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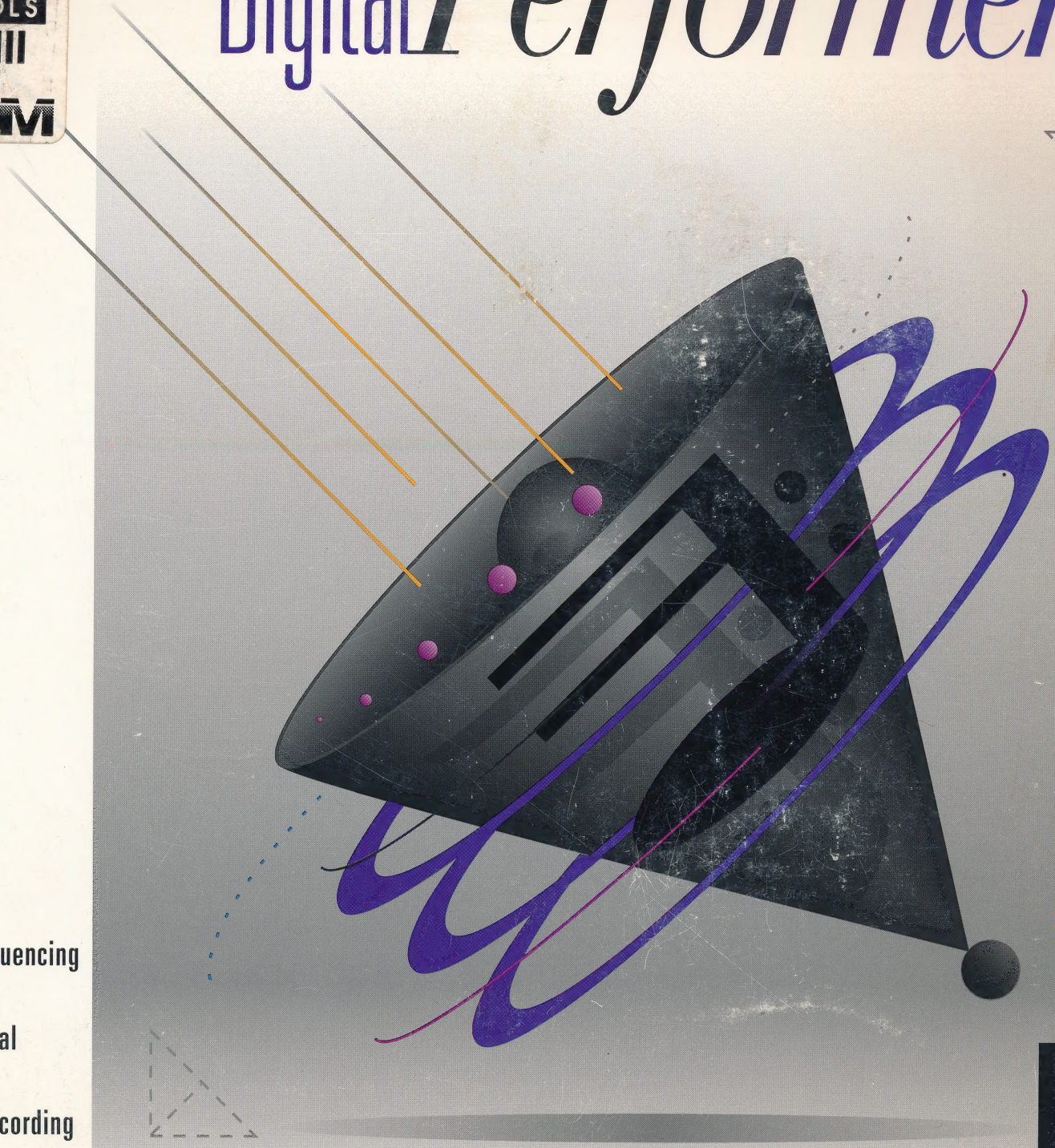
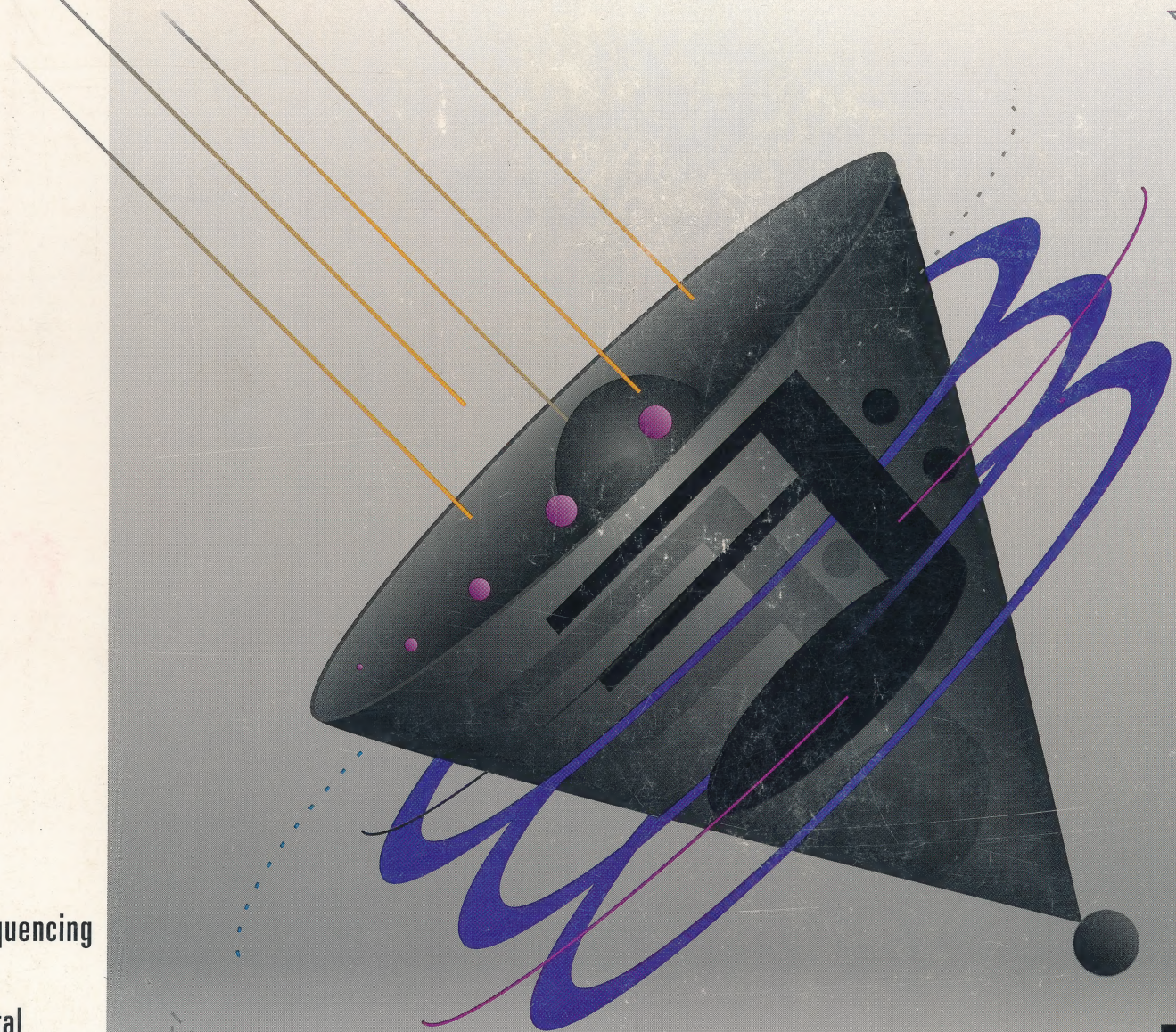
Now Supports PRO TOOLS II & III and TDM

Digital Performer



MIDI Sequencing and Digital Audio Recording

Digital Performer



MIDI Sequencing

and Digital

Audio Recording

Digital Performer

MIDI Sequencing

and Digital

Audio Recording

Digital Performer

MIDI Sequencing

and Digital

Audio Recording

Digital Performer

Version 1.6

Digital Performer

Version 1.6 Installation Guide

Read this first!

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Start Here! Digital Performer® 1.6 Installation Guide

Welcome to Digital Performer! Mark of the Unicorn is pleased to present you with our award-winning, integrated sequencing and digital audio recording software for Macintosh.

About this guide

This guide provides important information about Digital Performer Version 1.6 not found in the other manuals.

Important! Register your software

Before you go any further, take a moment to register your new Digital Performer software as described in the following section that applies to you. Doing so entitles you to:

- A free backup master disk (if applicable)
- Free, unlimited technical support
- Free newsletters, software updates, and announcements about major software upgrades and new products

Since Mark of the Unicorn can only provide customer service and technical support to registered users, please be sure to send the card in immediately after purchase.

If you upgraded directly from Mark of the Unicorn

You are already registered as a Digital Performer user with your original Performer registration and serial number. Keep your original Performer manual with the registration card page inside the front cover for your future reference. You may also want to write down the serial number in your copy of the Digital Performer *Guide to Digital Audio* manual.

If you upgraded through your dealer

You will be automatically registered when the dealer returns your upgrade coupon to Mark of the Unicorn. We will acknowledge its receipt by mailing you a backup key disk, along with your new Digital Performer registration number.

If you purchased Digital Performer

Take a moment now to fill in and mail the registration card found at the beginning of the Digital Performer *Guide to Digital Audio*, which accompanies this booklet. Leave the rest of the cardboard page in the manual for your future reference.

Audio hardware requirements

Digital Performer 1.6 supports the following Digidesign audio cards:

- Audiomedia I and II
- Audiomedia LC
- Sound Tools II
- Pro Tools (4-16 channels)
- Pro Tools III (16-48 channels)

Refer to Digidesign for information about the compatibility of the hard disk(s) you plan to use with the Digidesign Audio Engine (DAE) and their audio hardware.

Some of these audio cards may not be supported in future versions of DAE. Please check with Digidesign for the latest information regarding future compatibility.

Macintosh requirements

Digital Performer will run on any Macintosh that is compatible with the Digidesign audio cards listed in the previous section. Please contact Digidesign about the compatibility of these audio cards with specific Macintosh models.

System software requirements

Digital Performer requires System 7.0 or higher with 32-bit memory addressing enabled. If your Mac is not 32-bit clean, the Digital Performer installer will automatically install MODE32 or the 32-bit Enabler, whichever is correct for your Mac model. However, you must still enable 32-bit addressing manually after running the installer.

RAM requirements

Digital Performer requires a minimum of 12 megabytes of RAM, but this configuration may require you to lower Digital Performer's default memory partition or strip your system of extensions, control panels and fonts. More RAM is recommended. If you have System 7.5 or higher, you will probably need more than 12 Mb of RAM because of the size of System 7.5.

Install and test your Digidesign hardware first

We recommend that you install and test your Digidesign hardware before installing Digital Performer 1.6. If possible, try playing back some audio with Sound Designer II or other Digidesign software to verify that the hardware is properly installed and functioning normally. If you experience problems, this will help narrow your focus and eliminate Digital Performer as a possible cause. Once you've got the Digidesign hardware working, you will most likely not have problems with Digital Performer.

Installing Digital Performer 1.6

Before installing Digital Performer, we recommend that you review the hardware requirements listed above before proceeding.

1. **Restart your Macintosh with Extensions OFF by holding down the Shift key while powering it up.**

2. **Insert the Digital Performer 1.6 master disk (the disk with the colored glossy label) in any floppy drive and double-click the installer program named "Double-Click to Install".**

   Follow the instructions provided. Currently, the installer installs DAE 1.32, DigiSystem 2.8, A/ROSE 1.19 (only needed on System Accelerator-equipped Macs) and Pro Tools SysAxe 2.34 (only needed on System Accelerator-equipped Macs). If you already have any of these Digidesign files in your system, the installer will only replace them if they are older versions. Please contact Digidesign for information on newer versions of these files.

3. **After completing the installation, restart your Mac.**

4. **Launch Digital Performer 1.6 and you will be asked to write-enable and insert the Digital Performer 1.6 master disk.**

   This will authorize Digital Performer 1.6 to run on your hard disk. If you want to install Digital Performer on a hard disk other than the one to which the installer copied it, drag the Digital Performer™ 1.6*.f* folder to that hard disk before launching and authorizing. If you would like more information about authorizing, see "Authorizing your hard disk" on page 36 of the Performer *Getting Started* manual, as well as "About authorizing" on page 37.

5. **If, after authorizing, you see a message about FreeMIDI as shown below, proceed to Chapter 5, "Getting Started with FreeMIDI" on page 41 of the Performer Getting Started manual.**

   Don't worry if you see this message. It just means that you need to describe your MIDI setup to Digital Performer.

A brief overview of the Digital Performer 1.6 manuals

Digital Performer 1.6 ships with three separate manuals, which are briefly described below.

Performer "Getting Started" Manual

The Performer *Getting Started* book contains basic installation and setup information. It tells you how to set up FreeMIDI. It provides a brief overview of Performer's main features (including a summary of new ones), as well as two extensive tutorials. One tutorial takes you step by step through the process of recording your first MIDI track. The second tutorial shows you step by step how to build an entire song, while introducing you a number of basic tasks such as cycle-recording, quantizing and step recording.

This book is ideal for anyone who is new to Performer and would like a quick look at "the lay of the land".

Performer Reference Manual

The Performer *Reference Manual* contains all the chapters having to do with Digital Performer's MIDI capabilities (although see the note below). If you are already familiar with Performer, consider this to be an up-to-date reference for Performer's MIDI features, and turn to the *Guide to Digital Audio* for information about audio features that are unique to Digital Performer.

Please note: there are a few new, non-audio features described in the following places in the *Guide to Digital Audio:*

- chapter 4, "The Movie Window" (page 23)
- "MIDI Time Code Generation" on page 20
- "Frame Rate command in the Basics menu" on page 20
- "New preferences for what appears when you double-click a track" on page 21

Digital Performer Guide to Digital Audio

The Digital Performer *Guide to Digital Audio* contains all information having to do with Digital Performer's audio capabilities, including tutorial and troubleshooting chapters, written exclusively for audio features. In addition to being an audio reference, this book is ideal for anyone who is already familiar with Performer and would like information about Digital Performer's audio features.

Where to go next

Here are some recommendations for where to go next.

What you want to do:	Where to go next:
If you would like a brief overview of new digital audio features in Version 1.6	Guide to Digital Audio chapter 3, "New Features in Version 1.6" (page 15)
If you would like a brief overview of other new features in Performer	Performer Getting Started "What's New in Performer® 5" on page 13. and Guide to Digital Audio chapter 4, "The Movie Window" (page 27) "Using the mouse to edit values in text boxes" on page 15 "MIDI Time Code Generation" on page 24 "Frame Rate command in the Basics menu" on page 24 "New preferences" on page 25
If you would like a brief overview of Performer in general	Performer Getting Started chapter 7, "Performer Overview: A Picturebook Tour" (page 69)
If you would like a brief, step-by-step tutorial for recording MIDI	Performer Getting Started chapter 8, "Getting Started: Recording Your First Track" (page 87).
If you would like an extensive tutorial about how to cycle-record and build a sequence	Performer Getting Started chapter 9, "Tutorial: Building a Sequence" (page 103).
If you are new to digital audio recording and you'd like some basic information about it	Guide to Digital Audio chapter 5, "Hard Disk Recording Basics" (page 33) chapter 6, "Audio Track Basics" (page 43)
If you need to start recording audio right away	Guide to Digital Audio chapter 7, "Recording Audio" (page 57)
If you need to start sequencing right away	Performer Getting Started chapter 7, "Performer Overview: A Picturebook Tour" (page 69).

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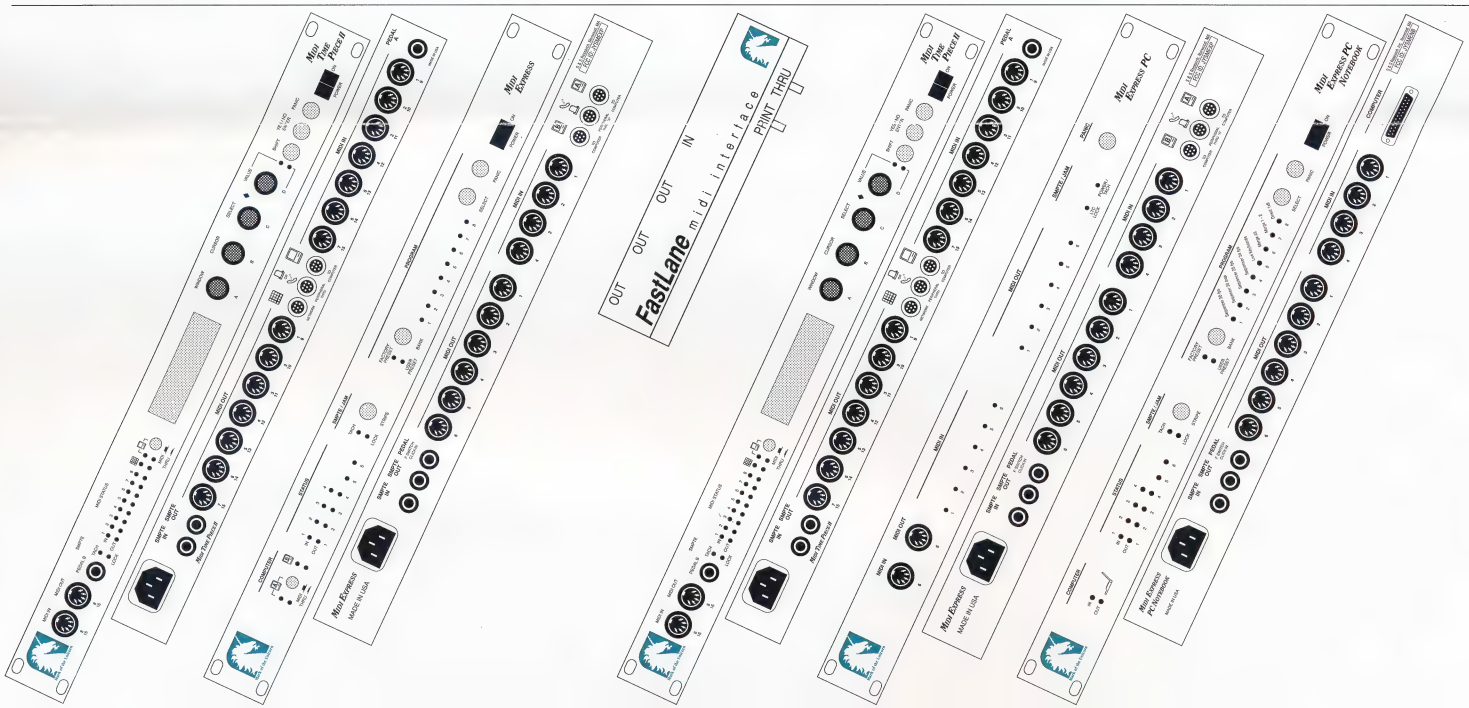
	MIDI Time Piece II Macintosh	MIDI Express Macintosh	FastLane Macintosh	MIDI Time Piece II PC / Windows	MIDI Express PC / Windows	Express Notebook PC / Windows
MIDI IN / OUT	8 / 8	4 / 6	1 / 3	8 / 8	6 / 6	4 / 6
Computer connection	modem / printer port	modem / printer port	modem / printer port	8-bit card	8-bit card	parallel port
MIDI channels	128	96	16	128	96	96
Maximum units / ports / channels in a network	4 / 32 / 512	No networking	No networking	2 / 16 / 256	No networking	No networking
Total merging, routing, muting, re-channelizing	All ports	All ports	1 MIDI IN to 2 MIDI OUTs	All ports	All ports	All ports
SMPTE tape sync	All frame rates	All frame rates	no	All frame rates	All frame rates	All frame rates
SMPTE conversion	MTC & DTLe	MTC & DTLe	no	MTC	MTC	MTC
SMPTE jam sync	continuous / one-time	continuous / one-time	no	continuous / one-time	continuous / one-time	continuous / one-time
Adjustable freewheeling	0-32 frames	0-32 frames	no	0-32 frames	0-32 frames	0-32 frames
Convert click to MIDI	yes	yes	no	yes	yes	yes
Foot pedal inputs	2 (1 rear, 1 front)	1 rear	none	2 (1 rear, 1 front)	1 rear	1 rear
Foot pedal types	continuous / switch	switch only	no	continuous / switch	switch only	switch only
Stripe SMPTE / front panel	yes	yes	no	yes	yes	yes
Panic button / front panel	yes	yes	no	yes	yes	yes
Modem/printer THRU port with front panel switch	yes	yes	yes	n / a	no	no
Internal power supply	yes	yes	no power required	yes	powered by computer	yes
Scene memory (battery backed)	8 base setups with 128 variations	16 (8 preset / 8 user)	no	8 base setups with 128 variations	16 (8 preset / 8 user)	16 (8 preset / 8 user)
Front panel programming	16x2 Backlit LCD	scene select buttons	THRU buttons	16x2 Backlit LCD	scene select buttons	scene select buttons
Accepts program changes	yes	yes	no	yes	no	yes
Front panel MIDI ports	1 IN / 1 OUT	no	n / a	1 IN / 1 OUT	1 IN / 1 OUT	no
Operates without computer	yes	yes	yes	yes	no	yes
Fast 1/X data transfer rate	yes	no	no	no	no	no



Choosing the MIDI interface that's right for you.

MOTU interfaces are engineered to meet your needs today—and in the future

Plug and play Mark of the Unicorn MIDI interfaces ship with "plug and play" settings so you can begin using them right away with your sequencer, patch editor/librarian, and other music software, without touching the unit's front panel or running the control panel software accessory (available for both Macintosh® and Windows®).

"Set it and forget it" The MIDI Express and MIDI Time Piece families have built-in, battery-backed memory. If you need to make a change to the factory default settings, just run the intuitive, graphic control software. The interface remembers the change, even if you turn it off. You can even store multiple operating configurations for instant front-panel recall in any situation (studio versus stage, for example).

Much more than a MIDI patchbay With completely independent MIDI ports, the MIDI Express and MIDI Time Piece families provide totally flexible MIDI data routing. Route and merge data from any combination of inputs to any combination of outputs; mute any type of data you wish, on input or output. Even switch data from one channel to another as it is sent to or from any MIDI device. All it takes is a few clicks of the mouse.

Compatibility Our Macintosh interfaces are fully compatible with all Macintosh music software. In fact, they've become a standard —so much so that many programs specify the MIDI Time Piece by name. They fully support FreeMIDI, Mark of the Unicorn's MIDI operating system. OMS (Opcode MIDI System) has a "MIDI Time Piece" mode to ensure compatibility. Our PC/Windows interfaces support all music applications compatible with the Microsoft Multimedia Extensions™ (MME) driver.

With or without a computer Our interfaces serve as more than just interfaces: they are the "MIDI hub" of your studio. Even when the computer is turned off, they offer instantly accessible THRU functions on the front panel that let you route data from your controller to any connected device. With the MIDI Time Piece II, you can program all of its features—routing, merging, muting, rechannelizing, and more—right from the front panel. It's so complete, you'll never need to unplug your gear again.

Reliability From hit records to mega-star concert tours, top professionals rely on Mark of the Unicorn interfaces every day. Just look in their racks of gear: you're bound to see a MIDI Time Piece.

FastLane
Affordable and Portable

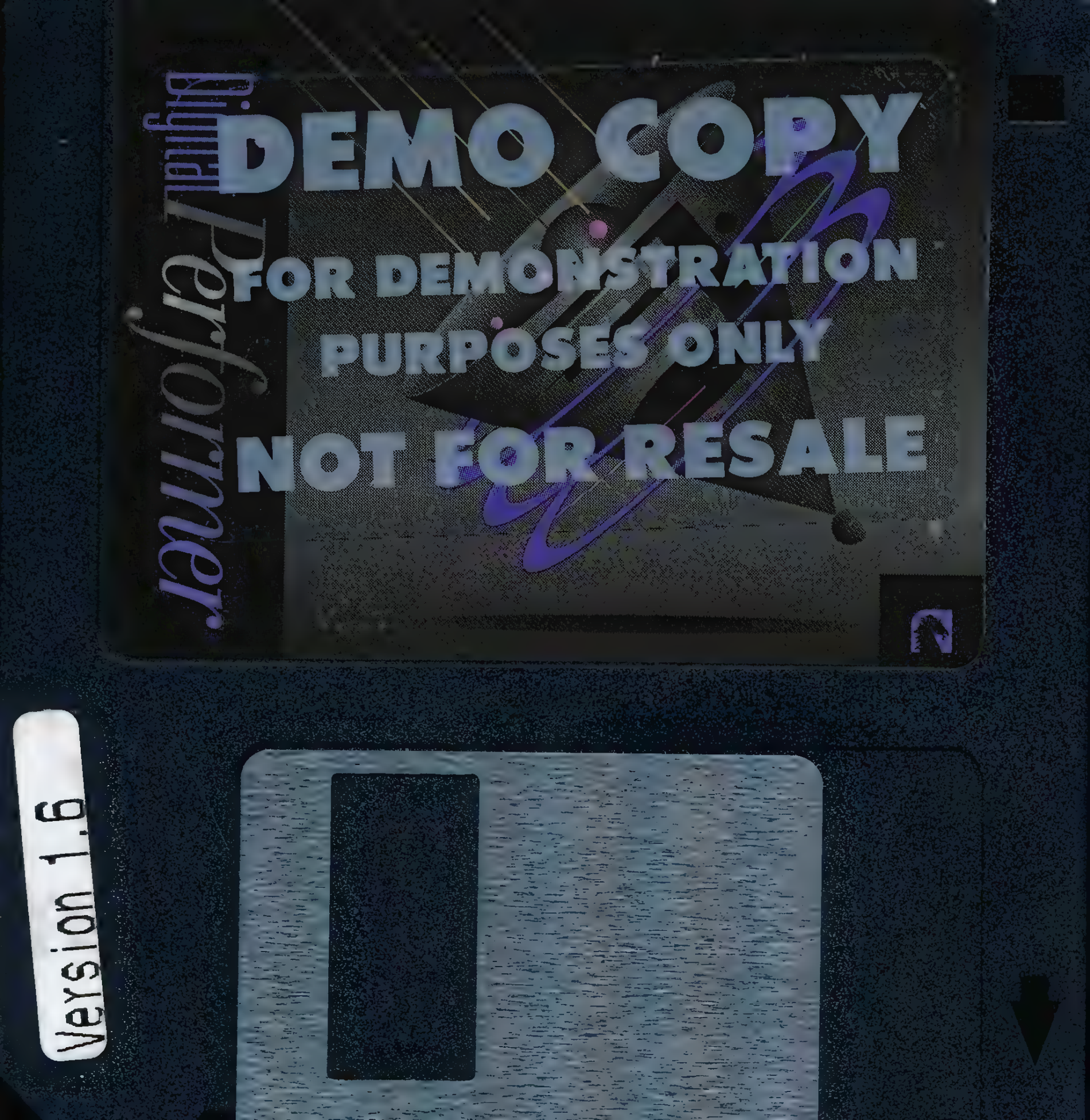
FastLane is a flexible and economical way to add MIDI to your Macintosh. FastLane can be installed in seconds and will open your Mac to the world of music software. It even has a unique MIDI THRU button that allows you to play your MIDI gear even when the computer is turned off—without having to disconnect cables. No other 1x3 interface for the Mac offers this important feature.

MIDI Express
Making the jump to multiple MIDI ports

The MIDI Express is ideal for medium-sized MIDI setups and essential tasks such as MIDI sequencing, multimedia production, and sound management with patch/editor librarian software. When sequencing with more than one or two MIDI devices, you want to connect each device directly to the interface so it gets its own set of 16 MIDI channels, which means you don't have to worry about sysex ID's or MIDI channel conflicts in your software. Just pick an instrument, choose a sound, and go! If you use editor/librarian software—or get sysex bulk dumps in your sequencer—you'll need the MIDI Express's multiple ports for bi-directional MIDI connections (both IN and OUT). The MIDI Express is based on the same time-tested technology as the MIDI Time Piece II, so it provides the same level of performance you'd expect in a multi-port interface. It's the affordable choice when you don't require the full-bore features of the MTP II.

MIDI Time Piece II
When you have to have the best

The MTP II gives you more of everything: more MIDI ports, more MIDI channels, more internal memory, expandibility via networking, faster MIDI data throughput to your MIDI rig from the computer (Macintosh version), complete control via the front panel, and the list goes on. It's ideal for live performance situations, where intense MIDI routing and processing—along with instant, flexible changes to its internal settings—are a must. And the MTP II has what it takes to support even the largest studio rigs, with features like networking, which provides up to 512 MIDI channels, and cable lengths of up to 1,000 feet. The MTP II is completely compatible with the original MIDI Time Piece. In fact, it's a perfect addition because networked together, they function as a 16x16 interface with 256 MIDI channels. You can even program the settings of the original MTP from the MTP II's front panel.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Digital Performer™ Disk 3

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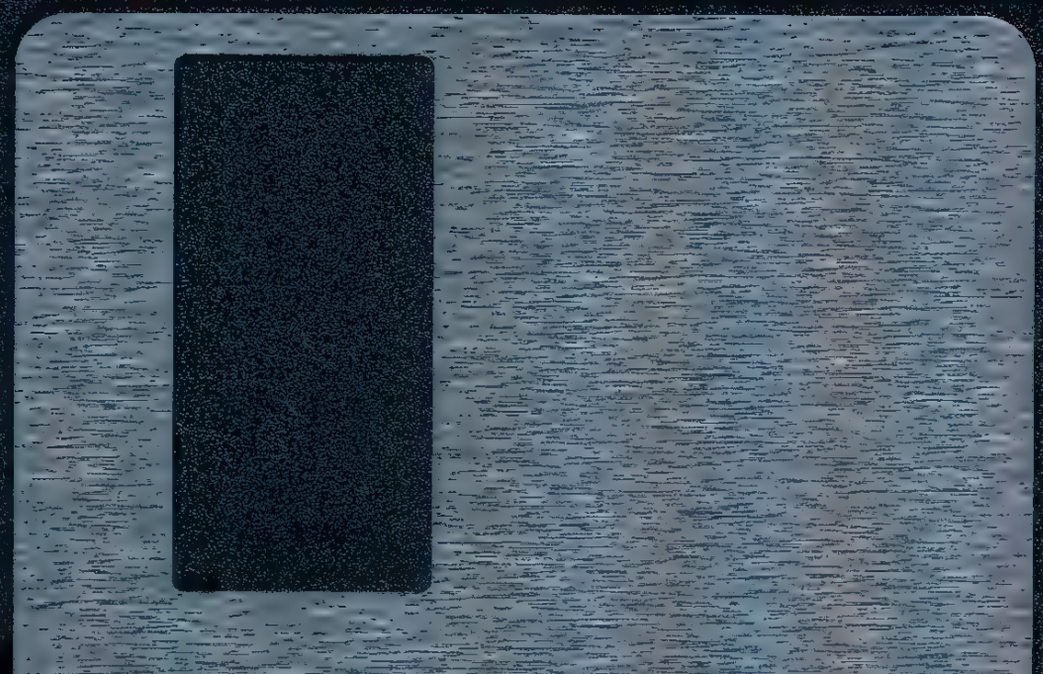

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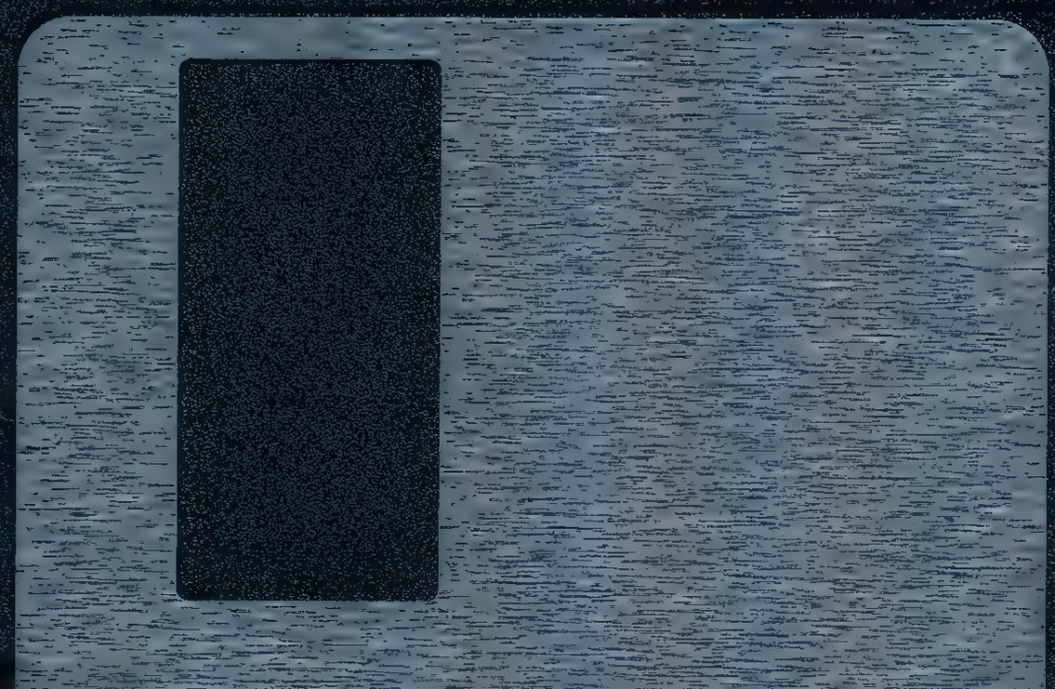


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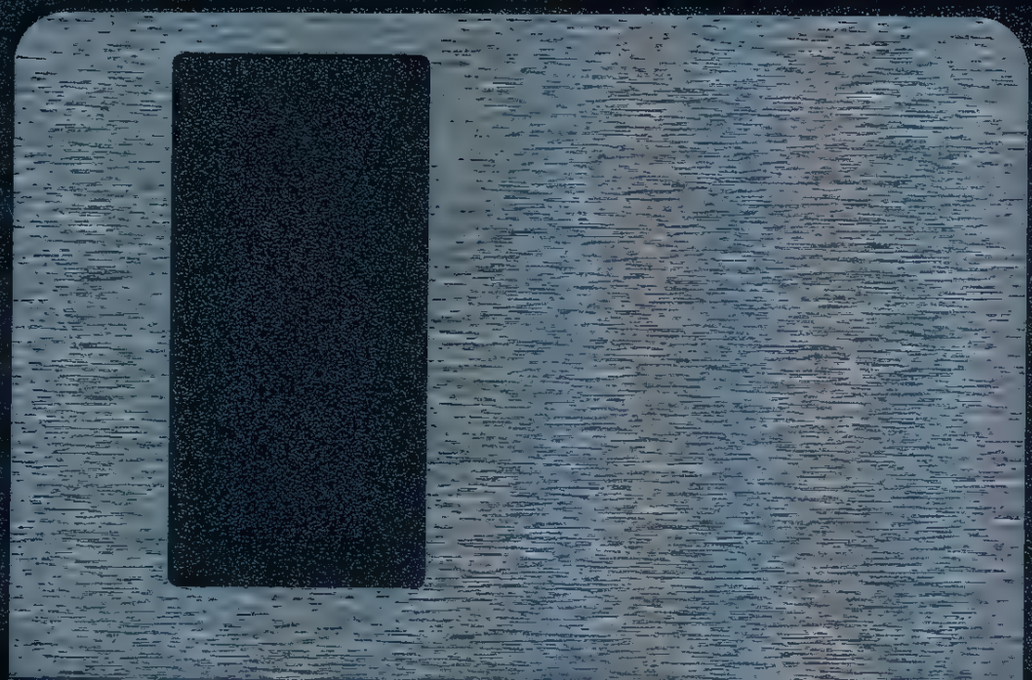

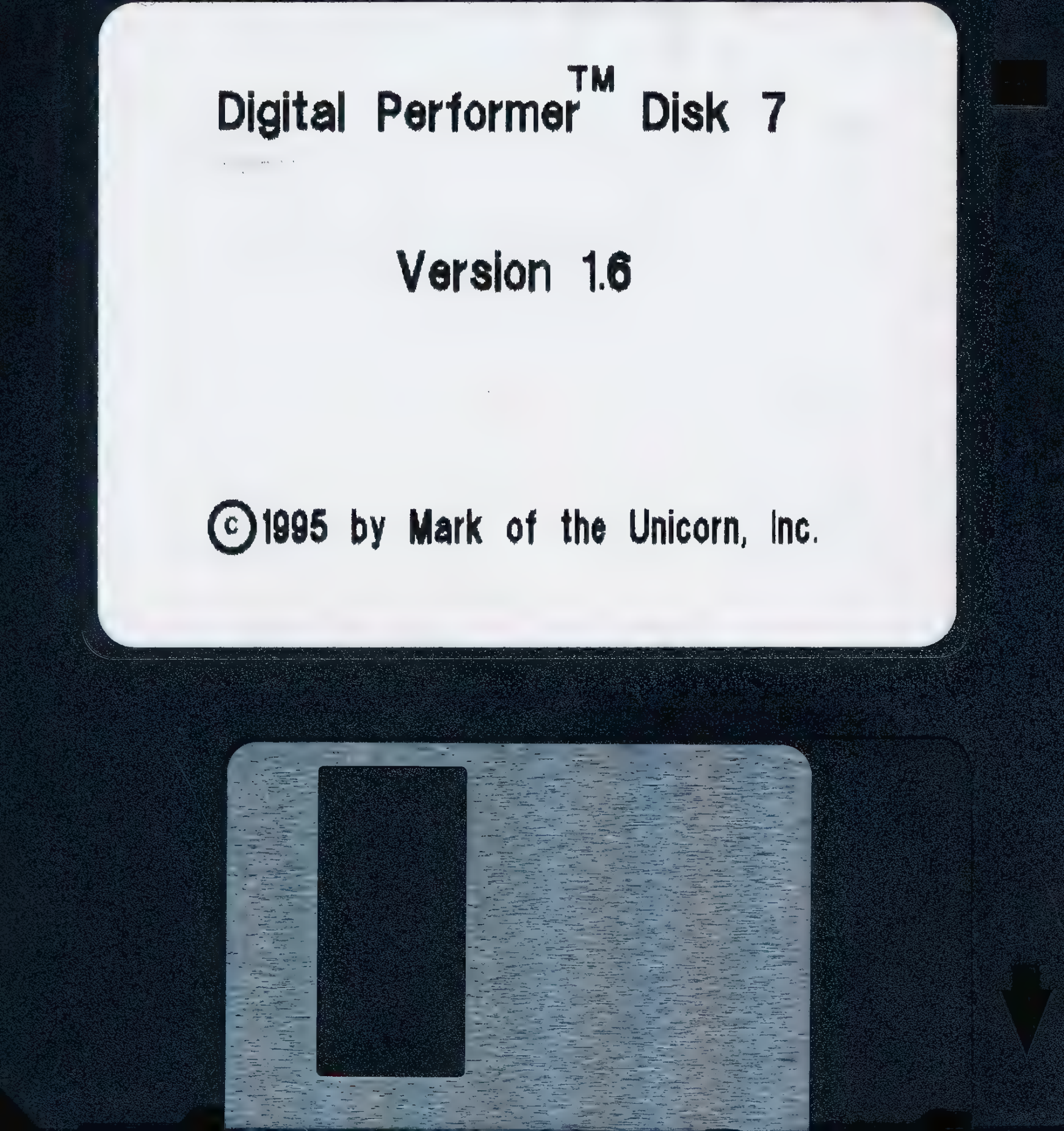
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Getting Started :Performer

THE MIDI SEQUENCER SOFTWARE

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Performer®

Getting Started

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Technical support: (617) 576-3066
Fax: (617) 576-3609

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Part IV: Other FreeMIDI Releases

Part V: Appendices

Chapter 1 *Welcome to Performer®*

Welcome to Performer! Mark of the Unicorn is pleased to present you with our industry-leading professional sequencing environment for the Macintosh computer.

Mail in the Registration Card

Before you go any further, take a moment now to fill in and mail the registration card found at the beginning of the Performer Reference Manual, which accompanies this guide. Doing so entitles you to:

- A free backup master disk (if applicable)
- Free, unlimited technical support
- Free newsletters and software updates
- Announcements about major software upgrades and new products

Leave the rest of the cardboard page in the manual for your future reference. Since Mark of the Unicorn can provide customer service only to registered users, please be sure to send the card in immediately after purchase.

Overview of this guide

This guide is organized into six sections:

What's new in Performer Version 5

This section provides you with a brief overview of the advanced, state-of-the-art features added to Performer in this major upgrade.

Installation

This section is for beginners and Macintosh sequencing experts alike. It provides step-by-step installation and setup instructions for those who would like them, including how to customize Performer for operation in your MIDI studio. It also provides summary information for expert users regarding unique aspects of Performer's installation (such as the FreeMIDI setup process).

Tutorials

This section provides the following introductory approaches to Performer:

- A picturebook tour, which gives a short overview of Performer's main windows and features.
- A short tutorial to teach you how to record a single track.
- A longer tutorial that introduces you to most of Performer's main features and helps you record a short, multiple track sequence, including a cycle-recorded drum loop and step-recorded chords.

Other FreeMIDI Releases

Performer Version 5 offers MIDI software system integration with the Mark of the Unicorn products listed below. If you have purchased one or more of these products, read this section for important information about how to use them together with Performer Version 5.

- Unisyn
- MIDI Time Piece II
- MIDI Express

Appendices

The appendices provide important information about using Performer Version 5 with OMS and MIDI Manager. There is also a troubleshooting and customer support appendix.

Part I
New Features

Chapter 2 *What's New in Performer® 5*

Performer Version 5 is packed with the following new features and enhancements:

- Redesigned interface
- Groove Quantize and Create Groove
- Cycle-recording with instant update and spot-erase
- Enhanced Split Notes command
- Better music notation display, editing, note entry, printing, and vastly improved transcription algorithms in the QuickScribe Notation window
- Support for MIDI Machine Control devices such as the Alesis ADAT™, the Akai DR4d, and the Tascam DA-88
- Large counter window for improved visibility in the recording studio
- MIDI System Integration with FreeMIDI
- Bank select
- DNA™ Grooves and DrumTrax™ Special Edition drum patterns included free of charge
- Many other enhancements

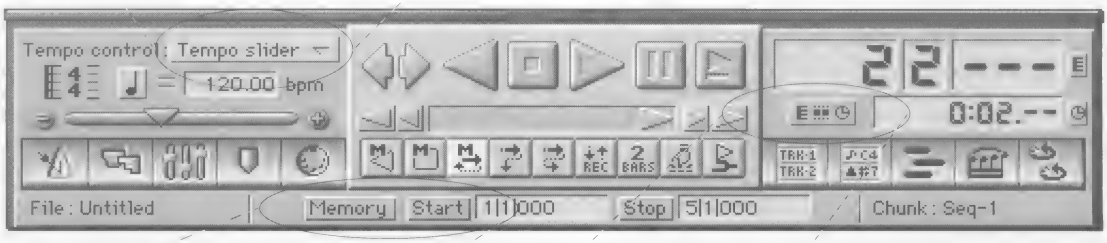
The following pages provide a glimpse into these new features, along with page references to the Performer Reference Manual.

For a similar overview of Performer's main features, see chapter 7, "Performer Overview: A Picturebook Tour" (page 69).

Redesigned interface

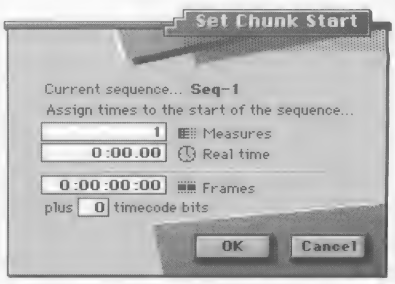
If you just upgraded to Version 5, don't worry! You won't have to learn a whole new program. Performer is still Performer. But we *have* added a pleasing color interface to all Performer's familiar features, along with many refinements. Version 5 even looks great on a black and white monitor, but once you see it running on a color monitor, you'll never look back. Below are a few highlights of the new look and feel.

In addition to the new look and feel, Version 5 is full of refinements. The example shown here is the new Tempo Control pop-up menu in the Metronome panel.



You'll find that many of Performer's existing features are greatly enhanced and clarified by color. You may even discover features and shortcuts that you never knew existed.

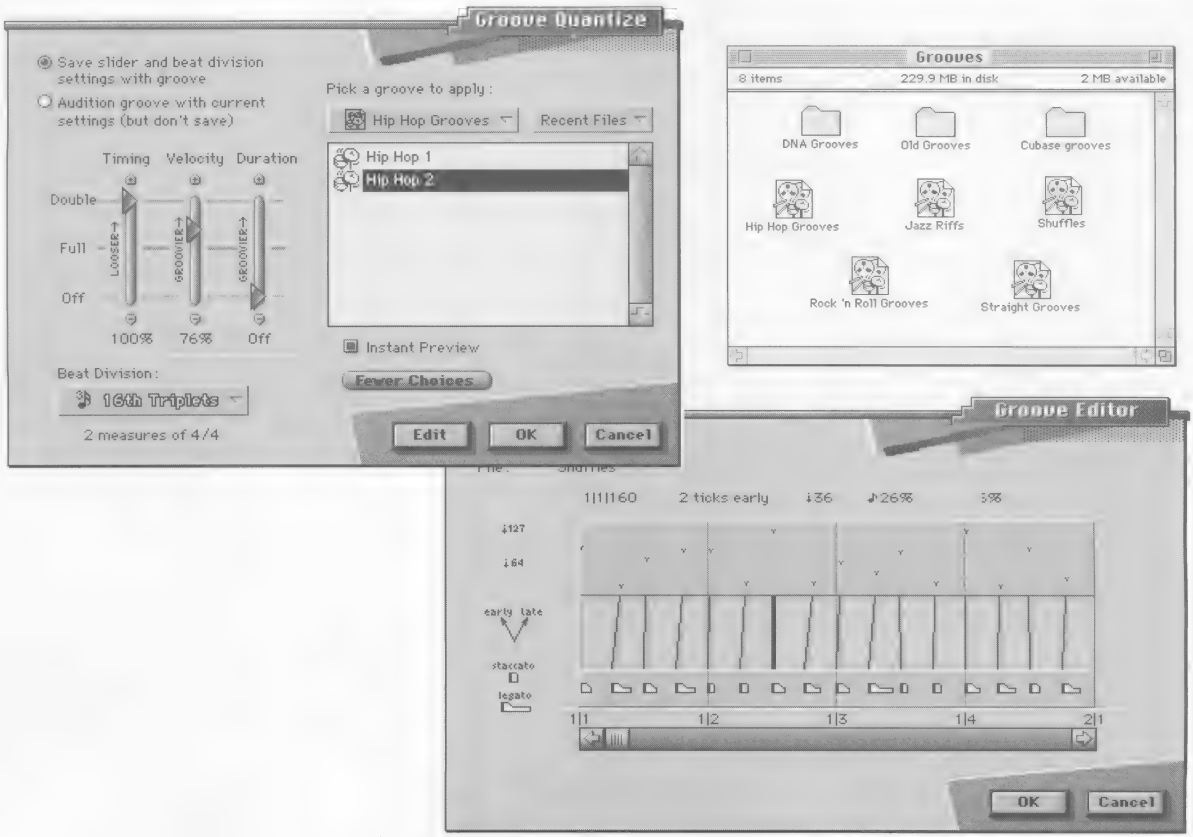
Many enhancements in Version 5 are the direct result of feedback from Performer's thousands of users. The new Start Time button has been added to the main counter to quickly allow you to set SMPTE offsets and add pick-up measures.



Groove Quantize and Create Groove

For more information, see chapter 30, "Groove Quantize" (page 487) in the Reference Manual.

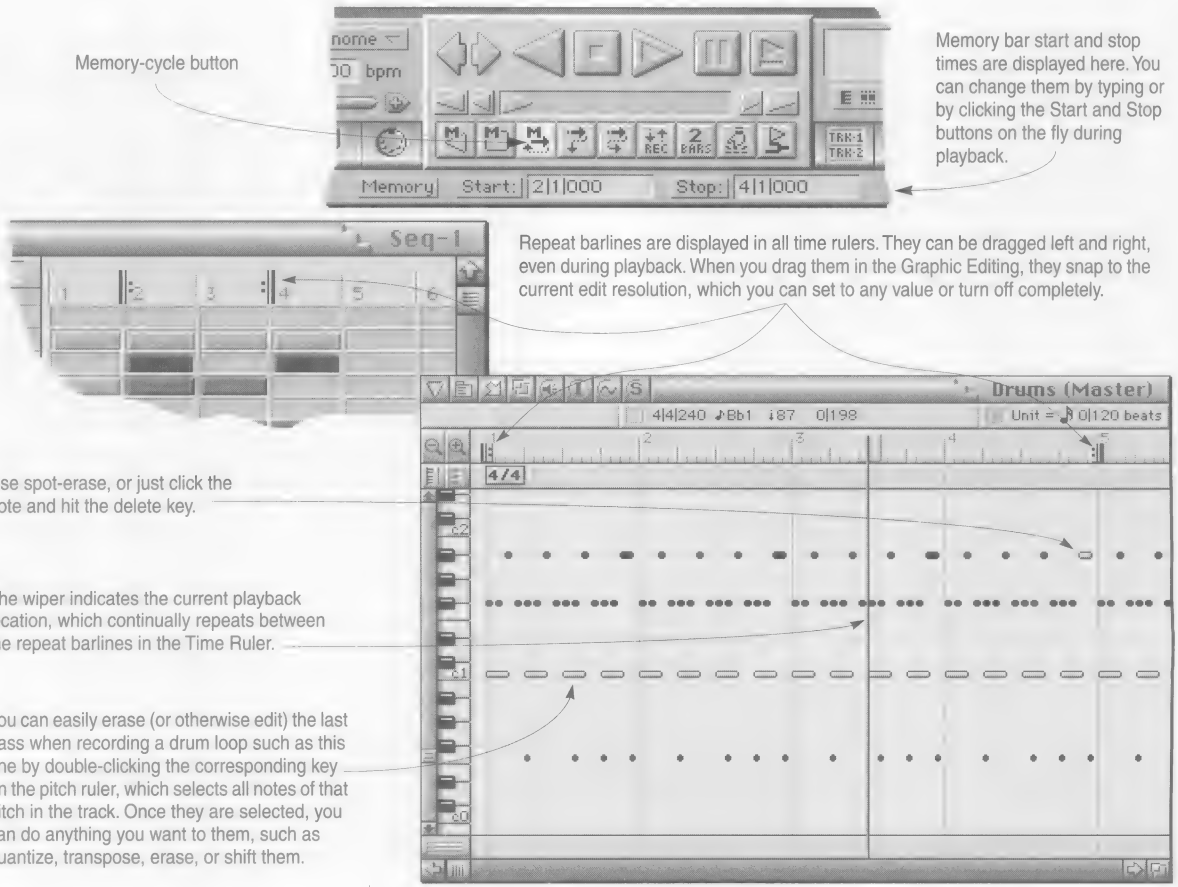
Performer's Groove Quantize and Create Groove commands in the Region menu add a new dimension to sequencing. A groove is a unique rhythmic feel that you can instantly apply to your music. You get immediate feedback as you dynamically adjust the feel of grooves with faders. Use the Create Groove command to create your own grooves, of any length, from any music you have recorded into Performer or loaded from a standard MIDI file. Then apply it to any other track, and even edit the groove to perfect the feel. You can build your own groove library, or purchase commercially available libraries with hundreds of carefully crafted grooves. Performer Version 5 even ships with a sample library of DNA™ grooves, including straight, shuffle, laid back, and pushing grooves.



Cycle-record with instant update and spot-erase

For more information about this feature, see "Cycle-recording" on page 130 in the Performer Reference Manual.

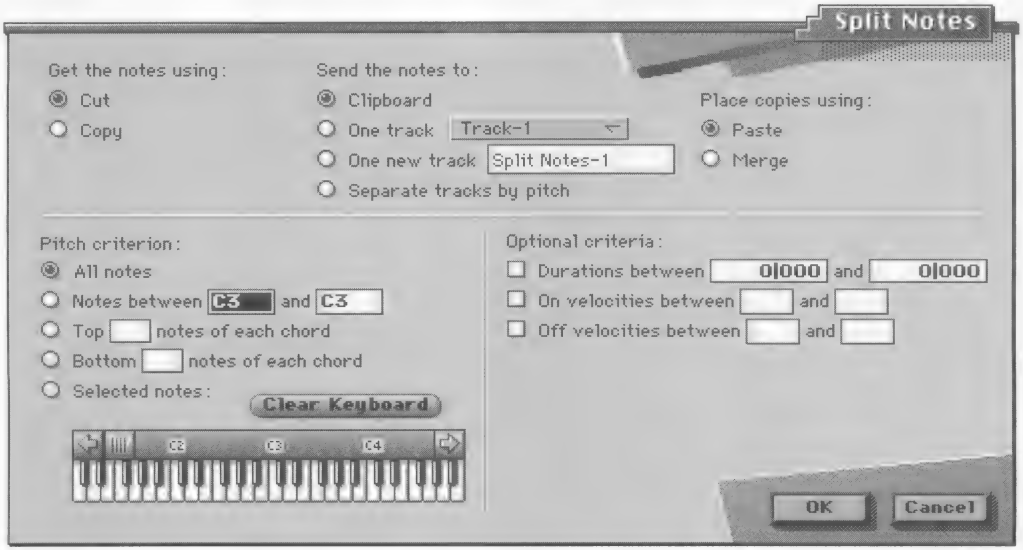
Performer is now more interactive than ever when it comes to building loops in real time. Three key enhancements make Performer a powerhouse for drum machine style loop-recording. First, Performer's main counter loops seamlessly, just like traditional drum-machine style pattern recorders with the improved Memory-shuttle feature. Secondly, notes and other data show up immediately as you record them, so with a graphic or notation editing window open while you record, you can immediately edit the notes you record without ever hitting the stop button. Finally, a new spot-erase remote control lets you erase notes while cycle-recording by holding down the key for the pitch you want to erase, just like your favorite drum machine or hardware sequencer.



Enhanced Split Notes command

Split Notes has been greatly enhanced to save you valuable time. Split notes can now automatically create a new track and Paste the split notes to it. It can even create a set of new tracks and Paste the split notes to each track according to their pitch. You can select what pitches to split by playing them on your MIDI controller.

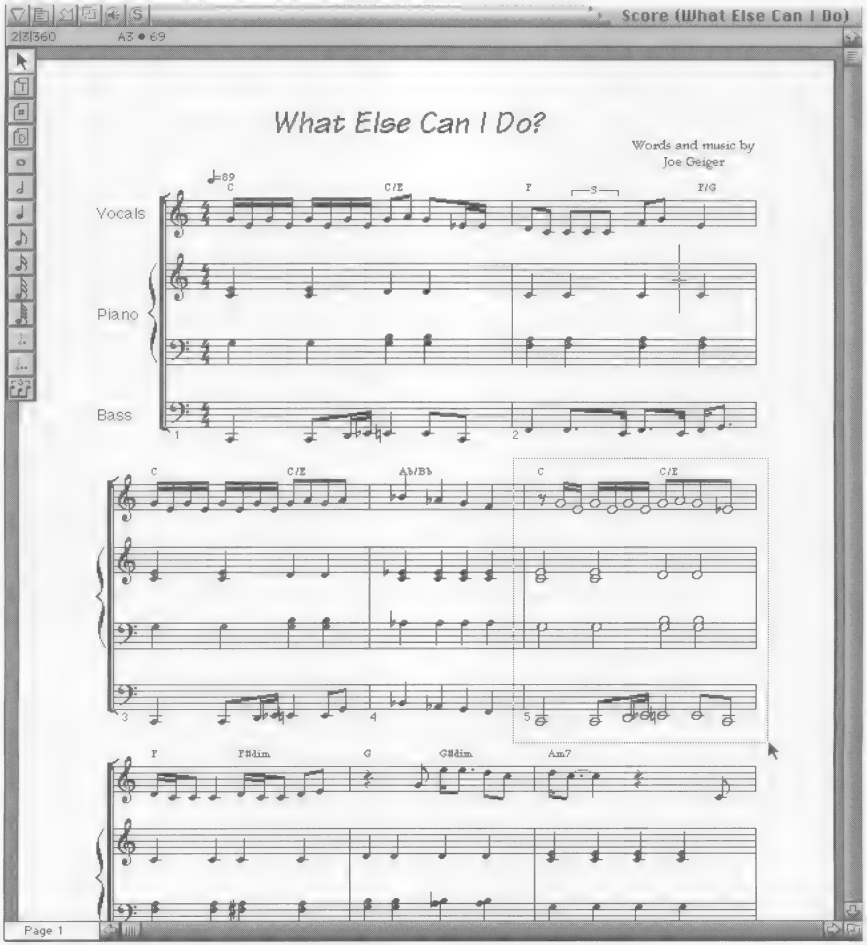
For more information, see "Split Notes" on page 441 in the Performer Reference Manual.



Better notation transcription, editing, and note entry

Performer Version 5 provides more advanced music notation features, including new MIDI transcription technology that produces the most accurate transcription ever in Performer. In addition, Performer's enhanced QuickScribe window now provides palette-based note entry and editing directly on the page. Note insertion is especially improved. Text is now handled with familiar, Macintosh-style text boxes to give you complete flexibility.

For more information, see chapter 23, "QuickScribe Notation" (page 345) in the Performer Reference Manual.



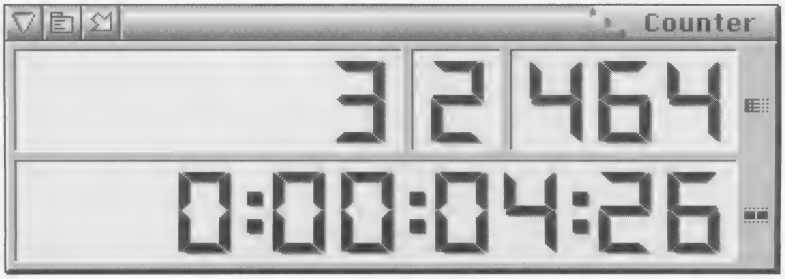
MIDI Machine Control

Performer Version 5 serves as a command center for the modern desktop recording studio. MIDI Machine Control allows you to manipulate the transport controls of popular multi-track recording systems such as the Alesis ADAT™, Akai DR4d, and Tascam DA-88. Play, stop, rewind, fast forward, record-enable, and punch in and out, all from Performer's familiar tape-deck style transport controls.

For more information, see chapter 39, "Using MIDI Machine Control" (page 629) in the Performer Reference Manual.

Large counter display

The counter window has been enlarged to improve visibility in the recording studio. All three time formats can be displayed. Other than its increased size, this window functions exactly as explained in the Reference Manual in chapter 11, "The Counter Window" (page 161).



MIDI System Integration with FreeMIDI

FreeMIDI is a Macintosh system extension that is automatically placed in the System Folder when you install Performer Version 5. FreeMIDI is easy to use because it is seamlessly integrated with Performer, and provides many advantages for all FreeMIDI-compatible software, including:

- A "virtual" studio on your Macintosh that graphically mirrors your entire MIDI hardware setup and is shared by all FreeMIDI-compatible programs
- A simple, intuitive pop-up list of your MIDI devices whenever you need it in any FreeMIDI program
- A pop-up list sound list for each one of your MIDI devices, which make it easy for you to choose sounds by name
- The ability to start playback, stop playback, rewind and cue all FreeMIDI-compatible programs at once (For example, you can slave Mosaic to SMPTE time code via Performer and FreeMIDI.)

To see how easy it is to set up your FreeMIDI studio, see chapter 5, "Getting Started With FreeMIDI ™" (page 41).

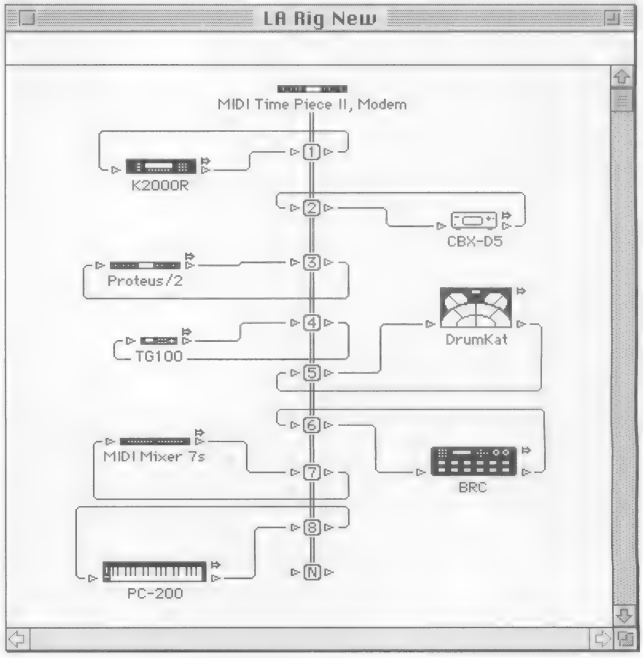
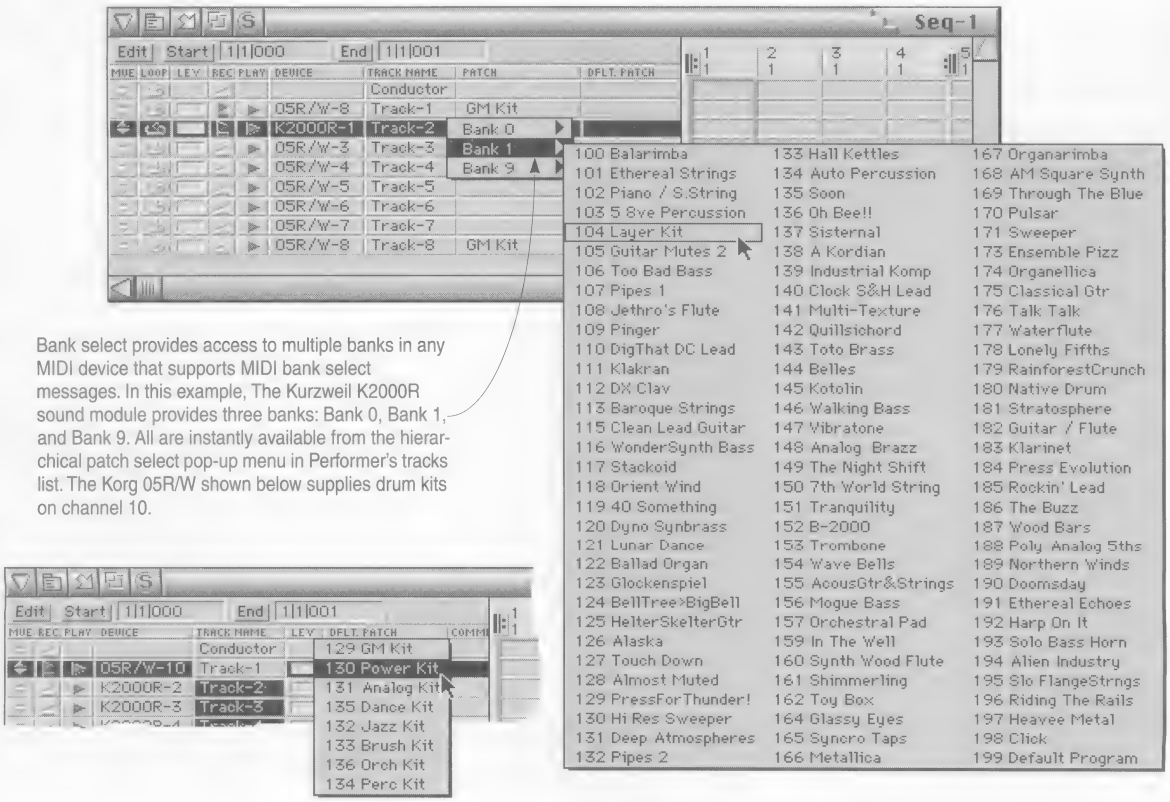


Figure 2-1: FreeMIDI provides an intuitive, graphical representation of your MIDI studio. You can arrange the icons in the window to match their location in your studio using familiar Macintosh System 7 conventions.

Bank select

For more information, see "Using Multiple Patch Lists & Bank Select Messages" on page 747 in the Performer Reference Manual.

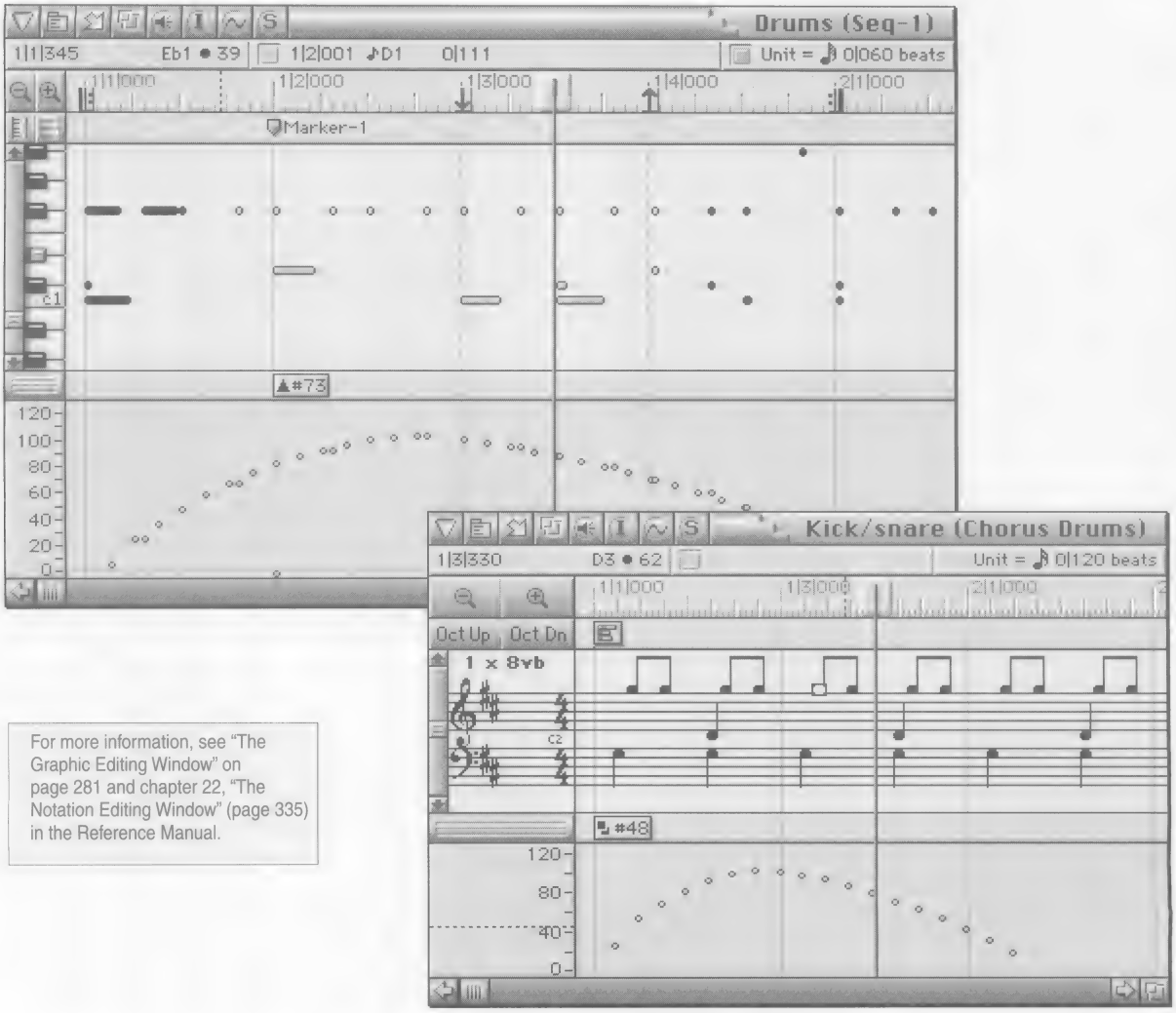
Together, Performer and FreeMIDI let you break the 128-sound barrier imposed by the MIDI patch change event. Now, you have hundreds of sounds at your fingertips from within Performer using any sound module or keyboard in your MIDI studio that supports MIDI bank select messages. FreeMIDI provides hierarchical pop-up patch list menus in Performer that let you select any sound from any bank instantly. You can even sort the patch lists alphabetically to help you find sounds more quickly.



Bank select provides access to multiple banks in any MIDI device that supports MIDI bank select messages. In this example, The Kurzweil K2000R sound module provides three banks: Bank 0, Bank 1, and Bank 9. All are instantly available from the hierarchical patch select pop-up menu in Performer's tracks list. The Korg 05R/W shown below supplies drum kits on channel 10.

Enhanced Graphic Editing

The Graphic Editing and Notation Editing windows have been redesigned to show more data in a clearer fashion.



For more information, see "The Graphic Editing Window" on page 281 and chapter 22, "The Notation Editing Window" (page 335) in the Reference Manual.

DNA Grooves & DrumTrax™ patterns

Performer Version 5 ships with 50 free DNA Grooves created by WC Music Research, an industry leader in rhythmic analysis. These grooves can be fully incorporated into Performer's new Groove Quantize features. DNA Grooves provide a variety of feels derived from hit records and drum tracks by top studio drummers; they can be varied by the Groove Quantize beat divisions to provide a total of 500 distinct Groove styles.

Version 5 also ships with the DrumTrax™ Special Edition drum pattern library, a set of drum patterns in Performer format that offer a variety of popular percussion styles. Created by professional studio drummers, these patterns can be used as the rhythmic foundation for sequences, as practice material, and as inspiration for new ideas. The DrumTrax Special Edition also includes Humanize maps to generate new patterns and fills.

Other enhancements

If you are upgrading from previous versions of Performer, you'll notice many refinements. Here are just a few:

- You can now click on the text for radio button and check boxes to select the button.
- Step Record now locks to the main controls in a more intuitive fashion, playing the rest of the sequence as you step. Step Record is more fun than ever before.

Part II
Installation

Chapter 3 *Performer System Requirements*

To avoid problems later on, carefully review the information in this chapter before you install Performer.

This chapter provides important requirements and recommendations for the following components in your Macintosh computer system:

- Type of Macintosh
- Type of monitor
- RAM (memory)
- System software

Computer Requirements

Below is a chart summarizing how Performer supports each type of Macintosh computer. A Macintosh with a 68020 processor or faster is required, as well as a hard disk and a total of at least 5 megabytes (MB) of RAM.

Not supported:†	Supported:*	Recommended:
512K	Classic II, Color Classic	SE/30
512KE	LC/LC II	LC III, LC 475, 520, 550, 575
Plus	Mac II, IIx, IIcx, IIvi	IIci, IIsi, IIvx, IIfx
SE	Performa 200, 400, 405, 410, 430	PowerBook 145, 145B, 160, 165, 165c, 170, 180, 180c, 520, 520c, 540, 540c
Classic	PowerBook 140	Centris 610, 650, 660AV
PowerBook 100		Quadra 605, 610, 650, 700, 800, 840AV, 900, 950
Portable		Performa 450, 460, 466, 467, 475, 476, 550, 560, 575, 577, 578, 600
		Duo 210, 230, 250, 270c, 280, 280c
		Power Macintosh 6100/60, 6100/60AV, 7100/66, 7100/66AV, 8100/80, 8100/AV, 8100/110, 8100/110AV

☛ *You may experience delays in Performer because of the slower microprocessor in these machines.

☛ †Any of these Macs may experience problems with Performer Version 5 if an accelerator with a 68020, 68030, or 68040 processor is installed.

Please note that these computer requirements may change as future updates become available.

Computer Recommendations

The faster the Macintosh, the more responsive Performer is. Scrolling during playback is smoother, the counter updates regularly, and actions that you take with the program are faster—*especially during* playback. Below is a list of eligible Macintosh computers, ranked approximately from slowest to fastest, moving from top to bottom respectively in the list:

Computer:	Processor type:	Processor clock:
LC & Mac II	68020	16 MHz
Mac SE/30, IIx, IIcx, IIvi, Classic II, Color Classic, LC II, PowerBook 140, Performa 200, 400, 405, 410, 430	68030	16 MHz
IIsi	68030	20 MHz
IIci, PowerBook 145, 145B, 160, 170, LC III, Duo 210, LC 520, Performa 450	68030	25 MHz
Performa 600, IIvx	68030	32 MHz
PowerBook 165, 165c, 180, 180c Duo 230, 250, 270c, LC 550, Performa 460, 466, 467, 550, 560	68030	33 MHz
IIfx	68030	40 MHz
Centris 610	68LC040	20 MHz
Quadra 605 LC 475, Performa 475, 476 PowerBook 520, 520c	68LC040	25 MHz
LC 575, Performa 575, 577, 578, Duo 280, 280c, PowerBook 540, 540c	68LC040	33 MHz
Centris 650, Quadra 610, 660AV, 700, 900	68040	25 MHz
Quadra 650, 800, 950	68040	33 MHz
Quadra 840AV	68040	40 MHz
Power Macintosh 6100/60, 6100/60AV	PowerPC 601	60 MHz
Power Macintosh 7100/66, 7100/66AV	PowerPC 601	66 MHz
Power Macintosh 8100/80, 8100/80AV	PowerPC 601	80 MHz
Power Macintosh 8100/110, 8100/110AV	PowerPC 601	110 MHz

Math Co-processors

Math co-processors do not have an effect on Performer's speed of operation.

Accelerator Boards

Performer's speed of operation is increased by accelerator boards that enhance or replace the computer's CPU—and thus speed up all operations on the computer. We strongly recommend that when you purchase an accelerator, you purchase it on a "try-before-you-buy" basis because some accelerators can be fundamentally incompatible with Performer. Please contact Mark of the Unicorn Technical Support at (617) 576-3066 before you purchase an accelerator board in order to check compatibility with Performer.

RAM Recommendations

If you will be working with sequences that contain lots of MIDI data, you may need more than the minimum recommendation of 6 MB, depending on the size of your system software and the amount of additional start-up software or other applications you run at the same time as Performer.

How to Check RAM

To check how much RAM your Macintosh has, choose *About this Macintosh* (or *About the Finder* in System 6) from the Apple menu and look for the Total Memory indication.

When you run Performer, the Memory Monitor displays the amount of free memory (RAM) available to Performer. Try to keep at least 150K free. To increase this amount in MultiFinder or System 7, quit Performer, select the Performer program icon, and choose Get Info from the File menu. Increase the application memory size in the Get Info window.

Monitor Recommendations

Performer is designed specifically for the following screen depths:

- Black and white (1 bit)
- 256 colors or grays (8-bit)

To set your monitor to one of these color depths, use the Monitors Control Panel in the Apple menu.

System Software

To run Performer, a Macintosh computer must be booted with System System 6.0.7 or higher. System 7 is recommended. Please note that these minimum requirements may change in future updates.

To obtain the version number of the System and Finder files, choose *About this Macintosh...* (or *About the Finder* in System 6) from the Apple menu just after you switch on the computer.

To determine Performer's version number, run Performer and choose About Performer from the Apple menu. A window then displays Performer's logo and version number. This is the same screen that you see when you first run the program. This display remains until you click the mouse.

Installing 32-bit QuickDraw in System 6 for Color

If you are running in System 6, and you would like to run Performer in color, 32-bit Color QuickDraw must be installed in the system. 32-Bit Color QuickDraw is built into some Macintoshes running System 6.0.7 or 6.0.8, but not all. If not, Performer will display in black and white. If you would like to run Performer in color in this case, use the Customize option on your System 6 installer disks to install 32-Bit Color QuickDraw.

FreeMIDI is Required

Performer requires FreeMIDI, a Macintosh System Folder extension developed by Mark of the Unicorn. FreeMIDI is automatically placed in your system when you install Performer as described in this booklet.

FreeMIDI greatly enhances the way in which Performer interacts with your MIDI hardware. It provides Performer with the names of all of your MIDI hardware devices, and it even provides Performer with the names of the sounds currently available in each one of your MIDI synthesizers.

Performer 5uses TrueType™

Mark of the Unicorn has developed a TrueType music font called QuickScribe™ to support Performer Version 5's notation printing and editing features. This font is provided free of charge with Performer, and provides the highest possible printing quality and screen display available on the Macintosh. It is automatically installed in your Macintosh System Folder by the Performer installer.

In System 7, no special preparations are required for the use of this font.

In System 6, TrueType fonts require a minimum of System 6.0.7, LaserWriter Driver 6.1 or higher, and the TrueType INIT. (An INIT is a startup document that should be placed in the top level of the System Folder.) The TrueType INIT is automatically installed, if necessary, when you run the Performer installer.

Do Not Use Virtual Memory

Do not use Virtual Memory with Performer. Virtual memory causes the computer to operate too slowly for Performer to maintain real-time operations such as playback and recording.

Support for 32-bit memory in System 7

Performer supports the use of extended RAM with 32-bit memory mode in System 7.

MultiFinder

Performer is compatible with MultiFinder, which allows several applications to run concurrently in System 6. At least 5 megabytes of RAM are required to run MultiFinder with Performer. More RAM may be required depending on the number and size of the applications you are running together.

In MultiFinder, you should only switch to other applications from the main Performer screen. Avoid switching in the middle of a command, or while working in a dialog box.

By default, Performer allocates a certain amount of memory to itself in MultiFinder. To assign more, Get Info on the Performer icon and type in a large application memory size.

MIDI Hardware Requirements

The following MIDI hardware is the minimum necessary to work with Performer:

- a standard MIDI/Macintosh interface
- at least two MIDI cables
- at least one MIDI device

Chapter 4 *Installing Performer*

This chapter provides step-by-step instructions for installing Performer. It also contains helpful information about the installation process.

Running the installer

All Mark of the Unicorn software products are installed for you by an installer utility on the product's master disk. For software that ships on several disks, such as Performer, the master disk is the one with the glossy, colored label.

To run the installer:

1. **Disable all Control Panel Devices and Extensions, including virus protection utilities such as SAM, Virex, Vaccine, Disinfectant, or GateKeeper during the installation process.**

   These files can sometimes interfere with installation. To do so under System 7, restart or turn on your Macintosh with the shift key held down until you see the message, "Extensions Off", which appears right after "Welcome to Macintosh". Doing so turns off all extensions until the computer is restarted. Under System 6, remove all non-Apple INIT's and Control Panel devices from your System Folder and then Restart your Macintosh. It is especially important to do this right before you install the program and authorize the hard disk. Once the program has been installed and authorized, you can re-enable them.

2. **Insert the master disk and run the installer by double-clicking the icon called "Double-click to install".**

Figure 4-1: The Performer master disk, with the installation and authorizing utilities.

3. **Follow the directions that the installer gives you, and insert the appropriate disks when they are requested.**

   When you finish, the installer may ask you to restart.

