known as *CD Text* has been developed over the years. It allows for the embedding of some text data on the CD, most notably track names.

If you check the *Save Titles as CD Text* box in the Bounce to Disk dialog (Figure 65-7 on page 571), the track titles will be added to the burned disc. Each track's name is taken from the soundbite or marker used to determine its start time. If the track start time is being specified by the soundbite start, the track name will be the name of the soundbite. Similarly, if a marker is used to determine the track start, the marker name is used. These names are displayed in the track info panels (Figure 65-8 on page 572).

iTunes does not automatically read in track names from CD Text. (With commercially available CDs, the track names come from an online database rather than the disc itself.) Fortunately, however, there are free scripts available on the internet that can import your audio CD track names into iTunes.

Audio CD Disk Images

Along with the *Burn Audio CD* choice in the Bounce to Disk dialog, there is also an *Audio CD Disk Image* option in the Format menu (Figure 65-7 on page 571) that lets you save the bounce as an image on your hard drive to be burned to a CD at a later time. This is useful when you want to burn more than one CD or to simply save a snapshot of your work.

Image files have the extension *acdi* (Audio CD Image). Double clicking an acdi file in the Finder or Explorer will launch Performer Lite and present the burn dialog.

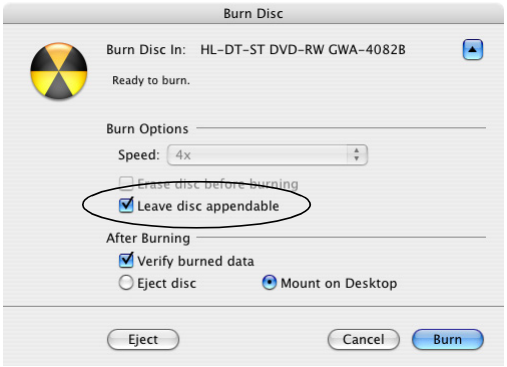
"Enhanced" CDs

You can use Performer Lite's CD burning features in combination with macOS X's Disk Utility to create an *Enhanced CD*: a hybrid audio CD and data disc. Insert it into a CD player and it plays your sequence as an audio CD. Insert it into a Mac and it mounts on the desktop as a data CD volume with a backup copy of your Performer Lite project data files.

The audio portion of the CD must be burned first by Performer Lite, followed by the data portion by Disk Utility.

1 Choose *File menu* > *Bounce To Disk* and choose the desired settings for your CD burn. Click OK to begin the bounce.

2 When the bounce finishes and you are prompted to insert a CD and configure the burn options, expand the dialog to show all settings and then check the *Leave disc appendable* box.



3 Click *Burn*.

4 When the burn finishes, you will have an audio CD. However, the disc is not closed so it is still possible to add further disk images to it.

5 Launch Disk Utility (found in /Applications/Utilities).

6 Choose *File menu* > *New* > *Disk Image from Folder*.

7 Select the folder containing the data you wish to burn to the CD and click *Image*.

8 Specify where the image file will be saved on your hard drive and choose a name for it. Make sure the *Image Format* menu is set to "compressed". Click *Save*.

9 The image file (ending in .dmg) will be created on your hard drive. This may take some time, as the data must be copied into the image file.

10 After the .dmg file is created, it will appear in the list along the left of the window. Select it and choose *Images menu* > *Burn*.

11 In the Burn Settings dialog, uncheck *Leave disc appendable*.

12 Press the *Burn* button and insert the CD you burned with Performer Lite.

13 When the burn finishes and your CD is complete, it will mount on the Mac desktop as two CDs: one audio and one data.

If you would like to add more than one data session to the disc, keep the *Leave disc appendable* box checked in Step 11, then repeat Step 5 through Step 9 as many times as you would like. When you add the final session, uncheck the *Leave disc appendable*.

BOUNCING TO A MOVIE

You can bounce an audio output bundle (mono or stereo), together with video, to a movie file. This allows you to export a complete movie from Performer Lite in one easy operation, complete with a sound track that you've created in Performer Lite. To do so:

1 Open a project that has a sequence with a movie.

2 Assign the audio tracks you wish to include in the movie to the same audio output bundle. It can be any channel format (mono or stereo).

3 Select the audio tracks over the range you wish to bounce in the usual fashion.

4 Choose *File menu> Bounce to Disk*.

5 Choose *QuickTime Export: Movie* (Mac) or *Windows Video Exporter: H.264 MP4* (Windows) from the *Format* menu.

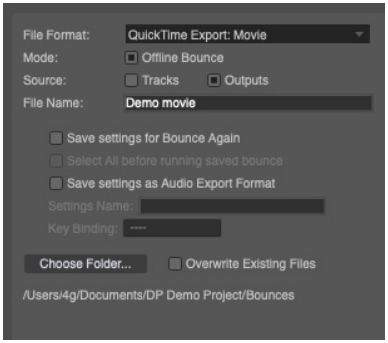


Figure 65-12: Exporting audio plus video to a movie.

6 Choose the appropriate output bundle from the *Source* menu, and specify a destination folder as usual.

7 If you wish to replace the existing movie, check the *Overwrite Existing Files* option.

8 Click OK.

9 *Mac only:* The QuickTime export options appear. If you are running MacOS 10.7 or later, set *Include film scoring events track* as desired.

10 Click OK.

Mac only: Exported audio tracks are encoded as Apple AAC in the sample rate of the Performer Lite project. Apple's AAC encoder only supports sample rates up to 48 kHz, so Performer Lite will downsample, if necessary, during the bounce operation.

Video black

If the audio starts before the source video begins or extends past where the source video ends, Performer Lite appends the movie with video black so that the resulting movie matches the length of the audio.

Include film scoring events track

Under MacOS 10.7 or later, this option lets you include film scoring events as part of the video.

BOUNCING STEMS

To bounce stems, the basic procedure is as follows:

1 Preview your mix to make sure all tracks to be mixed down are unmuted.

2 Select All.

3 Choose Bounce to Disk.

4 For the source options, choose both *Tracks* and *Outputs*.

5 Select each track for which you wish to create a stem file.

6 If you wish to include a full stereo mix as part of your stem export, select your primary output pair (e.g. *Main Outs*).

7 Enter an appropriate file name as a base name for all the stems.

8 Make the other settings in the Bounce to Disk dialog as desired.

9 Click OK.

CHAPTER 66 Mastering

OVERVIEW

Mastering is the process of preparing your mix for final delivery on audio compact disc, in MP3 format, or any other delivery medium of your choice. This chapter discusses several topics related to mastering that are specific to Performer Lite. However, there is much more to know about the art of mastering and the many engineering techniques involved. The internet is an excellent resource for further information. As you learn more about general mastering principles, keep in mind that Performer Lite provides all of the tools you need to achieve even the most advanced mastering objectives.

Overview 577
Master fader 577
Allocating processing power 577
Real-time bounce to disk 578
Rendering audio 579
Bounce to disk 580
Delivery 580

MASTER FADER

The master fader is the most important element in your mix. If you are not using a master fader on your mix and are encountering distortion, chances are, you are overloading the mix bus. The solution for this is very simple. Create a master fader and assign its output to the same output as the rest of your faders. This allows you to pull down the over all level of your mix to avoid distortion.

MasterWorks Limiter

The next step is to apply the MasterWorks Limiter to the master fader to control the overall average level of your mix. For complete details, see "MasterWorks Limiter" on page 36 in the *DP Plug-in Guide*. Here is a brief overview of how to get started:

1 Set the master fader at unity gain (0.0 dB).

2 Lower the MasterWorks Limiter ceiling to -0.5dB.

3 Set the MasterWorks look-ahead to 1ms.

4 Set the MasterWorks release to 0.10ms.

5 Be sure dithering is on.

6 Press play in Performer Lite.

7 Gradually bring the threshold down until you see gentle gain reduction in the area of –2 to –4dB. You may have to use the input gain to bring the mix into the range of the limiter.

At this point, you have accomplished a gentle normalization of your audio with dithering.

Experiment with the threshold control to bring up the overall average level of your mix.

ALLOCATING PROCESSING POWER

When using a native audio system such as MOTU Audio System, you may find it necessary to juggle buffer settings depending on what you wish to accomplish. When finalizing a mix and then mastering it, your goal should be to maximize the amount of processing power available for real time MOTU Audio System effects. One way to do this is to raise the buffer settings for your audio system. 1024 is a good setting at which to mix.

Higher buffer settings free up more processing power for mixing at the expense of increased input monitoring latency. This may or may not be an issue for you, depending on how go about mixing and mastering your project. In many cases, input monitoring latency only comes into play at the

beginning of a recording project when you are first laying down tracks. While monitoring live input during recording, you can reduce the buffer size to eliminate monitoring delay and afterwards raise it again for increased processing power during mixing and mastering.

While mastering, however, your mix may include real-time elements (software synths or MIDI triggered effects, for example) that require that you maintain low buffer settings. In this case, you need to do the best you can to balance your system resources with the demands of these real-time elements of your mix.

If your project contains only audio and MIDI assigned to virtual instruments (e.g. no real-time input from aux tracks from external sources), then you are ready to bounce your project to disk. If your project contains any external real-time sources (MIDI tracks assigned to hardware MIDI Instruments, external processing, virtual instruments, etc.) you have two strategies for finishing your mix:

- Real-time bounce to disk
- Rendering

These techniques are discussed in the next few sections.

REAL-TIME BOUNCE TO DISK

Let's say you have a fairly complex project with MIDI tracks submixed externally and their combined audio signal entering Performer Lite via an aux track. You may also have some external virtual instruments (like Propellerhead's Reason) coming into some aux tracks as well. If your mix sounds good at this point, you can perform a real time bounce to disk as follows:

1 Reassign the outputs of all your audio and aux tracks to an unused stereo bus. You may have to create one if one does not exist. It might help to use an audio bundle and give it a name such as 'my mix bus'.

2 Create a new stereo audio track and set the input of the audio track to the newly created bus ('my mix bus'). You may also set the output of your audio track to your original monitor outs so you can monitor the progress.

3 One final touch: rename the new audio track 'final mix'. When Performer Lite writes the new file to disk, the file will assume the track name.

External virtual instrument compensation

If you are using a virtual instrument that runs as a stand-alone application alongside Performer Lite (like Propellerhead's Reason), you may wish to compensate for latency by pushing the MIDI tracks assigned to that instrument ahead in time. This can easily be accomplished with the non-destructive Time Shift MIDI plug-in. If your virtual instrument MIDI track has data starting at 1|1|000, you can shift your entire project later by one measure to avoid having the first note of that track disappear.

For virtual instrument plug-ins, Performer Lite provides automatic latency compensation.

External effects compensation

Externally processed tracks can also benefit from latency compensation. For example, you may decide to send a drum submix out to a vintage compressor and feed the result back into Performer Lite's mixing board. If the input buffers are set at 256 samples, for example, you can used the Shift command (Edit menu) to advance your drum tracks by 256 samples.

RENDERING AUDIO

Another strategy for finishing your mix is to render all elements of your mix as audio. This procedure requires more disk space, but these commodities are quite affordable these days. One strong advantage of this approach is complete portability. For example, you may open up the project in the future and find that you don't have access to the same outboard processing gear or virtual instruments. If this is a concern for you, it may be a good idea to render these elements. After all the elements of your mix are rendered as audio, then you can perform a normal, non-real time bounce to disk.

Rendering software MIDI instruments

In most cases, Bounce to Disk can be used to render your virtual instruments as audio. See "Source tracks" on page 568 for more details.

Rendering external MIDI instruments

Recording the audio output of MIDI modules as audio exactly preserves the performance of that instrument.

Some MIDI modules include digital outputs which you may want to take advantage of. If you own many instruments with digital outputs, it may be a good idea to consider a MOTU 308 digital interface. In addition to functioning as a digital patchbay, it allows you to keep all your digital gear wired directly into Performer Lite. This means you can record the output of a sound module without disconnecting the analog outputs.

If you use multiple MIDI modules, chances are good that you are already using a mixer to sum the outputs of these devices. You can render the entire MIDI submix by recording the output of the mixer. Another method is to use an alternative set of outputs or busses to avoid re-patching the outputs of your mixer.

Under some circumstances, you may want to record the outputs of your MIDI tracks individually for more flexibility when mixing in Performer Lite. If you find yourself doing this frequently, you may want to dedicate a set of sends to inputs on your audio interface. Another technique is to employ a patchbay so you can quickly route signals from the mixer to the audio interface. This also eliminates unnecessary additional gain stages between the output of your MIDI module and the input of your audio interface.

Recording individual MIDI tracks presents some opportunities to enhance your mix. You may own an outboard processor that has a certain 'magic'. Recording individual MIDI tracks through this processor one at a time effectively multiplies the number of instances that you have of this processor.

Rendering external processors

Recording the output of a signal processor does not require any latency compensation as discussed earlier because it does not involve real-time monitoring. This is another advantage to rendering, as it leaves you with one less thing to worry about.

If you feed a Performer Lite disk track to an external signal processor and then feed the processor output back into Performer Lite as a live input, you can precisely compensate for the delay. See "External effects compensation" on page 578.

Rendering MIDI triggered effects

In a bounce to disk operation, MIDI elements are ignored because bouncing is not a real time process. If you used MIDI triggering of effects in Performer Lite, such as with MasterWorks Gate or Multimode Filter, you will need to capture the real time output of that effect. Create a new audio track and set the output of the original track to a bus assigned to the input of the new track. Lower the

hardware buffer setting and record the result. Be sure to mute the original track before you bounce to disk.

BOUNCE TO DISK

Now that you have rendered all elements of your mix to audio tracks, you can now touch up your final mix and bounce to disk. See chapter 65, "Bounce To Disk" (page 564) for complete details. Be sure the *Add to soundbites window* option is enabled. Name your mix something memorable, such as 'final mix'.

DELIVERY

Performer Lite supports a variety of native file formats: interleaved and deinterleaved Broadcast WAVE and AIFF files at 16-bit, 24-bit, or 32-bit floating point. When you need to export your mix out of Performer Lite, open the Soundbites list, select your 'final mix' file and choose *Export Selected Soundbites* from the mini-menu. You can export the mix in all of Performer Lite's supported formats and more.

Create an MP3 file

Use Performer Lite's Bounce feature or the *Export Selected Soundbites* feature mentioned above to export directly to MP3 file format.

Part 12
Synchronization

CHAPTER 67 Receive Sync

OVERVIEW

The Receive Sync command (Setup menu) allows you to 'slave' Performer Lite to a wide variety of 'master' timing sources. Performer Lite supports all standard MIDI synchronization formats, including MIDI Time Code and MIDI beat clocks with Song Position Pointer data for synchronization with drum machines, hardware sequencers, and other MIDI devices. With a SMPTE-to-MIDI converter such as MOTU's MIDI Express XT, Performer Lite can sync to audio tape, video, or film, ensuring that events in your sequence happen at exactly the same spot on tape or film every time. Performer Lite also supports sample-accurate digital audio synchronization with devices that support the ADAT and Tascam sample-accurate digital audio synchronization protocols. Performer Lite also has a Tap Tempo feature for synchronizing to prerecorded music, conducting a sequence as it plays back, or simply recording a tempo map in real time.

Overview 582
Receive Sync basics 582
Basic types of sync 582
Using Receive Sync 583
Choosing a SMPTE frame format 583
Choosing a SMPTE start frame 584
Sync to port menu 584
Record while still-framed 584
Sample-accurate sync 585
MTC (MIDI Time Code) 586
MIDI Beat Clocks 587
Tap Tempo 588
Slaving to external sync 589
Using Tap Tempo 590
Using Tap Tempo while slaved to external sync 592

RECEIVE SYNC BASICS

Performer Lite supports all standard modes of synchronization: Sample Accurate Sync, MIDI Time Code, MIDI Beat Clocks, and Tap Tempo. These modes are selected in the Receive Sync settings window. When MIDI Beat Clock or Tap Tempo is selected, other parameters appear in the Receive Sync settings window and must be set correctly; the MIDI Time Code and Sample Accurate modes have no other parameters (except for the frame rate). The mode you use depends on the equipment to which you are synchronizing.

BASIC TYPES OF SYNC

The following section describes the common forms of synchronization and the corresponding modes in Performer Lite.

Sample Accurate

Sample-accurate synchronization is the tightest possible synchronization between two devices. It offers the strong advantage of exactly preserving the phase relationship between digital audio tracks in a multitrack project, even when they are not transferred at the same time. For example, if you transfer 8 tracks from the ADAT into Performer Lite, sample accurate sync ensures that they will maintain their exact phase relationship to one another, even if you record them into Performer Lite one at a time.

SMPTE time code

SMPTE time code is an international standard that was developed for film and video work but has proven to be very useful in normal audio work as well. This is an absolute time code, expressing hours, minutes, seconds and divisions of the

second in digital form. It can be recorded on tape or film and read by a special device to convert it to MIDI.

Since SMPTE has no intrinsic tempo information, the sequencer or device converting SMPTE to MIDI must generate its own tempo. Performer Lite's flexible tempo map and frame time display make it ideal for work with SMPTE time code. Because of its accuracy and wide-spread acceptance, SMPTE is the most powerful of the time code formats.

Depending on your converter, you can use the MIDI Beat Clock or MIDI Time Code modes. MIDI Time Code is the easiest and most accurate mode. MIDI Time Code allows the use of Performer Lite's tempo maps, and is far superior to the MIDI Beat Clocks mode.

In addition, MOTU Audio interfaces can slave directly to SMPTE timecode – consult your MOTU Audio interface user guide.

MIDI beat clocks

MIDI Beat Clocks are produced by most MIDI compatible drum machines and sequencers, and by some synthesizers (particularly those with built-in sequencers).

MIDI beat clocks are transmitted 24 times a beat. If the master device changes tempo, the MIDI beat clocks slow down or speed up accordingly; any slave device will follow this tempo change. Most devices that generate MIDI beat clocks also send Start, Stop, and Continue messages; slave devices will start playback, pause, rewind, or play from the current location according to the combination of these messages received. In addition, many devices send Song Position Pointer data. These messages set the current location for playback, much like setting the Counter in Performer Lite.

To sync Performer Lite to devices using these MIDI messages, use the MIDI Beat Clock mode in the Receive Sync settings window.

Tap Tempo

Tap Tempo is Performer Lite's real-time tempo control facility. This form of synchronization slaves Performer Lite to a 'tap' entered from your MIDI controller. Performer Lite receives a MIDI event for each tap and computes a tempo based on the current meter, the click value, and each event's distance in time from the previous event. Any tempo information in the sequence is ignored while Performer Lite is slaved to Tap Tempo. Tap Tempo supports both recording and playback, so your tap can conduct or be recorded into any sequence, empty or finished. When you record in Tap Tempo, each tap becomes a tempo event in the Conductor Track. Even if you have a minimal MIDI setup, you have everything you need to use Tap Tempo synchronization.

USING RECEIVE SYNC

The following sections explain the Receive Sync settings (opened from the Setup menu).

CHOOSING A SMPTE FRAME FORMAT

If you are slaving to any sync type that involves SMPTE time code, or if the work you are doing in Performer Lite requires that you reference SMPTE time code, be sure to choose the correct SMPTE frame format at the top of the Receive Sync settings window as shown below in Figure 67-1. This setting is the same setting as the Frame Rate selection in the Setup menu.

All standard SMPTE frame rates are provided: 23.976, 24, 25, 29.97 drop, 29.97 non-drop, and 30 fps.

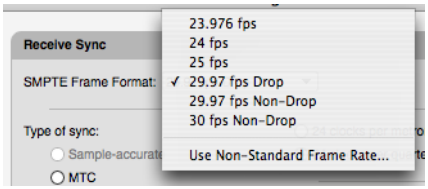


Figure 67-1: Choosing a SMPTE time code frame format.

CHOOSING A SMPTE START FRAME

When slaving Performer Lite to SMPTE Time Code (via MTC or LTC), you need to specify a SMPTE start time for the sequence. This is the frame location at which the sequence begins to play. See "Setting the start time" on page 109.

SYNC TO PORT MENU

The *Sync to Port* menu lets you choose the source from which Performer Lite will receive MIDI timing information (beat clocks, MIDI Time Code, etc.)

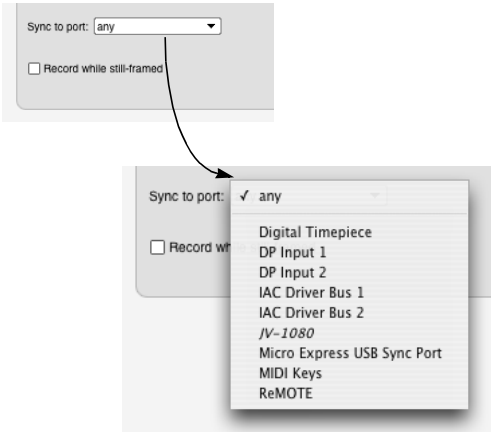


Figure 67-2: The Sync to Port menu.

Any device in your MIDI device configuration (Setup menu > Bundles > MIDI Devices tab) that has the MIDI Beat Clock or MIDI Time Code attribute checked will appear in this menu. Choose *Any Port* to allow Performer Lite to slave to any timecode that it receives, regardless of its source.

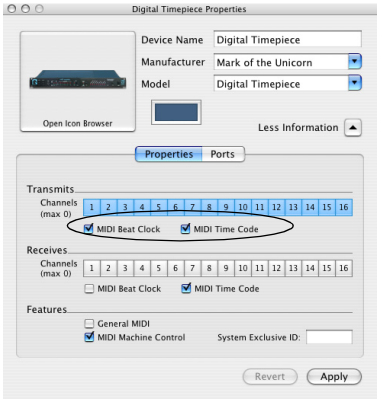


Figure 67-3: Any device that has the 'Transmits MIDI Beat Clock' or 'Transmits MIDI Time Code' properties checked will appear in the Sync to Port menu in Performer Lite's Receive Sync settings window.

RECORD WHILE STILL-FRAMED

The Receive Sync preferences has an option called *Record while still-framed*. Without this option checked, Performer Lite drops out of record as soon as you stop the tape after a record pass while slaved to tape; Performer Lite will not record again until you press the Record button. This prevents unintentional recording while cuing and accidental loss of Undo Record. When this option is checked, Performer Lite stays in record when you stop the tape so that you can record a hit while parked on a frame. This is particularly useful when frame-advancing while slaved to a VITC-compatible synchronizer such as a MOTU Video Timepiece or Digital Timepiece, which provides accurate frame-advancing. Unless you are recording while frame-advancing, we recommend that you leave this option unchecked.

SAMPLE-ACCURATE SYNC

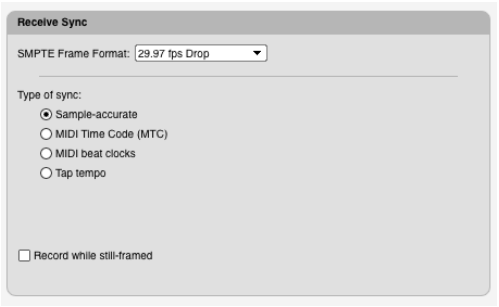


Figure 67-4: Sample-accurate sync settings. Notice that there is no 'Sync to Port' setting for sample-accurate sync, since Performer Lite directly accesses the audio hardware for sample address information.

If you are using Performer Lite with a MOTU PCI-424 system, MOTU 828mkII, or any other sample-accurate audio interface, Performer Lite can achieve sample-accurate synchronization with ADATs or any external recording device that supports sample-accurate synchronization.

This allows you to transfer digital audio — entirely in the digital domain — between Performer Lite and an ADAT (or similar ADAT-compatible digital audio recorder) via ADAT optical cables (or other digital audio format) with single-sample accuracy. For example, if you record some audio from the ADAT into Performer Lite, and then send it back to the ADAT, it will be placed at exactly the same location — to the very sample — from where it originated (assuming you don't move it while it's in Performer Lite). You could transfer audio back and forth digitally between Performer Lite and the other device as many times as you like, and the audio will not drift even one sample earlier or later, no matter how many times it is transferred between the two devices.

Sample-accurate transfers like this can also be achieved with Tascam family tape decks (such as the DA-38, DA-88, or DA-98) via a 2408mk3/PCI-424 system. A MOTU Digital Timepiece is required.

Digital audio I/O is required

Sample-accurate digital transfers require a digital audio interface such as a MOTU 828x, which supports sample-accurate sync. MOTU's audio interfaces provide a variety of digital audio formats, including 8-channel ADAT optical, AES/EBU and S/PDIF. For details, visit www.motu.com/products.

MOTU PCI-424/FireWire hardware setup

If you have MOTU PCI-424 or FireWire Audio system, refer to your hardware manual for specific details about how to connect your system for sample-accurate sync to an ADAT or Tascam tape deck.

Performer Lite settings

For sample-accurate sync, choose the *Sample-accurate* sync setting as shown above in Figure 67-4. No additional sync settings are required. Notice that the Sync to Port setting disappears when you choose Sample-accurate sync. This is because Performer Lite accesses the sample address information directly in the hardware (via the hardware driver, e.g. the PCI-424 driver for the MOTU 2408mk3, or the MOTU FireWire Audio driver for the MOTU 828mkII FireWire audio interface).

Hardware driver settings

Choose *Setup menu>Configure Audio System>Configure Hardware Driver* and make the appropriate clock source setting for the hardware you are using. For the 2408mk3, choose PCI-424: *ADAT* from the *Clock Source* menu as shown below.

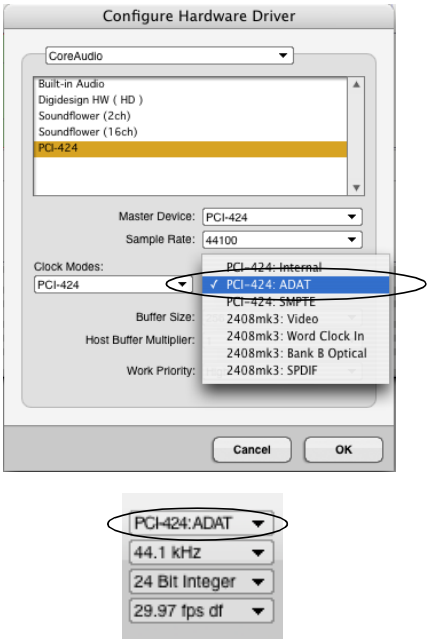


Figure 67-5: The clock source setting for sample-accurate sync. If you have multiple interfaces, make sure that these two settings match.

Transport control from Performer Lite via MMC

If you have a MIDI Timepiece AV or other MMC-capable ADAT synchronizer and would like to control everything from Performer Lite's transport controls via MMC, open the MMC window and enable MMC. This puts Performer Lite in *Slave to External Sync* mode. Make sure your MIDI Timepiece AV (or other MMC synchronizer) is on-line.

Optical input/output settings

To transfer audio digitally from another device to Performer Lite, be sure to choose a digital input for the track you will be recording into. Conversely, when you want to transfer audio from Performer Lite to the other device, make sure you've chosen digital output assignment of the track you want to transfer.

MTC (MIDI TIME CODE)

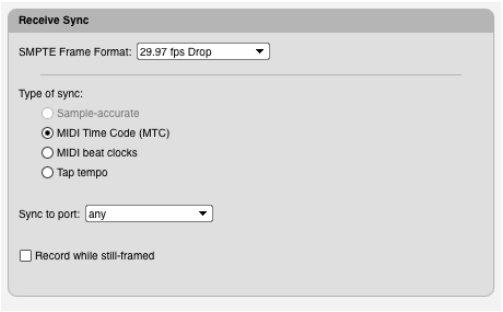


Figure 67-6: Slaving to SMPTE time code. As you can see, there are no extra options for SMPTE timecode sync.

Use the *MTC* mode when you are slaving Performer Lite to SMPTE time code via a converter that supports MTC (MIDI Time Code).

SMPTE time code (an analog audio signal) is fed from a master source such as an audio tape recorder, video tape recorder, or SMPTE generator into a SMPTE-to-MIDI converter such as a MOTU MIDI Express XT, which translates the SMPTE time code into MIDI timing information. This MIDI timing information is produced in the form of MIDI time code (MTC), an industry standard format.

MTC sync mode is a simple and direct way to slave Performer Lite to an external source generating SMPTE time code. Performer Lite is able to lock to the frame times of the master, insuring precise synchronization between devices. In addition, Performer Lite remains under its own tempo control, allowing you to program sophisticated tempo maps while slaved to time code.

To use MTC sync mode, you must have a SMPTE-to-MIDI converter that supports MTC, such as a MIDI Express XT from MOTU.

There are no special options to select in the Receive Sync settings window: when in MTC mode, Performer Lite simply responds to timing data directly.

After Performer Lite is locked to the master, there is no need to use Performer Lite's main transport controls unless you wish to record. Performer Lite will start, stop and locate under control of the master. Also upon lockup, if Click is enabled, Performer Lite will click in the meter specified at 1|1|000 or will default to 4/4.

You can put Performer Lite into play or record either before or after you start rolling tape. In either case, Performer Lite will lock up quickly.

Using MTC sync mode

After you have chosen MTC mode, slave Performer Lite as explained in "Tap Tempo" on page 588.

MIDI BEAT CLOCKS

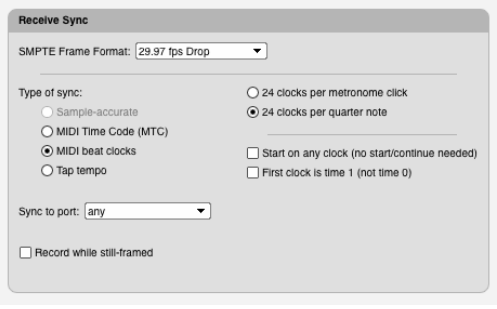


Figure 67-7: The MIDI Beat Clock options.

This is a standard form of synchronization between two MIDI devices. When the MIDI Beat Clocks option is selected, Performer Lite can sync to a master device that is generating MIDI clock signals. If you want to slave Performer Lite using a drum machine, external sequencer or other MIDI device as master, use this mode. This mode may also be used with a SMPTE converter that generates its own tempo map. In MIDI Beat Clocks mode, Performer Lite's tempo will match that of the master device; Performer Lite's tempo features are disabled.

Implementations of MIDI have evolved over the years. As a result, not all devices transmit and send MIDI clock signals in the same way. Performer Lite provides several options for maximum synchronization compatibility with your master device:

24 clocks per metronome click/ 24 clocks per quarter note

Some manufacturers make devices which send 24 clock signals per beat (one click of the device's metronome) instead of the standard 24 clocks per quarter note. This method is very useful when there are meters which do not use the quarter note as the beat unit: 3/8, 5/16, etc. In 6/8, for example, there might be a metronome click every three eighth notes; in 4/1, the metronome would click once every whole note. If you were using a less common meter such as 5/32 or 3/16 + 4/16, using the quarter note as the timing base would not be very useful. Instead, use the 24 clocks per metronome click option.

Start on any clock

When this option is checked, Performer Lite will automatically start if it receives a time clock even if no start or continue command was received. This option is necessary when using some early MIDI devices which don't send start or continue commands, only timing clocks.

First clock is time 1

When this option is checked, Performer Lite interprets the first MIDI clock signal it receives as the *second* timing clock of the sequence, 1/24th of a beat after the beginning. Devices manufactured recently send the first clock signal (time 0) after the start command for the sequence. Some earlier devices assume the start command to be the first clock signal. The first clock signal they send would be 1/24th of a beat after the beginning. If you are using one of these devices, you should check this option.

Since manufacturers rarely explain this aspect in their documentation, you may not know if your device behaves this way. The best way to find out is to experiment: set the metronome to the slowest possible tempo, play both devices (with Performer Lite as slave) and listen for discrepancies in attacks and beat alignment. The difference of 1/24th of a beat is very audible at a slow tempo. If Performer Lite seems slightly behind the master device, try checking this option.

Default beat clock settings

The default settings reflect the most commonly used MIDI standards. It is best to set them this way before choosing to alter them:

- 24 clocks per *quarter note*
- start on any clock: *unchecked*
- first clock is time 1: *unchecked*

Using MIDI Beat Clocks mode

After you have made the *MIDI Beat Clock* settings as needed, slave Performer Lite as explained in "Tap Tempo" on page 588.

TAP TEMPO

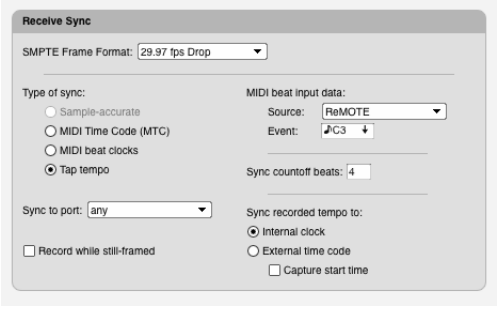


Figure 67-8: Tap Tempo settings.

Tap Tempo is Performer Lite's real-time tempo control feature. Tap Tempo lets you slave Performer Lite to a tap entered from any MIDI controller before, during, or after the recording of your sequence. You can 'conduct' an existing sequence by tapping the tempo, complete with accelerandos, ritards, and rubato passages; Performer Lite will follow precisely. More importantly, you can record your tap into the Conductor Track for use in subsequent playback and recording.

Tap Tempo can be used during virtually any stage in the creation of a sequence. For example, if you have acoustic music on tape, two completed tracks in Performer Lite, and three more Performer Lite tracks to record, you can 'teach' the two existing tracks to follow the prerecorded music. Your remaining tracks will be recorded into a sequence that has all of the temporal nuances of the prerecorded music.

Preparing for Tap Tempo

The following are general points to consider when preparing to use Tap Tempo sync.

Establish a meter

When slaving to Tap Tempo, Performer Lite must know how many of your taps to group as one measure. Before recording or playing back a passage in Tap Tempo mode, make sure you've entered the correct meter using the Change Meter command (Project menu>Conductor Track>Change Meter).

Establish a metronome click value

Your taps correspond to the current metronome click value, specified using the Change Meter command. For example, the tempo of a 4/4 passage can be tapped and expressed in whole notes, one tap per measure, or in sixteenth notes, sixteen taps per measure. Each tap becomes a tempo change event, so the smaller the click value, the higher the resolution of the resulting tempo map.

Choose a tap source

You can use any standard MIDI event as your tap source. Performer Lite will interpret this MIDI event as a tap whenever it occurs on the specified input channel. If you plan to record music while

slaved to Tap Tempo, choose a combination of MIDI event and channel that won't be needed in the musical passage. For example, let's say you're tapping C3 on a controller keyboard, transmitting on channel 1. The result? *Any other C3's transmitted on the same channel* will not be recorded. Again, this is only true for C3's transmitted on channel 1. C3's transmitted on other channels will be recorded normally.

Note that although pitch bend and controller events are acceptable as tap sources, the most common controls for sending them (wheels, joysticks) make reproduction of a single, specific value difficult. For example, to define your tap you enter a pitch bend value of 392 using a pitch bend wheel. To slave Performer Lite, you'll need to generate values of 392 or higher — you send a 392 value by going precisely to it, but also by going past it. That much is easy, but remember that Performer Lite will treat only the events with 392 values as taps. All other values sent by your mod wheel will be recorded and interpreted as normal pitch bend events. This makes bend and controller events less practical tap choices than events with precise triggers or more limited values, such as a note or a Controller #64 (sustain pedal) event.

MIDI beat input data

Source
Choose the MIDI device you will be tapping from in the menu provided.

Event
Specify the MIDI event you wish to use as a tap. Tab to the Event box or click in it, then enter a MIDI event from any MIDI controller connected to the specified port (play a note, tap a sustain pedal, etc.). The event appears, highlighted; click on the highlighted event if you wish to change it. You can use any standard MIDI event as a tap source.

Countoff beats
Specify the number of times you wish to tap as a countoff. The default number of sync countoff beats is four, but the countoff can be any number between 1 and 127. If you enter a number outside this range, the computer will beep when you click the OK button and the number will be highlighted. If this happens, click on the highlighted value and enter a new one.

Using Tap Tempo mode

After you have made the *Tap Tempo* settings as needed, follow the steps explained in "Using Tap Tempo" on page 590.

SLAVING TO EXTERNAL SYNC

After you have chosen one of the desired sync modes already discussed in this chapter, slave Performer Lite to an external source as follows (refer to the next section for Tap Tempo):

1 Select Slave to External Sync from the Setup menu.

This puts Performer Lite into slave mode, waiting for sync information from an external device.

2 Click on the Play or Record button in the main transport controls.

The Play button will flash on and off, meaning that Performer Lite is waiting for sync information to start.

3 To start Performer Lite, start the external device.

When Performer Lite is locked and playing, the Play button will turn blue. When locked, Performer Lite will follow, start, stop and rewind under control of the master.

4 To terminate the lock up with the master, click on the Stop button.

Clicking on the Stop button will both stop Performer Lite and remove it from the master's control. This can be done at any time. To return to normal operation, turn off Slave to External Sync by reselecting it from the Studio menu.

USING TAP TEMPO

To use Tap Tempo mode:

1 Choose Slave to External Sync from the Setup menu.

This puts Performer Lite in slave mode; it is now waiting for sync information from an external source.

2 If you wish to record the tap into your sequence, record-enable the Conductor Track. Your tap will be stored as tempo change events in the Conductor Track and used in subsequent playback and recording. Existing tempo changes will be replaced. Other Conductor Track information will be unaffected.

3 If you wish to record music into your sequence, record-enable the desired tracks.

If you wish to record the tapped tempo and music simultaneously, or record music onto more than one track, specify the record device for each track that is record-enabled. The Conductor Track will record from the device specified in the Receive Sync settings window.

4 Press the Play or Record button in the main transport controls.

The Play button will flash, meaning that Performer Lite is waiting to receive sync information. Overdub mode will not function on the Conductor Track; that is, recording in either normal or overdub mode will erase any existing tempo events.

5 If you will be tapping along with a prerecorded passage, start playback of the recording.

Ideally, the prerecorded music will have a sufficient countoff so that you can tap the number of countoff beats specified in the Receive Sync settings window.

6 Begin 'tapping' the MIDI event that you designated in the Receive Sync settings window.

Performer Lite will listen for the specified number of countoff beats to predetermine the tempo for the beginning of playback or recording. When Performer Lite has received the countoff, playback or recording will begin.

7 Tap the desired tempo and tempo changes.

Make your tap as expressive and dynamic as you wish; Performer Lite will follow. The Counter display will update as you tap.

8 To end recording or playback, press the Stop button in the main transport controls.

Don't be alarmed if the computer pauses after you stop recording. Performer Lite is calculating precise tempo changes from the taps you just recorded.

9 Take Performer Lite out of slave mode by choosing Slave to External Sync from the Setup menu.

10If you recorded your tap, you can hear the results by rewinding the sequence, making sure the metronome under Conductor Track tempo control, and pressing Play.

Your sequence will play back using the tempo that you tapped. If you are not satisfied with the results, you can use the Undo Record command in the Edit menu and then repeat the above process. You

can make adjustments by rerecording certain sections and by editing individual tempo changes in one of the Conductor Track's edit windows.

Tapping to prerecorded music on tape

You can use Tap Tempo to record a tempo map while Performer Lite is slaved to tape—or, more accurately, *referenced* to external time code. You can record a tempo map that matches the music on tape, allowing you to perfectly synchronize your sequence to the prerecorded music. This process is explained in detail in "Using Tap Tempo while slaved to external sync" on page 592.

Hints for using Tap Tempo

Here are some ways to use Tap Tempo.

Recording music simultaneously

If you plan to record music simultaneously with your tap, choose a tap event that doesn't require use of your hands. Controller #64, sustain, is usually triggered by a foot pedal and is a good choice for a tap because it has only two values: On or Off.

Further, Performer Lite will let you use either value for your tap.

Using alternative tap values and sources

You can set the tap as an Off value for a particular note or controller:

1 In the Receive Sync settings window with Tap Tempo chosen, Tab to the Event box.

2 Depress the note or controller, leaving it depressed.

For example, push a modulation wheel away from its 'zero' location. The controller number and its value will appear in the box, highlighted.

3 Without releasing the note or pedal, click on the highlighted Event value.

4 Release the note or pedal.

To continue the example, let the mod wheel spring back to its zero location. The Event box will show Off or 0 as the tap value.

So far, our examples of using Tap Tempo have involved tapping a MIDI instrument to 'teach' Performer Lite the temporal details of a sequence. When you tap, you simply send a MIDI event and Performer Lite does the rest. This means you can use any MIDI sequencer to load its own tempo map into Performer Lite — just program the sequencer to play a song's worth of quarter notes while Performer Lite is slaved to Tap Tempo sync.

Yet another way of sending Performer Lite a tap is to use a device that converts an audio click into a MIDI event. A click or other regular, amplified signal (a click track on tape, a miked rim shot, etc.) can be fed into such a device and converted into MIDI events from which Performer Lite can generate a tempo map.

Punching in a tempo

AutoRecord can be used with Tap Tempo to 'punch in' tempo changes for a section while preserving the tempi outside that section. Enter the Punch In and Out times in the Auto-Record bar, found in the Control Panel, click on the Auto-Record button, then follow the applicable steps above. (Don't be alarmed if both the Play and Record buttons go grey at first; the Play button is waiting for sync information, and the Record button is waiting for the Counter to reach the punch In location.)

Remember also that slaving Performer Lite to Tap Tempo disables the sequence's existing tempo map. So when you start playback in Auto-Record mode, even though Performer Lite will only record taps from the In location to just before the Out location, you will have to tap throughout the pass. Give yourself the most accurate temporal

'context' — the tempi before and after the punch-in passage — as is possible, so that the recorded section will fit smoothly into the rest of the sequence. As always, you can fine-tune all tempo change events in the Conductor Track.

USING TAP TEMPO WHILE SLAVED TO EXTERNAL SYNC

You can use Tap Tempo to record a tempo map while Performer Lite is slaved to tape—or, more accurately, *referenced* to external time code. You can record a tempo map that matches the music on tape, allowing you to synchronize your sequence to the prerecorded music.

This process can be performed in a more precise fashion if you have an audio click track recorded on the tape and a click-to-MIDI converter such as a MOTU MIDI Express XT.

Preparation

The following are general points to consider before tapping tempo to prerecorded music:

Before you begin, establish SMPTE synchronization to tape. This is necessary for two reasons: 1) Performer Lite needs to receive a timing reference from the tape while creating the tap tempo map, and 2) later on, after you successfully record the tempo map, you will be using the SMPTE to lock the sequence to the tape. To establish SMPTE synchronization, see chapter 67, "Receive Sync" (page 582).

After you have set up SMPTE sync, set up Tap Tempo. To do so, simply follow the directions in the *Receive Sync* chapter for setting up Tap Tempo, as explained in "Tap Tempo" on page 588. Test it to be sure that when you tap, Performer Lite does indeed follow your taps. This will ensure that you have the proper channel and event for Tap Tempo mode. Remember, you may also need to set up a meter map in the sequence that matches the meter map of the music on tape.

If possible, set up two full measures of countoff on the tape before the first downbeat of music. This will be extremely helpful to your accuracy when tapping the first downbeat, which is the most important downbeat because all subsequent taps—the entire tempo map—will be referenced to its exact location.

Setting up Tap Tempo

After you have made these preparations, you are ready to begin. To Tap Tempo to prerecorded music on tape:

1 Open the Receive Sync settings (Setup menu).

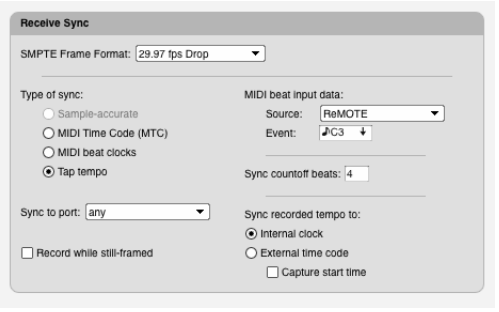


Figure 67-9: Receive Sync settings for Tap Tempo while slaved to external time code.

2 Set the *Sync to port* option to *Any Port*.

3 Select the Tap Tempo option.

4 Choose the Tap Tempo settings as described earlier in "Preparing for Tap Tempo" on page 588.

If you are feeding a click track through a click-to-MIDI converter, make sure that the Tap Tempo *event* setting matches the MIDI event being generated by the converter.

Also be sure that the number of countoff beats you choose here corresponds in a useful way to the number of countoff beats on tape. For example, ideally, you should have 2 measures of countoff on tape; if so, set the countoff beats here to 1 measure.

When you roll the tape, you can get ready during the first measure of countoff, tap along for the second measure, and hit the downbeat right on the money. If you don't have an countoff on the tape, you will have to develop a system that works best for you. You might try just one countoff beat.

5 Check the *External time code* option.

Performer Lite will now reference your taps to incoming timecode.

6 Select the *Capture start time* option.

This option makes Performer Lite remember the exact SMPTE frame of your first tap (excluding the countoff beats) so the sequence will start at the correct SMPTE time.

The procedure
Now you are ready to go:

1 Record-enable the Conductor Track.

2 Choose Slave to External Sync (Setup menu).

3 Press the Record button.

4 Get ready to tap, and roll the tape.

5 Listen for the countoff, and 'tap' along with it such that the first downbeat of the sequence corresponds to the first downbeat of music on tape.