   ☛ If you have more than one hard disk, the installer may only let you install on hard disks that have a System Folder on them. If you want to install on a disk that doesn't, install on a hard disk that does and copy the resulting folder to the desired disk afterwards.

For Quadra 900, 950 and IIfx users

If you have one of these computers, the installer places the Serial Switch control panel into the System. Before you proceed any further in the installation, you must set the Serial Switch control panel to *compatible* before you run Performer.

To set the Serial Switch control panel to *compatible*:

1. **Choose Control Panel from the Apple menu.**
2. **Double-click the Serial Switch icon.**
3. **Select the "Compatible" option.**
4. **Close the Control Panel and choose Restart from the Special menu.**

What does the installer do?

The installer checks the computer to make sure it meets the hardware and software requirements necessary to run the program. If so, the installer places the program in a folder on the top level of the hard disk, along with several additional files in some cases. The installer also adds other necessary files to your Macintosh System Folder such as fonts, system extensions, and other necessary items.

The following table provides a summary. The information in this table is subject to change.

Installed item:	Explanation:
Performer	The program itself is placed in a folder with the same name on the top level of your hard disk.
FreeMIDI System Extension	This system extension is placed in your System Folder and serves as an integrated MIDI operating system for all FreeMIDI-compatible software. It it required by all Mark of the Unicorn programs.
FreeMIDI Folder	This folder is placed in your System Folder and contains files that are required by FreeMIDI.
FreeMIDI Applications Folder	This folder is placed on the top level of your hard disk. It contains several programs that help you configure FreeMIDI.
FreeMIDI Setup™	FreeMIDI Setup is a program found in the FreeMIDI Applications folder. It allows you to create a FreeMIDI Configuration, which describes your MIDI studio and is required for MIDI recording and playback.
PatchList Manager™	PatchList Manager™ is a program in the FreeMIDI Applications folder. It obtains the names of the sounds in your MIDI synthesizers so you can choose sounds by name from within any FreeMIDI-compatible program.

Serial Switch	If you have a Quadra 900, 950, or Macintosh IIfx, this system extension is placed in the Control Panels folder by the installer to allow MIDI communication on the modem and printer ports. Without it, none of your MIDI software would work. Once it is installed, it must be set to "Compatible" mode.
Unicorn Power	If you have a Macintosh PowerBook 140, 145, 145B, 160, 165, 165c, 170, 180, or 180c, this system extension is placed in the Control Panels folder by the installer to provide error-free MIDI communication on the modem and printer ports. Without it, you might have trouble using Mark of the Unicorn software.
Performer Help	Leave this file in the Performer folder. It contains all of the information provided by Performer's online help feature.
Performer Fonts	This font suitcase contains several fonts required by Performer, and they are placed in your System by the installer. The fonts are: QuickScribe, PerfPrintGeneva 9, and PerfPrintIcons 12.

Authorizing your hard disk

Performer requires you to authorize your hard disk. Authorizing allows the program to run without asking you to insert the master disk. Otherwise, the program will ask you to insert the master disk each time you run it, briefly scanning the disk before opening.

In some situations, you may not want to authorize. For example, you may be working at a temporary location. If you don't want to authorize, do not double-click the Authorizer. Instead, see "Running programs without authorizing" on page 38.

To authorize a hard disk:

1. **If the master disk is not currently in a disk drive, insert it now.**

2. **Double-click the Authorizer/Deauthorizer on the master disk to authorize your hard disk.**

3. **Follow the directions that appear on the screen.**

   If you have more than one hard disk, be sure to authorize the disk from which you will be running the program.

Mark of the Unicorn programs do not authorize one another. For example, if you authorize your hard disk for Performer, and you have Unisyn, you need to authorize the hard disk for Unisyn using the Unisyn master disk.

What next?

The rest of this chapter tells you several things you should know about authorizing and deauthorizing. After you complete this chapter, proceed to the next one, chapter 5, "Getting Started With FreeMIDI ™". It has important information about setting up your FreeMIDI configuration, which is essential for all Mark of the Unicorn MIDI software products.

About authorizing

Once you have authorized your hard disk as described earlier, the program will run without asking for the key disk. Because the authorization is not specific to one copy of the program, you can even make several copies of the program on the hard disk, including updated versions. Likewise, you can drag a copy of the program to the trash without losing the hard disk authorization.

A master disk can authorize one hard disk. Mark of the Unicorn provides a second, identical back-up master disk free of charge when you mail in your signed registration card. This backup disk should be stored in a safe place and only used if the original master disk authorization somehow becomes damaged.

Deauthorizing a hard disk

If needed, you can deauthorize the hard disk for any reason, such as to reformat the disk, switch to a different hard disk, etc. To deauthorize a hard disk, insert the original master disk, open the disk, and double-click the Authorizer/Deauthorizer. From there, just follow the instructions provided on the screen and click the Deauthorize button when it is presented to you.

☛ If the Deauthorize button is greyed out (can't be clicked), you are not using the master disk that you originally used to authorize. Quit and check your other master disk using this same procedure.

Deauthorize before reformatting a hard disk

If you reformat an authorized hard disk, it loses its authorization. Therefore, always deauthorize an authorized hard disk before you reformat it. After reformatting, you can authorize it again.

Handling hard disk emergencies

If your hard disk fails before you have an opportunity to deauthorize it, use your backup master disk to authorize a new, repaired, or reformatted hard disk. (Disk authorizations cannot be restored from hard disk backups.) Contact Mark of the Unicorn technical support for information about getting a replacement authorization. Telephone: (617) 576-3066. Fax: (617) 576-3609.

Running programs without authorizing

If you would like to install and run a program without authorizing the hard disk, do not run the Authorizer/Deauthorizer on the master disk. Instead, launch the copy of the program on your hard disk. Insert the master disk when it asks you to do so. At the first window you see, click Continue instead of Authorize. The master disk will be scanned briefly, and the program will open without authorizing the hard disk.

About the authorization procedure

Mark of the Unicorn's installation/authorization process is different from past installation procedures.

- It authorizes the entire hard disk rather than a specific copy of the program.
- Once a hard disk is authorized, any copy of the program will run without the master disk, including updates. In fact, you can have two or more copies of the program on the same authorized hard disk and all copies will run without asking for the master disk.
- Updating is much easier: you drag the update onto the hard disk as you would drag any file.
- Authorization is *not* lost by dragging the program icon into the trash. (The hard disk remains authorized even when there is no copy of the program present.)

Taking care of your master disks

The master disk for authorized programs like Performer is crucial, as is the backup key disk that you receive in return for your registration card. Without one or the other, you cannot install and use the program. Treat them with care, and store them in a safe place when you are not using them!

☛ Rule of thumb: always keep your original disks locked. The only exception is that you need to unlock the master disk briefly during the process of authorizing and deauthorizing your hard disk. At all other times, we strongly recommend locking all original disks.

Chapter 5 Getting Started With FreeMIDI™

Introducing FreeMIDI

FreeMIDI is a Macintosh system extension that is automatically placed in your Macintosh System Folder when you install any Mark of the Unicorn software product. FreeMIDI provides many advantages for all FreeMIDI-compatible software. Here are a few of the most important features. FreeMIDI provides:

- A "virtual" studio on your Macintosh that graphically mirrors your entire MIDI hardware setup and that is shared by all FreeMIDI-compatible programs
- A simple, intuitive pop-up list of your MIDI devices whenever you need it in any FreeMIDI program
- An intuitive sound list for each one of your MIDI devices, which makes it easy for you to choose patches by name
- The ability to use several FreeMIDI-compatible programs simultaneously (for example, you can play back Performer while editing patches in Unisyn at the same time)
- The ability to start playback, stop playback, rewind and cue all FreeMIDI-compatible programs at once

This chapter is required

This chapter takes you through the initial process of creating your FreeMIDI studio configuration, which Performer requires. This chapter represents the bare minimum necessary to get MIDI input and output going. A section at the end tells you where to go for further information about FreeMIDI.

Are you in a hurry?

If you are in a hurry, see "For MIDI Experts: Setup overview and quick-start guide" on page 42.

You can skip this chapter if...

You can skip this chapter if you already have another FreeMIDI-compatible program for which you have already created a FreeMIDI configuration and successfully achieved MIDI input and output with the Macintosh.

For MIDI Experts: Setup overview and quick-start guide

If you already have experience with the Macintosh, MIDI, or Mark of the Unicorn software, and you are in a hurry, this overview should give you a pretty good idea of what you need to do to make the transition to FreeMIDI. A page number is included next to each step so you can get more detailed information about that step.

To install FreeMIDI:

1. **Set up your MIDI gear. (page 43)**

   Make sure that your MIDI gear is connected and turned on, including your MIDI interface.

2. **If you use OMS, decide if you want to use FreeMIDI instead, and, if so, install the OMS emulator as described in "Emulating OMS" on page 176.**

   FreeMIDI can emulate the Opcode MIDI System™ (OMS), allowing you to completely remove OMS from your system if you like. If you use software that requires OMS, you have two choices:

   - you can remove OMS (by dragging the OMS system extension out of the System Folder) and install the FreeMIDI emulator. (See page 176 for details.)
   - You can use both OMS and FreeMIDI independently.

   If you aren't sure what you want to do, see "OMS Compatibility" on page 175 for more information about making this decision.

3. **If you use any program that requires MIDI Manager, install the FreeMIDI MIDI Manager driver as described in "FreeMIDI and MIDI Manager" on page 179.**

   MIDI Manager adds much complexity. Only use it if you have a program that absolutely *requires* it. Remember, if you have applications that need to run simultaneously (such as Digidesign's Sample Cell™ software), and they support FreeMIDI or OMS, you don't need MIDI Manager.

4. **Run FreeMIDI Setup. (page 46)**

   This application is located in the FreeMIDI Applications folder.

5. **Set the FreeMIDI System Preferences to tell FreeMIDI Setup which serial ports to search for MIDI interfaces. (page 51)**

   The preferences dialog should appear automatically. If it doesn't, choose FreeMIDI Preferences from the File menu.

6. **Create your FreeMIDI Configuration by defining each device one at a time or, if possible, by defining them automatically using one of several shortcuts.**

   In a nutshell, here are the three shortcuts. Choose the one that best suits your situation:

   - Use the Auto Config button option in the Quick Setup dialog box to have FreeMIDI search for all the devices in your studio automatically. This only works for devices that are connected with both their MIDI IN and MIDI OUT. (page 51)
   - Use the Continue button in the Quick Setup dialog box to define each device by hand using pop-up menus to indicate manufacturer, model, and device ID. (page 56)
   - Use the Open command in the File menu to open an existing Performer (version 4.2 or earlier), Digital Performer (version 1.4 or earlier), or OMS (version 1.2.1 or earlier) configuration file. The Performer configuration can be loaded from any source, either a regular Performer file or a separate configuration file. (page 55)

7. **Use the Save command in the File menu to save the FreeMIDI Configuration to any location on your hard disk.**

8. **Use the *Check Connections* command in the MIDI menu to make sure that FreeMIDI is successfully sending and receiving MIDI data to and from your MIDI devices. (page 62)**

9. **Quit FreeMIDI Setup.**

   You will now be ready to use any FreeMIDI-compatible software. You do not need to keep FreeMIDI Setup open.

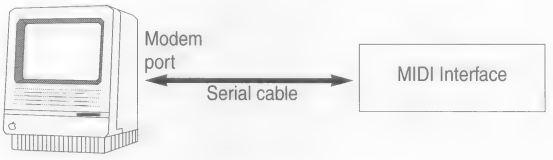
Setting up your MIDI equipment

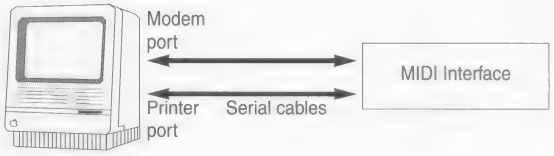
Before you set up FreeMIDI, connect your MIDI hardware to the Macintosh. To so do, you will need:

- Any standard MIDI/Macintosh interface
- At least two MIDI cables
- At least one MIDI device

1. **Before you start, make sure the Macintosh is turned off.**
2. **Connect the MIDI interface to the Macintosh.**

   Refer to the owner's manual of the interface for specific directions. FreeMIDI can send and receive MIDI information through *both* the modem and printer serial ports on the back of the Macintosh. If your interface connects to only one, and the owner's manual does not specify which port to use, connect it to the modem port. If you have a MIDI Time Piece II or a MIDI Express interface, connect it to the modem port. You can also connect two separate interfaces, one to each port, or a single interface that attaches to both.





Printer port icon

Modem port icon

3. Connect your MIDI device(s) to the interface as shown in one of the following diagrams.

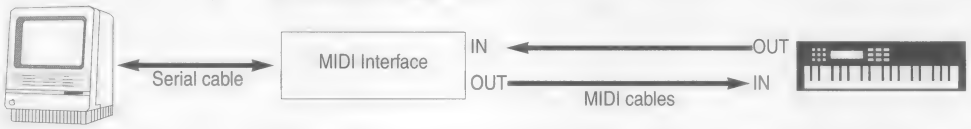


Figure 5-1: Connecting a single MIDI device. Connect the device's MIDI OUT and MIDI IN ports to the MIDI interface as shown here.

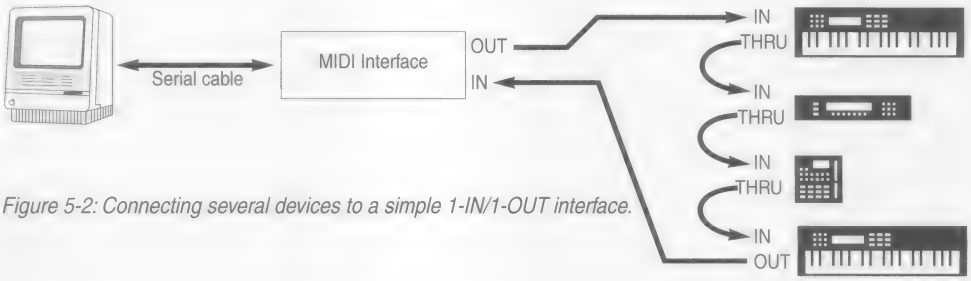


Figure 5-2: Connecting several devices to a simple 1-IN/1-OUT interface.

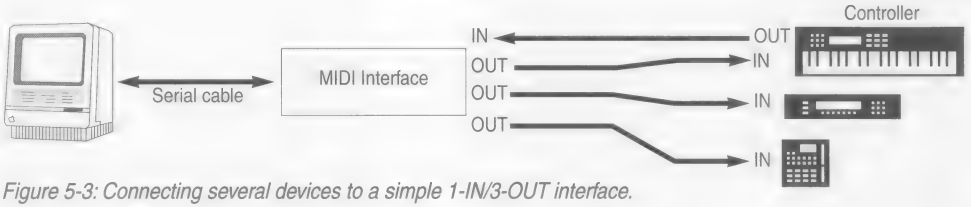


Figure 5-3: Connecting several devices to a simple 1-IN/3-OUT interface.

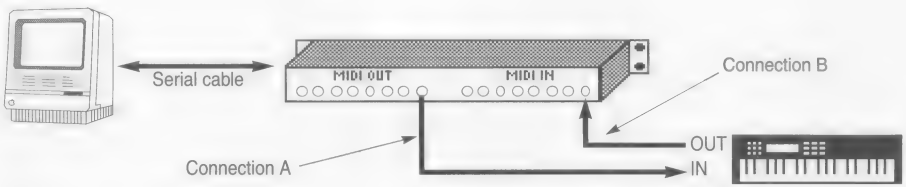


Figure 5-4: Connecting several MIDI devices to a multi-port interface such as the MIDI Time Piece II.

Setting up FreeMIDI

Installing FreeMIDI

Once your MIDI hardware is connected to the computer, you are ready to begin setting up FreeMIDI.

FreeMIDI is automatically installed in your System Folder when you install Performer as described in the previous chapter.

OMS compatibility

If you currently use the Opcode MIDI System (OMS) and it is required for OMS applications that are not yet FreeMIDI-compatible, you can use FreeMIDI to emulate OMS. We recommend that you proceed now to Appendix A, "Using FreeMIDI with OMS" in this booklet for information on enabling FreeMIDI's OMS emulation. After enabling OMS Emulation, please return to this page to continue your FreeMIDI configuration session.

FreeMIDI Setup can read OMS configuration files created by OMS 1.2 and 1.21 and translate them into FreeMIDI configurations. Please read on for more information on this feature.

MIDI Manager compatibility

If you need to use applications that require MIDI Manager and do not yet support FreeMIDI, we recommend that you proceed now to "FreeMIDI and MIDI Manager" on page 179 for information on installing the FreeMIDI MM Driver for MIDI Manager. After installation the FreeMIDI MM Driver, please return to this page to continue your FreeMIDI configuration session.

What is a FreeMIDI configuration?

A *FreeMIDI configuration* is a file that you create and save on your hard disk using a program called *FreeMIDI Setup*. The file contains a graphical representation of the MIDI hardware devices in your studio, and it shares this list of devices with all FreeMIDI applications.

Here is an overview of the process we will go through in this chapter to create it:

1. Run FreeMIDI Setup.
2. Set the FreeMIDI System Preferences to tell FreeMIDI Setup which serial ports to search for MIDI interfaces.
3. Create your FreeMIDI Configuration by defining each device one at a time or, if possible, by defining them automatically using one of several shortcuts.
4. Save the FreeMIDI Configuration to disk.

5. Use a feature called *Check Connections* to make sure that FreeMIDI is successfully sending and receiving MIDI data to and from your MIDI devices.

Launching FreeMIDI Setup

Locate the FreeMIDI Setup program. During installation, it is placed in the FreeMIDI Applications folder on the top level of your hard disk.

1. **Double-click the FreeMIDI Setup application icon to launch the program.**

   After the initial splash screen, the *Welcome to FreeMIDI* dialog box appears:

Figure 5-5: Welcome to FreeMIDI Dialog Box

2. **Click Continue.**

   The FreeMIDI Preferences dialog box appears.

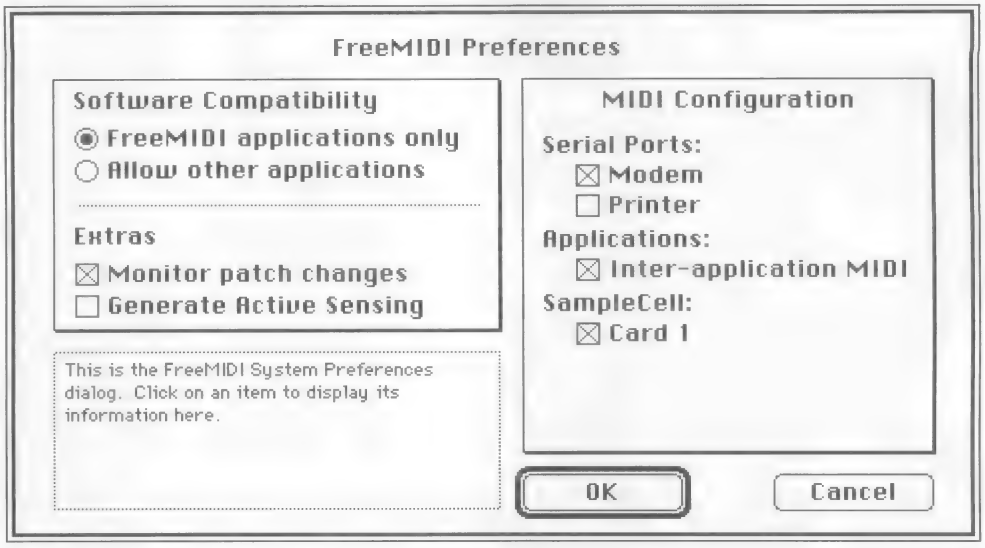


Figure 5-6: FreeMIDI Preferences Dialog Box.

3. Set the FreeMIDI Preferences as described below.

Preference	How you should set it
Software compatibility	Choose the *FreeMIDI Applications only* option, unless you want to run other non-FreeMIDI software at the same time as FreeStyle. If so, use the *Allow other applications* option. This option may also be necessary if you have FAX/modem, networking, or other communication software that requires access to the modem or printer port while FreeMIDI applications are running.
MIDI Configuration	Click the check box for each serial port (modem and printer) to which you have a MIDI interface connected. Be sure your MIDI gear is turned on.
Inter-application MIDI	Leave this option unchecked, unless you have another FreeMIDI program that requires that it be checked.
Sample Cell	If you have a Digidesign Sample Cell or Sample Cell II card installed in your Macintosh, check its box.
Monitor patch changes	Make sure this option is checked.
Generate active sensing	Leave this option unchecked, unless you have a MIDI device in your studio that does not function correctly unless it receives Active Sensing data at all times. In our experience, the only MIDI devices that are in this category are some Yamaha Clavinova-series electric pianos.

4. **Before you click OK in the Preferences dialog box, check to be sure that your MIDI interfaces are connected and powered-up.**

5. **Click OK to confirm your preference settings.**

   When you click OK, FreeMIDI Setup scans the serial port(s) that you have selected for MIDI interfaces. If you selected the printer port option under MIDI Configuration, and AppleTalk is enabled on the printer port, a warning alert box appears to ask if you would like to claim the printer port for MIDI.

Figure 5-7: AppleTalk Warning Alert

6. **If you are using AppleTalk for network communications or an AppleTalk printer, you should click *Leave it alone* and re-think your MIDI studio setup.**

   Otherwise, click *Claim the port* and FreeMIDI will be able to use the printer port for MIDI. If you do so, remember to disable AppleTalk in the Chooser when you are through configuring FreeMIDI in order to avoid seeing this warning alert again. If you are using AppleTalk for an Ethernet network and your Ethernet connection is made via NuBus or SCSI or some other bus that does not utilize the printer port, FreeMIDI should not ask about disabling AppleTalk and network communications should not be interrupted.

7. **If there are interfaces in your setup that are not powered on or connected properly, FreeMIDI Setup cannot find them.**

   If FreeMIDI cannot find any interfaces, the No Interface Found dialog appears:

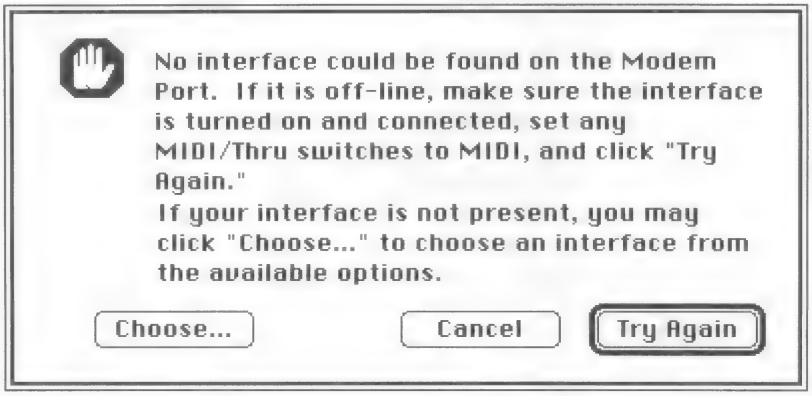


Figure 5-8: No interface Found Dialog Box

8. **Check the connections and power switches and any MIDI/Thru switches on your interfaces and click Try Again.**

   If your interfaces are not currently connected or not powered on, you can still create a FreeMIDI configuration at this time, but you will need to use the Update Interfaces feature. For more information, see "Adding Interfaces" on page 701 in the Performer Reference Manual. If FreeMIDI Setup cannot find some or all of your interfaces and you believe that they are connected properly and are powered on, proceed to Appendix C, "Troubleshooting FreeMIDI".

Initiating the Auto Config process

After you click Begin, FreeMIDI checks every cable on all of your MIDI interfaces for MIDI devices. The piano keyboard progress bar gradually fills up as FreeMIDI searches your studio for MIDI devices as shown in Figure 5-10 on page 51.

As FreeMIDI finds MIDI devices, it lists them in the status box below the piano keyboard. If you have the *FreeMIDI Applications only* option set in the FreeMIDI preferences, you can even switch out of FreeMIDI Setup to another application and FreeMIDI will continue searching your studio for MIDI devices while you do other work on your Macintosh! If you have the *Allow other applications* option set in the FreeMIDI Preferences, you can still switch to another application during the Auto Config procedure, but FreeMIDI will stop searching for MIDI devices until you switch back into the FreeMIDI Setup application.

This search can take several minutes depending on the number of MIDI devices and the type and number of MIDI interfaces in your studio. Click *Stop* if you want to interrupt the search process at any time and Auto Config will stop searching for MIDI devices. The Quick Setup dialog box opens and displays all the devices found up to that point.

Keep in mind that Auto Config may not be able to find *all* the MIDI devices in your studio. It is also possible that one MIDI device from a manufacturer could not be distinguished from another, closely related MIDI device from the same manufacturer. An example of this

A few things that can happen during Auto Config

If you have a MIDI device that echoes (merges) incoming MIDI data to its MIDI out, this may cause errors during the Auto Config process. For best results, we recommend disabling this feature. Unfortunately, in some MIDI devices, echoing cannot be disabled. If this is the case, we recommend powering off these units until Auto Config is complete. You can then power them back up and add them to your FreeMIDI configuration manually. Some examples of such devices are the Yamaha KX-88 and Roland SBX-80.

Due to their MIDI implementation, some MIDI devices may display "MIDI Buffer Full", "MIDI Overflow error" or "device ID number mismatch" error messages in their front-panel display during Auto Config. This is due to the large number of sysex messages that are sent to each device. Don't worry. This is harmless. (Hopefully, more and more manufacturers will support the universal MIDI device inquiry message, which will prevent messages like these.)

Some MIDI devices may be found more than once because they are able to respond to more than once device ID at a time. If possible, try to set these devices to a single ID before using Auto Config.

is the Korg M1 family, which consists of the M1, M1R, M1EX, and M1REX. Auto Config will probably find all of these units and identify them all as Korg M1s.

To fine-tune and finalize your configuration, proceed to "Adding devices manually with Quick Setup" on page 56.

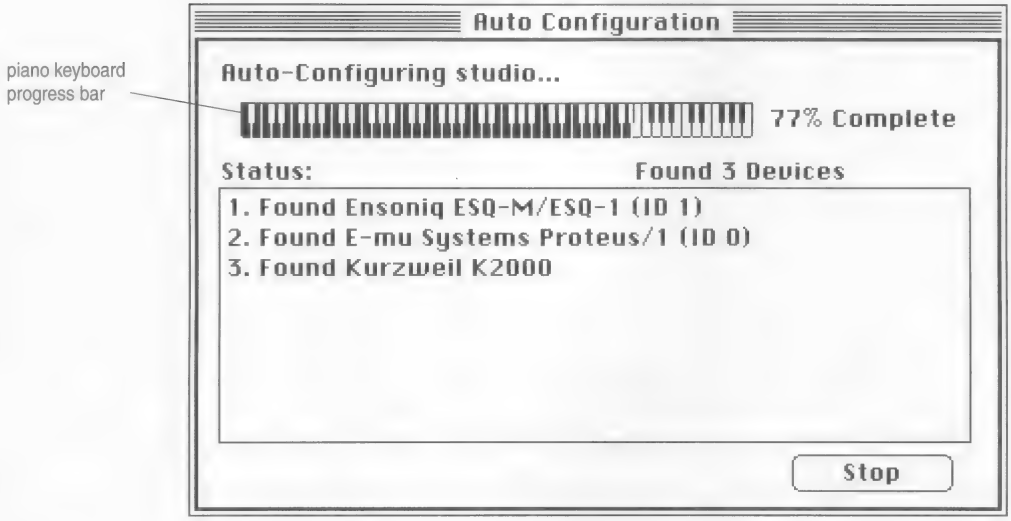


Figure 5-11: Auto Config Progress Window

Customizing Auto Config

If you know which MIDI devices are in your studio, click *Customize...* so that you can tell FreeMIDI what devices to search for. This can greatly reduce the amount of time it takes for Auto Config to find your MIDI devices.

1. **After clicking *Customize*, the Customize dialog box appears as shown in Figure 5-12.**

   If you change your mind and no longer want to customize Auto Config, but you still want FreeMIDI to search for MIDI devices and configure your studio automatically, click *Simplify* to return to the Auto Config dialog box and proceed to "Initiating the Auto Config process" on page 52.

2. **Select a device or devices from the list on the left and click *Add*.**

   To select more than one device, command-click each device that you wish to add. Shift-drag to select multiple devices that are together in the list. To select all the devices from the list at once, click *Add All*.

3. **If you accidentally add a device or some devices for which you do not want FreeMIDI to search, select the device or devices from the list on the right and click *Remove*.**

4. **Keep adding devices until you have told FreeMIDI about all the devices in your studio that are in the list.**

5. **When you are done, click *Begin*.**

   FreeMIDI proceeds to check every cable of all of your MIDI interfaces for all the MIDI devices you have defined. You'll see the progress dialog box shown in Figure 5-10 on page 51.

6. **Proceed to "Initiating the Auto Config process" on page 52.**

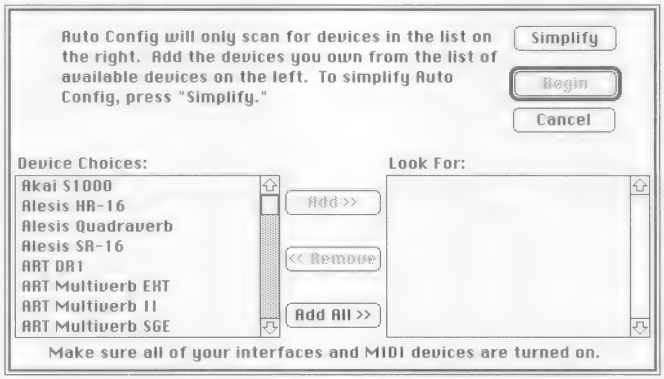


Figure 5-12: Auto Config Customize Dialog Box

Translating Performer, Digital Performer, or OMS files

FreeMIDI Setup can open configuration files created by Performer 4.2, Digital Performer 1.4, or OMS Setup 1.2 or 1.21 and create a FreeMIDI configuration that closely matches *this configuration*. This can save a considerable amount of setup time. When translating Performer and Digital Performer configurations, you can open either a regular Performer/Digital Performer file or the configuration file, which may be saved separately.

To translate any of these files:

1. **Choose Open from the File menu. Alternately, you can type command-O on your Mac keyboard.**

   A standard Macintosh File Open dialog box opens.

2. **Select the Performer, Digital Performer, or OMS Setup file that you wish to translate and click Open.**

   Use the directory pop-up menu to navigate to the disk and folder that contains the configuration you wish to translate. See your Macintosh owner's manual for more information on opening files and navigating to disks and folders.

3. **The selected file is translated as closely as possible into a FreeMIDI configuration.**

If, after the translation process, all of your MIDI devices now appear in the FreeMIDI Configuration window and are connected to the proper MIDI interface input and outputs, proceed to "Arranging the FreeMIDI Configuration window" on page 58 in this chapter for the next steps in the configuration process.

You may find, however, that some devices are misnamed, missing, incorrectly duplicated, or improperly defined. If so, you will need to edit the configuration using Quick Setup:

1. **Choose *Quick Setup* from the Configuration menu and click Continue.**

   The About Quick Setup dialog box appears.

2. **Click *Continue*.**

3. **Proceed to "Adding devices manually with Quick Setup" on page 56.**

Adding devices manually with Quick Setup

At this point, you have completed one of the following:

- You have just completed the Auto Config process (the search is 100% complete).
- You have just translated a Performer, Digital Performer, or OMS file and have skipped to this step.
- You have just clicked the Quick Setup button to configure your studio manually.

In any case, you now see the Quick Setup dialog box on-screen as shown below in Figure 5-10.

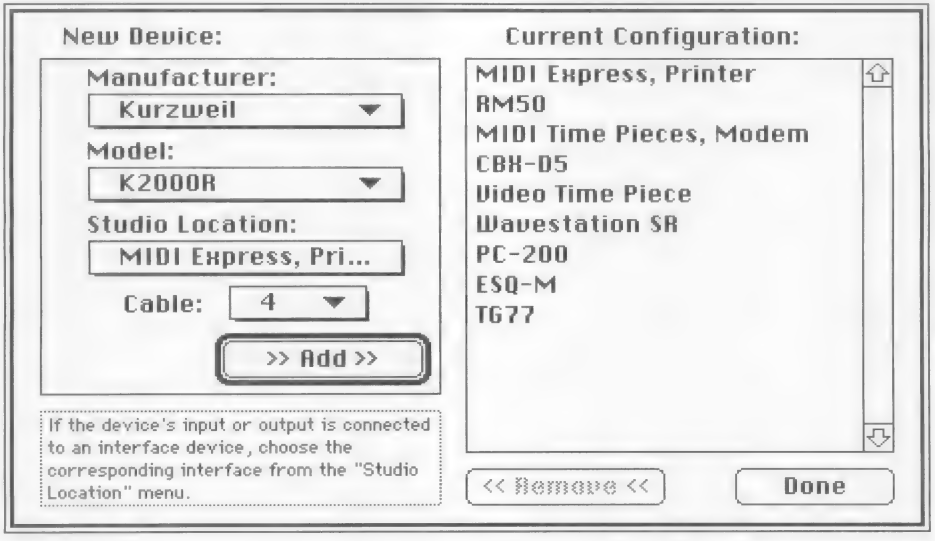


Figure 5-13: Quick Setup Dialog Box

If all the MIDI devices in your studio already appear in the list, you are done! Click *Done* and the FreeMIDI Configuration window will appear containing all your MIDI devices and their connections. If there are no devices listed, or the list is incomplete, you will now need to tell FreeMIDI about these devices manually as follows:

1. **Select the correct manufacturer, model, studio location and cable (if applicable) from the pop-up menus on the left and then click *Add Device*.**

   If the pop-up menus do not contain a description of a particular device, choose *Other* and click *Add Device*. The first generic device you add is given the name *Device-1*. You will learn how to re-name and re-define these devices later on.

2. **If Auto Config found devices that are not the exact model installed in your studio, such as a Korg M1 instead of a Korg M1R, you can easily edit these devices.**

   Select the device on the right and click Remove. Now choose a new model from the pop-up menu on the right and click add. A new device is added with the same manufacturer and studio location.

3. **When you have added all the devices to the list that are in your studio, click *Done*.**

   The FreeMIDI Configuration window appears, displaying all of your MIDI devices and their connections.

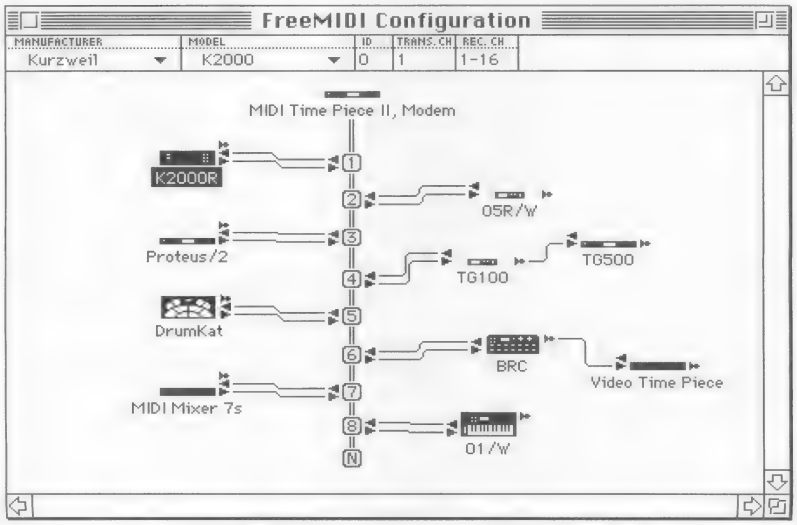


Figure 5-14: FreeMIDI Configuration Window

The Clean Up Window Command

You can use the Clean Up Window command in the Views menu to quickly arrange all the devices in the window into uniform columns.

Arranging the FreeMIDI Configuration window

You can arrange the FreeMIDI Configuration window any way you like. We suggest that you drag device icons so that they appear as they do in your studio. For instance, you can arrange all the modules to the left of your Mac on the left side of the window and do the opposite for the modules to the right of your Mac. You can drag the patch cords, which connect the devices to the interfaces, up or down so that you can view the connections clearly. You can drag MIDI ports in a multi-cable interface, such as the MTP, MTP II or MIDI Express, up or down to create more or less space between them. You can delete input or output cables, which are not part of your studio setup, by clicking the patch cord to select it and typing the backspace or delete key on your Mac keyboard. You can also make and break connections by just dragging the ends of the patch cords. You can use the different options in the Views menu to change the size of the icons and to view input and outputs separately, together, or only when the device to which they are connected is selected.

Making MIDI thru connections

When more than one MIDI device shares a single output port from a MIDI interface, you need to connect the MIDI Thru port of the device to the input of the other device. This mirrors the physical connection that you should have between the devices.

Figure 5-15:MIDI Thru Connection

Making multiple MIDI input connections

FreeMIDI Setup allows you to connect more than one MIDI output from a device to a single MIDI input on an interface. When you make such a connection, you are telling FreeMIDI that both devices' MIDI outputs are connected to a single MIDI input on an interface. Without some type of MIDI merger, this type of connection is not possible.

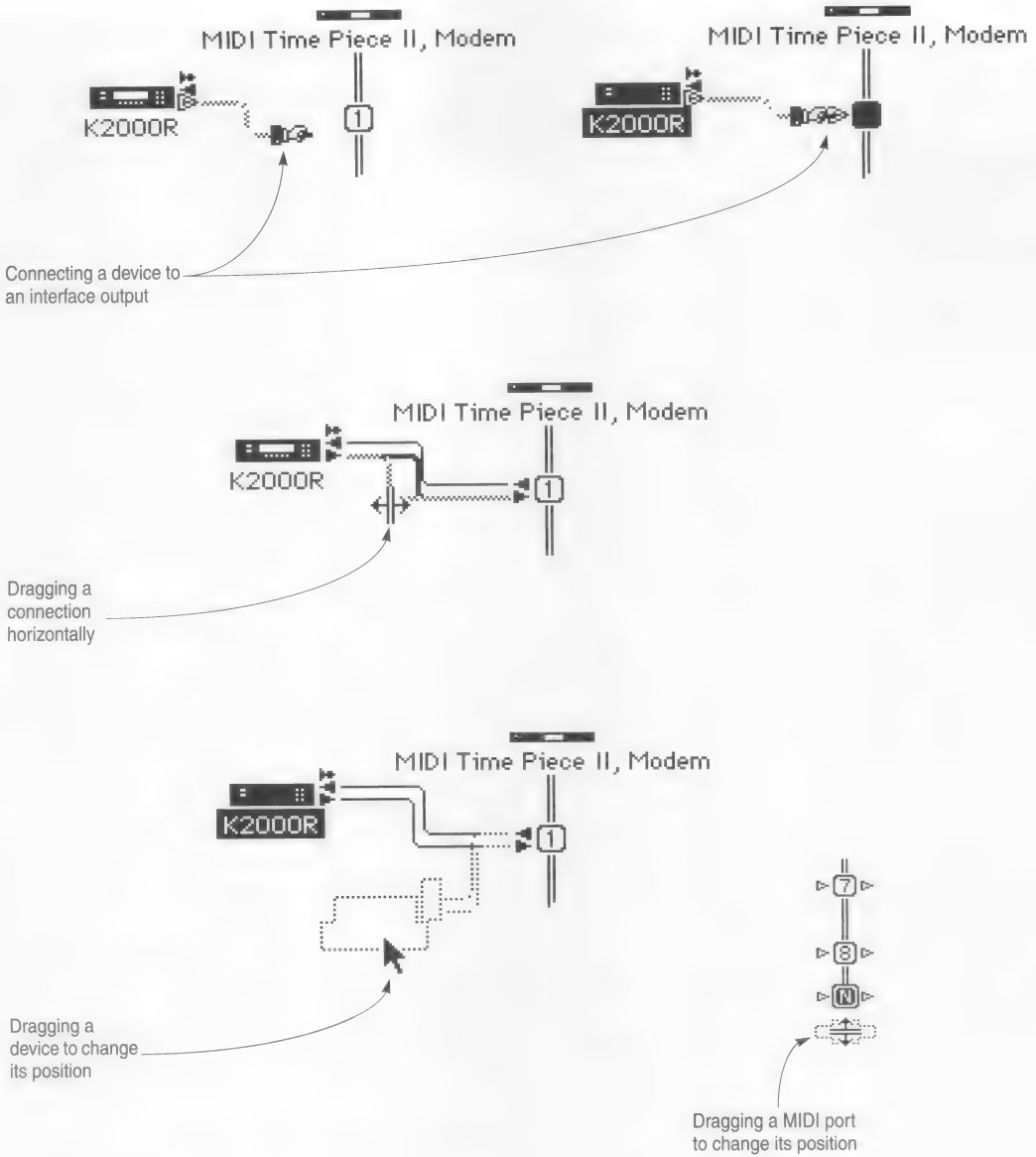


Figure 5-16: Arranging FreeMIDI devices and connections

Connecting devices to other devices

FreeMIDI Setup allows one connection per port (input output, or thru) on each device. You cannot connect devices to each other except from MIDI Thru to MIDI In of a separate device. If you would like to make such connections, use the Cable Routing (on MIDI Time Piece and MIDI Express interfaces) or similar features in your MIDI interface or MIDI patch bay/merger gear.

Using MidiLocate to make connections

MidiLocate is a unique feature designed to make adding devices to your FreeMIDI configuration easier. In this mode, FreeMIDI automatically determines the proper input cable to which a device is physically attached and then displays this connection in the FreeMIDI Configuration window.

MidiLocate is a checkable menu item. This means that its state (on or off) is toggled each time you choose it from the menu. When there is a check next to the MidiLocate menu item in the MIDI menu, MidiLocate is enabled.

To use MidiLocate:

1. **Select a FreeMIDI device in the FreeMIDI Configuration window.**
2. **Check to be sure that MidiLocate menu item in the MIDI menu is enabled.**

   The MidiLocate command should have a check next to its name. If it does not, choose it to select it. You can also use the Mac keyboard shortcut to toggle the state of MidiLocate by typing command-L.

3. **Play some MIDI data from the MIDI device.**

   FreeMIDI will determine from where the MIDI data is coming and redraw the FreeMIDI Configuration window to indicate the appropriate connection.

Here is an example of MidiLocate in action. Let's say you have a Kurzweil K2000 that is connected to some MIDI input on your MTP II, but you are not sure which input:

1. **Add a K2000 FreeMIDI device your configuration using *Quick Setup* or *Create Device*.**
2. **Enable MidiLocate.**

3. **Select the K2000 device by clicking its icon.**

4. **Play some notes on its keyboard or send some other MIDI data from it and the K2000 device automatically is connected to the correct MIDI input port on your MTP II in the FreeMIDI Configuration window.**

Saving the FreeMIDI Configuration

Once you have a FreeMIDI configuration, it is a good idea to save it to disk so that you will not have to configure FreeMIDI for your studio again.

To save your configuration:

1. **Choose Save from the File menu. Alternately, you can type command-S on your Mac keyboard.**

   A standard Macintosh File Save dialog box opens.

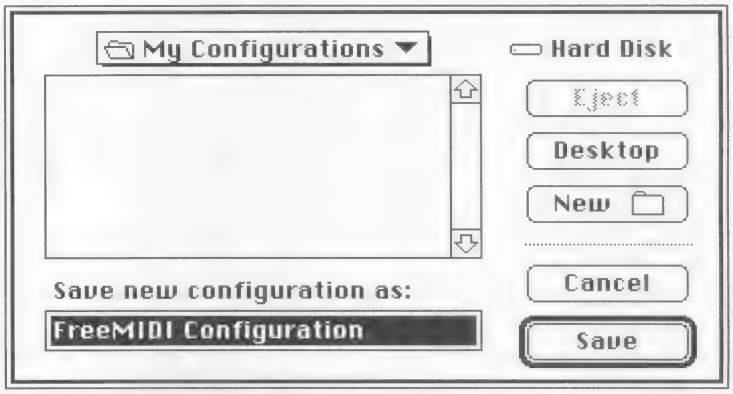


Figure 5-17: Macintosh File Save dialog box

2. **Use the suggested name "FreeMIDI Configuration" or enter another name for your configuration, if you like, and click *Save* or click *Cancel* to cancel the operation.**

   Use the directory pop-up menu to navigate to a disk and folder in which you wish to save this configuration.

   ☛ If you are using System 7, you can use the New Folder button to create a new folder in which to save this configuration and others that you might create in the

future. See your Macintosh owner's manual for more information on saving files and navigating to disk and folders.

The current FreeMIDI Configuration

There is no need to make this configuration "current". Whichever configuration is visible in the FreeMIDI Configuration window is the current configuration that all FreeMIDI applications will use. Whenever you launch FreeMIDI Setup to view or edit your FreeMIDI configuration, the configuration document with which you were last working is opened automatically.

Testing for MIDI input and output

You are almost done setting up your FreeMIDI configuration. The last thing you need to do is test the MIDI connections between your MIDI devices and FreeMIDI. To test for MIDI input and output:

1. **Choose *Check Connections* from the MIDI menu.**

   This command puts FreeMIDI Setup in a special studio testing mode which allows you to easily test MIDI inputs and outputs. When the menu item is checked, Check Connections mode is enabled and the mouse cursor will change to the Check Connections cursor as shown in Figure 5-10 below.

Figure 5-18: Check Connections mouse cursor

2. **Check MIDI input by playing notes on your MIDI controllers or sending other MIDI data such as patch changes, controller data or system exclusive data from your other MIDI modules.**

   When FreeMIDI is receiving MIDI correctly in Check Connections mode, the MIDI port to which the MIDI device sending the MIDI data is connected will flash the eighth note symbol as shown in Figure 5-10 below. If no activity is indicated, check to be sure that the MIDI device that is sending the data has its MIDI output connected to the proper MIDI input on your MIDI interface.

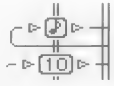


Figure 5-19: Incoming MIDI Data indicator

3. **Check MIDI output by clicking devices.**

   In Check Connections mode, FreeMIDI Setup generates a C major chord on the default play channel and sends it to the MIDI output to which the device you click is connected. If all is well, this device should play a C major chord. If the MIDI device does not play notes, check to be sure that the MIDI device has its MIDI input connected to a MIDI output on your MIDI interface.

Quitting FreeMIDI Setup

If your connections check out OK, you are finished! You are now ready to use any FreeMIDI-compatible software. All of your FreeMIDI configuration devices will appear in any places where you choose MIDI devices for playback and recording (input and output).

You do not need keep FreeMIDI Setup open. The only time you need to open FreeMIDI Setup is when you would like to make changes to your FreeMIDI studio configuration. Conversely, you can open FreeMIDI Setup at any time, even while you have other FreeMIDI-compatible programs open.

Where to go next

Regardless of your level of experience, turn now to chapter 6, "Starting Performer for the First Time" for some important things you need to know before you begin using Performer.

Chapter 6 Starting Performer for the First Time

Before you start up Performer for the first time, be sure that you have already completed the installation process described in the previous chapters. At this point, you should have:

- Connected your MIDI hardware to your Macintosh
- Installed Performer and FreeMIDI
- Authorized your hard disk to run Performer (if desired)
- Created your FreeMIDI configuration and tested your MIDI connections in the FreeMIDI Setup program

If you have completed the above installation procedures, you are now ready to start Performer.

To open Performer for the first time

To open Performer, double-click the Performer program icon.

The Performer program icon

Performer™

☛ If you see a message informing you that Performer cannot run yet because FreeMIDI is not installed in the system or because there is no FreeMIDI configuration yet, refer to the previous chapter in this booklet to make these preparations.

☛ The examples of Performer's windows that you see in this manual are what you see when Performer is running on a Macintosh with an 8-bit color monitor (with 256 colors). If you have a black and white monitor, what appears on your screen will be slightly different than what you see printed in this book.

Where to go next

At this point, you are ready to open a file to begin working with Performer. Where you go next depends on what you would like to do.

What you want to do:	Where to go next:
If you would like a brief overview of Performer	Turn to chapter 7, "Performer Overview: A Picturebook Tour" (page 69) in this guide.
If you would like a brief, step-by-step tutorial	Turn to chapter 8, "Getting Started: Recording Your First Track" (page 87).
If you would like an extensive tutorial about how to cycle-record and build a sequence	Turn to chapter 9, "Tutorial: Building a Sequence" (page 103).
If you don't read manuals and would like to begin sequencing right away	Go for it. Before you do, though, you might want to check out chapter 7, "Performer Overview: A Picturebook Tour" (page 69).
If you would like brief overview of the most recent changes in Performer	Turn to "What's New in Performer® 5" on page 13.
If you have a MIDI Time Piece II or a MIDI Express and you are just getting started with Version 5 and FreeMIDI	Turn to chapter 10, "Using Other FreeMIDI Releases with Performer" (page 151) for information about how to run their software with FreeMIDI and Performer Version 5.
If you would like to be able to choose sounds (patches) on your MIDI synthesizer by name in Performer and other FreeMIDI-compatible programs	Turn to chapter 48, "Using PatchList Manager" (page 725) in the Reference Manual. It discusses how to load lists of sounds into FreeMIDI from your MIDI gear. If you have Unisyn, also consult chapter 44, "Using Performer With Unisyn" in the Reference Manual.
If you would like to learn more about FreeMIDI	This installation guide has told you the basic things you need to know. However, FreeMIDI provides much more. For example, you can create your own icons for your MIDI devices in the FreeMIDI configuration. As another example, you can connect Performer's transport controls (play, stop, rewind) to another FreeMIDI application, like Unisyn, so that you can control Performer from Unisyn. For more information, the see the following FreeMIDI-related chapters in the Performer User's Guide: • chapter 46, "Using FreeMIDI Setup" • chapter 47, "Quick Reference for FreeMIDI Setup" • chapter 48, "Using PatchList Manager" • chapter 49, "Editing FreeMIDI Device Files"

Part III
Tutorials

Tutorials

Chapter 7 *Performer Overview: A Picturebook Tour*

If you don't like to read manuals

This chapter provides a quick overview of Performer's main features. Each page gives you a brief introduction to Performer's important windows and features. You'll probably get a good idea of how to get around in the program just by scanning these pages. Once you have, you'll be primed and ready for the step-by-step tutorials that follow. Or you can try to begin sequencing on your own.

Following along in Performer

You can read this tour without actually being in front of your computer and without running Performer. If you would like, however, you can run Performer so that you can try things in the software as you read. To do so, just double-click the Performer program icon now to launch the program (if you haven't already done so). A new file appears, and at the top of the window, you'll see... (turn the page)

The Consolidated Controls panel

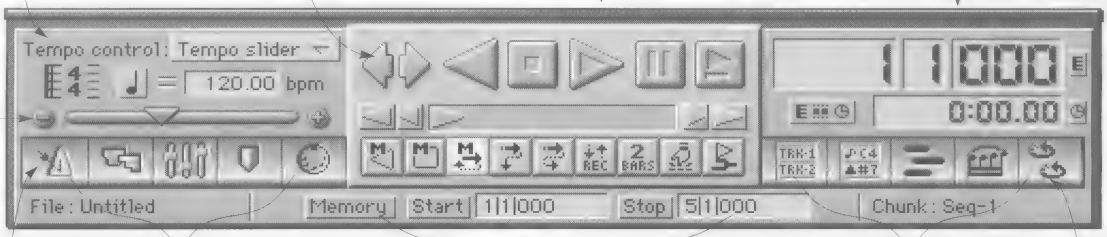
The Consolidated Controls panel provides tape-deck style transport controls, a metronome panel for tempo control, a counter, and buttons that open most of Performer's important windows. Because this panel is so central to Performer's operation, it appears whenever you open a new or existing file, and it cannot be closed.

Metronome Panel
Controls the tempo of the music. Drag the tempo slider, or type in the desired tempo in beats per minute.

Skip Buttons
You can have several—even many—sequences in one Performer file and skip between them, just like a CD player.

Transport Controls
Function just like a standard tape deck. From left to right: rewind, stop, play, pause, and record. The position bar below can be used to cue quickly anywhere in the music.

Counter
Displays the current playback time in the music in bars, beats, and ticks. There are 480 ticks per quarter note. The auxiliary counter displays one of Performer's other two time formats: real time or SMPTE time code.



Tempo Slider

Window Buttons
These buttons open windows for commonly used features in Performer, such as the Markers window.

Memory Bar
Displays the start and stop time of the memory-cycle playback loop. These are the locations Performer will shuttle between when Memory-cycle is turned on.

Window Buttons
These buttons open editing windows. From left to right: Tracks, Event list, Graphic Editing, and QuickScribe notation windows.

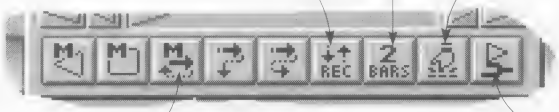
Metronome Click
Press this button to turn the metronome click on and off. Double-click it to set the click preferences.

Auto Record
Lets you automate recording punch-in and punch-out.

Countoff
Gives you a countoff before playback or recording. Double-click to set preferences.

Wait
Makes Performer wait for a MIDI event trigger or key press before it begins playback or recording.

Set Loop
Click this button to insert a permanent loop in the currently selected region in one or more tracks.



Memory Cycle
When this button is highlighted (on), Performer cycles playback and recording between the Start and Stop times displayed below in the Memory bar.

Overdub Record
During normal recording, Performer erases existing music in the track. Use Overdub Record to preserve existing material and merge new material with it. Use it whenever you are cycle-recording so that each new pass through the loop doesn't erase the last pass.

For more information, see chapter 5, "The Consolidated Controls Panel" (page 63) in the Performer Reference manual.

Performer's unique interface

Before you go any further, here are several unique aspects to Performer's overall design that you should be familiar with. They are easy to learn and streamline your working environment in Performer.

Pushdown button
The Pushdown button moves the window behind all other windows. This is useful when you don't want to close the window, but you'd like to move it out of the way temporarily.

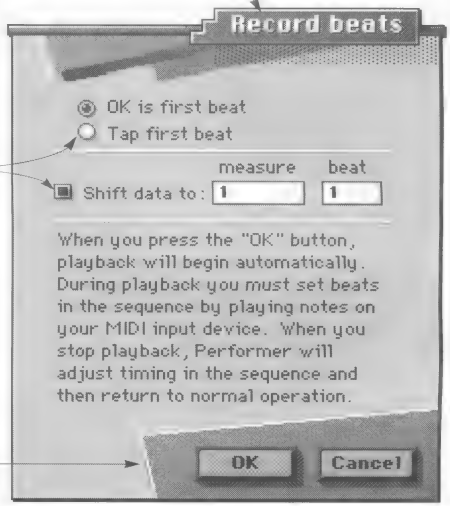
Zoom button
Opens the window to the full size of your screen or to a size that show all of its contents. If you click it again, it returns to its original size.

Close button
Closes the window.

Window mini-menu
Contains commands that apply only to the window that contains the menu. To pull it down, press on the menu icon and then select a menu option as you would in a standard Macintosh menu.

Drag the title bar of the dialog box to move it on the screen—in case you need to see something behind it before closing it.

Performer's three dimensional radio buttons and check boxes function just like standard Macintosh buttons. For example, you can click the text label of the button to select the button.



Three dimensional OK and Cancel buttons.

The Tracks Window

For more information, see chapter 12, "The Tracks Window" (page 163) in the Performer Reference manual.

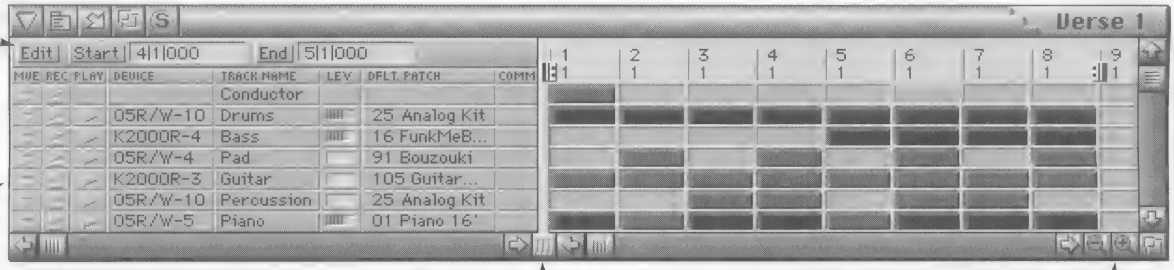
The Tracks window is based on the familiar concept of a multi-track tape deck. Each track can be play-enabled, recorded into, and soloed. Each track has an activity level meter, a MIDI playback assignment (one of the devices in your MIDI studio), a track name, comments, and perhaps an initial patch (sound) to play. You can add an unlimited number of tracks, and you can place them in any order in the list. The Tracks overview on the right provides you with a bird's-eye view of the music, showing which measures have music in them. You can drag segments that contain music to move them and to select them for editing. A scrolling playback indicator is also provided to show the current playback location.

Selecting and editing with The Edit Bar

The start and end times in the edit bar determine the region of time in the currently selected track(s) that will be affected by commands you choose from the Edit and Region menus. In addition to typing in times by hand, there are many useful shortcuts for setting the start and end times. For example, you can click the Start and End buttons to set them to the current playback location—even on the fly during playback. You can also double-click them to automatically go to the beginning or end of the sequence.

The Tracks Overview

Provides you with a view of the music in the tracks. The time ruler above indicates the measure in each column. The ruler also displays draggable memory-cycle repeat barlines and auto-record punch points. Double-click the ruler to make playback jump to that location. In the grid, colored segments contain music (or other MIDI data). Dark segments indicate dense data. Drag segments to move them. Click them or drag over them to select them for editing using the commands in the Edit and Region menus.



A track is represented as one row in the list. It has a move handle, record-enable button, play-enable button, MIDI device assignment (for playback), a name (option-click to rename it), level meter that shows MIDI activity, a default patch (sound), a current patch, and a comment. You can choose to hide any of these columns by double-clicking the column title. For example, if you never use default patches, you can hide the column. The **Conductor track** at the top of the list doesn't hold MIDI data; instead, it holds tempos, meter changes, key changes, and markers (explained later).

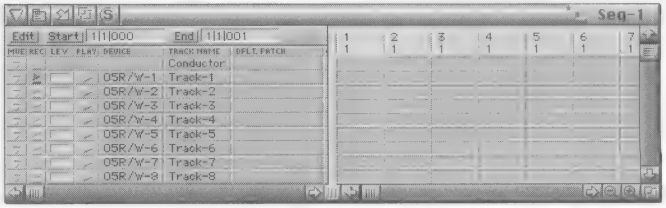
Divider

Drag this handle left and right to show more or less of the Tracks Overview.

The ruler can be **zoomed** to show more or less time in each column. Right now, each column represents one measure. You can zoom in, however, so that each column represents one beat. Or zoom out so that each column is two bars instead of one.

Opening a new file

When you open a new file, the Tracks window looks something like this. The columns may be in a slightly different order from left to right.



The Event List

The event list gives you a precise, numerical display of the MIDI data in a track. To open it, double-click the track name or a segment in the Tracks Overview. Or highlight either one and click the Event List button in the Consolidated Control panel. To temporarily hide any type of data, use the View Filter in the mini-menu.

For more information, see chapter 20, "The Event List Window" (page 257) in the Reference manual.

Event List button

Insert Menu
Select any type of data from this menu to insert it at any location in the track.

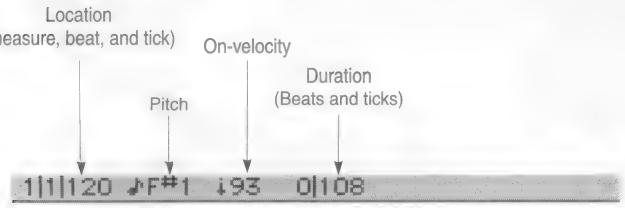
Solo button
Solos the current track during playback. Double-click the button to configure soloing.

Window Title
In all of Performer's edit windows, as a shortcut, you can switch to a different track by command-clicking the title to open a pop-up menu of other tracks.

Audible Mode
When this button is turned on, notes play when you click them. To play a phrase, select a group of notes and option-click the button.

Chord
These three notes are a chord because they all occur at the same time.

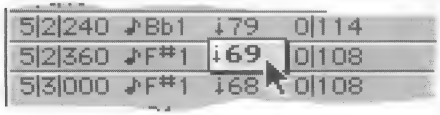
Selecting events
To select a single note or event, click it. To select several in a row, drag over them. (Use command-click to extend the selection.) Once you've selected notes, you can edit them any way you want with the commands in the Edit and Region menus.



A note event

Legend
Use the Legend in the Event List mini-menu to identify each type of MIDI data.

Pop-editing
Double-click any value to pop-edit it



The Graphic Editing window

The Graphic Editing window displays notes and MIDI controllers in a track on a piano-roll style grid. To open it, command-double-click the track name or any segment in the Tracks Overview. Or click them once and then click the Graphic Editing button in the Consolidated Control panel.

For more information, see chapter 21, "The Graphic Editing Window" (page 281) in the Reference manual.

Graphic Editing button

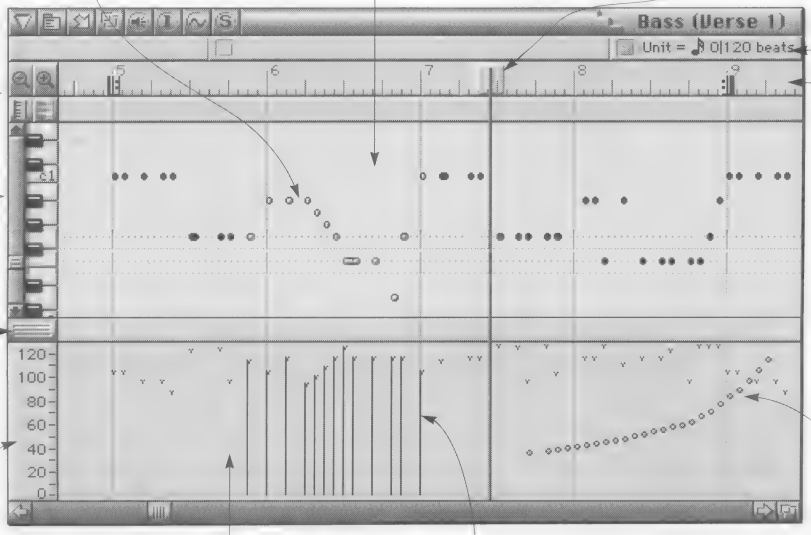
Zooming
Zoom the time ruler and pitch ruler with these buttons.

Selected Notes
To select several notes, drag the cursor over them, just like you would in a graphics program.

Note Grid
Insert and edit notes in this grid. Drag notes up and down to change pitch. Drag left and right to change their time. To change duration, drag the right end of the note.

Scrolling Wiper
Indicates the current playback location. Double-click anywhere in the ruler to make the playback wiper jump to that location.

Edit Resolution
Check the Edit resolution box to make everything "snap" to a rhythmic grid as you drag it, including notes, loop points, and even region selection.



Pitch Ruler
Double-click a key to automatically select all notes of that pitch in the track.

Time Ruler
Shows time in measures, beats and ticks. To select a region, drag in the ruler. To change the memory-cycle points or auto-record punch points, drag them.

Drag this handle to display more or less of the note grid and continuous data grid. You can even drag it all the way up or down to hide either grid.

Continuous Data Ruler
Click this ruler repeatedly to switch between three different controller displays: controllers only (0-127), pitch bend only (-8192 to 8191), or both.

Continuous Data Grid
Displays note velocities, MIDI controllers, and pitch bend data.

Selected note velocities
To graphically edit velocities (or a controller curve), select them by dragging over them. Then click the Reshape button in the title bar and drag across the selected data.

Inserting curves
To insert a curve like this, set the edit resolution to determine the time interval of the individual events. Then choose the type of data you want to insert from the Insert menu ("I") in the title bar. Then drag from left to right in the grid. Option-drag to draw a line that generates a smooth curve.

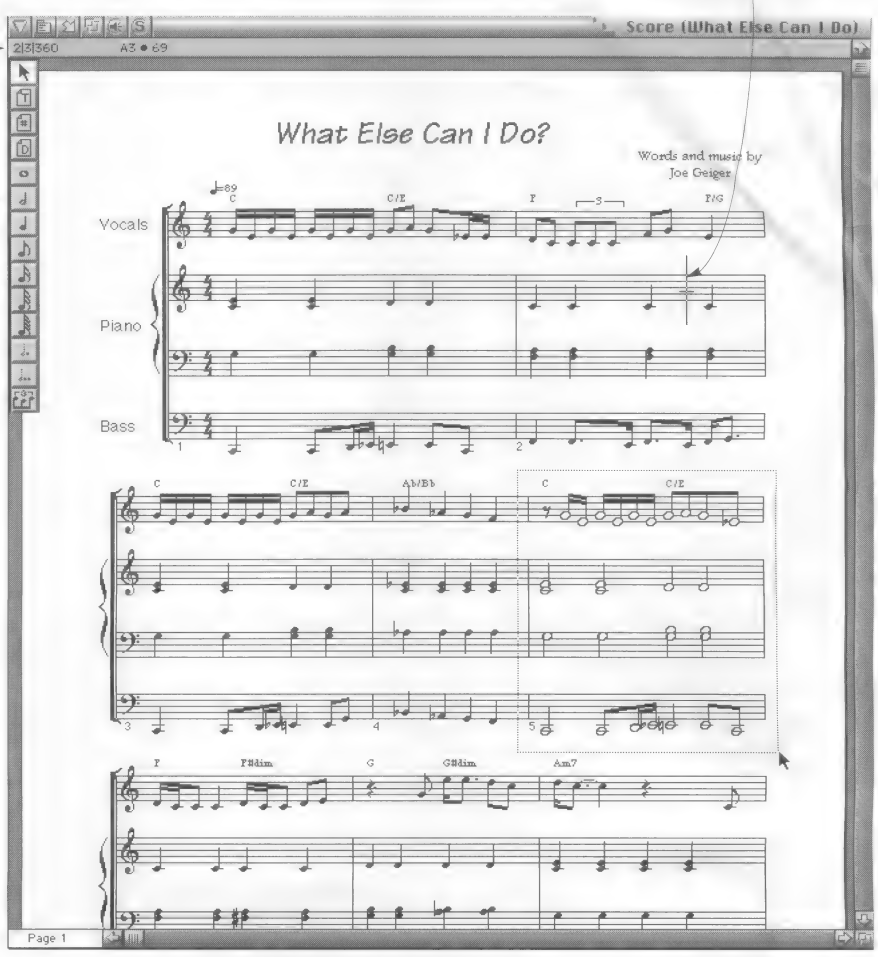
QuickScribe notation window

For more information, see chapter 23, "QuickScribe Notation" (page 345) in the Reference Manual.

The QuickScribe notation window displays music from one or more tracks on a page in standard music notation. To open it, select a track by clicking its name in the Tracks window—or shift-click as many as you like. Then choose the range of measures you'd like to see by setting the start and end times in the Edit bar. To quickly select the entire piece, double-click the Edit button. Then click the QuickScribe notation button in the main control panel. The music is formatted just like it will print out.

QuickScribe Notation button

Entering notes with Mac keyboard
Click the staff with the arrow to get this cursor. Choose durations from the keypad. Press return to insert the note.



Cursor coordinates
Shows the exact location of the cursor for note insertion.

Tool Palette
Click a duration in the palette. Press anywhere in the desired measure and while holding down the mouse, drag to any pitch and location. Watch the cursor coordinates for precise feedback about where you are in the measure. You don't have to get the pitch exactly right when you first click because you can drag up or down after you press the mouse to get just the right pitch and accidental. The mouse automatically snaps to even subdivisions of the beat to make rhythmic placement easy.

Transcription
Even though the notation looks quantized, the MIDI data in the track remains in its original, unquantized form. If Performer doesn't transcribe a section quite right, you can quantize the data to improve the rhythmic interpretation.

Step Recording
Click the staff with the arrow to get the insertion cursor. Use the arrow keys to place it at the desired location. Choose a duration in the palette. Play the notes on your MIDI controller.

The Chunks list, sequences, and songs

For more information, see chapter 14, "The Chunks Window" (page 205) in the Reference manual.

So far, you've been introduced to the Tracks list and three ways to view the MIDI data recorded into tracks. In Performer terminology, the Tracks window and the set of tracks it contains are called a *sequence*. But you are not limited to just one sequence in a Performer file. You can have as many sequences as you want. Sequences are displayed in the Chunks list window. The Chunks list also displays another type of chunk called a *song*. Together, sequences and songs are referred to as *chunks*, so read the word *chunk* as *sequence and/or song*. The Chunks window is great for "pattern-based" sequencing, where you build parts of a song separately and then combine them into a song as shown on the next page.

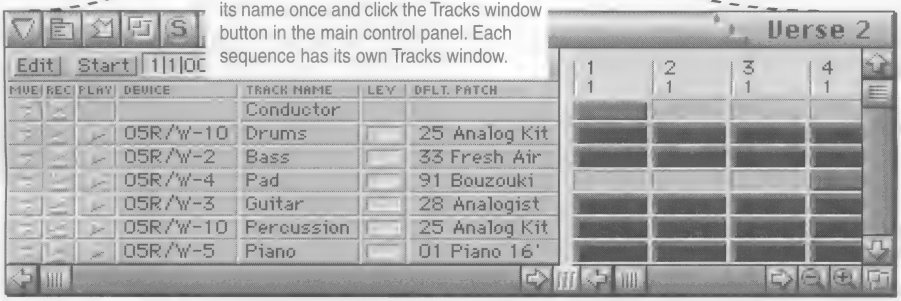
The Chunks list

Only one chunk can be play-enabled at a time. Each chunk has a move handle, play-enable button, song select number, end time (which indicates its length), a name (option-click to change it), and comment. To make a copy of a sequence, highlight its name and choose Copy from the Edit menu. Then choose Paste.

To open the Chunks list window, click the **Chunks list button**.

Opening a Tracks window

To open the Tracks window for a sequence, double-click its name, or click its name once and click the Tracks window button in the main control panel. Each sequence has its own Tracks window.

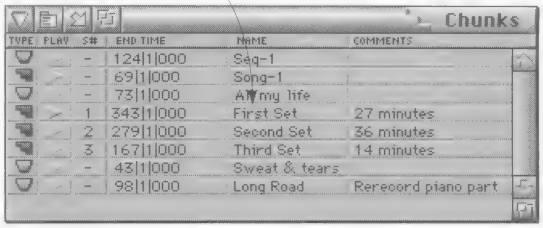


The Song window

Build a song with sequences and other songs simply by dragging and dropping them into the Song window. Each chunk plays seamlessly from one to the other. The song even has its own conductor track, which can have either a unique tempo map, or a composite tempo map built from its component sequences and songs.

Building a song
To build a song, drag any number of sequences and other songs into the song window and "drop" it at an existing column. To drag and drop, grab the chunk's handle.

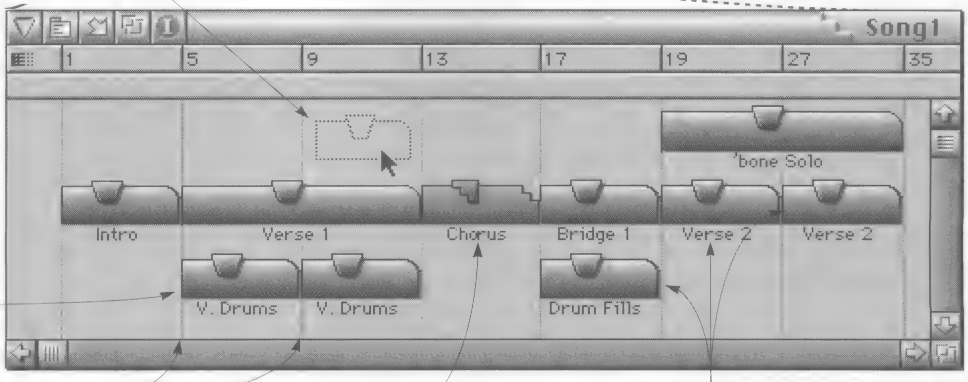
Building live performance sets
Songs are ideal for building live performance sets because each sequence (or song) can play seamlessly into the next.



For more information, see chapter 15, "The Song Window" (page 217) in the Reference manual.

To open a song window, double-click its name.

Unique Non-linear Display
The Song window has a unique, non-linear display. Each chunk is given equal length, regardless of its actual duration, which provides you with a condensed view of your music.



Column ruler
Shows the measure and beat location of each chunk in the song.

Stacking chunks
Stack chunks vertically to make them play simultaneously.

Columns
Columns get automatically created at the beginning and end of each chunk. To create a column at any location, use the Insert column button ("I") in the title bar. Chunks "snap" to the nearest column when you drag them.

Song Chunk
Songs can be placed inside other songs. Go as many layers deep as you want.

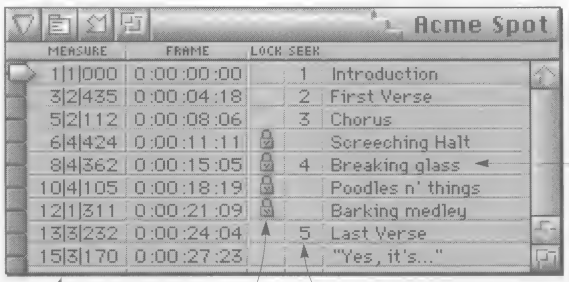
Sequence chunks
To move sequences, drag them up and down or left and right to another column. They "snap" to the *nearest column. Double-click* a sequence to open its tracks window.

The Markers window

For more information, see chapter 19, "The Markers Window" (page 245) in the Reference manual.

To open the Markers window, choose Markers from the Windows menu, or click the Markers window button in the Consolidated Controls. A Marker is a particular location in your sequence. It may be at the beginning or end of a section, or it may be a visual "hit point" that occurs at an exact location when you are scoring for film or television. You can add as many markers as you want to your music. They are useful for identifying any location. You can instantly cue to the marker location using the Markers window. Markers appear in all editing windows. The can be cut, copied, and pasted in the Conductor track.

To open the Markers list window, click the **Markers list button**.



Playback Position indicator
Click on this strip to immediately jump playback (and the position indicator) to the marker at that location.

Marker name
Click the marker name to rename it.

Marker location
Marker times can be displayed in all three time formats: measures and beats, SMPTE time code, and real time.

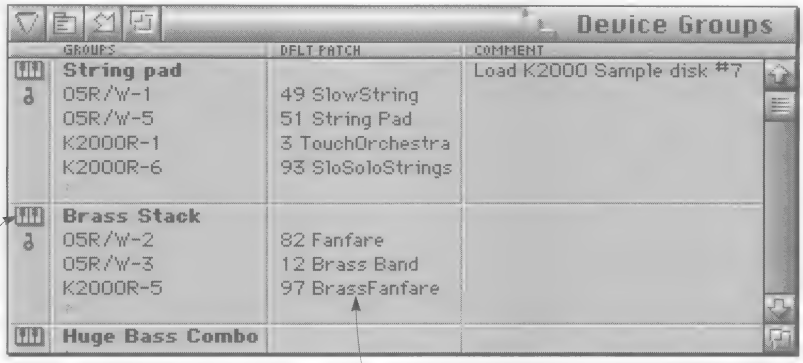
Locked indicator
Attaches the marker to its current SMPTE time code location, regardless of tempo changes.

FreeMIDI seek point
If you are cueing multiple FreeMIDI programs, up to eight markers can serve as FreeMIDI seek points.

Device Groups

For more information, see "Creating a device group" on page 112 in the Reference manual.

Often when you are sequencing, you'll want to be able to make a track play back using several MIDI devices together (or several channels on the same device) to create a layered sound. The Device Groups window lets you define groups of devices. You can then assign any track to the device group. Notes and other data in the track will play on all devices in the group.

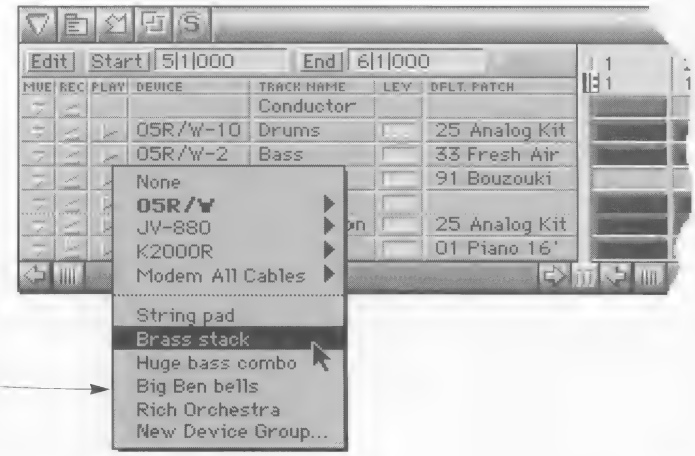


Creating a device group

To create a device group, choose Add Device Group from the mini-menu. To name it, double-click the name to pop-edit it. Then click the arrow beneath the name to add the first device to the group. The arrow moves down one line below the new device so that you can always add another device. You can add up to 10 devices in a group.

Using Default Patches

If you want, you can choose a MIDI patch change event that gets sent to the MIDI synth automatically to call up the sound you want for each layer. Patch names like the ones shown here appear when you set up the appropriate patch lists with FreeMIDI's PatchList Manager utility, with Unisyn, or with any FreeMIDI-compatible librarian software.



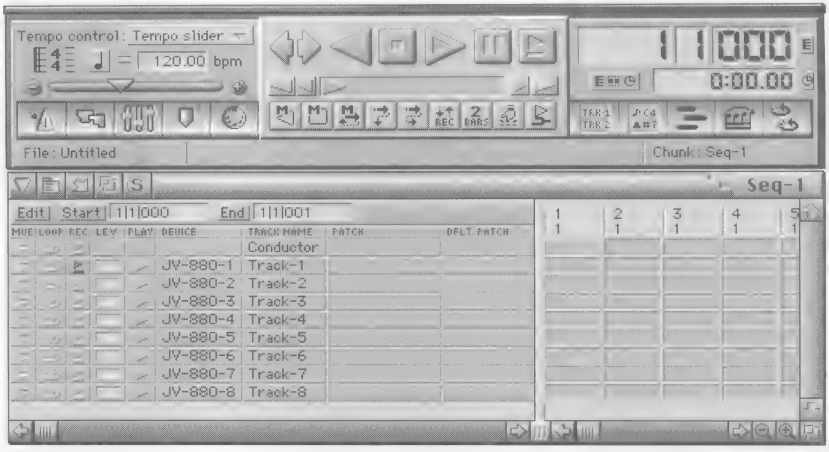
Using Device groups

To assign a track to a device group, just select it from the device pop-up menu next to the track. Device groups are available in Performer wherever this playback assignment pop-up menu appears.

Recording

Recording into Performer is easy. This section gives you a quick overview. The tutorial chapters following this one provide a more in-depth introduction.