Performer Lite automatically remembers the exact SMPTE time of your tap on the first downbeat of the sequence and saves it as the sequence start time. When you later slave the sequence to tape, Performer Lite will automatically start the sequence at the correct SMPTE time.

6 Tap along with the music as accurately as possible.

Remember that synchronization later on will only be as accurate as the accuracy with which you tap in this procedure.

7 To end recording, press the Stop button in the main transport controls.

Don't be alarmed if the computer pauses for a while after you stop recording. Performer Lite is calculating precise tempo changes from the taps you just recorded.

Listening to what you have done
Now that you have recorded the tempo map, try slaving Performer Lite to the tape using your usual method of synchronization, such as Direct Time Lock or MIDI Time Code, in the Receive Sync window. Also, make sure that the Metronome is under Conductor track tempo control. You will now be able to playback, rewind, or fast forward anywhere in the song on tape, and your Performer Lite sequence will exactly reproduce your tapping performance with respect to the music on tape. If you tapped accurately, Performer Lite will play along accurately. If you are not satisfied with your tapping performance, just try again.

CHAPTER 68 Transmit Sync

OVERVIEW

The Transmit Sync settings, available from the Setup menu, allow you to configure Performer Lite as a master time source. When being used as a master, Performer Lite sends synchronization signals to which other MIDI devices can slave. Performer Lite can generate these types of MIDI timing and synchronization data:

- Standard MIDI beat clocks
- MIDI Time Code (MTC)
- Analog SMPTE timecode (LTC); requires a MOTU Audio interface

For more information on synchronization, see chapter 67, "Receive Sync" (page 582).

You may use Performer Lite as a master of some devices while Performer Lite itself is slaved to another device. This is especially useful when slaving Performer Lite to SMPTE time code; Performer Lite (slaved to the tape) can generate tempos for other sequencers slaved to Performer Lite.

Overview **594**
MIDI Time Code **594**
MIDI Beat Clocks **595**
Turn off Transmit Sync when you don't need it **596**

MIDI TIME CODE

MIDI Time Code (MTC) is the MIDI equivalent of SMPTE Time Code. It is a steady stream of MIDI events that expresses time in hours, minutes, seconds and frames. (For further explanation, see "Basic types of sync" on page 582.) MIDI Time Code provides the following two basic components of synchronization:

- Time base — a common reference for the passage of time that devices can follow
- Address — an indication of *where* playback is at any moment

MIDI Time Code does not provide tempo or beat information. Devices that slave to MIDI Time Code will either have no need for tempo and beat information, or they have their own idea of tempo and meter. (MIDI Beat Clocks, however, *do* provide tempo and meter beat information. See "MIDI Beat Clocks" on page 595.)

Transmitting MTC to another device

When you transmit MIDI Time Code from Performer Lite to a device that can slave to MTC, such as a tape deck of some kind or a mixing console, Performer Lite serves as the timing *master* and the other device follows as the *slave*.

On macOS, the other "device" doesn't necessarily have to be hardware: it could be other Core MIDI-compatible software running at the same time as Performer Lite.

To slave a device to Performer Lite via MIDI Time Code, choose Transmit Sync from the Setup menu, and choose it as a destination for MTC from the menu.

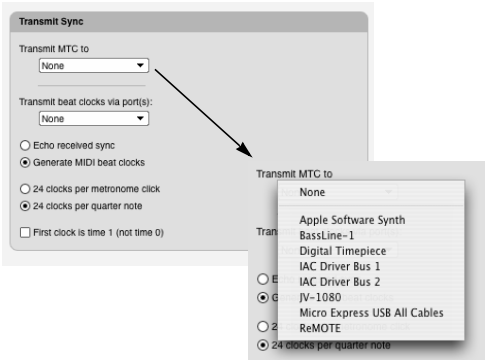


Figure 68-1: Transmitting MTC to another device. If you are also running another Core MIDI-compatible program (on MacOS) that can slave to MTC, it will appear in this menu, allowing you to transmit MTC to it from Performer Lite.

Choosing multiple MTC destinations

You can choose more than one destination by clicking on the menu as many times as needed. Choose the destination again from the menu to turn off MTC transmission (and uncheck the destination in the menu). On MacOS, you can also send MTC to other Core MIDI-compatible applications.

Setting the SMPTE frame rate

Choose the appropriate SMPTE format from the Frame Rate command in the Setup menu.

Make sure both Performer Lite and the other device is set to the same SMPTE frame rate.

Choosing a SMPTE start time

Choose *Set Sequence Start Time* from the sequence menu in the Control Panel to set the sequence's SMPTE start frame. See "Setting the start time" on page 109 for details. The start frame is the hour, minute, second, and frame which Performer Lite (and the other device) consider to be the beginning of the sequence (on the first downbeat). Other devices may refer to this as the *SMPTE offset*.

Transmitting MTC while slaved to external Sync

When Performer Lite is set to Slave to External Sync and is receiving MTC, incoming MTC is echoed directly, rather than being regenerated by Performer Lite.

MIDI BEAT CLOCKS

When you tell Performer Lite to transmit beat clocks, Performer Lite becomes a master time source: any MIDI devices (that can slave to beat clocks) connected to Performer Lite will follow Performer Lite's tempo changes, and start or stop along with the program. If the slave devices respond to MIDI Song Position Pointer data, then they will also follow Performer Lite when the Counter location is changed or the Rewind button is used.

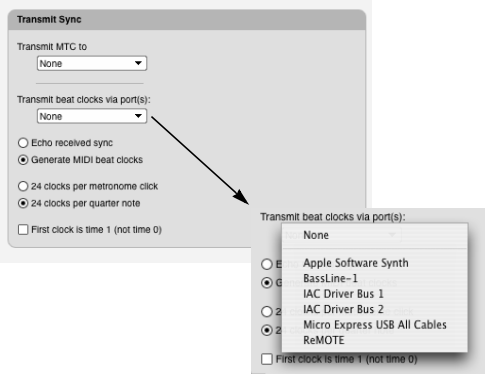


Figure 68-2: Transmitting MIDI beat clocks to other devices. Choose the desired USB interface from the Transmit beat clocks menu.

Choosing a USB interface to transmit beat clocks to

Unlike MIDI Time Code, which can be routed to specific devices on a multi-port interface like the MIDI Express XT, beat clocks are not channel or port specific, as defined by the MIDI specification. As a result, they are sent to all devices connected to the USB interface that you choose in the Transmit Sync settings window.

You can choose more than one USB interface in the menu by clicking on the menu as many times as needed. Choose the port again from the menu to turn off beat clock transmission (and uncheck the port in the menu). If no USB interface is selected, Performer Lite will not generate or echo MIDI beat clocks.

Echo received sync vs. Generate MIDI beat clocks
Performer Lite can transmit beat clock information in two ways: it can simply pass on (or echo) any beat clock messages it receives, or it can generate new beat clocks based upon its own tempo map and controls. These options are described below:

Echo received sync
This option echoes beat clocks that are received by Performer Lite from some other source. No processing is performed. The reception port must be selected in the Receive Sync settings window, and Performer Lite must be in External Sync mode for beat clocks to be echoed. Beat clocks are echoed to the ports selected in the Transmit Sync settings window. There is less delay between reception and re-transmission using this mode than if *Generate MIDI beat clocks* is selected.

Use this mode if you wish to slave Performer Lite and another device to a master that generates MIDI beat clocks. However, for best results, you should use a MIDI thru box and connect both Performer Lite and the other slave directly to the master. Echoing sync through Performer Lite results in a small delay.

Generate MIDI beat clocks
Performer Lite generates MIDI beat clocks in tandem with the other MIDI information being played back. Use this mode when Performer Lite is the master. You may also find this mode useful when slaving Performer Lite to SMPTE using one of the time lock modes. Performer Lite will generate MIDI beat clocks according to its tempo map in sync with the SMPTE code, so you can slave a sequencer, drum machine or device that doesn't support SMPTE through Performer Lite.

24 clocks per metronome click/24 clocks per quarter note
Some MIDI devices expect 24 clock signals per beat (one click of the device's metronome) instead of the standard 24 clocks per quarter note. This method is very useful when there are meters which do not use the quarter note as the beat unit: 3/8, 5/16, etc. In 6/8, for example, there might be a metronome click every three eighth notes; in 4/1, the metronome would click once every whole note. If you were using a less common meter such as 5/32 or 3/16 + 4/16, using the quarter note as the timing base is not very useful. Instead, use this option to make the metronome click value the timing base.

First clock is time 1
When this option is checked, Performer Lite interprets the first MIDI clock signal it sends as the *second* timing clock of the sequence, 1/24th of a beat after the beginning. Recently manufactured devices expect to receive the first clock signal (time 0) after the start command for the sequence. Some earlier devices assume the start command to be the first clock signal; the first clock signal would thus be 1/24th of a beat after the beginning. If you are using one of these older devices, you should check this option.

TURN OFF TRANSMIT SYNC WHEN YOU DON'T NEED IT

If you are not slaving external devices to Performer Lite, set both of the Transmit Sync settings window menus to *None* to improve performance.

Part 13

More Information

CHAPTER 69 Hard Disk Recording Concepts

OVERVIEW

This chapter briefly covers several important concepts about hard disk-based digital audio recording. You may not feel that you have the time to review the "basics", but the more you know, the more you will be able to accomplish. After you read this chapter (it will only take a few minutes):

- You will get a better sense of the vast creative possibilities open to you with this technology.
- You will work more efficiently.
- You will be less likely to make costly mistakes.

If you are using an audio interface from another company, be sure to consult the owner's manual, as the use of third-party hardware can impact Performer Lite in many important ways.

HOW AUDIO IS RECORDED ON DISK

Overview **598**
How audio is recorded on disk **598**
How much disk space does audio require? **599**
Hard disk requirements and maintenance **600**
Digital audio terms **600**

Performer Lite and other computer-based digital audio recording systems record audio data in much the same way. Audio data gets recorded onto the hard disk in the form of an audio file: you press record in Performer Lite, play in some music, and the audio signal is encoded digitally in the audio file.

Performer Lite automatically creates a separate audio file for each record take. By default, Performer Lite uses interleaved audio, which stores all channels for each track in a single file. If you record onto a mono audio track and a stereo audio track, Performer Lite will create two audio files.

Every time you press the record button, record some music, and then stop, Performer Lite automatically creates a new audio file when you start recording, records the audio data into the audio file as you play, and then closes the audio file when you press stop. Performer Lite immediately readies another audio file for the next take while inserting the last one into the audio track at the appropriate time and adding it to the list in the Soundbites list.

Random access

A computer hard drive provides instantaneous access, often called *random access*, to the audio files you record, allowing you to cue immediately to any location in your music. Hard disk recording systems convert an audio signal into digital data (basically transforming the audio signal into a continuous stream of numbers), and then write the digital data sequentially to the hard disk. Because of the extremely high speed of the hard disk read/write mechanism, you have instant access to any part of the recorded audio.

Non-destructive editing

With their random access capability, hard disk recording systems provide other important advantages over tape machines. For example, you can cut, snip, splice, shift, re-arrange, and otherwise edit the original pass of audio without actually modifying the original data. If you rearrange the order of a few sections in a digital audio track, Performer Lite simply rearranges references to those sections of data without affecting the original audio data itself. This process, called *non-destructive editing*, is possible because Performer Lite stores the edit points separately from the audio data. You can always

revert to the original audio data if you want, up until the time that you decide to permanently erase it from the hard disk.

Instantaneous editing

Non-destructive editing is a virtually instantaneous process because the edit points you create during editing are very small (only a few bytes) and can therefore be handled quickly by the computer. As a result, your edits in Performer Lite take effect immediately as you do them.

Non-linear editing and playback

As you can see in Figure 69-1, non-destructive editing makes it quick and easy to re-arrange the order of any portion of the originally recorded audio. You can revert to the original take at any time.

Repetition without duplication

Random access also allows you to repeat the same section of music as many times as you like within your piece of music without duplicating the actual audio data itself. For example, you could have a one-measure drum loop that repeats for 60 measures, but it only consists of one measure's worth of audio—approximately two seconds. The loop is simply placed end to end in the track sixty times. (Alternatively, it could be looped with a loop in the track.) You can even play back the same region of audio on several tracks *at the same time*. A chorus effect can be created with a vocal passage by placing it in four separate tracks and slightly offsetting the audio in each track. When you do so, Performer Lite does not actually create four copies of the audio data on your hard disk; instead, the computer references the same passage of audio on the hard disk four times simultaneously. As a result, you are actually conserving hard disk space when using a single region of audio in multiple places.

HOW MUCH DISK SPACE DOES AUDIO REQUIRE?

The freedom you enjoy as a result of the benefits described above comes at a price: hard disk space. One mono minute of CD-quality (16-bit, 44.1 kHz) audio takes up about 5 megabytes (MB) of space on your hard disk. A stereo minute takes up 10 MB. If you have a MOTU UltraLite audio interface, and you have audio playing on 24 channels for a five minute tune, that's 24 channels times 5 minutes, which adds up to 120 minutes of audio. Multiply that by 5 MB per minute, and your 5 minute song takes up 600 MB of hard disk space! And that doesn't count alternative takes, overdubs, and other audio that you generate during the course of a recording session. During a typical session, you can easily fill upwards of 1 GB (1 gigabyte) of hard disk space in no time.

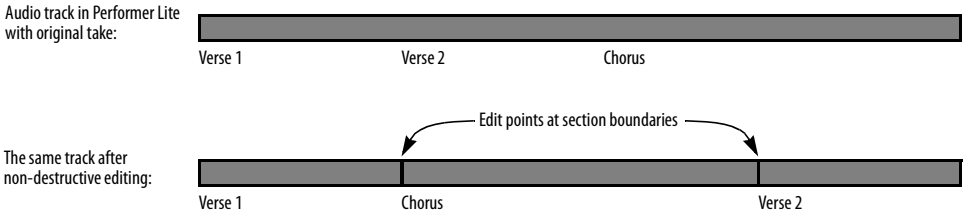


Figure 69-1: Hard disk recording systems provide non-destructive editing, which gives you instantaneous flexibility, as well as the ability to revert back to the original take at any time. Note that when you do this type of editing in Performer Lite, the audio data stored on hard disk does not move. Performer Lite just rearranges 'pointers' to the audio data.

The table below shows disk space (in Megabytes) for one minute of digital audio at various sample rates and bit depths:

Bits	Ch	44.1 kHz	48 kHz	88.2 kHz	96 kHz	176.4 kHz	192 kHz
16	1	5.3	5.7	10.5	11.5	21	23
24	1	7.9	8.6	15.9	17.3	31.7	34.6
32	1	10.5	11.5	21	23	42.3	46
16	2	10.6	11.5	21.2	23	42.3	46
24	2	15.9	17.2	31.7	34.5	63.5	69
32	2	21.1	23	42.3	46	84.7	92

Figure 69-2: Hard disk space requirements for one minute of mono and stereo digital audio at various sample rates and bit depths.

In addition, Performer Lite provides audio management features that let you easily identify unused audio and delete it from the hard disk.

HARD DISK REQUIREMENTS AND MAINTENANCE

Performer Lite itself does not have any special requirements with regard to the performance of the hard disks on which you will be recording audio. If you are using Performer Lite without a sound card, the faster your hard drive, the more tracks you will be able to play and record simultaneously. (To learn more about getting the most out of your computer's performance, see "Configure Studio Settings" on page 25.)

If you are using an audio interface from another company, it may have certain requirements for hard disk performance. To avoid problems, be sure to consult the manual.

In either case, hard disk maintenance procedures such as defragmenting and re-initializing will help improve overall performance.

DIGITAL AUDIO TERMS

Here are some terms and concepts you should be familiar with.

Project

A *project* is a folder that Performer Lite creates on your hard disk when you start a new recording session. It includes a Performer Lite file, along with a folder for the audio files you'll generate while recording.

Audio file (or Sound file)

An audio file is a document on your computer's hard disk that contains digital audio data. Its size is determined by the duration of the audio data, by the sample resolution, and by the number of audio channels (1 for mono files, 2 for stereo files). A one-minute mono audio file recorded at 44.1 kHz takes up about 5 megabytes of hard disk space. Stereo files are twice as large as mono files. Therefore, a one-minute stereo file is about 10 megabytes.

Audio files come in several different formats. In Performer Lite, the default format for recording is Broadcast WAVE, but you can also record as AIFF (Audio Interchange File Format).

Audio files contain more than just the audio information. They also contain a list of *regions* (explained below) in the audio file, as well as any *playlists* (also explained below) that have been created for it using other audio software programs.

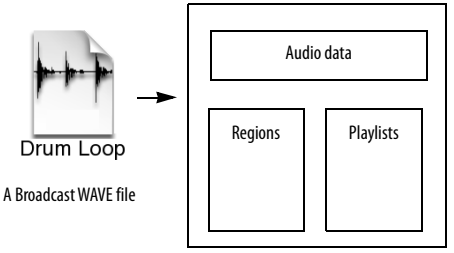


Figure 69-3: An audio file contains the original audio recorded into it, as well as any regions (soundbites) and playlists created by Performer Lite or other audio editing software you might use to edit the file.

Region
This is the term most commonly used to refer to a section of audio in an audio file. It could be a one-second sound effect, a 16-bar phrase, or the entire length of the audio file. You can define an unlimited number of regions in an audio file. Technically speaking, a region consists of *pointers*, which are references to the exact location (digital sample) in the audio file where the region begins and ends. These pointers are very small compared to the amount of audio data they represent. This is why region editing is so fast and efficient: it deals with the manipulation of pointers, which consist of a very small amount of data.

Soundbite
The word *Soundbite* is synonymous with the word *Region* as described above. In Performer Lite, we call regions *soundbites* because the word *region* means something entirely different in Performer Lite: it is a period of time within one or more tracks over which an editing command will take effect. (For example, consider Performer Lite's *Region menu*.) Therefore, to avoid confusion with the word *region*, we use the term *soundbite* to describe an audio region. They are one and the same.

Soundbites can be placed in any audio track at any time location. They can be duplicated as many times as you like with virtually no additional memory overhead, since they are merely pointers to audio data on the hard disk. With only two exceptions, soundbite editing and management in Performer Lite is entirely non-destructive. (The exceptions are the Compact command and deleting the very last soundbite in an audio file, which cause audio data to be deleted from disk.)

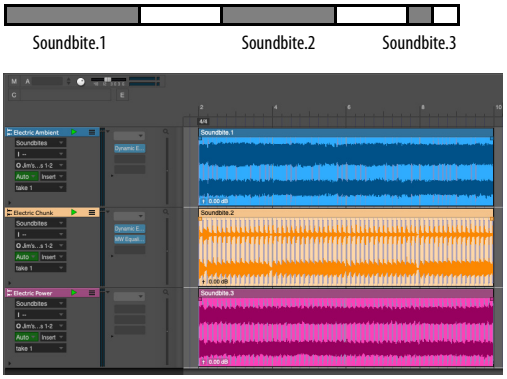


Figure 69-4: Soundbites (regions) exist within an audio file. A soundbite is any portion of an audio file. It can even be the entire audio file. Soundbites that you record or import into a Performer Lite file are cataloged in the Soundbites list. They appear as regions of audio in the Sequence Editor.

Playlist
A *playlist* is a collection of regions played end-to-end to produce a continuous presentation of music. Some programs can save playlists within the audio file itself, just like regions. Playlists stored in audio files can be imported into Performer Lite as a single audio track in the Sequence Editor. You can also build a playlist in Performer Lite by dragging soundbites from the Soundbites list into a track.

Audio track
An *audio track* holds audio regions (soundbites), as well as audio volume and pan data. You can view the contents of an audio track in the Sequence Editor.

Audio input/output
An *audio input* or *output* refers to the physical input or output jack in the recording system you are using. If you are running Performer Lite without an audio interface, you will use the microphone and speaker jacks (usually in the form of stereo mini plugs) located directly on the computer itself. If you are using an audio interface of some kind, the interface will have digital and/or analog input and output connectors. Regardless of

the system you have, Performer Lite allows you to freely assign audio tracks to whatever physical inputs and outputs are provided.

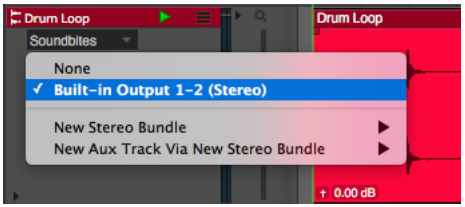


Figure 69-5: Assigning an audio track to an audio output.

MOTU Audio System

The *MOTU Audio System* is the "audio engine" that provides digital audio recording and playback in Performer Lite. The MOTU Audio System can operate with no extra audio hardware installed in the computer, although it also supports all MOTU audio interfaces and a wide variety of third-party audio hardware.

The MOTU Audio System also supplies real-time effects plug-ins that you can use to process audio tracks in real time with effects like parametric EQ, reverb, chorusing, etc. It is also an open system, supporting real time plug-ins from other companies as well. All plug-ins are processed with extremely high fidelity 32-bit, floating point calculations.

In general, the overall performance of the MOTU Audio System (the number of audio tracks you can play simultaneously, along with the maximum amount of effects processing you can employ in real time) depends on the overall speed and performance of your computer. Together with these features, the MOTU Audio System also supports all MOTU Audio interfaces, as well as a wide variety of third-party audio hardware. When you use the MOTU Audio System with one of these systems, you get the best of both worlds: you get to take advantage of the large number of possible audio tracks and real-time effects provided by the MOTU Audio System, along with the high-fidelity analog and digital inputs and outputs supplied by the audio hardware.

For the most part, you don't need to be concerned with the MOTU Audio System. It runs automatically when you use Performer Lite. The only time you would think about it is if you would like to try to optimize its performance with the *Configure Audio System* in the Setup menu of Performer Lite. For details, see "Configure Studio Settings" on page 25.

CHAPTER 70 Audio File Management

OVERVIEW

This chapter tells you:

- Where audio files are stored on disk
- How to manage the audio files associated with a Performer Lite project
- How to get rid of unused audio
- How to reclaim hard disk space using the Compact command

THE AUDIO FILES FOLDER

Overview 603
The Audio Files folder 603
Renaming audio files 603
Moving audio files 603
Working with multiple drives 603
Deleting audio files 603
Getting rid of unused audio 604

As explained in "Components of a Performer Lite Project" on page 98, each Performer Lite project includes an Audio Files folder (Figure 16-1 on page 98).

The Audio Files folder keeps track of all of the audio files for a Performer Lite project. In a new project, takefiles are placed in the Audio Files folder by default. You can record an entire Performer Lite session without concern for the location of the audio files you record because Performer Lite will automatically store them by default in this folder. However, audio files do not have to be located in this folder. For example, you might import an audio file into the project that is located on another hard drive.