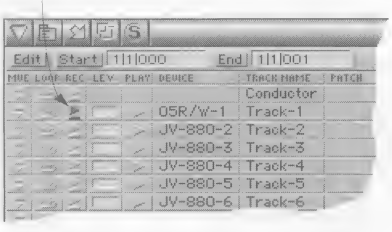
For more information, see chapter 9, "Recording" (page 127) in the Reference manual.



1 **Open a new file.**
If you haven't opened Performer yet, double-click the Performer icon and a new file will open after a moment. If Performer is already open, and you have a file on the screen, choose Close from the File menu and then choose New.

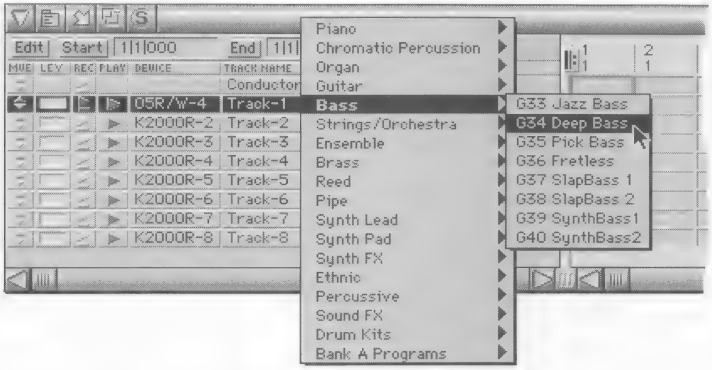
2 **Check to make sure that Performer is receiving MIDI from your controller.**
To do so, open the MIDI Monitor from the Windows menu. When you play notes on your controller, watch the MIDI activity indicators. One of them should light up. If not, see "Testing for MIDI input and output" on page 62 of this guide. If your controller isn't present in the MIDI Monitor, choose it from the MIDI Monitor window mini-menu.

3 **Record-enable the track you want to record on.**
In a new Performer file, the first track is already record-enabled. When it is, the record button is red (black on a monochrome monitor).

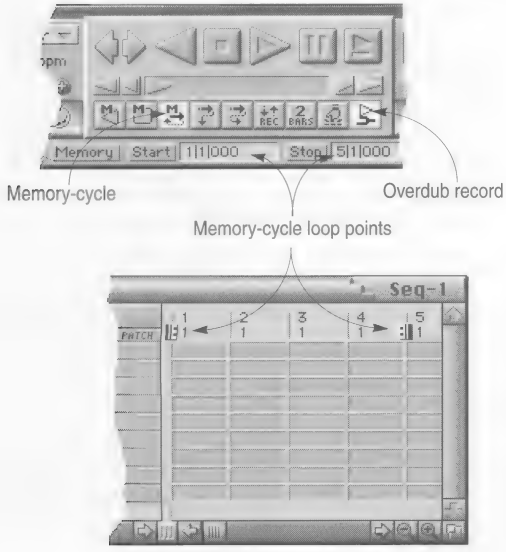


4 **Choose a playback device and channel for the Track.**
Select the device and MIDI channel you want to hear as you record. Remember, you can always change the playback assignment later. To select a playback device, press the name of the current device (in the device column) next to the record track to get a pop-up menu of devices in your studio like the one shown below.

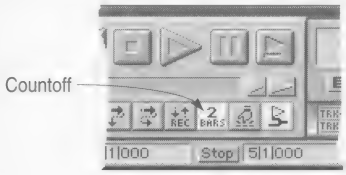
5 **Choose a sound on the Track's playback device and channel.**
You have several ways to do this. One way is to call up the sound on the synthesizer itself using the front panel controls. If you have already set up patch lists using FreeMIDI's PatchList Manager, you can choose a sound by name from the Patch column pop-up menu as shown here. Otherwise, you'll see a generic list with "Patch-1, Patch-2" etc.



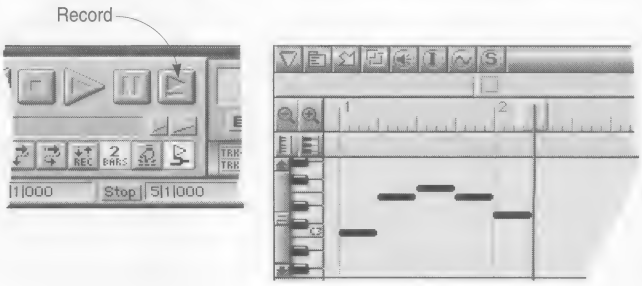
6 **If you want to cycle-record (loop record), turn on Memory-cycle and Overdub record, and set the loop points.**
The memory-cycle button causes Performer to loop a region. Set the length of the region by dragging the repeat barlines in the Tracks overview or by typing in the desired times in the Memory bar. Overdub record mode causes each new record pass to be merged with previous ones. Without Overdub, Performer drops out of record at the end of the first pass.



7 **If you want a few bars of countoff before you begin recording, press the Countoff button.**
This button gives you two measures of the metronome click before Performer begins recording. Double-click the button to change the number of countoff measures and other metronome settings.



8 **Set the tempo with the tempo slider. When you are ready to begin recording, press the record button.**
Don't worry about making a mistake. You can always delete the notes and try again. Or you can choose Undo Record from the Edit menu. If you want to see what you are recording, open the track's Event List, Graphic Editing window, and/or QuickScribe Notation windows. The notes appear in these windows as you record.



Step-Record

For more information, see chapter 10, "Step Record" (page 139) in the Reference manual.

Step-Record, available in the Basics menu, is one of the most important and powerful features in Performer. It is an alternative to real-time recording: it waits for you to enter notes one at a time and allows you to specify the duration of each. Step-Record is ideal for passages too complex for real-time entry. Notes you enter in Step-Record are rhythmically precise (they won't need quantizing).

1 – 5 **Steps 1 through 5 are the same as steps 1-5 for regular recording described in the previous section.**

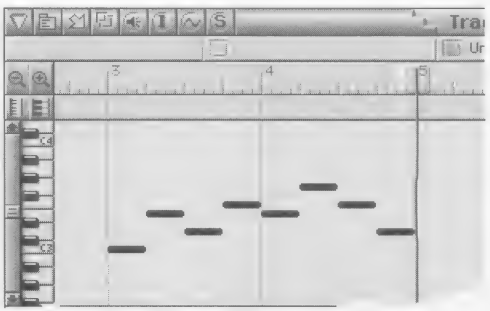
6 **Set the main counter to the location at which you would like to begin step-recording.**
You can type in the location directly into the counter. You can also double-click the time ruler in the Tracks Overview or a Graphic Editing window.

7 **Open the Step-Record window by choosing it from the Basics menu.**
When you do so, Performer automatically goes into record mode and is ready to record the first note.

8 **Choose the desired duration of the note(s) you would like to enter.**
Click the appropriate note duration button and a dot, if necessary. If you are inserting triplets or tuplets, use the tuplet check box and type in the desired tuplet value.

9 **Play one or more notes on your MIDI controller.**
Notes are inserted into the track with the chosen duration. Notice that the main counter updates with each step. Here are a few tips:

- Notes are inserted when you release the key.
- Play notes as slowly as you like.
- Change duration whenever you want by simply clicking a different duration.
- Play notes and chords in a staccato fashion to prevent accidentally inserting notes from the next step.
- To prevent other tracks from playing as you step, use the Solo Playback option.
- As you step, Performer's main counter follows your progress, and other tracks play back at the same time. To disconnect from the main counter, click the Lock button in the Step Record window title bar.
- To insert a rest, press the Step button.
- To insert silence and advance to the next beat or measure, click the Beat or Measure buttons.
- Open an Event List, Graphic Editing, or Notation window so you can see what you are recording.
- To stop, close Step Record.



Selecting

For more information, see chapter 25, "Selecting Regions" (page 387) in the Reference manual.

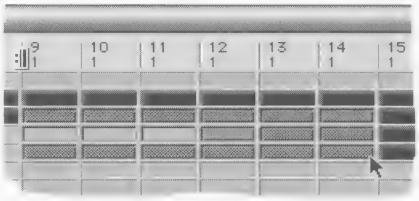
Once you've recorded, Performer provides powerful editing features to mould your music any way you want. But *before* you can edit even a single note, Performer needs to know exactly *what* you want to edit. This sections shows you some of the many convenient ways to select music in Performer. Once you've selected it, you can unleash Performer's powerful editing features.

Using the Edit Bar in the Tracks window

Set the start and end times, and then select the tracks you want to edit within the those times. To set the start and end times, type them in. Or click the start and end button during playback to load the current playback location. To quickly select the entire length of the sequence, double-click the edit button. To select a single track, click its name. To select several non-adjacent tracks, shift-click each one. To select a group of adjacent tracks, drag over their names. To select all tracks, press command-A.

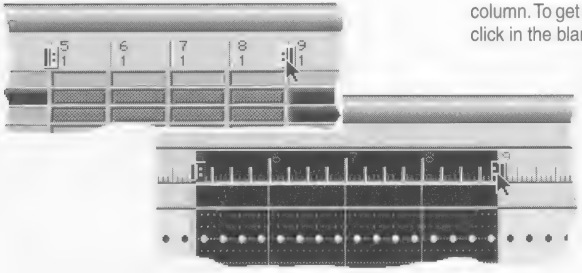
Using the Tracks Overview

Zoom the display to a useful zoom level. Then drag over the segments you want to select. To select non-adjacent segments, shift-click each one. To select an entire column, click in the time ruler above the column. To get rid of the current selection, click in the blank space below the grid.



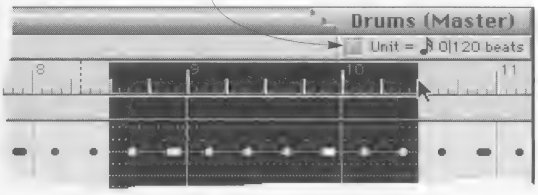
Selecting the Memory-cycle region

Double-click either loop point in the Tracks Overview or Graphic Editing window ruler.



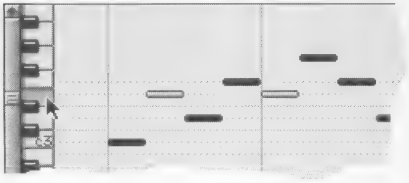
Dragging in the graphic editing window time ruler

Any notes or controller data within the highlighted region becomes selected. To make your dragging "snap" to rhythmic grid locations, check the Edit Resolution box and set the desired grid resolution.



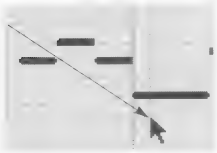
Selecting all notes of the same pitch

Double-click the key on the pitch ruler in the Graphic Editing window.



Selecting in the note grid

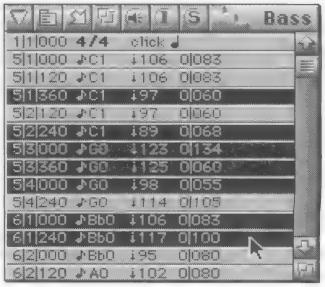
Drag a rectangle over the beginning of the notes you want to select.



Also read about the Remember Times command in the section "Shortcuts for using the Edit Bar" on page 388 in the Reference manual.

Using the event list

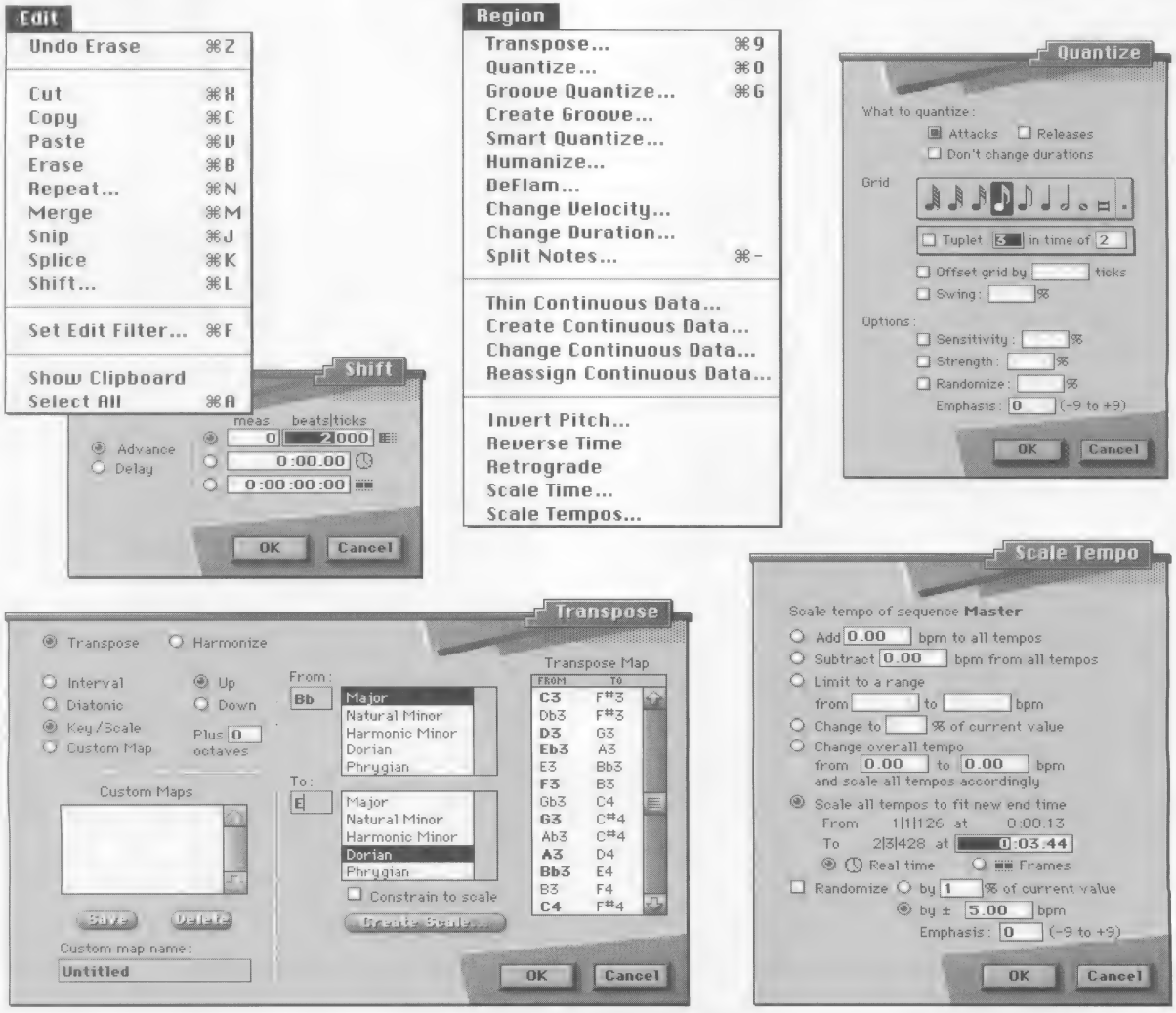
Click an event to select it. To select several non-adjacent events, shift-click each one. To select a group of adjacent events, drag over them. To extend the current selection, command-click. To select all events, press command-A.



Editing

For more information see chapter 26, "Edit Commands" (page 395) chapter 27, "Region Commands 1" (page 409), and chapter 28, "Region Commands 2" (page 451) in the Reference manual.

Once you've selected your music, you can choose any command in the Edit menu or Region menu. For many of them, a dialog box appears on the screen with many powerful options—much more than can be covered here. A few samples are shown below. Most Edit and Region menu commands can be applied during playback, so you don't have to stop the music to hear the effect. Some, like Groove Quantize, allow you to apply the effect in real time, so you have instant feedback, without even closing the command's window.



Mixing with consoles

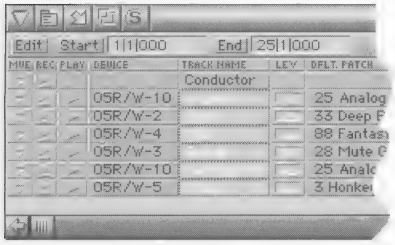
For more information, see chapter 31, "Custom Control Consoles" (page 505) in the Reference manual.

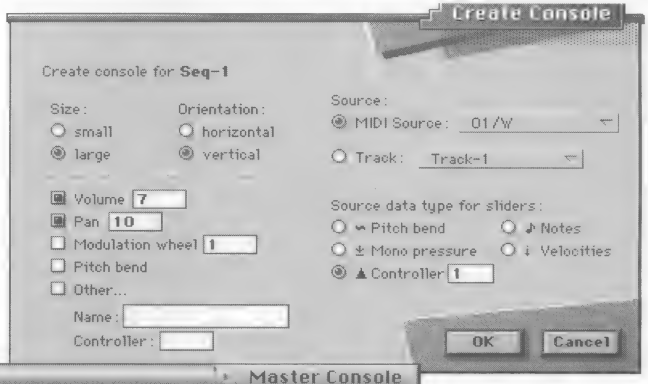
After recording and editing comes mixing. Many MIDI devices nowadays respond to automatic mixing effects such as volume and panning that you program directly in Performer. Performer can instantly generate a mixing console for your sequence, with a volume fader and pan knob for each track. You can even build your own customized consoles, adding your own faders, knobs, pop-up menus, value boxes and more.

1 **To create a mixing console, select the tracks you would like to include in the mix.**
Use the techniques you just learned in the section "Selecting" on page 83.

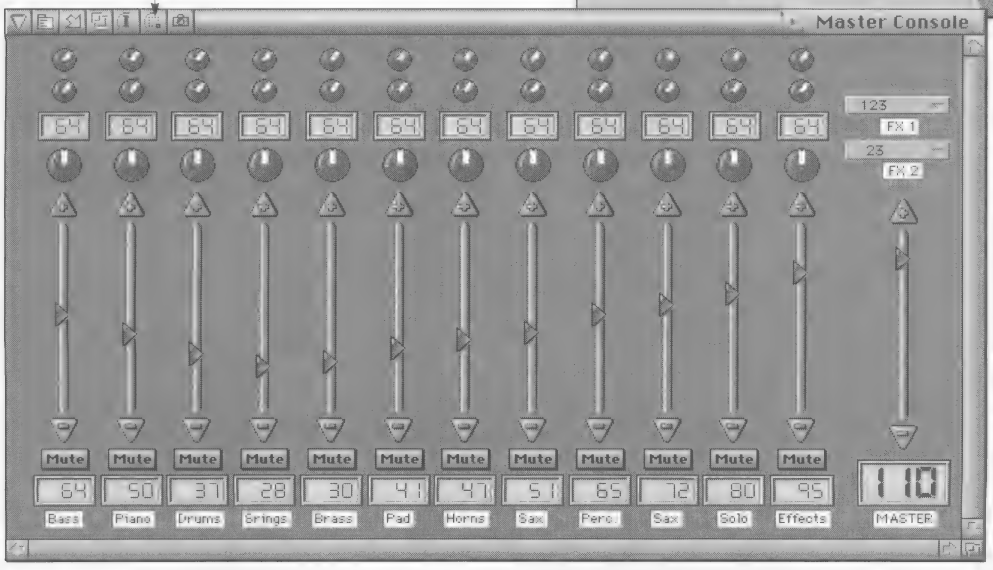
2 **Choose Create Console from the Tracks window mini-menu.**

3 **Choose the orientation you'd like, and click the volume and pan options.**
These are the only buttons you need to click to get the console. You can add other controls, if you'd like. Click OK when you are done.





Edit mode



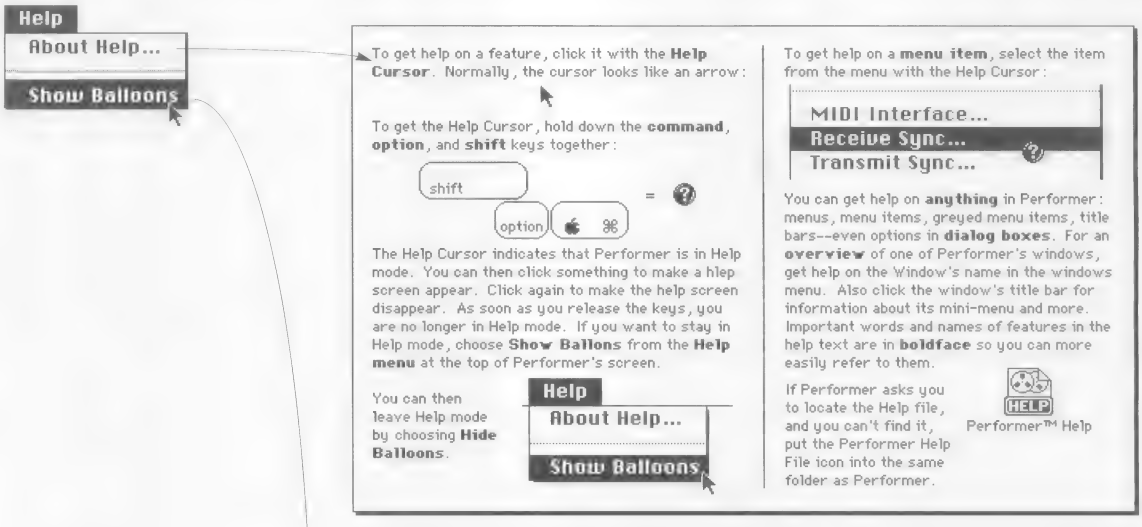
4 **Use edit mode to refine the appearance of the console as desired.**
In edit mode, you can drag controls wherever you want and insert additional ones with the insert menu.

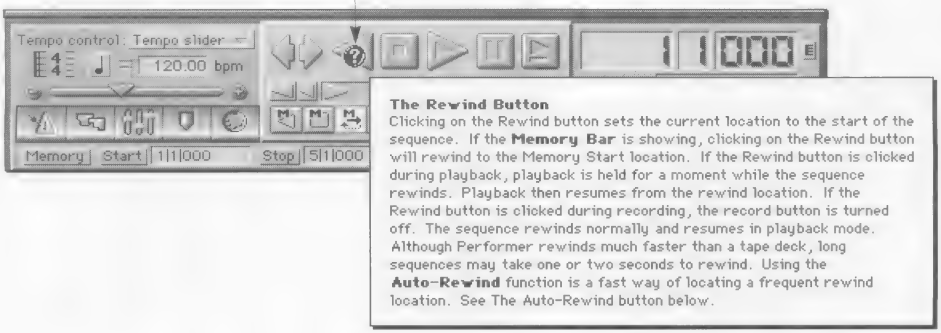
5 **Record an automated mix-down with the faders and knobs.**
Volume and pan data gets recorded into the appropriate track automatically.

Using on-line help

For more information, see chapter 2, "On-Line Help" (page 27) in the Reference manual.

Hopefully, this chapter has piqued your curiosity and you now want to explore Performer even more. Performer's on-line help feature can help greatly: it provides a brief explanation for every window, menu, dialog box, button—and just about anything else you can click on. To get help, choose Show Balloons from the Help menu and then click anything with the balloon cursor to get help on it. There's even a way to get help on how to get help! Just choose About Help from the Help menu.





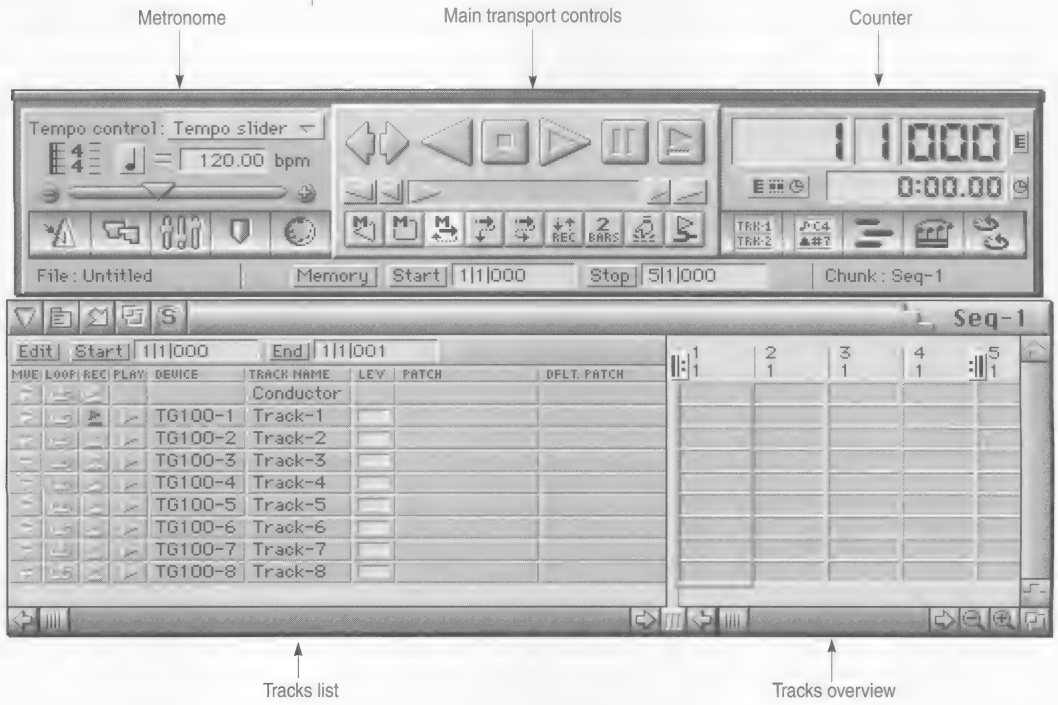
Chapter 8 *Getting Started: Recording Your First Track*

This chapter is a brief introduction (approximately 20 minutes). These step-by-step instructions will lead you through starting Performer, recording and playing back a single track, and viewing and editing MIDI data. Working through this chapter is a good way of confirming that you have correctly set up your MIDI system.

To begin, start Performer by double-clicking the Performer program icon. If this is the very first time you are opening the program, please refer briefly to chapter 6, "Starting Performer for the First Time".

Recording a scale

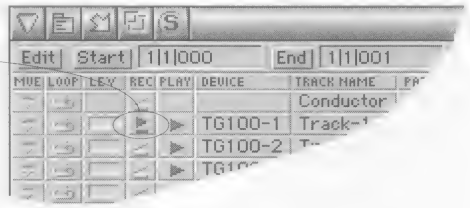
After a few moments, the screen should look like what you see below. If not, choose *New* from the File menu:



The top portion of the screen shows the Consolidated Controls window. Across the top you see the Tempo controls, Main Transport Controls, and the Counter. Just below are buttons that open windows for Performer's main features. Underneath is the Tracks window for sequence 1 (Seq-1). These windows contain the basic controls and information you will need to record and play a sequence.

Record enabling a track

At this point, eight tracks are shown in the Tracks window. The first track is named "Track-1". (In later chapters you will learn how to rename tracks and add descriptive comments to the Tracks window). To record-enable a track, click its record button to make it black. Track-1 should already be record-enabled, as shown below. If not, click its record button.



Setting the playback Device

At this point, Track-1 is set to play back on channel 1 of one of your MIDI devices. If you would like to change the channel, or even the device altogether, you can select the desired one easily by choosing it from the play destination pop-up menu. If you don't need to change the channel or device, you can skip this step.

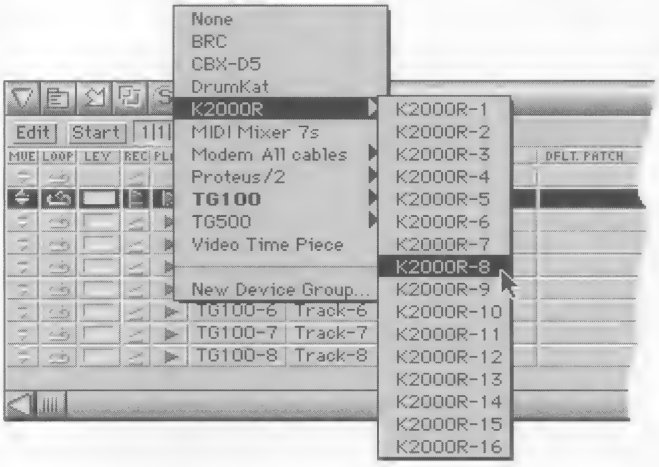
> ☛ The list of MIDI devices that appears in the play destination pop-up menu is provided by FreeMIDI. If the device you wish to use is not present in the list, see "Using Quick Setup to Add FreeMIDI Devices" on page 685 in the Performer Reference Manual.

1. **In the Tracks window, press on the Device assignment next to the Track-1 name.**

   A pop-up list of devices appears.

2. **Select the desired MIDI device and channel from the hierarchical pop-up menu.**

   In the example below, the original device was the Yamaha TG100 and the new device being selected is the Kurzweil K2000R, MIDI channel 8. This pop-up menu is a standard Macintosh hierarchical menu.

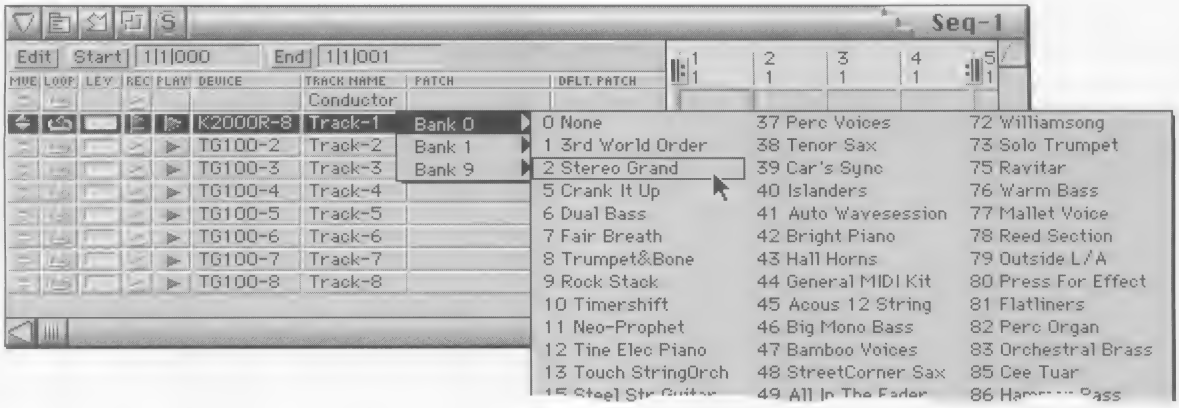


Setting up a piano sound

Now let's set up a piano sound for the track. This is done by calling up a piano sound on the same MIDI device and channel that you chose in the previous step. In the example above, we chose the Kurzweil K2000R channel 8. So we would need to set up a piano sound on channel 8 on the K2000R.

For many popular MIDI devices, you can do this directly from within Performer: just choose the sound by name from the Patch column next to the track as shown in the next picture.

If you see a generic list of names ("Patch 1, Patch 2, Patch 3", etc.), Try Patch 1. Many synths have a piano sound there. Play a few notes on your controller keyboard. Do you hear a piano? If not, try a few different choices from the pop-up menu until you find one that kind of sounds like a piano. It doesn't have to be *exactly* like a piano for the purposes of this tutorial. By the way, you can replace the generic patch names with actual ones; see chapter 48, "Using PatchList Manager" (page 725) in the Reference Manual for details.

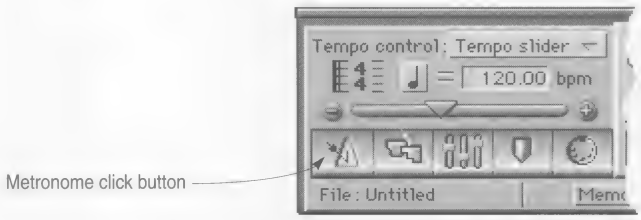


Setting a metronome click and tempo

Performer organizes MIDI data into measures, beats, and ticks (there are 480 ticks per quarter note). To ensure that your music lines up with the beat correctly, always listen to Performer's built-in metronome while recording:

1. **Make sure the Metronome click button is turned on.**

   On a color screen the inset portion of the button turns yellow when the click is on. Try clicking the button a few times to toggle it back and forth so you can see the difference between off and on.



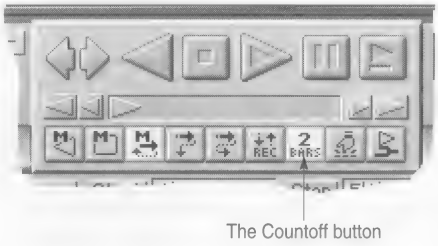
2. **Drag the Tempo Slider to 60 bpm.**

   Performer can handle a wide range of tempos and tempo changes. For now, simply set a steady tempo of 60 beats per minute. You can click on the + and - buttons to make fine adjustments. Alternately, you could click the tempo marking in the box, type in "60", and press return to confirm your typing.

Setting a countoff

The final step to prepare for recording is to set a couple of countoff bars. A countoff helps you play in tempo, and gives you time to get to your MIDI keyboard after pressing Record in Performer.

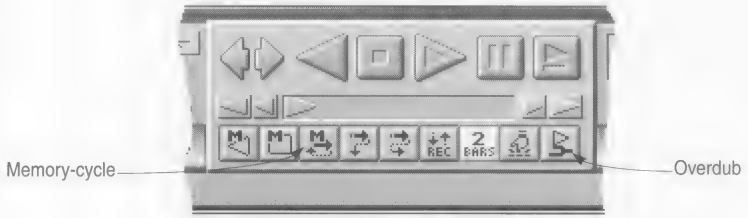
- Click on the Countoff button below the Transport controls.



A Countoff of two bars is provided, with a metronome click every quarter note. (If you want to change the number of countoff bars, double-click the button to open a dialog box that lets you do so.)

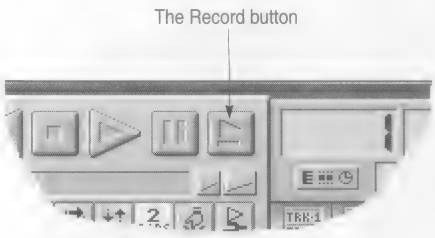
Turning off Memory-cycle and Overdub

The Memory-cycle button causes Performer to loop a region of the music indefinitely. This extremely useful feature is explored later. For now, let's make sure that it is off, as shown below. The same goes for Overdub record.



Recording a scale

You are now ready to record. Read over the next couple of steps beforehand, and make sure your controller keyboard is turned on and set up to send MIDI. When you're ready:



1. **Click the Record button in the Consolidated Controls window.**

   The two bars of countoff will begin as soon as the Record button is pressed. Count the eight beats of introduction while you move to your controller keyboard and prepare to play.

2. **Play an ascending C major scale, starting on Middle C and ending on the C an octave above.**

   Use quarter notes, one per metronome click.

3. **When you're finished, click on the Stop button.**

Performer will stop recording. Note that the counter has advanced, and that the position bar arrow has moved to the far right, indicating that you are currently at the end of your sequence.

If you make a mistake, don't panic. Press the Rewind button to return to the start of the sequence, then repeat the previous three steps.

Playing back your sequence

To hear what you just recorded:

1. **Click on the Rewind button in the Controls window.**

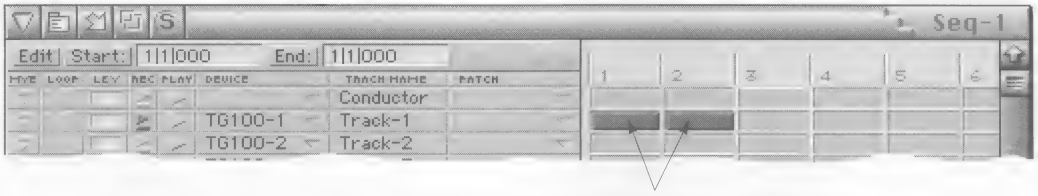
   This returns Performer to the start of the sequence. Note that the Counter and position bar are reset to their starting values.

2. **Click on the Play button.**

   You should hear the scale play back on the assigned keyboard(s) or sound modules. If you don't hear anything, turn to "Problems" on page 99.

Opening an Event Editing window

You have just recorded a MIDI sequence, that is, a string of MIDI commands that exactly describe your performance. The Tracks Overview shows the data that you have just recorded into *Track-1*:



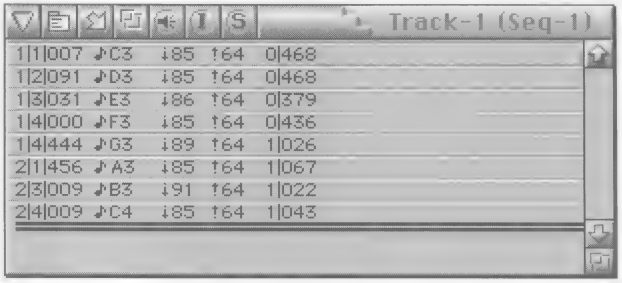
The first few measures of Track-1 now contain the scale you just played. Double-click any segment to open the Event List window of the track, which shows each note that you played.

Performer allows you to view and edit these MIDI 'events' directly by opening an Event Editing window for a recorded track. Each track can be viewed in one of four Event Editing windows: the Event List window, the Graphic Editing window, the Notation editing window, or the QuickScribe notation window. In this example we'll use the Event List window. For detailed information on the other windows, refer to their respective chapters, starting with *chapter 20, "The Event List Window" (page 257)* in the Performer Reference Manual.

To see the data you have just recorded:

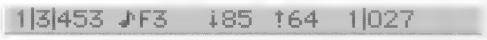
- Double-click on one of the filled-in track segments for Track-1 in the Tracks Overview. Alternately, you can double-click the track name *Track-1* in the Tracks List.

A new window will appear, looking more or less like this:

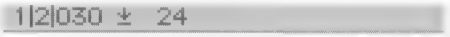


Setting the View Filter

MIDI-equipped keyboards transmit a wide variety of MIDI data. Your event list should contain the notes you just played, indicated by a small note symbol:



You may see additional events, such as aftertouch events:

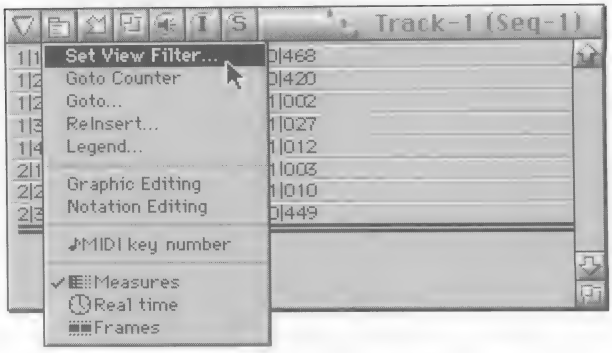


Later in this manual, you'll learn how to set the Input Filter to filter out aftertouch data during recording if you don't want to record it.

If your event list contains anything other than note events, follow these steps to temporarily hide the other data:

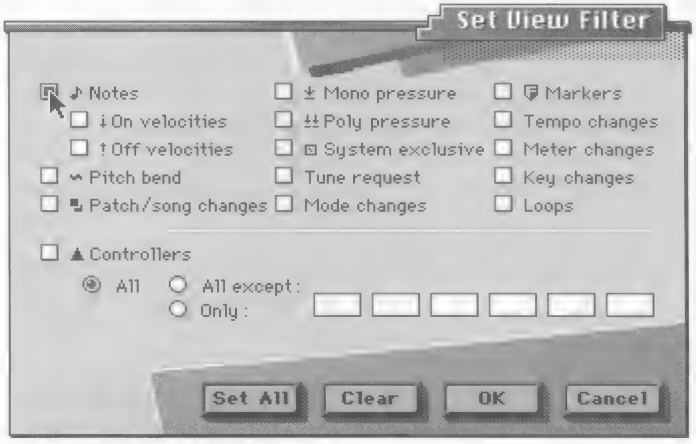
1. **Select Set View Filter from the Event List window mini-menu.**

   Place the pointer on the mini-menu icon at the top of the Event List window and press the mouse. Still pressing, slide the mouse pointer down until the option 'View Filter' is highlighted, then release the mouse.



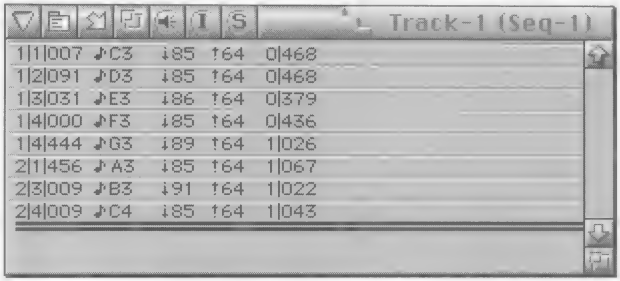
2. **Option-click on the Notes check box.**

   This is a shortcut for deselecting everything but Note events for viewing: hold down the option key and click on the small box next to the Notes symbol.



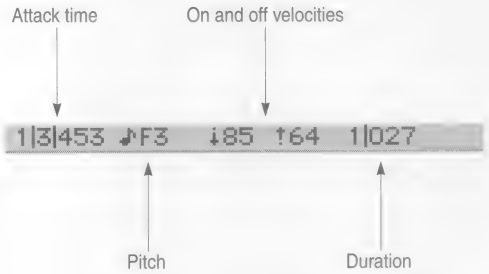
3. **Click OK to confirm your choice.**

Now you should only see Note events in your event list:



Editing an event

The information for a Note event is displayed as follows:



The Attack Time is the time, displayed here in measures | beats | ticks, at which the note is played. This note begins in the first measure, third beat, and 453rd tick (there are 480 ticks in a beat).

The Pitch of the note is indicated by its letter name and octave number. This note is an F3, that is, the F just above middle C.

The Duration is displayed in quarter notes and ticks. Like attack times, there are 480 ticks per quarter note; a value of 1 | 027 ticks is just a little longer than a quarter note.

You may directly change any of these values. For example, to move your first note to the exact start of the sequence:

1. **Double-click on the attack time of the first note event.**

   The event is highlighted and the attack time field 'pops up'.

2. **Click on the 'ticks' field and type in *000*.**

3. **Press the Return key to confirm your change.**

   The note event is redisplayed with its new attack time.

Editing a group of events

While directly editing events in an Event List window allows precise, flexible control over your sequence, editing notes one at a time can be time consuming when editing dozens of notes. The commands in the Edit and Region menus let you edit whole sections, tracks, or sequences at once, while maintaining precise control over the final results. For example, we can use the Quantize command from the Regions menu to align the notes of our scale exactly on the beat:

1. **Click in the Tracks window to activate it.**

   The Tracks window comes to the front.

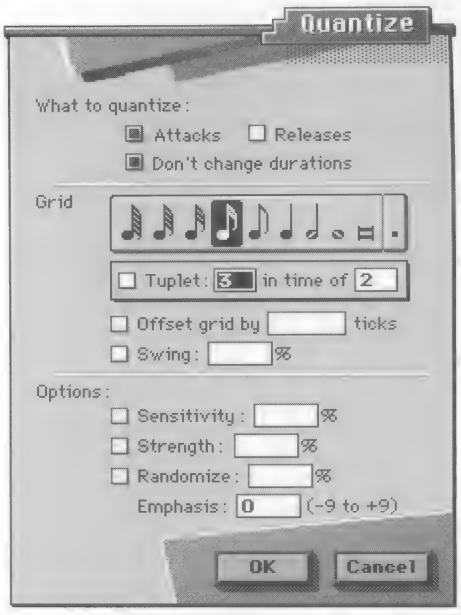
2. **Click Track-1 once to highlight it.**

   This selects Track-1 for editing. Alternately, you could also drag over the filled-in track segments in the Tracks Overview; they will highlight.

3. **Double-click on the Edit button above the track names.**

   This is a shortcut to set the Start and End times in the Edit bar at the top of the Tracks window to the beginning and end of your sequence, respectively. You can alternatively set these times manually, by clicking on the Start and End time fields and typing in the desired values.

4. **Choose Quantize from the Region menu.**



The Quantize dialog box appears. There is a full description of this box and how it works in chapter 27, "Region Commands 1" (page 409). For now, simply select a quarter note as the rhythmic value:

1. **Click on the quarter note icon.**

2. **Click on the OK button to confirm your choice.**

   Performer will process the command and remove the dialog box. At this point, if you examine the Event List window you will note that the Attack Times are all precisely on the beat, i.e. the tick fields all show '000':

Use the Rewind and Play buttons on the Controls window to play back your sequence again. The notes of the scale will play precisely on the beats.

Saving your sequence

The sequence you have recorded and edited is currently stored in the Random Access Memory (or RAM) of your computer. You should make a permanent copy of any work you do with the Save and Save As commands on the File menu:

1. **Select Save As from the File menu.**

   A standard Macintosh file dialog box appears.

2. **Type a name for your file.**

   Always try to use descriptive names, so you can identify your files later. "Simple Scale" might be a good name for this file.

3. **If necessary, use the Desktop and Eject buttons to select the correct disk on which to save.**

   If you are not sure how to do this, please review your Macintosh manual.

4. **Click the Save button to save the file.**

Problems

If you follow the steps described in this chapter you should be able to record, view, and edit a simple sequence. If, for some reason, you have a problem, don't panic. Try to pinpoint the problem with these steps:

If Performer won't run, or doesn't recognize the key disk, or displays a Macintosh System Error message:

☛ Turn to the Appendix C, "Troubleshooting FreeMIDI" in this booklet for more suggestions and instructions on how to contact Mark of the Unicorn's Customer Support program.

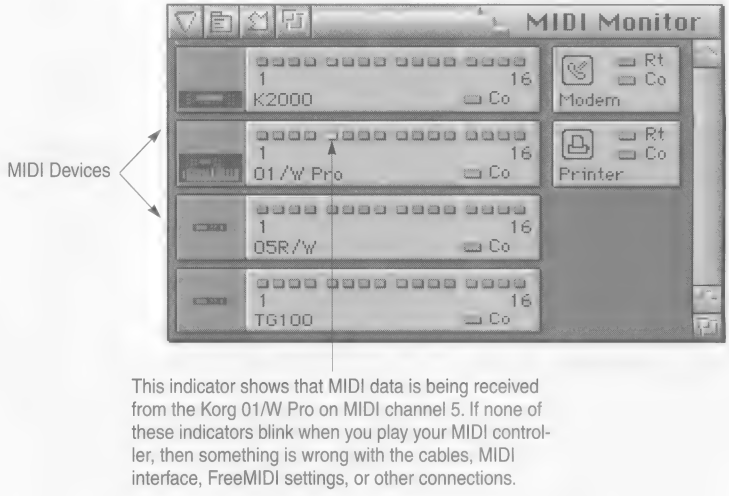
If Performer runs, but doesn't record (i.e. nothing appears in the Event List window):

1. **Select Quit from File menu.**
2. **Shut down your Macintosh.**
3. **Make sure that your MIDI equipment is on and correctly set up, and that the MIDI cables are working and firmly plugged in to the equipment.**

   To test your MIDI cables, try a simple hook up between two MIDI modules, or exchange input and output cables.

4. **Start the Macintosh again, insert your Performer disk(s) if necessary, open a new file, and open the MIDI Monitor window.**

   The MIDI Monitor window shows incoming MIDI data from your MIDI devices.



This indicator shows that MIDI data is being received from the Korg 01/W Pro on MIDI channel 5. If none of these indicators blink when you play your MIDI controller, then something is wrong with the cables, MIDI interface, FreeMIDI settings, or other connections.

5. **Play notes on your MIDI controller and watch the MIDI Monitor.**

   If no indicators blink, then Performer is not receiving any MIDI data, which probably means that something is wrong with the MIDI cables, MIDI interface, or other connection. If an indicator does blink, then you are receiving data successfully.

6. **Go through this chapter again.**

   Follow each step carefully; it's easy to miss something the first time through a program of this scope.

If you can record a track and view the notes in the event list, but can't get your sequence to play back:

☛ Check the volume and MIDI setting for your MIDI keyboard and/or sound module. Make sure the playback destination in the Tracks window in Performer corresponds with the channel setting on your MIDI device, otherwise the MIDI information will not reach your synth.

Further troubleshooting

If these steps don't help, you almost certainly have a problem with your MIDI interface, cables, or keyboard. Check with the dealer or manufacturer for help on testing the hardware. Appendix C, "Troubleshooting FreeMIDI" in the Performer Reference manual contains more suggestions and instructions on how to contact Mark of the Unicorn's Customer Support program.

Chapter 9 Tutorial: Building a Sequence

What's in this tutorial

In this tutorial, you will:

- Cycle-record a drum loop and use the Graphic Editing window during recording
- Apply a groove to the drum loop
- Step-record a keyboard part
- Insert a bass line in the notation window by hand
- Mix the sequence with a fader console
- Build a song out of several sequences

The tutorial will probably take about an hour and a half. You can stop at any time by choosing Quit from the File menu.

Tutorial checklist

To make the tutorial as clear as possible, we assumed the following:

- You've successfully completed the entire installation section of this guide, including the setup of your FreeMIDI studio configuration.
- You have a MIDI keyboard (or other MIDI controller) and a multi-timbral MIDI setup. If you'd like a further explanation of this, see "Categorizing your MIDI setup: how many notes can you play at once?" on page 104.
- You know how to call up sounds in your MIDI gear, including a drum kit.
- If you are using your controller keyboard as a sound source, you have turned off *Local Control*. If you'd like a further explanation of this, see "Disabling Local Control in your MIDI controller keyboard" on page 104.
- It helps if you have gone through the previous two chapters, but they are not required.

Categorizing your MIDI setup: how many notes can you play at once?

Perhaps the most fundamental concept of MIDI sequencing is that the sequencer itself produces no sound whatsoever. Instead, the sequencer triggers synthesizers, which produce the actual sound. A sequencer just records and plays back performance information: *when* notes were played, *what* notes were play, *how hard* they were struck, *how long* they were held down, and so on. This is one of the reasons why sequencing is so powerful. It gives you incredible flexibility in working with the instruments and sounds in your music.

So the maximum number notes you can play at one time when sequencing in Performer depends on your MIDI hardware.

Only the most basic MIDI synthesizers are limited to one note at a time, and fortunately, this type of instrument is a thing of the past for the most part. An instrument that can only play one note at a time is referred to as being *monophonic*.

Today, most keyboards, sound modules and other types of synthesizers (often referred to as a *sound sources*) can play several notes at once. For example, you can play a chord on them consisting of 3 or more notes at one time. A device that can do this is referred to as *polyphonic*. Keyboards and sound modules produced in the late 1980's could typical play up to eight notes at a time (*eight note polyphony*). Today, affordable synths are 32-note and even 64-note polyphonic.

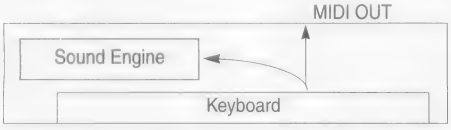
Most of today's synths are also *multi-timbral*, which means that they can play different types of sounds at the same time. For example, you may have a sound module that can play drums, bass, piano, guitar, sax, synth pad, and a solo instrument all at once. Many devices can play up to 16 different sounds at once (one per MIDI channel).

To take full advantage of Performer's power, a multi-timbral MIDI setup is highly recommended. Even a single general MIDI sound module such as the Yamaha TG100, Korg 05R/W, or Roland Sound Canvas gives you an entire orchestra at your fingertips in Performer.

Disabling Local Control in your MIDI controller keyboard

Local Control is a setting found on just about every MIDI keyboard. It's easier to understand what local control does if you first understand the basic architecture of a keyboard synthesizer.

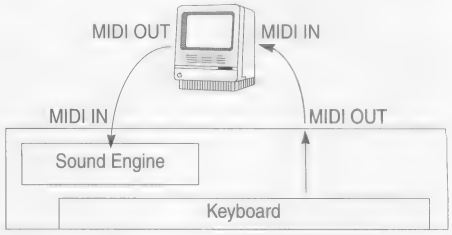
Most keyboard synthesizers actually consist of two separate components as shown below. The keyboard controller sends performance information to both the built-in synthesizer and the MIDI OUT port.



It's easy to think of them as being one and the same, but actually, the sound engine inside the synth is separate from the keyboard. In fact, many synth manufacturers ship a rack-mountable version of their popular keyboards that is simply the sound engine by itself, without the keyboard. Often the unit fits a single rack space—sometimes even a half-rack space.

Local Control is the setting that connects the keyboard to the sound engine. When Local Control is on, the keys on the keyboard trigger notes in the sound engine. When Local Control is turned off, this connection is temporarily severed, and the keys no longer trigger sounds within the synthesizer.

When you are using your keyboard as a sound source as well as a controller with Performer, turn Local Control off. (Consult the manual; it may be called "Local On" or "Local Off".) Don't worry, though. You'll still be able to trigger sounds via Performer's Patch Thru feature in the Basics menu, which echoes controller keyboard input to any sound source in your MIDI studio.



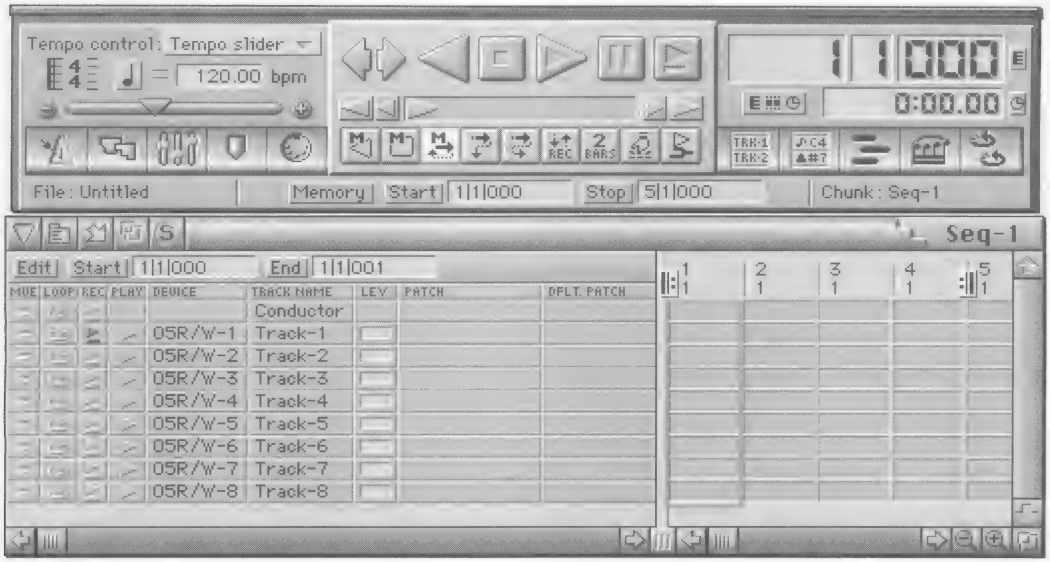
Open a new file

Lets begin with a new, empty Performer file.

1. **If Performer is not currently running, double-click its icon to launch the program.**

2. **If Performer is currently running, choose New from the File menu.**

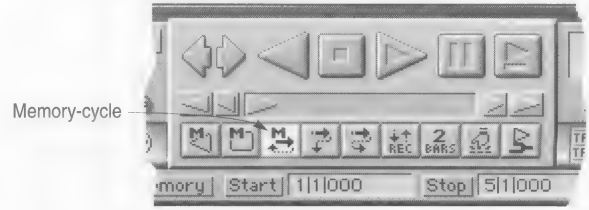
   If a file is currently open, you'll have to close it first by choosing Close from the File menu.



Set up memory-cycle recording

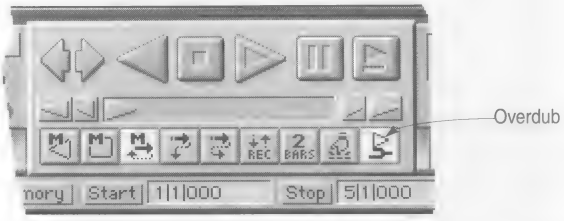
Memory-cycle lets you build a section of music by loop recording. We are going to build a two-bar drum loop.

1. **If it isn't already highlighted, click the Memory-cycle button to highlight it.**



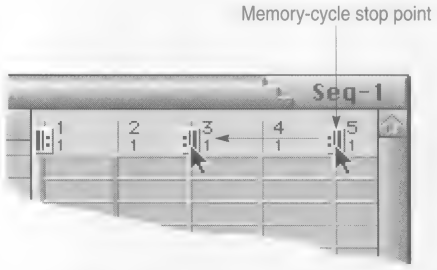
2. **Click the Overdub Record button to highlight it.**

   Overdub record mode causes newly recorded material to merge with data that is already in the track instead of erasing and replacing it.



3. **Drag the Memory-cycle stop point to bar 3 in the Tracks Overview.**

   The "tab" snaps to barlines as you drag, so you don't have to be exact. Performer will now loop the first two bars indefinitely.

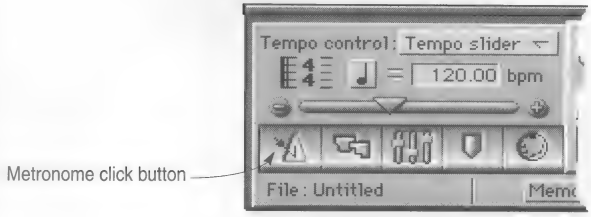


Set up a Metronome click

When you first record in real time into Performer, you need a metronome click so that you can play along with the measures and beats in Performer. Actually, it is possible to record without a click and afterwards line up the beats and barlines with your performance. For more information, see chapter 36, "The Record Beats Command" (page 591) in the Reference Manual. But for building our drum loop now, let's play to a click.

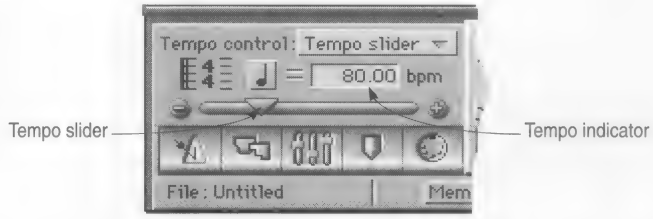
1. **Make sure the Metronome click button is turned on.**

   On a color screen the inset portion of the button turns yellow when the click is on. Try clicking the button a few times to toggle it back and forth so you can see the difference between off and on.



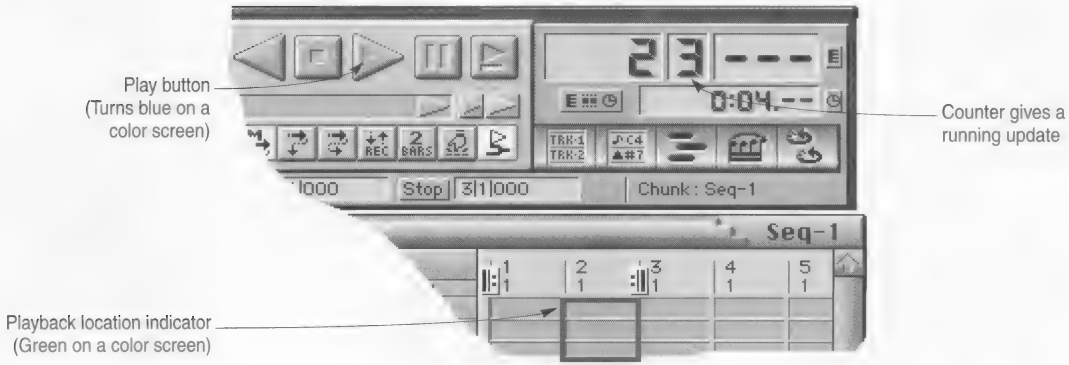
2. Set the tempo slider to a comfortable recording tempo.

A great thing about MIDI sequencing is that you can record at a slow tempo and then move up to full speed afterwards. Let's set the tempo slider to about 80 bpm (beats per minute).



3. To test the metronome click, press the play button and listen for the click sound produced by the Macintosh's internal speaker.

Performer begins to play, looping the first two measures. The main counter gives you a running update, and the playback location indicator scrolls in the Tracks Overview. Play for as long as you'd like.



4. **Press the Stop button to stop playback and press Rewind to return to the beginning of the sequence.**

   When you are done with this step, the Counter should read measure 1, beat 1 as shown below.

5. **If you did not hear the internal speaker click during playback, or if you feel that it won't be loud enough during recording, see the side-bar "Setting up a MIDI click".**

   Performer cannot produce an internal speaker click on some Macintosh system configurations.

Setting up a MIDI click

In addition to Performer's internal speaker click, you can use a drum machine, sampler, or other sound source to generate a click sound of your choice.

To set up a MIDI click:

1. **In the Tracks window, record-enable any track that is currently assigned to the drum machine, sampler, or other device that you'd like to use for the click sound.**

   If you need help with this step, see "Record enabling a track" on page 88 and "Setting the playback Device" on page 88.

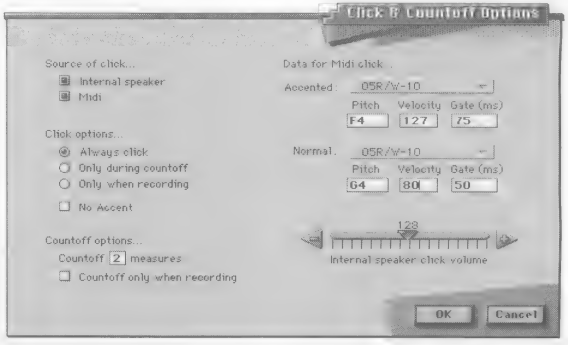
2. **From the Basics menu choose Click and Countoff Options.**
3. **Check the MIDI check box at the top of the window.**
4. **On the right, choose the device you would like to use for the accented click from the pop-up menu provided.**

   The accented click falls on the downbeats of measures.

5. **Double-click in the Pitch box to select it and either type the desired note or simply play the desired note on your controller keyboard.**
6. **Set the note-on velocity (0-127) and gate (duration in milliseconds) as desired.**
7. **Make the Normal click settings in the same fashion.**

   The Normal click falls on beat boundaries within each measure.

8. **Click OK.**

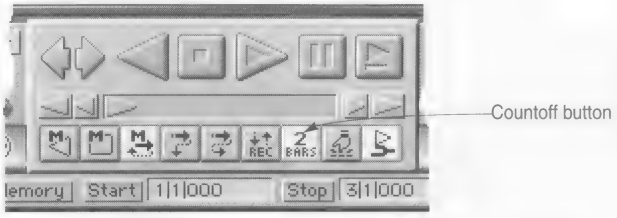


Set up a one bar countoff

Performer can give you a countoff before you begin recording, just like a conductor would, to get you into the tempo before the first downbeat. In fact, as you probably know, it's almost impossible to play in time with the first downbeat without a countoff.

Performer defaults to giving you a two-bar countoff. But we are recording at a fairly slow tempo, and we don't want to have to wait through a full two bars, so let's change the countoff to one bar.

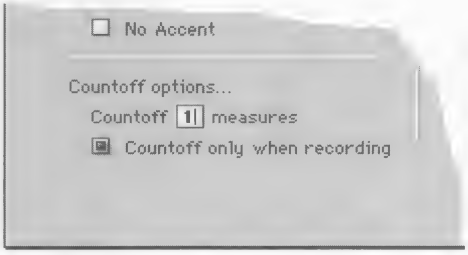
1. **Click the Countoff button once to turn it on.**



2. **Double-click the Countoff button to open the Click and Countoff Options dialog box.**

   For a full picture of this dialog box, see the picture that accompanies "Setting up a MIDI click" on page 108.

3. **In the Countoff Options section, change the 2 in the text box to a 1.**



4. **Check the "Countoff only when recording" option.**

   This option causes Performer to skip the countoff when you click the Play button.

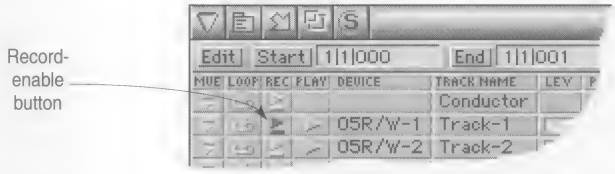
5. **Click OK to confirm the new settings.**

Set up a track for recording

Let's set up Track-1 for recording the drum loop.

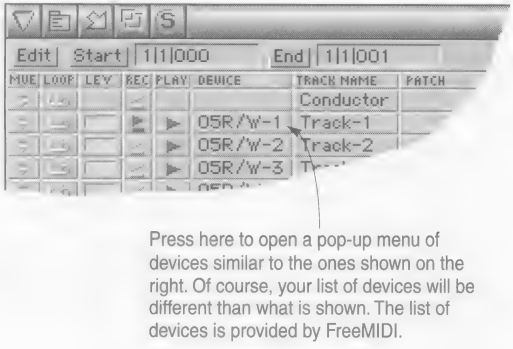
1. **Make sure that Track-1 is record-enabled.**

   In a new Performer file, Track-1 is record-enabled by default. If for some reason it is not, click its record button so that it is red (or black on a black and white screen).

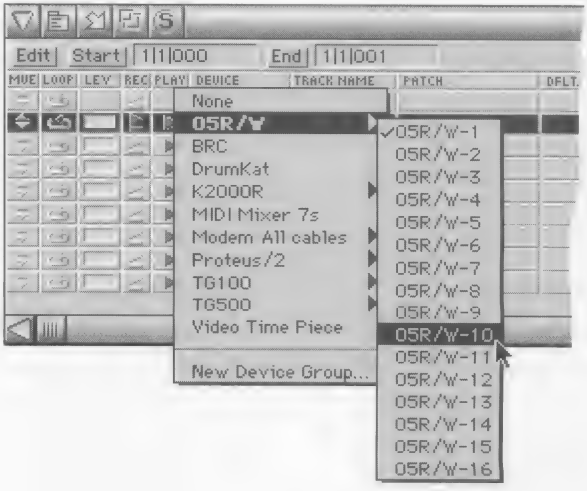


2. **Choose a sound source that can produce a drum kit from the pop-up menu in the Device column next to Track-1.**

   Press on the current device assignment to open the pop-up menu. Choose your drum machine, sampler, or other device. On many multi-timbral synthesizers and sound modules, the drum kits can be found on MIDI channel 10.



Press here to open a pop-up menu of devices similar to the ones shown on the right. Of course, your list of devices will be different than what is shown. The list of devices is provided by FreeMIDI.



3. **Make sure there is a drum kit currently playing on the device and channel that you chose.**

   First, check in the Patch column next to the track. If you see sounds listed by name similar to Figure 9-1 below, choose a drum kit. If you see a generic list of names ("Patch 1, Patch 2, Patch 3", etc.), don't choose anything for now. Instead, set up a drum kit manually using the front panel controls on the MIDI device itself. Make sure you set up the drum kit on the same MIDI channel as the one you've assigned to Track-1 in Performer. By the way, you can replace the generic patch names with actual ones; see chapter 48, "Using PatchList Manager" (page 725) in the Reference Manual for details.

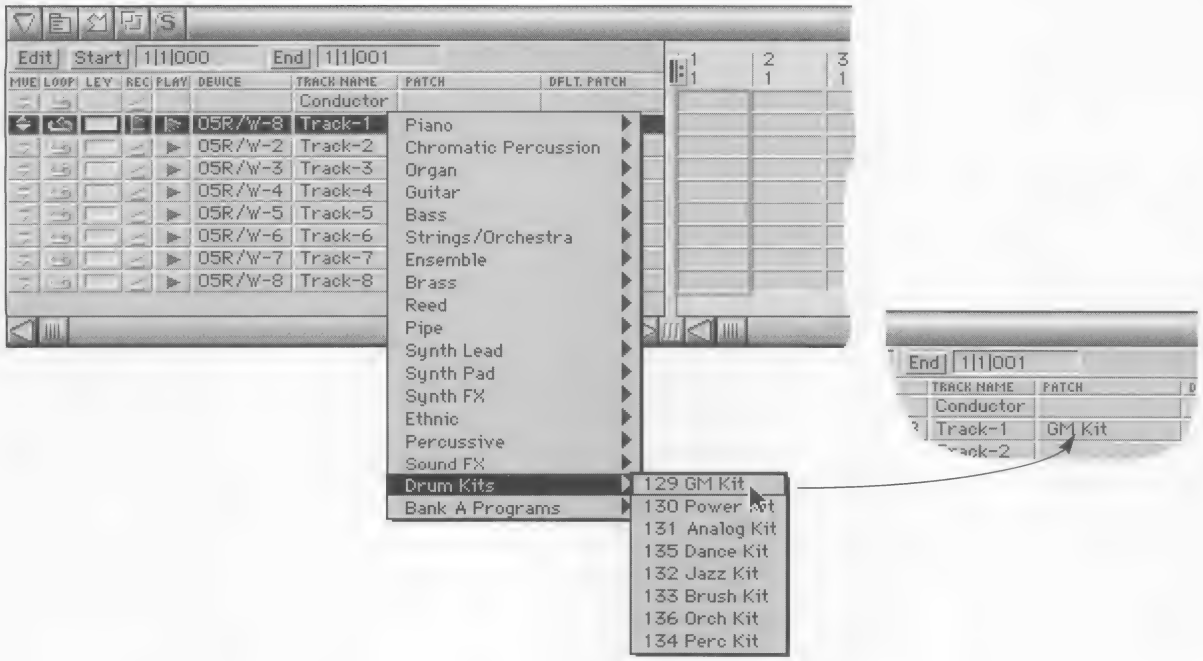
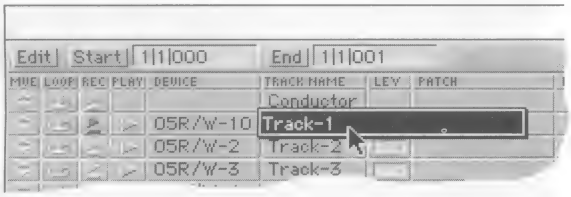


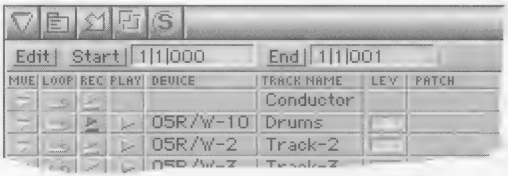
Figure 9-1: Choosing a drum kit for the drum track.

4. **Rename Track-1 by option-clicking the name to pop-edit it.**

   Type in the name "Drums" and then press the return key to confirm your typing.



Option-click a track name to pop-edit the name.



Press return to confirm the new name.

☛ Shortcut: when you are naming several tracks in a row, use the down arrow key to finish with the current track and pop-edit the next one in the list.

5. **Test the track setup by playing a few notes on your MIDI controller; you should hear drum sounds as you play.**

When you play notes on your controller, Performer receives them and then echoes them to the playback device for the currently record-enabled track—even when Performer is stopped. At this point, your controller should be playing the drum kit source you selected. If not, check the volume of the MIDI device. If it has a MIDI activity indicator, check to see if the indicator blinks when you play notes on your controller. If you have a multi-port MIDI interface such as a MIDI Time Piece II or MIDI Express, see if the MIDI OUT light corresponding to the MIDI Device blinks when you play your controller. These things will give you an indication of whether the MIDI note information is reaching the device or not. If not, see "Testing for MIDI input and output" on page 62.

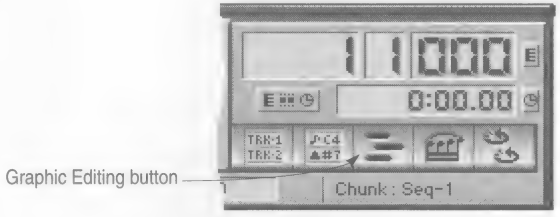
Open the Graphic Editing window to see what you record

Let's open the Graphic Editing window before we begin recording so we can see the notes we record.

1. **Click the track name "Drums" to highlight it.**

   Doing selects the track.

2. **Click the Graphic Editing window button in the Consolidated Controls panel.**



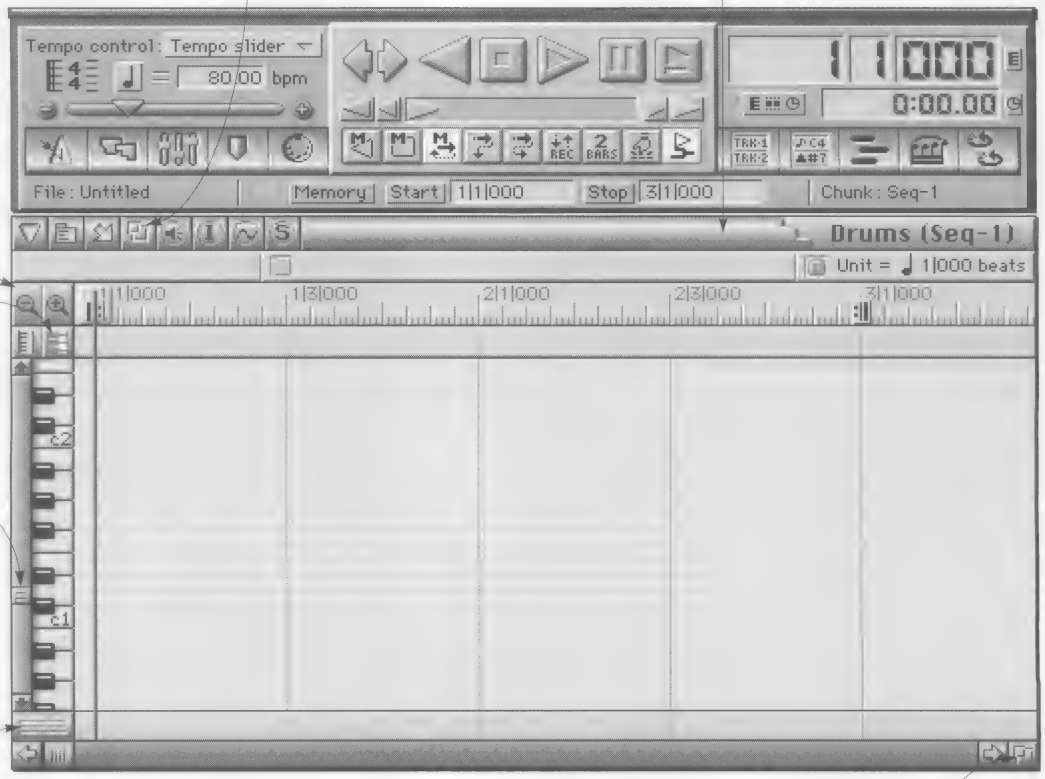
3. **After the Graphic Editing window appears, use the controls shown in the following diagram to optimize the position of the window on your screen.**

   Be sure to keep the main control panel visible, as you'll need to use it during recording.

Click the Time ruler "zoom in" button once (maybe twice) to fill the window with the looped region (the first two bars).

If you'd like to quickly open the window to the full width of your screen, click the resize button.

To move the Graphic Editing window, drag its title bar.



Click the Pitch ruler "zoom in" button twice to zoom in on about a one-octave range.

Use the pitch ruler scroll bar to scroll the ruler and note grid to the note range that contains the drum pitches for kick, snare, and hi hat. These sounds are usually in the octave from C1 to C2 as shown here.

Drag the median strip handle all the way down to temporarily hide the continuous data grid (which will be covered later).

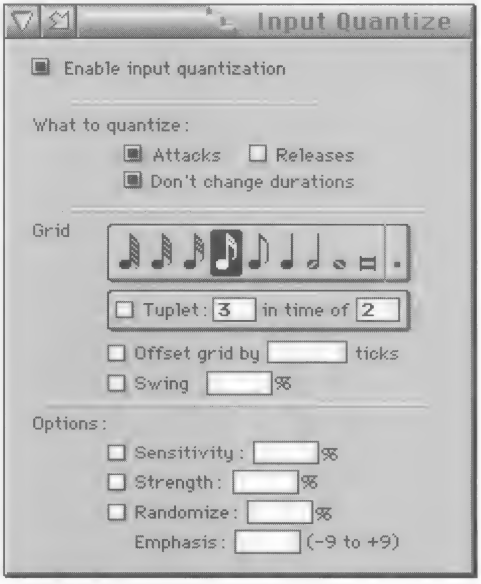
Drag the resize box to resize the entire window.

Quantize on input

Performer records what you play very accurately, including every timing nuance. Performer's Input Quantize feature can be a great help when recording drums, regardless of your level of drum or keyboard chops. Input Quantize places notes on an evenly spaced timing grid so that they are recorded in a rhythmically precise fashion. This helps get notes on the proper beat right as they are recorded so you don't have to spend time afterwards making slight corrections.

Don't worry about sounding stiff or robotic; we are going to apply a groove to the drum loop a little later in the tutorial to give it some feel.

1. **Choose Input Quantize from the Windows menu to open the Input Quantize window.**



2. **Click the check box at the top of the window labeled Enable Input Quantize. Leave the rest of the options alone for now.**

3. **Close the Input Quantize window.**

   This window could be left open, but for now, click its close button at the far left of the title bar, or press command-w.

And now the fun really begins

You are ready to record! You'll now build the drum loop, one pass at a time. Try adding one drum part at a time as described in the next few sections, and feel free to let the loop play as many times as you want before recording the next part. If you make a mistake, you can either fix it in the Graphic Editing window or erase the pass entirely.

If you haven't done this sort of thing before with a drum machine or other pattern-based sequencer, you may find it useful to record related sounds together, such as kick and snare, and closed hi-hat with open hi-hat.

> ☛ Once you begin recording below, try to complete the drum loop without ever stopping the music. We've set up the tutorial so that you can fix mistakes, and do everything you need to do without ever having to hit the stop button. It's fun, and more importantly, you'll learn to become more interactive with the music.

Record kick and snare first

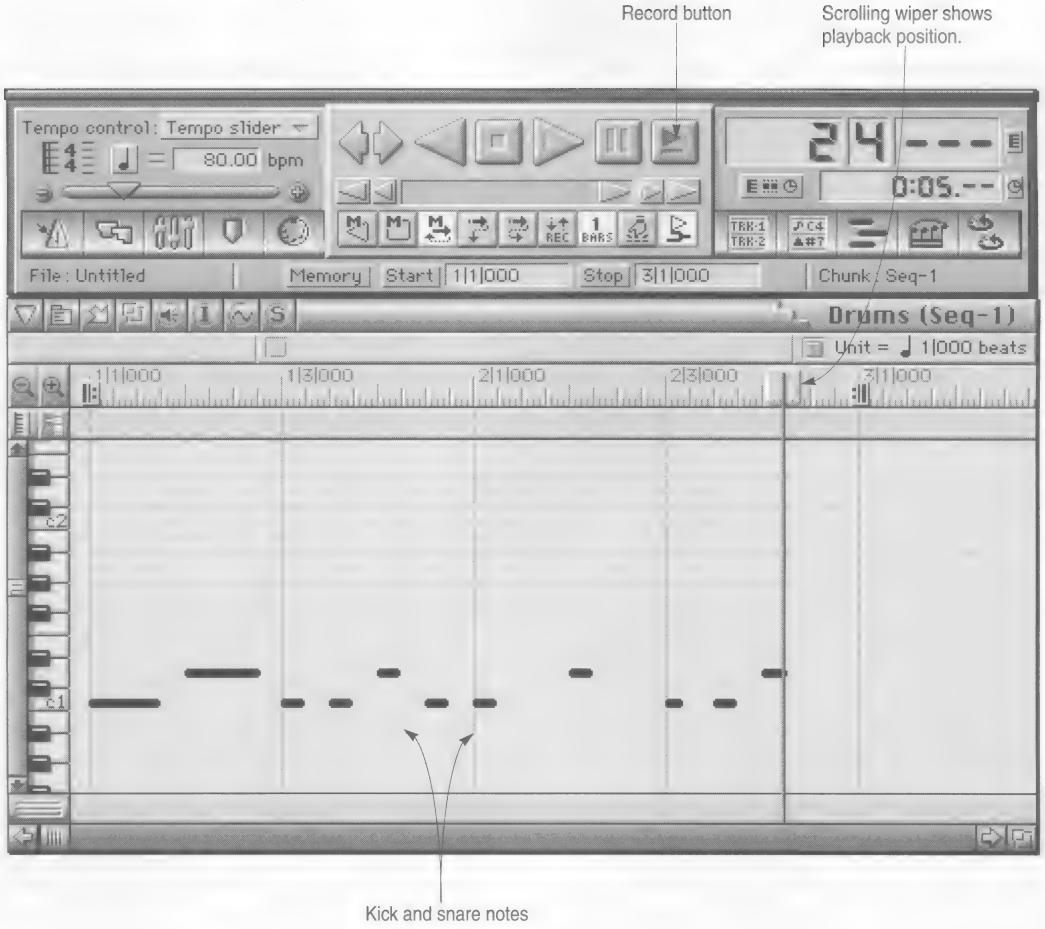
Let's start with the kick and snare:

1. **Before you start recording, find the kick and snare keys on your controller keyboard.**

   For the purposes of this tutorial, it doesn't really matter what you play. If nothing else, play the kick "four on the floor" and the snare on beats two and four.

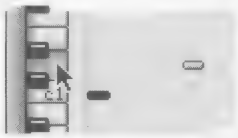
2. **When you are ready, click the Record button, listen to the countoff, and play a two bar kick-snare pattern.**

3. **If you make a mistake, don't worry. Let the loop keep playing for now and proceed to the next section.**


Record button
Scrolling wiper shows playback position.
Tempo control: Tempo slider
80.00 bpm
File : Untitled
Memory
Start
1|1|000
Stop
3|1|000
Chunk : Seq-1
Drums (Seq-1)
Unit = 1|000 beats
1|1|000
1|3|000
2|1|000
2|3|000
3|1|000
c2
c1
Kick and snare notes

Fix mistakes and get ready to add the hi-hat part

Here are several things you might want to do next:

What you want to do:	How to do it:
Erase all the notes and start over	Choose Undo from the Edit menu.
Erase all notes of one particular sound (such as all hi-hats)	Double-click the corresponding key on the pitch ruler, which selects all the notes of that pitch, and press the delete key. 
Erase a wrong note	Click it and press the delete key. 
Move a note earlier or later	Click the Edit Resolution note in the upper right corner of the window, change it to a sixteenth note, and then drag any note in the note grid. 
Hear the drum loop at full tempo	Drag the tempo slider up to the desired tempo.
Practice the hi-hat part without recording it yet	Click the Record button to take Performer out of record and keep playing.
Record the hi-hat part	Click the Record button again to put Performer back into record mode and wait for the next iteration of the loop.
Stop loop recording altogether (because the phone rang or something)	Again, try to resist pressing the Stop button. But if you absolutely have to…

Add the hi-hat

To add the hi-hat, slow the tempo way down and play a boring, sixteenth-note pattern (four notes to each beat). (We'll spice it up later with a groove.)

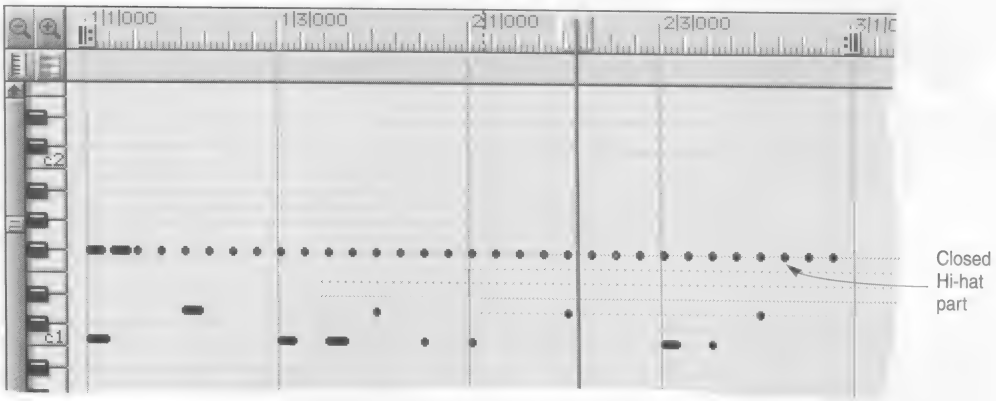
1. **Drag the tempo slider down to about 60 bpm.**
2. **Click the Record button to take Performer out of Record mode temporarily while you find a closed hi-hat key on your MIDI keyboard.**

   You may also want to practice playing the part once or twice before going back into record, just to get the hang of it.

3. **Once you've found the key, put Performer back into record by clicking the record button.**
4. **Wait for the loop to cycle back to the beginning.**
5. **Play the closed hi-hat part, in a sixteenth pattern, four notes to each beat.**

   Notice that Input Quantize makes them rhythmically precise. If you make a mistake, don't panic. Refer to the chart of the previou page to fix it or erase it and try again.

You should now have something like this:



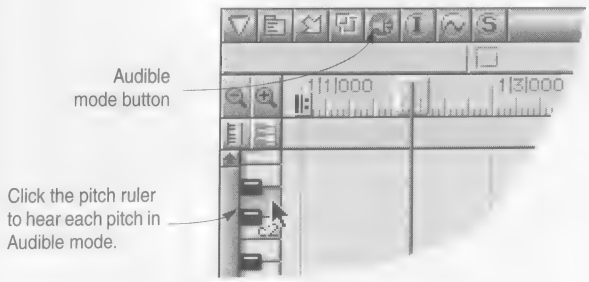
Add a few open hi-hats

Adding open hi-hats to the closed hi-hat part is easy. Just change a few closed hi-hat notes into open hi-hat notes by dragging them up or down.

1. **Drag one of the closed hat notes up or down to the open hi-hat pitch.**

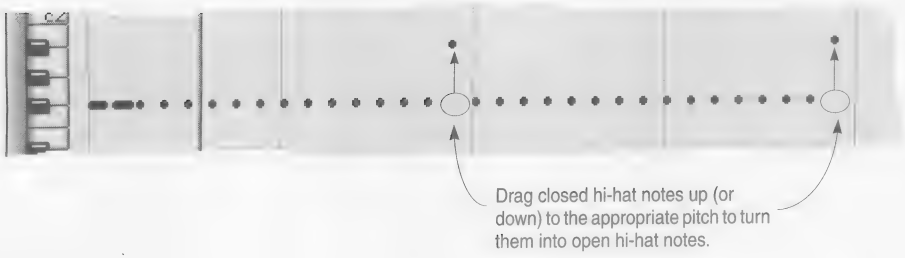
2. **If you aren't sure what pitch is the open hi-hat, click the Audible mode button in the title bar and then click keys on the pitch ruler.**

   In audible mode, notes and keys on the pitch ruler play when you click them. Keep clicking the pitch ruler keys until you find the open hi-hat sound. Then drag the closed hi-hat note straight up or down to that pitch.



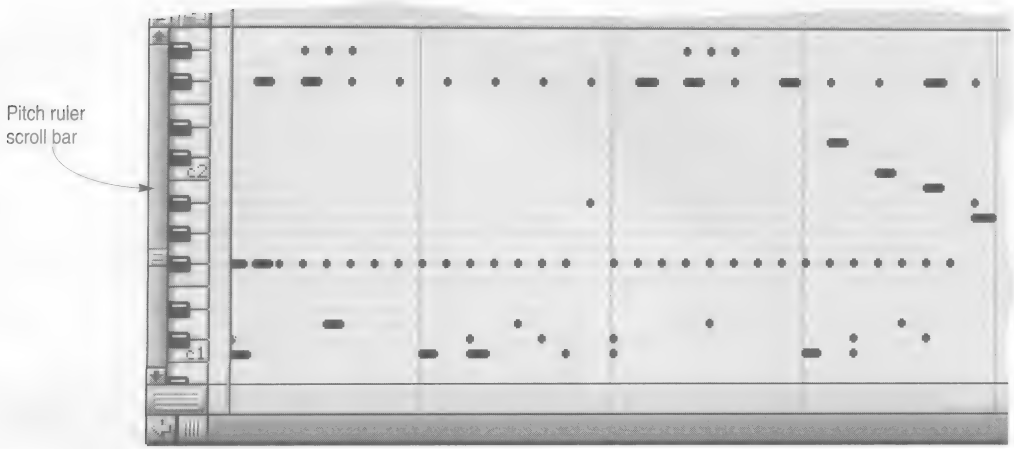
3. **Do the same for a few other notes of your choice.**

   Try using ones that are just before a measure downbeat.



Add more percussion with what you already know

Congratulations! You've just created your first drum loop in Performer. With what you already know, feel free to add more percussion parts to the loop if you'd like. Just keep in mind that if the drum sound you want to record is not in the octave currently showing in the note grid, you'll need to scroll the grid with the pitch ruler scroll bar to see the notes.



Save what you have done so far

As you sequence, Performer stores your work in the computer's memory. But memory is volatile; it is completely erased when the computer is shut down or restarted. If this happens unexpectedly (the computer crashes, or the power goes out), you loose everything—unless you save it to disk. Therefore, get in the habit of saving every time you reach a point where you like what you've got so far. Try to save every few minutes during a session so you never risk losing more than a few minutes worth of work. If magic happens in a session and you record that perfect take, save it immediately. Once saved to disk, you run much less of a chance of losing your work, although even on disk it can be lost. So back up your hard disk, too.

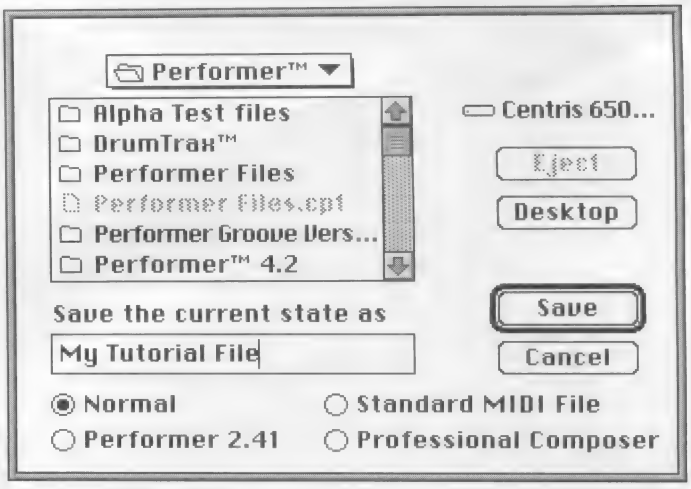
To save your file:

1. **Press the Stop button.**

   Saving is one of the few things that Performer can't do while playing.

2. **Choose Save from the File menu.**

   The standard Macintosh Save dialog box appears.



3. **Type in a name for the file.**

4. **If desired, choose a folder in which to save the file.**

5. **Click Save.**

Select the loop and apply a groove

Now that we've successfully recorded the notes, let's apply a groove to the drum loop to give it some feel with the Groove Quantize command in the Region menu. You'll use the commands in the Region and Edit menus all the time.

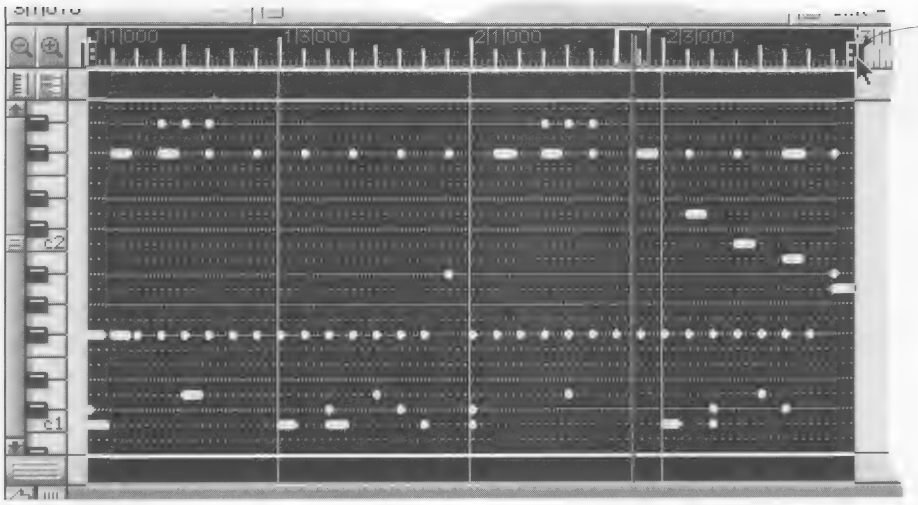
1. **Press the Play button to start playback again.**

2. **Set the tempo slider to a tempo around 104 bpm.**

   This tempo suits the grooves we will apply in a moment.

3. **Select the drum loop by double-clicking either repeat barline icon in the time ruler.**

   The ruler and note grid highlights between the loop points.



4. Choose Groove Quantize from the Region menu.

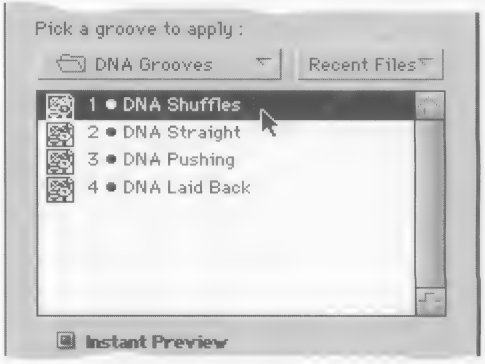
The Groove Quantize dialog appears.

☛ If you get a message saying that Performer couldn't find the Grooves folder, you'll need to stop the tutorial for a moment to locate the groove folder in the Macintosh Finder and drag it into the same folder as Performer. If you'd rather not disrupt the flow of the tutorial, you can skip this section of the tutorial and flip to the next section.

5. **Double-click the folder called DNA Grooves.**

   Grooves are stored in groove files. The DNA Grooves folder has several groove files, called *DNA Grooves*™, provided free of charge with Performer by WC Research, Inc., who provide an extensive library of commercially available grooves.

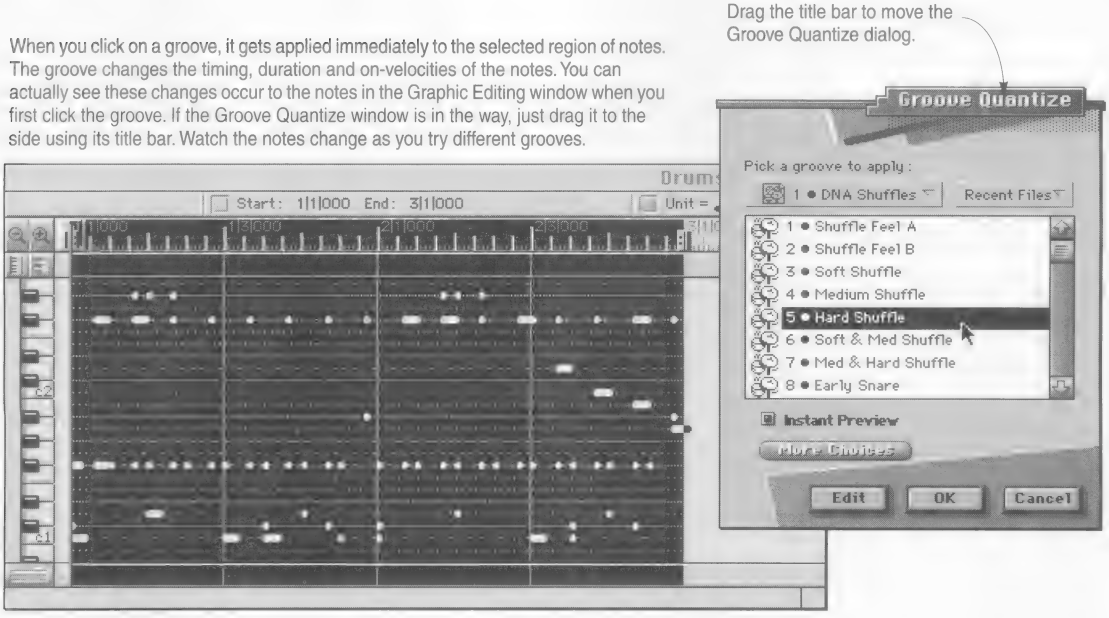
6. **You'll now see a few groove files in the list as shown below. Double-click the file labeled "1•DNA Shuffles" to open it.**



7. **Now you'll see a list of shuffle grooves. Make sure the "Instant Preview" check box is checked below the list, and click one of the grooves in the list to apply it to the drum loop.**

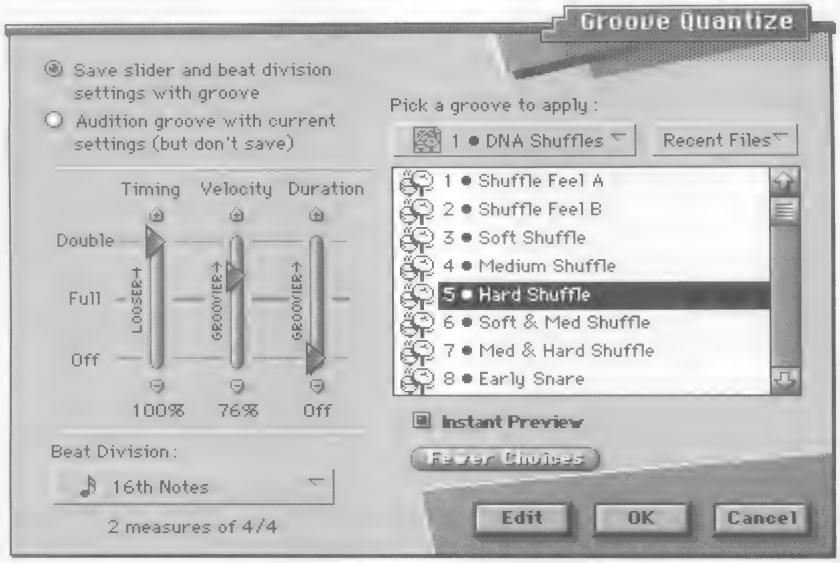
   When Instant Preview is turned on, the groove is applied to the loop as soon as you click on the groove name. But the groove doesn't get permanently applied until you click OK. So feel free to experiment with different grooves in the list. To try a different groove, just click its name.

When you click on a groove, it gets applied immediately to the selected region of notes. The groove changes the timing, duration and on-velocities of the notes. You can actually see these changes occur to the notes in the Graphic Editing window when you first click the groove. If the Groove Quantize window is in the way, just drag it to the side using its title bar. Watch the notes change as you try different grooves.



8. **When you find a groove you like, click the More Choices button.**

   This button adds more controls to the Groove Quantize window.



9. **Use the three faders to experiment with changing the degree to which the groove is applied.**

   The three faders control how much timing, velocity, and duration information is applied from the groove. They let you fine-tune the effect of the groove. With Instant Preview turned on, changes you make to a slider occur as soon as you release the slider handle.

10. **After you're done experimenting, and you have the groove the way you like, click OK to apply the groove to the drum loop.**

    The Groove Quantize dialog goes away, and the groove is permanently applied to the drum loop.

11. **Press the Stop button to stop playback at this time, and press rewind to rewind to measure 1, beat 1.**

12. **Now would be a good time to save the file again. Choose Save from the File menu.**

    Since you already created and named the file once already, it doesn't ask you for a name this time. Instead, it just saves the file to disk in its current state.

Prepare to record a second track

Let's put away the Graphic Editing window for now. To do so, click its close button at the far left of the title bar. Now let's prepare Track-2 for recording.

1. **Record-enable Track-2.**

   There are two ways to do this: 1) click the record-enable button in the Tracks list window, or 2) press the down arrow key.

2. **Choose a playback device for Track-2 from the Device pop-up menu.**

   For a review of this procedure, see "Set up a track for recording" on page 110.

3. **Choose a bright piano or bright synth sound for the new track from the Patch column (or call up the sound manually from the device itself, if sound names are not yet showing in Performer's patch pop-up menu).**

   If you have a general MIDI sound module, use "Honky Tonk Piano".

4. **Rename the track "Chords".**

   As you did earlier in the tutorial, option-click the word "Track-2" to pop-edit the name.

5. **Test the track by playing a few notes on your controller keyboard.**

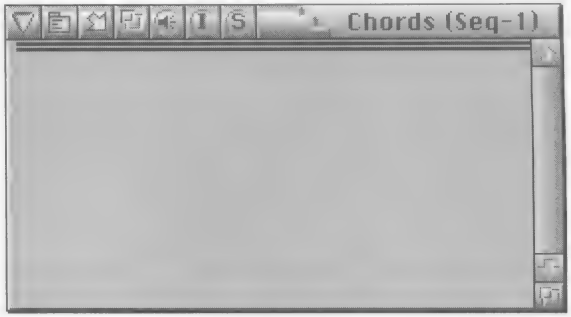
   You should hear the piano sound you called up earlier.

Step record a piano part

Step Record is a powerful sequencing feature because it lets you record notes one at a time. It is especially useful if you don't have well-practiced keyboard skills. We'll use it to enter some half-note chords:

1. **Press the Rewind button to make sure that the sequence is rewound to measure 1, beat 1.**

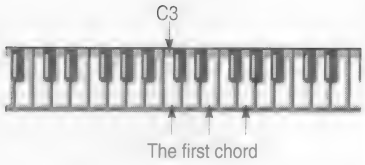
2. **To be able to see what you are entering, double-click the track name "Chords" to open the event list window for the Chords track.**



3. Choose Step Record from the Basics menu.

The Step Record window appears. If necessary, move the Step Record window by dragging its title bar so that it doesn't obscure the event list window.

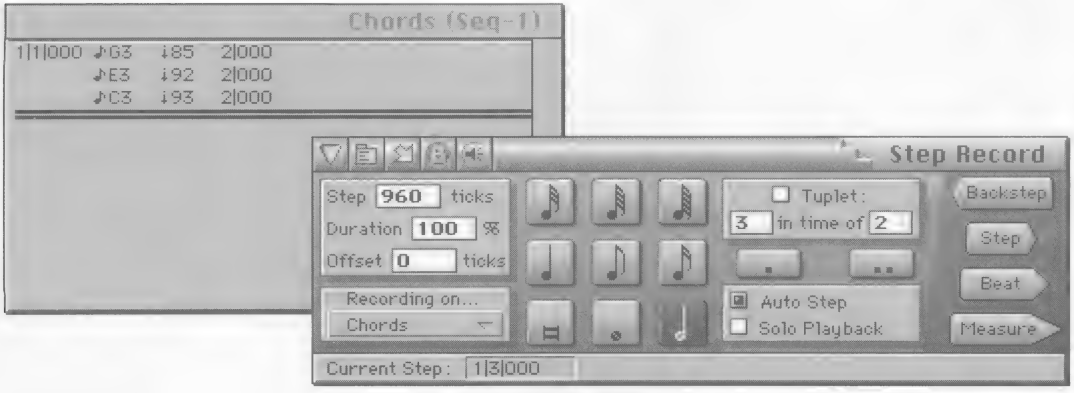
4. Click the half note duration button.



5. The first chord you'll enter is a simple C major triad (C-E-G) starting on middle C (C3). To enter the chord, press these three keys down together once and then release them together.

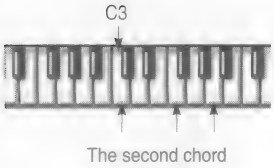
The chord is actually entered when you release the keys. Notice that the current step and the main counter advance the duration of a half note to beat 3. In addition, Performer plays the first two beats of the measure when you enter the notes so you can hear the chords in context with the rest of the sequence. Notice also that the chord notes displayed in the event list are precise half notes: they have a duration of two beats (2|000) and all occur together exactly on beat 1 (1|1|000).

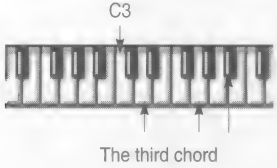
☛ If you make a mistake, Don't worry. Press the Backstep button and try again.

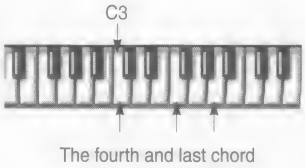


6. In a similar fashion, play the second chord: F maj (for beats 3 and 4 of measure 1).

Remember, when you are step recording, you can take as much time as you want with each step. Use the Backstep button if you make a mistake and need to re-enter the chord.







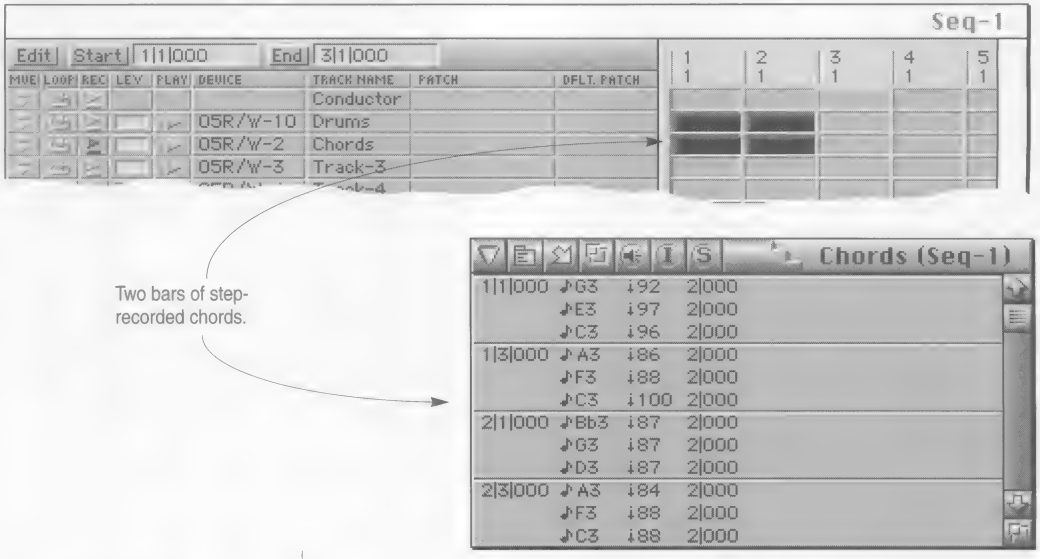
7. **At your leisure, play chords three (G minor) and four (F major again).**

   Be sure to completely take your hands off the keys before playing the next chord. In fact, it is good technique when step-recording to play in a staccato fashion—almost as if you were pecking at the notes. This ensures that you won't play too many notes on a beat.

8. **When you are done, close the Step Record window.**

   You now have two bars of chords in the sequence.

9. **To hear the chords play back in real time with the drums, press the Memory-cycle button to turn it back on (Step Record turns it off), press the Rewind button, and then press the Play button.**



Set up a bass track

Now let's add one more track: a bass part.

1. **Record-enable Track-3.**

2. **Choose a playback device and channel from the Patch column in the Tracks window.**

3. **Choose a bass sound for the track from the Patch column (or call up the sound manually from the device itself, if sound names are not yet showing in Performer's patch pop-up menu).**

4. **Change the name of Track-3 to "Bass".**

Enter the bass part in the QuickScribe notation window

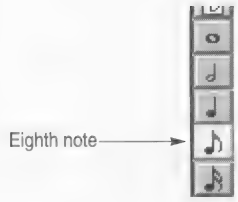
You're now ready to enter the bass part. Let's do it by inserting notes graphically in the QuickScribe notation window. If you don't read music notation, don't worry. You'll still be able to follow the tutorial here.

1. **Select the Bass track by clicking its name.**

2. **Check to see that the end time in the Edit bar is 3|1|000. If not, double-click the Edit button in the Edit bar.**

   This selects the first two bars in the Bass track.

3. **Click the QuickScribe notation button to open the QuickScribe window.**



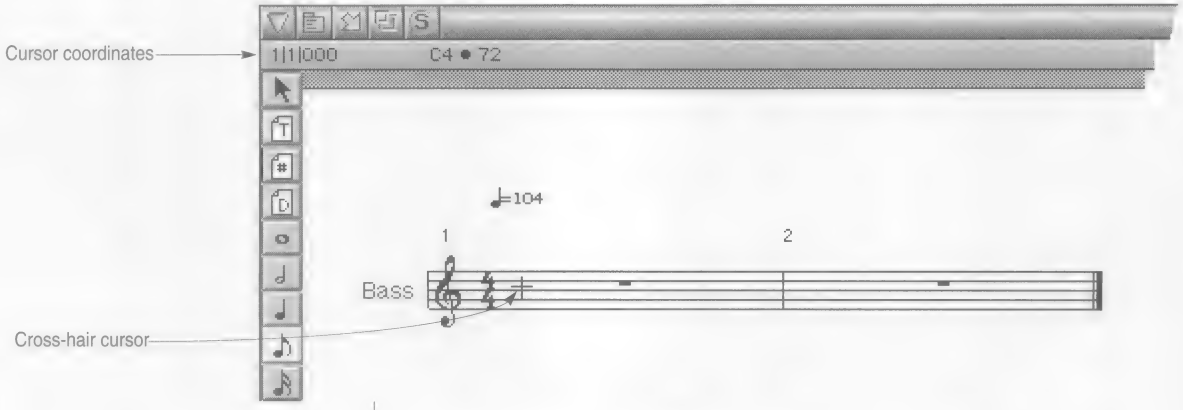
4. **Click the eighth note in the tool palette to select an eighth note duration.**

   The cursor turns into a cross hair to indicate it is ready to insert notes.

5. **Place the cross-hair cursor in the middle space on the staff on beat one in the first measure.**

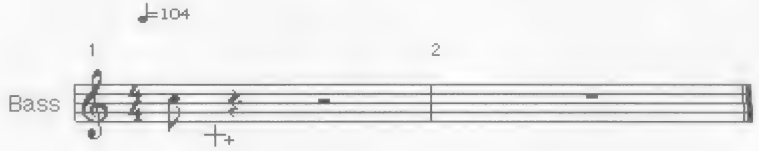
   Use the cursor coordinates display to help you position the cursor. Before you click, the cursor coordinates should read "1|1|000 C4 • 72".

   ☛ We are entering the bass part in the middle of the treble clef staff to avoid dealing with lots of ledger lines below the staff. We will transpose the notes down to the proper octave after we enter them. The clef with then automatically change to a bass clef.



6. **Click the mouse to insert an eighth note on beat one.**

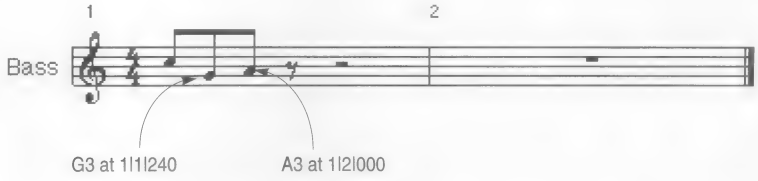
   ☛ If you make a mistake, don't worry. To fix it, you have two choices: 1) choose Undo from the Edit menu and try again, or 2) drag the note up, down, left, or right to the correct pitch or location. To drag the note, click the notehead and drag as needed.



7. **In a similar fashion, enter the next two eighth notes in bar 1.**

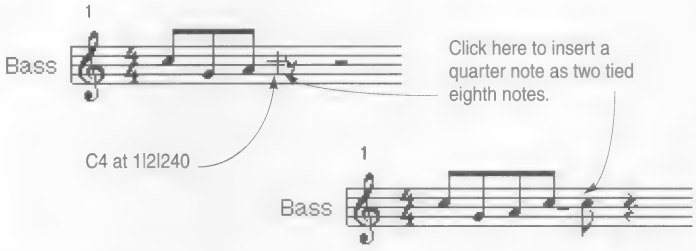
   Use the cursor coordinates display to position the cursor at the proper beat and pitch before you click. Notice also that the cursor "snaps" to a grid to help guide you.

   ☛ Don't worry about the rests, ties, and beams. Performer adds them automatically.



8. **Now let's enter a quarter note. Click the quarter note icon in the tool palette and click as shown below.**

   Performer properly notates the quarter note as two tied eighth notes because it lies across a beat boundary.



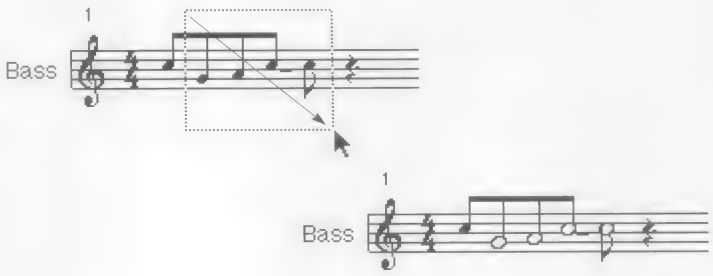
Complete bar 1 by copying and pasting

Let's complete bar 1 by learning how to copy and paste notation.

1. **Click the arrow in the tool palette to select it.**

   The cursor changes back to the standard Macintosh arrow.

1. **Select all the notes except the first one by dragging as shown below.**

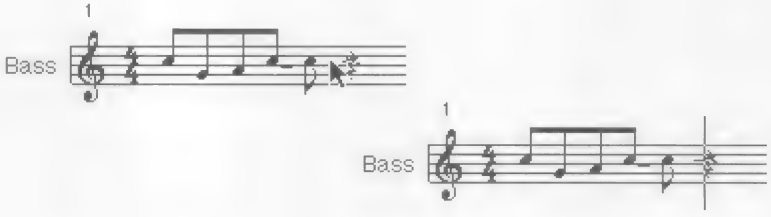


2. **Choose Copy from the Edit menu.**

   This copies the notes into the Clipboard.

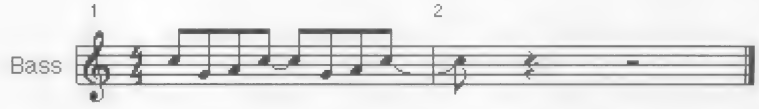
3. **Click in measure 1 to the right of the last note.**

   An insertion cursor appears on the staff.



4. **Choose Paste from the Edit menu.**

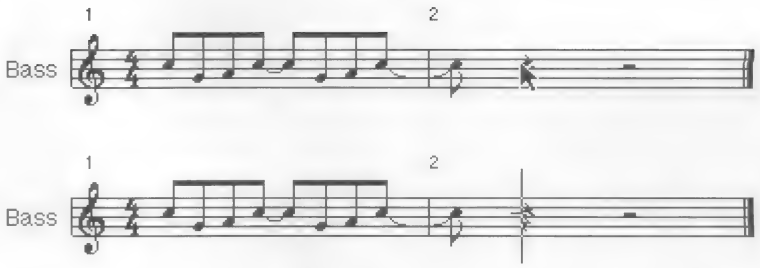
   The notes are pasted into the measure.



Finish bar 2 with Macintosh keyboard note insertion

The QuickScribe notation window also provides note insertion directly from the Macintosh keyboard. Let's finish bar 2 from the Macintosh keyboard. First, we need to place the insertion cursor back on the staff.

1. **Click in bar 2 on the rest after the first note to place the insertion cursor there.**



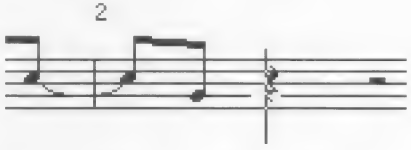
2. **Use the up and down arrow keys to move the cross-hair to the second line from the bottom as shown below.**

3. **Press the right bracket key ( ]) twice.**

   This selects the eighth note tool in the palette. You can freely use the right-bracket and left-bracket keys to select any duration tool in the palette.

4. **Press the return key.**

   Another eighth note appears in bar 2.

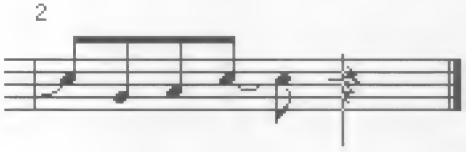


5. **Press the up-arrow key to move up to the second space**

6. **Press return to enter the next eighth note in the second space.**

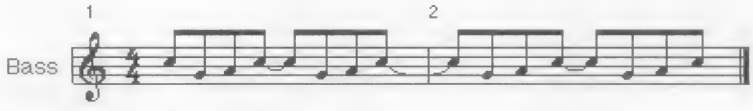
7. **Press the left-bracket key once to change to the quarter note tool in the palette, and press the up-arrow twice to move the cross hair to the middle space.**

8. **Press return to enter the quarter note.**



9. **Use the keys shown below to finish the measure.**

To do this:	Type this:
Select the eighth note tool	Left-bracket ([ ) & right-bracket ( ])
Move the cross-hair up and down	Up arrow & down arrow
Move the cursor left and right	Left arrow & right arrow
Insert a note	Press return
Fix a mistake	Choose Undo from the Edit menu



Transpose the bass part to the proper octave

For ease of entry, we entered the bass part on a treble clef staff in the octave of C3 to C4, which is too high. Let's transpose it down to the proper octave.

1. **Choose Select All from the Edit menu to select all the notes.**

   Alternately, you could press command-A. This *convention works* in just about every window in Performer.

2. **Choose Transpose from the Region menu.**

   The Transpose dialog box appears.

Let's transpose by interval down three octaves:

3. **Play C4 on your MIDI keyboard so that it shows up in the highlighted "From" box on the screen.**

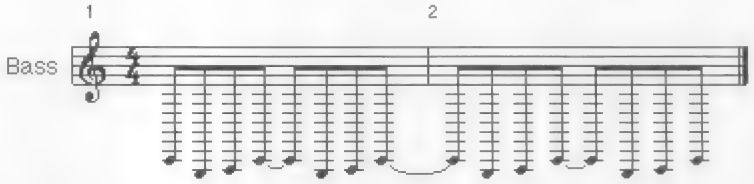
   If you don't get C4 on your first try, don't worry. Keep playing until you see "C4" appear in the box.

4. **Press the tab key once to highlight the second box labeled "to", and then play C1.**

   The dialog should now say From C4 to C1".

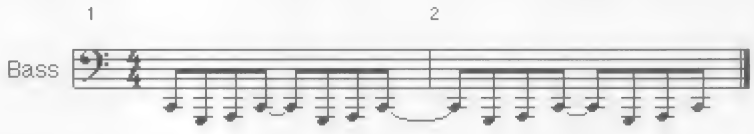
5. **Click OK.**

   The notes are transposed down three octaves.



6. **To switch the clef to a bass clef, choose Repaginate from the QuickScribe window mini-menu.**

   The staff is automatically redrawn with a bass clef. Performer automatically senses the appropriate clef for each staff.



7. **Close the QuickScribe window for now by clicking its close box at the far left of its title bar.**

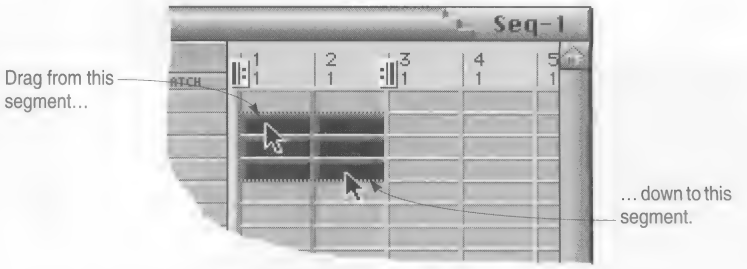
You can print out the contents of the QuickScribe window. For more information, see chapter 23, "QuickScribe Notation" (page 345) in the Reference Manual for more information.

Make a four bar phrase

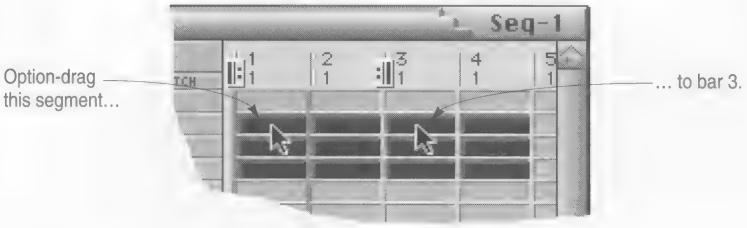
Let's make our two bar loop into a four bar phrase now by making a copy of it in bars 3 and 4.

1. **In the Tracks Overview, press on the upper left segment in the Drum track and drag down and to the right over the last segment in the bass track.**

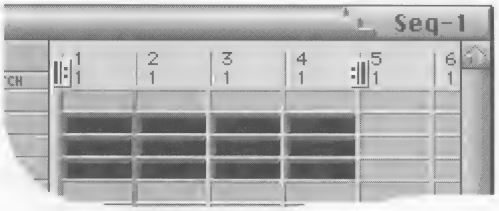
   This selects the first two bars in all three tracks.



2. **While holding down the option key, click the upper left segment again and drag two columns to the right to drop it in bar 3.**



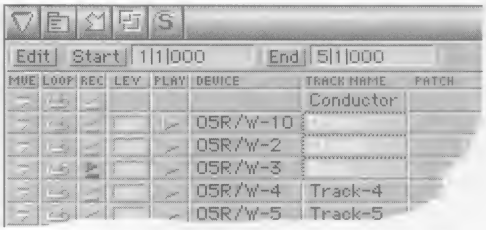
3. **Move the Memory-cycle end point to bar 5.**



Create a mixing console

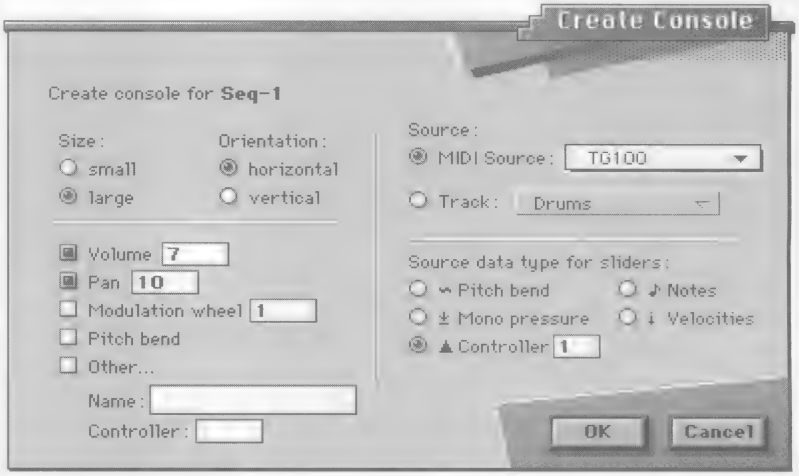
Now let's create a mixing console to control volume and panning.

1. **Select the three tracks by dragging over their names in the Tracks lists.**



2. **Choose Create Console from the Tracks window mini-menu.**

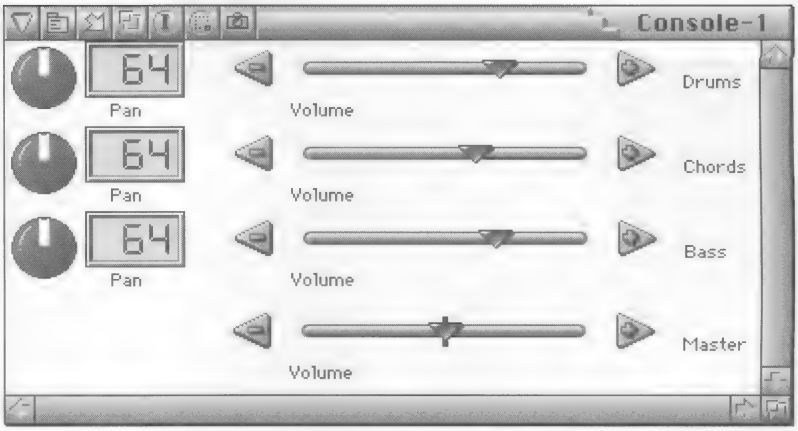
   A dialog box appears.



3. **Choose the orientation and size that you would like, and click the Volume and Pan options.**

4. **Ignore the other options for now and click OK.**

   Performer creates a new console for you, complete with a master fader. You can create an unlimited number of consoles in Performer. This console emulates a hardware mixing console, and you can create a real-time, automated mix-down of your music.



5. **Start playback by pressing the space bar, and adjust the mix as follows.**

To do this:	Do this:
Adjust a track's volume	Drag each track slider individually. You can also press on the plus and minus buttons, or click anywhere on the slider to make a sudden jump.

Adjust panning	Drag a knob up and down or left and right. You can also click on the value box next to the knob and type in the desired value (between zero and 127, where 64 is pan center).
Smoothly fade all tracks at once	Drag the master fader.
Record a fader movement	**1. Record-enable any empty track.** **2. Press the Record button.** **3. Move the fader you want to record.** When you record a fader, it generates a stream of continuous controller data in the track it controls. Since you are Memory-cycle recording, be aware of where you are in the loop as you record so that you don't overlap. For example, try to start recording in bar 1 and finish in bar 4. To start recording the slider, just grab it's handle with the mouse. To stop, just let it go.
Watch a fader animate after recording	Just play the sequence.

☛ Some MIDI synthesizers don't respond to a MIDI mixing console like this one. If you don't get any response from your MIDI device as you adjust the controls in the console, this is probably the case. Try assigning the tracks to a different MIDI device, if you have one.

6. **Before we move to the last section of the tutorial, adjust the mix to a comfortable setting.**

7. **Close the mixing console by clicking its close box. You can re-open it at any time by choosing it from the Windows menu.**

Open the Chunks list

Congratulations! You have just built a sequence in Performer. You now know enough to build your own sequences of any length with any number of tracks. Many people use the Tracks window as their sole organizing tool for their music. You can create sequences hundreds of bars long and you can organize them with markers.

Performer has another way to organize your music: the Song window. The Song window gives you a graphical, structural view of your music. And creating a song is easy. First you build sequences just like the one we made in this tutorial. Then you arrange them in a song window. Let's try it now.

1. **Close the Tracks window.**

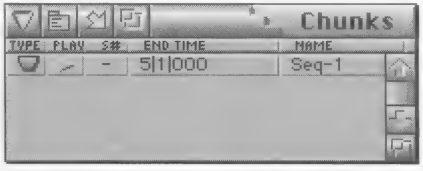
2. **Open the Chunks List window by clicking its button in the Control panel.**

   The Chunks list window shows you all of the sequences and songs—collectively referred to as *chunks*—in the Performer file you have open.

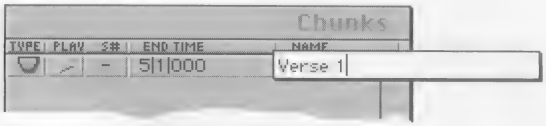
The Chunks list button.

3. **The Chunks list window appears, showing Seq-1, the sequence have been working on in this tutorial.**

   Seq-1 is play-enabled, and it is four bars long, so it has an end time of 5|1|000, which is the downbeat of measure five.



4. **Rename Seq-1 by option-clicking its name to pop-edit the name. Call it "Verse 1". Press Return to complete the change.**



Create an intro sequence

Let's create a modified version of "Verse 1" so we have two sequences to work with:

1. **Click the sequence name to select it.**
2. **Choose Copy from the Edit menu.**
3. **Choose Paste from the Edit menu.**

   A second copy of Verse 1 appears in the list. Currently, they are identical.

4. **Rename the second copy; call it "Intro".**

   Now let's modify the Intro sequence a little bit so that it sounds different from Verse 1.

5. **Double-click the name "Intro" to open the Tracks list window for it.**

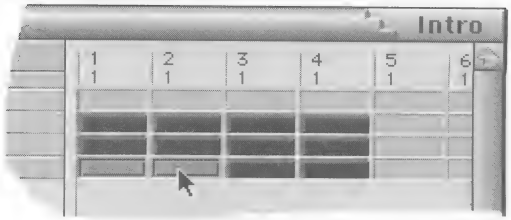
   First, let's delete the empty tracks.

6. **Select Track-4 through Track-8 and choose Delete from the Tracks window mini-menu.**

   Now let's delete the first two bars of bass.

7. **Select the first two bars of the bass track in the Tracks overview.**

   To do so, you can drag over them, or shift-click each one.



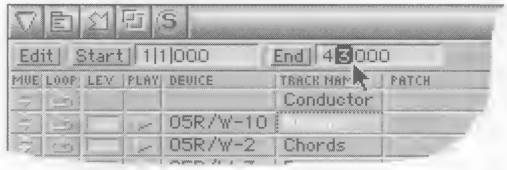
8. **Press the delete key to clear the selected segments.**

   Now let's delete all but the last two beats of the drum track.

9. **Click the track name "Drums".**

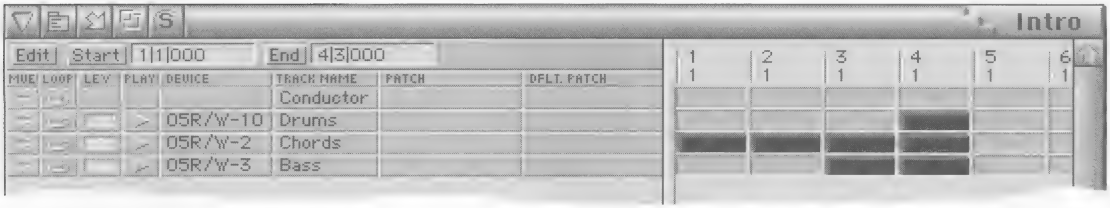
10. **Set the Start time in the Edit bar to 1|1|000, and set the End time to 4|3|000.**

    To set the times, click on one of the numbers, type to change it, use the tab key to cycle to the next number, and press return when you are done.



11. **Choose Erase from the Edit menu, or press the delete key.**

12. **The Tracks Overview should now reflect the changes we have made.**



13. **Close the Tracks window by pressing command-w.**

Listen to the intro

Now let's listen to the Intro.

1. **Click the Play button in the Chunks list next to the Intro sequence.**

   Notice that the Verse 1 sequence un-play-enables when you do so. Only one sequence can be play-enabled at a time in this list. You'll see in a moment how to play several at once.

2. **Start playback by pressing the space bar. Press the space bar again to stop when the sequence reaches the end of the four bars.**

Create a song

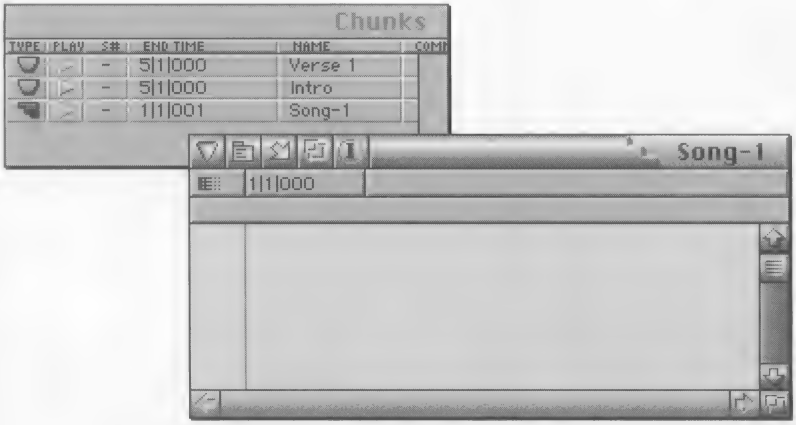
Let's build a song with these two sequences.

1. **Choose Add Song from the Chunk list window mini-menu.**

   A song appears in the list. Notice that it has a different icon than the sequences.

2. **Double-click the name "Song-1" to open the Song window.**

   The Song window appears.

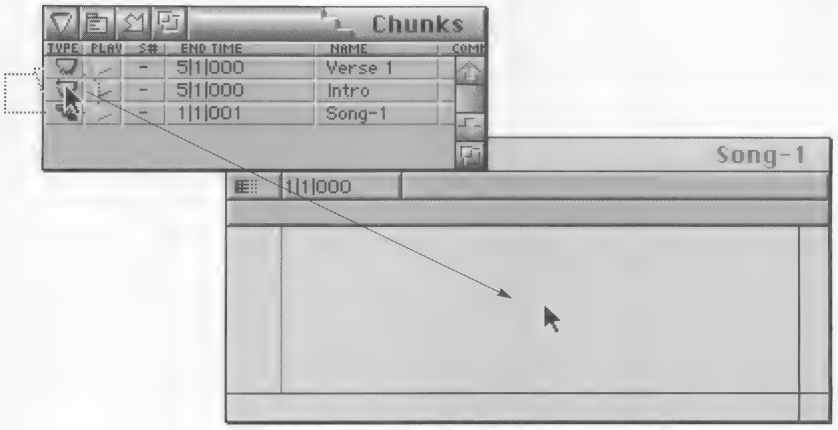


Add sequences to the song

Now we can build the song out of the component sequences.

1. **Drag the icon for the Intro sequence from the Chunks list into the middle of the Song window.**

   You may need to reposition the windows beforehand.

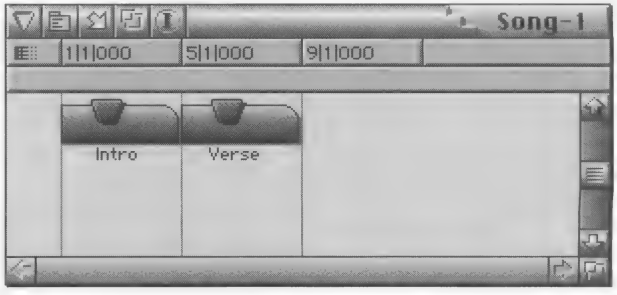


2. **The Intro sequence snaps to the first column at 1|1|000.**

   Notice also that a new column is automatically created after the sequence.

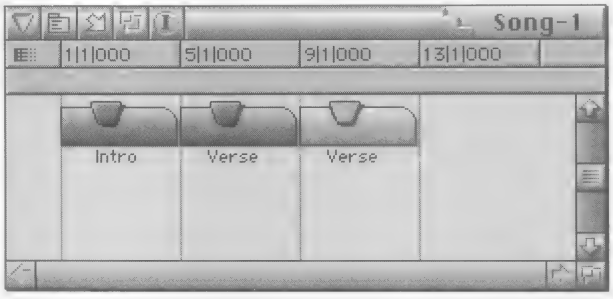
3. **Add the Verse 1 sequence in a similar fashion, dropping it into the song to the right of the intro sequence.**

   Notice that the Verse 1 sequence snaps to the column at the end of the intro sequence.



4. **Duplicate the Verse chunk by option-dragging it to the right. Drop the duplicate to the right of the column at 9|1|000.**

   You can freely drag sequences—and even other songs—around in this window. If you option-drag, you make a duplicate. The duplicate is actually a reference to the original sequence in the Chunks list window; duplicating in the Song window does not create new data. Instead, it creates another reference to the original data. If you change the original, all instances of it change, too.



Play the song

To play the song:

1. **Click its play button in the Chunks list window.**
2. **Set the metronome slider to 104 bpm.**

   A song has its own tempo setting—although you can make it follow the tempos of its component sequences if you want.

3. **Turn off Memory-cycle.**
4. **Press the play button, or hit the space bar.**

Congratulations!

You now know enough about Performer to sequence your heart out. Believe it or not, we've only scratched the surface. Performer has many more powerful features. We strongly urge you to check out the Reference Manual. You'll probably find features not covered in this tutorial that will be of immediate use to you. Also be sure to consult the addendum section in this guide: it contains important information about enhancements that have been made to Performer not covered in the Reference Manual. Enjoy!

Part IV

Other FreeMIDI Releases

FreeMIDI

Chapter 10 Using Other FreeMIDI Releases with Performer

This section provides information about the following software updates:

- Unisyn 1.1
- MTP II Console 1.1 (for the MIDI Time Piece II interface)
- MIDI Express Console 1.1 (for the MIDI Express interface)

These updates are available free of charge to all registered users of these products. They provide support for FreeMIDI, the integrated MIDI operating system upon which Performer Version 5 is based. In some cases, other non-FreeMIDI features have been added as well, free of charge.

Performer Version 5 does not require these versions. You can use earlier versions if you like without losing any capabilities. These versions (and higher), however, provide the benefits of working with FreeMIDI. For an overview of these benefits, see the "Introducing FreeMIDI" on page 41, as well as the introductions in following update chapters.

Chapter 11 Unisyn 1.1 Update Notes

New features

All new features in Unisyn 1.1 have been added to accommodate FreeMIDI. These changes are:

- All Profiles have been updated
- Device Setup is simplified
- MIDI Setup is controlled by FreeMIDI
- Standard FreeMIDI commands have been added to Unisyn's command set

Device Setup

The first time you launch Unisyn 1.1 after installation, you will need to create a Device Setup file. You are prompted to do this by the appearance of the Device Setup dialog box.

To create a Device Setup file:

1. **Launch Unisyn 1.1 for the first time by double-clicking its icon.**

   The Device Setup dialog appears:

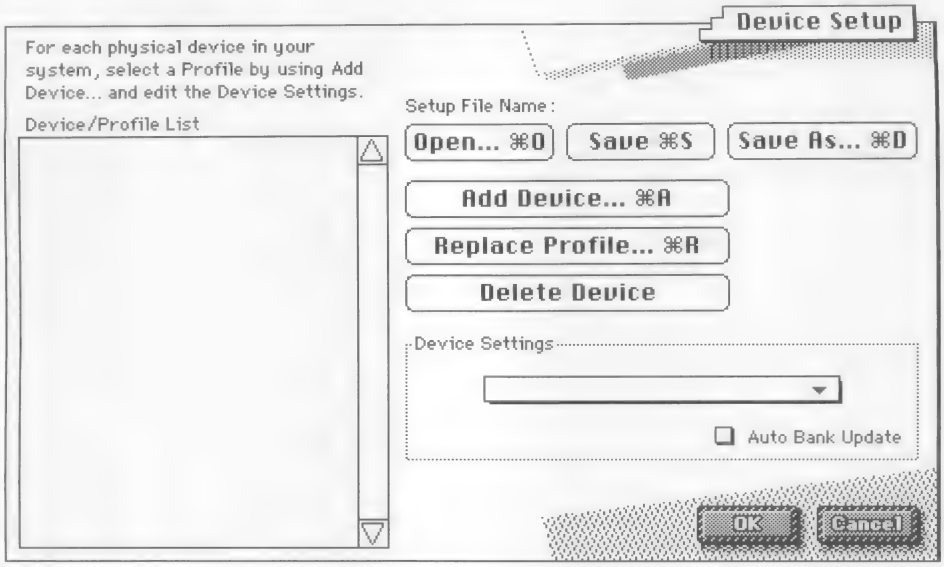


Figure 11-1: Device Setup Dialog Box

2. **Click Add Device or type command-A.**

   A standard Macintosh File Open dialog appears:

3. **Navigate to your Profiles Folder containing the new Unisyn Profiles and select a profile for one of your MIDI devices.**

4. **Click Open.**

   The Profile name appears in the Device Setup dialog devices list. When profiles are added to the Device Setup, Unisyn tries to automatically match the profile to its corresponding FreeMIDI

Device from your current FreeMIDI Configuration. So when you add a Profile, Unisyn displays a FreeMIDI Device in the Device Settings pop-up menu.

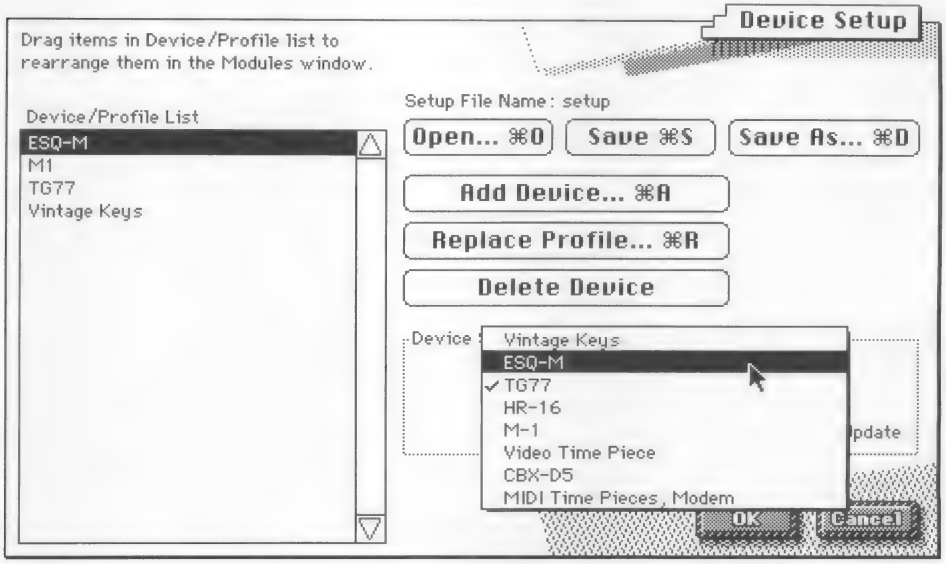


Figure 11-2: Device Settings Pop-up Menu

If the FreeMIDI Device displayed in the pop-up menu is correct, proceed back to Step 2 above and add more profiles until you have completed the Device Setup. If the FreeMIDI Device displayed in the pop-up menu is incorrect, choose the correct FreeMIDI Device from the menu and then proceed back to Step 2 above and add more profiles until you have completed the Device Setup.

☛ In Unisyn 1.1, Auto Bank Update is enabled for all devices by default. We recommend using this setting for all devices in order to produce the best results when using FreeMIDI's patch lists. For more information on Auto Bank Update, consult your original Unisyn user's manual.

5. **When you have added all the profiles needed for your MIDI setup, click Save to save the Device Setup file to disk.**

   A standard Mac File Save dialog box appears.

6. **Name the Setup file, navigate to the Data Folder contained in the Unisyn 1.1 Folder and click Save.**

7. **Click OK to close the Device Setup dialog box and proceed with use Unisyn 1.1.**

MIDI Setup

MIDI Setup is now controlled by FreeMIDI. Use the FreeMIDI Setup application to make changes to your MIDI Setup as outlined in the FreeMIDI update notes. The MIDI Setup command has been replaced by the *Interface Settings* command.

Use the *Interface Settings* command to open the Interface Settings dialog box. This dialog box is the same dialog box that appears in other FreeMIDI applications and will control FreeMIDI's access to the serial ports of your Macintosh for all FreeMIDI applications. This dialog box allows you to enable and disable the two serial ports for MIDI. If, for instance, you have a printer attached to the Thru port of your MTP II and the MTP II is connected to the Printer serial port, you will need to disable MIDI on the printer port in order to do any printing.

Transport Controls

The Transport Controls window contains buttons that can control the transport functions (Play, Stop, Rewind, Locate) of other FreeMIDI applications from within Unisyn. For instance, you might want to start a sequence playing in Performer while you are using Unisyn to audition various patches. You do so by opening the Transport Controls window, enabling FreeMIDI Sync, and clicking Play. With this feature there is no need to switch to Performer.

Once FreeMIDI Sync is enabled you can also stop or pause Performer, rewind the sequence, or auto-locate to up to 8 predefined positions within the sequence directly from Unisyn.

FreeMIDI Sync can be enabled from any FreeMIDI application that is currently open and that supports this feature of FreeMIDI. In Performer, this switch is in the Basics menu. When you enable FreeMIDI Sync in any open FreeMIDI application, it is enabled for all FreeMIDI applications on that Macintosh.

To use the Transport Controls:

1. **Choose *Transport Controls* from the Play Menu.**

   The Transport Controls window appears.

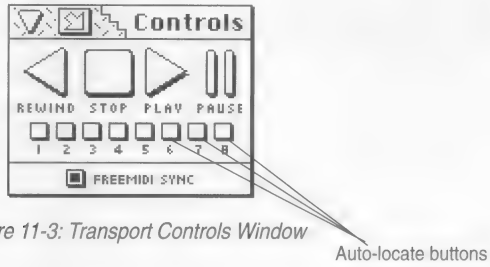


Figure 11-3: Transport Controls Window

2. **Click *FreeMIDI Sync* to enable FreeMIDI Sync.**

   You can skip this step if FreeMIDI Sync has already been enabled by some other FreeMIDI application. If it is already enabled, the FreeMIDI Sync check box appears selected (filled-in).

   ☛ The state of FreeMIDI Sync (ON or OFF) cannot be changed while a FreeMIDI application, such as Performer, is playing.

3. **Click the Transport Control function that you want to use.**

   Click Rewind, Play, Stop, or Pause to send those commands to the FreeMIDI application that you are controlling. The FreeMIDI application should respond to these commands as if you were using its own controls.

4. **If the FreeMIDI application that you are controlling supports their use, you can use any of the 8 auto-locate buttons to auto-locate to some pre-defined location in the sequence or song that is currently playing.**

   In Performer, you can define these auto-locate points in the Markers window. Assign a number from 1-8 for a marker in the Seek column and that marker's location in the sequence will be defined as one of the 8 FreeMIDI auto-locate points. Click the

corresponding button in the Transport Controls window and Performer will locate to that point. You can auto-locate at any time, even during playback.

Edit FreeMIDI Configuration

There is an *Edit FreeMIDI Configuration* command in the MIDI menu. Choosing this command will launch the FreeMIDI Setup application (or switch to FreeMIDI Setup if it is already open) and display the current FreeMIDI Configuration. There is a Return command in FreeMIDI Setup (command-R) that will switch back to Unisyn if you entered FreeMIDI Setup using the *Edit FreeMIDI Configuration* command. Please note that this feature is only supported in System 7 and higher.

Chapter 12 MTP II Console 1.1 Update Notes

Changes to MTP II Console 1.1 from Version 1.03 have been made to accommodate the FreeMIDI System. Other new features have been added as well. These changes are:

- Serial Port Setup is controlled by FreeMIDI
- Standard FreeMIDI commands have been added to MTP II Console's command set
- Cable Names are produced by FreeMIDI
- The current Base Setup or Modifier name displays in the title bar of other windows [new MTP II feature]
- MIDI Cannon [new MTP II feature]
- Custom Pedal Curves [new MTP II feature]

Serial Port Setup

Serial Port setup is now controlled by FreeMIDI. The Serial Ports window and its corresponding command in the Windows menu have been removed. Additionally, all the command key equivalents in the Windows menu have changed accordingly. Use the FreeMIDI Setup application to control which serial ports the MTP II Console will search for MTP and MTP II interfaces as outlined in the FreeMIDI reference chapter.

Interface Settings

Use the *Interface Settings* command in the Utilities menu to open the Interface Settings dialog box. This dialog box is the same dialog box that appears in other FreeMIDI applications and will control FreeMIDI's access to the serial ports of your Macintosh for all FreeMIDI applications. This dialog box allows you to enable and disable the two serial ports for MIDI. If, for instance, you have a printer attached to the Thru port of your MTP II and the MTP II is connected to the Printer serial port, you will need to disable MIDI on the printer port in order to do any printing.

Transport Controls

The Transport Controls window contains buttons that can control the transport functions (Play, Stop, Rewind, Locate) of other FreeMIDI applications from within MTP II Console. For instance, you might want to start a sequence playing in Performer while you are using MTP II Console to edit Modifiers. You do so by opening the Transport Controls window, enabling FreeMIDI Sync, and clicking Play. With this feature there is no need to switch to Performer.

Once FreeMIDI Sync is enabled you can also stop or pause Performer, rewind the sequence, or auto-locate to up to 8 predefined positions within the sequence directly from MTP II Console.

FreeMIDI Sync can be enabled from any FreeMIDI application that is currently open and that supports this feature of FreeMIDI. In Performer, this switch is in the Basics menu. When you enable FreeMIDI Sync in any open FreeMIDI application, it is enabled for all FreeMIDI applications on that Macintosh.

☛ The state of FreeMIDI Sync (ON or OFF) cannot be changed while a FreeMIDI application, such as Performer, is playing.

To use the Transport Controls:

1. **Choose *Transport Controls* from the Windows menu.**

   The Transport Controls window appears.

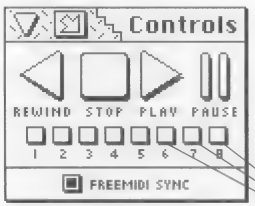


Figure 12-1: Transport Controls Window

Auto-locate buttons

2. **Click *FreeMIDI Sync* to enable FreeMIDI Sync.**

   You can skip this step if FreeMIDI Sync has already been enabled by some other FreeMIDI application. If it is already enabled, the FreeMIDI Sync checkbox appears selected (filled-in).

☛ The state of FreeMIDI Sync (ON or OFF) cannot be changed while a FreeMIDI application, such as Performer, is playing.

3. **Click the Transport Control function that you want to use.**

   Click Rewind, Play, Stop, or Pause to send those commands to the FreeMIDI application that you are controlling. The FreeMIDI application should respond to these commands as if you were using its own controls.

4. **If the FreeMIDI application that you are controlling supports their use, you can use any of the 8 auto-locate buttons to auto-locate to some pre-defined location in the sequence or song that is currently playing.**

   In Performer, you can define these auto-locate points in the Markers window. Assign a number from 1-8 for a marker in the Seek column and that marker's location in the sequence will be defined as one of the 8 FreeMIDI auto-locate points. Click the corresponding button in the Transport Controls window and Performer will locate to that point. You can auto-locate at any time, even during playback.

Edit FreeMIDI Configuration

There is an *Edit FreeMIDI Configuration* command in the Utilities menu. Choosing this command will launch the FreeMIDI Setup application (or switch to FreeMIDI Setup if it is already open) and display the current FreeMIDI Configuration. There is a Return command in FreeMIDI Setup (command-R) that will switch back to MTP II Console, if you entered FreeMIDI Setup using the *Edit FreeMIDI Configuration* command. Please note that this feature is only supported in System 7 and higher.

Cable Names Produced by FreeMIDI

Cable names in the Cable Routing, Channel Mapping, Event Muting, Knobs & Pedals, Patch List, MIDI Cannon, and Setups & Modifiers windows are produced by FreeMIDI. MTP II Console gets the names of each input and output cable from the names of connected FreeMIDI Devices. Use FreeMIDI Setup application to change these names.

Current Preset Display

The name of the currently selected preset appears in parentheses in the Cable Routing, Channel Mapping, Event Muting, SMPTE Controls, Pedal & Click, and Setups & Modifiers windows. This makes it easier to know which Preset is currently selected without opening or finding the Presets window.

MIDI Cannon

The MIDI Cannon allows you to store a group of MIDI events in a Modifier to be sent to any or all MIDI devices on an MTP network when the Modifier becomes current. There are two ways to make a Modifier current, by selecting it in the Setups & Modifiers window and by selecting an MTP II patch with a patch change command. Please consult your original MTP II user's manual for more information on Modifiers and Patches.

Open the MIDI Cannon window by selecting its command from the Windows menu.

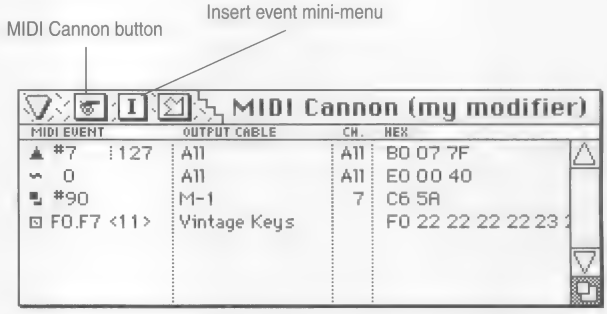


Figure 12-2: MIDI Cannon Window

This window allows you to add, edit, and delete MIDI events in a specific MIDI Cannon message. It also allows you to test the current MIDI Cannon message.

Creating MIDI Cannon Messages

To create a MIDI Cannon message:

1. **Select or create a Modifier in which you wish to store the MIDI Cannon message.**

   See your original MTP II user's manual for more information on selecting and creating Modifiers.

2. **Select MIDI Cannon from the Windows menu.**

   The MIDI Cannon window appears.

3. **Select a MIDI event from the Insert mini-menu**

   You can select any type of MIDI data that is in the mini-menu.

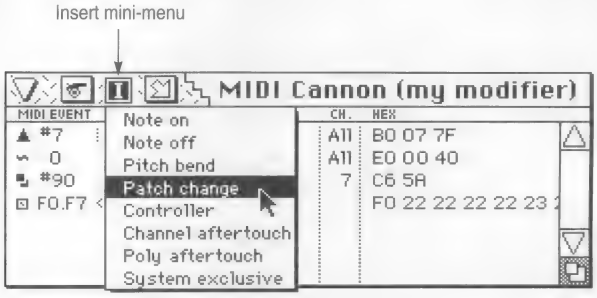


Figure 12-3: Insert mini-menu

4. **Edit the values of the newly inserted event.**

   For instance, if you inserted a patch change event, you will need to enter the patch change number you want, or if you entered a controller event, you will need to enter the controller number and the value you want. Each event type has a different set of fields for entering the desired values.

5. **Assign a Cable and Channel (CH) for the event by using the Cable and Channel pop-up menus.**

6. **Add more MIDI events by repeating steps 3-5 until all the MIDI events that you want in this message are displayed in the MIDI Cannon window.**

   You can add as many events as you like up to the maximum size for the Modifier.

   ☛ the maximum size for a Modifier is determined by the amount of free RAM in the MTP II's memory. Please consult your original MTP II user's manual for more information.

7. **Test the MIDI Cannon message by clicking the MIDI Cannon button.**

   All of the MIDI events in the list are transmitted to the assigned cables and channels.

8. **If the MIDI Cannon message is correct, save the Modifier and "MIDI Cannon message" appears in the script for that Modifier in the Setups & modifiers window.**

Editing MIDI Cannon Messages

You can edit MIDI Cannon messages that you have already created in two ways.

- Remove the MIDI Cannon message from the Modifier and then create a new MIDI Cannon message for that Modifier.
- Change the MIDI events in a MIDI Cannon message.

To remove a MIDI Cannon message from a modifier:

1. **Make the Modifier that contains the MIDI Cannon message you wish to edit current by selecting it in the Setups & Modifiers window.**
2. **Select the MIDI Cannon message line in the script for the Modifier and type delete or backspace on your Mac keyboard.**

   The MIDI Cannon message is removed and you can then open the MIDI Cannon window to insert a new MIDI Cannon message as described above in "Creating MIDI Cannon Messages" on page 162 in this chapter.

To change the events in a MIDI Cannon message:

1. **Make the Modifier that contains the MIDI Cannon message you wish to edit current by selecting it in the Setups & Modifiers window.**
2. **Open the MIDI Cannon window.**

   The MIDI Cannon message appears as a list of MIDI events.

3. **Select MIDI events in the list and type delete or backspace on your Mac keyboard to remove them.**

   Alternately, you can use the Clear command in the Edit menu to remove MIDI events from the list.

4. **Double-click events and type to change their values.**

   A double-clicked event pops-up for editing as illustrated below.

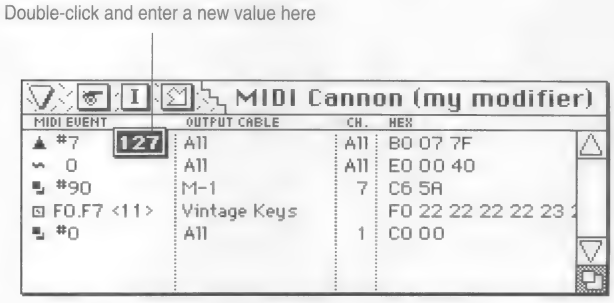


Figure 12-4: Editing a MIDI event

5. **Use the Cable and Channel pop-up menus to change the MIDI destination for an event.**

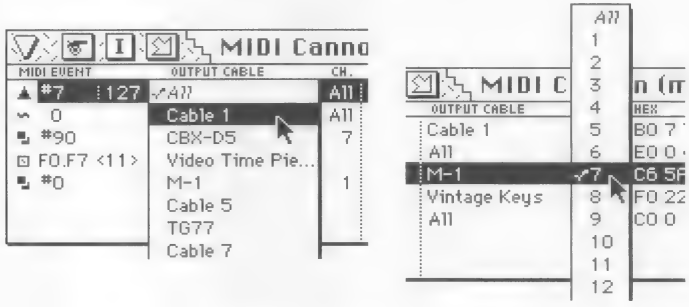


Figure 12-5: Changing Cables and Channels for a MIDI event

6. **Test the MIDI Cannon message by clicking the MIDI Cannon button.**

   All of the MIDI events in the list are transmitted to the assigned cables and channels.

7. **If the MIDI Cannon message is correct, save the Modifier and "MIDI Cannon message" appears in the script for that Modifier in the Setups & modifiers window.**

Custom Pedal Curves

Custom pedal curves can now be created and saved within Modifiers to allow the MTP II's Pedal inputs to react in a non-linear manner to control voltage foot pedals. When Pedal A or B input is assigned to be controlled by a Korg or Roland Expression-type foot pedal, you can make a custom pedal curve for that pedal in the Pedal Curves window. The Knobs & Pedals window contains a new check box to toggle whether a pedal input uses the current custom pedal curve.

To make a custom pedal curve:

1. **Select or create a Modifier in which you wish to store the pedal curve.**

   To save a pedal curve, it must be part of a Modifier. Pedal curves cannot be saved as part of Base Setup. See your original MTP II user's manual for more information on selecting and creating Modifiers.

2. **Choose Pedal Curve from the Windows menu.**

   The Pedal Curve window appears.

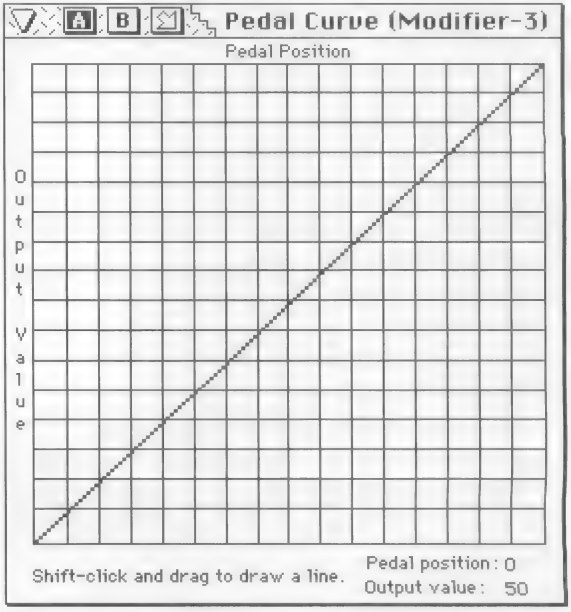


Figure 12-6: Pedal Curve

3. **Choose the pedal, A or B, for which you wish to create a custom pedal curve, by clicking A or B in the Pedal Curve window title bar.**

   The current pedal curve for the selected pedal displays.

4. **Use the mouse to draw a new curve.**

   Shift-click and drag the mouse to draw a straight line.

5. **Save the Modifier and "Pedal Curve Message" appears in the script for that Modifier in the Setups & modifiers window.**

   The custom pedal curve is saved as part of the modifier.