RENAMING AUDIO FILES

You can rename audio files at any time by editing the file name on the computer desktop or by Option/Alt-clicking its name in the Soundbites window. In either case, Performer Lite automatically updates the name in the other location so that they always match.

MOVING AUDIO FILES

You can freely move audio files to any location you want and Performer Lite will automatically keep track of them. You can even place them on a different hard drive. If you are not sure where an audio file is, and you would like to find out, click one of its soundbites in the Soundbites window and look at the information for the parent audio file in the Sound File Information window. If necessary, you can make the window larger to see the entire path.

If you copy a file onto another volume and delete the original, Performer Lite will *not* know about it and will ask you to find it.

WORKING WITH MULTIPLE DRIVES

Since Performer Lite does not care on which hard drive you record and store your audio files, you can store audio files for a single Performer Lite project on several different hard drives. This can help improve the overall disk performance of your system because it distributes the intensive disk accessing burden across more than one disk.

DELETING AUDIO FILES

You can delete audio files by dragging them into the trash or recycle bin. The only drawback to this method is that you can't view or audition the regions that the file contains to verify that you don't need them. If you want to inspect the soundbites in the audio file before deleting it, use

Performer's Soundbites window. Open the Performer Lite file associated with the audio file (or import its soundbites into Performer Lite) and do the following:

1 View by file name (using the View by menu the top of the window).

This groups the soundbites together by audio file.

2 If you want to check the soundbites by listening to them, turn on the Audible Mode button (in the Control Panel) and click them.

3 Drag over their names to highlight them.

4 Choose *Delete* from the mini-menu and answer Yes when asked if you would like to delete the audio file.

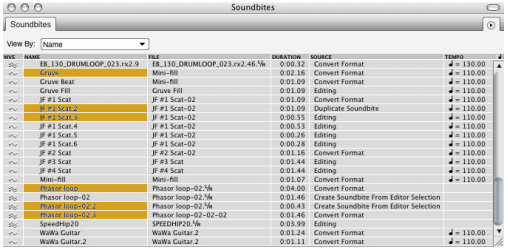
As a shortcut, hold down the Option/Alt key when selecting the *Delete* mini-menu command to bypass the warning dialog.

GETTING RID OF UNUSED AUDIO

Performer Lite provides several simple techniques for permanently removing unused audio data from the hard drive. You can employ these techniques at any time to generate more free hard disk space. Just be aware that they permanently remove audio data, so be careful when choosing what to delete. The next few sections cover these techniques.

Selecting and deleting unused soundbites

The Soundbites window mini-menu has an item called *Select Unused Soundbites*. This command highlights all soundbites in the list that are not being used in any track in any sequence in the file. (For more information, see "Selecting unused soundbites" on page 224.)



You can delete the highlighted soundbites by choosing *Delete* from the mini-menu.

Compacting audio files

After a recording session, you may wish to get rid of all the data that ended up not being used in any of the tracks to reclaim significant amounts of free space on the hard disk. Compacting is a process

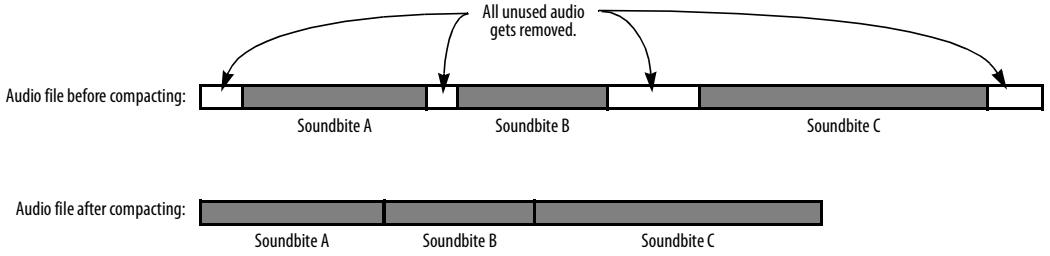


Figure 70-1: Compacting removes all audio data that doesn't fall within an existing region. Depending on how much unused audio gets removed, this process can free up large amounts of space on the hard disk.

that deletes portions of an audio file that are not part of a soundbite and then closes the gaps between the leftover regions.

As shown in Figure 70-1, the unused data between soundbites is removed, and the remaining soundbites are placed end to end. Compacting conserves disk space by removing unwanted data from within a file, while preserving data being used for soundbites.

You can compact all audio files at once or individually.

When compacting occurs, there is only one criterion for determining if data is thrown out:

☛ Is the data part of a region in the audio file's region list?

If the data **is** part of a region in the audio file's region list, it is *not* deleted.

If the data is **not** part of a region, it *is* deleted.

The key to successfully compacting a file is to make sure that the region list in the audio file contains regions that you want to keep, and *only* those regions that you want to keep.

How do you do this? With the Soundbites window. If you delete a soundbite that you want to discard, Performer Lite removes the soundbite's corresponding region in the audio file's region list (see "Deleting soundbites" on page 224), and the remaining audio data is deleted when compacted. Conversely, soundbites that are not deleted are not compacted.

If any audio data in the audio file is being used by other Performer Lite files, it is not deleted by these commands as long as you have not deleted the region from the audio file's region list with Performer Lite or other sample editing software. Performer Lite does not delete any regions in the audio file, even if they are not used in the currently open Performer Lite file.

Since compacting results in the erasure of audio data on the hard disk, and possibly *very large amounts* of audio data, this operation may take a few moments, depending on how much audio data is being removed.

To compact one or more audio files:

1 (Optional) Choose *Select unused soundbites* from the Soundbites window mini-menu.

This highlights all of the soundbites that are not being used in any track in the file. These are likely candidates for disposal.

2 Delete all soundbites from the Soundbites window that you want to discard using the *Delete* command in the mini-menu.

If necessary, you can audition ones that you aren't sure about using Audible mode. To delete the soundbite, highlight its name and choose *Delete* from the mini-menu. *Don't use the Remove from list command—it will not remove the regions from their audio files.*

3 Highlight a soundbite from each audio file that you wish to compact.

If you want to compact all the audio files, choose *Select All* from the Edit menu (or press Command/Ctrl-A).

4 Choose *Compact* from the Soundbites window mini-menu.

Compacting won't work if…

There is one condition in which compacting won't do the right thing for you: if the data you want to get rid of exists as a region in the audio file and

there is no corresponding soundbite for it in Performer's Soundbites window. This situation can arise if:

- the region wasn't created in the current Performer Lite file

OR

- at some point you highlighted the region and chose the *Remove from list* mini-menu command, which removes the soundbite name from the Soundbites window but doesn't delete the corresponding region from the audio file region list.

The first case is rare. It isn't often that you want to delete a region from anywhere other than the file it was first created in. Otherwise, the region is probably there for a purpose — and therefore you don't really want to delete it.

To avoid the second case, only use the Remove from list command with soundbites you are absolutely sure that you will never want to discard. Otherwise, they might take up hard disk space without you even knowing it. If this is the case, import the region into Performer Lite and then delete the soundbite with the *Delete* command.

CHAPTER 71 Frequently Asked Questions

OVERVIEW

This chapter provides answers to frequently asked questions, organized by topic.

Overview 607
Setting up 607
Becoming familiar with Performer Lite 608
Recording and playback 609
Editing 611
Mixing and Finishing 611
Plug-ins 612
Virtual instruments ("soft synths") 612

SETTING UP

On Windows, the buffer size setting is grayed out in the Configure Hardware Driver dialog (Setup menu). Why?

Some ASIO drivers don't allow host applications to change their buffer size setting. In this case, click the *Configure Driver* button (Figure 3-1 on page 21) to launch the hardware's console software to make the setting there.

How do I configure my audio inputs and outputs?

Use the Bundles window (Studio menu). See and "Bundles" on page 261.

How do I change the input and/or output on multiple tracks simultaneously?

Select the desired tracks, then choose *Studio* > *Track Assignments* (or press Option/Alt-A). If you don't see the inputs or outputs available that you wish to use, go to the Bundles window and create bundles for them.

☛ See "Making I/O assignments for multiple tracks" on page 71.

Why do I get a "no outputs enabled" error when launching Performer Lite?

If your computer has separate drivers for input and output, and only the input driver has been enabled in Performer Lite, you'll get an error telling you that there are no outputs enabled. Open the *Configure Hardware Driver* dialog and enable both the input and output drivers.

☛ See "Enabling multiple drivers (Mac only)" on page 24.

How do I change the tempo, meter, or key of my project?

The two most common tempo modes are Fixed Tempo and the Conductor Track. To change the tempo mode, click the Tempo menu to the right of the tempo value.

For information on these and other tempo modes, see "Tempo Controls" on page 111. Here are brief overviews of the Fixed Tempo and Conductor Track modes.

Fixed Tempo:

- The tempo can be set using the tempo text field in the Tempo Control section of the Control Panel (beneath the counter).

The meter is set at 4/4 in Fixed Tempo mode, and a key of no sharps or flats. To switch to other meters or keys, use Conductor Track mode. In Fixed Tempo mode, there is one tempo, beat, and meter for the whole sequence. If you need changes throughout your sequence, use Conductor Track mode.

Conductor Track:

■ In Conductor Track mode, Performer Lite follows the Conductor Track for tempo, meter, and key changes. Each type of event can be inserted and manipulated in a number of ways. The Conductor Track can be edited in the Sequence Editor and altered with the commands found under *Project menu > Modify Conductor Track*.

How do I hear a click or countoff?
To configure a metronome click:

1 Choose Click preferences from the Studio menu, or Option/Alt-click the Click button in the Control Panel.

2 Choose the type of click you want to hear: MIDI click or audio click. You can enable one or the other, or both.

For a MIDI click, choose a MIDI device, channel, and note; for an audio click, choose the audio output and click file (mono AIFF, WAVE, or SDII).

☛ If you are using MIDI Only mode, the audio click routing option is not available; the click & countoff will then be automatically routed to a device in your MIDI configuration (in the Bundles window MIDI Devices tab).

3 To audition the click to hear what it will sound like, check the *Audition click* option in the lower left; it will audition at the current tempo.

4 Close the Preferences window, then enable the Click button in the Control Panel.

To configure a Countoff:

1 Open the Preferences and choose *Countoff* from the list on the left, or Option/Alt-click the Countoff button in the Control Panel.

2 First, set the number of measures and beats for your countoff; the default is 2 measures, 0 beats.

3 Next, choose whether you want to have a Countoff all of the time, or only when recording.

4 Audition the Countoff in the same way as the Click: enable the *Audition Countoff* box in the lower left.

5 Close the Preferences window, then enable the Countoff button in the Control Panel.

How do I view or change key commands?
Open the Commands window from the Setup menu (or press Shift-L). You can scroll the list to find the command you are looking for, or you can search using the text box at the top. To enter a new key command, click in the *Key 1* column, and press the desired key combination.

You can save or load sets of key bindings via the mini-menu's *Export* and *Import* commands.

To Print the key commands, open the Commands window and choose *Print* from the File menu. Note that you can collapse any section by clicking its disclosure triangle (holding option while clicking a disclosure triangle collapses or expands all sections at once).

For more information, see "Commands" on page 257.

BECOMING FAMILIAR WITH PERFORMER LITE

I'm familiar with an older version of Performer Lite. What changes have been made?
If you are familiar with Performer Lite version 5 or earlier, some user interface elements have changed in Performer Lite version 6 and later. For information on these changes, please refer to the "Users of previous versions of Performer Lite" page in Performer Lite's online help files (*Help menu > Performer Lite Help*).

RECORDING AND PLAYBACK

MIDI input is not recording. What should I do?
Here are some things to try if you are not able to record MIDI into Performer Lite:

- Make sure the MIDI input light of your MIDI interface is lighting up when you play your MIDI controller keyboard. If not, check you have a MIDI cable going out of the keyboard into the interface.
- Try a different MIDI cable.
- Make sure your keyboard is set up to *Local Off* or *Local Control: Off* mode, and configured to send out MIDI notes. If you have other MIDI keyboards or modules with a MIDI IN connection, try connecting the MIDI OUT of your controller directly into the MIDI IN connection of one of those pieces of MIDI gear: does it receive MIDI notes?
- Check that the interface and MIDI keyboard is properly configured in your MIDI device configuration (Setup menu > Bundles > MIDI Devices tab).
- Check that you have specified the specific input and channel your controller is transmitting on.
- Try using the MIDI Keys window (Studio menu). Open the MIDI Keys window and press any letter in the "ASDF" row of your computer keyboard. You can also click the keys on-screen in the MIDI Keys window.

How do I use my USB MIDI keyboard with Performer Lite?
Some MIDI controller keyboards have USB connections that allow them to connect directly to the computer, instead of through a MIDI interface.

Some keyboards will be recognized automatically. Once connected via USB, they will simply appear as an input option and an output option (if the keyboard has MIDI output ports).

If the keyboard isn't automatically recognized:

1 Install the drivers and software provided by the keyboard's manufacturer.

2 When that is successful, you will see the keyboard in your MIDI device configuration (Setup menu > Bundles > MIDI Devices tab). It will appear similar to a MIDI interface, with its MIDI ports displayed on the bottom of the device.

3 Choose *Add New External Device* from the MIDI Devices menu, and double-click the *New external device* to open its Device Properties window.

4 For Device Name, type the name of the keyboard (this name is what it will be referred to as in Performer Lite).

5 Hit Apply and close the Device Properties window.

6 Draw a connection in and out of this device to the keyboard that originally appeared (the one with the ports on the bottom).

Now when you choose MIDI inputs or outputs in Performer Lite you will be able to choose your USB MIDI keyboard.

MIDI input is recording, but I can't hear my MIDI instrument.
If you're sending MIDI to a virtual instrument on an instrument track in Performer Lite:

- Make sure the instrument track has its output assigned to a valid audio bundle. If the output assignment is *italicized* then it is invalid; reassign the output to a valid bundle.
- Make sure the instrument track is not muted.
- If the instrument is multi-timbral, make sure that you've assigned your MIDI track to the correct MIDI channel.

If you're sending MIDI to a hardware MIDI instrument:

■ Have you connected the audio output of the MIDI device to an input on your audio interface? This must be done to bring the audio output from the MIDI device back into your Performer Lite project.

■ Have you created an audio or aux track in your sequence that corresponds to the hardware input you've connected the MIDI device's output to? Make sure the input and output assignments are valid and that the track is not muted.

■ Try listening directly to the MIDI device's output, perhaps from its headphone output. Do you hear output there?

■ If the MIDI device responds to MIDI volume messages (CC 7), try adjusting the MIDI track's fader in the Mixing Board to send MIDI volume messages to the MIDI device.

■ If the MIDI device doesn't respond to MIDI volume message, make sure the volume control on the hardware is turned up.

■ If the MIDI device has multiple audio outputs, check that the MIDI channel you are triggering is assigned to the desired outputs on the device.

Audio input is not recording.

■ Make sure the input meters on your audio interface are lighting up when you send input. If they're not, check that you have audio cables connected properly.

■ Try a different cable or microphone. For condenser microphones, make sure that you have phantom power enabled.

■ Try using a different input on your interface. If you have one, try a different interface.

■ Check that the audio interface is properly configured. For example, if you can enable or disable inputs on the interface, make sure that the input you want to use is enabled.

■ Make sure that the inputs your tracks are assigned to are the inputs you are recording from. For example, if your microphone is connected to Mic/Guitar 1 on an 828mk3, make sure your audio track is assigned to *Mic/Guitar 1*.

■ Are your input assignments in italics? Make sure that your audio interface is being seen in the *Setup* > *Configure Audio System* > *Configure Hardware Driver* window, and that it is the selected driver. If it is being seen, open *Studio* > *Bundles* and make sure that the bundles you have are assigned the inputs you want.

■ Is the track record-enabled?

■ Is the track enabled? The Enable item is accessible under the Track Settings menu in the Sequence Editor, and from the track pop-up menu available at the bottom of the channel strip in the Mixing Board.

I press play and I do not hear anything.

■ Make sure that the outputs your tracks are assigned to are the outputs you are monitoring from. For example, if you are monitoring from an 828mk3's Main Outs, make sure your tracks are assigned to Main Out 1-2.

■ Are your output assignments in italics? Make sure that your audio interface is being seen in the *Setup* > *Configure Audio System* > *Configure Hardware Driver* window, and that it is the selected driver. If it is being seen, open *Studio* > *Bundles* and make sure that the bundles you have are assigned the outputs you want.

■ Are the tracks muted in the Mixing Board?

■ Is Solo Mode engaged?

■ Are the tracks enabled? The Enable item is accessible under the Track Settings menu in the Sequence Editor, and from the track pop-up menu available at the bottom of the channel strip in the Mixing Board.

- Is the Master Fader and main outs of your audio interface or mixer turned up?
- Speakers on? Volume turned up on your speakers and/or amplifier?
- Everything plugged in the way it should be? Try different cables, headphones, or speakers.
- Try bypassing plug-ins to see if an effect is altering your audio in a way that it cannot be heard.

How do I convert my MIDI sequence to Audio?
MIDI is a language and does not contain audio in and of itself, rather it gives commands and triggers MIDI devices to play sounds and controller information.

If your MIDI triggers sounds that are generated from an external sound source such as a MIDI sound module, synthesizer, or sampler, then you will need to connect the analog or digital outputs of that device into your audio interface to record the audio onto an audio track.

If your MIDI sequence uses sounds from virtual instruments, you can simply select the MIDI tracks and use Bounce to Disk.

A limited number of virtual instruments may not Bounce to Disk. If so, you can use the Freeze command:

- Highlight the instrument track that your instrument is on
- Highlight the MIDI tracks that are assigned to that instrument track, if any
- Choose *Audio menu > Freeze Selected Tracks*.

The audio output of the instrument will be recorded onto a new audio track.

If your MIDI sequence is using sounds from an application like Reason (or similar):

- Add a stereo audio track or mono audio track.
- Set the input to be the outputs of whichever application you are sending from.

For example, if you are using Reason, add a stereo audio track and set the input to be *Reason Main: L-R*, or any specific output that your Reason rack unit is outputting to.

EDITING

Why is my track name underlined in the Sequence Editor?
When a track name is underlined, it indicates that the track is frame-locked.

Why do my crossfades have a blue or red outline?
Fades and crossfades are normally the same color as the soundbites underneath, as are the fade outlines. Two special colors are used to indicate problems:

- Blue fade outlines mean that there is not enough audio to compute the fade
- Red fade outlines mean that the faded audio is clipping.

MIXING AND FINISHING

Why are the meters in the Mixing Board labeled as +/-48 dB?
When an audio track's meter scale is labeled as +/-48 dB instead of -48 to +6 dB, the track is in Trim Touch or Trim Latch automation mode. For more information, refer to "The Trim modes" on page 497.

How do I mixdown my project to a stereo file?
Use the Bounce to Disk command. See "Bounce To Disk" on page 564.

How do I burn a song made in Performer Lite to a CD? (Mac only)
Refer to "Bouncing to a CD or disk image (Mac only)" on page 570.

How do I export as an MP3?
To take a finished mix done in Performer Lite and convert it to an MP3, follow these steps:

1 Prepare the project as if you were bouncing down to any other format, such as WAVE, AIFF, etc. See "How do I mixdown my project to a stereo file?"

2 After choosing *File menu>Bounce to Disk*, select *LAME Audio Export: MP3* as the Format. Give the file a name, and choose the location where you'd like the file to be saved. When you press OK, you'll see a second dialog with some options for the MP3 you are creating. If you don't have any preference for these settings, just use the default settings. Press OK in this dialog, and the file will begin bouncing.

3 After the bounce is complete, you can open this file in your MP3 player software of choice, such as iTunes.

You can also export any soundbite in the Soundbites List as an MP3. Select the desired soundbites and choose *Export Selected Soundbites* from the mini-menu. Choose *LAME Audio Export: MP3* from the File Format menu.

How do I back-up a Performer Lite project?
To backup the data for your entire Performer Lite project, use the *File > Save A Copy As* command. Make sure to check the *Duplicate audio and copy shared samples to project* option. This will take all of the audio files that your project is using and make a copy of them into the new project's Audio Files folder, and also copy any samples you are using with nanosampler or Model12.

Performer Lite supports WAVE and AIFF files. For the most broadly compatible back-ups, using WAVE files is recommended.

PLUG-INS

How do I use MAS, VST and Audio Unit (AU) plug-ins?
See chapter 13, "Instrument Tracks" (page 82) and chapter 58, "Audio Effects Plug-ins" (page 521).

How do I force Performer Lite to rescan my VST and Audio Unit plug-ins?
Open the Plug-in Preferences, select the desired plug-ins, and hit Reexamine. For more information on managing your plug-ins, see "Audio plug-in preferences" on page 525.

How do I use RTAS plug-ins?
RTAS plug-ins are not supported.

VIRTUAL INSTRUMENTS ("SOFT SYNTHS")

How do I use virtual instruments ("soft synths") in Performer Lite?
Performer Lite includes six virtual instruments, and you can also use third-party MAS, VST and Audio Unit instruments. To use a virtual instrument in Performer Lite:

1 Add an Instrument Track (*Project menu > Add Track > Instrument Track).*

2 Choose the desired instrument from the Instrument Tracks list, and it will create an Instrument Track for it.

3 Record enable the instrument track.

For more information, see chapter 13, "Instrument Tracks" (page 82).

I closed the window for my virtual instrument, how do I open it again?
In Performer Lite's Mixing Board (Project menu, or press Shift-M), locate the instrument track. The first insert will be tinted yellow; this is the instrument plug-in. Double-click this yellow insert to open the instrument's interface.

Alternatively, you can open the Effects window (Project menu, or press Shift-F) and select your instrument track from the first drop-down menu. You may also double-click an instrument track name in the Sequence Editor to open its instrument plug-in interface.

How do I use multiple outputs from my virtual instrument?

To use multiple outputs from Performer Lite's included MAS instrument plug-in, VST instruments and Audio Unit instruments, see "Multiple audio outputs" on page 530.

Some MAS instruments tap directly into Performer Lite's internal busses. For such instruments, assign the part to the desired bus in the instrument plug-in window.

After the bundles are created, you can create an aux track or an input monitor-enabled audio track with that same bus as the input.

Input monitor-enabled audio tracks have the benefit of being able to switch between monitoring and recording audio easily. For example, while composing you will leave the track input monitor-enabled, but once the part is finished you can record-enable the audio track and record the instrument's output in real-time. This is particularly advantageous when you have many outputs from one instrument, as you can record all of them to their corresponding audio tracks at once.

CHAPTER 72 Additional Resources

OVERVIEW

This *Getting Started* guide is just the beginning. There are a variety of resources available to help you get the most out of Performer Lite.