Chapter 13 MIDI Express Console 1.1 Update Notes

Most of the changes to MIDI Express Console 1.1 from Version 1.01 were made to accommodate the FreeMIDI System. These changes are:

- Serial Port Setup is controlled by FreeMIDI
- Standard FreeMIDI commands have been added to MIDI Express Console's command set
- Cable Names are produced by FreeMIDI
- The current Preset name displays in the title bar of other windows

Serial Port Setup

Serial Port Setup is now controlled by FreeMIDI. The Serial Ports window and its corresponding command in the Windows menu have been removed. Additionally, all the command key equivalents in the Windows menu have changed accordingly. Use the FreeMIDI Setup application to control which serial ports the MIDI Express Console will search for MIDI Express interfaces as outlined in the FreeMIDI reference chapter.

Interface Settings

Use the *Interface Settings...* command in the Utilities menu to open the Interface Settings dialog box. This dialog box is the same dialog box that appears in other FreeMIDI applications and will control FreeMIDI's access to the serial ports of your Macintosh for all FreeMIDI applications. This dialog box allows you to enable and disable the two serial ports for MIDI. If, for instance, you have a printer attached to the Thru port of your MIDI Express and the MIDI Express is connected to the Printer serial port, you will need to disable MIDI on the printer port in order to do any printing.

Transport Controls

The Transport Controls window contains buttons that can control the transport functions (Play, Stop, Rewind, Locate) of other FreeMIDI applications from within MIDI Express Console. For instance, you might want to start a sequence playing in Performer while you are

using MIDI Express Console to edit presets. You do so by opening the Transport Controls window, enabling FreeMIDI Sync, and clicking Play. With this feature there is no need to switch to Performer.

Once FreeMIDI Sync is enabled you can also stop or pause Performer, rewind the sequence, or auto-locate to up to 8 predefined positions within the sequence directly from MIDI Express Console.

FreeMIDI Sync can be enabled from any FreeMIDI application that is currently open and that supports this feature of FreeMIDI. In Performer, this switch is in the Basics menu. When you enable FreeMIDI Sync in any open FreeMIDI application, it is enabled for all FreeMIDI applications on that Macintosh.

☛ The state of FreeMIDI Sync (ON or OFF) cannot be changed while a FreeMIDI application, such as Performer, is playing.

To use the Transport Controls:

1. **Choose *Transport Controls...* from the Windows menu.**

   The Transport Controls window appears.

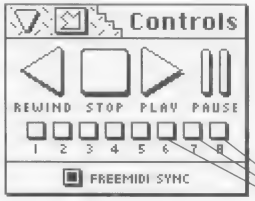


Figure 13-1: Transport Controls Window

Auto-locate buttons

2. **Click *FreeMIDI Sync* to enable FreeMIDI Sync.**

   You can skip this step if FreeMIDI Sync has already been enabled by some other FreeMIDI application. If it is already enabled, the FreeMIDI Sync checkbox appears selected (filled-in).

   ☛ The state of FreeMIDI Sync (ON or OFF) cannot be changed while a FreeMIDI application, such as Performer, is playing.

3. **Click the Transport Control function that you want to use.**

   Click Rewind, Play, Stop, or Pause to send those commands to the FreeMIDI application that you are controlling. The FreeMIDI application should respond to these commands as if you were using its own controls.

4. **If the FreeMIDI application that you are controlling supports their use, you can use any of the 8 auto-locate buttons to auto-locate to some pre-defined location in the sequence or song that is currently playing.**

   In Performer, you can define these auto-locate points in the Markers window. Assign a number from 1-8 for a marker in the Seek column and that marker's location in the sequence will be defined as one of the 8 FreeMIDI auto-locate points. Click the corresponding button in the Transport Controls window and Performer will locate to that point. You can auto-locate at any time, even during playback.

Edit FreeMIDI Configuration

There is an *Edit FreeMIDI Configuration...* command in the Utilities menu. Choosing this command will launch the FreeMIDI Setup application (or switch to FreeMIDI Setup if it is already open) and display the current FreeMIDI Configuration. There is a Return command in FreeMIDI Setup (command-R) that will switch back to MIDI Express Console, if you entered FreeMIDI Setup using the *Edit FreeMIDI Configuration...* command. Please note that this feature is only supported in System 7 and higher.

Cable Names Produced by FreeMIDI

Cable names in the Cable Routing, Channel Mapping, Event Muting, Pedal & Click, and Presets windows are produced by FreeMIDI. MIDI Express Console gets the names of each input and output cable from the names of connected FreeMIDI Devices. Use FreeMIDI Setup application to change these names.

Current Preset Display

The name of the currently selected preset appears in parentheses in the Cable Routing, Channel Mapping, Event Muting, SMPTE Controls, Pedal & Click, and Presets windows. This makes it easier to know which Preset is currently selected without opening or finding the Presets window.

Part V
Appendices

Appendices

Appendix A *Using FreeMIDI with OMS*

OMS Compatibility

FreeMIDI is compatible with the Opcode MIDI System™ (OMS). If you currently use OMS and it is required for OMS applications that are not yet FreeMIDI-compatible, you have two options:

Option:	Explanation:	Pros and cons:
Option 1: Keep both FreeMIDI and OMS in your System, and set each to "Allow other applications".	In this scenario, FreeMIDI and OMS peacefully coexist with no interaction whatsoever. You maintain two studio configuration files, one for OMS and one for FreeMIDI. You'll continue to use OMS normally, and FreeMIDI operates as if OMS wasn't even there.	Cons: you have to maintain two separate studio configuration files: one for OMS and one for FreeMIDI. OMS and FreeMIDI applications can't send and receive MIDI at the same time. Pros: this method maintains the MIDI processing features available with the Studio 4 and Studio 5. Also, with OMS present, you can more easily put the Studio 4 and 5 into "MTP" emulation mode, which is required with FreeMIDI.
Option 2: Remove OMS, install the FreeMIDI OMS Emulator, and have FreeMIDI emulate OMS.	You completely remove OMS from your System by dragging the System extension out of the System folder. You then install a replacement for it, the *FreeMIDI OMS emulator*. FreeMIDI then looks like OMS to OMS applications: they share the FreeMIDI studio configuration, and they function just like they do with OMS. For example, all of your FreeMIDI devices appear in each OMS application in the same places that OMS devices would.	Pros: all applications share the FreeMIDI studio configuration file, and all applications can send and receive MIDI at the same time. Cons: the MIDI processing features in the Studio 4 and Studio 5 become unavailable. Also, if you have a Studio 4 or 5, you still have to run OMS once before using FreeMIDI to put them into "MTP" emulation mode. Note: As of this writing, Galaxy, Opcode's universal editor/librarian software, does not share patch lists with FreeMIDI, so Galaxy patches will not show up in FreeMIDI applications like Mosaic and Performer. Galaxy patch lists, can, however, still be shared with Vision when using this option.

Emulating OMS

FreeMIDI emulates Opcode MIDI System (OMS) in the following way. You install a system extension called OMS Emulator, along with the FreeMIDI System Extension and other FreeMIDI System files and restart your Macintosh and FreeMIDI will then appear to be OMS to your OMS applications.

> ☛ Before proceeding with OMS Emulation, you should put your Studio 4 or Studio 5 MIDI interface (if you have one) into "MTP emulation" mode and then remove OMS by dragging the OMS Extension out of your System folder and restarting your Mac.

To install the OMS Emulator extension:

1. **Disable all Control Panel Devices and Extensions, including virus protection utilities such as SAM, Virex, Vaccine, Disinfectant, or GateKeeper during the installation process.**

   These files can sometimes interfere with installation. To do so under System 7, restart or turn on your Macintosh with the shift key held down until you see the message, "Extensions Off", which appears right after "Welcome to Macintosh". Doing so turns off all extensions until the computer is restarted. Under System 6, remove all non-Apple INIT's and Control Panel devices from your System Folder and then Restart your Macintosh. It is especially important to do this right before you install the program and authorize the hard disk. Once the program has been installed and authorized, you can re-enable them.

2. **Insert the Performer master disk and run the installer.**

   The installer is the icon called "Double-click to install".

3. **Click OK when the installer logo screen appears.**

4. **Click Customize.**

   This produces the Custom install window where you can select individual files to be installed.

5. **Click the Drive as necessary in order for the current drive selected to be the disk which contains your System Folder.**

6. **Select the OMS Emulator file from the scrolling list on the left side of the window.**

7. **Click Install.**

8. **When the Install is complete, you will be asked to Restart your Macintosh. Click Restart.**

   OMS Emulator installation is completed.

Once OMS Emulator is installed, all your OMS applications should work as if OMS were present only they will use your FreeMIDI Configuration to communicate with your MIDI gear.

Appendix B FreeMIDI and MIDI Manager

FreeMIDI is MIDI Manager-compatible. However, we strongly recommend that you only use MIDI Manager if you have a program that absolutely *requires* it. MIDI Manager eats up a considerable amount of extra CPU processing power and makes your MIDI system much more complex. And you won't lose any capabilities by not using MIDI Manager because FreeMIDI does everything that MIDI Manager does (and a lot more, too).

> ☛ If you have applications that need to run simultaneously (such as digidesign's Sample Cell™ software together with Performer), and the programs support FreeMIDI or OMS, you don't need MIDI Manager.

If you absolutely require MIDI Manager...

If you require MIDI Manager, please read this entire chapter. This chapter makes three assumptions:

- You have already created a FreeMIDI Configuration and are familiar with the majority of FreeMIDI's features and commands. If you are not familiar with FreeMIDI or have not yet created FreeMIDI Configuration, please see chapter 5, "Getting Started With FreeMIDI ™" before proceeding.
- MIDI Manager is correctly installed and functioning. Consult your Apple MIDI Manager user's manual for information on installing and using MIDI Manager.
- You understand how MIDI Manager functions.

If you need to use MIDI Manager-only applications that are not yet FreeMIDI-compatible, you need to install FreeMIDI's MIDI Manager Driver. This file is called *FreeMIDI MM Driver*. Once the FreeMIDI MM Driver is installed, you use the PatchBay application to connect all your MIDI Manager-compatible applications to FreeMIDI.

The FreeMIDI MM Driver allows you to add up to 4 output and 10 input ports for playing MIDI between MIDI Manager and FreeMIDI. The output ports route MIDI data from FreeMIDI sources (devices or

applications) to the MIDI Manager port. The input ports route MIDI data from MIDI Manager to FreeMIDI destinations (device or applications).

Remove all other drivers before you start

Before starting to use FreeMIDI and MIDI Manager together, we recommend that you remove the Apple MIDI driver and any other MIDI Manager drivers that may be installed. You will find these drivers in the top level of your System Folder or in the Extensions folder within your System Folder. It is best to let FreeMIDI handle all communication with the serial ports. If these other drivers are installed, you will get potentially confusing alerts as FreeMIDI and MIDI Manager both try to gain access to the serial ports.

Installing the FreeMIDI MM Driver

To install *FreeMIDI MM Driver*:

1. **Disable all Control Panel Devices and Extensions, including virus protection utilities such as SAM, Virex, Vaccine, Disinfectant, or GateKeeper during the installation process.**

   These files can sometimes interfere with installation. To do so under System 7, restart or turn on your Macintosh with the shift key held down until you see the message, "Extensions Off", which appears right after "Welcome to Macintosh". Doing so turns off all extensions until the computer is restarted. Under System 6, remove all non-Apple INIT's and Control Panel devices from your System Folder and then Restart your Macintosh. It is especially important to do this right before you install the program and authorize the hard disk. Once the program has been installed and authorized, you can re-enable them.

2. **Insert the Performer master disk and run the installer.**

   The installer is the icon called "Double-click to install".

3. **Click OK when the installer logo screen appears.**

4. **Click Customize.**

   The Custom install dialog box appears. Select individual files to be installed here.

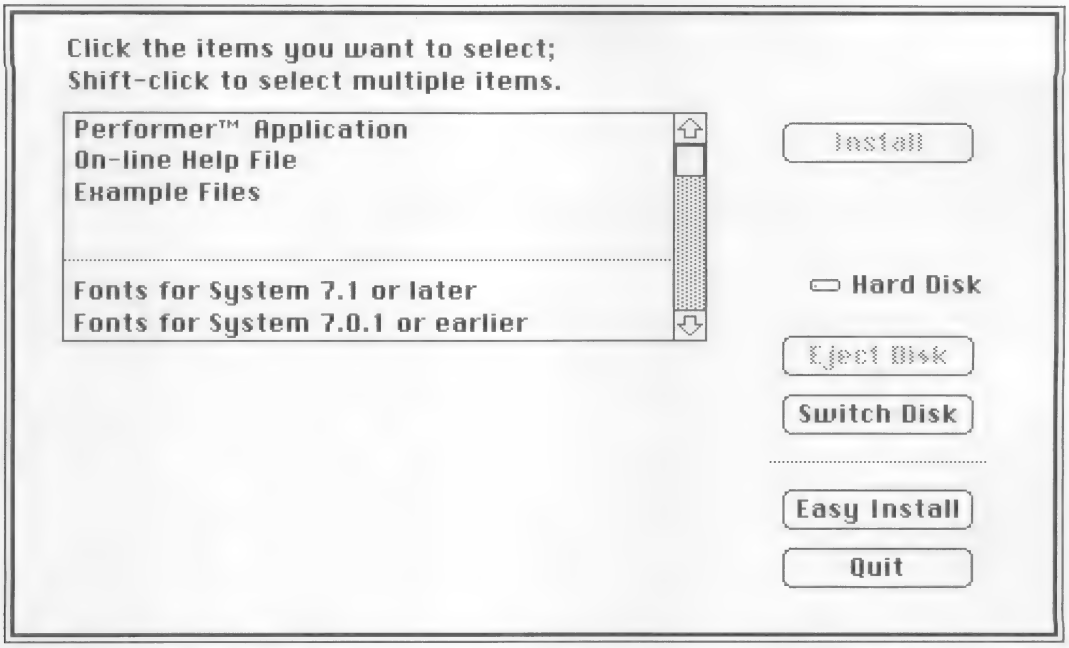


Figure 13-1: Custom Install Dialog Box

5. **Click Switch Disk as necessary in order for the current drive selected to be the disk that contains your System Folder.**

6. **Select the *FreeMIDI MM Driver* file from the scrolling list.**

   Some help text appears giving information about the file you select.

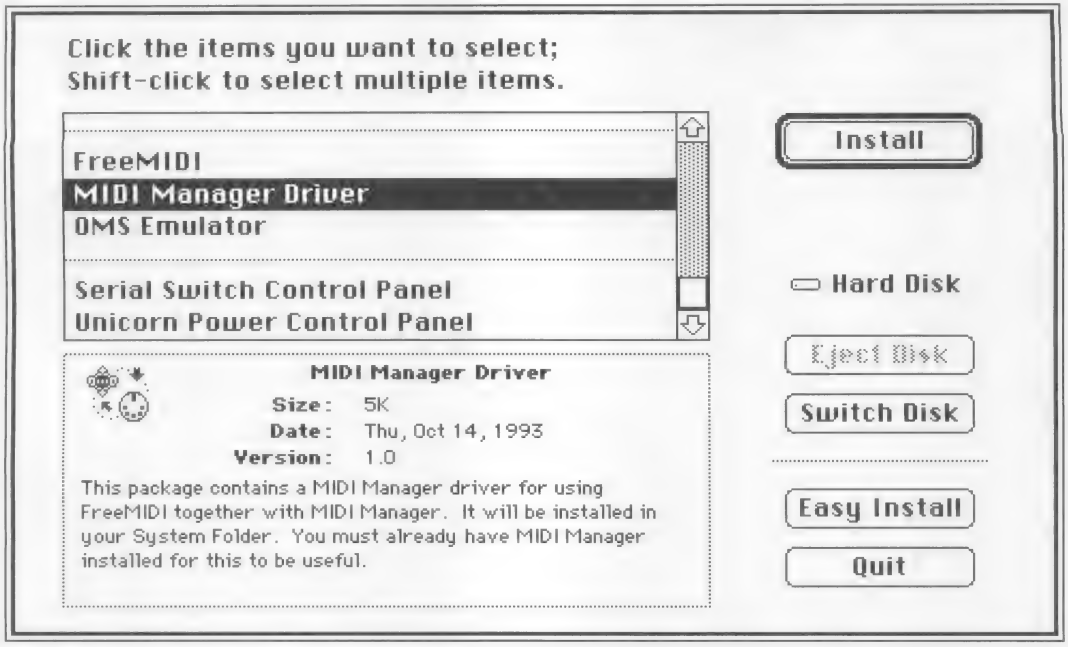


Figure 13-2: Selecting the FreeMIDI MM Driver

Using the FreeMIDI MM Driver

7. **Click Install.**

8. **When the install is complete, you will be informed of its status. You should Restart your Macintosh now in order to make FreeMIDI and MIDI Manager active.**

   The FreeMIDI MM Driver installation is completed.

To connect FreeMIDI to your MIDI Manager-compatible applications:

1. **Adjust the memory allocation for the PatchBay application in its Finder Get Info window.**

   We recommend allocating at least 128K to the PatchBay. Allocating even more memory seems the make the PatchBay less prone to crash or cause system errors.

☛ Only use the PatchBay application. The PatchBay DA does not function with the FreeMIDI MM Driver.

2. **Open PatchBay by double-clicking its icon in the Finder.**

   The PatchBay window appears with the FreeMIDI MM Driver installed.

Figure 13-3: PatchBay Window

3. **Double-click the FreeMIDI MM Driver icon.**

The FreeMIDI MM Driver Control Panel appears.

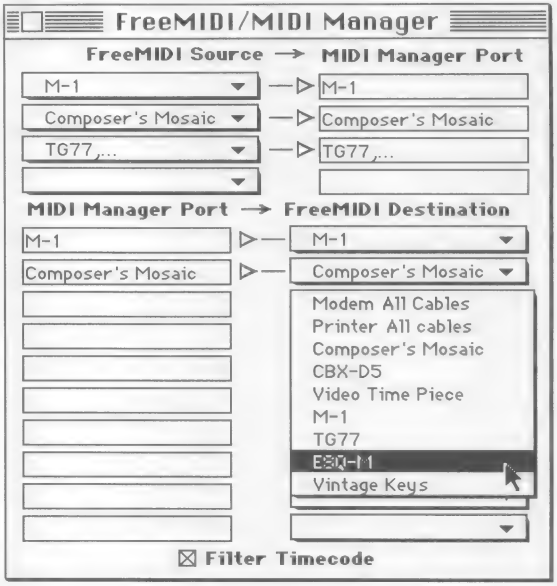


Figure 13-4: FreeMIDI MM Driver Control Panel

4. **Define up to 4 input and 10 output ports for the FreeMIDI MM Driver by choosing FreeMIDI devices and/or applications from the pop-up menus.**

You can assign multiple devices/applications to the same port by selecting them from the same pop-up menu. Each selection will be retained and indicated by a check mark in the pop-up menu. By default, the name of the port is the same as the device/application selected. If more than one device/application is selected, the name is a list of all selected devices/applications truncated with an ellipsis. If you like, you can enter your own names for the ports in the text boxes in the MIDI Manager Port column.

FreeMIDI MM Driver ports appear in the PatchBay window as they are defined.

5. **Close the FreeMIDI MM Driver Control Panel by clicking its close button.**

   The PatchBay window appears and the FreeMIDI MM Driver *icon* displays its input and output ports.

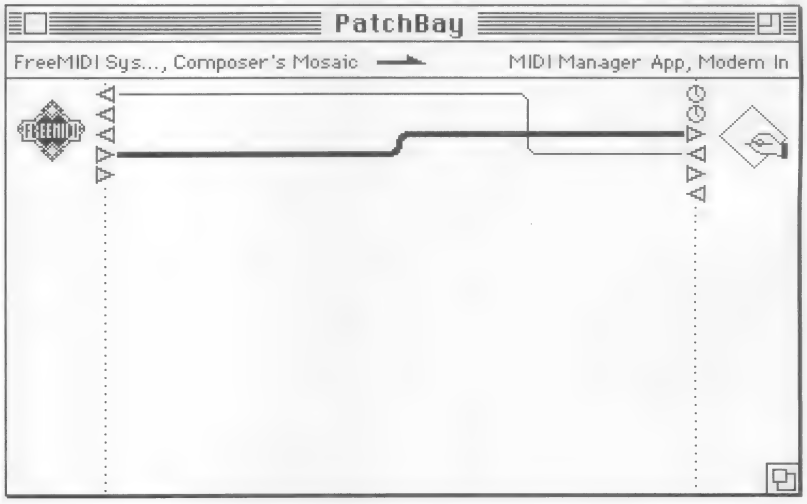


Figure 13-5: PatchBay Window with FreeMIDI ports

6. **Connect the outputs and inputs of your non-FreeMIDI MIDI Manager-applications to the FreeMIDI MM Driver outputs and inputs.**

   You can now send and receive MIDI between FreeMIDI and your MIDI Manager applications.

When the FreeMIDI MM Driver Control Panel is open in the PatchBay application, a FreeMIDI menu that contains some standard FreeMIDI commands, appears in the menu bar.

Appendix C Troubleshooting FreeMIDI

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 applying 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 recur.

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 FreeMIDI 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: starting the program from a different disk drive, restarting the Macintosh with a system folder containing different versions of the System File and the Finder, working with a new configuration instead of an existing one, etc.

If the problem is truly inconsistent, then it is likely to be a hardware problem: improper disk drive alignment, a loose connection, over long cables, signal 'aliasing', etc.

The most important tools for tracking down problems are the Check Connections and PatchThru commands. Using these commands can isolate problems that stop the flow of MIDI data from your MIDI gear to the Macintosh and back again.

If screen display in a FreeMIDI sequencer such as Performer is erratic or seems to stall and skip: You may be running into the limits of your Mac's processing power. FreeMIDI gives priority to sending and

receiving MIDI data over most screen redisplaying. However, with enough of an overload you may hear delays or erratic timing in your music.

Usually the overload is caused by vast reams of aftertouch (mono or poly key pressure), controller, or pitch bend events in one or more synthesizer tracks.

To solve the problem, you must reduce the amount of MIDI information being passed through the modem and/or printer port in the following ways:

- Slow down the tempo of the sequence during the problem passages.
- Delete a track or tracks from the sequence.

If FreeMIDI starts correctly, but you are unable to record (or play) anything: double-check your cable connections and synthesizer settings. Use the Check connections command to find out where the break in the data flow has happened. Often you will find that FreeMIDI may think that a certain device is connected to an incorrect MIDI port.

If you cannot open a particular configuration file: First try opening other existing configuration files, or a new configuration file, to be sure FreeMIDI 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 information by using the Clipboard to copy the devices and paste them into another configuration file.

If FreeMIDI Setup will not start up at all, or always brings up an irregular or damaged file when the FreeMIDI Setup icon is opened from the Finder, your working copy may be damaged. Re-install FreeMIDI from one of your Master disks. Restart the Macintosh and try opening another (new or existing) file with your new working copy to see if you have the same problem. Check also to see if other applications (Performer, MacWrite, MacPaint, etc.) are working properly.

If one of your key disks becomes damaged and fails to work as a key, our Customer Support Department will be glad to replace it. See the *Customer Support* section below for more information.

Disk Repairs

We are glad to replace damaged disks belonging to registered users. Please contact Mark of the Unicorn Technical support by phone, fax, or letter, if your disk needs to be repaired or replaced. Our Technical support phone number is: (617) 576-3066. Our Fax number is: (617) 576-3609. We also provide technical support on-line with CompuServe. You can talk to a MOTU technical support representative in the Section 12 of the MIDI Vendor C Forum.

Customer Support

We are happy to provide customer support to our registered users. If you haven't already done so, please take a moment to complete the registration card in the front of the manual and send it in to us. When we receive your card, you'll be placed on our mailing list and sent a free backup key disk.

Registered users who are unable, with their dealer's help, to solve problems they are encountering with FreeMIDI may call our technical support line. The number is (617) 576-3066, and is staffed Monday through Friday 9 AM to 8 PM, Eastern Time. If you decide to call, please have your FreeMIDI 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 manual) which holds the registration card. 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 FreeMIDI you are working with.** This is displayed briefly in the start-up screen when FreeMIDI is started; it is also available through the *About FreeMIDI* command on the Apple menu from within FreeMIDI.
- **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 or creation date of the system software you are using to run the Macintosh.** See the Installation Guide for help in finding version numbers for 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 FreeMIDI. If you have features or ideas you would like to see implemented in our music software, we'd like to hear from you. Please write to the FreeMIDI Development Team, Mark of the Unicorn 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 from the address indicated on your registration card, please send us a note with your change of address so that we can keep you informed of future upgrades and releases.

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Mark of the Unicorn
1280 Massachusetts Ave.
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Digital Performer

Guide to Digital Audio

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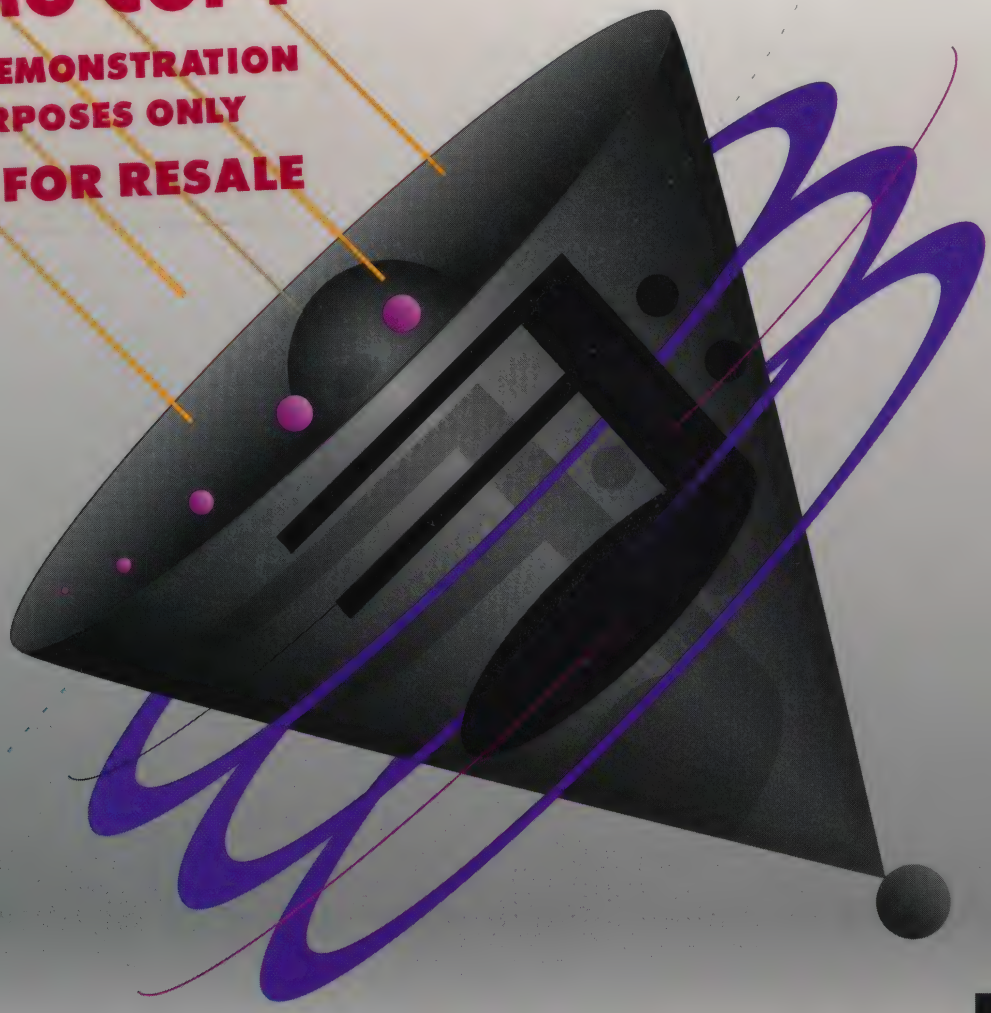

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We would like to help you get the most from Digital Performer. If you have difficulty using this program, we recommend that you first consult the product manual and on-line help features. Then consult the dealer from whom you purchased this product. If you still cannot find an answer to your question after checking these resources, call our Customer Service department Mondays through Fridays, 9 AM - 8 PM Eastern Time, at (617) 576-3066. Before calling, please gather all information related to the problem; this will make it easier for our service representatives to help you.

1.6

Serial number **DP 15067933**

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2nd Edition

Digital Performer®

Guide to Digital Audio

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Contents

Chapter 14 – Editing Audio

Chapter 15 – The Mixing Board

Chapter 1 About This Guide

This guide is one of three that ship with Digital Performer. All three guides are summarized below.

Performer Getting Started Booklet

The Performer *Getting Started* book contains basic installation and setup information. It tells you how to install Performer and set up FreeMIDI. It provides a brief overview of Performer's main features (including recent new ones), as well as two extensive tutorials. One tutorial takes you step-by-step through the process of recording your first MIDI track. The second tutorial shows you step-by-step how to build an entire song, while introducing you to a number of basic tasks such as quantizing and step recording.

This book is ideal for anyone who is new to Performer and would like a quick look at "the lay of the land".

Performer Reference Manual

The Performer *Reference Manual* contains all the chapters having to do with Digital Performer's MIDI capabilities. If you are already familiar with Performer, you can consider this to be an up-to-date reference for Performer's MIDI features, and you can turn to the *Guide to Digital Audio* (described below) for information about audio features that are unique to Digital Performer.

Digital Performer Guide to Digital Audio

The Digital Performer *Guide to Digital Audio* contains all information having to do with Digital Performer's audio capabilities, including an overview, tutorial, and troubleshooting chapter written exclusively for audio features. In addition to being an audio reference, this book is ideal for anyone who is already familiar with Performer and would like information about Digital Performer's audio features.

The guide to digital audio is divided into three parts:

Part I: What's New

This section contains a brief overview of new audio features in Version 1.6, as well as a chapter documenting the new Movie window, which provides synchronized digital video playback with audio and MIDI.

Part II: Tutorials

This section provides a brief overview of audio features in the form of a guided tour through the demo project that ships with Version 1.6. It also provides a chapter on digital audio basics for those who are new to random access digital audio recording.

Part III: Digital Audio Reference

This section contains complete documentation on all of Digital Performer's audio-related features.

Chapter 2 About Digital Performer

Overview

Digital Performer™ provides a powerful new approach to making music in the MIDI era: it integrates MIDI with desktop digital music production on the Macintosh computer. Digital Performer allows you to simultaneously record and play back multiple tracks of digital audio and MIDI data in a comprehensive, totally integrated, creative environment. Digital Performer's award-winning multitrack sequencer design, combined with new non-destructive digital audio editing capabilities, provide you with unprecedented flexibility and control over the music that you make.

Digital Performer supports the following Digidesign hard disk recording systems:

- Audiomedia
- Audiomedia II
- Audiomedia LC
- Sound Tools II
- Pro Tools (4 - 16 channels)
- Pro Tools III (16 - 48 channels)
- TDM and TDM-compatible software plug-ins

Integration with Performer's existing interface

In developing Digital Performer, we have integrated audio features into Performer's existing features in a way that complements Performer's unique user interface—and accommodates those of you who are already familiar with Performer. In fact, many features in Performer work on audio data in exactly the same way as MIDI data. For example, *soundbites* (parcels of audio data) have on-velocities just like notes. You can edit them in the same way as you edit note velocities. Soundbites can be cut, copied, and pasted in exactly the same fashion as MIDI note data.

If you are not familiar with hard disk recording and playback, there are aspects to Digital Performer that may be entirely new to you. If so, we recommend that you review chapter 6, "Hard Disk Recording Basics" (page 47) for a briefing on concepts that are crucial for working with Digital Performer.

Digital audio specifications

Digital Performer records professional, CD-quality monophonic digital audio at whatever sampling rates are offered by the recording hardware being used. Digital Performer can record in stereo by recording into a pair of audio tracks. Recording with Digital Performer produces approximately 5 Megabytes of data per minute of monophonic audio at 44.1 kHz (10 megabytes per minute of stereo). Digital audio data can be backed up and mixed down to any standard digital audio medium.

File formats

Digital Performer generates 16-bit, Sound Designer II files at any available sampling rate. It can load and play back files in the following formats: Sound Designer, Sound Designer II (mono), and Audio IFF.

Part I

New Features

Chapter 3 *New Features in Version 1.6*

All new features introduced in Performer Version 5

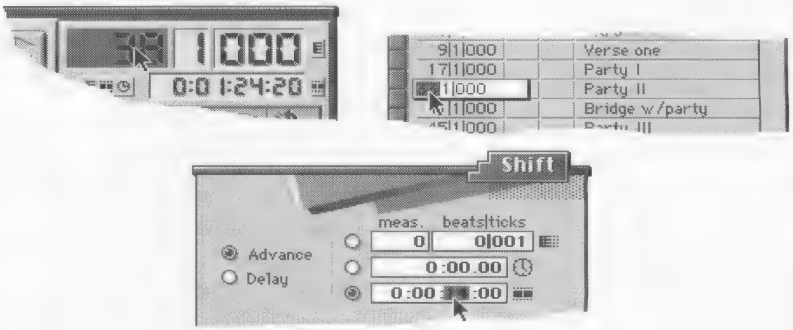
Digital Performer 1.6 has all of the new features introduced in Performer Version 5, including color, Groove Quantize, and more. Features new to version 5 are summarized in chapter 2, "What's New in Performer® 5" (page 13) of the Performer *Getting Started* book.

Movie Window for digital video playback

Digital Performer 1.6 can play back QuickTime movies. See chapter 4, "The Movie Window" (page 27).

Using the mouse to edit values in text boxes

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



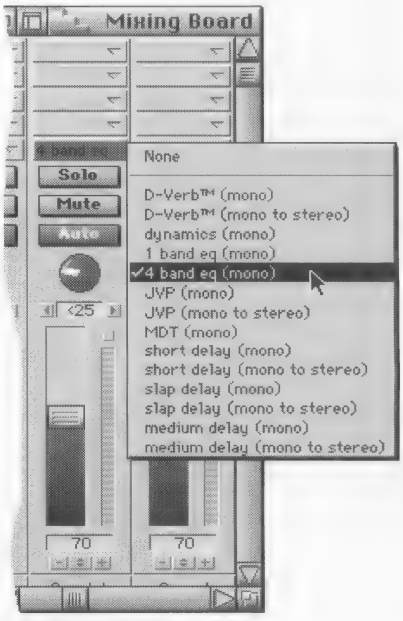
Support for the Digidesign Audio Engine (DAE)

Digital Performer Version 1.6 has been completely re-engineered for the Digidesign Audio Engine (DAE). DAE handles the core tasks of interacting with the Digidesign audio recording hardware. Digital Performer's support for DAE provides support for:

- Pro Tools III (16-48 tracks)
- Pro Tools (4-16 tracks)
- 4 independent audio inputs/outputs in Sound Tools II systems
- Audiomedia LC support
- Complete support for TDM
- Future compatibility with Session 8

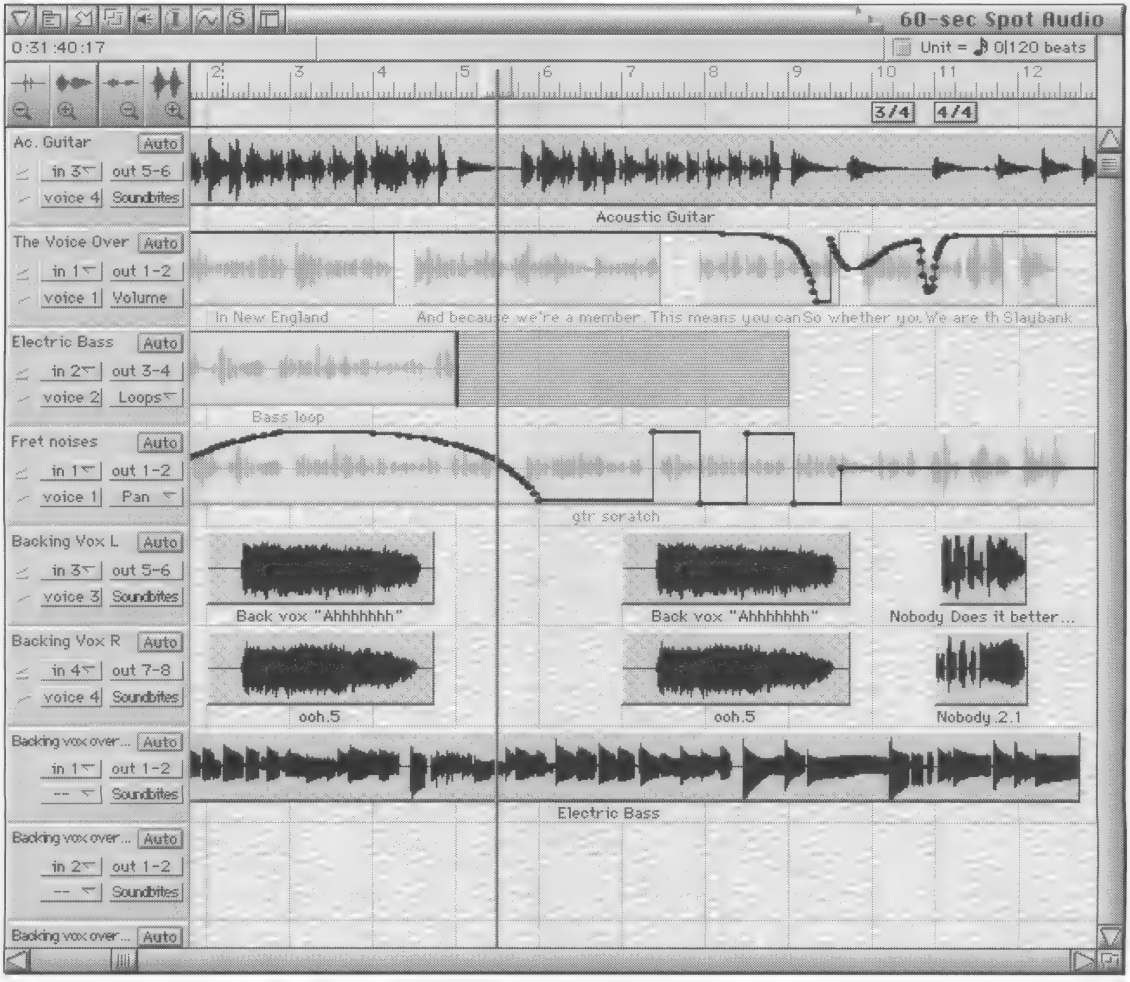
Support for TDM

Digital Performer's TDM-related features allow you to mix and process audio tracks with TDM plug-ins if you have a Pro Tools I with TDM or Pro Tools III hardware setup. TDM effects are accessed via the effects inserts in the new Mixing Board window (described later). The number of effects that you can apply simultaneously depends on the amount of DSP processing hardware you have in your system. The example below shows Digidesign's 4-band EQ plug-in.



Multi-track graphic editing window for audio tracks

There is now one graphic editing window for all audio tracks in a sequence. In the window, you can quickly display and hide any combination of the audio tracks in a sequence. In addition to many other advanced graphic editing features, this window displays and edits audio volume, audio pan, and loop data directly on top of the audio waveforms in each track as shown in the example below.



The Mixing Board window: totally integrated mixing, EQ, and effects

The new Mixing Board window has channel strips controlling volume, pan, inserts, solo, mute, and automation for every audio and MIDI track. You can configure this window to display all or any combination of the tracks in a sequence, and you can save board layouts for instant recall. Volume and Pan are available for both MIDI and audio tracks. Effects are available for all MIDI tracks and all audio tracks (if the hardware supports audio effects). Choosing an effect from one of the insert pop-up menus opens the Effects window.

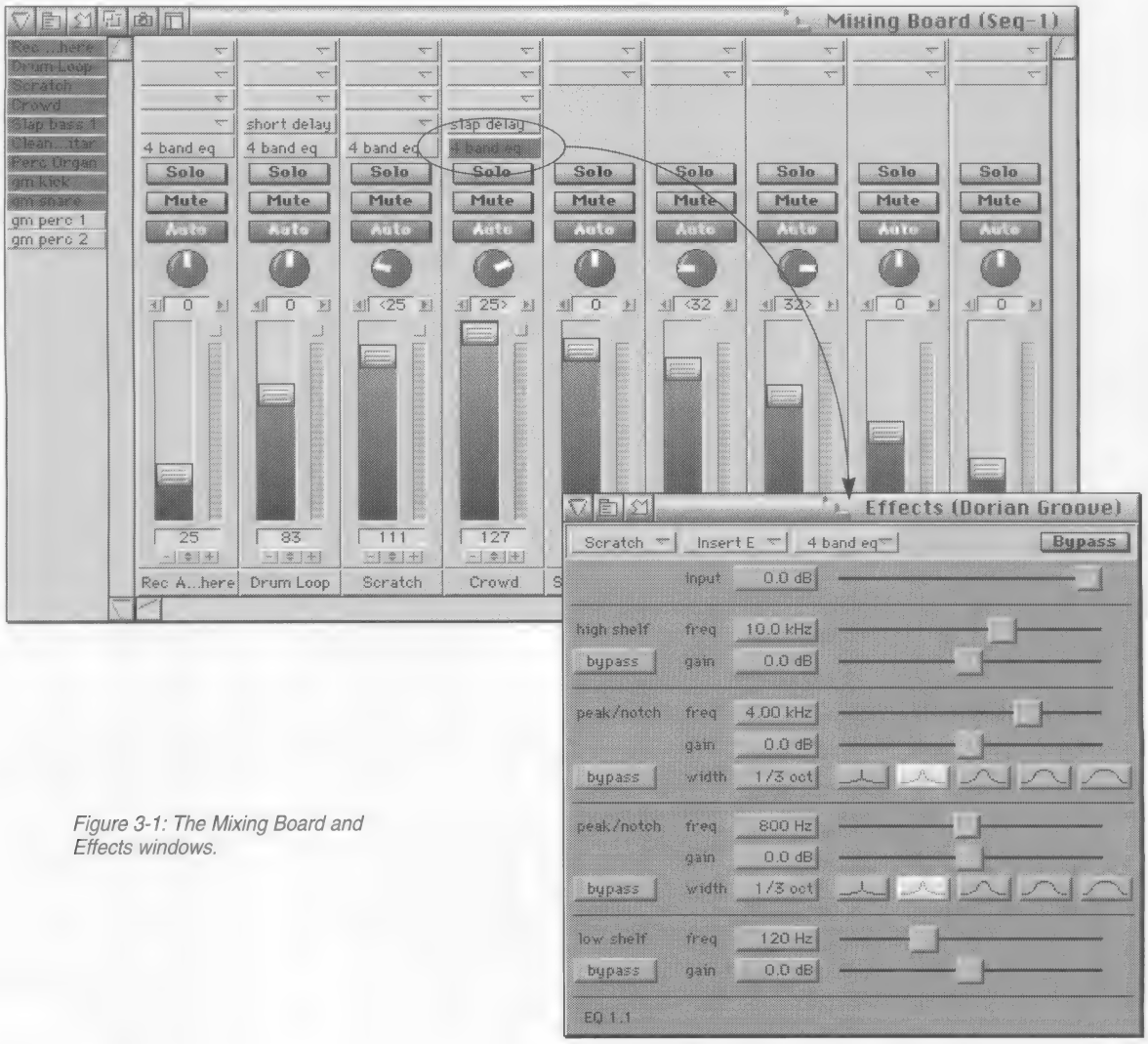
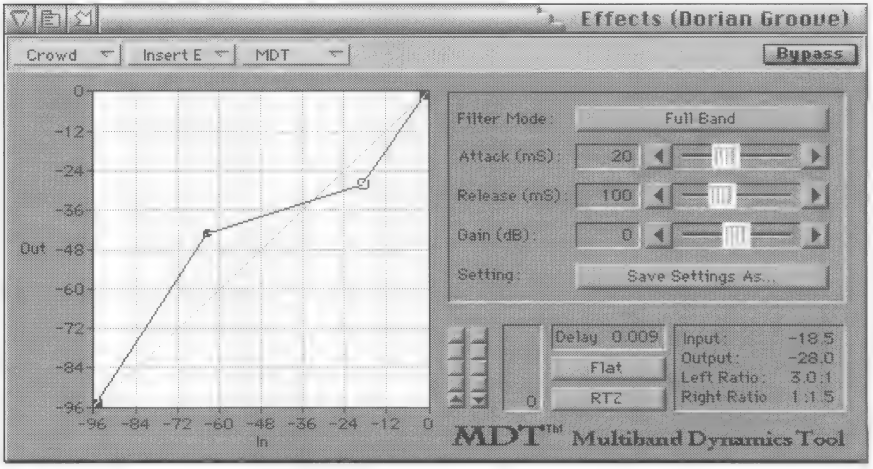


Figure 3-1: The Mixing Board and Effects windows.

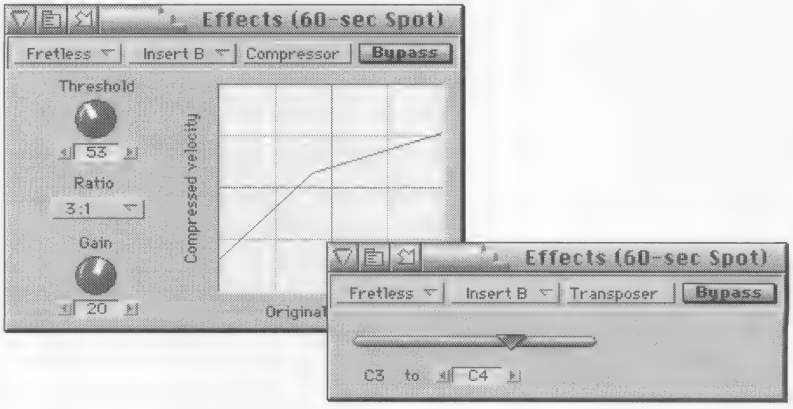
Effects window

The Effects window can be accessed by choosing the desired effect from the channel insert pop-up menus in the Mixing Board as shown in Figure 3-1 on page 18. The Effects window provides access to all third-party TDM plug-ins you have in your system, as well as MIDI processing parameters for MIDI tracks.



MIDI output processing

MIDI tracks can now be non-destructively processed with MIDI "effects". This means that you can transpose a track on the fly, for example, without affecting the original data in the track. MIDI processing is located in the effects section of the new Mixing Board window. This new feature offers two initial effects: *transposition* and *velocity compression*. Look for many other MIDI processing modules in future versions of Digital Performer, including quantizing, shifting, and many more.



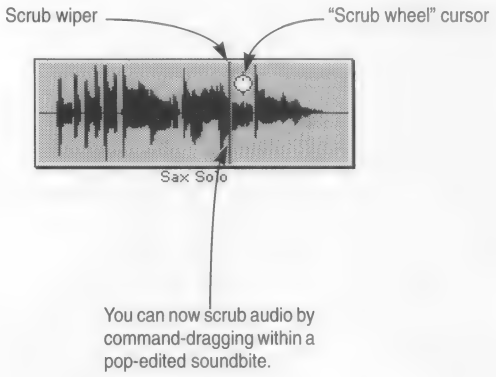
Improved audio file management and organization

Digital Performer offers improved sound file management. Audio files for a Digital Performer project are stored in an automatically created Audio Files folder. You can store the audio files wherever you want—even on a different hard drive—and Digital Performer will keep track of them by placing System 7 aliases in the folder. Digital Performer keeps better track of audio files by taking advantage of other System 7 file management enhancements.

Figure 3-2: A typical Digital Performer recording project.

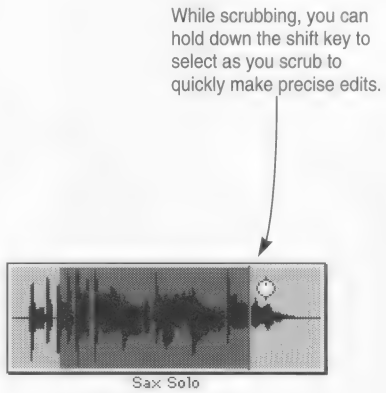
Audio scrubbing

Version 1.6 offers scrubbing in soundbites by command-dragging inside a pop-edited soundbite as shown below.



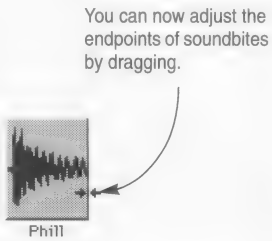
Scrubbing while selecting

When you are selecting a region of audio within a soundbite, you can scrub the audio as you select to get auditory feedback of what you are selecting.



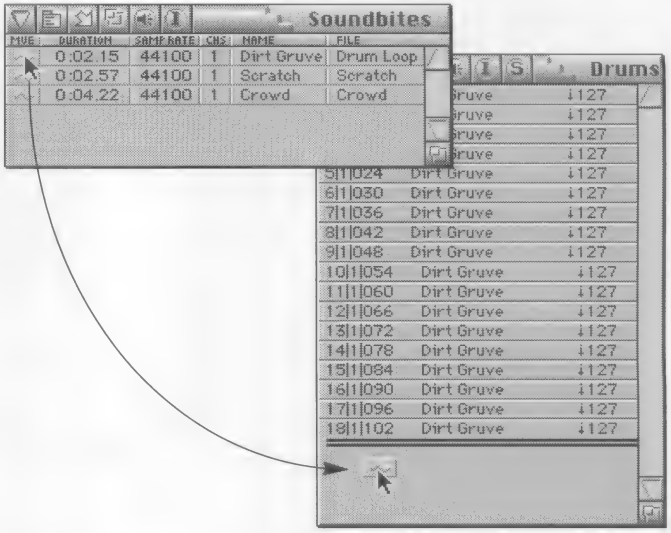
Adjusting soundbite boundaries

The boundaries of soundbites can now be freely adjusted by dragging the endpoints of the soundbites. The waveform is "uncovered" or covered as you drag to show more or less of the audio data in the audio file.



Dragging and dropping soundbites

You can drag and drop soundbites from the Soundbites window into the Tracks Overview, Event List window, and the Graphic Editing window. In the Graphic Editing window and Tracks Overview, use the command key while dragging to place the soundbite at the end of the previous one to quickly build a playlist.



Soundbite "throwing" in the Graphic Editing window

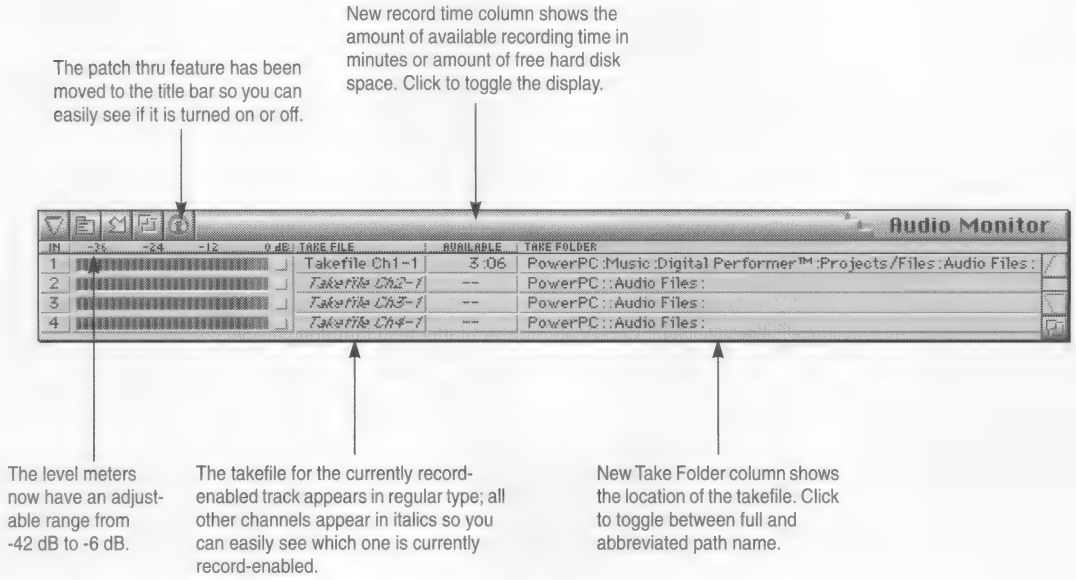
By command-dragging soundbites in the Graphic Editing window, you can "throw" them to the edge of the next or previous soundbite. You can achieve a similar effect by dragging soundbites from the Soundbites window into an event list, which drops the soundbite into the track at the end of the last soundbite.

Enhancements for selecting and editing inside soundbites

Many enhancements have been made to select and edit audio within a pop-edited soundbite. For example, you can now scroll and zoom the window as needed while the soundbite remains popped up. You can even do so with a portion of the soundbite highlighted. You can also cut, copy, or erase a highlighted region within a soundbite.

Enhancements to the Audio Monitor window

The Audio Monitor has numerous small enhancements to improve its usefulness during a session.

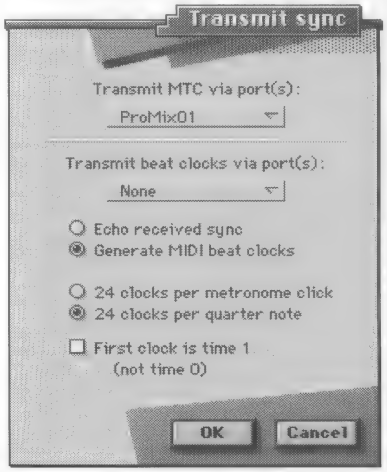


Edit on Zero Crossings command

You can now control whether Digital Performer will automatically find zero crossings when you edit soundbites with commands such as cut, copy, split, trim, etc. Turning off Edit on Zero Crossings mode gives you greater precision. Turning it on helps avoid noise artifacts at edit boundaries.

MIDI Time Code Generation

Digital Performer can now transmit MIDI Time Code to any piece of MIDI hardware in your setup via the Transmit Sync command in the Basics menu. It can also transmit MTC to other applications running at the same time as Digital Performer when Inter-application MIDI is turned on in FreeMIDI Setup preferences (File menu).



MTC is generated at the SMPTE frame rate specified for the current file except when Digital Performer is set to Slave to External Sync and is receiving MTC. In this case, incoming MTC is echoed directly.

To generate MTC:

1. **Choose Transmit Sync from the Basics menu.**

2. **Choose a destination for MTC from the pop-up menu.**

   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. If Inter-application MIDI is enabled in FreeMIDI Preferences (FreeMIDI Setup, File menu) you can send MTC to other FreeMIDI applications (including OMS applications, if OMS Emulator is installed).

Frame Rate command in the Basics menu

You can now set the SMPTE frame rate for a file using the Frame Rate command in the Basics menu. When you choose this command, a hierarchical menu appears containing the various supported SMPTE frame rates. Choose one and it will change the SMPTE frame rate for the current file. This has the same effect as setting the SMPTE frame rate from within the Receive Sync dialog.

Improved audio track muting and soloing

Audio tracks now mute and solo faster than previous versions. When muting, the response is instantaneous. When unmuting, the response depends on whether the DAE still has audio data to play. If it does, then the response is instantaneous. If not, then there is a delay while the DAE reloads its buffers.

Soundbite names can be edited in edit windows

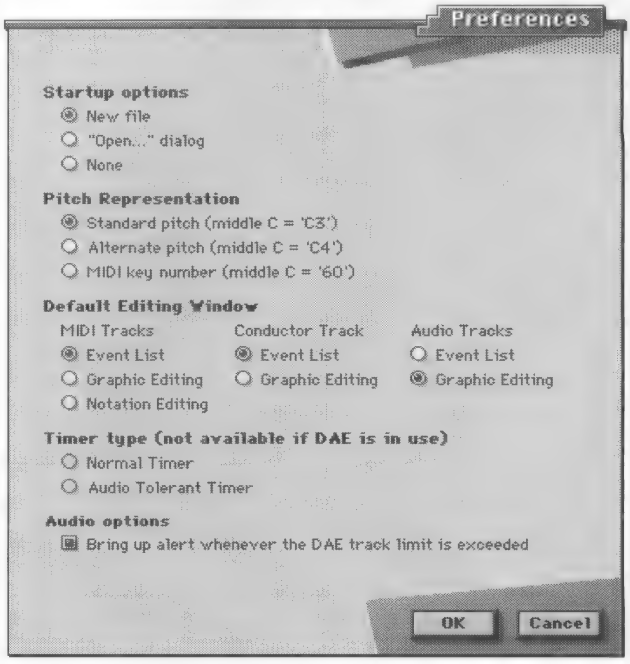
Option-click to pop-edit soundbite names now in the event list window and in the graphic editing window info bar.

Audio faders now animate during playback

Audio faders in consoles now animate during playback to reflect audio volume and pan controller data in the track. Faders for audio tracks in the Mixing Board also animate during playback.

New preferences

There are several new audio-related preferences. You can set preferences in by choosing Preferences from the File menu.



Chapter 4 *The Movie Window*

Random access digital picture

Digital Performer's Movie Window provides synchronized playback of a QuickTime Movie with both MIDI and audio tracks in a sequence.

QuickTime movies provide a quantum leap in flexibility and convenience over the process of synchronizing to video decks because QuickTime movies give you random access picture—just like digital audio. Here are just a few example benefits. 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
- Seamlessly loop both picture and music

And all of this can be done without the hassles of slaving to external time code. The time you save and the flexibility you gain more than make up for the cost of digitizing your film, video, or other media.

QuickTime 2.0 (or higher) is required

The Movie command is grayed out if you do not have QuickTime 2.0 or later properly installed in the Extensions Folder inside your System Folder.

Opening and closing movies

The Movie Window command in the Windows menu opens a QuickTime movie in Performer. To open a movie, choose this command to get a standard Macintosh Open dialog box. You may choose any QuickTime movie file, or any other file which QuickTime knows how to convert to a movie.

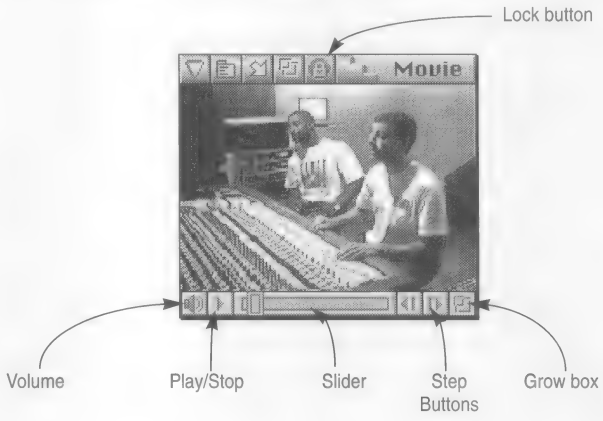
You may close the Movie window, and Performer will still remember which movie file you opened -- this information will be saved with the file. To reopen the movie, just choose Movie from the Windows menu again.

To close the movie permanently so that Performer forgets about it, chose Close Movie from the mini-menu.

If you have a movie open and want to choose a different movie, choose Open Movie... from the mini-menu. Only one movie may be open at a time.

Movie controls

Here is an overview of the controls in the movie window:



The Lock button

If the lock button in the movie window's title bar is on, the movie is locked to Performer's transport. The movie will slave to Performer as you play, stop, and locate. Conversely, you can use the movie controls at the bottom of the movie window to control Performer. If the lock button is off, you can control the movie and Performer's sequences independently. This is useful if you want to preview a movie without synths blaring, wipers scrolling, and so on.

Volume slider

The volume control allows you to set the playback volume for the movie's audio track. If the movie has no sound, there will be no volume control. Option-clicking will mute or unmute the movie's sound. Shift-clicking lets you "overdrive" the volume up to 300%.

Play/Stop button

The Play/Stop control toggles between playing and stopping. Also, clicking the movie itself will stop; double-clicking will play.

Slider

The slider shows where in the movie you are, and can be used to "scrub" the movie or to set your location in the movie.

Step buttons

The step buttons move forward or backward 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. Option clicking moves to the beginning or end of the movie. The left and right arrow keys will also work if the window is in front.

Grow box

The grow box works as usual, with these additions:

- Holding down the option key while resizing the window constrains the window to a "good" size, meaning one which QuickTime is able to playback efficiently. This means one quarter, half, three quarters, full size, double, triple, etc.
- Holding down the shift key while resizing the window keeps the aspect ratio correct at any size, but the movie is not likely to play back efficiently.

Movie window mini-menu commands

Open Movie: Presents you with a standard Macintosh Open dialog box. You may choose any QuickTime movie file, or any other file which QuickTime knows how to convert to a movie. You can use this command to switch to a different movie.

Close Movie: Closes the movie permanently, so that Performer forgets about it.

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 chunk 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's counter.

Use Movie's Color Table: Movies can have preferred color tables stored inside them. If the movie window is on a screen in 256-color or 16-color mode, and the movie has a color table, this item will be enabled (not grayed out). If you check it, Performer will use the movie's color table whenever the movie window is open, giving (hopefully) truer colors.

Half Size, Normal Size, and Double Size: Resize the window. One of these may be checked if the window is already that size.

Improving the performance of the movie window

QuickTime can tell if it has the power to play all the frames in the movie. If not, it drops one or more frames, but keeps playing at full speed. So a movie with 30 fps in it might play at 30 fps on a fast machine, but only at 15 fps on a slow machine, dropping roughly every other frame.

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, e.g. a CD-ROM drive
- Resizing the window to non-optimal sizes (not double, full, or half size)
- Having many other open windows with scrolling wipers, auto scroll, level meters, etc.

Avoiding these things will help your movies play back more smoothly.

Movie audio while slaved to external sync

The Movie window's audio track is automatically disabled in Slave to External Sync mode. The volume control will disappear in this case.

Part II
Tutorials

Chapter 5 *A Guided Tour of Digital Performer*

An overview of audio features

This chapter provides an overview of Digital Performer's audio features in the form of a guided tour through a typical Digital Performer recording session.

Following along in Digital Performer

The tour begins by opening the demo file that ships with Digital Performer 1.6, allowing you to get "hands-on" in front of your Macintosh. If you aren't at your computer, don't worry: you can still get just as much out of this chapter, which provides a great introduction to Digital Performer's extensive audio features.

Have you seen the Performer picture-book tour yet?

This tour is similar to the *Picture-book Tour* of non-audio Performer features in the Performer *Getting Started* Booklet (starting on page 69), which provides a brief overview of Performer's essential features. If you are new to Performer and have not yet reviewed the *Picture-book Tour*, we strongly recommend doing so before reading this chapter because it will help you place the audio features shown here in context with the rest of the program.

Before you begin...

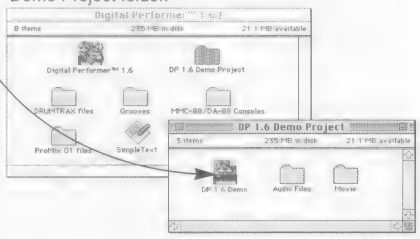
The tour assumes that you have successfully installed Digital Performer as described in the *Version 1.6 Installation Guide* booklet. This includes creating your FreeMIDI configuration. If you haven't yet done so and you plan to follow along in the Digital Performer, refer to the installation guide before proceeding.

Opening and playing the demo music

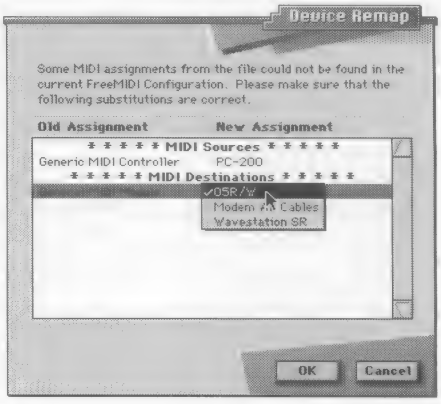
To open the Digital Performer 1.6 demo file, look for it in the Digital Performer folder as shown below and double-click the file icon.

> If you have trouble playing, or you don't hear anything, see chapter 20, "Audio Troubleshooting" (page 225).

1 **Open the demo file by double-clicking the file icon.**
The file is located in the DP 1.6 Demo Project folder.



2 **When the device mapping dialog appears, choose a general MIDI synth in your studio.**
If you don't have one, just choose any multi-timbral synth or sound module, in which case the MIDI tracks may not play back with the proper sound at first. The diagram below shows how to choose another sound on your synth for each track.



3 **Look over the diagram below and then press the play button to start playback.**
This sequence has four audio tracks at the top of the track list assigned to audio voices 1, 2, 3, and 4. The audio tracks contain repeated, single-measure audio 'soundbites' of a drum loop, a 'scratch', and crowd noise. Notice that the soundbites are repeated many times. To experience the power of random access disk-based audio, use the markers to instantly locate anywhere in the music.

4 **To start playback**
Click the play button.

5 **To stop playback**
Click stop & rewind.

Counter
Shows the current bar and beat during playback.

Markers
Identify important locations in the music. Click on the bar to instantly skip around in the music.

Audio tracks
Appear here in the track list along with MIDI tracks.

MIDI tracks
Appear with the device they are assigned to here.

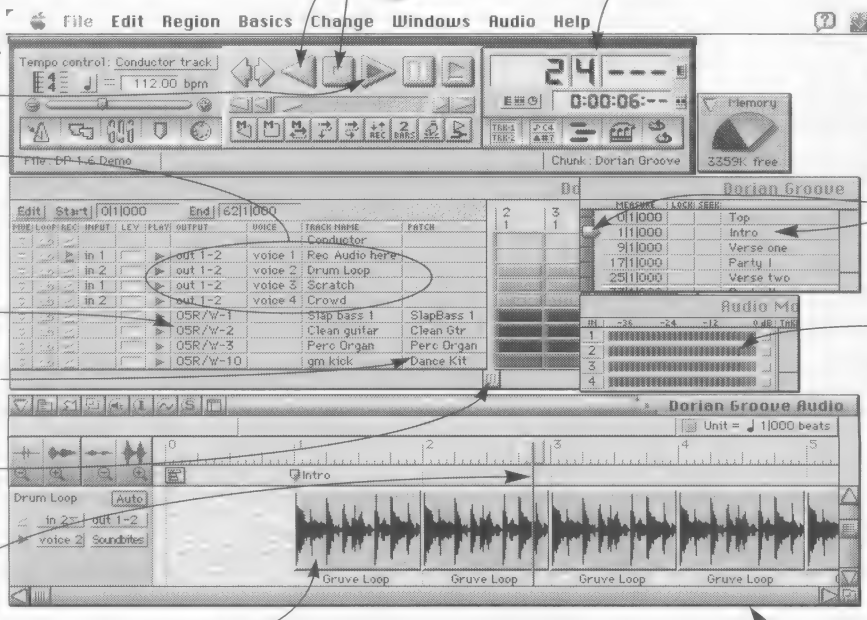
MIDI track sounds
If the MIDI tracks don't play with the correct instrument, drag this handle to the right and choose a sound from the "Default patch" menus.

Playback wiper
Shows the current playback location.

Soundbites
Regions of audio like these are called 'soundbites'.

Audio level meters
Show the input level for each audio input in your hard disk recording hardware.

Audio display
The audio graphic editor shows the audio data in all of the audio tracks in the sequence.



Audio tracks in the Tracks window

For more information, see chapter 7, "Audio Track Basics" (page 59).

Digital Performer records and plays audio in audio tracks, which are located in the Tracks window alongside MIDI tracks. You can create an unlimited number of audio (and MIDI) tracks, giving you as many "virtual" tracks as you want for alternate takes, different mixes of the same audio, and more. Depending on your hardware, there are limits to the number of audio tracks you can play and have active at one time.

1 **Click the title bar of the tracks window to activate the window.** Many of the actions you take in Digital Performer apply to the active window. Notice that the window's borders are fully detailed when it is active, and the other windows are not.

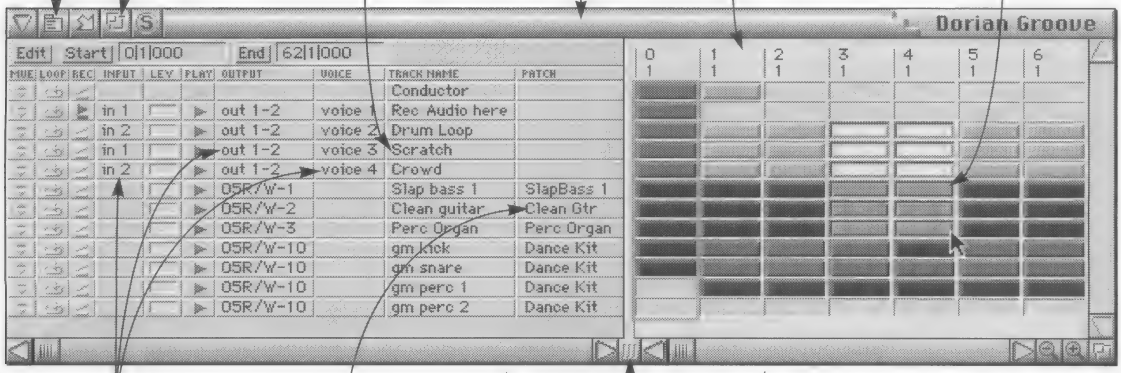
2 **Zoom the Tracks window.** The zoom button expands the window so that it displays all the tracks and fills the entire width of your screen. This is one of Digital Performer's many convenient shortcuts.

Create new tracks With the *Add track* and *Add Audio Track* commands here in the mini-menu.

Opening tracks Double-click track names to see the data inside.

Time ruler Each column represents one measure. Clicking selects the measure for editing. Use the magnifying glass buttons in the scroll bar below to zoom in and out.

Selecting data allows you to edit MIDI and audio tracks together. Try dragging over track segments to select them. You can apply edit commands such as cut, copy, snip, and splice.



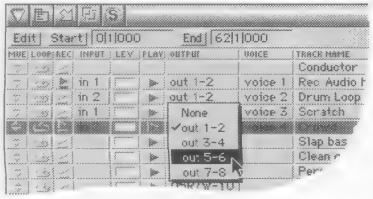
Audio track assignments Press here to see the audio hardware input, output, and voice assignment pop-up menus for each track. The number of inputs, outputs and voices you see in the menus depends on your hard disk recording system.

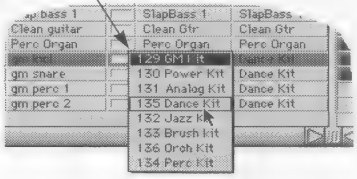
MIDI sounds The sounds you see in these pop-up menus may be different than what you see here because you have a different MIDI synth.

Track list Shows all audio and MIDI tracks.

Tracks overview Graphically shows what is in each track.

3 **Drag this handle to show more or less of the track list on the left and the tracks overview on the right.**





4 **Zoom the window back.** Click the zoom button in the title bar again as you did in step 2 to shrink the window back to its original size. If it doesn't (because you dragged the window's grow box at some point), use the grow box to do this (it's in the lower right corner of the window).

Audio graphic editing

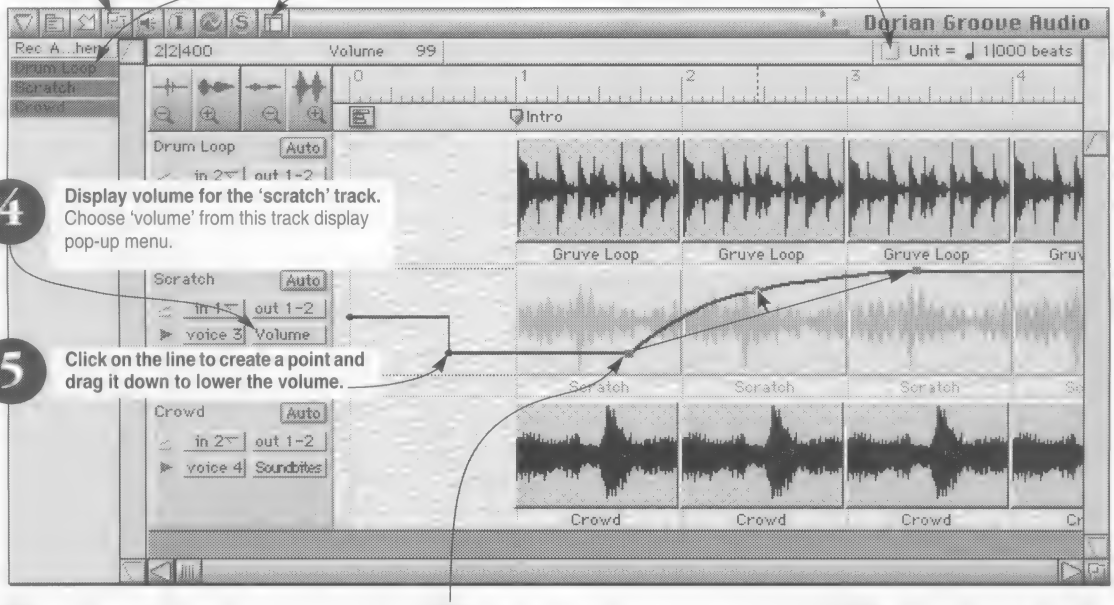
For more information, see chapter 13, "Audio Graphic Editing" (page 125).

Digital Performer gives you hands-on, precision control of digital audio data in the multitrack graphic editing window. Here, you will insert a volume curve, scrub audio, and much more.

1 **Expand the graphic editing window.**
Click its title bar and then click the zoom button. The controller grid appears below the soundbites.

2 **Click the track list button to open the track list.**
The track list lets you quickly show and hide audio tracks simply by clicking their name. Try it.

3 **Turn off Edit Resolution.**
Edit resolution causes dragging operations to 'snap' to a precise grid. For now, let's turn it off by unchecking the check box.



4 **Display volume for the 'scratch' track.**
Choose 'volume' from this track display pop-up menu.

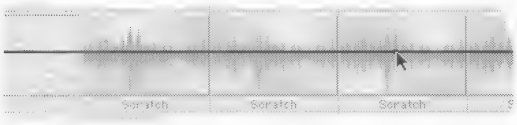
5 **Click on the line to create a point and drag it down to lower the volume.**

6 **Create a volume curve.**
Now let's create a volume curve. Click the Volume/Pan curve button in the title bar. The cursor turns into a cross hair.

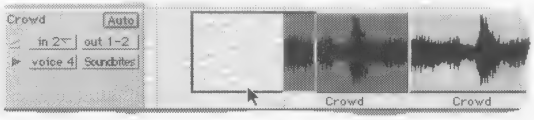
7 **Drag here to insert the line tool.**
After you insert the line tool, drag the red (or black) handles on the line tool to give it any shape you want.

8 **Press return to insert the curve.**
A series of individual volume events are inserted in the track in the shape of a smooth curve.

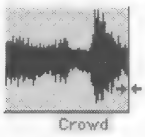
9 **Remove the curve you just inserted.**
To do so, grab the point you inserted in step 5 above and drag it to the right to "wipe out" the curve. Now delete the point itself by command-clicking it.



10 **Moving and 'throwing' soundbites.**
Try grabbing the first 'Crowd' soundbite and dragging it to the left to make it play earlier as shown below. (You can also drag soundbites vertically between tracks.) Now try 'throwing' the soundbite back to the edge of the soundbite to its right. To do so, command-drag a short amount to the right and then let go. The soundbite 'snaps' to the edge of the next soundbite to its right.

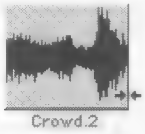


11 Trim the soundbite.
Now try trimming the soundbite. Place the mouse cursor over the left or right edge of the soundbite and drag towards the middle of the soundbite to make it smaller. Notice that all instances of the soundbite in the track change when you do this.



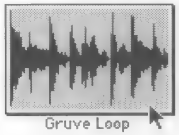
12 Undo the Trim.
Now undo the trim so that we can do it again, but slightly differently. Choose Undo Trim from the Edit menu.

13 Make a copy while trimming.
Trim the soundbite again, but this time, hold down the option key while grabbing the edge of the soundbite. When you finish trimming, notice that a number is added to the end of the soundbite name to indicate that it is an entirely new soundbite based on the original, leaving the original untouched—as well as all other instances of the original.

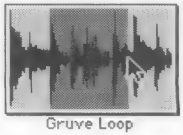


14 Turn on Audible Mode and audition the soundbite.
Click the Audible Mode button in the title bar so that it turns yellow (or black). To audition the soundbite, press on it. It will continue to play as long as you press.

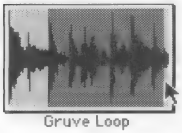
15 Double-click the soundbite to 'pop up' the waveform inside.
Doing so allows you to select a portion of the waveform in the soundbite, as apposed to clicking the soundbite, which selects it as a whole.



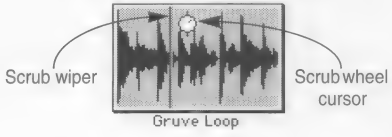
16 Drag inside the soundbite to select a portion of the waveform.
You can select any portion of the waveform you want. Notice that what you select plays as soon as you release the mouse. If you don't want this, turn off Audible Mode.



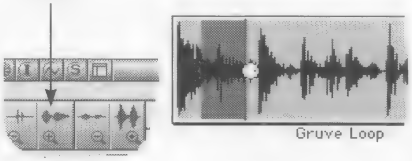
17 Shift-click and shift-drag to extend or shorten the selection.
You can shift-click near either edge of the selection. You can even shift-drag. Turn Audible Mode on or off as desired.



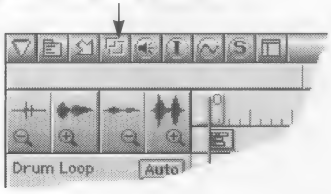
18 Command-drag to 'scrub' the audio waveform.
The scrub wiper indicates the current scrub location. The 'scrub wheel' cursor position determines speed (up to 2 times normal). Drag farther to play faster; drag closer to the wiper to play slower.



19 Command-shift drag to scrub while selecting.
You can scrub and select at the same time to hear what you are doing as you make accurate selections. You can also zoom in for finer resolution.



20 Zoom back the graphic editing window and open the track's event list.



Integrated, automated mixing for audio and MIDI tracks

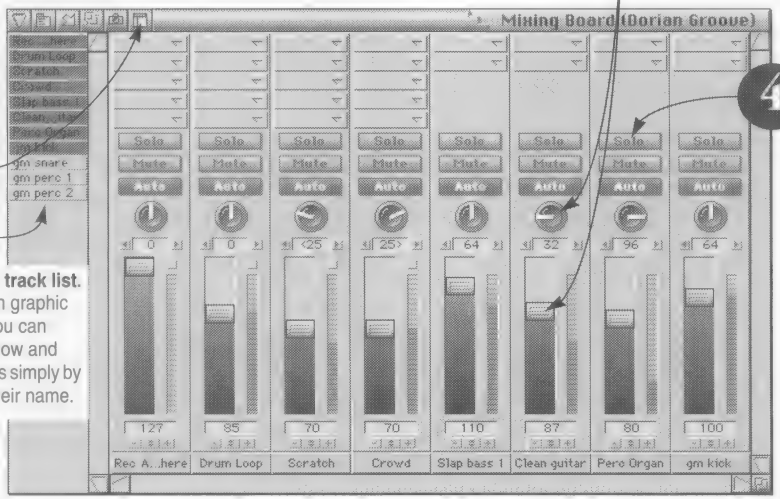
For more information, see chapter 15, "The Mixing Board" (page 175).