Overview **614**
Frequently Asked Questions (FAQ) **614**
The Performer Lite User Guide **614**
Help Tags **614**
Tutorials **614**
motu.com **614**
Training webinars **615**
Youtube.com/motuTV **615**

FREQUENTLY ASKED QUESTIONS (FAQ)

Refer to the previous chapter starting on page 607 for frequently asked questions (FAQs).

THE PERFORMER LITE USER GUIDE

The *Performer Lite User Guide* is a comprehensive resource for all of the windows, functions, commands, and options in Performer Lite. It is provided in printed form and on-line form in the Help menu. There are a number of ways to quickly locate information.

If you want information on…	look in the…
A broad topic (ex: "Editing", "Mix Automation", "the Sequence Editor")	Contents at a Glance
A specific topic (ex: "Editing during playback", "Tempo-locked, beat-based automation", "Scrubbing in the Sequence Editor")	Contents
A specific command, window, dialog, tool, etc. (ex: "Change Tempo", "Pencil tool", "Edge Edit Copy")	Index

You can also use the text search feature in your PDF viewer to find all instances of the text string you are searching for in the manual.

HELP TAGS

Performer Lite provides "tool tip" help tags to help you identify the names of buttons, controls, and other window elements. Place your mouse cursor above an item for a few seconds and the help tag will appear. Some items also have extended descriptions that can be accessed by holding the Command/Ctrl key while viewing the help tag. To turn off help tags, uncheck *Help menu > Show Help Tags*.

TUTORIALS

An excellent way to learn Performer Lite quickly is to follow the tutorials. Choose *Help menu > Tutorials* to open the Tutorials sidebar.

MOTU.COM

Our web site is continually updated with new resources and downloads to complement Performer Lite and other MOTU products. RSS feeds are provided to help you keep up-to-date with new content.

Tech Notes

Tech Notes are short pieces of technical information, usually in the form of a question, such as *Do I need an external drive to record audio with a laptop?*, and so on. Tech notes sometimes cover late-breaking information not found in the manual, so if you have a question you may want to search the tech notes for an answer even if you have your manual handy. The answers to many common questions can be found in the tech notes, so try searching the tech notes before contacting tech support:

motu.com/techsupport/technotes

Downloads

Keep up-to-date with the latest software updates for Performer Lite with our downloads section: motu.com/download.

Tech Support

If you have a question or problem that isn't answered or resolved with the above resources, registered users should contact technical support. If you haven't already done so, you should register your copy of Performer Lite online at www.motu.com/registration. For more information on contacting tech support, please see "Technical support" on page 625.

Other resources

Links to additional resources, such as books, tutorial movies and links to MOTU-related social media can be found at motu.com.

TRAINING WEBINARS

MOTU often hosts Performer Lite training webinars. Visit motu.com for information about the next webinar and for links to recordings of past webinars.

YOUTUBE.COM/MOTUTV

Visit youtube.com/motuTV for Performer Lite how-to videos.

Part 14

Appendices

APPENDIX A Control Surfaces

OVERVIEW

The Control Surface Setup command (Setup menu) lets you configure Performer for use with a variety of hardware and virtual control surfaces. Multiple control surfaces are supported, including expansion units added to a base control surface unit, or even completely different control surface products operating at the same time. Expansion units attached to a base unit will operate as a single, unified control surface as long as the driver (control surface plug-in) supports this feature. The Mackie Control supports this feature for its expander units (as demonstrated in Figure 72-2 on page 618); for other control surface products, contact the developer.

MIDI Device configuration **617**
Enabling a control surface driver **617**
Configuring a driver **618**
Working with multiple control surfaces **618**
CueMix Console control surface **618**
Supported devices **619**
EuCon **619**
Native Instruments Komplete Kontrol mk2 ..... **619**
Softube Console 1 ..... **621**
Track Pinning Options **621**

MIDI DEVICE CONFIGURATION

Before you can configure your hardware control surface in Performer, you must add it to your MIDI device configuration (Setup menu > Bundles > MIDI Devices tab). You can use the preset device supplied (if there is one), or you can create a generic device and simply give it the appropriate name. No special device properties are required for the device. Just make sure that MIDI channel 1 is enabled to transmit and receive. Be sure its virtual MIDI connections in your MIDI Device tab configuration match device's physical connection to your MIDI interface.

Configuration for virtual control surface devices varies; refer to the product's documentation for details.

ENABLING A CONTROL SURFACE DRIVER

When you first open the Control Surface Setup dialog, click the "+" button to add a driver, as shown in Figure 72-1.

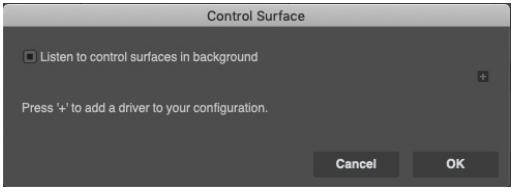


Figure 72-1: The Control Surface Setup dialog before adding a driver.

To add additional drivers (for multiple independent units), click the "+" button outside of the driver box. If you are adding additional units to a single driver that supports multiple units, click the "+" button inside the driver box. Doing so creates one unified control surface that will scroll tracks and track banks together as one unit. The top-to-bottom order inside the driver box corresponds to a left-to-right ordering of the tracks. So be sure that the top-to-bottom order of each unit corresponds properly with the left-to-right positioning of your hardware units.

☛ If you don't see your control surface in the menu, it probably means that its plug-in is not properly installed. Consult the installation instructions for your control surface software.

CONFIGURING A DRIVER

Choose the desired driver from the menu on the left, and then choose the corresponding control surface device from the input and output menus on the right. You must have a separate device in the MIDI device tab (Bundles window) that corresponds to each hardware unit. Some products provide a connection via USB (instead of standard MIDI cables). Refer to the control surface's documentation for details.

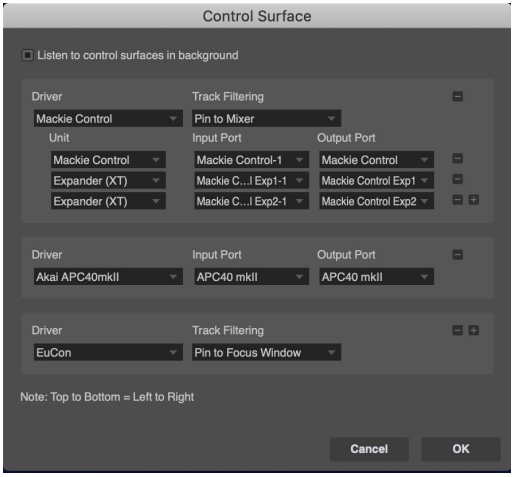


Figure 72-2: Multiple control surfaces.

WORKING WITH MULTIPLE CONTROL SURFACES

The Mackie Control is an example of a control surface driver that supports multiple units. In the example shown in Figure 72-2, the driver is configured for one base unit (Mackie Control) and two expander units (Expander XT), all residing within the same "Mackie Control" driver box. This causes them to operate as a single unit: tracks and track banks will scroll seamlessly across all units.

The HUI driver does not support multiple units, so you need to set up separate driver boxes for each HUI as shown in Figure 72-2.The only difference is that they don't scroll their channels as one unit. But in all other respects, you can easily work with multiple independent units, even products from different manufacturers. But pay attention to what you're doing: you need to manage which tracks are being controlled by each device. It is actually possible to control the same tracks from two different units. This might be useful in some situations, but potentially confusing if you're not aware of what's going on.

CUEMIX CONSOLE CONTROL SURFACE

If you use your control surface to control your MOTU audio interface no-latency CueMix monitoring (via the CueMix Console software), then *uncheck* the *Listen to control surfaces in background* option (Figure 72-2). This causes Performer to relinquish the control surface when Performer goes to the background and you switch to CueMix Console to independently tweak your CueMix monitor mix from the control surface. Otherwise, with this option left enabled (checked), changes you make in CueMix Console (via the control surface) would also be made to your Performer Mixing Board mix. Or, conversely, if your Performer project has mix automation, that automation would be applied to your CueMix when CueMix is in the foreground. By unchecking this option, the control surface is kept completely independent from the background application and correctly controls just the current foreground application.

If you don't use your control surface to control your CueMix monitoring, then leave the *The Listen to control surfaces in background* option checked (enabled). This allows you to control your Performer mix, even when Performer is in the background.

SUPPORTED DEVICES

Performer provides native support for many work-surface devices on the market.

Device	For more information
Mackie HUI & compatible	Help menu > Control Surfaces Help
Mackie Control Universal	Help menu > Control Surfaces Help
Mackie Control compatible	Help menu > Control Surfaces Help
Avid EuCon	"EuCon" on page 619
Novation Launchpad series	"Novation Launchpad" on page 212
Akai APC series	"Akai APC40 mkII" on page 211
Native Instruments Kontrol	"Native Instruments Komplete Kontrol mk2" on page 619

EUCON

EuCon is Avid's protocol for controlling all EuCon compatible control surfaces. This plug-in has been substantially updated to include support for Avid's S series consoles, including the S6.

NATIVE INSTRUMENTS KOMPLETE KONTROL MK2

Transport controls

Loop
Enables and disables Performer's Memory Cycle.

Holding the loop button and turning the 4D encoder shifts the memory cycle in/out points by one bar.

Metronome
Enables and disables the metronome click.

Tempo
Enables itself/lights up when the current sequence is not in Conductor Track mode.

When enabled, tap to set the tempo of the current sequence. To tap a new tempo without being affected by previous taps, wait for a few seconds and start tapping again.

Play
Plays the currently play-enabled sequence. When playing, press again to stop.

Restart [shift Play]
Restarts the play-enabled sequence from the beginning

When Loop (memory cycle) is enabled, the counter will restart from the beginning of the memory cycle.

Record
Equivalent of pressing/toggling record on the currently play-enabled sequence.

Count-in [shift Record]
Enables/disables Performer's countoff.

Stop
Stops playback/recording. When the transport is not rolling, *Stop* rewinds to the sequence start. If memory cycle is enabled, it rewinds to the memory cycle start.

Undo/Redo
Triggers undo/redo in Performer.

Quantize
Single press to toggle input quantize. Double-press to open/close input quantize settings.

Auto [shift Quantize]
Toggles the automation recording state of the currently selected track.

When the selected track is record-armed, the automation button will:

- Remain solid if the transport is not rolling
- Blink if the transport is rolling and automation record is not punched in
- Remain solid if the transport is rolling and automation is punched in

Play Head (4D encoder)
Move the play head left and right in one-beat increments, snapping to the nearest beat.

Navigation controls

Push the 4D encoder to navigate tracks, clips or scenes in the currently active Performer window.

Prev/Next track [4D]
Move selected track to previous/next track relative to the current selection.

Prev/Next scene [4D]
Moves the selection between scenes (Clips window only, disabled when the Clips window is not in focus)

Prev/Next
Scrolls banks of tracks visible on the controller.

Mixer controls

Select track
The selected track is always automatically record-armed.

If you're in any window other than the Clips Window, only MIDI and voice tracks will be visibly record-armed in Performer. In the Clips Window, all tracks will reflect their record-arm state.

Auto-Record Arming
When selecting tracks from Komplete Kontrol, the newly selected track is always automatically armed.

If a different track is selected in Performer, you can create a state where the selected track on the Komplete Kontrol is not the track that is record-armed. This is a valid state, and would reset itself when another track is selected on the Komplete Kontrol.

Selected track
The selected track will always be the "Active Track" as far as Performer is concerned. When there is no active track, the Komplete Kontrol selects the first track in the sequence to be active by default.

Selection restoration
When a MIDI track is selected with the device, the record-arm state of the track prior to being selected is saved. When the track is later deselected from the device, the state should be restored.

Performer's selection takes precedence. If a track is selected on the controller but the state is modified from Performer, then this overrides the controller and the controller responds to Performer's selection settings. In other words, changing selection from Performer breaks the "restoration" state from the controller. The controller's "restoration" state only affects when selection is changed multiple times from the controller.

Komplete Kontrol editing
When a MIDI track is selected with the device, Performer automatically traces the MIDI track's output connection. If the MIDI track is connected to exactly one VI destination, Performer will connect the Komplete Kontrol to the destination for VI editing (activating the Komplete Kontrol editing ability, if applicable). If the MIDI track is connected to something else, such as a MIDI group or another MIDI track's input, Performer will deactivate the Komplete Kontrol's plug-in editing.

When an Instrument track is selected with the device, Performer will connect the Komplete Kontrol to the VI on the current instrument track.

When selecting between MIDI tracks, a MIDI track without a traceable VI instance of Komplete Kontrol assigned to it will not replace or erase the

selected instance of Komplete Kontrol on the keyboard. This is intentional behavior, designed to enable users of MIDI groups or more complex connections to Komplete Kontrol VI instances to first select the desired Komplete Kontrol instance by selecting the VI track, then select the MIDI track in the group in order to record it.

Clips Window
When a track is selected, Performer will automatically move the clip selection to the currently selected track (column). If no row is selected, Performer will select the first row.

When a track is hidden by the track selector, Performer simply selects nothing if it's chosen from the controller (the controller never has "invisible" tracks).

Volume control 1-8
Edit volumes in slots 1-8 on the keyboard.

Pan control 1-8
Edit pan in slots 1-8 on the keyboard.

Selected volume
Edit volume of currently selected track on keyboard.

Selected pan
Edit pan of currently selected track on keyboard.

Track name
Displays the track name, limited to 33 characters.

Track pan readout
Displays Performer's readout of Pan values.

Track volume readout
Displays Performer's readout of Volume value.

Track mute (1-8, selected track mute)
Toggles mute state of the selected track

Track solo (1-8, selected track solo)
Toggles solo state of the selected track. No effect on any track which is Solo Exempted.

SOFTUBE CONSOLE 1

Performer fully supports the Softube Console 1 series of control surface products, including Console 1, Console 1 mkII and Console 1 Fader. To get started, follow Softube's instructions for installing, registering, activating and connecting your Console 1 product. Then, simply instantiate the Console 1 plug-in on the desired track in Performer. From there, you can control the plug-in from the hardware unit, Performer's plug-in window or the Console 1 window. For further details, consult your Console 1 product documentation.

TRACK PINNING OPTIONS

Most control surfaces can be pinned (anchored) to one of three track selections: *Mixer*, *Focus Window* or *All Tracks*.

☛ Not all surfaces support this functionality. If not, they function in *All Tracks* mode, which includes all enabled V-Racks (except for pad controllers, which are bound to the tracks currently displayed in the Clips window).

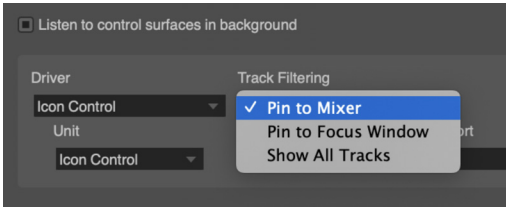


Figure 72-3: Track pinning

Mixer

When you first add a control surface, *Mixer* is the default setting. When pinned to *Mixer*, V-Rack tracks appear following the visibility in the mixer. Mixer allows you to show/hide tracks from the control surface using the Mixing Board's track selector.

All Tracks
All Tracks shows all tracks available in the sequence. V-Rack tracks appear at the end, after all other tracks.

Focus Window
Focus Window sets the track selector based on the currently active window or focus cell in the consolidated window. This allows you to show/hide tracks from the control surface by using the current Track Selector. Tracks on the control surface follow the focused window.

Track indicator lights
In the Sequence Editor and Mixing Board, indicator lights appear in a strip to show which tracks are currently active on any control surface. In the Sequence Editor, this vertical strip appears on the left of the track strip. In the Mixing Board, it appears as a horizontal strip at the bottom of each channel strip. If a track is active on one or more control surfaces, this strip will light up with the selection color of the theme. If the track is selected, the strip turns to the color of the track itself.

APPENDIX B Troubleshooting and Support

OVERVIEW

Overview 623
Preventing Catastrophe 623
General troubleshooting 623
MIDI troubleshooting 624
Audio troubleshooting 624
Technical support 625

PREVENTING CATASTROPHE

Keep up-to-date backups of your sequences as you work, so that you always have copies of the most recent work you have done. *Almost any software problem is survivable as long as you have kept backups of your work*. Refer to "Helpful project and disk hints" on page 104 for detailed suggestions about file management.

Keep plenty of free space on any disk containing sequences which you are actually working on. This will prevent the computer from running out of disk space. Running out of disk space can result in an unreadable and irretrievable sequence.

GENERAL TROUBLESHOOTING

Troubleshooting is always simplest and most effective when the exact problem can be specified clearly and concisely. If you are surprised by an error message or by seemingly erratic behavior in the program, take a moment to jot down the relevant details: exactly what the error message said (including any error ID numbers), what actions were done on-screen just before the problem occurred, what kind of file you were working with, how you recovered from the problem, and any unusual conditions during the occurrence of the problem. This may not enable you to solve the problem at once, but will greatly aid in isolating the problem should it reoccur.

If the problem you are encountering seems inconsistent, try to determine what the necessary pattern of actions are that will cause it to occur. Genuine bugs in application software like Performer Lite are almost always consistent in their manifestation: the same set of actions under the same conditions invariably brings about the same results. Determining the exact cause of a bug often requires experiments which replicate the problem situation with one factor changed: working with a new sequence instead of an existing one, trying a different plug-ing, etc.

If the problem is truly inconsistent, then it is likely to be a hardware problem: improper disk drive alignment, a loose connection, overlong cables, signal 'aliasing', etc. For example, if you play a sequence several times consecutively from 1|1|000 without making any changes to it, and on one pass you hear a wrong note at 3|1|043, and on another pass you hear a different wrong note at 6|2|332, and the other times it plays back without any errors, the problem is almost certainly external to Performer Lite. At this point you will want to experiment with changes in your MIDI hardware configuration (where possible) to attempt to isolate the source of the problem.

Isolate the problem

One of the best troubleshooting techniques is to try to isolate the problem. If you can whittle down a complicated setup or scenario to a much simpler case, chances are you'll zero in on the problem more quickly.

Simplify your setup
One of the most common causes of problems is a conflict with other software in the system. Run Performer Lite by itself, with no other plug-ins or virtual instruments, and see if the problem you are having still happens.

Check the 'Read Me First'
It's human nature to blow right past the Read Me First, but you'll probably be glad you took the time. If you experience problems with Performer Lite, check the Read Me notes that ship with the current version you are using.

If you cannot open a particular file
First try opening other existing files, or a new file, to be sure Performer Lite is working at all. If a file is opened and seems damaged, will not let you save changes, etc., you still may be able to save some or all of its musical information by using the Clipboard to copy the tracks and paste them into another file.

MIDI TROUBLESHOOTING

If Performer Lite starts correctly, but you are unable to record (or play) any MIDI data
Double-check your cable connections and MIDI instrument settings. Check your MIDI device configuration (Setup menu > Bundles > MIDI Devices tab) and the connections to the computer. Often only A/B tests will reveal the source of the problem. It may be necessary to switch your MIDI cables, and if possible, to try using a different MIDI interface or MIDI instrument for input/output. Make sure that any recording channel assignments correspond to the MIDI channels set in the controlling keyboard or device.

If you're having problems synchronizing Performer Lite with other equipment
Refer carefully to chapter 67, "Receive Sync" (page 582). Try to deduce exactly which signals are not being sent or are being misinterpreted by which pieces of equipment.

AUDIO TROUBLESHOOTING

Here are some additional issues related specifically to audio recording and playback.

If Performer Lite can't find the audio card
If you launch Performer Lite and see a warning box that says that there is no audio hardware, when actually there is, quit Performer Lite, shut down your computer, and make sure that the audio recording card is seated properly in its slot. Make sure you have the correct versions of the drivers.

If you record and get nothing
If you record but don't get anything, the track you are recording on may be set to the wrong channel. Set it to another channel and try again.

If you don't hear sound
If you don't hear sound, check the following things:

- Make sure the volume is turned up on the audio hardware units.
- Make sure you have cables connected to the correct plugs on inputs and outputs for the audio recording hardware
- Try setting the volume in the Mixing Board. See chapter 20, "Mixing Board" (page 174) for details.
- If you don't hear sound while recording, make sure the Audio Patch Thru is on.

If you see an error message after playback or recording
Performer Lite keeps close track of whether or not it had any trouble processing the audio data during the last record or playback pass. If conditions prevent Performer Lite from successfully handling all of the digital audio information, it presents an error message letting you know how many errors occurred. These errors can be due to conditions such as these:

- Highly fragmented audio files on the hard disk

- A hard disk with an access time that is too slow
- Other background software interruptions
- Other third party software

If you are running under the MOTU Audio System, you may also get an error message if available RAM is tight.

If you get such an error message, try optimizing the hard disk with defragmentation software. You can also try adjusting the buffer size of the MOTU Audio System as described below.

Adjusting buffer sizes to avoid playback error messages
Sometimes adjusting the size of the MOTU Audio System disk buffers can help. For details, see "Configure Studio Settings" on page 25.

If you experience a crash or other interruption while playing or recording
When Performer Lite begins recording or playback, it allocates a large amount of the free space on your audio hard disk to the current take files. If audio recording (or playback with at least one track record-enabled) is ever interrupted at this point due to a power failure or system error, this free space will remain allocated to the interrupted takefiles. When this happens, The next time Performer Lite is launched, it displays the Rescued Takefiles dialog.

This dialog shows partially recorded takefiles and allows you to recover or delete these files. You can click the takefile to audition it and determine whether there is useful audio data in it. In most cases, you should choose to delete the files. If you believe that important audio data exists in the files, use the Recover button to move the file into the Trash. You can then drag the file out of the Trash and then extract the important audio data from the file. You should choose to either recover or delete these files. Otherwise, they will needlessly take up hard disk space.

☛ Before auditioning soundbites in this window, turn down the volume of your sound system or headphones, as the results can sometimes be random noise at full volume (0 dB).

If you suddenly have very little hard disk space free
See the previous section regarding the rescue of takefiles after a crash or other interruption during playback and recording.

If the screen redisplay gets jerky
During playback, Performer Lite does its best to update items on the computer screen, such as the Counter and scrolling windows. However, audio recording, playback and effects processing can place a high demand on the computing power of the machine, and Performer Lite makes playback a higher priority than refreshing the screen display. Therefore, you may find at times that the counter will stop and start during playback or recording. This effect is minimized on faster computers.

If you run out of disk space
If you run out of hard disk space, compact existing audio files and delete unused audio files. For details, see "Compacting audio files" on page 604.

TECHNICAL SUPPORT

We are happy to provide customer support to our registered users. If you haven't already done so, please take a moment to visit motu.com/registration (or complete and mail the Competitive Upgrade envelope if you purchased the Performer Lite Competitive Upgrade). Then you'll be properly registered for technical support.

Registered users who are unable, with their dealer's help, to solve problems they are encountering with Performer Lite may contact our technical support department in one of the following ways:

- Phone: (617) 576-3066
- Online: www.motu.com/support

- Web site (for information, tech support database and downloads): www.motu.com

Technical support is staffed Monday through Friday 9 AM to 6 PM, Eastern Time.

If you decide to contact technical support, please have your Performer Lite manual at hand, and be prepared to provide the following information to help us solve your problem as quickly as possible:

- **The serial number of the program.** This is printed on the cardboard page at the front of the User Guide. (If you purchased Performer Lite as an upgrade, your manual won't have this cardboard page. Instead, MOTU will have notified you separately of your serial number.) Be sure to retain this page in the manual for your reference. You must be able to supply this number to receive technical support.

- **The version of Performer Lite you are working with.** This is displayed briefly in the start-up screen when Performer Lite is started; it is also available through the *About Performer Lite* command in the Performer Lite menu from within Performer Lite.

- **A brief explanation of the problem**, including the exact sequence of actions which cause it, and the contents of any error messages which appear on the screen. It is often very helpful to have brief written notes to refer to.

- **The pages in the manual** which refer to the parts of the program which you are having trouble with.

- **The version of the system software**.

We're not able to solve every problem immediately, but a quick call to us may yield a suggestion for a problem which you might otherwise spend hours trying to track down.

Our technical support telephone line is dedicated to helping registered users solve their problems quickly. In the past, many people have also taken the time to write to us with their comments, criticism and suggestions for improved versions of our software. We thank them; many of those ideas have been addressed in this version of Performer Lite. If you have features or ideas you would like to see implemented in our music software, we'd like to hear from you. Please visit motu.com/other/feedback/suggestions, or write to the Performer Lite Development Team, MOTU Inc., 1280 Massachusetts Avenue, Cambridge, MA 02138.

Although we do not announce release dates and features of new versions of our software in advance, we will notify all registered users immediately by mail as soon as new releases become available. If you move or otherwise change your mailing address, please send us a note with your change of address so that we can keep you informed of future upgrades and releases.

16-bit 289, 568
24-bit 289, 568
32-bit 289, 568
32-bit operation 16
64-bit operation 16
8-bit 567

A

About Performer
Version number 626
Absorb Selected Tracks options 416
Accelerando 465-469, 588
Accidentals 149
acdi disk image file extension 574
ACE-30 (see DP Plug-ins Guide)
Acid files
importing 228, 230
Add instrument track 82
Add Instruments with Options command 82
Add Place 214
Add Selection to Group 96
Add sequence selection commands automatically 259
Add Similar Tracks 63
Add Track 63, 67, 73, 283
Add Unassigned Instrument 83
Adjust Beats 480
Adjust Bite Volume +/- 0.5dB 413
Adjust durations 471, 474
Adjust Pitch Segmentation 414, 552
Adjust Sequence To Soundbite Tempo 426
Adjust Soundbites to Sequence Tempo 426
AIFF files
exporting 230
importing 228
Akai APC 211
All Selections command 306
All Takes sub-menu option 416
Allow Measure Selection 136
Alternate Tool 119
Always click option 116
Analog Chorus (see DP Plug-ins Guide)
Analog Delay (see DP Plug-ins Guide)
Analog Phaser (see DP Plug-ins Guide)
Analysis Files Folder 99
Analyze Soundbite Tempo 424
Anchoring tempos 463, 466
Any MIDI channel 75
Any Port 584
APC (Akai) 211
Apple
retina display support 16
Apple Loops 228
Apply Plug-in sub-menu 414, 523
Arpeggiator effect 533
Arrangement Palette 135, 165
Arranging a score 161
Articulation 401
Articulations palette 153
As Played 536
ASIO drivers 21
Ask before closing preference 252
Assign Track Colors 66
Attach MIDI Controller command 178, 193
Attach Mixer MIDI Controller 201, 208
AU (see Audio Units)
Audio
(see also Soundbites)
Beats sub-menu 414
CD burning 570
CD Disk Image option 574
converting on import 227
export presets 230
exporting 217, 230
importing 227
interleaved 598
menu (see Audio menu)
MIDI Setup
how it provides playback devices 75
MIDI Setup utility 30
Patch Thru 280
plug-ins preferences 525
track
playback 67-??
troubleshooting 624-625
Audio data
amount of recording time 599
how it is recorded 283, 598
selecting 315, 341
Audio files
compacting 226
creation of 283, 598
defined 600
deleting 225-226, 603
editing basics 302
exporting 217, 230
folder 603
hard disk requirements 600
how recorded 283, 598
importing 228
managing 603-606
moving 603
region editing 296
renaming 603
size on disk 599
stereo 222
stereo file size 600
Audio Loop settings 363
Audio menu 411-414
Apply Plug-in sub-menu 414, 523
Audio Beats
Clear Beats 430
Clear beats 414
Copy Beats 414
Disable Beats under Strength Threshold 414
Find Beats 414, 430
New Soundbites from Beats 414
Audio Beats sub-menu 414
Bite Volume and Gain 413
Bounce to Disk 564-576
Copy Beats 433
Copy Beats as MIDI 434
Delete Fades 411
Disable Beats under Strength Threshold 430
Fade 348, 411
Merge Soundbites 411
New Soundbites from Beats 431
Pitch and Stretch 413, 550, 552, 554
pitch and stretch
clear bite stretch 435
Smooth Audio Edits 411
Soundbite Tempo 414
Adjust Sequence To Soundbite Tempo 426
Adjust Soundbites to Sequence Tempo 426
Copy Sequence Tempo to Soundbite 425
Double Soundbite Tempo 425
Find Tempo Factor Near Sequence Tempo 425
Half Soundbite Tempo 425
Set Soundbite Tempo 424
Spectral Effects 413, 558
Audio MIDI Setup
Open Audio MIDI Setup 75
Audio Patch Thru 280
Audio System
configuring
MOTU Audio System 277
MIDI Only 19, 73
MOTU Audio System 19, 277
Audio System Clock (see Clock Source) 22
Audio track
bouncing 72
channel assignment 277
creating 67
defined 601
explained 67
max you can hear at once 72
muting & unmuting 269
pitch and stretch 70, 255
Record-Enable button 69
record-enabling 277
stretch 69, 255
Audio Units 524, 528
delay compensation 26
duplicate 527
examining 526
multiple outputs 88, 530
passed/failed/skipped 526
presets 519
scanning 18
virtual instruments 82-88, 189
Audition 255
Audition Click option 117
Audition Selection 270, 304, 306
Auditioning
importing audio 227
Auto (patch thru) 280
Auto (Snap to Grid) 357
Auto button 111-112
Auto Channelize 278
Auto Punch Out Delay command 193

Auto Record 284-285
Sequence Editor strip 123, 129
Auto Zoom Track 300
Auto/Manual end time 233, 237
Auto-locating 50
Automated mixing 190, 490
Automatic Conversions 217, 227, 252
preferences 252
Automatic Conversions Settings 217
Automatic Plug-in Latency Compensation 25, 522
Automatic tempo mode 463
Automatically Add Inserts 178
Automation
mixing board controls 187
modes 494
show lanes 321, 344
snapshot 503
Automation Setup window 491, 507
AutoPan (see DP Plug-ins Guide)
Auto-Record 118-119
loading remembered times 310
Tap Tempo 591
Autosave preference 252
Aux tracks 89-90, 192
applying effects to 528
Average Bit Rate 570
Avid EuCon 619

B

Backup copies of files 100, 623
Barlines 165
Base CD Tracks On menu 572
Bassline instrument plug-in (see DP Plug-ins Guide)
Beat click 447
defined 115
Beat clocks (see MIDI beat clocks)
Beat Detection Engine 428
disable/enable beats
Beat division (in Groove Quantize) 390
Beat Grid 124, 434
Beat value 111
Counter window 110
meters 471
tempo 463, 465
Beats per minute 111
Beats within soundbites 380
Big Sur 16
Bite
Gain 337, 347, 413
Bite volume 347
Blend (patch thru) 280
Bounce to Disk 564-576
in real time 578
movies 575
MP3 format 569
offline bounce 566
outputs 568
QuickTime movies 294
Sample Format 567
source 568
stems 564, 568
track bouncing 72
tracks 568
bpm 112
Brightness 78
Broadcast WAVE 228
Buffer Size 23
Built-in audio
improving performance 20
input monitoring 280
Bundles window 261
importing/export bundles 263
instruments tab 88, 264
MIDI Devices tab 28, 264
MPE setup 80
Burn Audio CD option 571
Bus
applying audio effects to 528
defined 191
Buses
setting number of 25
Byte 439

C

Capture start time 593
Cascade overlapping markers option 144
CC74 78
CD
burning 570
importing 228
Chaining
sequences 233, ??-233, 237-??, 237-??
sequences$startrange> 233
Change Duration 398-401
plug-in 532
Change Key 446, 476-478
custom key signatures 477
Notation Editor 154
Change Meter 446, 471-475
Adjust durations 471, 474
denominator 471
meter maps 452, 472
Notation Editor 154
numerator 471
Only move barlines 471, 474
Realign music automatically 471, 473-474
Change MIDI Channel 78, 86, 405
Change Selected Notes to Automatic Durations 149
Change Selected Notes to Manual Durations 149
Change Tempo 447, 463-470
Anchor indicators 463, 466
beat value 463, 465
curves 466-468
density 464, 466
mid-beat 468
Notation Editor 154
Options 464, 469
Change Velocity 188, 395-398
compress 396
expand 396
limiting velocities 396
Channel
audio 67-72
Channel Strip window 46, 364
Channels ??-59, 238-??
playback ??-59, 61, 238-??, 268-269, 276
recording 275, 278
Tap Tempo 588-589
Chord Play 536
Chord symbols 150-152
Enter Chord Symbol command 150, 159
Notation Editor Chord Symbols options 134
preferences 151
suffixes 151
transposing 151
Chords 304
Clear
all clipping indicators 189
Arrangement 136
Bite Gain 413
Bite Stretch 435
Bite Volume 413
Continuous Data Color 322
default patch 124
Keyboard button 403
MIDI Controller command 178
Movie 293
Mute Automation 336, 502
Pitch 414, 550, 554
Pitch Control Points 414, 550
Clear Beats 414, 430
Clear Mixer MIDI Controller 201, 208
Click 115-??
accented 115, 117
beat click 447
change event 447
pattern click 448
sound 115
tacet 448
value 115, 446, 471, 472, 473
Tap Tempo 588
volume 116
Click preferences 115
audition click 117
No accent 117
Clicks per frame (display) 447, 465
Click-to-MIDI converter 592
Clip Detune 207
Clip Editor 206
opening 343
Clip Quantize 207
Clip Transpose
audio clips 207
MIDI clips 207
Clipping
indicators in Mixing Board 189
Clips
editing 341-??, 343, ??-343
looping 343
Sequence Editor 341-343
Clips window 198-213
Editor 206

lInk Clip to Master 204, 206
MIDI binding 206
Clock Source 22
Cloning 333
Close All Effect Windows command 47, 518
Close All Windows command 47
Close command (Window menu) 46
Color schemes 64
Colors 64
Assign Track Colors 66
Clear Continuous Data Color 322
color scheme 64
Edit Track Color Schemes 64
Reset Continuous Data Color To Default 322
Set Continuous Data Color 322
Column setup
Soundbites list 217
Columns Setup 217
Commands
Run command 259
Tap to Enter Tempo 111, 113
window 257
Comments
Conductor Track 446
Set List 233, 236, 443-444
Comp takes 416-420
Comp tool 249, 418
Compact 217, 226, 604-606
Compact disc
burning 570
Compact disc (see CD)
Compare 520
Composite tracks 72
Conductor Trac 449-??
Conductor Track 446-452
click change 447
Edit commands 450-451
key changes 446
looping 452
Markers 447
meter changes 446
partial measures 451-??
meter maps 452, 472
recording 590
Sequence Editor ??-450
tempo changes 447
tempo maps 463, 464-465
tempo mode 112
Configure Audio System
Configure Hardware Driver 21
Configure Studio Settings 25
Input Monitoring Mode 282
Configure Hardware Driver 21
Buffer Size 23
Clock Source 22
enabling multiple drivers 24
Follow System Audio Settings 22
Master Device 22
Sample Rate 22
Work Priority 24
Configure Studio Settings 25
Automatic plug-in latency (delay) compensation 25
Prime Milliseconds 25
Stereo buses 25
Console 1 (Softube) 621
Consolidate Rests 136, 166
Constant Bit Rate 570
Constrain to scale 375-376
Content Browser 214-215
Performer Producer Pack 215
Contextual menu 48
Continuous data
preferences 125
Ruler 322
setting initial values in tracks 271
Control Panel 46, 106-??
Auto-Record 118-119
Countoff 114
keypad controls 119-120
Main Counter Display 44
Memory Bar ??-118
Memory Cycle 117
Memory-shuttle 117-118
Overdub 113-114, 285-286
Play button 106-107
Record button 107, 118-119
Remote Controls for 120
Rewind button 107
Set Countoff 114
Stop button 107
Tempo Slider 112
Control points 343
deleting 346
dragging 346
inserting a curve 345
Control Surface Setup 617
Controller chasing 270
Controllers
see Continuous Data
Convert
file format 540
interleaved format 540
Legacy Instrument Track 86
sample format 540
sample rate 540
Convert Audio File command 217, 540
Converters 583
Copy 365
Copy Beats 414, 433
Copy Beats as MIDI 434
Copy selection to new sequence 234
Copy Sequence Tempo to Soundbite 425
Copy to New Sequence 234
Core MIDI 30
Counter 107-??
display 108
during countoff 114
Playback dashes 108
Round on Entry 108
Scroll To 124
Counter window
editing 50
frame time 109-110
measure time 109-110
real time 109-110
Set Sequence Start 109-110
Countoff 114
beats 592
length 115
movie window 114
n measures 115
only when recording 115
preferences 114
While slaved to tape ??-593
Countoff at Auto Record Start Time 115
Create fixed-length fades option 354
Create Groove command 391
Create new crossfades option 354
Create new fade-ins/outs options 354
Create New Folder 217
Create Scale 378-379
Creation time 219
Crescendos 395, 398
Crossfades 348, 491
Crosshair selection 306
Cubase
grooves 394
Cue Mix™ 282
Cue sheet 453, 462
Cueing 106, 107, 255
sequences 233-??, 233, ??-233, 235-??, 235-236, ??-236, 237-??, 237-??
using the counter 107-108
Current Take sub-menu option 416
Cursor Coordinates 123
Cursor Information 359
Cursor Selection Mode 306
Curvature 396-397, 466-468
editing in Edit windows 246
Curves
Change Tempo 466-468
Change Velocity 396-397
Edit windows 246
Custom '59 (see DP Plug-ins Guide)
Custom edit filter 380, 381
Custom Maps list 372
Custom Scale button 378-379
Custom transpose map 376-377
Customer support 625
contacting 17
Customizing
key signatures 477
Cycle through device group assignments 535
Cycle to Next Tool 244
Cycle-recording 117, 286

D

D Plus (see DP Plug-ins Guide)
D+ (see DP Plug-ins Guide)
Data Display Preferences 252
Decrescendos 395, 398
Default patch 76
DeFlam 385, 394-395
Delay compensation 25, 522
pitch automation 548

Delay plug-in (see DP Plug-ins Guide)
Delete
Markers 459
Markers window 455
Sequence 233
Sequence Editor 64
Set List 235
Soundbites list 217, 224
Delete Fades command 411
Delete if before start of chunk option 460
Delete Mix command 197
Delete Track Folders 92
Delete Track Group 96
Delete Tracks 64
Delta Fuzz (see DP Plug-ins Guide)
Denominator 471
Deselect All 369
Detune
audio track setting 71
clip editor setting 207
Device
Patch ??-77
Diamond Drive (see DP Plug-ins Guide)
Diatonic transposition 374-375
Digital video (see Movie Window)
Diminuendo 395, 398
Direct Echo 278
Direct hardware playthrough option 282
Disable Beats under Strength Threshold 414, 430
Disks
errors 104
keeping enough free space 623
Display menu 156
Display Resolution 137
Display-only notes 135, 166
Divide Comp At Selected Soundbite Boundaries 420
Divide Comp at Selection Boundaries 420
Divide Comp at Wiper 420
Do not import option (Bounce to Disk) 568
Do to Selected Measures
Hide 163
Move 164
Pop Out 164
Don't move locked markers 460, 474
Don't Pitch Shift 555
Double Clip Loop 204
Double Soundbite Tempo 425
Double strike notes 537
Dragging & dropping soundbites 226, 333
Drop frame
29.97 583
Drum machine
Patch Thru 279
short note durations 400
transposing 378
Duplicate 367
Sequence 233
sequence 234
Track Layout 233, 234
Duplicate audio data and copy shared samples to project 101
Duplicate Mix command 197
Duplicate Take 415
Duplicate Tracks 63
Duplicates, Remove 539
Duration 316, 319
adjusting short durations 400
Change Duration 398-401
Change Duration plug-in 532
drum machines 400
Scale Time 407
soundbites 219
Dynamic Equalizer (see DP Plug-ins Guide)
Dynamics 184
audio 491
Dynamics (Mixing Board) 184
Dynamics Palette 135

E

Echo
applying to your playing 279
MIDI echo 277-279
synchronization 279, 596
Echo effect 533
Edge Edit Copy 125, 339
Edit
Audio Export Formats 217
grid 124
Resolution 124
scales button 372
Edit commands
Edit windows 302
Markers 459-??
selecting region 128, 318-319
Edit Layer menu 62
Edit menu 365-369
Copy 365
Cut 365
Deselect All 369
Duplicate 367
Erase 367
Merge 367-368
At Original Time 368
At Original Time Multiple 368
At Wiper 368
At Wiper Multiple 368
Paste 366
At Original Time 366
At Original Time Multiple 366
At Wiper 366
At Wiper Multiple 366
Redo 365
Repeat 367
Conductor track 452
Select All 368-369
Trim 368
Trim Audio 368
Trim End 368
Trim Start 368
Undo 365
Undo History 296
Edit Per Note Events 321
Edit Per-Note Event 328
Edit resolution box 302, 357-358
Edit Selected Measures
Hide 136
Move 136
Pop Out 136
Edit System Margins 134
Edit windows
editing 301-302
selecting events
Note grid 301
Shift key 301
Editing
audio 601
Counter 50
during playback 104, 107, 269, 296
Markers 447, 456-457, 459-??, 459
selecting 148
selecting data for editing 305
sequences 233-234, 234-235, 236-237
System Exclusive 440-442
tracks 308
EDL (creating with Find Tempo) 483
Effects
accessing 179
Next/Previous Preset 520
side chain input 529
window 522
Effects window 516
and Patch Thru 279
applying effects 193
closing 518
compare presets 520
copying & pasting parameters 194
opening 518
plug-ins 521
Presets menu 518
quick reference 516
User Presets 519
Emphasis 410
quantizing 385
tempos 469
velocities 397
Enable Mouse Wheel for Sliders and Knobs 177
Enable Multi-Queue 201
Enable Preview (Content Browser) 215
Encoding mode 570
End time
Auto/Manual 237
Set List 233, 235, 237
Endings 165
Enter Chord Symbol 150, 159
Enter/Exit Fullscreen 46
EQ 516
EQ (Mixing Board) 184
Equal Gain fade 352
Equal power fade 352
Erase 367
Error messages 623, 624
audio playback/recording 624
Errors
disk 104
file 104, 623, 624
fonts 158

system 623, 626
EuCon 619
Event & Phrase Selections Only command 306
Event Chasing 270-??
forward chasing CCs 272
importance for automated mixing 190
Event Information 359-360
Event List window
Markers 459-??
Events
selecting 307
Tap Tempo 588-589
Exclude soundbites 380, 381
Expansion board setup 29, 266
Export key bindings 260
Export Selected Soundbites 217, 230, 580
Exporting
audio export presets 230
bundles 263
movies 575
MP3 files 230, 569
MusicXML notation file 171
QuickTime movies 294
Extend releases to closest attack 400
External time code option 593
Extracting grooves 391
Extracting parts 403

F

Factory presets (plug-ins) 519
Fade command 411
Faders
temporarily removing from group 96
Fades command 348
FAQs 607
Fast forward/rewind 107, 255
File Format
conversion 540
File menu
Exit 104
Export MusicXML notation file 171
Import Audio 217
New 99
Open 100
Open Recent 100
Page Setup 103
Print Window 103
Revert to Saved 102
Save 100
Save a Copy As 100
Save As 100
Files 104
errors 104, 623, 624
opening new file 100
Revert to Saved 102
Save As 100
Film Cues Only 139, 169
Film Cues View 167
Film Scoring Events 292
Film/video
hit points 453, 459, 460-461, 462
Markers 453-462
partial measures 451-??
synchronization 460-461, 582-583
tempo maps 464-465
Filter frequencies below 10 Hz 570
Filters
Input Filter 275
Patch Thru 279
System Exclusive 440
View Filter
Markers 461
Find Beats 414, 430
Find Tempo
command 483
for Locked Markers 455, 484
Find Tempo Factor Near Sequence Tempo 425
Fixed (Snap to Grid) 357
Float Effects by Default 517
Floating 517
Folders
soundbites (see Soundbites list)
tracks (see Track folders)
Follow System Audio Settings option 22
Fonts
installing in text menu 158
Frame Rate 583
Frame time 109-110
Frame-click tempo display 447, 465
Fullscreen 46

G

Gain (in velocity compressor) 532
Generate Streamer Track for 455
Generate VTP Streamers option 455
Go To
Marker 457, 458
Grand staff
bracket 141
Grid
Continuous data 320-??
MIDI Editing Note Grid 314, 316-??
offset 382
Quantize 379, 381-382
Groove Editor 393
Groove Quantize 386-394
applying a groove 387
creating a groove 391
deleting,moving,duplicating 388
Groove folder 389
grooves defined 386
Move Controllers and Automation 388
renaming a groove 388
Grouping (see Track Groups)

H

Halve Soundbite Tempo 425
Hand tool 249, 315, 331
Handshake 444
Hard disk
access time 290, 625
compacting audio files 604-606
deleting audio files 603-604
fragmentation 289, 624
managing audio files 603-606
recommendations 600
requirements 600
running out of space 625
size of files on disk 599
spreading audio over several drives 603
Hardware
requirements 27
setup 27-??
Hardware Insert (see DP Plug-ins Guide)
Harmonic transposition 375
Harmonies
creating 375
Harmonizing 372
Help menu
Show Help Tags 614
Hexadecimal 439, 440-441
Hide Lanes 344
Hide markers when showing _ or more bars per line 144
Hide measures in sequential bars 164
Hit points 453, 460-461, 462
Hit range before/after 484
Hi-Top Booster (see DP Plug-ins Guide)
Hold Notes 537
Humanize
existing tempos 410
tempos 468-469