Digital Performer has powerful MIDI and audio mixing features that allow you to automate a mix-down for both types of tracks in one seamless environment. The tools for mixing audio and MIDI data are one and the same to save you time on the learning curve. Perhaps the most powerful mixing feature is Digital Performer's Mixing Board window, which gives you animated faders and knobs in a console.

1 **Open the Mixing Board window.** Choose *Mixing Board* from the Windows menu.

2 **Rewind to the beginning and start playback.** You'll see the faders animate at the beginning, and you'll see the level meters pump during playback as well.

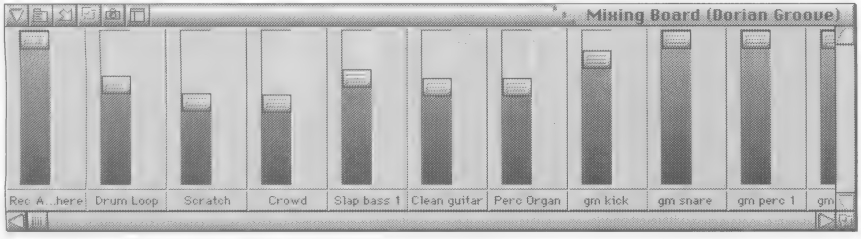
3 **Adjust individual faders.** Try both audio and MIDI tracks. These faders generate audio volume controllers and MIDI volume controllers (#7), which are recorded into the track they monitor. You can automate your entire mix right from this window.



4 **Glide across the Solo and Mute buttons.** Drag across a row of buttons to enable or disable a group of tracks quickly. This allows you to 'ride' the mix, making quick changes to groups of tracks in real time.

5 **Open the track list.** Just like in graphic editing, you can quickly show and hide tracks simply by clicking their name.

6 **Change the board layout quickly and easily.** Try this. Hold down the option key and choose Faders from the Mixing Board window mini-menu. You instantly see faders only. You can show and hide any section you want — on a dime. Just check or uncheck it in the mini-menu. You can even save your favorite board layouts for instant recall.

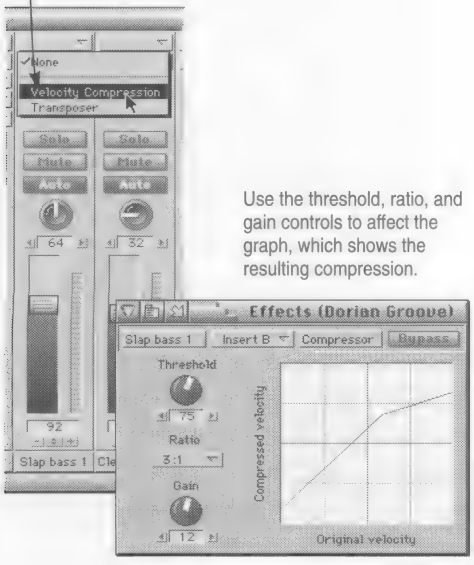


7 **Go back to a full console.** To instantly display all sections and tracks, command-click title bar as shown below and choose Show Everything from the pop-up menu.

MIDI output processing and integrated audio effects

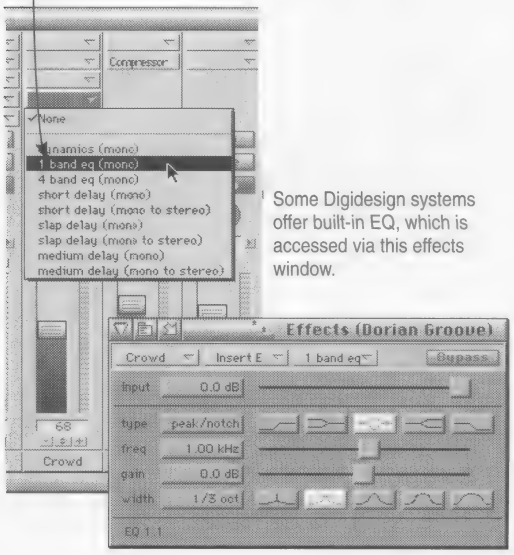
The Mixing Board window provides real-time MIDI output processing effects such as velocity compression and note transposition. In addition, it provides access to built-in EQ (on Digidesign systems that have it), the powerful TDM bus (if you have it), and all third-party plug-ins that you have installed in your TDM system. All of these features are accessed via effects inserts in the Mixing board, which open the Effects window shown below.

8 **Open the velocity compressor.**
To do so, press on one of the two pop-up menus above the Slap Bass track (or any other MIDI track) and choose Velocity Compressor from the menu.



Use the threshold, ratio, and gain controls to affect the graph, which shows the resulting compression.

9 **Choose an audio effect.**
This is done in the same fashion: choose the effect from one of the pop-up menus above the audio track. If you have a TDM system, you'll see plug-ins as shown below.



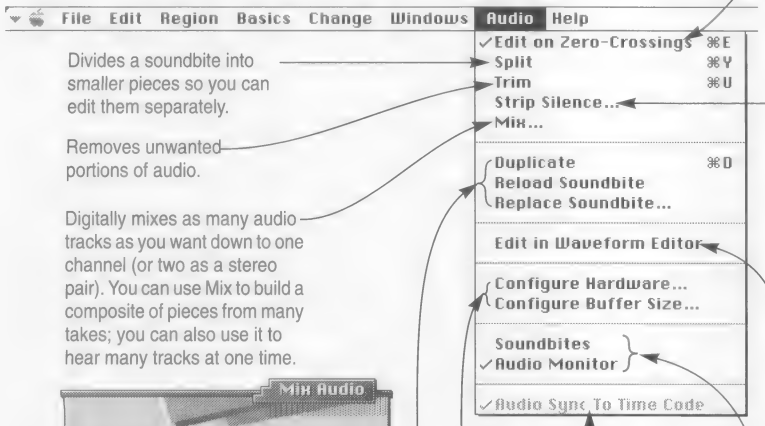
Some Digidesign systems offer built-in EQ, which is accessed via this effects window.

10 **Close the Mixing Board by clicking its close button.**

The Audio menu

The audio menu serves as a central location for many of Digital Performer's audio features.

For more information, see chapter 14, "Editing Audio" (page 157).

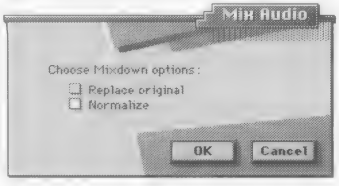


Helps avoid clicks and pops at audio soundbite boundaries when you edit them. Unchecking it gives your edits greater precision.

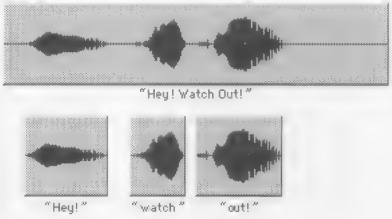
Divides a soundbite into smaller pieces so you can edit them separately.

Removes unwanted portions of audio.

Digitally mixes as many audio tracks as you want down to one channel (or two as a stereo pair). You can use Mix to build a composite of pieces from many takes; you can also use it to hear many tracks at one time.



Removes periods of silence from a soundbite, which take up unnecessary space on your hard disk. Acts just like a noise gate. The resulting pieces can be edited separately.



Takes you directly into another program such as Sound Designer II, which allows you to perform destructive waveform editing operations like 'pencil tool' editing of digital audio samples and DSP operations such normalize, reverse, time dilation, etc.

These commands help manage soundbites in their parent audio files on disk.

This command is grayed out unless you are slaving Digital Performer to SMPTE time code via MTC, DTL, or DTLe. For more information about it, see chapter 17, "Synchronizing Audio to SMPTE Time Code" (page 213).

These commands open the Soundbites window and the Audio monitor, which are covered next in the guided tour.

Provide options for configuring your hardware, such as global sample rate for recording and playback.

Preparing for recording in the Audio Monitor

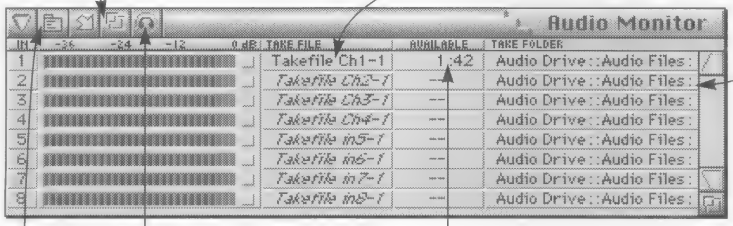
The Audio Monitor provides important information about the audio files that you generate on disk when recording in Digital Performer. It is crucial to the process of recording audio.

For more information, see chapter 9, "The Audio Monitor" (page 85).

1 Expand the Audio monitor window by clicking its title bar and clicking the zoom button.
The number of audio channels you see in this window depends on your audio hardware.

2 Notice that input 1 is record-enabled.
Input 1 is record-ready because the audio track named 'Record Audio Here' is record-enabled in the Tracks window. (Its button is red or black.) The other takefile names are italicized to show that they are not record-enabled.

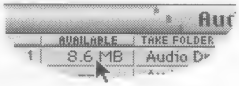
3 The Take Folder shows you the location of the takefile.
Click it to toggle between abbreviated name and full path name.

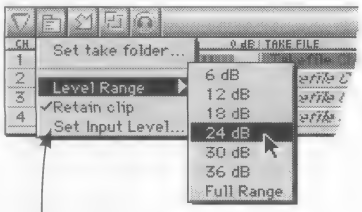


Patch Thru button
This button causes signal received on the record-enabled input to be patched thru to the audio hardware's output.

5 Set the range for the level meters.
The Level Range command in the mini-menu lets you choose the dynamic range for the meters. You can change it any time.

4 See how much record time you have available.
The available record time on your hard disk is shown in minutes and seconds. Click the time available to toggle between minutes:seconds and megabytes on disk.





Other commands
The other commands you see in this mini-menu can vary depending on your hardware.

6 Zoom the audio monitor back to its original size.

The audio event list

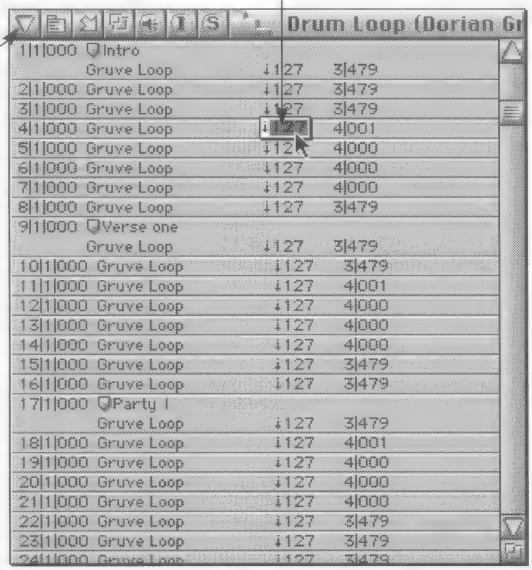
For more information, see chapter 12, "The Audio Event List" (page 117).

The audio event list gives you precise, numerical control over the audio data in audio tracks. It looks almost exactly like a MIDI track event list, and it works identically, too.

1 **Open the event list.** There are many ways to do this. One way is to click the soundbite called 'gruve loop' and then choose *Event List* from the graphic editing window mini-menu.

2 **In the event list, double-click a soundbite velocity to pop-edit it and type in a new velocity between 0-127.** Soundbite velocities affect the soundbite volume. The even list gives you precise numerical control over them, as well as the soundbite's attack time. Note, however, that this numerical information is also available in the info bar of the graphic editing window.

3 **Close the event list.** To do so, click the close button in the title bar.



Cataloging audio and building playlists in the Soundbites window

The Soundbites window serves as a catalog of all the soundbites (audio regions) in the file. It tells you the duration, sample rate, number of channels, and parent audio file for each soundbite.

For more information, see chapter 10, "The Soundbites Window" (page 93).

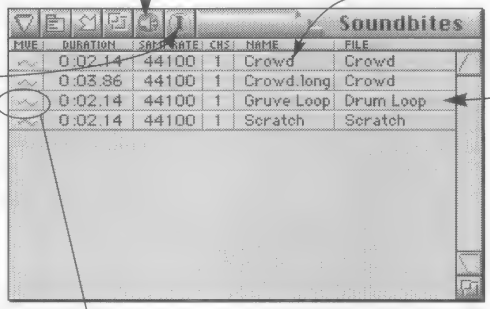
1 **Bring the Soundbites window to the front by choosing its name from the Audio menu.**

2 **Turn on Audible mode, if it isn't already on.**
The button should be yellow (or black).

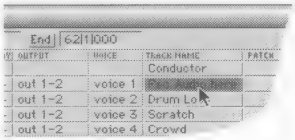
3 **Click a soundbite's name to hear it.**
Unlike the Graphic Editing window, you just click on the name. You don't have to keep holding the mouse down.

4 **Click here to toggle the parent audio file display between name only and full path.**

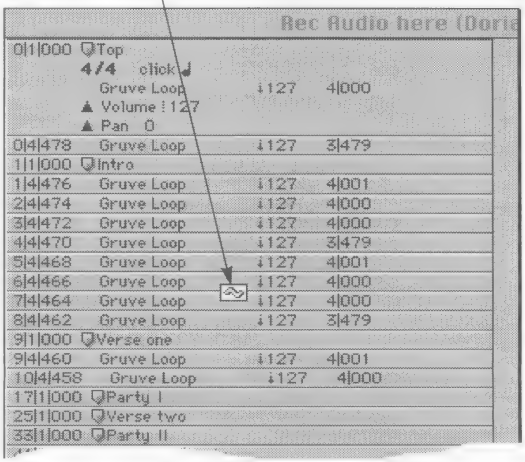
5 **Import an audio file or soundbite.**
Click the Import button to open the audio import dialog box. This dialog allows you to import any audio file or any region inside an audio file into Digital Performer.



6 **Open an event list to "drag and drop" soundbites into it.**
You can quickly place soundbites end to end in a track by dragging and dropping them into an event list or Graphic Editing window. To open an event list for an empty track, command-double-click the track called "Record Audio Here".



7 **Drag the 'Gruve Loop' soundbite by its handle anywhere on top of the event list window to build a playlist.**
A playlist is a series of soundbites placed end to end to create the effect of continuous playback. Try dropping 8 or more copies.



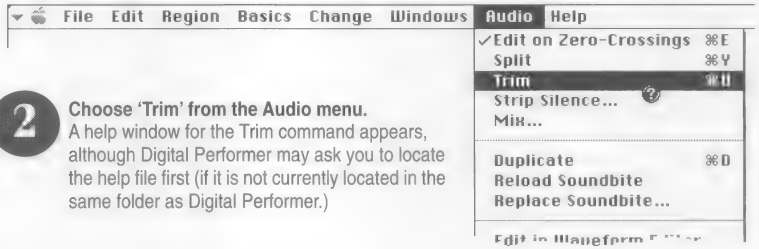
8 **Solo the track with the solo button in the event list title bar and press the play button to play back what you have done.**

9 **Stop playback, turn off solo mode, close the event list, and close the Soundbites window.**

Get quick answers with on-line help

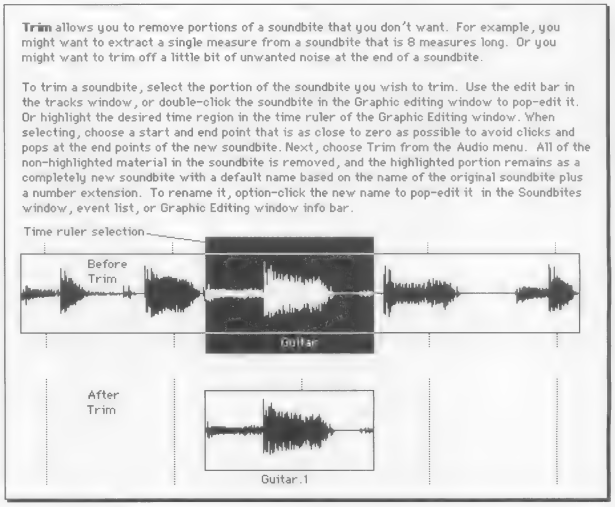
Digital Performer's on-line help feature offers you quick answers. You can get help on just about everything, including windows, menu items (even grayed out ones), and buttons and other options in dialog boxes. Try getting help on a few things as shown below.

1 **Hold down the command, option, and shift keys together to get the help cursor shown below.**



2 **Choose 'Trim' from the Audio menu.**
A help window for the Trim command appears, although Digital Performer may ask you to locate the help file first (if it is not currently located in the same folder as Digital Performer.)

3 **Read the help and then click anywhere to make the window disappear.**



Integrated digital video playback in the Movie window

For more information, see chapter 4, "The Movie Window" (page 27).

Digital Performer 1.6 has the ability to open and play back QuickTime movies. However, movie playback requires QuickTime 2.0 or higher to be installed in your Extension Folder. If you don't have QuickTime installed, skip this page of the guided tour and proceed to the next page.

1. **Choose Movie from the Windows menu.**
The movie window appears. If you don't have QuickTime installed in your System Folder, Digital Performer will tell you that it cannot open the movie.

2. **Press the play button to start playback.**
You can also press the play button in Digital Performer's main transport panel.

3. **To improve movie performance, close other windows, especially scrolling ones like Graphic Editing and the Tracks Window. Closing the Audio Monitor also helps.**

4. **Stop playback and try cueing around in the movie with the slider in the movie's control bar.**
Notice that the movie and Digital Performer are synchronized together. If the movie was recorded at a standard frame rate, such as 30 frames per second, its frames will match Digital Performer's frames in the SMPTE counter.

5. **Option-drag the resize box until the movie 'snaps' to one size larger.**
You may need to move the window into the center of the screen first to give you enough room to do so. Option-dragging constrains the size of the movie window to sizes that provide optimum playback quality, such as half, full, double, and triple size.

6. **Click the lock button.**
This button disconnects the movie from Digital Performer's main transports so you can play the movie separately from the music.

7. **Play the movie unlocked and at double size.**
Press the play button in the movie control bar. Press it again to stop the movie.

8. **After stopping the movie, lock it again and try frame-advancing forwards and backwards using the movie's frame advance buttons.**
This demo movie was recorded at approximately 15 frames per second, so it won't line up exactly with the SMPTE frames in Digital Performer's main counter. But notice that it will stay in sync with the music as is.

9. **Close the movie window.**

Congratulations!

Congratulations! You are now familiar with several of Digital Performer's most important audio features.

Continuing on your own

Feel free to play around further with any of the features you have learned about already, or poke around to find ones we didn't cover. Don't worry about "messing up" the tutorial file because you can quit without saving the changes you make.

Recording your first audio

If you'd like to try recording some audio, now is a good time. The track called "Record Audio Here" at the top of the list is already record-enabled and ready to go. Check disk space and input level in the Audio Monitor and then just press the record button in Digital Performer's main transport panel. For a more detailed step-by-step recording tutorial, see chapter 8, "Recording Audio" (page 71).

Quitting the guided tour

To quit the tutorial, choose Quit from the File menu and answer 'No' when it asks if you would like to save changes.

Chapter 6 Hard Disk Recording Basics

Know the basics so you can work smart

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.

Also be sure to consult the owner's manual of the hard disk recording hardware you have, as the hardware can impact Digital Performer in many important ways.

How hard disk recording differs from recording with a tape deck

Consider for a moment how audio is recorded on a tape deck: it is essentially a *linear* process. The audio signal gets recorded in a straight line (on the tape) from beginning to end. To play back, the tape passes over the head of the tape deck. If you want to start playback at a certain location in the music, you have to fast-forward or rewind the tape to that location. This is true for traditional analog tape decks as well as digital tape machines like the Alesis ADAT™.

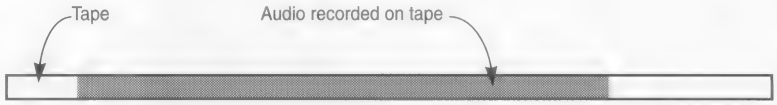


Figure 6-1: On a traditional tape deck, audio is recorded linearly on the tape from beginning to end.

Consider, on the other hand, how a computer hard disk works: it is very similar to a CD player. The hard disk consists of a round, magnetic platter that spins very fast and stores data. Suspended above

this spinning platter is an extremely fast read/write mechanism, similar to the optical mechanism in a CD player, which reads and writes data to the platter. The read/write "head" moves incredibly fast (faster than the eye can see), providing virtually instantaneous access to any location on the hard disk.

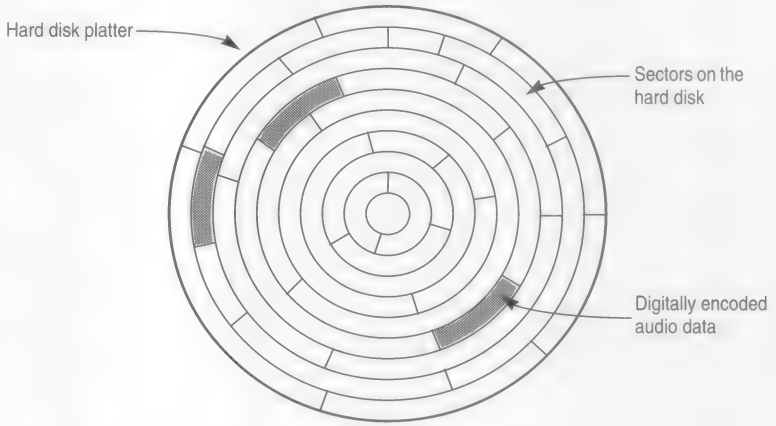


Figure 6-2: With a hard disk recording system, audio is converted into digital form (numbers) and stored on the hard disk platter, much like a CD player. The hard disk read/write mechanism moves so fast, it has virtually instantaneous access to any location on the hard disk.

Random access

This instantaneous access, often called *random access*, allows you to cue immediately to any location in your music, without having to wait for the hard disk mechanism to locate it. 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. For example, if you rearrange the order of a few sections in a digital audio track, Digital Performer simply rearranges references to those sections of data without affecting the original audio data itself. This process, called *non-destructive editing*, is possible because Digital Performer 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.

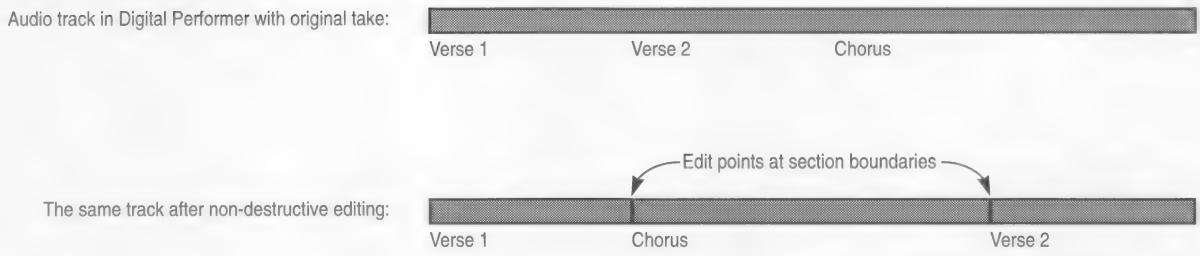


Figure 6-3: Hard disk recording systems provide non-destructive editing, which gives you instantaneous flexibility, as well as the ability to revert back to the original take at any time. Note that when you do this type of editing in Digital Performer, the audio data stored on hard disk does not move. Digital Performer just rearranges 'pointers' to the audio data.

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 Digital Performer take effect immediately as you do them.

Non-linear editing and playback

As you can see in Figure 6-3 above, non-destructive editing makes it quick and easy to re-arrange the order of any portion of the originally recorded audio. And 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, the demo file that ships with Digital Performer has a one-measure drum loop that repeats for the entire 60 bars of the piece, 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. (Alternately, 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*. For example, you might create a chorus effect with a vocal passage by placing it in four separate tracks and slightly offsetting the audio in each track. When you do so, Digital Performer 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 audio can you record on a hard disk?

The freedom you enjoy as a result of the benefits described above comes at a price: hard disk space. One mono minute of audio takes up about 5 megabytes (Mb) of space on your hard disk. A stereo minute takes up 10 Mb. If you have a four-channel hard disk recording system, and you have audio playing on all four channels for a five minute tune, that's 4 channels times 5 minutes, which adds up to 20 minutes of audio. Multiply that by 5 Mb per minute, and your 5 minute song takes up 100 Mb of hard disk space! And that doesn't count alternate takes, overdubs, and other audio that you generate during the course of a recording session. During a typical session, you can fill a 500 Mb hard disk in no time.

Fortunately, Digital Performer's Audio Monitor always shows you how much hard disk space you have available on your hard disk during a session so that you can manage your audio tracks intelligently and never run out of space at a crucial moment (such as the middle of a record pass!)

In addition, Digital Performer provides audio management features that let you easily identify unused audio and delete it from the hard disk.

Hard disk requirements and maintenance

Digital Performer itself does not have any special requirements with regard to the performance of the hard disk(s) on which you will be recording audio. However, the hard disk recording system you purchase to use with Digital Performer probably does. To avoid problems, be sure to consult the hardware manual for information about hard disk performance requirements. You may also learn about hard disk maintenance procedures such as defragmenting and re-initializing, which can help improve performance.

Digital audio terms

Here are some terms and concepts you should be familiar with.

Project

A *project* is a folder that Digital Performer creates on your hard disk when you start a new recording session. It includes a Digital Performer 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 Macintosh 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. The most common format on the Macintosh, and the only format you can generate when recording in Digital Performer, is a Sound Designer II file. Digital Performer can import and play back old Sound Designer files, as well as AIFF (Audio Interchange File Format) files.

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 software programs, such as Sound Designer II.

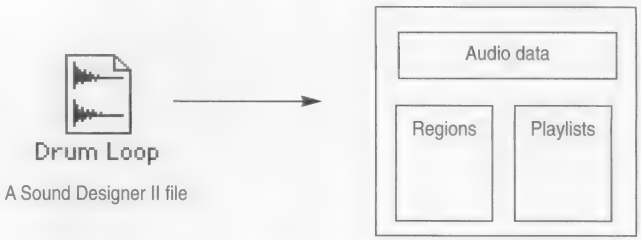


Figure 6-4: A sound file contains the original audio recorded into it, as well as any regions (soundbites) and playlists created by Digital Performer or other audio editing software you might use to edit the file, such as Digidesign's Sound Designer II.

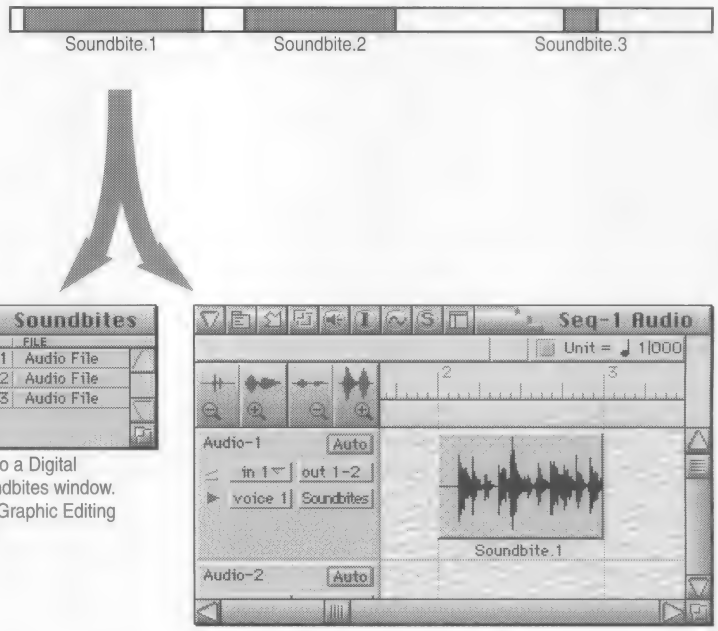
Region

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 Digital Performer, we call regions *soundbites* because the word *region* means something entirely different in Digital Performer: it is a period of time within one or more tracks over which an editing command will take effect. (For example, consider Digital Performer's *Region menu*.) Therefore, to avoid confusion with the word *region*, we use the term *soundbite* to describe a Sound Designer II file region. They are one and the same.

An mono audio file contains a single channel of audio data. (Stereo audio files contain two channels.) Soundbites (regions) of any length can be defined within the audio file.



Soundbites that you record or import into a Digital Performer file are cataloged in the Soundbites window. They appear as regions of audio in the Graphic Editing and Event List windows of audio tracks.

Figure 6-5: 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 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 Digital Performer 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.)

Playlist

A *playlist* is a collection of regions played end-to-end to produce a continuous presentation of music. Some programs, like Digidesign's Sound Designer II™, can save playlists within the audio file itself, just like regions. Playlists stored in audio files can be imported into Digital Performer as a single audio track in the Tracks window. You can also build a playlist in Digital Performer by dragging soundbites from the Soundbites window into a track's event list window.

Audio track

An *audio track* is a track in Digital Performer's Tracks list that can hold audio regions (soundbites), as well as audio volume and pan data. You can view the contents of an audio track with its event list window and/or its graphic editing window.

Audio voice

MIDI synthesizers have a maximum number of notes that can play at one time. Similarly, hard disk recording systems have a maximum number of channels, also referred to as *voices*, that can play at one time. For example, if you have a Digidesign Audiomedia II card, it provides Digital Performer with four audio voices. Digital Performer lets you assign any voice to any audio track as shown below. You can even assign the same voice to several tracks, but only one of the tracks can play at a time. When assigning voices, you can control how the playback resources of your hardware are allocated among the audio tracks in your music.

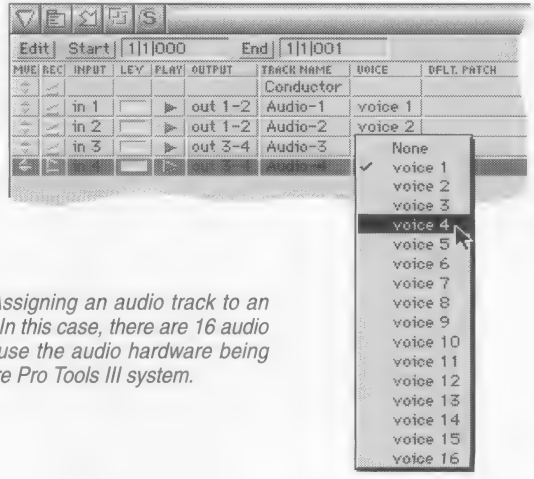


Figure 6-6: Assigning an audio track to an audio voice. In this case, there are 16 audio voices because the audio hardware being used is a core Pro Tools III system.

Audio input/output

An *audio input* or *output* refers to the physical input or output jack in the recording system you are using. Digital Performer allows you to freely assign audio tracks to the inputs and outputs in your system.

DAE

DAE is an abbreviation for the *Digidesign Audio Engine*, a software application developed by Digidesign that is shipped with Digital Performer. The DAE application is automatically installed in your system when Digital Performer is installed, and it automatically starts up every time you run Digital Performer. It is required by Digital Performer to record and play back audio data.

The DAE is the software "driver" for Digidesign hard disk recording hardware, serving as the link between Digital Performer's recording and playback features and the actual hardware itself.

You never need to be concerned about launching or quitting DAE. It launches itself and quits automatically when you run and quit Digital Performer.

If you don't have enough RAM to run Digital Performer and DAE at the same time, you will be informed of this when you first try to run Digital Performer. You can run Digital Performer without DAE, but you won't be able to record or play back any audio.

Because you may be using other programs that rely on DAE, you may need to keep track of what version of DAE you currently have (DAE is periodically updated by Digidesign) to make sure that it is compatible with Digital Performer. Consult the "Read Me" file and update notes included with new versions of Digital Performer as they become available. They will keep you informed of DAE version compatibility. In general, newer versions of DAE will most likely be compatible with the latest version of Digital Performer.

TDM

TDM is a software addition to DAE developed by Digidesign to allow comprehensive signal processing and mixing within the DAE environment. It consists of a folder of TDM plug-ins that resides in the DAE Folder with the DAE application. TDM is an open system, with plug-ins being offered by Digidesign and a host of other third party developers. All of these plug-ins can be used in Digital Performer's Mixing Board inserts and the Effects window.

Technically speaking, TDM is an acronym for *Time Division Multiplexing*. Digidesign has coined their own phrase for their implementation of this technology, *Trans-system Digital Matrix Bus*™, or *TDM Bus*™. The Digidesign TDM bus is a 256-channel, 24-bit digital audio bus that provides communication between all TDM-compatible hardware and software.

Part III

Audio Reference

Audio Reference

Chapter 7 Audio Track Basics

Digital Performer totally integrates the playback of digital audio tracks with the playback of MIDI tracks. You can use all of Performer's powerful and flexible cueing features to play audio and MIDI tracks together.

This chapter explains the following important aspects of audio tracks:

- Creating and managing audio tracks
- Assigning inputs and outputs
- Assigning voices
- Managing track and voice limits
- Registering and unregistering audio tracks
- Viewing audio track output levels

Audio tracks

In Digital Performer, *audio tracks* are very similar to MIDI tracks, and they all appear together in the Tracks window. 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.

Creating an audio track

To create an audio track in the Tracks window, choose *Add Audio Track* from the Tracks window mini-menu. New audio tracks are named *Audio-1*, *Audio-2*, etc. You can change the name by option-clicking the name to pop-edit it. Each audio track has the settings shown below in Figure 7-1.

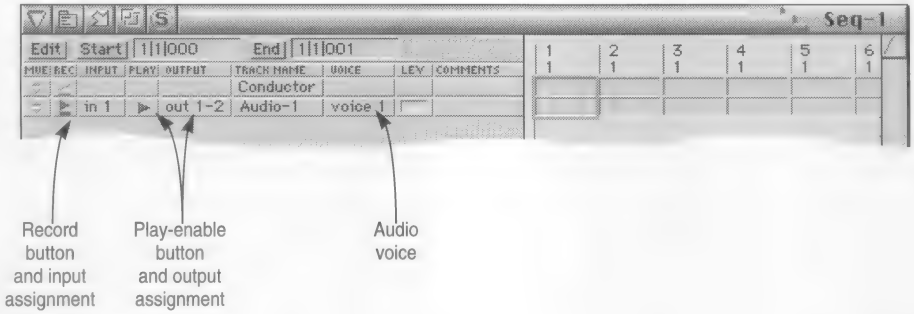


Figure 7-1: Creating an audio track. Note: the track columns shown here are ones that pertain to audio tracks. Columns pertaining only to MIDI tracks have been hidden in this example.

Adding several audio tracks at once

If you want to add several audio tracks at once, hold down the option-key while choosing the *Add audio track* command from the mini-menu. By default, newly created tracks are panned center (across the output pair that the track is assigned to). When adding multiple tracks, however, you are given the option of adding them in stereo pairs panned hard left and right.

Assigning inputs and outputs to an audio track

For each audio track, you choose an *input* and *output* as shown in Figure 7-1, which correspond directly to the physical input and output jacks on your audio hardware system. For example, Audiomedia II cards have 2 inputs and 2 outputs; single Pro Tools cards have 4 inputs and 4 outputs; core Pro Tools III systems have 8 inputs and 8 outputs. A red (or black) dot in the input pop-up menu indicates that the input is currently record-enabled.

Output assignments are made in left/right pairs

Output assignments are actually made in pairs, such as 1-2 or 3-4. The track is panned across the two outputs using the track's pan knob in the Mixing Board window, as well as pan controller events that you insert in the track. For example, the track in Figure 7-1 on page 60 is assigned to —and panned across — outputs 1 and 2. To play a track on a single output, pan hard left or right (where the odd numbered output is left and even is right).

Audio voices

In addition to their output assignment, audio tracks have a playback assignment called a *voice*. An audio voice is one of the channels of simultaneously playback provided by your hard disk recording hardware. The maximum number of voices you have depends on your hardware, as shown in the table below:

Digidesign System	Number of audio voices	Number of audio outputs
Audiomedia I, II, LC	4	2
Sound Tools II	4	4
Pro Tools	4	4
Pro Tools + SysAxe	8, 12, or 16	8, 12, or 16
Session 8*	8	8
Pro Tools III	16†	8†

**Session 8 will be supported in a future version of Digital Performer.*

†These figures are for a core configuration. More voices and outputs can be added with expanders and additional I/O modules. Contact Digidesign for more information.

Assigning a voice

When you add an audio track, it is assigned to Voice 1 by default. To assign an audio track to a different voice, press on the current voice assignment next to the track name as shown below.

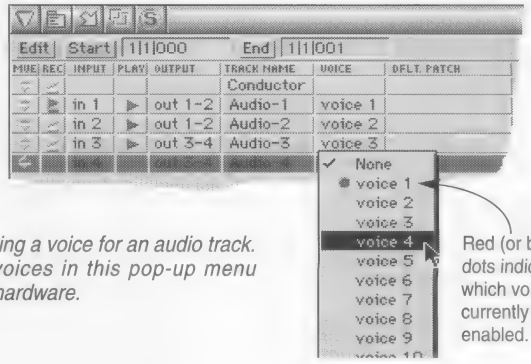


Figure 7-2: Choosing a voice for an audio track. The number of voices in this pop-up menu depends on your hardware.

Managing voice and track limits

As mentioned in the previous section, "Audio voices", the number of tracks you can actually hear at the same time depends on the maximum number of audio voices your hard disk recording system provides.

Don't resign yourself, however, to thinking in terms of the limited number of voices shown on page 61. Digital Performer allows you to work in ways that make it seem like you have many more.

Track bouncing with the Mix command

One way to hear more tracks at once is to mix many tracks down to one track (and therefore one voice). You can do this freely in Digital Performer because in the realm of digital audio, there is no noise build-up as a result of 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 Mix command, see chapter 18, "The Mix Command" (page 219).

Using a single playback voice for multiple tracks

Another way to overcome a small number of playback voices is to assign multiple tracks to the same audio voice—up to 32 tracks—as long as the material in each track doesn't occur at the same time. For example, if you had several different instruments playing solos at different times during a song, you could place each instrument in its own track and still assign them to the same audio voice because they never play at the same time.

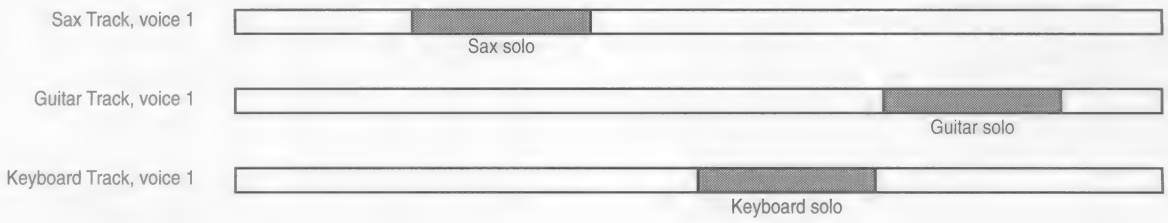


Figure 7-3: Several tracks can share the same audio voice if they don't overlap during the song. If they do happen to overlap, the track that gets priority is the one that is higher up in the list in the Tracks window.

Recording multiple takes of the same instrument

Another situation in which you can assign multiple tracks to the same voice is when you record multiple takes of the same instrument. You can record each new take into its own track, assign all of the tracks

to the same audio voice, and then play them one at a time (by muting all except one). This lets you do A/B comparisons between takes, and it provides you with complete freedom to choose among them. You can keep alternate takes around for as long as you want, provided you have enough space on your hard disk.

Overlapping soundbites and track priority

During playback, soundbites in each track play back on the audio voice assigned to that track. Only one soundbite can play at a time on the voice.

Digital Performer does not dynamically allocate playback across audio voices. Tracks can be assigned to one voice, and soundbites in the track play on that voice only.

If overlapping soundbites are placed in the same track, each soundbite "takes over" the voice when it begins and continues to play until it ends or until another new soundbite takes over.

If overlapping soundbites are placed in separate tracks assigned to the same audio voice, the soundbites "steal" the voice according to their *track priority*. Track priority is determined by the position of the track in the Tracks list: the higher the track, the higher its priority.

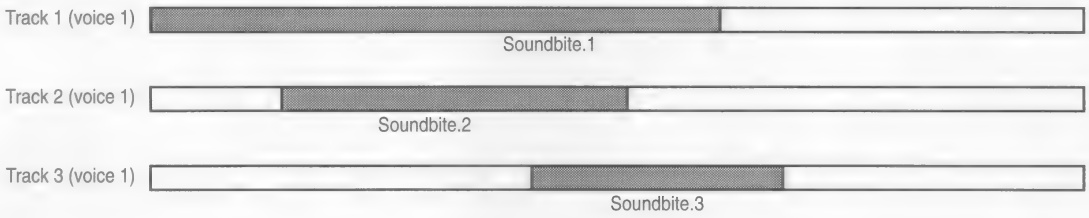


Figure 7-4: Voice stealing during playback is determined by track priority. The higher the track is in the list, the higher its priority. To change a track's priority, drag it higher or lower in the list.

If tracks 1, 2, and 3 in Figure 7-4 above are assigned to the same audio voice, Soundbite.1 plays first as playback proceeds from left to right. Soundbite.2 *never* plays because Soundbite.1 has priority during its entire duration. Soundbite.3 steals the voice from Soundbite.1, but only after Soundbite.1 has finished.

If all of the soundbites shown in Figure 7-4 on page 63 were placed in the same track as shown below, then each one would "take over" playback as soon as it begins. Therefore, Soundbite.2 will take over as soon as it begins, as will soundbite.3, which will then play through to its end.

Figure 7-5: If the soundbites shown in Figure 7-4 are placed in the same track, this is the resulting playback.

Audio track limits

Just as it does with MIDI tracks, Digital Performer allows you to create and record into an unlimited number of audio tracks. However, Digital Performer's audio playback and recording capabilities depend on the Digidesign Audio Engine (DAE), and DAE has built-in track limits. A DAE *track limit* is the maximum number of audio tracks that can be enabled simultaneously. We refer to this as the number of audio tracks that can be *registered* with the DAE. Registered tracks can play, record, scrub, etc. Unregistered tracks cannot.

Each Digidesign hardware system has a maximum number of audio tracks that can be registered at one time. Here are the limits for the various hardware configurations:

Digidesign System	Number of Audio Voices	Track Limit
Audiomedia I, II	4	12
Audiomedia LC	4	20
Sound Tools II	4	32
Pro Tools	4	64*
Pro Tools + SysAxe	8, 12, or 16	64*
Session 8	8	8
Pro Tools III core system	16	55

*On Pro Tools I systems with TDM, the track limit is 61 instead of 64.

In addition, there is a non-hardware specific limit of 32 audio tracks *per audio voice* in the DAE. This means that you can assign up to 32 tracks to the same voice (but only one will play at a time. See "Using a single playback voice for multiple tracks" on page 62 and "Overlapping soundbites and track priority" on page 63.)

Registered and unregistered audio tracks

Digital Performer does not limit the number of audio tracks that can be present in a Digital Performer file, but it does limit the number of audio tracks that are registered with the DAE at any given moment.

Digital Performer automatically unregisters audio tracks temporarily when needed. When a track becomes unregistered, its record-enable and play-enable buttons disappear as shown below in Figure 7-6 to indicate that the track is unregistered and will not play back. Unregistered tracks also do not take up any DSP playback bandwidth.

Registered tracks
Display a record button and play-enable button as usual.

Track assignments that are not available
Audio track assignments (input, output, or voice) that are no longer available (because the digidesign hardware system has changed) appear in italics.

Manually unregistered tracks
Display a '--' for the voice assignment because it has been set to "None", in addition to not having a record and play button.

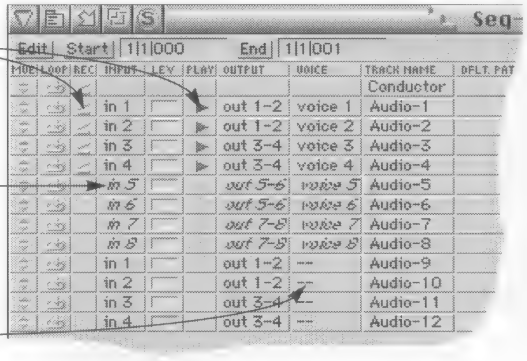


Figure 7-6: Unregistered audio tracks are displayed without a record button or play-enable button. You can manually unregister a track by setting its voice assignment to "None", which appears as a "--" in the Device column. A track automatically becomes unregistered if its voice or output assignment is no longer available (italic). In the example above, the file was last saved on a Pro Tools III system and is now opened on a Pro Tools I system.

Whenever audio tracks are going to become unregistered, Digital Performer displays the Audio Track Limits alert box to inform you. This alert can be turned off in the Preferences command in the File menu. We recommend that you leave this alert on for at least a little while, so that you can learn how and when these limits are reached.

Manually unregistering tracks

You can assign an audio track to any audio voice or to *None*. When an audio track is assigned to None, its assignment is displayed as two dashes (--) in the Tracks window as shown above in Figure 7-6 and it is unregistered with the DAE.

Soundbites within tracks that are assigned to None or are unregistered automatically cannot be played back or scrubbed.

Examples of when tracks are automatically unregistered

Here are some examples of when tracks will become unregistered:

- You are opening a Digital Performer file from any previous version that contains more than 32 audio tracks assigned to any one voice or more than the total audio track limit for your specific hardware. All the extra tracks retain their voice assignments, but the voice assignments appear italicized in the Tracks window and those tracks are muted.

- You have a file that is already at (or near) the audio track limit and you try to add a few more audio tracks using the Add Audio Track or Duplicate Track Layout commands from the Tracks window mini-menu. Digital Performer allows you to add as many tracks as you like, but the tracks beyond the limit are unregistered and muted.

- You play-enable a Song chunk that contains two or more sequence chunks with audio tracks and the total number of audio tracks in all the sequences exceeds the audio track limits for your hardware. This is important if you work with Songs. The total number of audio tracks within all the chunks contained in the Song cannot exceed the audio track limit.

- You open a Digital Performer file that was last saved under a hardware system that supports more voices and/or inputs and outputs than the current system. For example, if you save a file running under Pro Tools III (with 16 voices), and you then open the file on a system that has an Audiomedia II card (4 voices), audio tracks assigned to voices 5-16 will be unregistered (italicized).

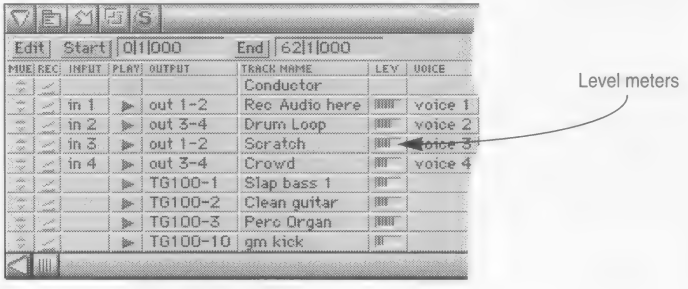
Since Digital Performer automatically disables tracks when the limit is reached, there is potential for confusion, so keep track limits in mind as you work with audio tracks so that you can effectively manage them.

Re-registering tracks

To play back or record into an unregistered track, you must first reregister it by choosing a valid (not italic) output assignment *and* voice for the track from their respective pop-up menus. If either of these conditions is not met, the track will not play back and does not take up any playback bandwidth.

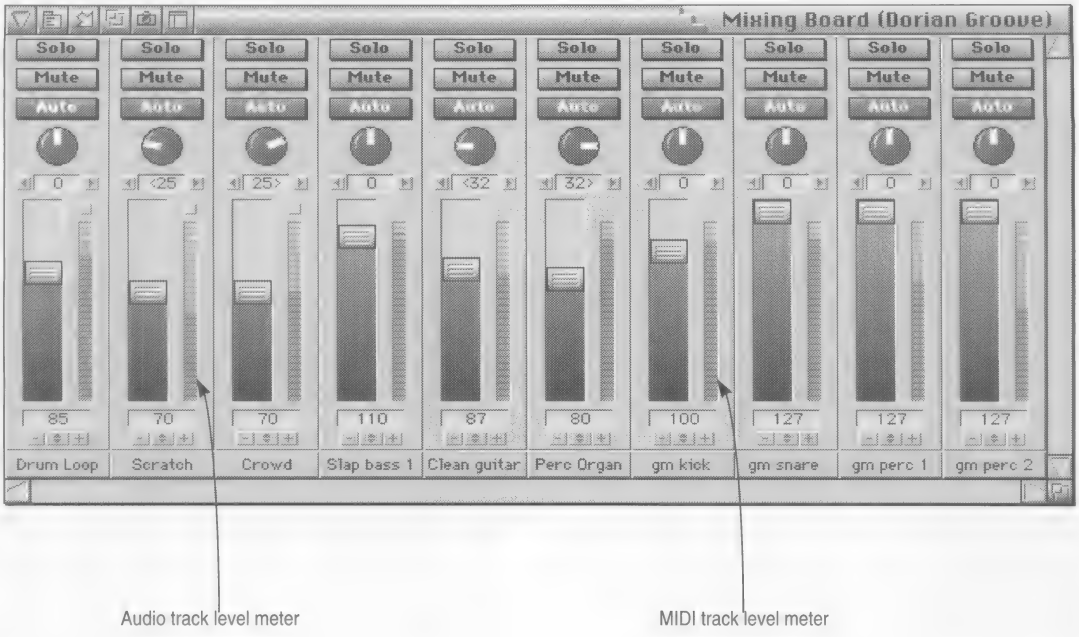
Displaying audio track levels in the Tracks list

The level meters in the Tracks list next to each audio track give you an indication of playback activity in the track, including an accurate display of true clipping. For a larger reading, use the level meters in the Mixing Board. (See the next section.)



Viewing audio track levels in the Mixing Board

The level meters in the Mixing Board display the output level on each audio track.



Volume

Digital Performer provides audio volume controller events that work in much the same way as MIDI volume controllers. The value range of an audio event is 0 to 127, and it can be use together with soundbite velocities to control volume in an audio track.

For more information about inserting and handling volume controllers, see chapter 15, "The Mixing Board" (page 175).

Panning

Panning is handled using special audio track pan controller events, which function similarly to MIDI continuous controller data. Each pan controller can have a value between -64 and +63, where 0 is dead center, -64 is hard left, and 63 is hard right. Pan controllers can be used one at a time to make a sudden change, or as an entire stream of events changing gradually to create smooth panning effects, just like MIDI continuous controllers.

Audio tracks default to pan center when they are first created, unless you add multiple tracks as stereo pairs (see "Adding several audio tracks at once" on page 60), in which case they are panned hard left and right.

For information about panning, see chapter 15, "The Mixing Board" (page 175).

Playing back stereo sound files

At the time of this writing, the Digidesign Audio Engine (DAE) does not support the recording or playback of interleaved, stereo sound files. (You *can*, however, work in stereo in Digital Performer. See "Recording in stereo" on page 81.)

Some digital audio applications have the ability to create interleaved, stereo Sound Designer II audio files. These files can be imported into Digital Performer, but DAE only plays the left channel when you play them back. You can, however, split up the stereo soundfile into two separate mono soundfiles and then place them in separate tracks in Digital Performer. This allows you to properly hear both channels. For information about de-interleaving stereo soundfiles, "Converting soundbites that cannot be played" on page 98.

For late-breaking news about stereo sound file recording and playback, consult the "Read Me" files and update notes of future versions of Digital Performer.

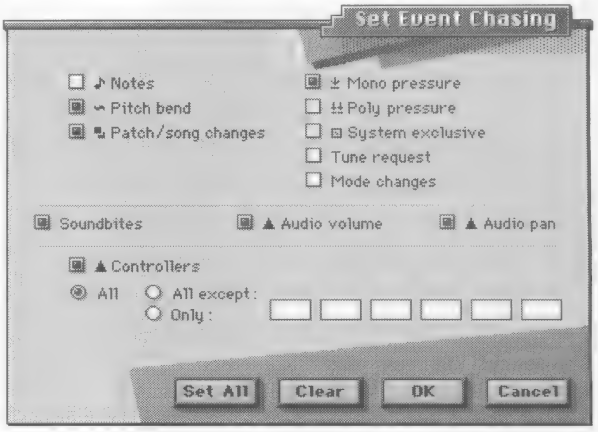
Screen redisplay

During playback, Digital Performer does its best to update items on the Macintosh screen, such as the Counter and scrolling windows. However, audio recording and playback does place a high demand on the computing power of the machine, and Digital Performer makes playback a much higher priority than refreshing the screen display. Therefore, you may find at times that the counter will stop and start during playback or recording.

Some hard disk recording systems, such as the Digidesign System Accelerator (or "SysAxe"), have a separate SCSI bus for digital audio. These systems relieve the Macintosh from the audio processing tasks. As a result, you will notice dramatically higher performance in Digital Performer's screen redisplay when using these systems.

Event chasing

Event chasing causes Digital Performer to always begin playback with the correct settings for chased events. The Event Chasing dialog box contains options for soundbites, audio pan, and audio volume. These options, when enabled, ensure that you hear the correct audio, level, and pan settings no matter where you start playback.



Under most circumstances, you should leave these options turned on to achieve accurate playback. The only effect they have when disabled is to give Digital Performer slightly faster response when you press the play button.

Remember, when you disable the *Soundbites* option, Digital Performer will not play a soundbite when playback begins in the middle of the soundbite.

Muting and unmuting audio tracks during playback

Audio tracks can be muted and unmuted during playback by using solo mode or by clicking their play-enable button in the Tracks window.

When muting a track, the response is instantaneous.

When unmuting a track, the response depends on whether the DAE still has audio data to play. If it does, then the response is instantaneous. If it does not, then there is a delay while the DAE reloads its buffers. However, since the DAE loads its buffers far ahead of the actual counter time, there may be several seconds before the track becomes unmuted. The exact amount of delay depends mainly on the DAE buffer size and whether a System Accelerator is being used.

Scrubbing audio

You can scrub the audio in a soundbite in the Graphic Editing window. For information, see "Scrubbing audio inside a popped-up soundbite" on page 147.

Slow and fast forwarding

Fast forward advances the counter at four times normal speed and skips audio like a CD player. Slow forward advances the counter at half speed and slows audio down without skipping.

Chapter 8 *Recording Audio*

Chapter overview

Recording audio requires a few careful considerations before you begin. This chapter explains how to:

- Create an audio track and record into it
- Punch in and out during recording (manually and automatically)
- Record in stereo
- Record multiple tracks at one time
- Record audio and MIDI tracks at the same time

Introduction

Digital Performer records audio in much the same way as a multitrack tape system, but with increased flexibility. Once audio data has been recorded, you have a great deal of control when editing, rearranging, and mixing audio tracks with your MIDI tracks.

In regular record mode, you record one audio track at a time. In MultiRecord mode, you can record several audio tracks at once—as many as your audio hardware will allow. In MultiRecord, you can also record in stereo.

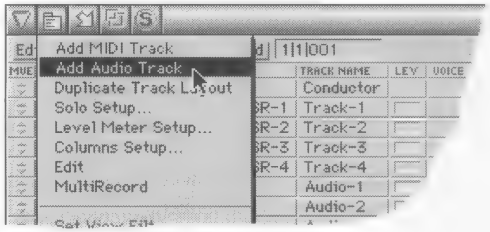
In either record mode, Digital Performer generates mono Sound Designer II soundfiles. Digital Performer does not currently create stereo soundfiles, although this capability is expected in future versions of DAE and Digital Performer. In the meantime, however, you can still record and play back in stereo, and this chapter explains how.

Preparing to record

Set up an audio track

Before you begin an audio recording session, make the following preparations for each audio track you would like to record into. If you are recording multiple tracks at once, also see "Using MultiRecord mode to record several audio tracks at once" on page 79 and "Recording in stereo" on page 81 for additional information.

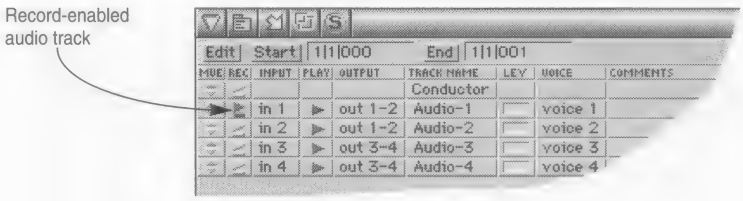
To create an audio track, choose *Add Audio Track* from the Tracks window mini-menu. To add several audio tracks at once, hold down the option key while doing so. Remember, you can control the position of the new audio track(s) in the list by highlighting an existing track before you add them. The new track is added below the highlighted track. If nothing is highlighted, the new track is added at the bottom of the list.



Record-enable the audio track

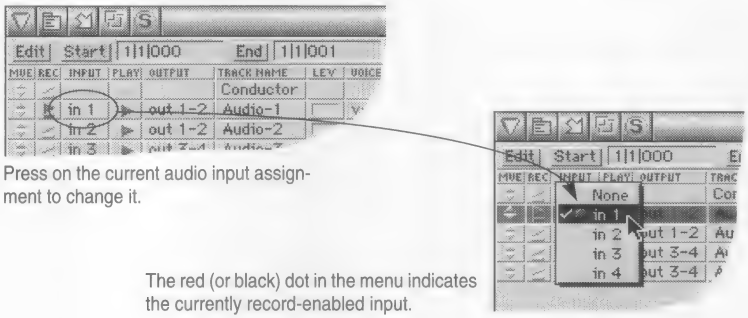
When you first create an audio track, it automatically gets record-enabled. If you are recording into an existing audio track, make sure that it is record-enabled by clicking the record-enable button to the left of its name.

- This step must be done before you actually begin recording; audio tracks cannot be record-enabled during playback or recording.
- If the track's record button is missing, then the track has become unregistered. To re-register the track, see "Re-registering tracks" on page 67.



Specify the audio input you will be recording from

This is the physical input on your recording hardware from which you want to record. To choose the audio input for recording, press on the current input assignment next to the track as shown below.



Press on the current audio input assignment to change it.

The red (or black) dot in the menu indicates the currently record-enabled input.

Set up the Audio Monitor

Now you are ready to check the following information in the Audio Monitor.

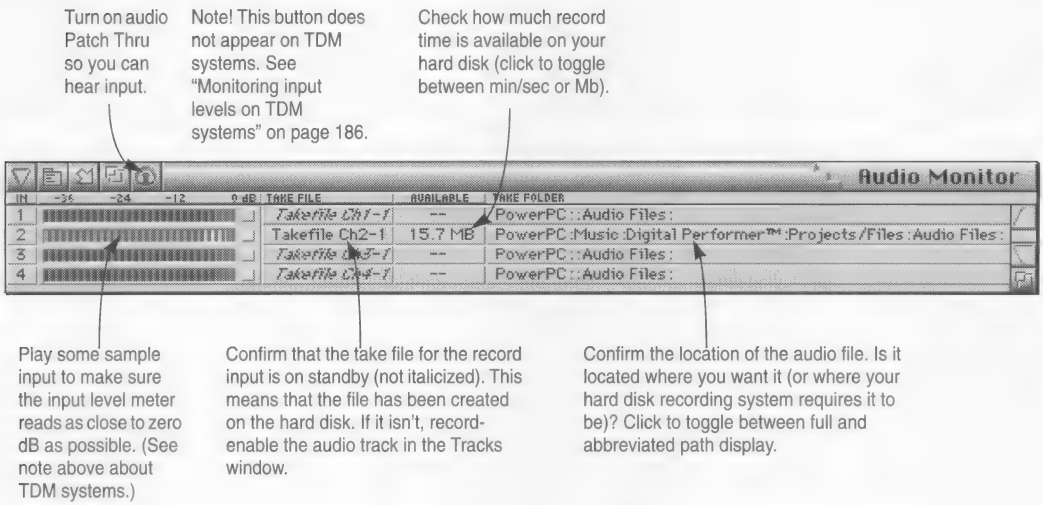


Figure 8-1: The Audio Monitor is an important component of the audio recording process. Always check the settings shown above before recording. In this example, recording is being done on input 2.

Confirm the current record input

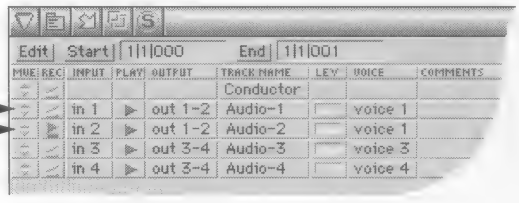
When you record-enable an audio track in the track list as discussed in the previous section, the corresponding takefile in the Audio Monitor switches to plain text (instead of being italicized) as shown in Figure 8-1. This occurs on the audio input currently chosen for the record-enabled track. Plain text indicates that the takefile has been created on disk and that the system is ready to record.

Turn on Audio Patch Thru

Press the Patch Thru button in the title bar of the Audio Monitor as shown in Figure 8-1 if you want to send the input signal to the track's output assignment on your hard disk recording hardware. Doing so allows you to monitor what you are recording. (If you have a TDM system, see "Monitoring input levels on TDM systems" on page 186.) Recording with Patch Thru on overrides any existing audio in tracks assigned to play back on the audio voice assigned to the track being recorded into. For example, if Track A and Track B are both assigned to Voice 1, and you are recording on Track B, Patch Thru will override any audio in Track A.

If Patch Thru is turned **off**, you'll hear audio in this track during recording because it has a higher playback priority.

If Patch Thru is turned **on**, you'll hear audio in this track during recording, regardless of playback priority.

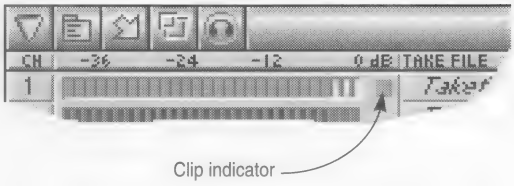


Check the audio input level

Next, adjust the level of the input signal to make sure that it peaks as close to zero dB as possible without clipping.

> ☛ On TDM systems, input monitoring is done in the Mixing Board level meters. For more information, see chapter , "Monitoring input levels on TDM systems" (page 186).

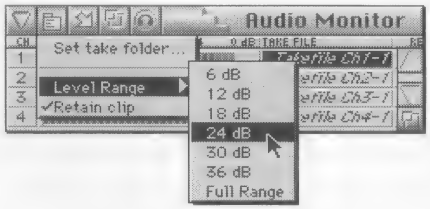
1. **Check Retain Clip in the Audio Monitor mini-menu.**
2. **Play the input signal at its peak levels.**
3. **Watch the level meter and adjust the input so that the peaks occur as close to 0 dB as possible without triggering the Clip indicator shown below.**



Digital clipping is much harsher than analog clipping. Therefore, it's better to err on the low side. Use discretion.

Changing the level meter range (optional)

If the audio level is fairly consistent, and you would like it to provide you with more detailed feedback closer to zero dB, use the Level meter range mini-menu command in the Audio Monitor to adjust the range covered by the level meters.



Check for free hard disk space

Now you are ready to see how much free hard disk space you have in the Audio Monitor, which automatically displays this amount in either minutes or megabytes (click to toggle the display as shown in Figure 8-1). One mono minute of audio takes up approximately 5 megabytes of disk space (at 44.1 kHz). One stereo minute of audio takes up twice that (10 megabytes). Plan your session accordingly. If necessary, you may need to back up and remove audio files left over from other projects from the hard drive. Or you may need to record onto a different hard drive than the currently selected one (see the next two sections).

It's a good idea to give yourself extra space (several megabytes at least) because hard disk fragmentation is more likely to adversely affect audio recording when the hard disk is almost full.

If you are recording multiple tracks at once, you can record them on separate hard drives—as long as your hard disk recording hardware allows this. Check the requirements of your system before attempting to do so. The next section explains how to choose a drive.

Check the location of the current takefile

When Digital Performer records audio, it places the audio data in an audio file on your hard disk and assigns the default name *Takefile* to it followed by an input number and take number for that session. By default, takefiles for an input are located in the same place on your hard disk as the last takefile recorded for that input. For new projects, takefiles are initially located in a folder called Audio Files, which is located in the project folder.

☛ When a SysAxe is installed, Digital Performer automatically puts takefiles in a folder on the SysAxe drive(s).

In a new project, takefiles are placed by default in the Audio Files folder, which is located in the project folder. If you want, you can change the default location of takefiles in your new file template.

The current takefile location is displayed in the Audio Monitor as shown below.

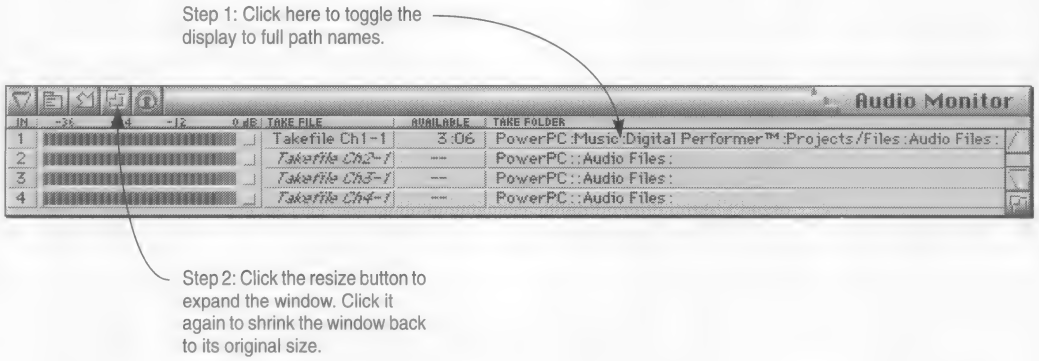
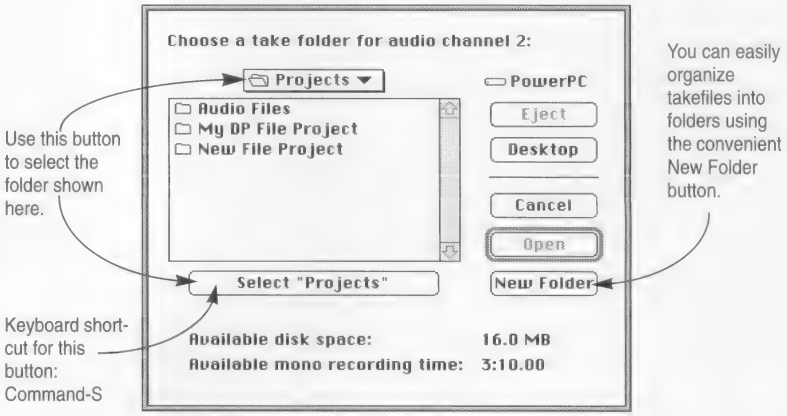


Figure 8-2: To quickly check the full path name, click the current take folder once to toggle to the full path name display, and then click the window resize button to fully expand the window. To shrink the window to its prior size, click the resize button again.

Changing the location of the takefile (optional)

If necessary or desired, you can change the location of the takefile. For example, you might want to organize the audio files in a session by instrument. Or you may need to move the takefile to a hard drive that has a large amount of free space on it.

To change the takefile location, just double-click the takefile name in the Audio Monitor to open a standard Macintosh open dialog box as shown below. Notice that this dialog box includes a New Folder button, which lets you easily organize takefiles into your own folders. Since you can often generate dozens of takefiles during the course of a session, you may want to organize them as you go along. For example, you might want to put all of the vocal takes into a folder called *Vocals*. It helps to do this before you begin recording.



☛ In SysAxe systems, you will not be able to select non-SysAxe hard drives in this dialog box.

Digital Performer automatically keeps track of the audio files associated with the project, regardless of where you store them on your hard disk(s). For more information, see chapter 11, "Audio File Management" (page 109).

Renaming the takefile (optional)

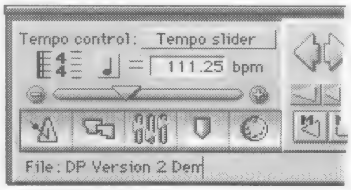
By default, the audio file that you generate when recording is given the name "Takefile" followed by a take number. If you want, you can give it a more appropriate name to better identify it. (Alternately, you could rename it later on after recording.) To set the takefile name before recording:

1. **Option-click the takefile name in the Audio Monitor.**
2. **Type in the desired name.**

3. **Press return to confirm or press command-period to cancel.**

Set the tempo!

It greatly simplifies things if you set the desired tempo of the sequence *before* you record any audio because changing the tempo *after* recording causes audio tracks to fall out of sync with MIDI tracks. To set the tempo, set Digital Performer's tempo slider accordingly, or program a tempo map using the Change Tempo Command in the Change Menu.



Choose the desired tempo control source (tempo slider or conductor track) and then set or program the desired tempo.

As a rule of thumb, it is advisable to program tempos in the Conductor Track using Change Tempo instead of just setting a tempo manually with the tempo slider, because you won't run the risk of changing the tempo slider setting after you've recorded audio, which will throw off the timing between audio and MIDI tracks. If you program the tempo, it is "hard-coded" in the conductor track.

If you get into a situation where you must change the tempo after you have already recorded audio, see "How soundbites are affected when you change the tempo" on page 209.

Begin recording

To begin recording:

1. **Set the Counter to the location in the sequence at which you want to begin recording.**

2. **Click the record button in the main controls.**

   You can use any of Digital Performer's alternate ways of initiating record: press the [3] key on the keypad, or initiate recording via a MIDI remote control. Digital Performer will begin recording.

   ☛ To achieve the fastest response possible when you begin recording, use pause-record. That is, press the pause button first and then record. Digital Performer allocates record buffers as needed and then waits for you to press pause again to begin recording.

During recording, Digital Performer replaces any existing audio, pan, and volume data in the track with the new data being recorded. To merge new data with existing data, use Overdub mode as described later in this chapter.

To stop recording:

- Stop Digital Performer by clicking the Stop button, pressing the space bar, or pressing the [0] key on the keypad.

Digital Performer stops recording and takes a moment to process the audio data.

Each record pass gets placed in the audio track as a single *soundbite*. The soundbite also gets added to the list in the Soundbites window. You can view the soundbite by opening the Event List window or Graphic Editing window of the track.

Using MultiRecord mode to record several audio tracks at once

MultiRecord mode allows you to record into multiple audio tracks simultaneously. It also allows you to record into MIDI tracks at the same time as audio tracks.

The total number of audio tracks you can record into at one time depends on your hard disk recording hardware. For example, an Audiomedia II card provides two inputs. A single Pro Tools card offers four inputs. A core Pro Tools III system provides eight inputs, and so on.

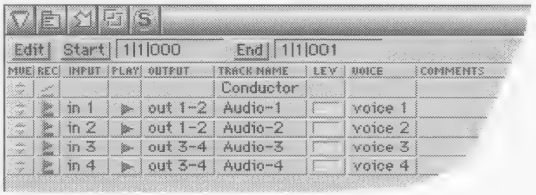


Figure 8-3: A single Pro Tools card allows you to record four inputs at once.

When recording multiple audio inputs at once, you can treat them as separate mono inputs or as left/right stereo pairs. In either case, Digital Performer records each input into a separate track and stores the data on disk as a mono Sound Designer II soundfile.

To prepare for MultiRecord:

1. **Check the MultiRecord mini-menu item in the Tracks window.**

2. **Make sure the audio tracks you want to record into have different input and voice assignments as shown in Figure 8-3 on page 79.**

   In Digital Performer, two tracks with the same voice assignment cannot be record-enabled simultaneously. The same is true for two tracks with the same input assignment.

3. **Record-enable the tracks you want to record into.**

   If the track's record button is missing, the track has become unregistered. See "Re-registering tracks" on page 67.

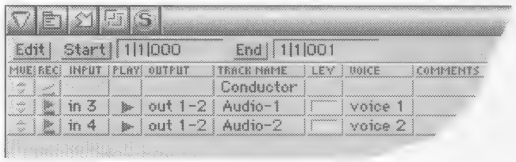


Figure 8-4: A typical track setup for stereo recording.

4. **(Optional) Record-enable as many MIDI tracks as you want.**

   See "Recording audio and MIDI at the same time" on page 81 for more information.

5. **In the Audio Monitor, prepare each input as described earlier in this chapter, paying special attention to the hard disk location of the takefile for each input.**

   Are all inputs being recorded onto the same hard drive? Does your hard disk recording system have special requirements when recording more than one input at a time? Most systems can easily handle two inputs on the same hard disk. Pro Tools can handle four inputs on one disk, as long as it is an officially recommended disk. Systems with more than four inputs usually require that inputs be recorded onto separate disks. Check the documentation for your hard disk recording system for these special requirements.

Recording in stereo

Use MultiRecord to record in stereo as described in the previous section and shown in Figure 8-4 above. To do so, enable MultiRecord mode and set up two audio tracks assigned to separate voices (such as voice 1 and 2). Use the track names to indicate that they are a stereo pair, such as *Vocals/L* and *Vocals/R*. You'll also probably want to place both takefiles into the same folder.

Recording audio and MIDI at the same time

In MultiRecord mode, you can record audio data and MIDI data at the same time. Just record-enable all the tracks that you want to record into. Make sure the input MIDI channel assignments are set properly for the MIDI tracks. For more information about using MultiRecord with MIDI tracks, see "Auto-Record" on page 136 of the MIDI Reference manual.

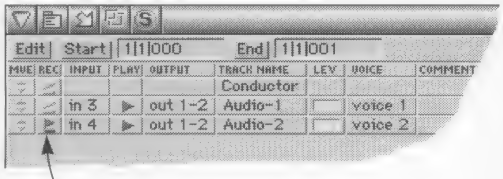
Punching in and out

Digital Performer provides both manual and automatic punch-in, with the following exception: Pro Tools systems with a System Accelerator (SysAxe) do not allow manual punch-in. This system requires that you use auto punch-in as described below.

In all cases, Digital Performer only allows you to punch in once per record pass. This means that you cannot punch in and out multiple times in a single pass. Instead, you have to stop Digital Performer's transports after you punch in the first time and before you can punch in again.

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—before recording actually begins.

To manually punch in, press play and then press the record button in the main transports at the desired time. Press record again to punch out. You can also use the 3 key on the Macintosh extended keypad.



Audio track record-enable buttons *cannot* be used to punch in on the fly. MIDI tracks can, however.

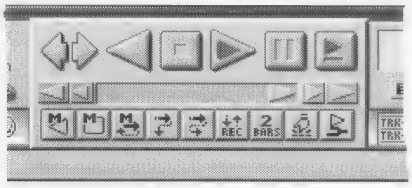


Figure 8-5: To punch in manually, use the record button in the main transports.

To punch in automatically, set up Digital Performer's Auto Record feature in the Consolidated Control panel as shown below in Figure 8-6. For information, see "The Auto Record Bar" on page 82 of the MIDI Sequencing reference manual.

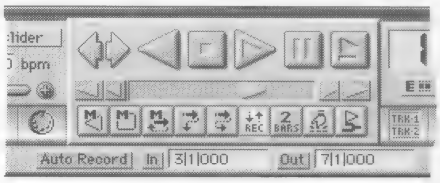
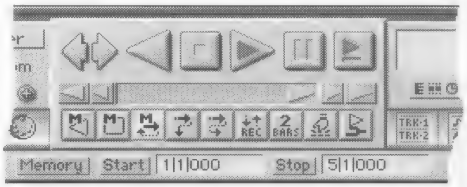


Figure 8-6: Use the Auto Record button in the main transport controls to automate punch-ins on audio tracks. This process works the same as for MIDI tracks.

You *cannot* punch in using the record-enable buttons next to audio tracks in the Tracks window. Instead, you must record-enable the track before you begin playback and then use either the record button in the main transport controls or the Auto Record feature as described above.

Cycle-recording

When cycle recording with the memory shuttle feature, Digital Performer automatically punches out at the end of the cycle if any audio tracks are recording.



Overdub recording

To understand how Overdub Record mode works with audio tracks, consider first how overdub works with MIDI tracks: newly recorded notes are merged with existing notes in the track. Any existing material in the track is left untouched, and the new material is added to it.

Overdub works the same way with audio tracks: newly recorded soundbites are simply "overlaid" on top of the existing ones, leaving existing soundbites in the track untouched.

☛ Note, however, that *the waveforms of each soundbite are not merged.* To merge soundbites together into one soundbite, use the Mix command in the Audio menu.

When the track plays back after overdubbing, it plays one soundbite at a time. Each soundbite takes over playback as it occurs in the track, and keeps playing until it ends or another soundbite begins. See "Overlapping soundbites and track priority" on page 63 for more information about how multiple, overlapping soundbites play back in a track.

How audio is recorded on disk

Digital Performer, Sound Designer II, and other Macintosh-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, play in some music, and the audio signal is encoded digitally in the audio file.

Digital Performer automatically creates a separate audio file for each record take. Every time you press the record button, record some music, and then stop, Digital Performer 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. Digital Performer 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 window.

Getting an error message

Both Digital Performer and the Digidesign Audio Engine (DAE) keep close track of whether or not they had any trouble processing the audio data during recording. If conditions prevent them 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:

- AppleTalk was accidentally left active in the Chooser
- Other background software interruptions (such as FAX modem software, etc.)
- A highly fragmented hard disk
- A hard disk that has an access time that is too slow
- Other interruptions

See chapter 20, "Audio Troubleshooting" (page 225) for more information about how to handle error messages.

Chapter 9 *The Audio Monitor*

The Audio Monitor displays important information about recording for each digital audio input.

Quick reference

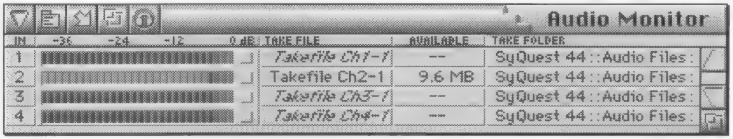


Figure 9-1: The Audio Monitor window.

Input(IN)

The leftmost column in the Audio Monitor indicates each audio input provided by your hardware.

Level meters

The level meters work like a standard VU meter on a mixing console. They indicate the amplitude of audio being recorded on each input. The meters in the Audio Monitor show input levels only. Playback levels are displayed in the level meters in the Mixing Board window. (See "Viewing audio track levels in the Mixing Board" on page 68.) The Level Range mini-menu command allows you to change the range of the meters from 6 dB to 42 dB.

Note! If you have a TDM system, see "Monitoring input levels on TDM systems" on page 186.

Takefiles

The Takefile column displays the name of the audio file that will contain the next portion of audio to be recorded on each input. As soon as you record-enable an audio track, Digital Performer automatically creates an audio file with a temporary name, *Takefile*, followed by an input number and a take number. For example, *Takefile Ch2-15* indicates channel (input) 2, take 15. Here's a brief summary of what you can do with takefile names:

To do this:	Do this to the takefile name:
To rename the takefile	Option-click
To relocate the takefile	Double-click
To select one or more takefiles for mini-menu commands	Click (or shift-click)

Available record time

Displays the total amount of time available for recording on the hard disk where the take file is currently located. Time is displayed in minutes and seconds. Click the value to toggle between minutes:seconds and megabytes (Mb). Option-click to toggle all inputs at once. One minute of audio at 44.1 kHz takes up about 5 Mb of hard disk space.

Take Folder

Displays the current location on disk of the takefile. Click to toggle the display between showing the full path name and the abbreviated path name.

Mini-menu quick reference

Set Take Folder: lets you change the location of the currently selected takefile(s) in the Audio Monitor window. Click, shift-click, or use Select All to highlight the take file names before choosing this command.

Level Range: lets you choose among several different level ranges for the meters in the Audio Monitor, from 6 dB to 42 dB.

Retain Clip: when checked, this command causes the clip indicators to remain lit after clipping has occurred (instead of only remaining lit *as* clipping occurs). Click the clip indicator to turn it off.

Input Level (Audiomedia I or II card only): Lets you set the input level for the Audiomedia card inputs.

Microphone Input (Audiomedia I card only): Enables the Audiomedia card's high-impedance mic input.

Naming a takefile before recording

If you want, you can give the takefile a more appropriate name to better identify it. To set the takefile name before recording:

1. **Option-click the takefile name in the Audio Monitor.**
2. **Type in the desired name.**
3. **Press return to confirm or press command-period to cancel.**

To rename the soundfile after it has been recorded, option-click its name in the Soundbites window.

Changing the location of the takefile before recording

By default, Digital Performer places takefiles into a folder named *Audio Files*, which it automatically creates in the project folder when you first open a new project. If necessary or desired, you can move the takefile to a different disk or folder. For example, your hard disk recording hardware may require that you record on a specific hard drive. Or you may just want to organize your takefiles into folders as

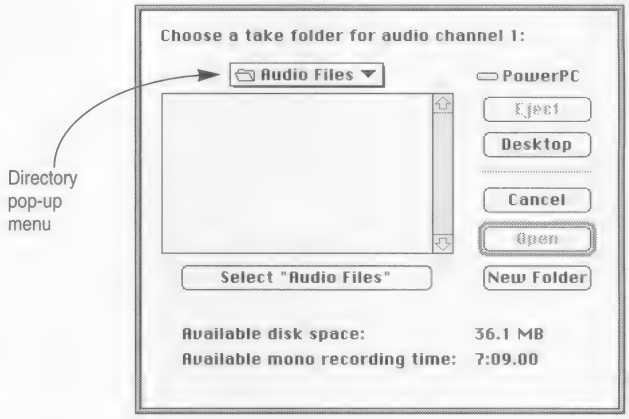
you record them for convenience. Each input can be assigned a different location, allowing you to record into separate folders and even hard drives. For general tips about audio file management, see chapter 11, "Audio File Management" (page 109).

☛ When a SysAxe is installed, Digital Performer automatically locates the current take folder for each takefile on the SysAxe drive(s).

To change the location where a takefile will be recorded:

1. **Double-click the takefile name in the Audio Monitor.**

   Alternately, you can click the takefile name once to highlight it and choose *Set take folder* from the mini-menu. The Change Directory dialog box appears.



2. **If necessary, use the Drive button and directory pop-up menu to navigate to desired folder or location on your hard disk.**
3. **If you want to create a new folder, click New Folder.**
4. **If you want to select an existing folder, click the folder's name in the list to highlight it, and click Select or type command-S.**

Changing the takefile location for several (or all) inputs once

To change the takefile location for all inputs at one time, click and shift-click the takefiles you want to change and then choose *Set Take Folder* from the Audio Monitor mini-menu.

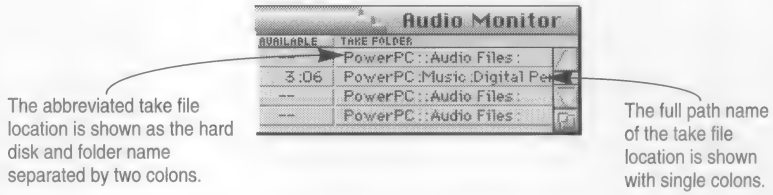
Organizing audio files into folders as you go

Use this capability to organize your audio files. For example, let's say you're currently adding the following to a sequence: backup vocals on input 1 and acoustic guitar on input 2. And you know you will be recording at least several takes for each part, thus creating several audio files for each.

In this situation, you might find it handy to place the vocal takes into one folder and guitar takes (record files) into another so that you don't get the vocal audio files mixed up with the guitar audio files. (It isn't absolutely necessary to separate record files like this, but the more takes you record, the easier it will be to sort through them later on if necessary.)

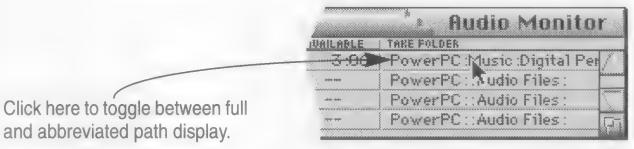
Checking the current takefile location

The current location of the takefile for each input is shown in the *Take Folder* column in the Audio Monitor as shown below.

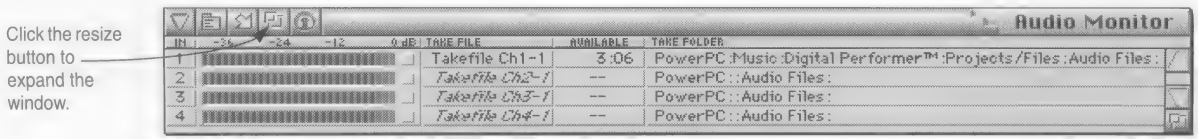


To view the full path to the takefile's location:

1. **Click the take folder location as shown below.**



2. **Click the window's resize button in the title bar to expand the window so you can see the full path name.**



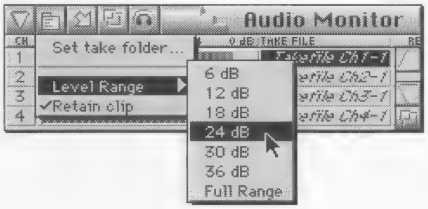
3. **Click the resize button again to return the window to is original size and position.**

Remembering takefile locations

Digital Performer remembers the takefile location settings when you save the file so that it will remember to put takefiles in the same folder the next time you record. If you like, you can save takefile locations in your new template file using the Save As New Template command.

Adjusting the level meter range

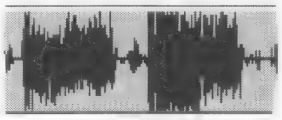
By default, the level meters have a full range from -42 dB to zero dB (clip). The Level Range mini-menu command lets you adjust the range to as small as 6 dB. Just choose the desired range from the menu. You can even change it during recording. For a signal with a wide dynamic range, use a larger value; for a signal with a fairly consistent and narrow dynamic range, use a smaller value and record it as close to zero as possible. But be sure not to clip. (See the next section.)



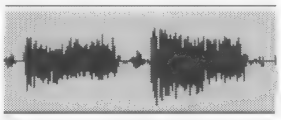
☛ The Level Range setting here in the Audio Monitor also controls the dynamic range of the output level meters in the Mixing Board window.

Using the clip indicator to avoid clipping

Each sample in a digital audio signal is expressed as a number within a certain range. (In 16-bit audio, the value of each sample is expressed as a binary number containing 16 bits, which provides a range of over sixty five thousand values.) If the level of audio being recorded or played back exceeds the range that can be expressed, the result is *clipping*. Those portions of the audio waveform that exceed the maximum value of the dynamic range get cut off at the maximum value that can be expressed. This causes the top of the waveform to get chopped off, giving it a shape more like a square wave, as shown below. The clipped audio signal on the left will sound distorted:

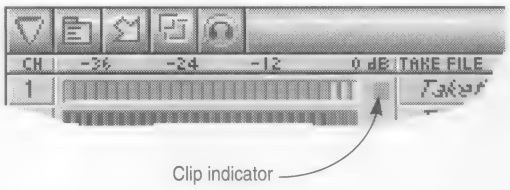


Clipped



Not Clipped

When clipping occurs, the level meter's clip indicator will light up as shown below:



Retain clip

If Retain Clip is checked in the Audio Monitor mini-menu, the clip indicator lights up at the first occurrence of clipping and remains lit as a reminder that clipping has occurred. To clear the clip indicator, click it. This is a convenient way to keep track of clipping without having to stare continuously at the meter.

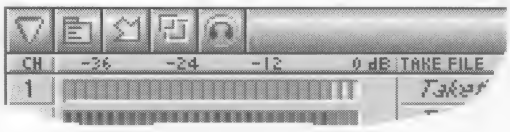
> ☛ The Retain Clip setting here in the Audio Monitor also affects the clip indicators of the output level meters in the Mixing Board window.

Clearing the clip indicators

Click an indicator to clear it. Double-click it to clear all indicators.

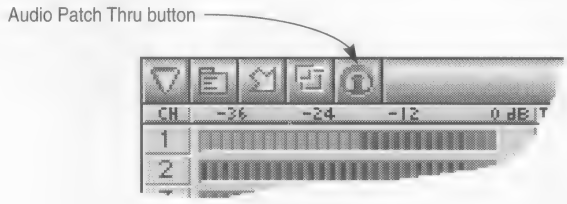
Setting the input level

When recording, get as high a level as possible without any clipping. Before you record, always sample the entire range of the audio input you will be recording and adjust the input level accordingly. Ideally, the loudest part of the signal should peak just below zero dB (when the meter is all the way up without the clip light). Digital clipping is harsh, with virtually no headroom, so try to avoid it as much as possible.



Audio Patch thru

When the Audio Patch Thru button is enabled in the Audio Monitor mini-menu title bar, audio received on a record-enabled audio input is echoed to the hardware's audio outputs so that the signal can be monitored from the recording hardware's outputs.



☛ The Audio Patch Thru button in the title bar of the Audio Monitor window does not appear when TDM hardware is present. For details, see "Monitoring input levels on TDM systems" on page 186.

If you do not need to monitor the incoming audio via the outputs of the audio hardware's outputs, disable Audio Patch Thru.

Adjusting the input level for Audiomedia I and II

The *Input Level* command appears in the Audio Monitor mini-menu when you have an Audiomedia I or II card in your system. This command lets you set the input level for the Audiomedia card inputs.

Enabling the mic input for Audiomedia I

The *Microphone Input* command appears in the Audio Monitor mini-menu when you have an Audiomedia I card in your system. This command enables the Audiomedia card's high-impedance mic input.

Chapter 10 *The Soundbites Window*

This chapter assumes that you are familiar with terms like *audio file*, *region, soundbite, playlist, Sound Designer II file*, and *audio track*. If you aren't familiar with these terms, review chapter 6, "Hard Disk Recording Basics" (page 47).

As you work with Digital Performer, you'll create many soundbites. The soundbites window helps you manage them. Think of the Soundbites window 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 keep the ones you want and throw away the ones you don't.

Quick Reference

Move Handle
Drag up or down to reposition the soundbite in the list. Also use it to drag and drop the soundbite into the Tracks overview, event list, or graphic editing windows. Command-drag to make it "snap" to the end of the previous soundbite in the track.

Duration
Indicates the length of the soundbite in minutes, seconds, and hundredths of a second. Durations can be expressed in SMPTE and real time when soundbites are displayed in an event list.

Channels
Indicates the number of audio channels needed to play back the soundbite. For example, a stereo soundbite, which contains separate left and right channel signals, requires two channels.

This icon means that Digital Performer 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.

This icon means that Digital Performer cannot currently play the soundbite for some reason. For example, it may be located on a hard disk that isn't supported by your hard disk recording hardware.

Sample Rate
Indicates the rate in samples per second at which the audio data making up the soundbite was sampled.

Soundbite Name
Displays the name of the soundbite (region). Click the name to select it. To hear it play back, turn on Audible Mode in the title bar and then click it. Option-click to pop-edit the name. Double-click the name to edit the soundbite in a separate waveform editor program such as Sound Designer II.

Audio File
This is the name of the audio file that contains the soundbite. Audio files can have one of the following formats: Sound Designer, Sound Designer II, or Audio IFF. Double-click to replace or relocate the soundbite. Option-click to change the name of the audio file. Click it to show the full path name.

Mini-menu

Add Soundbite: Opens a dialog box that allows you to audition and load audio files, soundbites (regions), and playlists (a sequence of regions).

Sort by name: Reorders the soundbites alphabetically by their names.

Sort by size: Reorders the soundbites in the list by their size on disk. The shortest one appears at the top of the list and the longest at the bottom.

Sort by soundfile: Reorders the soundbites by the names of their parent audio files, with the audio files listed alphabetically.

Select unused soundbites: Highlights all soundbites in the list that are not currently being used in any tracks in any sequence in the file. Once highlighted, these soundbites can be removed from the list with the Delete command.

Compact: Caution! Unlike Delete, this command actually removes audio data from the hard disk. It cannot be undone. Compact removes all portions of the parent audio file of the currently selected soundbite(s) 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.

Remove from list: Deletes the soundbite from the Soundbites window list without deleting its corresponding region in the audio file region list.

Delete: Removes the selected soundbites from the list. This command does not delete audio data on the hard disk. It removes Performer's reference to the data from the Soundbites window. If the soundbite is the last one in the parent audio file to be deleted, Performer asks if you would like to delete the parent audio file entirely.

Recording soundbites in Digital Performer

A new soundbite is created in Digital Performer 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 Soundbites window.

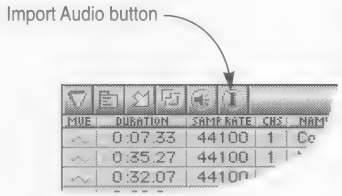
Generating soundbites while editing

Soundbites can also be created in Digital Performer with soundbite editing commands like Trim, Split, and Strip Silence. 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 Soundbites window.

Importing soundbites, playlists, audio files

Soundbites (audio regions), playlists and audio files can be imported into Digital Performer from existing audio files. For example, if you created a Sound Designer II file that contains regions, you can load the regions into Digital Performer. In Digital Performer, regions appear as soundbites in the Soundbites window. Once imported, soundbites can be placed into audio tracks.



To import a soundbite from an audio file:

1. **Choose Add Soundbite from the Soundbites window mini-menu, or press the Import Audio button in the title bar.**

   The standard import audio dialog box appears.

2. **Select the desired soundbite(s) as shown below.**

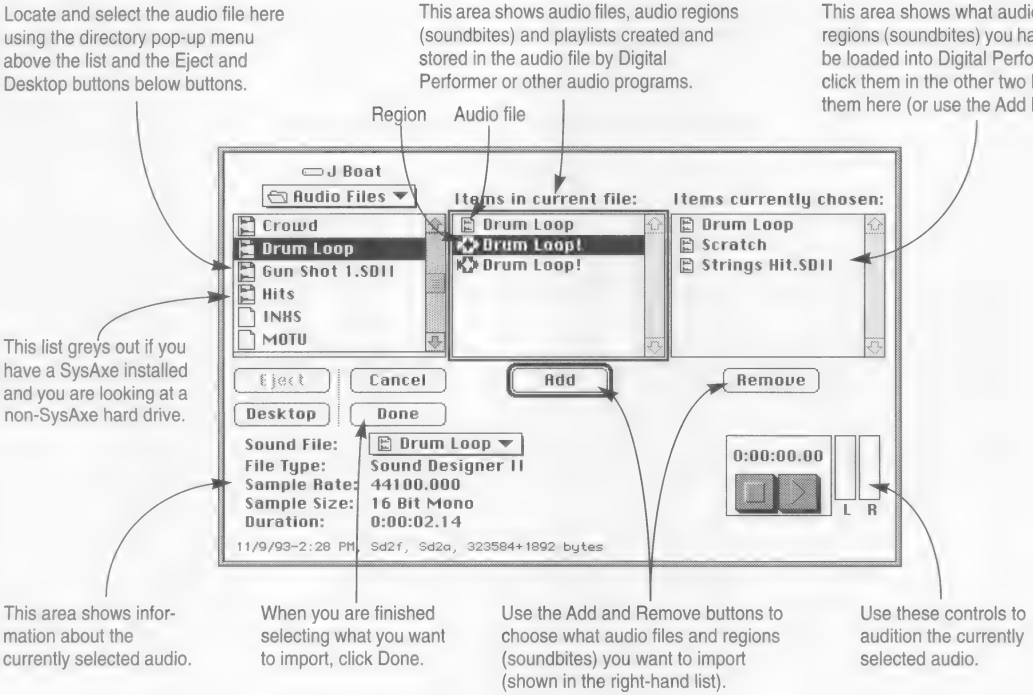


Figure 10-1: Importing audio into Digital Performer.

The imported audio files or regions appear at the bottom of the list in the Soundbites window. The soundbite's parent audio file is listed on the right. If the soundbite already exists in the list, it will not be loaded twice. You can insert the imported audio at any location in Digital Performer audio tracks.

Importing a playlist

Some audio editing programs, such as Sound Designer II, allow you to build *playlists*. A playlist is series of regions placed edge to edge in a particular order for playback. Since the regions within the playlist are merely pointers to the audio data in the audio file, you can arrange them with great flexibility *without altering the original audio data*. For example, you could record 4 bars of music and then define a handful of regions consisting of single measures and even single beats. You could then arrange them in a playlist in various combinations, mixing and repeating them in a musical fashion to generate a playlist that lasts for several minutes—all with only 5 seconds of music.

Like regions, playlists are stored in the audio file, along with the audio data, and they can be imported into Digital Performer just like audio regions. Please note, however, that Digital Performer does not load playlist cross-fades.

To import a playlist, use the same procedure as described in "Importing soundbites, playlists, audio files" on page 95. The playlist appears as an audio track in the Tracks window with the same name as the playlists. The regions making up the playlist get added to the Soundbites window list.

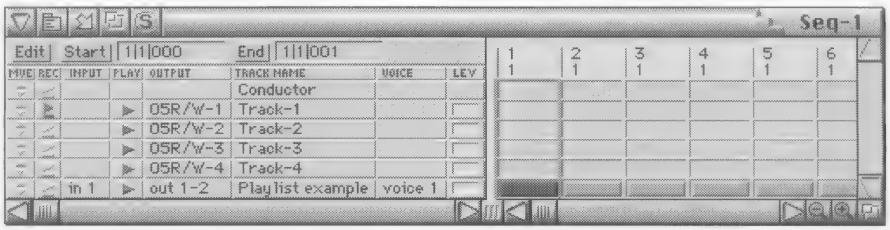


Figure 10-2: A playlist imported into Digital Performer appears as an audio track that contains all of the constituent soundbites (regions) in the playlist. In addition, all regions in the playlists are added to the list in the Soundbites window.

Importing an entire audio file

An entire audio file can be imported using the procedure described in "Importing soundbites, playlists, audio files" on page 95. Just select the audio file name, which is displayed with the audio file icon as shown below, and click Add:

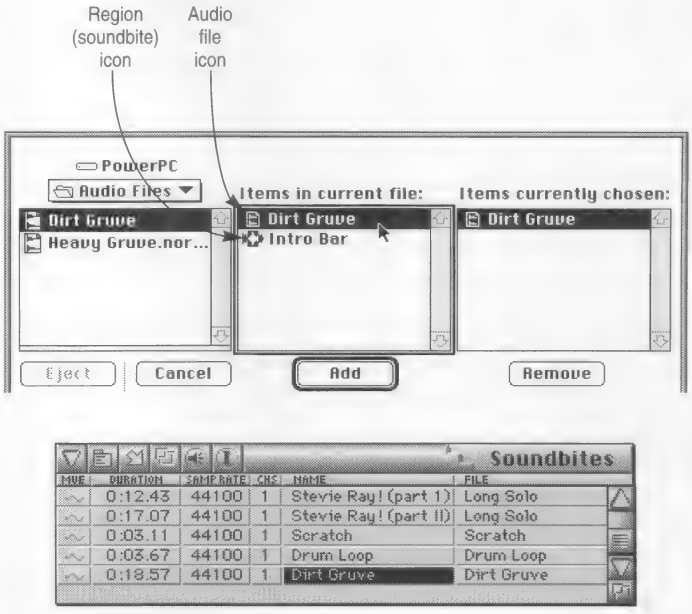


Figure 10-3: An audio file that has been imported into Digital Performer appears as a soundbite with its matching audio file name listed on the right.

Loading soundbites from other Digital Performer files

You may encounter a situation in which you have created soundbites in another Digital Performer file and you would like to work with them in the current Digital Performer file. To load soundbites from another Digital Performer file:

1. **Choose Load from the File menu.**

   The standard Macintosh Open dialog box appears.

2. **Open the file that contains the soundbites you wish to load.**

   Digital Performer's Load dialog box appears.

3. **Click the Load soundbites option.**

4. **Click any other items you wish to load and click OK.**

Converting soundbites that cannot be played

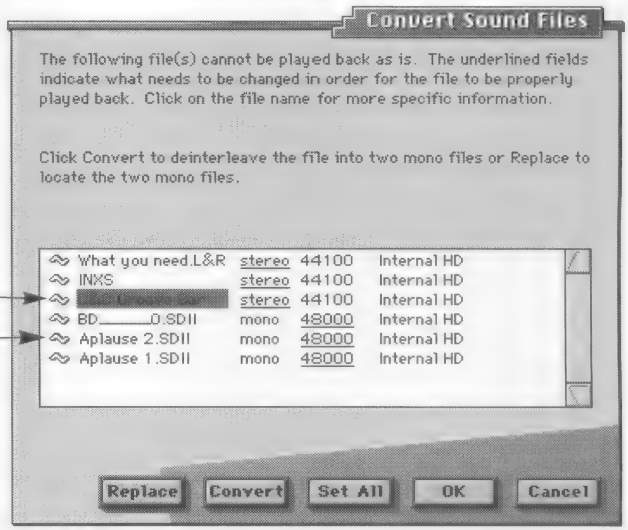
When you import soundbites into Digital Performer, it may be the case that they cannot be played properly. The most common causes for this are:

- The imported audio's sample rate does not match the playback sample rate currently chosen in the Configure Hardware dialog box, which means that the audio will play back at the wrong speed.
- The audio is an interleaved stereo audio file (DAE cannot currently play interleaved stereo audio files).
- You have a SysAxe system and the audio file is currently located on a hard drive other than the SysAxe drive, which means that the SysAxe cannot play it.

In any of these cases, Digital Performer presents the Convert Sound Files dialog box shown below:

To de-interleave a stereo audio file, click its name to highlight it (shift-click to select several) and click Convert.

To convert the sample rate of an audio file, you have to do so in another program such as Sound Designer II.



This dialog box shows which audio files cannot be played, and it underlines the reason why, as shown above. In the case of stereo soundbites, Digital Performer allows you to highlight them in the list and then click Convert to generate two separate mono soundfiles. The original stereo audio file is preserved. Click Replace to locate the two mono files corresponding to the left and right channels of the stereo file.

For SysAxe systems, soundbites located on non-SysAxe drives must be moved or copied to the SysAxe drive from the Finder.

To convert the sample rate of a file, use a program like Sound Designer II.

Managing soundbites

As you work with Digital Performer, you'll create many soundbites. The Soundbites window helps you manage them. Think of the Soundbites window 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 Soundbites window mini-menu provides several ways for you to list soundbites: alphabetically, by parent audio file, and by size. For example, if you would like to see all of the soundbites that belong to a particular audio file, choose Sort by audio file. All soundbites belonging to an audio file will be listed together. Or, if you need to see which soundbites are largest, sort by size.

When you choose one of these options, the soundbites in the list get re-ordered accordingly. Keep in mind, however, that re-ordering does not continue automatically. New soundbites are always added at the bottom of the list. In addition, soundbites that you re-order by dragging remain so until you choose one of these commands. Choose one of the sort by options to re-establish the ordering that you wish.

Sorting by audio file

Use the Sort by audio file option in conjunction with the other two options. The *sort by audio file* command lists audio files alphabetically, and groups together all soundbites from a particular audio file. For example, all the soundbites from audio file A would be listed at the top, followed by soundbites from audio file B, and so on.

Once grouped by audio file, the order depends on what it was in the list before you chose sort by audio file.

If you want soundbites within each audio file listed alphabetically:

1. **Choose Sort by name first.**
2. **Then choose Sort by audio file.**

If you want soundbites within each audio file listed by size:

1. **Choose Sort by size first.**
2. **Then choose Sort by audio file.**

Auditioning soundbites with Audible Mode

There are two ways to audition (play back) a soundbite in the Soundbites window:

1. **Click the Audible mode icon so that it is highlighted.**
2. **Click the name of the soundbite you wish to hear.**

3. **To stop playback, wait for the soundbite to finish playing, or click the mouse.**

Alternately, you can do the following, regardless of whether the Audible mode button is highlighted or not:

1. **Highlight the name of the soundbite you wish to hear.**
2. **Option-click the Audible Mode button.**
3. **To stop playback, wait for the soundbite to finish playing, or click the mouse.**

Renaming a soundbite

To rename a soundbite in the soundbites window, option-click its name.

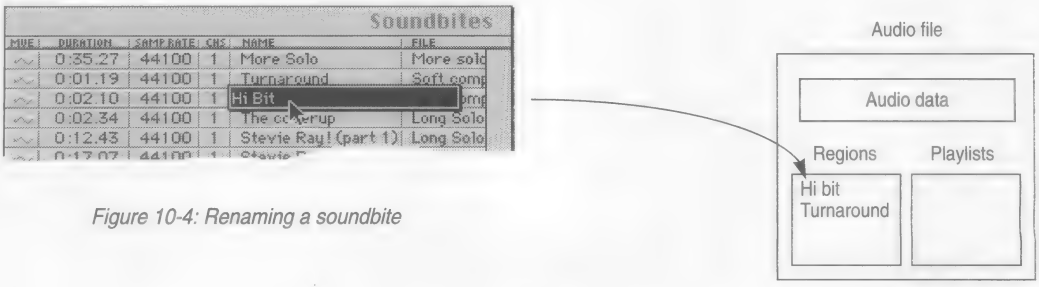


Figure 10-4: Renaming a soundbite

When you change the name of a soundbite, Digital Performer updates the name of the corresponding region in the audio file. For example, if you use the Split command to create a new soundbite, it appears in the Soundbites window with a name like *Soundbite.3*. Digital Performer adds a new region to the audio file region list called *Soundbite.3* as well. At this point, if you open the audio file with

Sound Designer II, you would see *Soundbite.3* in the region list. If you change the name of *Soundbite.3* to *Low whistle* in Digital Performer's Soundbites window, Digital Performer updates the name of *Soundbite.3* to *Low whistle* in the audio file region list as well.

Lost soundbites

At times, Digital Performer may lose track of the location of an audio file. For example, the audio file may have been dragged to the trash since the Digital Performer 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, Digital Performer displays the move handle of the soundbite with a question mark as shown below:

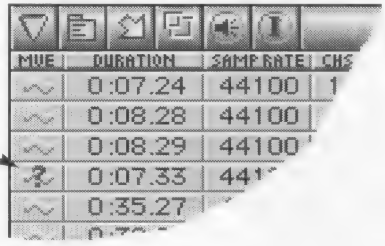


Figure 10-5: Digital Performer displays this icon when it does not currently know the location of the audio file containing the

Finding lost soundbites

If Digital Performer does not know the location of a soundbite as shown in Figure 10-5, you can remind Digital Performer where it is using the Replace Soundbite command in the Audio menu. Click the name of the soundbite to highlight it and choose Replace Soundbite from the Audio menu. Use the Replace Soundbite window to relocate the audio file. For more information, see "Replace Soundbite" on page 172.

Soundbites that cannot be played

Some hard disk recording systems, such as Pro Tools with a System Accelerator or Session 8, require audio files to be located on a particular hard drive. If an audio file is not located on the necessary drive, DAE cannot play it back. In this case, Digital Performer displays an "X" icon as shown below:

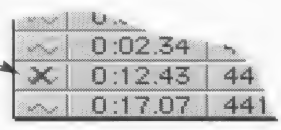


Figure 10-6: Digital Performer displays this icon when it cannot play back the soundbite for some reason.

To make the soundbite playable, move the soundbite's parent audio file (its name is displayed to the right of the soundbite in the Soundbites window) to the appropriate hard drive by dragging it in the Finder. If you aren't sure which hard drive to drag it to, check your hard disk recording system's documentation. Don't worry about

Digital Performer losing track of the audio file: Digital Performer uses System 7's alias manager to keep track of audio files regardless of where you drag them.

> ☛ IMPORTANT: If you copy an entire project to another volume and don't delete the original, then when you open the copied project file, it will still be using the original audio files, not the copied audio files in the copied project folder. System 7 aliases do too good of a job keeping track of audio files and will continue to use the originals. Use the "Replace Soundbite" command to relocate your audio file sources. See "Replace Soundbite" on page 172.

In some rare cases, you might see this icon even when the audio file is already located in the correct location. If so, try reconfiguring the hardware with the Configure Hardware command in the audio menu. Also check available memory for Digital Performer and DAE.

Selecting unused soundbites

While you work with Digital Performer, 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. Once highlighted, 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 Soundbites window mini-menu. All soundbites that are not being used in a track become highlighted in the Soundbites window list.

Deleting soundbites

The Delete command in the Soundbites window mini-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 10-7 below (unless the region is being used as part of a playlist in the audio file).

Note that the Delete command does not remove the actual audio data. It simply removes the region and its pointers, which are merely a reference to the audio data in the file. To delete the audio data itself, you need to use the Compact command. See "Compacting audio files" on page 113. If you do not want Performer to remove the region from the audio file region list (because it is used in another Performer file, for example), use the *Remove from list* command described in the next section.

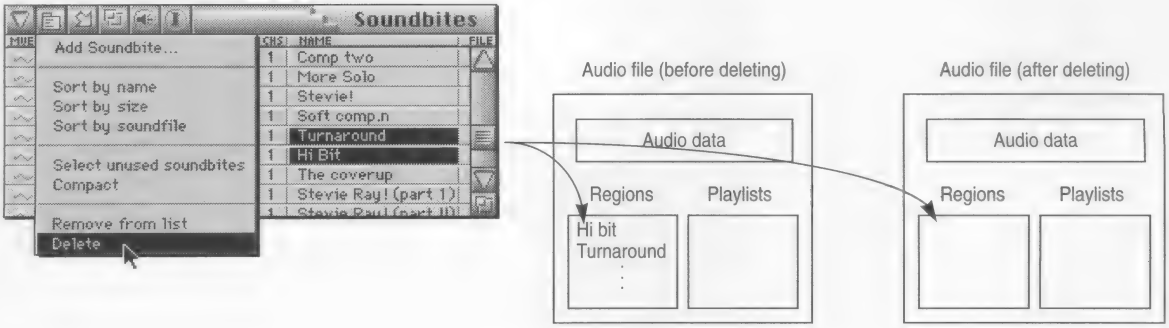


Figure 10-7: Deleting soundbites removes their corresponding region in the audio file. Just the region and its pointers are removed; not the actual audio data.

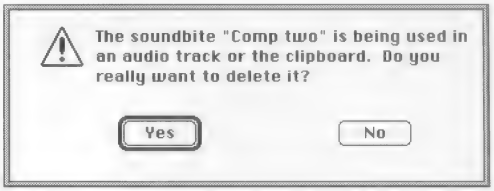
To delete one or more soundbites:

1. **Select the soundbite by clicking its name. Shift-click or drag to select multiple soundbites.**

   Alternately, you can use the Select unused soundbites command in the Soundbites window mini-menu (described in the previous section).

2. **Choose Delete from the Soundbites window mini-menu.**

   If the soundbite is being used in a track, Performer presents a warning box as shown below. As a shortcut, hold down the option key while choosing Delete from the mini-menu to bypass the warning dialog.



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 10-7 on page 103. For example, the region might be part of a sequence in another Digital Performer file. In this situation, use the *Remove from list* command.

Once 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. (See "Importing soundbites, playlists, audio files" on page 95.) Also, when using this command, keep in mind that you cannot compact the audio data in the region with the compact command without first importing it and then deleting the soundbite. (See "Compacting audio files" on page 113 for more information.)

To remove a soundbite from the Soundbite window list without deleting its corresponding region from the audio file region list:

1. **Select the soundbite by clicking its name. Shift-click or drag to select multiple soundbites.**

   Alternately, you can use the Select unused soundbites command in the mini-menu.

2. **Choose Remove from list from the Soundbites window mini-menu.**

   If the soundbite is being used in a track, Performer presents a warning box. Click yes if you still want to remove it; click no to cancel the command.

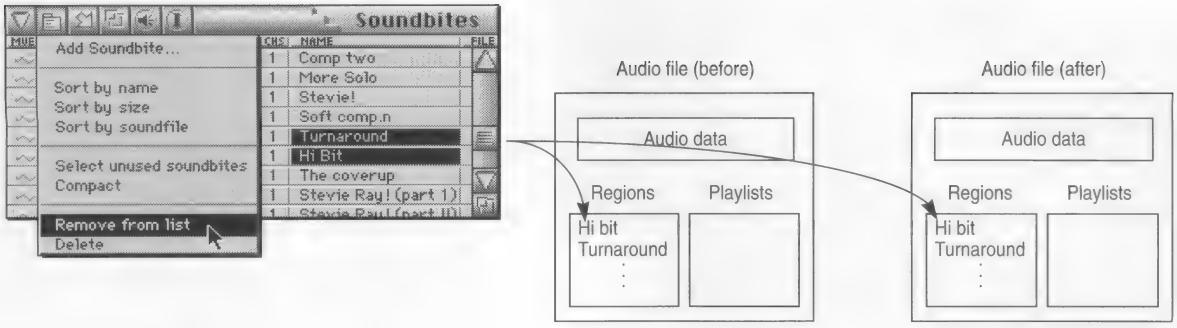
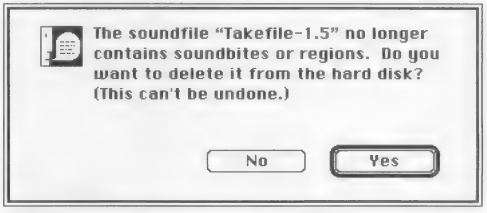


Figure 10-8: The Remove from list command leaves the region list in the audio file untouched. You can re-import the soundbites later, if desired.

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, Digital Performer asks you if you wish to completely remove (delete) the audio file from the hard disk:



Remember, Digital Performer 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, Digital Performer won't allow you to accidentally delete it.

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 in the Finder.

A shortcut for deleting audio files

If you are absolutely sure that you don't need a file anymore, you can bypass warning dialog boxes by holding down the option key while you choose Delete from the mini-menu. Digital Performer proceeds as if you answer Yes to both warning boxes.

Getting rid of unused soundbites after a session

After a recording session with Digital Performer, 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 Soundbites window mini-menu.**

   This highlights all soundbites that are not being used in a track.

2. **Hold down the option key and choose Delete from the Soundbites window mini-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 Soundbites window mini-menu deletes portions of an audio file that are not part of a soundbite and then closes the gaps between the leftover regions. This is one of the few ways to destructively edit audio data from within Digital Performer. For more information, see "Compacting audio files" on page 113.

Dragging and dropping soundbites

You can "drag and drop" soundbites into the Tracks window overview, event lists, and graphic editing windows. To do so, grab the move handle of the soundbite as shown below in Figure 10-9 and drop it on top of the desired window's data region.

In the Tracks overview the soundbite is placed at the beginning of the grid segment you drop it into. If you hold down the command key while dragging, the soundbite will "snap" to the end of the previous soundbite from the drop point or to the beginning of the track.

In the graphic editing window, the soundbite is placed where the cursor is located when you drop. If you hold down the command 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 from the soundbites window" on page 137.

In an event list, the soundbite is placed end-to-end with the last soundbite at the bottom of the list. For more information, see "Dragging soundbites into the event list from the Soundbites window" on page 121.

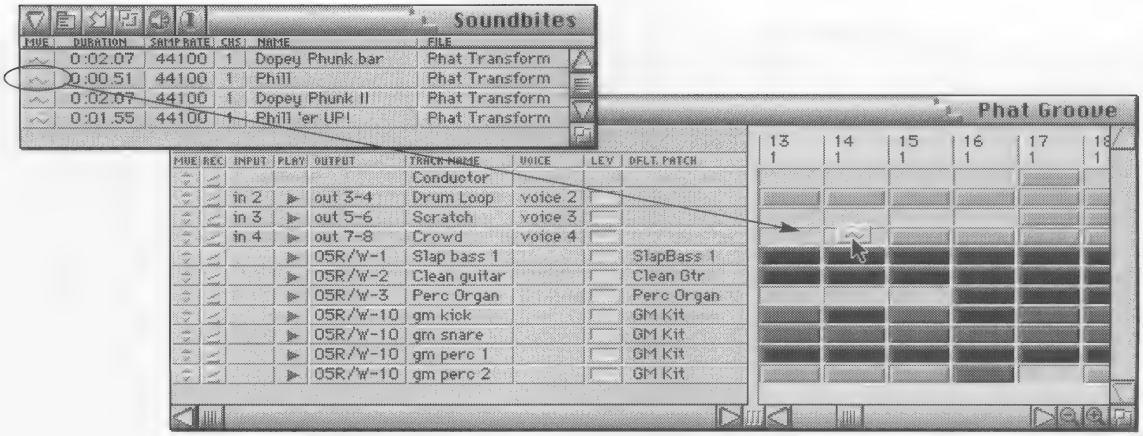


Figure 10-9: Dragging and dropping Soundbites into the Tracks window track overview. Soundbites can also be dropped into graphic editing windows and event lists.

More about soundbites...

There are several other commands that affect soundbites.

Reload Soundbite

Reload Soundbite updates a soundbite to match its corresponding region in the audio file. For example, if you tweak the pointers (boundaries) of a region in an audio file, the Reload Soundbite command loads those new boundaries into the soundbite. This command is useful after using the *Edit in Waveform Editor* command (see below). For more information, see "Reload Soundbite" on page 168.

Replace Soundbite

Replace Soundbite replaces a soundbite with a completely different region. For example, if you have inserted a soundbite called *Riff* in many places throughout your sequence, but later you record a better-sounding riff, you can quickly replace the old one with the new one using Replace Soundbite. For more information, see "Replace Soundbite" on page 172.

Edit in Waveform Editor

Edit in Waveform Editor switches you directly into waveform editing software such as Sound Designer II to edit the soundbite using their powerful sample editing features. Once there, you can edit the sound data itself, such as edit the waveform with a pencil tool or apply digital signal processing. For more information, see "Edit in Waveform Editor" on page 174.

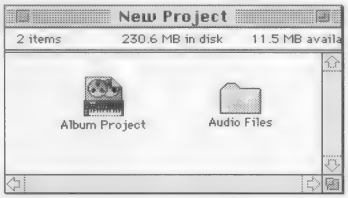
Chapter 11 *Audio File Management*

This chapter tells you:

- Where audio files are stored on disk
- How manage the audio files associated with a Digital Performer project
- How to get rid of unused audio
- How to reclaim hard disk space using the Compact command

The Project Folder

When you first create a new file, Digital Performer sets up Project folder in which it places your new Digital Performer file, as well as an empty folder titled Audio Files. As you record, Digital Performer places all of the audio files into the Audio Folder, unless you tell it to put them elsewhere before you record. (See "Changing the location of the takefile (optional)" on page 77.)



In future versions of Digital Performer, the Project folder will likely store additional documents related to the project.

The Audio Files folder

The Audio Files folder keeps track of all of the audio files for a Digital Performer project. In a new project, takefiles are initially located in the Audio Files folder by default. You can record an entire Digital Performer session without concern for the location of the audio files you record because Digital Performer 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. Or you might

want to record audio on another hard drive that has much more free space on it. (See "Changing the location of the takefile (optional)" on page 77.)

Aliases in the Audio Files folder

When you record, import, or move audio files to a location other than the project's Audio Files folder, Digital Performer automatically creates Finder *aliases* for them in the Audio Files folder. An alias is an icon that is a reference to its original, "parent" file. Aliases are very small. If you use the Finder's *Get Info* command on them, they have a *Find Original* button that lets you easily locate their parent file. Aliases help you keep track of the audio files associated with the project.

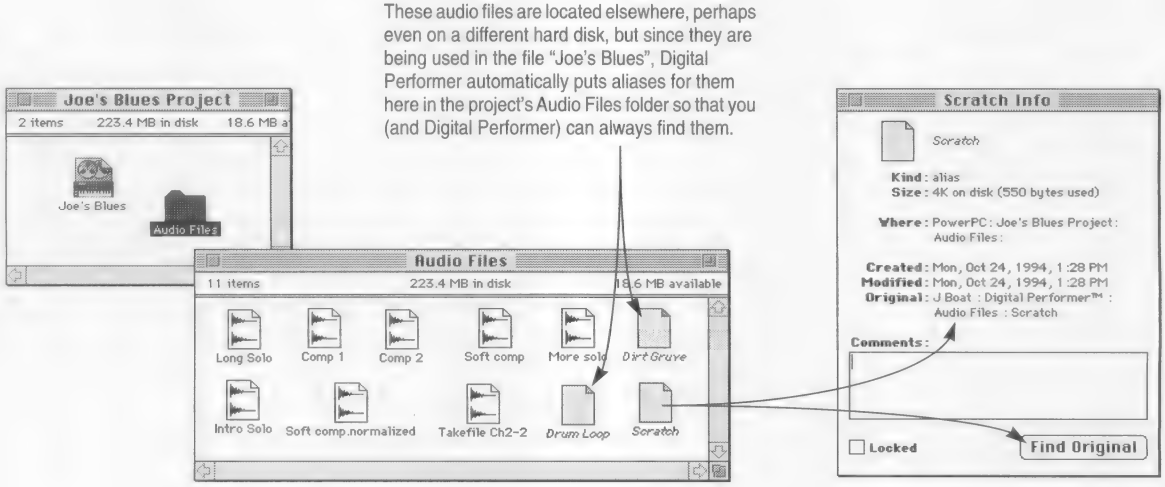


Figure 11-1: Aliases in the Audio Files folder for audio files that are located at other locations.

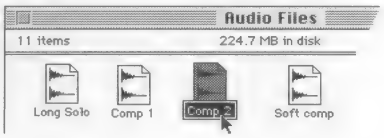
Here are a few examples of how an audio file alias gets created in the Audio File Folder:

- Using the Audio Monitor window, you move a takefile to a different hard disk before recording into it. An alias is placed in the Audio Files Folder after recording.
- Using the Soundbites window, you import a soundbite from another folder on the hard disk. The audio file remains in its original location, and Digital Performer places an alias for it in the Audio Files folder for the project.

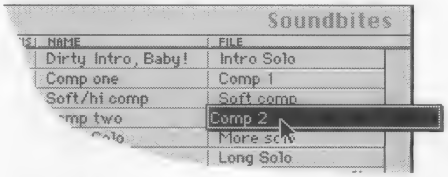
- In the Finder, you drag an audio file out of the Audio Files folder and place it in another location (perhaps even on a different hard disk). Digital Performer makes note of the new location and generates an alias in the Audio Files folder for the project.

Renaming audio files

You can rename audio files at any time by editing the file name in the Finder or by option-clicking its name in the Soundbites window. In either case, Digital Performer automatically updates the name in the other location so that they always match.



Edit the name in the Finder or...



...option-click the audio file name in the Soundbites window.

Moving audio files

As explained earlier in "Aliases in the Audio Files folder" on page 110, you can freely move audio files to any location you want and Digital Performer will automatically keep track of them using aliases in the Audio Files folder. You can even place them on a different hard drive.

If you copy a file onto another volume and delete the original, Digital Performer will *not* know about it and will ask you to find it.

Copying entire projects to another hard disk location

If you copy an entire project to another volume and don't delete the original, then when you open the copied project file, it will still be using the original audio files, not the copied audio files in the copied project folder. System 7 aliases do too good of a job keeping track of audio files and will continue to use the originals. In this case, you need to sever the connection with the original audio files and establish a new connection with newly copied files. See "Reloading all soundbites in an audio file at one time" on page 171.

Deleting audio files

You can delete audio files by dragging them into the trash in the Finder. 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 Digital performer's Soundbites window. Open the Digital Performer file associated with the audio file (or import its soundbites into Digital Performer) and do the following:

1. **Choose Sort by Soundfile from the mini-menu.**

   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 title bar) 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 key when selecting the *Delete* mini-menu command to bypass the warning dialog.

Getting rid of unused audio

Digital Performer 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 a command 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 102.)

Once highlighted, you can delete the soundbites by choosing Delete from the mini-menu.

Compacting audio files

After a recording session, you should 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 that deletes portions of an audio file that are not part of a soundbite and then closes the gaps between the leftover regions.

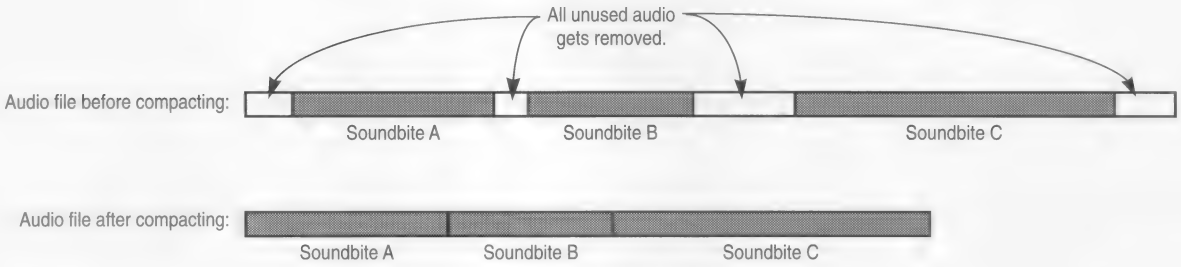


Figure 11-2: Compacting removes all audio data that doesn't fall within an existing region. Depending on how much unused audio gets removed, this process can free up large amounts of space on the hard disk.

As shown in Figure 11-2 above, 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, Digital Performer removes the soundbite's corresponding region in the audio file's region list (see

"Deleting soundbites" on page 103), 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 Digital Performer 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 Digital Performer or other sample editing software such as Sound Designer II. Digital Performer does not delete any regions in the audio file, even if they are not used in the currently open Digital Performer 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.**

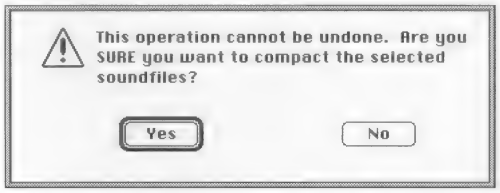
   If necessary, you can audition ones that you aren't sure about using Audible mode. To delete the soundbite, highlight its name and choose Delete from the mini-menu. *Don't use the Remove from list command—it will not remove the regions from their audio files.*

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-A).

4. **Choose Compact from the Soundbites window mini-menu.**

   A warning box asks you if you are sure you want to compact, since deleted data cannot be recovered. The compacting operation may take some time.



5. **Click Yes.**

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 Digital Performer's Soundbites window. This situation can arise if:

- the region wasn't created in the current Digital Performer 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.

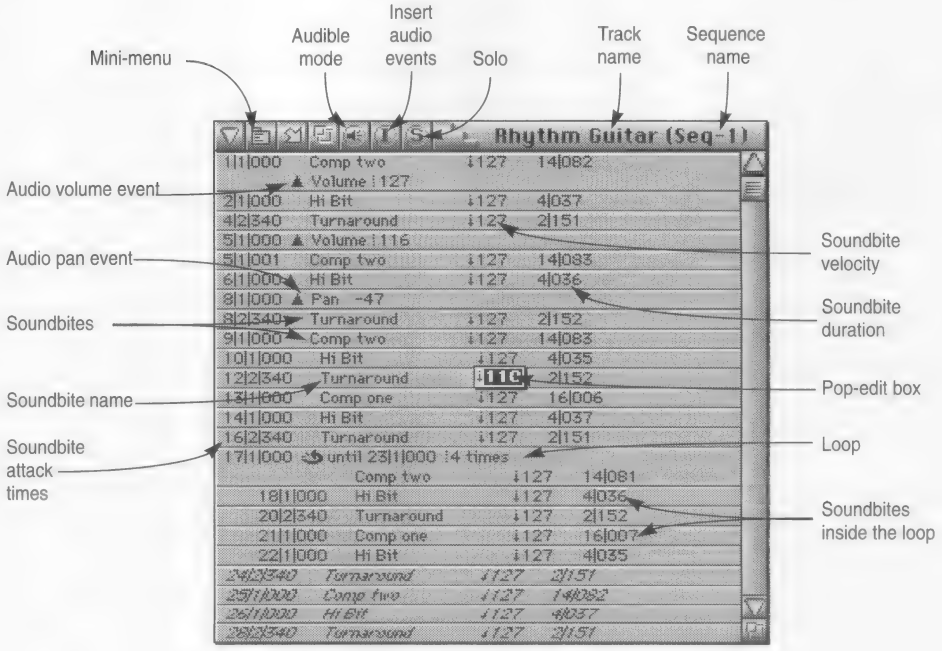
The first case is rare. It isn't often that you want to delete a region from anywhere other than the file it was first created in. Otherwise, the region is probably there for a purpose—and therefore you don't really want to delete it.

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 precious hard disk space without you even knowing it. If this is the case, import the region into Digital Performer and then delete the soundbite with the Delete command.

Chapter 12 *The Audio Event List*

This chapter focuses on features that are unique to audio Event List windows. For basic information, please refer to the *Event List Window* chapter the MIDI sequencing reference manual.

Quick Reference



Mini-menu: Choose items from the mini-menu in the same way as regular menus. The Event List mini-menu contains commands for controlling the display, etc.

Audible Mode: Click this button to activate Audible Mode. The button becomes highlighted. Audible Mode plays back soundbites one at a time as you click them in the Event List. You can also play an event by highlighting it first and option-clicking audible mode.

Insert: Inserts soundbites, pan, or volume events into the Event List.

Solo: Mutes all other tracks except the one shown in the event list window (as long as the window is front-most). Option-click to open the solo setup dialog, which lets you partially solo other MIDI tracks.

Pop-up box: A box that appears when you double-click or option-click on a field of an event. You can enter a new value for the field by either typing or by dragging up or down.

Sequence Name: Identifies the sequence that contains the track.

Soundbite Attack Time: Indicates the location at which the soundbite starts playing back. Both attack time and duration can also be expressed in SMPTE and real time.

Soundbite Duration: Indicates the length of the soundbite. This cannot be pop-edited. To edit the length (start or end time) of a soundbite, drag its edges in the Graphic Editing window. Both duration and attack time can also be expressed in SMPTE and real time.

Soundbite Name: Identifies the soundbite by name. Click it to select the soundbite. Option-click it to change the name. Double-click the name to replace the soundbite with another. Command-double-click to edit in Sound Designer II.

Soundbite Velocity: Similar to MIDI notes, soundbites have a velocity between zero and 127. This velocity affects the volume of the soundbite. In addition to pop-editing, soundbite velocities can be edited with the Change Velocity command or in the Graphic Editing window.

Soundbites: Each row of information represents a single soundbite or volume or pan event. Events at different locations are separated by a dotted line.

Track Name: Identifies the track that contains the data.

Mini-menu

Set View Filter: Calls up a dialog box from which you select the types of events which are visible in the Event List window. The View Filter applies to all open Event Editing windows.

Goto Counter: Automatically scrolls to the time currently displayed in the Counter.

Goto: Automatically scrolls the Event List display to a time you specify.

ReInsert: Inserts an event of the same type that you last inserted.

Legend: Opens a window that shows what each kind of event looks like in the Event List.

Graphic Editing: Opens the Graphic Editing window for the track.

Measures/Real time/Frames: These checkable entries control the types of time displayed for the attacks and durations in the Event List. You can use any combination of these three time formats. You can even uncheck all three to display no attack or duration times.

Audio Event List basics

The Event List window gives you precise information about soundbites and complete control over their playback. It consists of a chronological list of all the soundbites in the track. It also displays audio pan and volume events. Similar to MIDI data, audio data can be viewed and edited in both the Event List window and Graphic Editing window at the same time.

Event list soundbites are "clones" of their original

The most important thing to realize about soundbites in the event list is that they are "clones" of their original soundbite in the Soundbites window as shown in Figure 14-1 on page 158. For further explanation, see "Soundbites in a track are 'clones' of the original" on page 158.

Inserting a soundbite in the event list

Soundbites can be placed in an event list in one of several ways:

- by inserting from the Event List window
- by dragging and dropping it from the soundbites window

To insert a soundbite into an event list from the Event List window:

1. **Choose Soundbite from the insert menu in the title bar.**

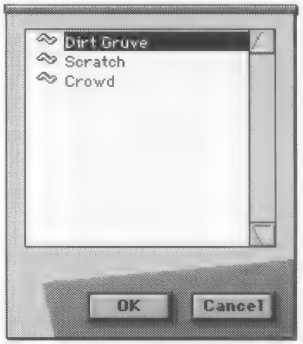
2. **In the popped-up event that appears, type in the measure, beat, and tick location at which you want to insert the soundbite.**

   Use the tab key to move from measures to beats to ticks.

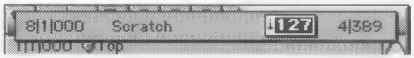
3. **Press tab again to select a soundbite.**

4. **Select the desired soundbite from the list that appears.**

   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.



5. **When the soundbites list disappears and the velocity field pops up, type in a velocity between 0 and 127.**



6. **Press return to insert the soundbite.**

   The soundbite appears in the event list at the location you specified.

Dragging soundbites into the event list from the Soundbites window

You can also insert soundbites into an event list by dragging them from the Soundbites window into the event list. Just grab the move handle of the soundbite as show below and drop it on top of the open event list window. The soundbite is placed end-to-end with the last soundbite at the bottom of the list.

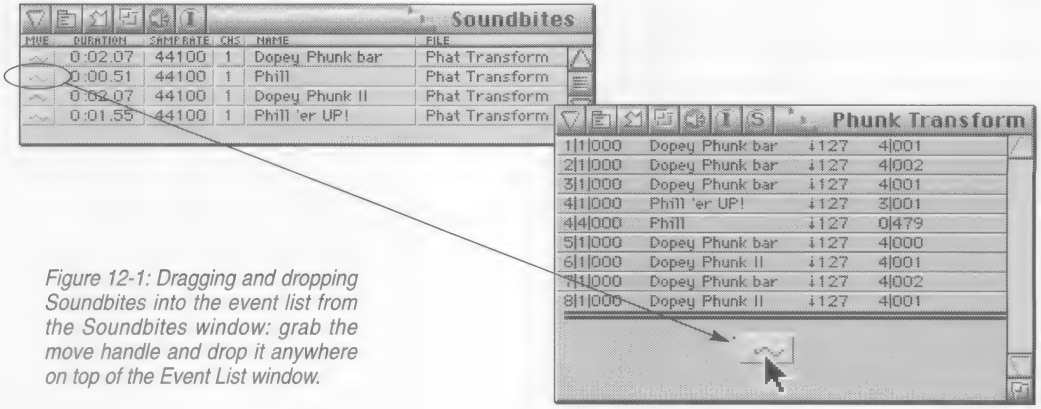


Figure 12-1: Dragging and dropping Soundbites into the event list from the Soundbites window: grab the move handle and drop it anywhere on top of the Event List window.

Building a playlist

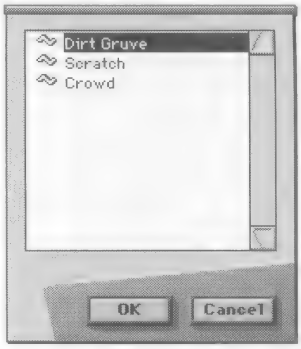
A *playlist* is a collection of regions played end-to-end to produce a continuous presentation of music. You can quickly build a playlist using the drag-and-drop technique shown in Figure 12-1 above. Just make sure that the soundbites you drop into the event list have lengths that generate an even tempo when they are placed end to end. For example, notice in Figure 12-1 that most of the soundbites being used in the playlist have a duration of exactly one bar so that the next soundbite used begins on a downbeat. You don't, of course, have to use one-bar lengths: just plan your durations accordingly when you are creating the soundbites you will use in the playlist.

Changing the name of a Soundbite

To change the name of a soundbite from the audio Event List window, option-click the soundbite's name. When you change the name of a soundbite, you change the name for all instances of that soundbite.

Replacing a soundbite with another soundbite

You can replace a soundbite with another by double-clicking the soundbite name in the event list. A list appears showing of all the soundbites in the file:



Double-click the desired soundbite. The new soundbite is placed in the same location as the original one with the same velocity.

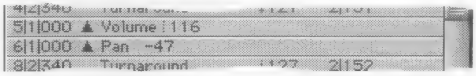
Editing soundbite velocities

There is one unique parameter that an instance of a soundbite can have in a track: velocity. Each instance of a soundbite can have its own velocity. If you set a velocity for one instance of the soundbite, this velocity does not affect other instances of it. For example, the following track contains the same drum loop soundbite played several times in a row. Notice, however that each instance of the soundbite has a different velocity:

Audio volume and pan events

Audio volume and pan events function identically to MIDI continuous controller data. They are *not*, however, MIDI events. (They can only be used in audio tracks.) Audio volume controllers affect the output volume of the soundbite that is currently playing in a track. Audio pan events control panning of the soundbite as it plays back on the pair of outputs its track is assigned to.

Audio volume and pan events can be identified by their name and continuous controller icon in the event list:



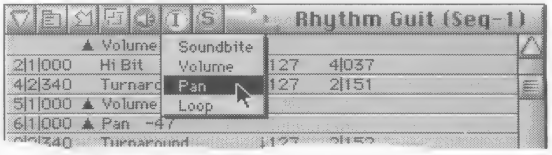
Volume events have a range from 0 to 127. Pan events have a range from -64 to +63, where 0 is dead center, -64 is pan left, and 63 is pan right.

For more information about controlling audio pan and volume, see chapter 15, "The Mixing Board" (page 175).

Inserting an audio volume or pan event

To insert audio volume or pan events one at a time in the event list:

1. **Choose pan or volume from the Insert menu in the title bar.**



2. **Type in the location and value for the event (0-127 for volume, -64 to +63 for pan).**

3. **Press return to enter the event or command-period to cancel.**

Using the View Filter

As with all types of data in Digital Performer, soundbites, volume events, and pan events can be removed from the display with the View Filter in the Event List window mini-menu.

Chapter 13 *Audio Graphic Editing*

There are many features packed into Digital Performer's Audio Graphic Editor. Its design is based on Digital Performer's graphic editing window for MIDI tracks (explained in the Graphic Editing Window chapter in the MIDI sequencing reference manual). However, this chapter focuses on the many additional features unique to digital audio. It also shows you many time-saving shortcuts.

This chapter is divided into the following main sections:

Quick Reference

Below is an overview of the Audio Graphic Editor, followed by a brief explanation of each item.

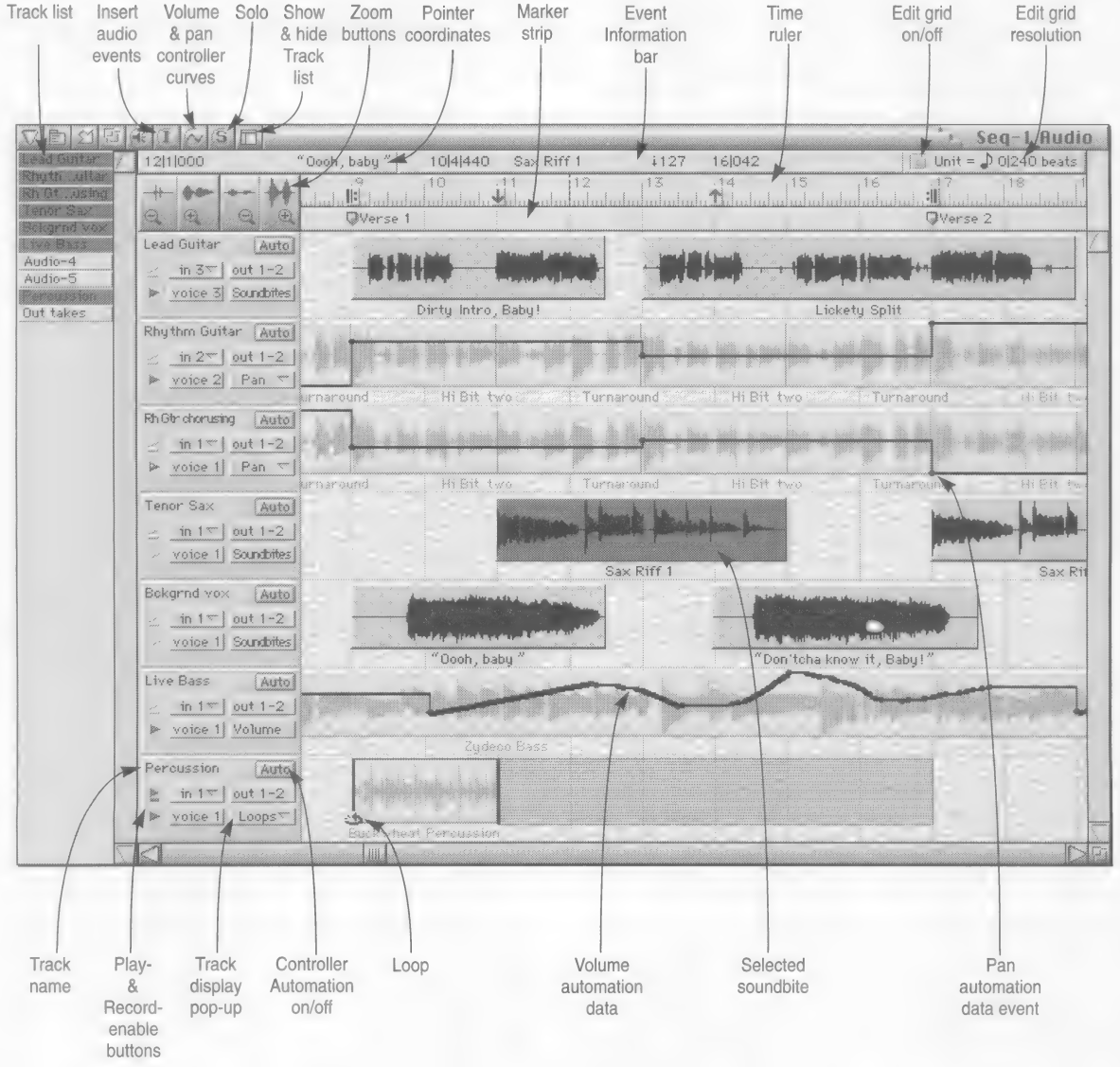


Figure 13-1: The Audio Graphic Editor

Track list: Click or drag over the names of the audio tracks in this list to show or hide them in the Audio graphic editor. Option-click to hide all except the one you click; command-click to show all except the one you click.

Insert Audio Events button: Pops up the Insert menu when clicked, from which a soundbite can be inserted.

Volume and pan controller curves: Produces a cross-hair cursor that can be dragged in a track strip to insert a smooth line or curve of audio volume or pan controllers. Before choosing this tool, select either Pan or Volume from the track's display pop-up menu in the control strip to the left of the grid.

Solo button: Solos all audio tracks visible in the Audio Graphic Editor.

Show & Hide Track list button: Shows and hides the list of tracks at the left side of the window.

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. 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-click to zoom in or out to minimum or maximum zoom level.

Pointer Coordinates: Displays the mouse pointer's current location, including the name of the soundbite it is currently over.

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.

Event Information: Displays the currently selected soundbite or controller event as it would appear in the Event List and allows you to edit the event's parameters, such as name, velocity, and attack time. If a region is selected by dragging in the Time Ruler, this box shows the region's start and end time. If a group of events is selected, this box displays information about the last event that was selected.

Time Ruler: Measures time in any combination of Performer's three time formats: measures|beats|ticks, SMPTE time, and real time. The Time Ruler can zoom in and out to enlarge or reduce the Soundbite display and Controller Data Grid. Command-drag to zoom the display to fit the selected region.

Edit Grid Resolution: Displays the current time resolution for editing. When the check box is selected, notes and data 'snap' to locations that correspond to the resolution displayed. If the check box is deselected, data does not '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 pop-up menu.

Track display pop-up: Lets you choose what type of data to view and edit in the track: soundbites only, volume, pan, or loops. Use the option key while selecting from this menu to change all tracks.

Controller Automation on/off button: Turns volume and pan automation on or off for the track. When automation is turned off, pan and volume events in the track are ignored, e.g. they do not play back.

Volume automation data: Volume automation data events are viewed by choosing *Volume* from the Track's display pop-up menu in the control strip to the left of the grid. Volume level is displayed as a line superimposed on top of the audio waveform, with volume events appearing as dots on the line, which can be inserted (by clicking), dragged, and deleted (by command-clicking).

Pan automation data event: To insert a single pan or volume event, choose *Pan* or *Volume* from the track's display pop-up menu in the control strip to the left of the grid and then just click in the track strip where you want the event. Drag the control point to move it. Command-click it to delete it. To insert a smooth line or curve (consisting of many events), use the reshape button in the title bar.

Soundbite: A reference to a region of audio data. Soundbites do not consist of actual audio data; instead, they consists of pointers—a start time and end time—to a region of audio data in a soundfile on a hard disk. The soundbite displays the waveform of the sound, along with the soundbite name.

Mini-menu

Set View Filter: Calls up a dialog box in which you specify types of events to be visible in the Graphic Editing window. The View Filter applies to all tracks and affects both the Graphic Editing and Event List windows.

Goto Counter: Scrolls the graphic display to the time currently displayed in the Counter. The counter location appears at the left-most position in the window.

Goto: Scrolls the graphic display to a time you specify, which appears at the left-most position in the window.

Set Rulers: Allows you to configure the Time Ruler in any combination of Performer's three time formats: measures|beats|ticks, SMPTE time, and real time. The main ruler is displayed lowest and determines the time format for editing.

Set Ptr. Coords...(Set Pointer Coordinates): Allows you to choose what time and pitch formats are displayed in the Pointer Coordinates Box.

MultiRecord: Toggles MultiRecord mode. When MultiRecord is on, you can record into several audio tracks at once.

Display Waveforms: When this command is checked, soundbites display a waveform that represents the audio contained in the soundbite. When this command is unchecked, soundbites display a grey bar and redraw on the screen faster.

Edge Edit Copy: When checked, this command causes a soundbite to be copied when you drag one of its edges, which preserves the original soundbite. When unchecked, dragging a soundbite edge affects the original soundbite, as well as every other instance of it. In either case, option-dragging a soundbite edge temporarily overrides the current setting of this command.

Selections use Edit Resolution: When this menu item is checked, selections will snap to the edit resolution when you drag them (if Edit Resolution is turned on).

Event List: Opens the Event List window for the currently selected soundbite. This menu item is grayed out until you select a soundbite.

Measures|Real time|Frames: These checkable entries control which time formats are displayed in the Information Bar and Event List.

The Audio Graphic Editor

This section explains several important concepts to keep in mind when you work in the Audio Graphic Editor.

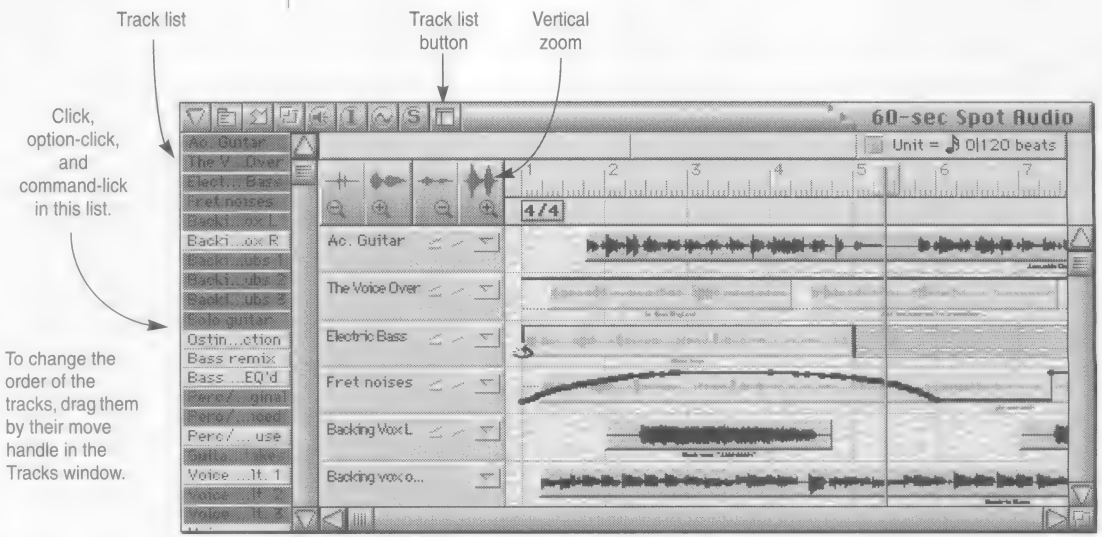
Opening the Audio Graphic Editor

There are several ways to open the Audio Graphic Editor:

- Double-click an audio track in the track list (this can be set in the Preferences command in the File menu)
- Click an audio track name (or track segment in the overview) to highlight it, and click the graphic editing window button in the main control panel
- Choose Graphic Editing from an audio event list window mini-menu
- Command-click the title of a MIDI track graphic editing window and choose *Audio Tracks* from the menu

Choosing tracks

To choose which tracks you want to display, click the track list button in the title bar as shown below to open the track list. Then just click tracks to either show them or hide them. Option-click to hide all except the track you click; command-click to show all except the track you click. Use the vertical zoom buttons to further control how many tracks are displayed in the window.

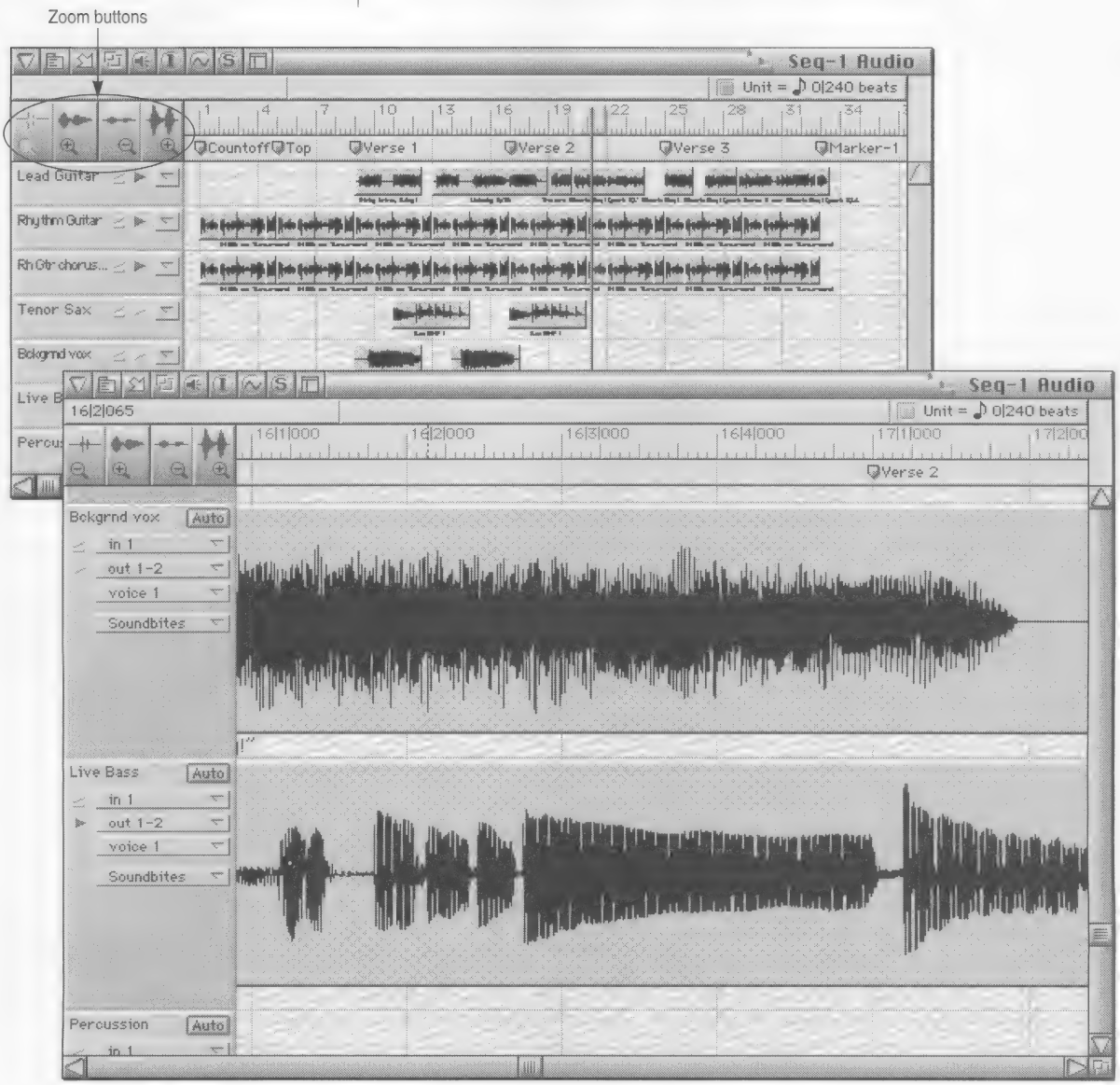


Moving tracks up or down

To move tracks up or down in the Audio Graphic Editor, drag them by their move handle in the Tracks window.

Zooming

The Audio Graphic Editor lets you zoom the display 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. Shortcut: option-click to zoom to the maximum or minimum setting.



The track controls

Each track in the Audio Graphic Editor has a control panel along the left side of the window.

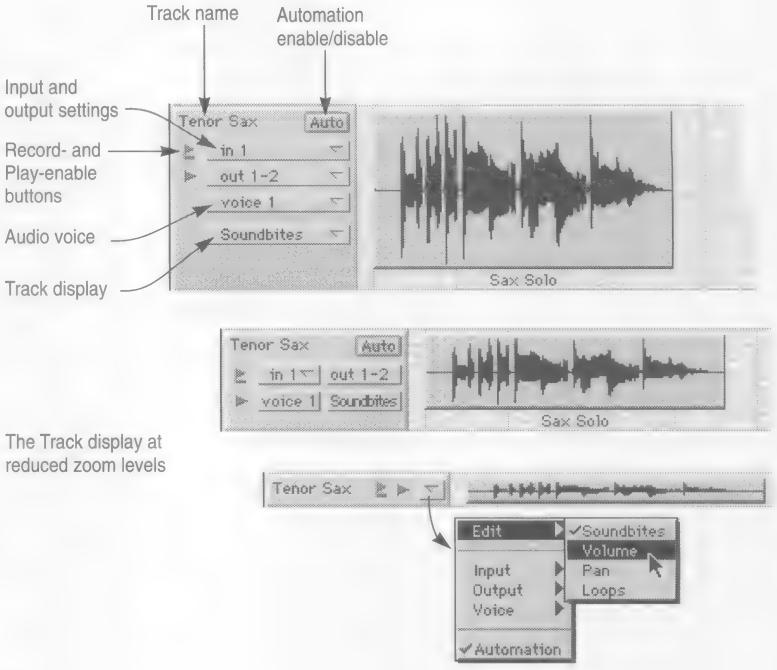
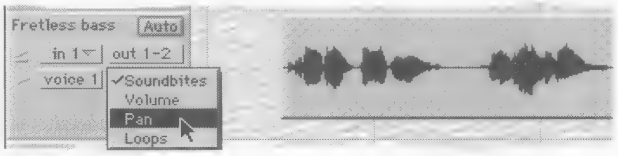


Figure 13-2: The track controls. The display of these controls changes slightly depending on the vertical zoom setting as shown.

Displaying soundbites, volume, pan, and loops

The track display pop-up menu lets you choose what type of data you would like to display in each track. Volume, pan, and loops are displayed directly on top of the soundbites, which are dimmed in the background. For more information about volume, pan, and loops, see "Editing volume, pan, and loops graphically" on page 149.



A shortcut for changing all tracks at once

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

Audio graphic editing basics

This section explains several important concepts to keep in mind when you work in the Audio Graphic Editor.

Working with waveforms

The Audio Graphic Editor displays soundbites — and the audio data within them — as a waveform in a standard time-versus-amplitude display as shown below. 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.

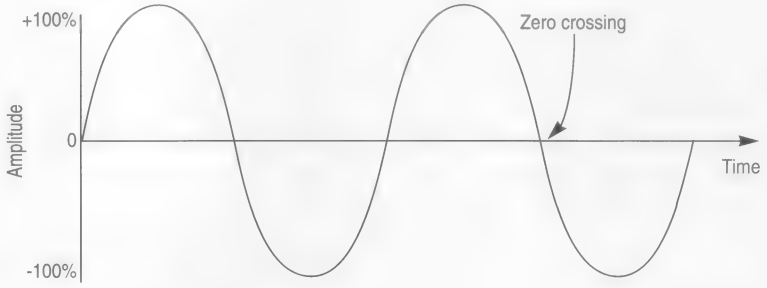


Figure 13-3: A simple audio waveform displayed on a time versus amplitude scale.

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 13-4: A soundbite is represented as a block of audio with a waveform inside.

Stereo versus mono waveforms

As of this writing, the Digidesign Audio Engine (DAE) does not support the recording or playback of interleaved stereo audio files. They can, however, be imported into Digital Performer, but only the

left channel will play (unless you de-interleave them when importing. For more information, see "Converting soundbites that cannot be played" on page 98.) Stereo audio files consist of two interleaved channels of audio data. They appear in the Graphic Editing window as two smaller waveforms joined together as shown below. A Stereo Soundbite shows both channels connected together as one unit, so that they can always be edited simultaneously.

Figure 13-5: A stereo soundbite is represented as two audio channels joined together.

Choosing not to display the waveform

Most of the time, the waveform display inside soundbites is critical for the tasks of editing digital audio. It does, however, require a significant amount of calculation on the part of Digital Performer. For example, when Digital Performer displays a newly recorded soundbite in the Audio Graphic Editor, it pauses briefly to calculate the waveform before you can see it for the first time. If you are in a hurry, and you don't want to wait, the Display Waveforms mini-menu command, when unchecked, eliminates these brief delays. Or, you can close the graphic editing window to prevent waveform calculations.

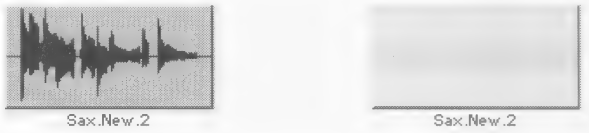


Figure 13-6: A soundbite displayed with and without its waveform.

Soundbites are clones

An important thing to realize about soundbites in the graphic editing window is that they are "clones" of their original soundbite in the Soundbites window as shown in Figure 14-1 on page 158. For further explanation, see "Soundbites in a track are 'clones' of the original" on page 158.

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 editing" on page 48.

Using the edit grid

The edit grid in the Audio Graphic Editor works the same as it does in MIDI graphic editing windows. When it's on, it causes whatever you are dragging to 'snap' to evenly spaced, rhythmically precise grid locations. When it's off, no snapping occurs when you drag. Turn the edit grid on and off with the button as shown in Figure 13-1 on page 126. Set the resolution of the grid with the note pop-up menu (also shown in Figure 13-1) or by typing in a value.