I

I-Beam tool 245
Ignore Mistakes 141
Import Audio command 217
Import key bindings 260
Import Movie Audio 294
Import option (Bounce to Disk) 568
Importing
Acid files 228, 230
AIFF files 228
Apple Loops 228
audio (entire file) 228
audio (Soundbites) 217, 227-230
bundles 263
CD audio 228
MP3 files 228
REX files 229
Sound Designer II files 228
WAVE files 228
Importing audio 227
Include in Find Tempo Range 455, 484
Information Bar 126, 356
Edit grid 357
Edit resolution box 302
preferences 126
Information windows ??-364
Input Filter 275
Patch Thru 279
System Exclusive 440
Input monitoring 59, 68, 69, 129, 280
Input Monitoring Mode 282

Input Only (patch thru) 280
Insert Continuous Data 500
Insert Measures 479
Insert Mute Automation 336, 502
Insert/Reshape Curve 246
Inserts 178
  choosing an effect 518
Instant 388
Instant Preview 387, 388
Instrument plug-ins 82-88
  mixing board 189
  playing from computer keyboard 77
Instruments tab (Bundles window) 88, 264
Intelligent Noise Gate (see DP Plug-ins Guide)
Interapplication MIDI 31
  Render quality 32
  Software synthesizer 32
Interface 27-??
  echo options with Patch Thru 279
Interleaved Format
  conversion 540
Interleaved format 598
Interval transposition 374
Invert Phase (see DP Plug-ins Guide)
Invert Pitch 404-405

K

Key changes 446, 476-478
  Conductor track 446-478
  custom key signatures 477
  Edit windows ??-478
  editing 478
  Sequence Editor 129
Key/scale transposing 375-376
Keyboard commands 49
  Customizing 49
Keyboard controller 277-278
  changing values from 319-320, 325
  Native Instruments Kontrol 619
  Roli 78
Keyboard note entry (computer) 77
Keyboard parts, splitting into right/left hand 401, 404
Keypad 108
  troubleshooting 50
Keypad controls 119-120
Kontrol (Native Instruments) 619

L

Lasso selection 306
Latch mode 495
Latency compensation 25, 522
  pitch automation 548
Launchpad 212
Lead line
  enhancing 403-404
  extracting 403
Learn Controller 193
Learn controller 516, 517, 529
Legato 399-400
Level meters
  Mixing Board window 188
Lift 78
Link Clip to Master 204, 206
Listen to control surfaces in background 618
Listen to MPE Configuration Message 80
Live performance
  cueing sequences 235-236, 237-??
Live Performance Mode 522
Live Room B (see DP Plug-ins Guide)
Live Room G (see DP Plug-ins Guide)
Live Stage (see DP Plug-ins Guide)
Lock 454, 460
Lock Marker 455
Locking markers 454, 455, 460
Loop recording (see Cycle-recording)
Loops
  Conductor Track 452
  graphic editing of 343
  meter changes 452
  recording (see Cycle-recording)
Loops (clips) 343
Lower zone 79
Lyrics 158-161
  arranged score 160
  hiding 160
  Notation Editor lyrics options 134
  preferences 160

M

Mac
  built-in audio performance 20
  requirements 16
Mac keyboard shortcuts 119-120
Mackie
  Control 619
  HUI 619
macOS 16
  Audio MIDI Setup 30
  Core MIDI 30
Magnifying glass tool (see Zoom tool)
Make Arrangement Markers 136
Manual button 111-112
Manual end time 233, 237
Manual tempo mode 463
Margins 145
Marker strip
  Sequence Editor 123, 128
Markers 453-462
  changing font in notation window 144
  changing location 457, 460
  Conductor Track 447, 459
  Deleting 455, 459
  displaying in Notation Editor 143
  Edit windows 459-??
  Event List window 459-??
  Find Tempo 483
  Generate Streamer Track for 455
  Generate VTP Streamers 455
  hit points 453, 460-461
  hit range before/after 484
  locating with 457
  Lock 454, 460
  Lock Marker 455
  Make Arrangement Markers 136
  mini-menu 455
  naming 454, 456
  New 456
  New Marker 455
  New Marker with Options 455, 456
  Notation Editing window 459-??
  Notation Editor marker options 134
  NUM (locate number) 454, 457
  opening Markers window 456
  position indicator 454, 457
  printing 103
  Record hits 455, 460-461
  selecting 458
  Set Marker/Streamer Options 455
  setting Counter location 457
  Shift locked markers 455, 460
  show streamers 455
  snapping to 129
  time display 454
  Toggle Streamer On/Off 455
  Unlock 455, 460
  weight 484
MAS plug-ins 523
  delay compensation 26
Master faders 192
  applying effects to 528
  tracks 90
Mastering 577
MasterWorks Compressor 185
  (see also DP Plug-ins Guide)
MasterWorks EQ 185
MasterWorks EQ plug-in
  (see also DP Plug-ins Guide)
MasterWorks FET-76
  (see DP Plug-ins Guide)
MasterWorks Gate 185
  (see also DP Plug-ins Guide)
MasterWorks Leveler
  (see also DP Plug-ins Guide)
MasterWorks Limiter 185
  (see also DP Plug-ins Guide)
Measure numbers 134
  display options 144
Measure range
  Change Key 472, 476, 477
  Change Meter 471, 473
  selecting 360-361
Measure spacing 134, 135, 144
MegaSynth (see DP Plug-ins Guide)
Melodic Pattern 536
Melody
  enhancing 403-404
  extracting 403
Memory Bar ??-118
  loading Remembered Times 310
Memory Cycle 117
  selecting the region 118
  Sequence Editor strip 118, 123, 129
  when applying a groove 387
Memory-shuttle 117-118
Merge 367-368
  At Original Time 368

At Original Time Multiple 368
At Wiper 368
At Wiper Multiple 368
Tracks with MPE 81
Merge by Channel 78, 85
Merge Soundbites 411
Meter
display 111
Meter changes 446, 471-475
Conductor Track 446
editing 475
looping 452
partial measures 451-??
Sequence Editor 129
Meter maps 452, 472
Mid-beat 468
MIDI
arpeggiator 533
beat clocks (see MIDI beat clocks)
binding (Clips) 206
channels 59, 238
any 75
playback ??-59, 61, 238-??, 268-269, 276
recording 59
Tap Tempo 588-589
controller
instruments 40
controllers
controlling volume 398
Input Filter 276
Tap Tempo 589, 591
Controllers and Track Automation option 381
data stream 270
Device Properties 29, 265
Devices tab (Bundles window) 28, 264
discrete events 328
echo 277-279
echo options with Patch Thru 279
Edit 124, 318, 319-320, 325
Effects plug-ins 405
events 359-360
hardware
requirements 27
setup 27-??
interface 27-??
Keys 77
Learn 516, 517, 529
Learn (clips) 208
mapper 278-279
merger 278-279
MIDI 1 protocol 79
note display preferences 253
note entry from computer keyboard 77
patch change 328
Patch Thru 277-279
Auto Channelize 278
Direct Echo 278
MIDI merge 278-279
ports 29, 266
rechannelizer 278-279
Song Position pointer 583
Song Select 232-233, 235-236
sustain 328
switch controllers 328
system exclusive 328
thru 277-279
Time Code 582-583
Track Protocol Settings 79
tracks
creating 73
VCA track 512
MIDI beat clocks 583, 587-590, 594
converted from SMPTE 587
start/ stop clocks 583, 587, 596
transmitting 594-596
MIDI Device Properties 29, 265
MIDI Editing 313-329
Continuous data
grid 320-??
Ruler 320, 322
discrete events 328-??
MIDI Edit 318, 319-320, 325
Mute tool
note events 314, 316-320, 323-??
Note grid 314, 316-320
Pitch ruler 314, 317-??, 317, ??-317
selecting all notes of one pitch 319
selecting events
Note grid 318-319
MIDI Editing Preferences 125
MIDI Effects Plug-ins 405
MIDI Express XT
SMPTE sync with 586
MIDI Keys 77
MIDI Mute tool
MIDI Only 19, 73
MIDI Panic 273
MIDI Polyphonic Expression 78-81, 327
MIDI processing
arpeggiator 533
as region operations 405
change duration 532
echo 533
quantize 538
Reassign Continuous Data 539
time shift 539
transposer 539
velocity compressor 532
MIDI Sequencer
description 40
MIDI Solo & Patch Thru
preferences 255
MIDI Time Code 583, 594
transmitting from Performer 594
MIDI Timepiece AV
SMPTE sync with 586
MIDI Track Protocol Settings 79
Min Time and Value Change command 178
Min Time and Value Range command 499
Mini-menu 43
Markers 455
Mixing Board window 177
Sequence Editor 124
Set List 233
Mini-menus
Movie Window 293
Soundbites list 217
Mix automation 490
taking a snapshot 503
Mix Mode
pop-up menu 175
Mix mode 196
Mixdowns (see Mix mode)
Mixing 174-197
Mixing Board 184
Enable Mouse Wheel for Sliders and Knobs 177
EQ 184
Mixing Board window 174-197
audio plug-ins 521
auto buttons 187
automated mixing 187, 190
grouping (see Track Groups)
inserts 178
level meters 188
mute buttons 186
opening 178
pan knobs 187
quick reference 175
re-ordering tracks 178
showing/hiding sections 177, 178
solo buttons 186
switching sequences 178
track strip described 178
volume faders 188
Mode changes
MIDI Editing 329
Model 12 instrument plug-in (see DP Plug-ins Guide)
Modes
transposing 375
Modifier keys 47
Module 278, 278-279
Modulo instrument plug-in (see DP Plug-ins Guide)
Monitor record-enabled tracks through effects option 282
Monitoring
button 59, 68, 69, 129
problems 89
Mono (no attenuation) 567
Mono (with 3.5 dB attenuation) 567
Mono key pressure 78
Mono Sum 183
Monterey 16
MOTU Audio System 20-26
Configuring 277
configuring 277
defined 602
improving performance 20
input monitoring 280
System requirements 16
Mouse techniques 47, 301-302
Move audio effect plug-in automation with soundbites option 381

Move Controllers and Automation 388
Move handle
Set List 232, 236
Move MIDI controller events with notes 381
Move releases to closest attack 399
Move Selected Tracks to V-Rack 241
Movie track 131, 293
Movie Window 291-294
bouncing to disk 294, 575
Clear Movie 293
controls 292
during countoff 114
exporting 294, 575
Import Movie Audio 294
improving performance 294
mini-menu 293
multiple 291
Open Movie window 293
opening
opening & closing 291
Reveal Movie in Finder 293
scrubbing with the slider 273
Set Movie 293
Set Movie Start Time 294
show movie in explorer 293
Size 293
Use Same Movie for All Sequences 291, 293
MP support (see Multi-processor support)
MP3 580
bounce to disk 569
file export 230
importing files 228
MPE (MIDI Polyphonic Expression) 78-81, 327
MTC (see MIDI Time Code)
Multi-processor support 192
MusicXML export 171
articulations 154
Mute automation 328
Mute tool 247, 315, 320, 331, 336
edit pitch segments 553
Muting
audio tracks 269
mute buttons in mixing board 186
MW Compressor (see MasterWorks Compressor)
MW EQ (see MasterWorks EQ)
MW FET-76 (see MasterWorksFET-76 in DP Plug-ins GuideEQ)
MW Gate (see MasterWorks Gate)
MW Leveler (see MasterWorks Leveler)
MW Limiter (see MasterWorks Limiter)

N

Naming
Files 100
Markers 454, 456
sequences 232
Tracks 60
Nanosampler instrument plug-in (see DP Plug-ins Guide)
Native Instruments Kontrol 619
New Audio File 217
New Audio File from Selected Soundbites 217
New Empty Clips Scene 204
New Marker 455, 456
New Marker with Options 455, 456
New Mix command 196
New Sequence 233, 234
New Soundbite Folder 217
New Soundbites from Beats 414, 431
New Take 415
New Track Folder 92
New Track Folder from Selected Tracks 92
New Track Group 92, 96
New Track Group command 92, 178
New V-Rack 233, 234
Next/Prev follows Marker Nums 455
Next/Previous Preset 520
No accent option 117
No pitch shift 548
Non-destructive editing 333, 601
defined 598
explained 302
Normal Notation 139, 169
Normal noteheads 150
Notation Editor ??-173
Allow Measure Selection 136
Arrangement 161
Arrangement palette 135, 165
Barlines 165
Change Meter/Key/Tempo 154
chord symbols 150-152
Chord Symbols options 134
Clear Arrangement 136
Consolidate Rests 136, 166
date 157
displaying markers 143
Display-only notes 135, 166
Do to Selected Measures
Hide 163
Move 164
Pop Out 164
dragging notes 149
Dynamics palette 135
Edit Selected Measures
Hide 136
Move 136
Pop Out 136
Edit System Margins 134
Endings 165
Exporting as MusicXML notation file 171
Film Cues Only 139, 169
Ignore mistakes 141
inserting notes 146
Lyrics options 134
Make Arrangement Markers 136
margins 145
Marker options 134
markers 143
Measure numbers 134
measure numbers 144
Measure spacing 134, 135
Normal Notation 139, 169
Notation+Film Cues 139, 169
Open Selected Ending Bracket 136
opening, opening multiple 136
Options 139
page numbers 157
page size 145
Pixel offsets 141
Playback-only notes 135, 166
Print Individual Parts 135
Repeat barlines 165
Score Options 134, 139
scrubbing with the wiper 273
Segno 165
Set Score Length 134
show alternate bar menus 135
show arranged score 135
show film cues 167
show film tools 135
show lyrics 135, 160
show tools 135
Split Selected Normal Notes 135
Switch Staff 135
Text 155
Tool palette 146
Track Options 134
track splitting 141
NotationEditor 132-??
Note events
doubling 404
mapping to single pitch 377-378
MIDI Editing 314, 316-320, 323-??
Notation Editor 146
Note grid
MIDI Editing 314, 316-320
Notehead size 150
Novation Launchpad 212
NRPN 539
Nudging 358
in the MIDI Editing 319
Num Lock Key (Windows) 50
Numerator 471
Numeric Base 259, 457, 458
Numericals 49

O

Octave range
transposing 377
Off velocities 395, 403
MIDI Editing 323
Offline Bounce 566
Offline Processing setting 545
Offset
SMPTE
bit 110
sequence start time 109-110
Offset grid option 382
On velocities 395, 403
MIDI Editing 323
One new track option 402
One track option 402
Only during countoff option 117
Only move barlines 474

Only when recording option 117
Open Audio MIDI Setup command 75
Open Movie window 293
Open Protocol Settings 79
Open Recent sub-menu 100
Open Selected Ending Bracket 136
Options 464, 469
Output column 75
Overdub 113-114, 285-286
Override internal buffer size 23
Overwrite Existing Files option 569
Overwrite mode 495
Overwrite Mode changes to Touch after pass 507

P

Pack Events into Notes 81
Pack into Clips 342
Pack MPE Events into Notes 81
Pad controllers 212
  Akai APC 211
Page numbers 157
Page Setup 103
Page size 145
Palette 146
Panic 273
Panning 187
  curve, removing 346
  curves, inserting 345
  curves, reshaping 346
  cut, copy, paste 347
  deleting and event (point) 346
  disabling automation temporarily 347
  graphic editing of 343
Partial measures 451-??
Paste 366
  At Original Time 366
  At Original Time Multiple 366
  At Wiper 366
  At Wiper Multiple 366
  Conductor track 450-451
  measure relative pasting 312, 366
  Smart Selection 312
  Smart Selections 366
Patch change events 328
Patch chasing 270-??
Patch Lists ??-77
  expansion boards 29, 266
  printing 103
Patch Thru
  applying MIDI effects 194
  Audio 280
  in Background option 280
  Input Filter 279
  MIDI interfaces 279
  timing information 279
Pattern click 448
Pattern Gate (see DP Plug-ins Guide)
Patterns
  Cycle (see Memory Cycle)
  see Memory Cycle
Pencil tool 245
Per Note Event Scale Tool 249, 328
Per note events 78-81, 327
Performer
  as master sync device 594-596
  as MIDI merger 278-279
  Cycle-record 287
  overview 39
  Producer Pack 215
  project 98-105
  version number 626
Performer menu
  Quit 104
phrases
  auditioning 304
Piano parts
  splitting into right/left hand 401, 404
Piano roll 40
Pick-up
  measures 110
Pitch
  automation 548
  Automation Playback setting 545
  transposing 548
Pitch (Track settings menu) 130, 555
Pitch and Stretch 413, 550, 552, 554
Pitch and Stretch Cache 70, 255
Pitch and Time Stretch options 255
Pitch bend
  MIDI Editing 320, 322
  MPE 78
Pitch ruler 314, 317-??, 317, ??-317
  zooming 317
Pitch segments 551
Pitch-shifting 542-546
Pixel offsets 141
Places 214
Play button 106-107
Play on Clip Queue 200
Playback 60, 268-273
  audio 67-72
  channels 61, 268-269, 276
  chasing during 270-??
  controller chasing 270-??
  features active during 107, 269
  locating with mouse 128
  Protocol 79
  scrubbing 273
  selecting a device 75
  sequence 235-??, 235-236, ??-236
  System Exclusive 439-440
  track play assignment 75
Playback dashes 108
Playback-only notes 135, 166
Play-Enable button 60-61, 268, 268, 269-270
  Set List 232, 235-236
Play-enabling sequences 232
player piano 40
Playlists
  building in Sequence Editor 334
  defined 601
Plug-in management 525
Plug-ins 521
  (see also DP Plug-ins Guide)
  accessing 179
  Audio Units (see Audio Units)VST plug-ins
  delay compensation 25, 522
  effects presets 518
  floating windows preference 528
  instruments 82-88, 189
  latency compensation 25, 522
  Learn controller 516, 517, 529
  management 525
  MAS 523
  MIDI effects 405
  MIDI Learn 516, 517, 529
  preferences 525
  ramp event density 528
  scanning Audio Units
  virtual instruments 82-88, 189
  VST (see VST plug-ins)
Pointer Coordinates (see Cursor Information)
Pointer tool 244
Poly key pressure 79, 327
PolySynth instrument plug-in (see DP Plug-ins Guide)
Pop Out of Consolidated Window 47
Ports (MIDI) 29, 266
Post-fader sends 183
Postroll 361
  file-based plug-in previewing 523
Pre-fader sends 183
Preferences 251, 252
  Ask before closing 252
  audio plug-ins 525
  Autosave 252
  Chord Symbols 151
  Click 115
  Countoff 114
  Cursor Selection Mode 306
  data display 252
  Film Scoring Events 292
  Information Bar 126
  Lyrics 160
  MIDI Editing 253
  MIDI Solo & Patch Thru 255
  Punch Guard 545, 557
  Receive Sync 583
  Soundbite List 218
  Tool palette 254
  Tools 254
  Transmit Sync 594
  Transport 255
  Undo Pruning 254
Preferences & Settings command 251
Pre-generation (pre-gen) 522
Preroll 361
  file-based plug-in previewing 523
Preserve current frame time option 460
Preserve length of time from start of chunk option 460
Presets
  effects 518
  Region menu 371
Preview check box 371

Preview Stays on when Window Not in Front 371
Primary external plug-in format 528
Prime Milliseconds 25
Print Individual Parts 135
Print Window 103
Printing 102-104, 132
  instrument parts 170
  keyboard part 170
  list windows 103
  margins 145
  page size 145
  score 171
  title page 139
Project 98
  Content Browser 214
  creating new 99
  opening 100
  saving 100
Project folder 98
  defined 600
Project menu
  Add Instruments with Options 82
  Add Similar Tracks 63
  Add Track 63, 67, 73, 283
  Add Unassigned Instrument 83
  Adjust Beats 480
  Change Key 446, 476-478
  Change Meter 446, 471-475
  Change Tempo 447, 463-470
  Content Browser 214
  Delete Tracks 64
  Duplicate Tracks 63
  Effects 84, 521
  Insert Measures 479
  Markers 453-462
  Mixing Board 174-197
  Modify Track Groups 92, 192
  Movie 291
  New Track Group 92
  Notation Editor 132-173
  Project Notes 102
  Sequence Editor 121-131, ??-347
  Soundbites 216-231
  Suspend Track Grouping 96
  Track folders 92
  Track Groups 92, 93, 192
  Ungroup Tracks 93
Project Notes 102
Propellerhead Reason
  multiple outputs 88, 530
Proton instrument plug-in (see DP Plug-ins Guide)
ProVerb (see DP Plug-ins Guide)
Pruning preferences 254
Punch Guard
  preferences 545, 557
PureDSP solo vocal 548
Push Window to Back command (Window menu) 46

Q

Quantize 379-386
  Attacks 380
  beats within soundbites 380
  custom edit filter 380, 381
  Don't change note durations option 380
  Durations 380
  Exclude soundbites 380, 381
  for notation 137
  grid 379, 381-382
  MIDI clip setting 207
  MIDI Controllers and Track Automation option 381
  MIDI track setting 76
  Move audio effect plug-in automation with soundbites option 381
  Move MIDI controller events with notes 381
  non-destructive (without changing actual data) 538
  Offset grid option 382
  Quantize MIDI controller events to grid 381
  Releases 380
  Sensitivity option 383-384
  Strength 384
  Swing 383
  tuplets 382
Quantize (MIDI effects processor) 538
Quantize MIDI controller events to grid 381
Quantize Pitch 414, 554
Question mark icon (on move handle) 219
QuickScribe Editor
  page scaling 139
  slurs 153
QuickTime Export 575
QuickTime video (see Movie Window)
Quitting Performer 104

R

RAM
  recommendations/requirements 16
Ramp event density 528
Random Access
  defined 598
Randomize
  quantizing 384
  tempos 410, 468-469
  velocities 397
Range Latch mode 495, 498
Range Selections Only 306
Range Touch mode 495, 498
Range Trim Latch mode 495
Range Trim Touch mode 495
Ratio (in velocity compressor) 532
Real time
  editing 104, 107, 269, 296
Realign music automatically 473-474
Reason
  multiple outputs 88, 530
Reassign Continuous Data 539
Receive Sync 582-593
  preferences 583
Recent Files pop-up menu 388
Record hits 455, 460-461
Record Poly Touch into Notes option 79, 327
Record Protocol 79
Record while still-framed 289, 584
Record With Overdub Off 286
Record With Overdub On 286
Recording 107, 118-119, 274-288
  audio 277-290
  audio with MIDI 284
  Auto-Record 118-119
    Bar 118-119
    button 118-119
    Tap Tempo 591
  Conductor Track 590
  hits 455, 460-461
  in a sequence 235
  in external sync 288
  Input Filter 275
  Overdub 285-286
  real-time 276-??
  Record channels 275
  Record-Enable button 69, 75, 276
  sequence 235
  stereo 283
  System Exclusive 439-440, 443
  Tap Tempo 590, 590, 591
  Undoing 107
Recover Takefiles dialog 625
Recycle
  importing files 228
Red outline (soundbites) 333
Redo 365
Redo/Undo
  Edit windows 302
Region
  defined 601
Region menu 370-410
  Audition Selection 270, 304, 306
  Change Duration 398-401
  Change MIDI Channel 78, 86, 405
  Change Velocity 395-398
    compressing 396
    limiting 396
    limiting velocities 396
  Create Groove 391
  DeFlam 385, 394-395
  editing on audio 296
  Groove Quantize 387
  Invert Pitch 404-405
  MIDI Effects Plug-ins 405
  Pack into Clips 342
  Presets 371
  Quantize 379-386
  Retrograde 406-407
  Reverse Time 406-407
  Scale Tempo 408-410
  Scale Time 407-408
  Split Notes 401-404
  Transpose 371-379
  Unpack Clips 342
  windows that stay open 370
Region selection

MIDI Editing 318-319
Sequence Editor 128, 308
using Markers 458-459
Registration
card 626
number 626
Releases
Extend Releases to Closest Attack 400
Move Releases to Closest Attack 399
Quantize 380
Remember Times 310, 458-459
Remote Controls
cueing with 235
Cycle-record control 287
Enter Counter options 361
Play-enabling sequences 237
Play-enabling with 235
printing 103
Remove Duplicates 539
Remove from Find Tempo Range 455, 484
Remove from list 217, 225-226, 606
Remove Tracks from Group 96
Rename Mix command 197
Rename Take 415
Render quality 32
Renumber by Name 455
Renumber by Time 455, 458
Repeat 367
Conductor track 452
Repeat barlines 165
Repeat bottom/top note 536
Reset Continuous Data Color To Default 322
Reshape Mode menu 246
Reshape tool 246
Retina display support 16
Retrograde 406-407
Reveal In Finder 333
Reveal Movie in Finder 293
Reveal Presets in Finder/Explorer 371
Reverb 516
Reverse Time 406-407
Revert to Saved 102
Rewinding 107, ??-118
Markers 454, 457
ReWire
multiple outputs 88, 530
REX files
importing 228, 229
Right-click menu (see Contextual menu)
Ritard 466, 588
Roli 78
Roll tool 249
Round on Entry 108
RPN 539
Rubato 588
Run command 259
RXT (see DP Plug-ins Guide)

S

Sample
format conversion 540, 541
rate conversion 228, 540
Sample Format 289, 567
Sample Format Conversion 541
Sample Rate 22
Sample rate
column in Soundbites list 219
Sample Rate Conversion 540
Sample-accurate
editing 303
sync 582
Save 100
Settings as Audio Export Format 230
Save a Copy As 100
Save As 100
Menu CategoryMenu Category 181
Save Settings command 518
Save Transpose maps 373
Scale all windows up/down 16, 256
Scale Expression 414, 551
Scale page contents by __% (QuickScribe Editor) 139
Scale Tempo command 408-410
Scale Time 407-408
Scale/key transposing 375-376
Scissors tool 247, 315, 331, 553
Score Length 134, 145
Score Options 134, 139
Screen updating 625
Scroll To 124
Counter 124
edit windows 124
File Start or End 301
Selection Start or End 301
Scroll wheel zooming 299
Scrubbing 273
with Movie window slider 293
Seamless chaining 237, 237
Segno 165
Select All 368-369
Select All Tracks in Range 368
Select Notes 402
Select unused soundbites 217
Selecting 148, 305
all notes of a single pitch 319
crosshair 306
events 307
Notation Editing window 148
Note grid 301, 314, 318-319
lasso 306
Markers 458
Notation window 148
sequences 234
time range 308-310
Tracks 307, 308-??
tracks 307
Selecting a region
all notes of a single pitch 319
Markers 458-459
MIDI Editing 318-319
Sequence Editor 128
Selection Bar 458-459
Selection Information 360-??, 360, ??-361
Smart Selection 310
Sends 183
assigning 183
configuring number of 184
level 183
mono sum 183
muting 183
panning 183
pre/post fader 183
remote control via MIDI controller 188
Send From Channel 183
Sensitivity 383-384
Separate tracks by pitch option 402
Sequence
Add sequence selection commands automatically 259
Control Buttons 233, 237
Controls 233
controls 237
defined 238
naming 232, 236
play-enabling 232, 233, 235-236, 237-??
skipping 237
Sequence controls 237-??
Sequence Editor 121-??
adding audio track 67
Auto Record strip 123, 129
Conductor Track 446-??, 449-450, ??-452
Device Patch ??-77
editing 315, 340
enable/disable track 70
folders 92
Information Bar 126, 145, 356
loops 343
marker strip 128
Memory Cycle 118, 123, 129
meter/key changes 129
MIDI Edit 124
mini-menu 124
mix automation data 343
moving soundbites vertically 335
moving tracks 125
playback channels 268-269, 276
playback devices 61
Play-Enable button 60-61, 269-270
quick reference 122, 331
Record-Enable button 276
recording channels 275
replacing a soundbite 334
scrubbing with the wiper 273
selecting 308-??
selecting a region 360-361
soloing 269
Takes 415
Time ruler 128
track display 124
track folders 125
track naming 60
View Mode 130
viewing initial track settings 190
Serial number 626
Session (see project)
Set Bite Gain 413
Set Chunk Start

preserving locked markers 460
Set Continuous Data Color 322
Set Countoff 114
Set Display 110
Set Focus to Next/Previous Cell command 47
Set Hit Range 455
Set List 232-??
Auto/Manual end time 233, 237
comments 233, 236, 443-444
copying 234
Cue Buttons 233, 237
current playback sequence 232, 235-236
Delete 233, 235
Delete Sequence 233
Duplicate Track Layout 233, 234
End time 233, 235, 237
mini-menu 233
naming 232, 236
New 234
New Sequence 233
New V-Rack 233
opening 234
play-enabling 232, 233, 235-236, 237-??
printing 103
rearranging sequences 236
selecting 234
Set Sequence Start Time 233
song select message 232-233, 235-236
type icon 232, 236
Set Marker/Streamer Options 455
Set Movie 293
Set Movie Start Time 294
Set Nudge Amount 358
Set Number of Effect Inserts 177
Set Number of Sends 178
Set Pitch Mode
for Selected Bites 414, 552, 554
for Track and Selected Bites 414, 552
Sequence Editor settings menu 130
Set Preset Key Bindings 371
Set Score Length 134, 145
Set Sequence Start 109-110
Set Sequence Start Time
Set List 233
Set Soundbite Tempo 424
Set Temporary Group Type to Custom Type 96
Set Temporary Group Type to Edit 96
Set Temporary Group Type to Edit & Mix 96
Set Temporary Group Type to Mix 96
Set Track Pitch Mode 414, 552
Set Zoom Setting 300
Setup menu
Audio System
MIDI Only 19, 73
MOTU Audio System 19, 277
Automation Setup 491, 507
Colors 64-66
Assign Track Colors 66
Clear Continuous Data Color 322
Color schemes 64
Edit Track Color Schemes 64
Reset Continuous Data Color To Default 322
Set Continuous Data Color 322
Commands 257
Configure Audio System
Input Monitoring Mode 282
MOTU Audio System 277
Control Surface Setup 617
Event Chasing 271
Frame Rate sub-menu 583
Input Filter 275
Patch Thru 279
System Exclusive 440
Interapplication MIDI 31
Live Performance Mode 522
Open Audio MIDI Setup 75
Preferences 251
Data display 252
Receive Sync 582-593
Transmit Sync 594-596
Shade Noes using Velocity 253
Shift
non-destructive (without changing actual data) 539
Shift locked markers 455, 460
Shortcut commands 49
Show
Active Layer Only 298
Alternate Bar Menus 135
Arranged Score 135
Clip Editor 201
Film Cues 135, 167
in Explorer 333
Lanes 321, 344
Lyrics 135, 160
Mixer (Clips window) 201
Movie in Explorer 293
note pitch 253
Notes When Scrolling Offscreen 254, 316
notes with gradient 253
notes with rounded corners 253
Per Note Events 254, 328
Presets in Finder/Explorer 519
Streamers 455
Times 125
Tools 135
velocity as bar 253
Show/hide takes 416
Side chain input 529
Skip buttons 237
Skip Master Fader tracks 72
Slave to External Sync 589
Tap Tempo 592-593
Slide tool 249
Slip tool 249
Slow forward/rewind 107, 255
Slurs 153
Small noteheads 150
Smart Selection 310-312, 361
check box 361
how it affects pasting 312
Smart Selections 366, ??-369
helping with editing conductor track 451
helping with meter editing 475
how it affects pasting 366
Smooth Audio Edits 411
Smooth Audio Edits Again 411
SMPTE 582-583
29.97 drop & non-drop 583
bit offset 110
bits per frame 110
converters 583
Drop frame 583
Frame Rate 583
frame time display 110
MIDI beat clocks 587
offset 109
Set Sequence Start 109-110
SMPTE-Z (see DP Plug-ins Guide)
Snap Information 357-359
Snap Relative 124, 358
Snap to Beat 358
Snap to Grid 357
Snap to Markers 358
Snap Information panel 357
Snap Relative 124, 358
Snap to Beat 358
Snap to Grid 357, 435
Snap to Markers 124, 129, 358
Snapshot
to set initial levels with 190
Snapshot automation 503
Snapshot button 176
Softube Console 1 621
Software synthesizer 32
Solo & Play Phrase override mute automation 507
Solo button
exemption 61, 189
in Mixing Board 186
Solo exemption 61, 189
Soloing tracks 269-??
exemption 61, 189
Soloist (see DP Plug-ins Guide)
Song Position pointer 583
Song Select 232-233, 235-??
Song window
Delete Markers 459
Sonic Modulator (see DP Plug-ins Guide)
Sort by file name 223
Sort by name
Soundbites 223
Sort by size 223
Sound Designer II files
exporting interleaved 217, 230
importing 228
Sound effects
stutter 336
Sound file (see Audio file)
Sound File Information 362-363
Sound module 279
Soundbite

Tempo sub-menu 414
Soundbite List
preferences 218
Soundbites 216-??
'X' icon 224
"throwing" 335
applying Region operations 296
Automatic Conversions 227
beat enable/disable
Bite Volume 337, 347
compacting 226
converting ones that can't play 228
copying while dragging 335
creating 222
defined 601
definition 601
deleting 224-225
dragging and dropping 226
dragging and dropping in Sequence Editor 333
duplicating end to end 336
edge editing 338
editing basics 302
Editing with MIDI 303
exporting 217, 230
extending a selection 310
gain 337, 347, 413
icon for lost soundbites 223
in audio tracks 302
inserting in Edit window 334
managing 223-226
moving 334
moving multiple 335
moving vertically in Sequence Editor 335
name 219
naming 223
playback 67-72
question mark icon 223
red outline 333
region editing 296
removing from list 225-226
renaming in Sequence Editor 334
replacing in Sequence Editor 334
selecting 315, 341
selecting regions of 296
selecting unused 224
Sequence Editor 124
snapping to grid while moving 335
snapping to next/previous 335
Sort by file name 223
Sort by name 223
Sort by size 223
stutter effect 336
tempo 422
that can't be played 224
trimming 338
Soundbites list
folders 220-222
Soundbites window
renaming audio files 603
Spectral Effects 413, 558
Spectrogram display 130
Spiral In/Out 536
Split by Channel 78, 86
Split Notes 401-404
Split Selected Normal Notes 135, 167
Split Tracks with MPE 81
Spot Erase 287
Staccato 401
Staff names
changing font in notation view 140
Staff system
bracket 141
spacing 140
Staircase Up/Down 536
Standard beat clocks (see MIDI beat clocks)
Stem bounce 564, 568
Stereo
creating a stereo track 67
recording 283
soundbites 222
Stereo audio files
converting 228
size on disk 600
Stereo buses setting (Configure Studio Settings dialog) 25
Stop button 107
Stop Sounding MIDI Notes 273
Straighten Swing 141
Streamers
Generate Streamer Track for 455
Set Marker/Streamer Options 455
Toggle Streamer On/Off 455
Strength 384
Stretch 69, 255
Strike 78
Studio menu
Audio Patch Thru 280
Bundles 261
clear all clipping indicators 189
Click 115
value 115, 446, 471, 472, 473
volume 116
Click Preferences 115
Control Panel 106-120
Cursor Information 359
Event Information 359-360
MIDI interface
echo options with Patch Thru 279
Patch Thru 279
MIDI Keys 77
MIDI Patch Thru 277-279
Selection Information 360-361
Slave to External Sync 589, 590
Snap Information 357-359
Sound File Information 362-363
Stop Sounding MIDI Notes 273
Tools 243
Track Assignments 71, 76
Track Selector 364
Suspend Track Grouping 96
Sustain MIDI controllers 328
Sustain pedal
Tap Tempo 591
Swing Quantize 383
Switch controllers 328
Switch Staff 135, 150
Sync
(see also Synchronization)
Sync Recorded MIDI to Patch Thru 280
Sync to Port menu 584
Synchronization
basic types 583
MIDI beat clocks 583
converted from SMPTE 587
start/ stop clocks 583, 587, 596
transmitting 594-596
recording in external sync 288
sample-accurate 582
Slave to External Sync 589, 590
SMPTE 582-583
Tap Tempo slaved to tape 592-593
System
troubleshooting 623
System errors 623, 626
System Exclusive 439-444
editing 329
SysEx editing window 441-442
handshake 444
Input Filter 440
insertion mode 441, 442
playback 439-440
recording 439-440, 443
replacement mode 441-442
System exclusive 328
System Requirements 16

T

Tacet click 448
Take Automation Snapshot Again 507
Takefiles
removing unwanted 225
renaming 603
Takes 415-421
Absorb Selected Tracks options 416
Comp tool 418
Delete all except current take command 416
Delete Take command 416
Divide Comp 420
At Selected Soundbite Boundaries 420
at Selection Boundaries 420
at Wiper 420
Duplicate Take command 415
hide takes 416
New Take command 415
Rename Take command 415
show takes 416
Turn Takes into Tracks option 416
Tap Tempo 583, 588-592
channel 588-589
click value 588
Conductor Track 590, 591-592
countoff 589
event 588-589
recording 590

recording music 590
slaved to tape 592-593
tap source 589
tempo maps 463, 591
Tap to Enter Tempo command 111, 113
Technical support 17, 625
contacting 17
Tempo
Anchor indicators 463, 466
automatic mode 463
basics 111
beat value 111
Change Tempo 463-470
curves 466-468
density 464, 466
display preferences 447, 465
editing conductor track during playback 451
frame-click display 447, 465
humanize 410
manual mode 463
maps 463, 464-465, 591
marking 141
mid-beat 468
randomize 410
randomizing 468-469
recording 590
resolution 111, 465
scaling 408-410
searching for (Find Tempo) 483
setting 111
synchronization 588-592
Tap to Enter Tempo 111, 113
Tempo changes 447, 463-470
Anchoring tempos 463, 466
beat value 463, 465
Change Tempo 447, 463-470
display preferences 447, 465
editing 470
modifying during playback 451
resolution 111, 465
Sequence Editor ??-329, 450-??
Tempo Controls 111-112
Tempo Slider 112
Remote Control 112
resolution 111, 465
Temporarily Group Selection 96
Temporarily Group Visible Tracks 96
Temporarily Toggle Track Grouping 96
Tempos
and audio 422
Text 155
box
defined 155
pasting into notation editor from other programs 158
typing and editing 158
Text menu
display 156
Threshold (in velocity compressor) 532
Time
anchored text 156
compress/expand preference 363
display 108
frame time 109-110
range selecting 308-310
Sequence Editor 128, ??-128
Shift (MIDI effects processor) 539
Time ruler 123
Sequence Editor 128
locating playback 128
Timecode bits 110
Time-stretching 542, 546
Timing resolution
beats per minute 111, 465
frames 110
Title page 139
Toggle Bite Volume Bypass 413
Toggle Streamer On/Off 455
Tool palette 133, 243, 338
MIDI Editing 315, 323, 331
Notation Editor 146
preferences 254
Studio menu 243
Tools
Comp tool 249, 418
Cycle to Next Tool 244
Hand tool 249, 315, 331
I-beam tool 245
Insert/Reshape Curve 246
Mute tool 247, 315, 320, 331
palette 243
Pencil tool 245
Per Note Event Scale Tool 249, 328
Pointer tool 244
preferences 254
Reshape Mode menu 246
Reshape tool 246
Roll tool 249
Scissors tool 247
Slide tool 249
Slip tool 249
Trim tool 248
Velocity tool 249, 315
Zoom tool 246
Touch mode 495
Track 58, 92
color 64
display 124
enable/disable 70
folders (see Track folders)
options 134
selector list 44
Stretch 423
Track Assignments command 71, 76
Track Color 64
Track Detune 71
Track folders 92
Delete Track Folders 92
in the Sequence Editor 125
in the track selector 45
New Track Folder 92
New Track Folder from Selected Tracks 92
Track Group Enable 96
Track Groups 92, 192, 509
Add Selection to Group 96
Delete Track Group 96
Modify Track Groups 92
New Track Group 92, 96, 178
Remove Tracks from Group 96
Set Temporary Group Type to Custom Type 96
Set Temporary Group Type to Edit 96
Set Temporary Group Type to Edit & Mix 96
Set Temporary Group Type to Mix 96
Suspend Track Grouping 96
Temporarily Group Selection 96
Temporarily Group Visible Tracks 96
temporarily overriding 96
Temporarily Toggle Track Grouping 96
Track Group Enable 96
Track Groups window 93
Ungroup Tracks 93, 96
Track Inspector window 45, 364
Track pad zooming 299
Track Quantize 76
Track Selector 123, 364
Track selector
button 43
list 44
Track Transpose
audio tracks 71
MIDI tracks 76
Tracks
(see also Audio tracks)
color 64
creating a MIDI track 73
enable/disable 70
folders (see Track folders)
grouping (see Track Groups)
instrument tracks 82-88
selecting 307
splitting in Notation Editor 141
types of tracks 58
virtual instrument tracks 82-88, 189
Tracks Overview
colors 64
Tracks window
colors 64
Transmit Sync 594-596
echoing sync 596
generate sync 596
generating MIDI beat clocks 595
generating MIDI Time Code 594
preferences 594
Transport
cueing 107, 255
preferences 255
Transpose 371-379
audio 548, 555
audio by adjusting pitch automation 372, 555
audio by creating new soundbites 373
audio preference 363
audio track setting 71
chord symbols 151

clip editor setting 207
key/scale transposing 375-376
Map 373-374
MIDI clip setting 207
MIDI effects processor 539
MIDI track setting 76
non-destructive (without changing actual data) 539
poly pressure option 372
portamento controller option 372
saving maps 373
Triggering MIDI notes 77
Trim 368
Trim Audio 368
Trim End/Trim Start 368
Trim Latch mode 495
Trim plug-in (see DP Plug-ins Guide)
Trim tool 248
Trim Touch mode 495
Trimming soundbites 338
Triplets
notating 137
Quantize 382
Troubleshooting 607-613, 623-626
audio 624-625
buffer size option grayed out 23
disk errors 623
error messages 623, 626
file errors 623, 624
fonts 158
input monitoring delays 281
Keypad on Windows 50
monitoring problems 89
system errors 623, 626
Tuner plug-in (see DP Plug-ins Guide)
Tuplets
notating 137
Quantize 382
Turn Takes into Tracks 416
Type icon 232, 236
Typing MIDI note entry 77

U

Über Tube plug-in (see DP Plug-ins Guide)
UI
scaling 16, 256
Unassigned (instrument track) 83
Unconsolidate Rests 136, 166
Undo 365
Undo History 296
preferences 254
Undo/Redo 365, 371
Edit windows 302
Record 107
Ungroup Tracks 96
Ungroup Tracks command 93
Unlock 460
Unlock Marker 455
Unlocking markers 455, 460
Unmuting
audio tracks 269
Unpack Clips 342
Unpack Per Note Events 81
Update existing fades option 354, 355
Updates 17
Upper zone 79
Urei metronome click 116
USB
MIDI hardware (installing) 27
Use Narrow view 177
Use Same Movie for All Sequences 291, 293
User interface 42-51
User Presets 519
User time (see User timestamp)

V

Variable Bit Rate (VBR) Fast 570
Variable Bit Rate (VBR) Standard 570
VBR (variable bit rate) quality 570
VCA
track 59, 192, 509-513
track group 92, 94, 509
Velocities
Change Velocity 395-398
compressing 396, 532
expanding 396
limiting 396
Off Velocities 323, 395, 403
On Velocities 323, 395, 403
randomizing 397
Velocity compressor (MIDI effects processor) 532
Velocity tool 249, 315
Ventura 16
Version numbers
Performer 626
Video Window (See Movie Window)
View by menu (Soundbites list 220
View Filter
Markers 461
View menu 297-298
scale
scale all windows up/down 16, 256
View Mode 130
Virtual instruments 82-88, 189
playing from computer keyboard 77
Volume
Click 116
creating volume changes 398
curve, removing 346
curves, inserting 345
curves, reshaping 346
cut, copy, paste 347
deleting an event (point) 346
disabling automation temporarily 347
faders 188
generating volume curves 500
graphic editing of 343
V-Rack Edit 517
V-Racks 239-241
defined 238
in Set List 238
instrument plug-ins 87
V-Rack Edit command 176, 177
VST 528
VST plug-ins
delay compensation 26
scanning

W

WASAPI 21
WAVE files
importing 228
Waveforms
explained 332
Welcome to Digital Performer window 19
Welcome window 19
What to quantize 379
Window controls 42
Window menu 46
Close 46
Close All Effect Windows 47, 518
Close All Windows 47
Pop Out of Consolidated Window 47
Push Window to Back 46
Set Focus to Next/Previous Cell 47
Window Sets 47
Window Sets 47
Window target 43
Window title 42
Windows 42-43
Audio driver 21
Num Lock key 50
WASAPI 21
Windows Video Exporter 575
Wiper
scrubbing with 273
zooming 272
Work Priority 24

X

X icon (on soundbite move handle) 219
X tool (see Mute tool)

Z

Zones (MPE) 79
Zoom 129, 344
auto zoom track 300
back/forward 300
buttons 299
Edit windows 298-301
in/out 299
keystroke shortcuts 299
menu 299
MIDI Editing ??-317
Pitch ruler 317
playback wiper 272
scroll wheel 299
Sequence Editor 124
settings 300
shortcuts 247
to default zoom 299
to selected time range 300
to selection 300
to track 300
tool 246, 300

track pad 299
wiper zoom 299
Zoom box 43
Zoom buttons 43
ZTX
formant-corrected 547
Pitch and Time Stretch Options 255
preferences 255
standard 548
technology explained 542