The edit grid affects all dragging operations, including:

- Dragging soundbites to move them
- Dragging in the time ruler to make selections
- Dragging the edges of soundbites
- Inserting volume and pan curves, including the density of the data inserted

Edit resolution does not, however, affect dragging inside a soundbite while pop-editing it.

Editing on zero crossings

When editing waveforms, you can often get noise artifacts such as clicks and pops at soundbite boundaries due to edit points that don't fall on a zero crossing. You can avoid this by using the Edit on Zero Crossings command. For more information, see "Editing on zero crossings" on page 159.

Editing audio events numerically in the info bar

The Info bar displays precise information about any audio event after you click it, and you can directly edit any of the information shown. This display is identical to the event list window. Use the time format commands in the mini-menu to choose the formats you want to see.

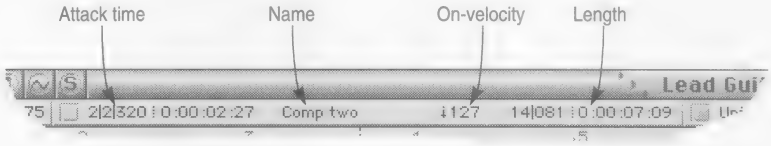


Figure 13-7: The info bar shows specific information about any event after you click it, including loops and volume and pan control points.

Opening the event list for a track from the Audio Graphic Editor

To open an event list for a track in the Audio Graphic Editor, click a soundbite to select it and choose *Event List* from the mini-menu, or click the event list button in the Consolidated Control Panel.

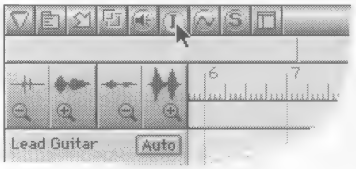
Inserting soundbites

Using the insert button

The following sections explain several different ways to insert soundbites into the Audio Graphic Editor. The soundbite must be present in the Soundbites window list before doing so. If it isn't, you must import it beforehand. See "Importing soundbites, playlists, audio files" on page 95.

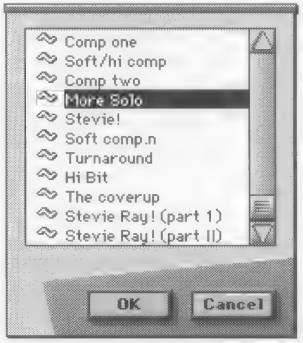
To insert a soundbite in the graphic editing window:

1. **Click the Insert button in the title bar as shown below.**



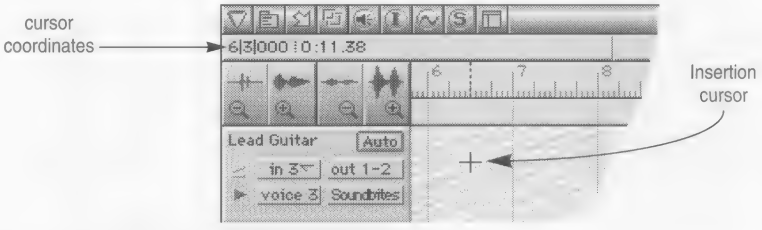
2. **Select the desired soundbite from the list that appears.**

   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.



3. **Click the cross-hair cursor in the graphic editing window at the location where you want to place the soundbite, using the cursor coordinates to help determine the location.**

Use the "Set Ptr. coordinates" mini-menu command to determine which time formats are displayed.



Dragging and dropping audio from the soundbites window

You can also place audio in the graphic editing window by dragging soundbites from the Soundbites window. Just grab the move handle of the soundbite as show in Figure 13-8 below and drop it on top of the open graphic editing window. The soundbite is placed at the exact location displayed in the pointer coordinates box at the moment you drop it. Command-drag the soundbite to make it "snap" to the end of the previous one (or the beginning of the track if it is empty).

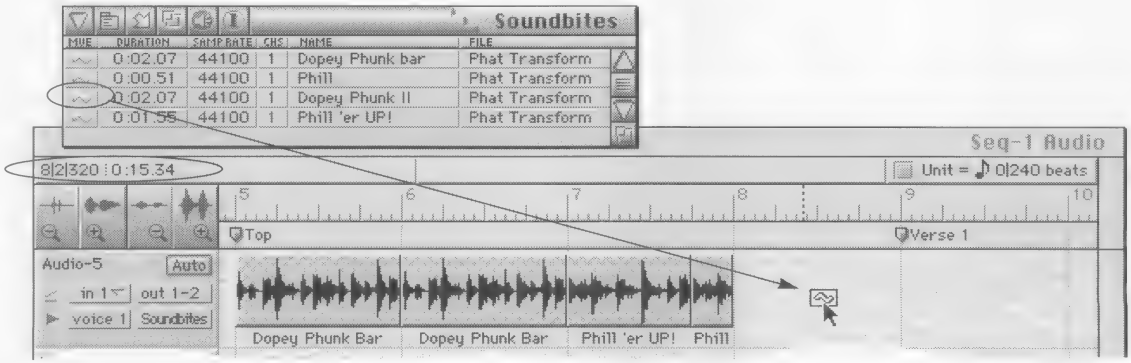


Figure 13-8: Dragging and dropping Soundbites into the graphic editing window from the Soundbites window: grab the move handle and drop it on top of the graphic editing window. Use the pointer coordinates for precise placement. Command-drag the soundbite to make it "snap" to the end of the previous one.

Building a playlist

As mentioned in the previous section, you can quickly build a playlist in the graphic editing window by command-dragging soundbites into it from the Soundbites window. Holding down the command 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 graphic editing window, click it once to select it and then option-click its name in the info bar as shown in Figure 13-7.

Replacing a soundbite with another

To replace a soundbite with a another one from the soundbites window, click it once to select it and the double-click its name in the info bar as shown in Figure 13-7.

Moving soundbites

Moving soundbites vertically from one track to another

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 setting.

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.

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 "Selecting audio" on page 144.

Snapping to the edit grid

When the edit resolution check box is checked, soundbites "snap" to the edit resolution grid when you drag them. See "Using the edit grid" on page 135 and the edit grid controls in Figure 13-1 on page 126.

"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: command-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, command-drag it to the right. You only have to drag a short distance—enough to determine the direction.

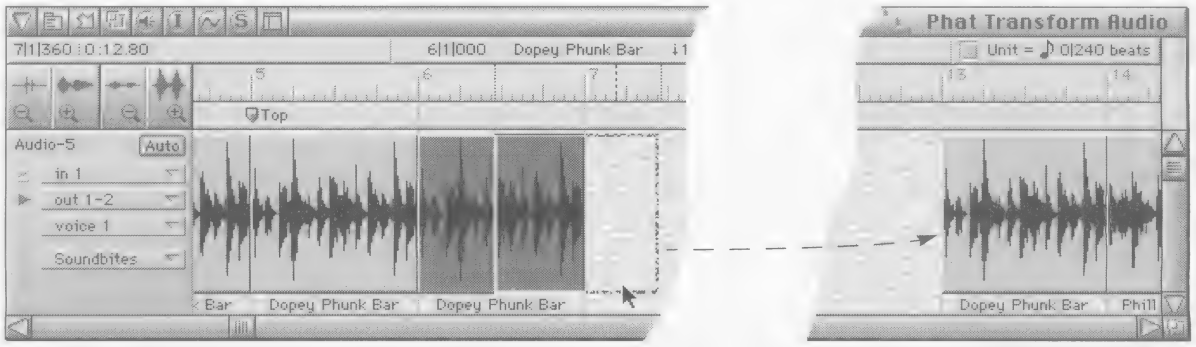


Figure 13-9: Command-dragging a short distance in either direction causes the soundbite to "snap" to the next or previous soundbite.

Option-dragging to make a copy

To quickly make a copy of a soundbite while dragging, option-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 window. For example, if you rename either copy, they will both change to the new name.

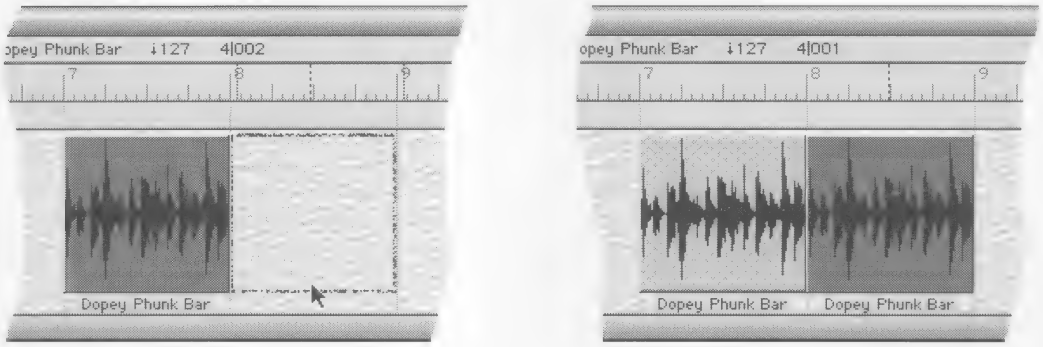
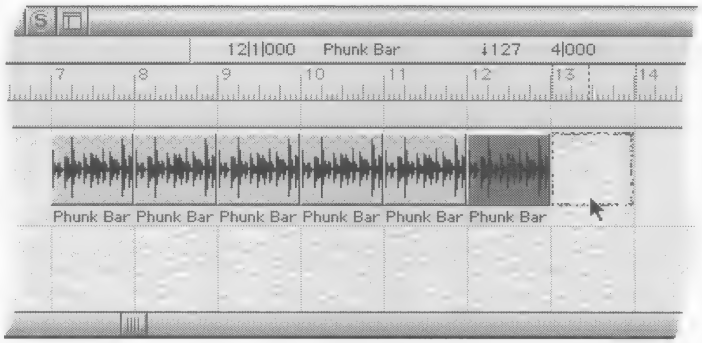


Figure 13-10: Option-dragging to make a copy of a soundbite.

Option-command-dragging to copy soundbites & place them end to end

By holding down both the option key and the command 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.



Creating a stutter effect

You can easily make a stutter effect by option-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.

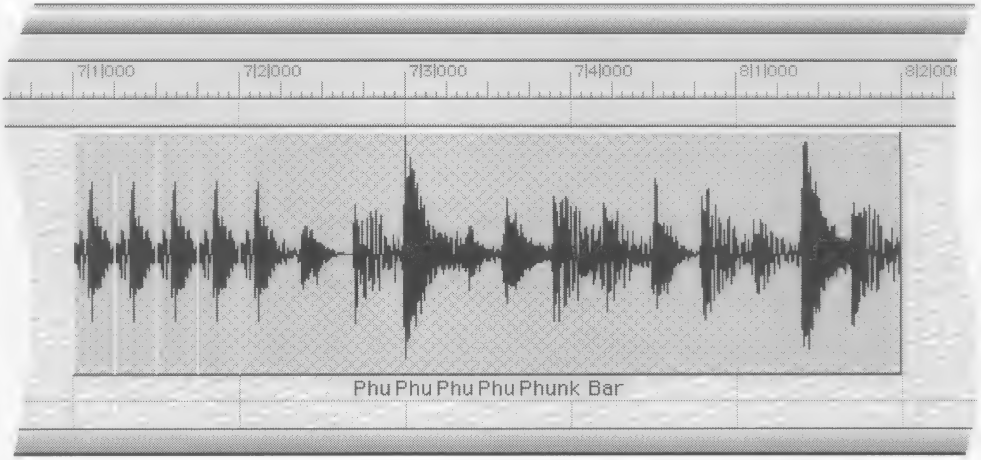


Figure 13-11: This 16th-note stutter effect was created by option-dragging copies of a soundbite with edit resolution turned on.

Edge-editing soundbites

As explained in Figure 6-5 on page 52, 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 a half hour. A soundbite can represent a portion of the parent audio file, or it can represent the entire file.

Digital Performer allows you to drag the edges of soundbites to change their boundaries. Just click the edge of the soundbite and drag left or right (the current edit resolution applies). When doing so, you "uncover" or "cover up" the audio in the audio file as illustrated in Figure 13-12 below.

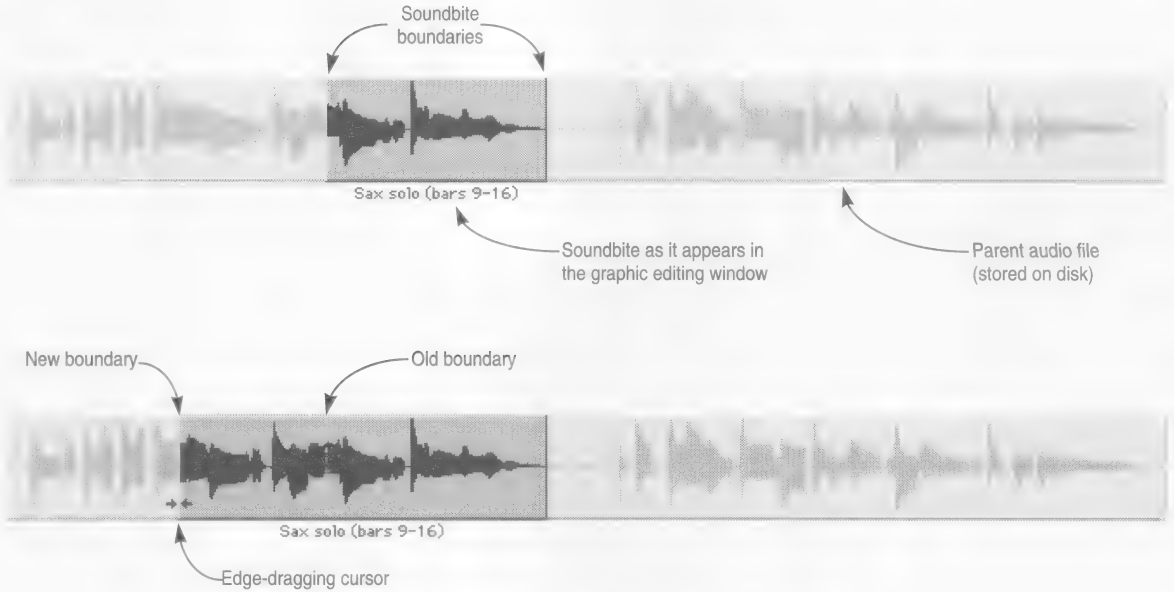


Figure 13-12: Edge-editing a soundbite by dragging its boundaries.

If the edge stops when you drag it, preventing you from going any further, then you have reached the end of the audio file.

Affecting all copies of a soundbite versus one copy

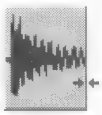
The *Edge Edit Copy* command in the graphic editing window mini-menu allows you to choose whether you want to modify the original soundbite you are dragging or preserve the original by making a copy of it when you drag.

Edge-editing all copies

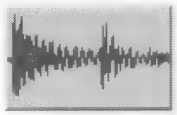
When *Edge Edit Copy* is unchecked, dragging a soundbite edge affects the original soundbite, as well as every other instance of it. For example, if you edge-edit a soundbite called *Drum Fill* that has been placed many times throughout a percussion track, all copies of it in the track will change.

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 window.



Original soundbite



New soundbite
after option-dragging its edge

Option-dragging to override Edge Edit Copy

Option-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-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-key to override this setting when needed.

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. In this situation, you can edit the hidden edge by command-clicking the opposite, visible edge. Doing so gives you control over the edge you *didn't* command-click.

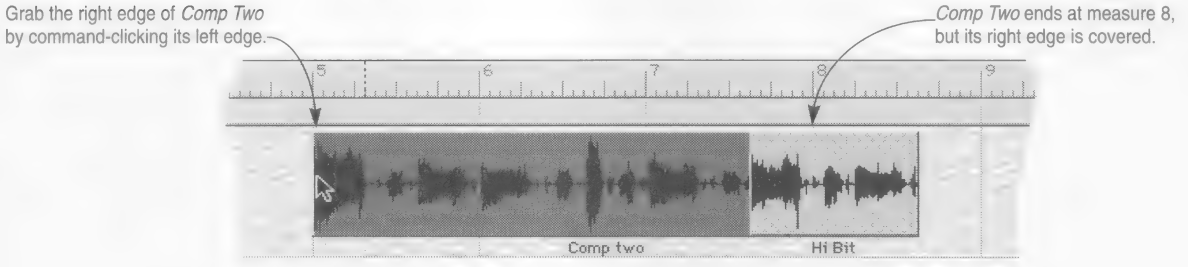


Figure 13-13: Edge-editing when the edge you want to drag is covered by another soundbite.

Using the edit grid when edge-editing

The edit grid affects edge-editing, so if you want edges of soundbites to snap to the grid when you drag them, turn on the grid and set it to the desired resolution using the controls shown in Figure 13-1 on page 126.

Selecting audio

Digital Performer offers a variety of ways to select audio. Once audio is selected, you can apply one of Digital Performer's many powerful editing operations.

Selecting soundbites

The table below summarizes a variety of ways to select soundbites.

To do this:	Do this:
To Select an entire soundbite	Click it.
To select several adjacent soundbites	Click anywhere in the background directly behind the soundbites and then drag over them.
To select non-adjacent soundbites	Shift-click each one.
To select a soundbite when it is behind another	Click any portion of the soundbite that is visible.

Selecting a region in the time ruler over one or more tracks

To select any time range of audio, regardless of the soundbites contained in within the region, drag in the time ruler as shown below. Notice that the time ruler selection affects *all* visible tracks, as well as all data currently visible in the view filter. Be sure to hide tracks and data types you don't wish to include. The start and end time of the selected region is displayed in the info bar. Pan and volume data in the region will also become selected, unless they are hidden in the view filter. Shift-click to extend or shorten the current selection. You can also turn on the edit grid when dragging.

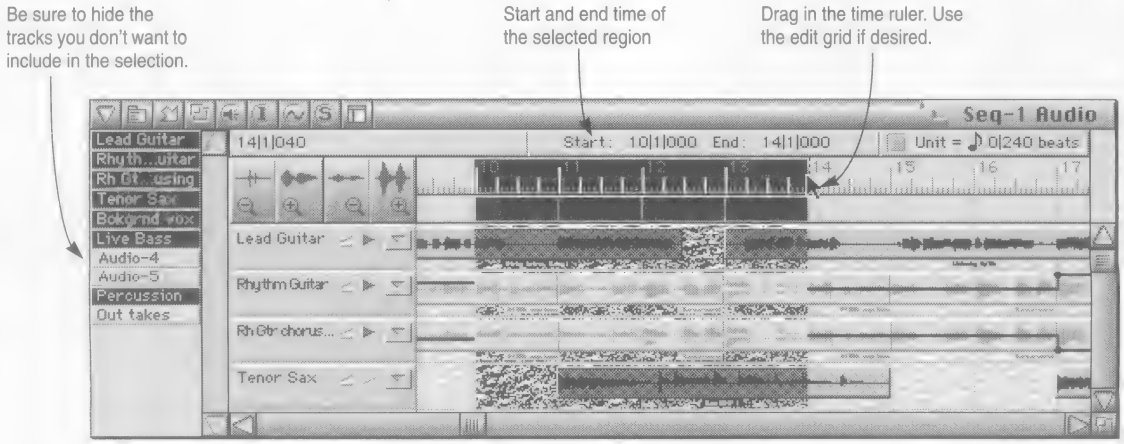


Figure 13-14: Selecting a time region across soundbites.

Selecting a portion of a soundbite using the time ruler

To select a portion of audio within a soundbite using the time ruler, just drag in the time ruler above the soundbite as described in "Selecting a region in the time ruler over one or more tracks" on page 144 and shown in Figure 13-14. All of the editing procedures discussed in the sections below apply to this case, too.

Using Cut, Copy, and Erase on a time ruler selection

Once a region is selected in the time ruler as shown in Figure 13-14, you can cut, copy, and erase the selected audio using the Edit menu commands.

Pasting into a time ruler selection

If there is audio 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.

Using Snip, Splice, Repeat, and Shift on a time ruler selection

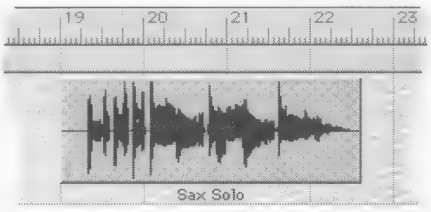
The Edit menu commands Snip, Splice, Repeat, and Shift will only affect soundbites whose attacks fall within the selected region. However, you can make these edit commands affect the selected region as a whole by using the Split command in the Audio menu before applying Snip, Splice, Repeat, or Shift. For more information about this technique, see "Splitting audio in the selected region before editing" on page 161.

Using Split and Trim on a time ruler selection

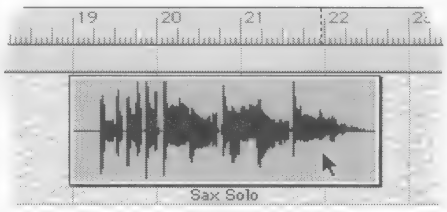
The Audio menu edit commands Split and Trim can be used on a time ruler selection. For complete information about these commands, see "Split and Trim" on page 164. Note, however, that the Strip Silence command does not affect this type of selection. To apply Strip Silence, click the soundbite to select it.

Selecting audio inside a soundbite by pop-editing it

To pop-edit a soundbite for selecting and editing, double-click it. The soundbite "pops up" to indicate that you can drag inside it. This method of selection offers several advantages, which are discussed in the following sections.



A soundbite before pop-editing

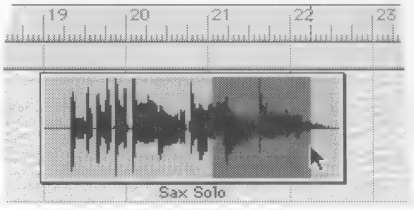


The same soundbite after it has been double-clicked for pop-editing

Selecting audio inside a soundbite

Once a soundbite is popped up, you can select any portion of it by dragging over the waveform inside. If necessary, you can scroll the window horizontally and zoom in or out to select portions of audio not currently visible in the window.

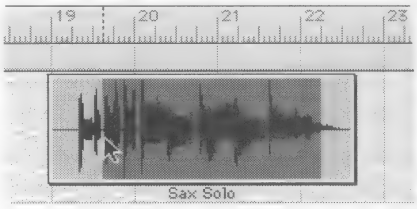
Selecting inside a soundbite



Extending or shortening the selection

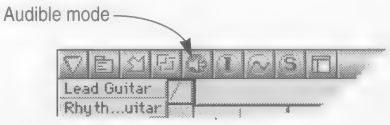
Once a selection has been made, you can adjust the edges of the selection, extending or shortening them as much as you like. Just shift-click (or shift-drag) near the edge you want to adjust.

Adjusting the boundaries of the selection by shift-clicking and shift-dragging



Listening as you make a selection

If you turn on the Audible mode button in the graphic editing window title bar, Digital Performer will play the selected region as soon as you release the mouse after making the selection. The same will happen when adjusting the edges of the selection as described in the previous section.



Listening to the current selection

To listen to the currently selected region of audio inside a soundbite, option-click the Audible mode button as shown above. Doing so causes the selected region to play in its entirety.

Scrubbing while selecting

You can also scrub audio while selecting audio in a pop-edited soundbite. For more information, see the next section, "Scrubbing audio inside a popped-up soundbite".

Editing the selected region inside a soundbite

Once a portion of audio is selected inside a soundbite, you can cut, copy, erase, delete, split and trim the selection using the Edit menu commands. If there is audio data in the Clipboard, you can also use the Paste command to paste it; doing so will place it in the track as a separate soundbite starting at the beginning of the selected region.

☛ The pasted soundbite will be placed *on top of* the popped-up soundbite.

Scrubbing audio inside a popped-up soundbite

To scrub audio inside a soundbite, first double-click the soundbite to pop-edit it. Then command-drag in either direction to scrub forwards or backwards as shown below. The scrub wiper indicates the current scrub location.

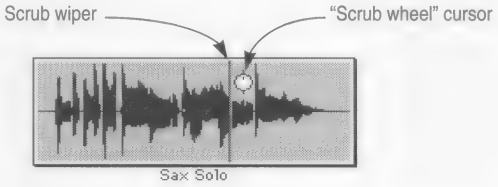


Figure 13-15: Command-drag to scrub audio within a pop-edited soundbite. In this example, the audio is being scrubbed forwards.

Controlling scrubbing speed

To speed up scrubbing — up to two times normal speed — move the "scrub wheel" cursor further away from the scrub wiper as shown below. To slow down, move the scrub wheel cursor closer to the scrub wiper. For a finer degree of control, zoom in the display horizontally.

Scrubbing forward slowly

Scrubbing forward quickly (2x normal)

Scrubbing while selecting

When dragging to make and adjust selections inside a soundbite, you can scrub the audio while selecting by holding down the command and shift keys together as shown below in Figure 13-16. This lets you hear what you are selecting as you drag. For example, if you have made a selection already, and you want to extend its edge and scrub at the same time, hold down both the command and shift keys while you drag.

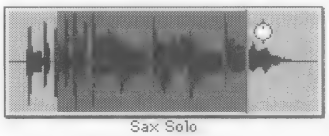


Figure 13-16: Scrubbing while selecting.

Editing selected audio data

Once you have selected audio data using one of the methods described in the previous sections, you can employ Digital Performer's numerous editing commands. For complete information, see chapter 14, "Editing Audio" (page 157).

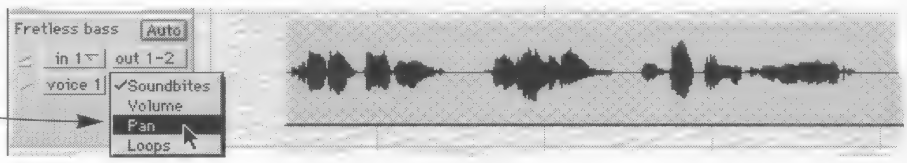
Editing volume, pan, and loops graphically

Switching a track to display volume, pan, or loops

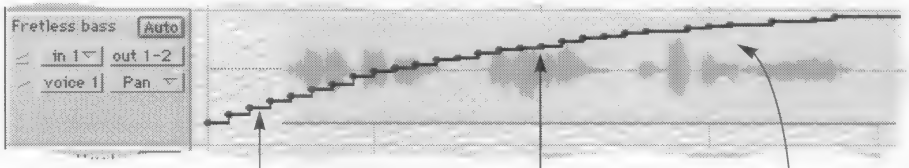
The Audio Graphic Editor provides the ability to display, insert, and edit volume and pan automation data in the form audio controller events. In addition, it allows you to do the same for loops in audio tracks. The sections below provide complete details.

To display and edit an audio track's volume, pan, and loop data in the Audio Graphic Editor, you need to switch the track display using the pop-up menu as shown below. Only one type of data can be displayed at a time in each track (together with soundbites). Once a data type is displayed, you are ready to edit.

Choose the type of data you want to see from the display pop-up menu.



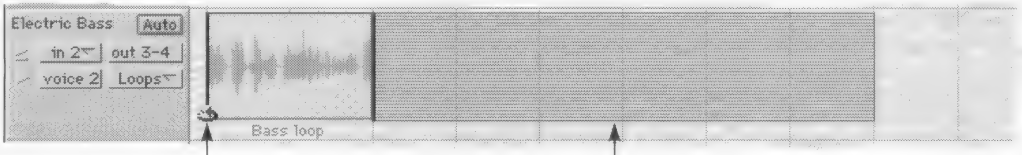
The soundbites in the track become dimmed and the volume, pan, or loop data is superimposed on top of the waveform.



The current volume level or pan setting in the track is displayed as a horizontal line.

Changes in the volume or pan level in the track appear as control points on the line. They represent discrete volume or pan events in the track.

A controller curve like this one actually consists of many events that change gradually over time.



The loop itself is shown as a loop icon with a bracket, which indicates the region being looped.

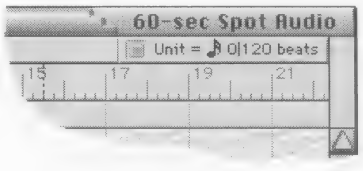
This shaded region indicates the period of time covered by the loop.

Zooming for a better view

When inserting controllers, it helps to get a zoom setting that best suits what you are doing. For example, if you are making fine adjustments to the track level, use a large vertical zoom setting for better resolution. If you need to check out the overall level throughout a track, zoom out.

Check the edit grid setting before editing

The edit grid affects all dragging operations in the Graphic Editor. For example, it determines the density of events when you insert a smooth line or curve. So be sure to keep an eye on it as you work with volume and pan controllers, as well as loops.



Working with control points on a line

As mentioned earlier, the pan and volume level in the track is displayed as a horizontal line. Changes in level are represented as control points on the line, which you can insert, drag, and remove. The next few sections give you a summary of techniques for inserting, editing, and removing control points on the line.

Inserting a control point to create a sudden change

Inserting a single volume or pan event creates a sudden change in the volume level or pan setting. To insert a single event:

1. **Check the edit grid settings.**
2. **Make sure the track is currently displaying either volume or pan.**
3. **Click the line at the location you want to insert the control point.**

   A control point is inserted on the line as shown in Figure 13-17 on page 151.

4. **While watching the cursor coordinates box, drag the control point to the location and level you want.**

   You can drag both vertically and horizontally. Zoom in for greater resolution as you drag.

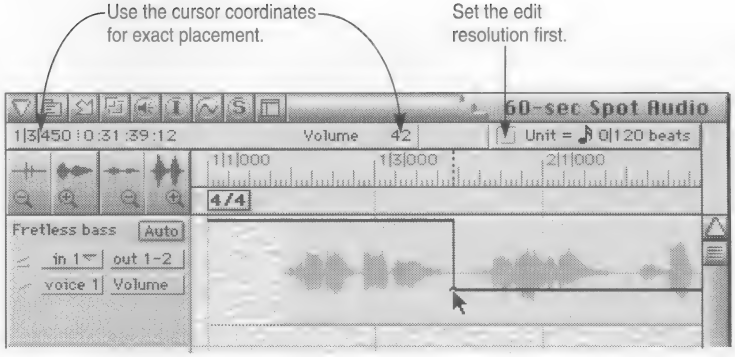


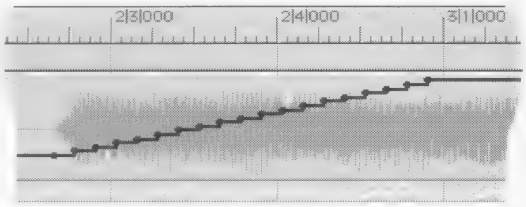
Figure 13-17: Inserting a single volume or pan event to create a sudden change.

Inserting a line or curve to create a smooth change

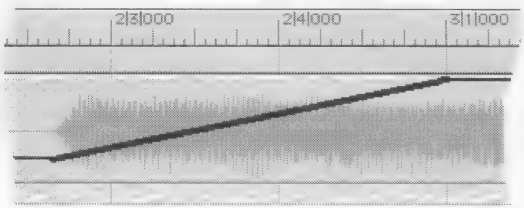
A line or curve actually consists of many control points placed close together that change gradually. The reshape tool in the title bar, however, allows you to insert them as a line or curve as follows:

1. **Choose the density of the data you are going to insert by setting the edit grid.**

   The edit grid setting determines how often events will be inserted. When the grid is turned on, events are inserted at regular intervals at the current grid resolution. For example, if you want events spaced at least every 60 ticks apart, choose a 32nd note resolution. If you want a higher density, pop-edit the tick value directly, either by typing or dragging. The higher the density, the smoother the change, but the higher the strain on DAE. If you turn off edit resolution altogether, events will be inserted as needed, but not necessarily at regular intervals.



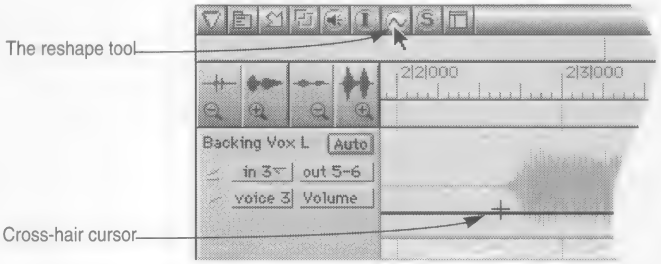
A volume swell at an edit resolution of 60 ticks.



The same swell re-inserted with edit resolution turned off.

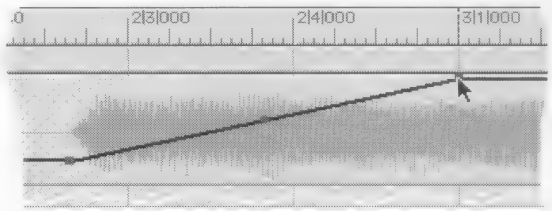
2. **Click the reshape tool in the title bar.**

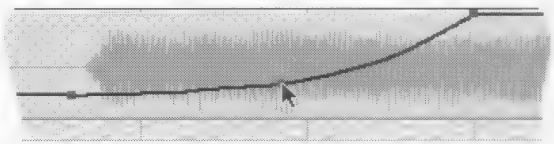
   The cursor turns into a cross hair.



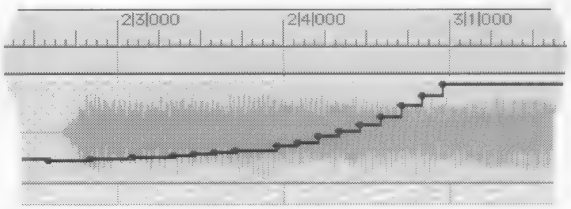
3. **Drag out the line tool as desired, using the red (or black) handles on the line to achieve the desired placement and shape.**

   Use the cursor coordinates for exact placement.





4. **When you are done adjusting the line tool, click anywhere in the soundbite grid to insert the curve, or press the return key.**

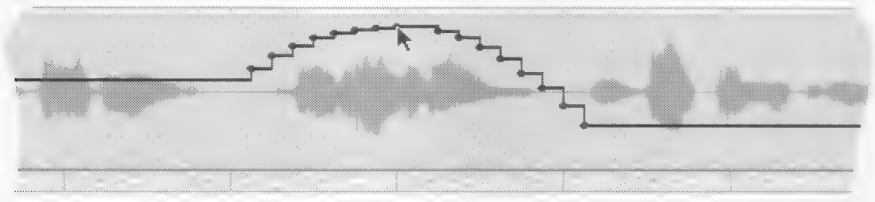


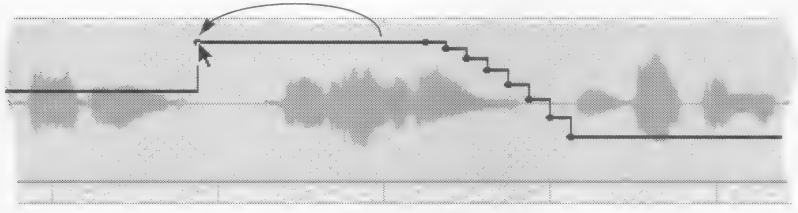
Reshaping an existing line or curve

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.

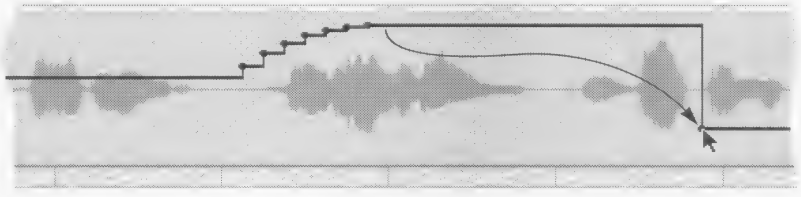
Dragging control points

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 line or curve.





Moving the control point to the left



Moving the control point to the right

In this example, the control point is being dragged both down and to the right.

Removing a control point

To remove a control point, command-click it. To remove several, drag over them as described in the above section.

Removing a line or curve

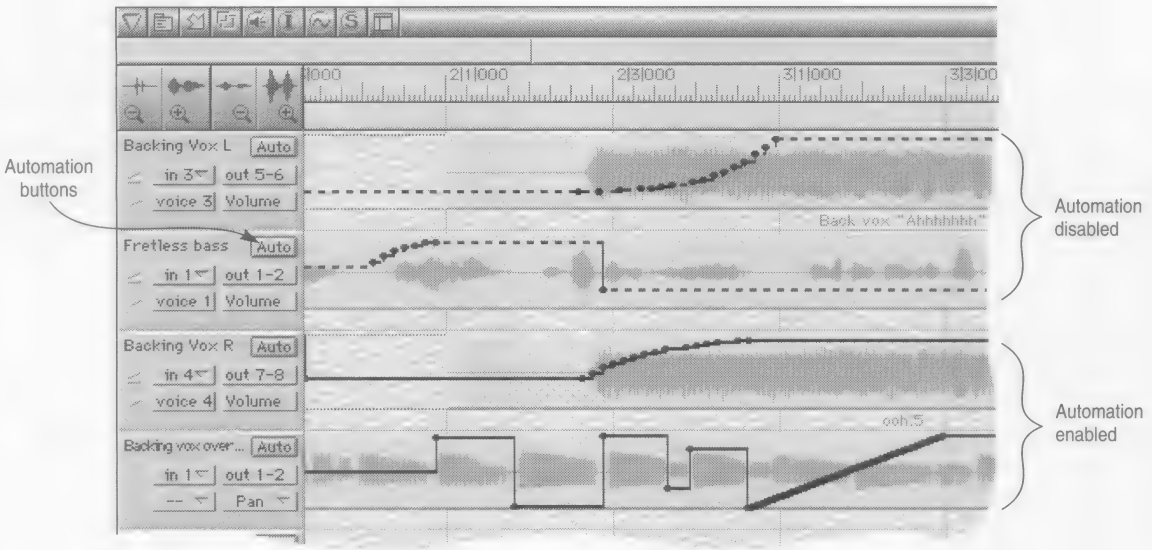
To remove a line or curve, drag a single control point over it as described in the section, "Dragging control points" above.

Cutting, copying, and pasting audio controllers

The only way to select audio controllers in the Audio Graphic Editor is by dragging in the time ruler to select a region of time. Note, however, that when doing so, you are also selecting *all data in the track*, including soundbites, volume, pan, and loops (unless you hide them beforehand with the View Filter command in the window's mini-menu). In addition, you are selecting all currently visible tracks. Once a time region is selected, you can cut, clear, or copy the material and then paste it elsewhere. To paste, select a region in the time ruler and the clipboard data will be pasted at the beginning of the selection.

Disabling volume and pan automation temporarily

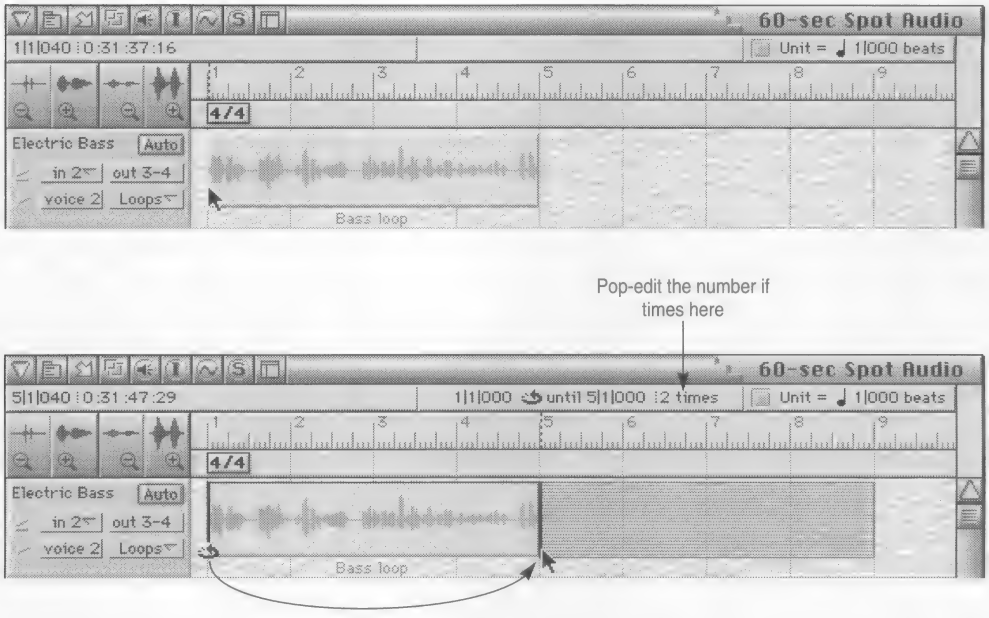
You can temporarily disable the volume and pan data in an audio track by turning off the Auto button in the track information panel as shown below. When Automation is disabled, volume and pan levels are displayed as a dashed line. They can inserted, edited, and deleted as usual, even when they are disabled.



Inserting a loop

To insert a loop in the Audio Graphic Editor:

1. **Choose Loops from the track display pop-up menu.**
2. **Turn on edit resolution as set it as desired.**
3. **Drag over the region you wish to loop.**
4. **To set the number of repetitions in the loop, pop-edit the loop parameters in the info bar as shown below.**



Changing the loop points by dragging

To change an existing loop's location or duration, drag either end of the loop's bracket.

Changing the loop numerically in the info bar

To change the loop numerically, click the loop icon to make the loop's information appear in the info bar, and then pop-edit the values in shown in the info bar.

Changing the number of repetitions in a loop

To change the number of repetitions in the loop, edit the loop numerically as described in the previous section.

Deleting a loop

To delete a loop, command-click the loop icon.

Duplicating a loop

To duplicate a loop, option-drag the loop icon.

Chapter 14 *Editing Audio*

Digital Performer provides powerful, non-destructive editing features for digital audio. Most of them can be applied to audio tracks and MIDI tracks at the same time, giving you a quantum leap in flexibility over systems that handle MIDI or digital audio only.

You can apply just about all of Digital Performer's powerful Edit menu and Region menu commands to digital audio. This chapter explains how and covers special considerations unique to audio.

This chapter is divided into the following main sections:

Audio editing basics

The following sections explain several important concepts to keep in mind when editing digital audio.

All audio editing is non-destructive

All of the editing procedures described in this chapter (cut, copy, paste, snip, erase, etc.) are non-destructive. (For an explanation of non-destructive editing, see "Non-destructive editing" on page 48.) However, destructive waveform editing operations, such as 'pencil tool' editing of digital audio samples and DSP features such normalize, reverse, time dilation, etc. are provided by third-party applications such as Digidesign's Sound Designer II program. Conveniently, Sound Designer can be accessed directly from within Digital Performer by the *Edit in Waveform Editor* command. See "Edit in Waveform Editor" on page 174.

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 window as shown below in Figure 14-1. 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 window. On the other hand, if you change the soundbite's name or length, all instances of it will change, too, including the original.

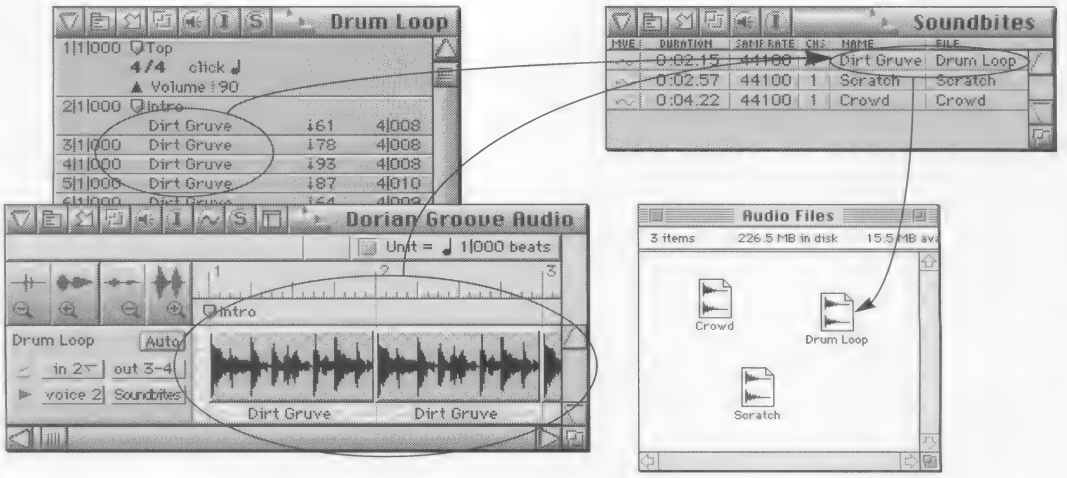


Figure 14-1: Soundbites in tracks are merely references, or "clones", of the original soundbite in the Soundbites list. In turn, the Soundbites there are references to the original audio data in the audio file on the hard disk.

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 shown above in Figure 14-1. 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.

Using the Edit and View Filters

As with MIDI data, soundbites are affected by the View Filter and Edit Filter. If the View Filter is set to filter soundbites in the Event List window, Graphic editing window, or Tracks Overview, soundbites are not affected by selecting and editing operations in these windows. Likewise, if soundbites are deselected in the Edit Filter, they are not affected by Edit Bar selection in the Tracks window.

You can't mix audio and MIDI in the same track

In Digital Performer, there are two kinds of tracks: MIDI tracks and Audio tracks. 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, Digital Performer 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 bar chorus, including audio tracks, to cut, copy, or paste the audio data along with the MIDI data. Be aware, however, that in many cases you'll need to use the Split command in the Audio menu before applying the edit operation you would like to get the desired results. See "Splitting audio in the selected region before editing" on page 161.

Editing soundbites in the event list

Editing soundbites in audio track event list is pretty much the same as editing MIDI note data. Soundbites are treated as single 'events' in the track, and Edit menu commands such as Cut, Copy, Paste, Snip, Repeat, etc. affect soundbites in the same way that they affect MIDI notes. For information about audio event lists, see chapter 12, "The Audio Event List" (page 117). For basic information about event list editing, see the Event List chapter in the Performer MIDI Sequencing reference manual.

Editing soundbites in the graphic editing window

The graphic editing window offers many special audio editing and selection features. For detailed information, see "Selecting audio" on page 144 and "Editing selected audio data" on page 148.

Editing on zero crossings

A zero crossing is a point in the audio waveform where its value is exactly zero — or when it has no amplitude, positive or negative, as shown in Figure 14-2 on page 160. By their very nature, sound waves oscillate back and forth across the zero point many times per second.

Digital Performer gives you precise control over editing audio waveforms, allowing you to edit them at any point you choose. Chances are, however, that your edit points won't fall exactly on a zero crossing and will instead fall somewhere else between +100% and -100% amplitude in the waveform. The further away in amplitude an edit point is from zero, the more likely it is to cause an audible click, pop, or similar noisy artifact.

The *Edit on Zero Crossings* command in the Audio menu automatically prevents noise artifacts by making your edits gravitate to the nearest zero crossing. When this command is checked, soundbite boundaries will automatically be placed at the nearest zero crossing in the waveform, as shown in Figure 14-2. The trade-off is that your edits may occasionally get moved a few ticks before or after the point you originally chose. When you need precise control over soundbite start and end points — such as editing soundbites that consist of a stereo pair, uncheck this command and try to make your edits at points in the waveform where it is relatively low (as close to zero as possible). Otherwise, leave it checked to avoid clicks and pops.

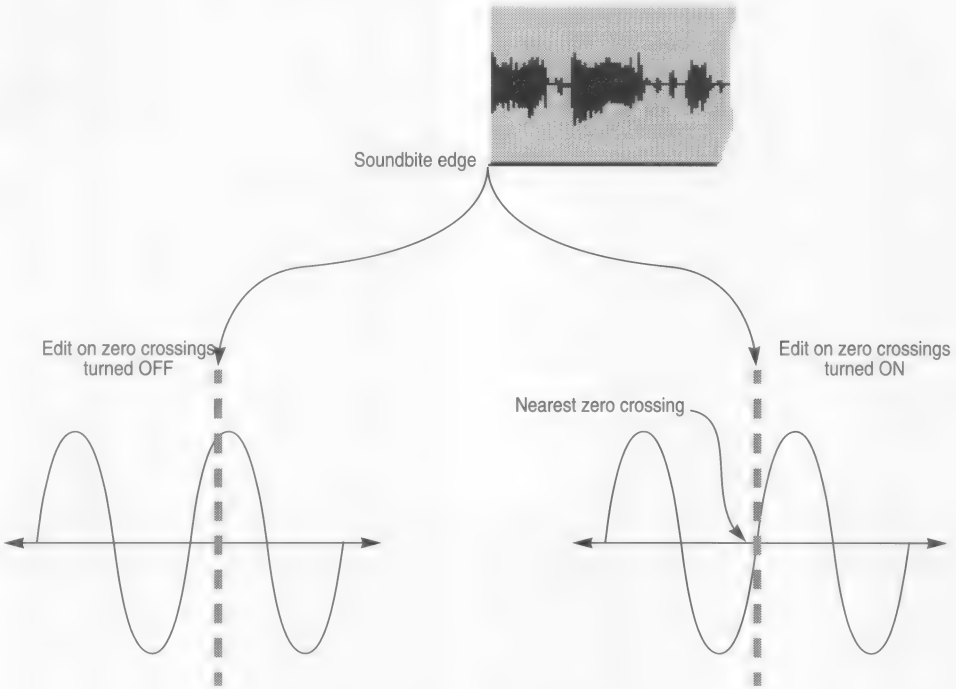


Figure 14-2: A simplified example of how the Edit on zero crossings command works.

Region editing in the Tracks window

Digital Performer's Tracks window provides flexible region editing across multiple audio tracks. You can also edit audio and MIDI tracks simultaneously. The process of region editing consists of the following basic steps:

1. **Select a region.**
2. **If necessary, choose Split from the Audio menu to create soundbite boundaries at the edges of the selected region.**
3. **Apply the desired operation from the Edit or Region menus.**

These steps are discussed briefly in the following sections.

Selecting regions

There are two basic ways to select regions of audio in the Tracks window:

- Highlight track names and set times in the Edit bar
- Select segments in the Tracks overview

In both cases, you can select MIDI and audio tracks together at the same time. For a detailed review of these methods, refer to the chapter called "Selecting Regions" in the Performer MIDI Sequencing reference manual.

Splitting audio in the selected region before editing

After selecting a region, it is important to realize that Edit and Region menu operations only affect a soundbite *when its attack falls within the selected region, and, if so, the soundbite is treated as whole, discrete event*. For example, if a note and a soundbite both start outside the currently selected region and extend into it as shown below in Figure 14-3, they would not be affected by the edit operation.

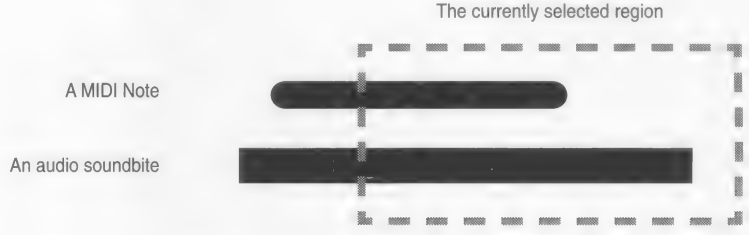
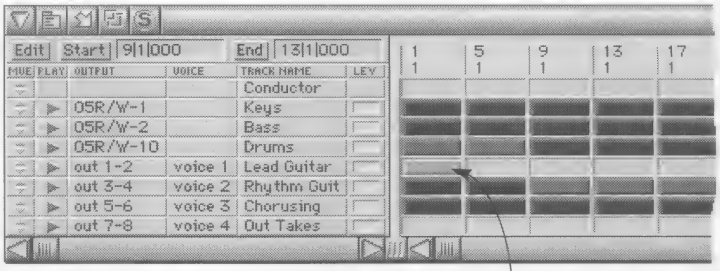


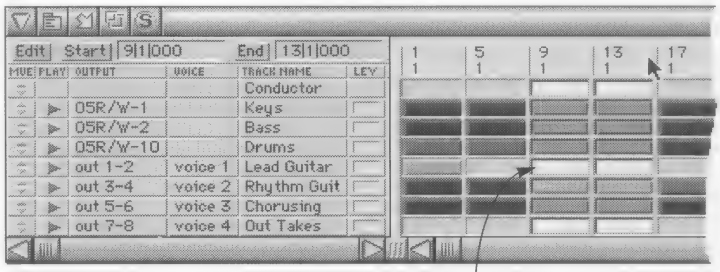
Figure 14-3: These two events would not be affected by a command like Change Velocity because their attacks occur outside the selection.

In some situations, this may be exactly what you want. But often, you'll want to edit the portions of audio that you've selected, regardless of soundbite attack times. For example, let's say that you have a guitar solo track that consists of a single, long soundbite that you recorded for the entire length of the sequence.



Guitar Solo starting at bar 1
(Soundbite plays for the entire track)

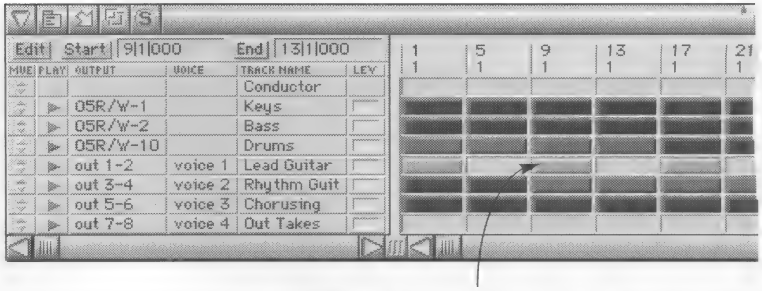
And you would like to copy an eight-measure verse from bar 9, along with the accompanying MIDI data, to paste it at the end for a fade. So you select bars 9 to 16 in the overview time ruler as shown below:



No audio is selected yet

But no audio data is selected yet because the soundbite attack falls outs side the selection (it's back at bar 1). To select the guitar solo audio in bars 9-16, you now have to choose Split from the Audio menu to make it a separate soundbite. This new soundbite can then be copied along with the MIDI data, as shown below. Once split, the chorus soundbite can be copied with the rest of the MIDI data within the region as shown below.

☛ Disable the *Edit on Zero Crossing* command when employing this technique to keep the new soundbite inside the selected region.



A new, 8-bar soundbite is created in bar 9, which can now be copied along with the MIDI data in the other tracks.

This technique can be applied before using just about any command in the Edit and Region menus.

Applying Edit and Region menu operations to audio

Once you've selected a region and, if desired, split the audio, you can choose any command from the Edit or Region menu. Region menu commands affect audio as discussed below.

The Change Duration command does not affect soundbites. Soundbite durations can only be changed by dragging them in the graphic editing window.

Region menu commands that affect timing (such as quantizing) 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. For details about Reverse Time, Retrograde, and other Region menu commands, see the chapter called *Region Commands 1* in the MIDI Sequencing Reference manual.

Split and Trim

The Split and Trim commands let you break up soundbites and trim them to the size you want.

Split

The Split command in the Audio menu allows you to break up a soundbite into separate, smaller soundbites. Split makes soundbite divisions at the boundaries of the region you select.

Split, Cut, and Erase all do a similar thing: they split out a section of the soundbite. The difference is that Split leaves behind the resulting piece, whereas Cut and Erase remove it. Split is a great way to break up audio soundbites so that pieces of a soundbite can be edited in the Tracks window along with MIDI data. If the region of audio that you want to edit along with MIDI is a portion of a soundbite, split the portion into its own soundbite and you can then cut, copy, and paste it right along with the MIDI data.

Trim

The Trim command in the Audio menu 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.

Using Split and Trim

To split or trim a soundbite:

1. **Select the region of audio you wish to split or trim.**

   You can use any region selection method you want. See "Selecting regions" on page 161, "Selecting a region in the time ruler over one or more tracks" on page 144, "Selecting a portion of a soundbite using the time ruler" on page 145, and "Selecting audio inside a soundbite by pop-editing it" on page 145.

2. **Set the "Edit on Zero Crossings" command as desired. (See "Editing on zero crossings" on page 159 for details.)**

3. **Choose Split or Trim from the Audio menu.**

   The soundbite is split or trimmed as shown in Figure 14-4. In the case of splitting, the soundbite is divided into three separate soundbites, each with a different name. There is no audible gap between split soundbites at this point (unless you move them).

4. **To change the name of the resulting soundbites, click each soundbite to select it and option-click its name in the info bar.**

Once split, soundbites can be dragged and edited independently.

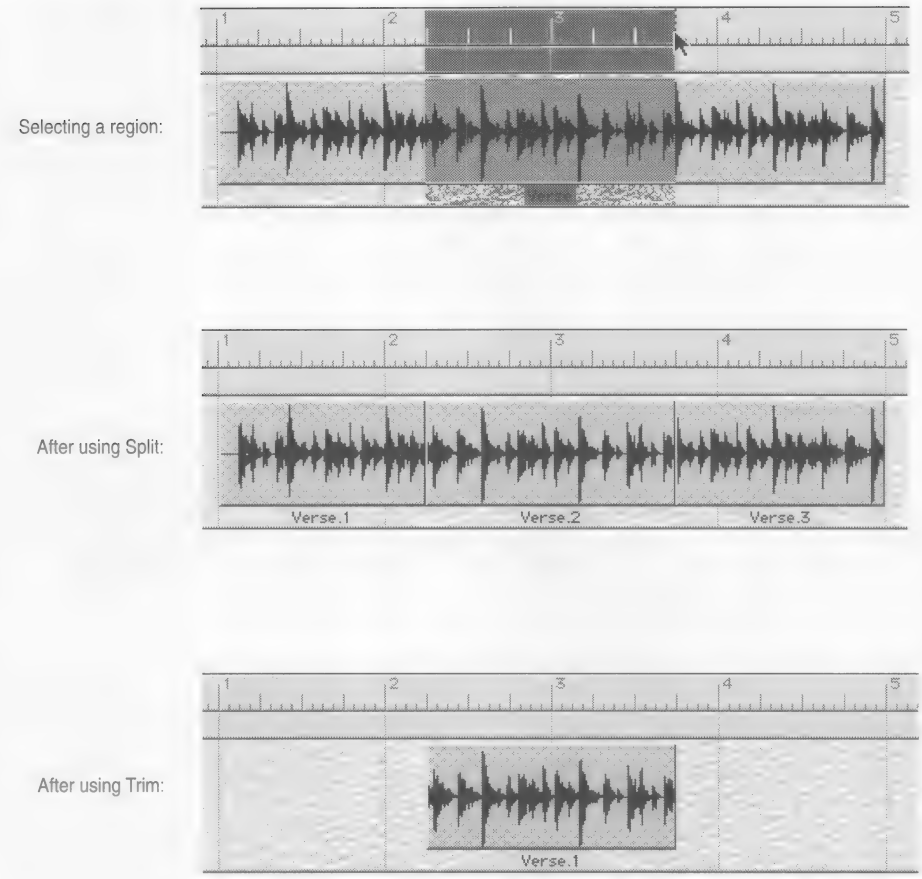
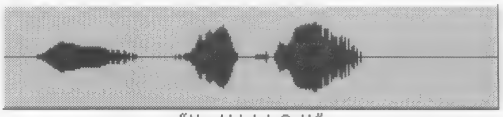


Figure 14-4: Using Split and Trim.

Strip Silence

Strip Silence breaks up a soundbite into several smaller soundbites by removing all of the portions that consist of silence. For example, the following soundbite consists of the spoken phrase "Hey! Watch out!":



"Hey! Watch Out!"

You could use Strip Silence to remove the silence from between the words and create three separate soundbites.

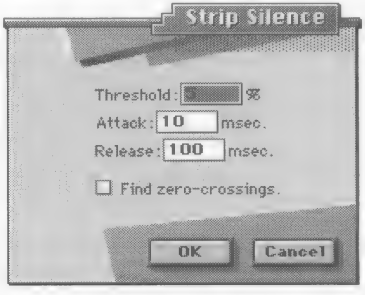
To use Strip Silence:

1. **Click the soundbite to highlight it.**

"Hey! Watch Out!"

2. **Choose Strip Silence from the Audio menu.**

   A dialog box appears asking for several parameters. See the discussion below for more information.



3. **Set the options accordingly and Click OK.**

   The space between each portion of sound (in this case each word) is removed and what remains are new, separate soundbites.

4. **Play back the new soundbites to check for clicks, pops, or cutoffs.**

   If the parameters you chose do not produce soundbite regions that are satisfactory, choose Undo from the Edit menu and try again with different parameters.

5. **When you get soundbite regions you are satisfied with, you can pop-edit their names in the Soundbites window to rename them.**

When Digital Performer creates new soundbites after stripping silence, it adds regions with the same name as the new soundbites to the parent audio file region list.

Setting the Strip Silence options

When you remove silence in a soundbite, Digital Performer needs a precise definition of silence from you, since there is always some noise in a recorded audio signal. The three options in the Strip Silence dialog box define silence. Together, they act just like a noise gate. They define a volume *threshold*, an *Attack* period, and a *Release* period.

Threshold

The *Threshold* is a cut off point for the (amplitude) level of the audio. If audio falls below the threshold, it will be cut. If it rises above the threshold, it won't be cut.

The Threshold is expressed in percent of amplitude; values range from 1 to 100%. What value you should use depends on the nature of the audio and the signal to noise ratio. The rule of thumb is to try to

set it as low as possible without generating unwanted soundbites (that are merely "noisy silence") or extensions at either end of soundbites. Using a low setting results in less clicks, pops, or clipping at the beginnings and ends of the soundbites created. But if you set the threshold too low, then hardly any audio will be removed, and you may still have unwanted low portions of the signal.

For "clean" audio with a high signal to noise ratio, use a Threshold value below 5%. You may be able to go as low as 1%, which will reduce a possible clipping effect at the beginning or end of each new soundbite and still produce individual soundbites that do not have an excessive amount of near silence at either end. With more noisy audio, you may have to select a higher Threshold to avoid creating lots of short, unnecessary soundbites.

Attack

The *Attack* is the minimum amount of time in milliseconds that audio must remain above the Threshold in order *not* to be cut. If the audio contains percussive attacks, such as drum sounds, you can set this fairly low (less than 10 milliseconds) to obtain a clean attack on the resulting soundbites. If the audio contains longer, sloping attacks, or irregular attacks, you might need to set this higher to avoid a clipped effect at the beginning of the soundbite.

Release

The *Release* is the period of time in milliseconds in which the audio must remain below the threshold in order to be cut. If the audio stays below the threshold for as long as the duration, it will be cut. If it rises above the threshold before the duration has passed, it will not be cut. Try values around 100 milliseconds. Set this value higher if the soundbites sound clipped at the end.

Find zero crossings

A zero-crossing is a point in the audio at which the waveform crosses zero amplitude (complete silence).

When checked, this option helps prevent clicks and pops at the boundaries of the soundbites by automatically moving the boundaries of each soundbite to the nearest zero crossing.

Reload Soundbite

When a soundbite is created, Digital Performer adds a corresponding region in the audio file with the same name as the soundbite. Digital Performer does this so that other applications (such as Sound Designer II) can access and use the regions. Most importantly, it prevents the region from being deleted when using the Compact command. (The Compact command never deletes audio data that falls within a region in the audio file's region list.)

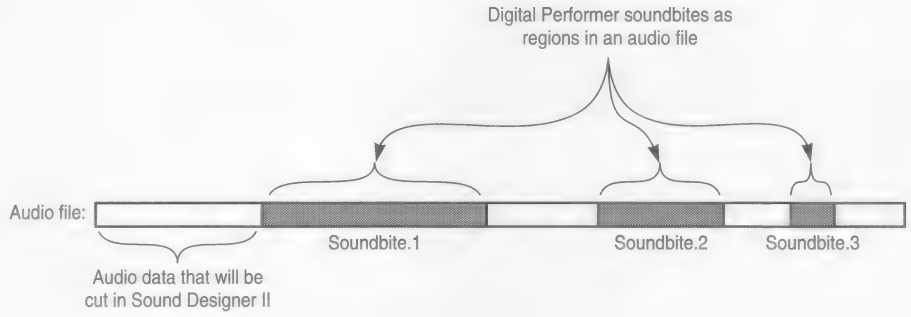
Use Reload Soundbite any time that you have made changes to a region in an audio file using software other than Digital Performer and wish those changes to be reflected in the region's corresponding soundbite in Digital Performer.

For example, let's say that you have changed a region's boundaries in an audio file using Sound Designer II, and you then switch back into Digital Performer. But now a discrepancy exists between the region in the audio file and the soundbite in the Performer file: the soundbite still consists of the original region, not the modified one. To make the soundbite match the region again, use the Reload Soundbite command.

To reload a soundbite, select the soundbite(s) by highlighting them in the Soundbites window, Event List, or Graphic Editing windows. (The Reload Soundbite command operates on only one soundbite at a time. If you select more than one in the Soundbites window, it replaces the highest one in the list. If you select more than one soundbite in the event list or Graphic Editing window, it replaces only the earliest one.) Choose Reload Soundbite from the Audio menu. Digital Performer searches in the parent audio file for a region that matches the name of the soundbite and loads the parameters for the region into the soundbite. Reload Soundbite affects all instances of a soundbite in a Performer file.

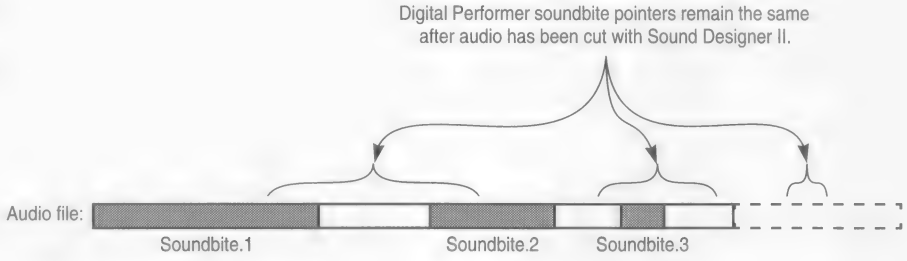
Reloading after destructive editing in an audio file

As another example, let's say that you have created several soundbites in Digital Performer.



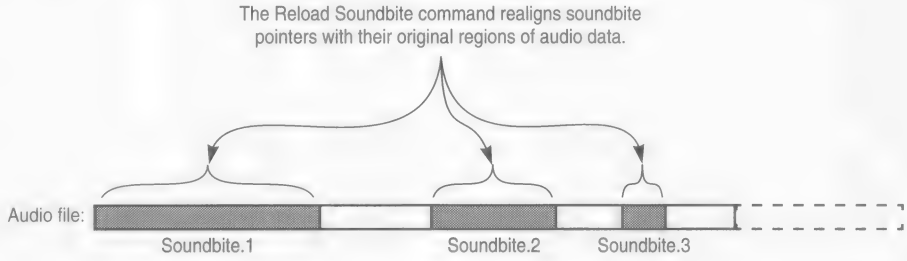
If you open the audio file with Sound Designer II and cut a region of audio data at the beginning, all of the regions after the cut are shifted earlier. Sound Designer II takes care of updating the region list within

the audio file, but Digital Performer, which may not even be running at the time, has no indication that anything has changed in the audio file.



The soundbites in Digital Performer no longer correspond correctly with the original regions of audio data, which have shifted earlier in the audio file due to the removed data. In fact, as you can see in the above example, Digital Performer is pointing to Soundbite.3 in a portion of the audio file that no longer even exists!

By using the Reload Soundbite command on the soundbites, you can properly re-align the soundbites in Digital Performer with their original regions of audio data:



To reload a soundbite:

1. **Select the soundbite you wish to reload.**

   You can do so by highlighting it in the Soundbites window, Event List, or Graphic Editing windows.

2. **Choose Reload Soundbite from the Audio menu.**

   Digital Performer searches in the parent audio file for a region that matches the name of the soundbite and loads the parameters for the region into the soundbite.

The Reload Soundbite command can be used any time that you need to refresh the boundaries of a soundbite.

In general, always use Reload Soundbite after modifying an audio file with other software besides Digital Performer.

> ☛ Please note: *Reload Soundbite affects all instances of a soundbite in a Digital Performer file.* In other words, reloading affects the soundbite and all "clones" of that soundbite wherever they may exist in audio tracks.

You'll notice that Reload Soundbite isn't really going to be used much if you don't use any other programs besides Digital Performer to work with the audio file. However, any time that you edit regions or audio data in an audio file, think about what impact the editing has on any Digital Performer files that contain soundbites from that audio file.

Reloading all soundbites in an audio file at one time

Often, you'll have several — and usually many — soundbites that originated the same audio file, and you'll need to reload all of them. Certainly a tedious task if you had to do so one at a time. But there is a shortcut for reloading all of them at once:

1. **Command-double-click the name of the parent audio file next to one of the soundbites in the Soundbites window.**

   It doesn't matter which soundbite you choose, as long as its from the parent audio file you need to reload from.

2. **In the dialog box that appears, locate and select the parent audio file.**

   If you are doing this procedure after having moved the entire project from one hard disk location to another, be sure to select the newly copied version of the audio file — not the original.

That's it. Digital Performer automatically reloads all of the soundbites in the file.

If reloading fails

The Reload Soundbite command fails if Digital Performer cannot find a region with the same name as the soundbite in its parent audio file. Or, it may not be able to find the parent audio file. If so, Digital Performer warns you that this is the case and asks you to select another region to replace the soundbite. For information about replacing soundbites, refer to the next section.

Replace Soundbite

The Replace Soundbite command is similar to Reload Soundbite but gives you more flexibility. It allows you to replace a soundbite with *any* audio file region— even an entirely different region from another audio file. In addition to updating the soundbite's start and end pointers, Replace Soundbite also updates the name if the soundbite is being replaced by a region with a different name.

Just like Reload Soundbite, Replace Soundbite replaces all instances of a soundbite in a Digital Performer file. Here's an example. Let's say that you recorded a vocal soundbite, named it *Yeah!*, and are using it as an effect in a mix. You have placed it fifteen or twenty times throughout the mix. During the course of the session, you decide that

you would like to replace all the *Yeah!*'s with a different soundbite that you recorded and named *Hey!* Replace Soundbite makes substitutions like this easy.

To replace a soundbite:

1. **Select the soundbite that you wish to replace.**

   The Replace Soundbite command operates on only one soundbite at a time. If you select more than one in the Soundbites window, it replaces the highest one in the list. If you select more than one soundbite in the event list or Graphic Editing window, it replaces only the earliest one.

2. **Choose Replace Soundbite from the Audio menu.**

   The open audio file dialog box appears. (See Figure 10-1 on page 95 for an example of this dialog.)

3. **Select the audio file and region you want to replace the soundbite with using the controls in the dialog box as shown in Figure 10-1 on page 95.**

   After you click the Done button, the new region takes the place of the old region. Likewise, all instances ("clones") of the old region in all the tracks are replaced as well.

Duplicate

The Duplicate command in the Audio menu creates an entirely new soundbite based on the currently selected soundbite. The new soundbite is given a different name from the original by adding a number extension to the end of the original name. For example, if you duplicate a soundbite with the name *Snare Hit*, Duplicate creates an identical soundbite with the name *Snare Hit.1*. The important thing to realize here is that you now have two separate soundbites that are not connected to each other. As a result, you can freely modify *Snare Hit.1* (drag an edge, for example) without affecting the original soundbite, Snare Hit.

Duplicating is different from copying a soundbite, which produces a "clone" of the original that is still connected to it. If you modify a copied soundbite, the original is modified, too (and vice versa).

> ☛ The Duplicate command does not duplicate the actual audio data; it duplicates pointers to the audio data. Therefore, destructive editing that you perform

on the duplicate soundbite with Sound Designer II will affect the original soundbite. So be careful when editing duplicate soundbites with Sound Designer II.

To use duplicate:

1. **Select the soundbites you wish to duplicate.**

   You can select as many at once as you wish. You can do so by highlighting them in the Soundbites window, Event List, or Graphic Editing windows.

2. **Choose Duplicate from the Audio menu.**

   A duplicate of the soundbite is placed at the bottom of the Soundbites window.

Edit in Waveform Editor

The *Edit in Waveform Editor* command in the Audio menu provides direct entry into Sound Designer II 2.5 (or higher) from Digital Performer. (Look for support of other waveform editing software in future releases of Digital Performer.)

This command allows you to perform "destructive" audio editing tasks not currently available directly in Digital Performer such as 'pencil tool' editing of digital audio samples or DSP features such normalize, reverse, time dilation, and so on.

For convenience, this command is activated by selecting a soundbite so that when you switch into Sound Designer II, the waveform window appears with the soundbite region already highlighted. Once in Sound Designer II, you can perform any Sound Designer II editing function that you wish on the selected region.

This command can be used to view the audio data in Sound Designer II's waveform window and to perform destructive editing tasks such as changing gain.

You can launch Sound Designer II from the Soundbites window, the Event List, or the Graphic Editing window. Highlight the soundbite you wish to edit and choose Edit Waveform Editor from the Audio menu, or command-double-click the soundbite. In the Soundbites list, you can simply double-click the soundbite. If this is the first time that you have opened Sound Designer II (or you have moved it since the last time you opened it) from within a copy of Digital Performer, a dialog box appears asking you to locate Sound Designer II on your hard disk.

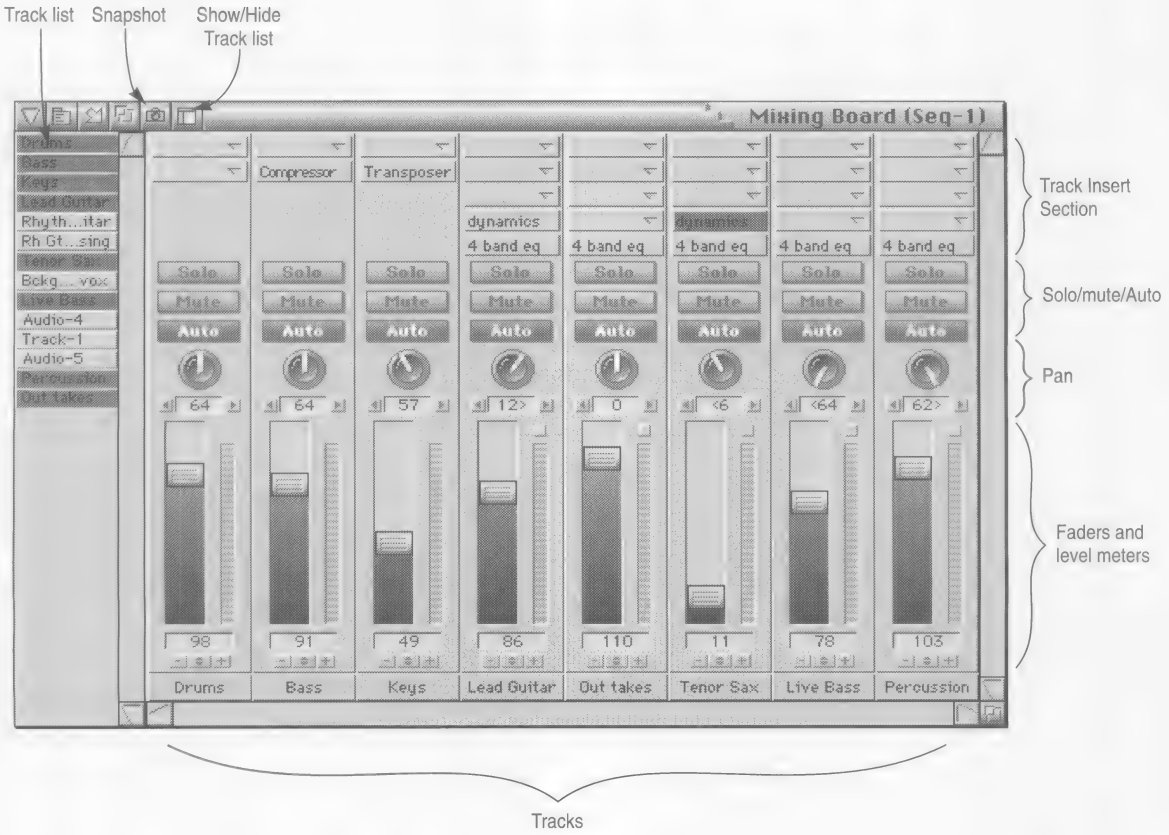
Chapter 15 *The Mixing Board*

Digital Performer's Mixing Board window provides a powerful integrated mixing environment for both MIDI and audio tracks. It also provides access to real-time effects processing for both MIDI and audio tracks, including access to Digidesign's powerful TDM mixing and effect environment, as well as the built-in EQ capabilities of Audiomedia II and non-TDM Pro Tools systems.

The Mixing Board will seem very 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.

Here is an overview of the main topics covered in this chapter:

Quick Reference



Track list: Click or drag over the names of the tracks in this list to show or hide them in the Mixing board. Option-click to hide all except the track you click; command-click to show all except the track you click.

Snapshot button: Takes a snapshot of the current settings for all visible pan and volume controls in the mixing board for every track currently being displayed. Command-click to include *all* tracks (even ones not currently displayed). The snapshot inserts controller events in each track at the current main counter location. This can be done while Digital Performer is stopped or playing back.

Show/Hide Track list: Shows and hides the list of tracks at the left side of the window.

Track Insert Section: Displays track inserts for MIDI and audio tracks. Choose the desired effect from the insert pop-up menu, or click a menu to open an effects window for the insert. MIDI track inserts consist of MIDI processing effects such as the transposer and velocity compressor. Audio inserts consist of TDM plug-in effects, such as EQ, dynamics, reverbs, delays, and any TDM-compatible plug-ins you currently have installed in your system. Built-in EQ is also provided on Audiomedia II and non-TDM Pro Tools systems.

Solo/Mute/Auto: These buttons perform standard soloing and muting functions. When the Auto button is turned off, volume and pan automation data in the track is temporarily disabled. "Glide" horizontally across these buttons with the mouse to quickly toggle several tracks at once.

Pan: Pans an audio track across its pair of outputs, as assigned in the Tracks list window. 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. For MIDI tracks, these pan pots generate standard MIDI panning data. Double-click the pan knob to go to pan center. If automation data has been recorded, knobs animate during playback (when the Auto 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 Auto button is enabled).

Level Meters: For audio tracks, the level meters display the audio output level for the track as determined by the soundbite velocities and volume controller data in the track. For MIDI tracks, the level meters indicate MIDI note-on velocities.

Tracks: Each strip in the Mixing Board represents a MIDI or audio track in the currently play-enabled sequence. Show or hide them as desired using the Show/Hide track list (described above). Drag the track strip name horizontally to re-order them.

Mini-menu

The top section of the mini-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 key to hide all sections except the one you choose; use the command 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.

Auto Resize: When checked, this menu item causes the Mixing Board window to resize itself when sections or tracks are shown or hidden.

Load Board Layout: Redraws the window with the mixing board layout that you choose from the sub-menu. A *layout* consists of which tracks and sections are currently showing in the window. There are several preset layouts, such as *Show Everything*, which shows all tracks and sections. You can also load a layout that you have previously created with the Save Board Layout command. A shortcut for this command is to option-click the title bar of the Mixing Board window.

Save Board Layout: Saves the tracks and mixer sections currently being shown in the window as a customized board layout, which you can name, save, and recall at later time using the *Load Board Layout* command described above.

Delete Board Layout: Discards the customized board layout that you choose.

Edit Group: Lets you add or remove faders or pan knobs from an existing group.

Create Group: Lets you create and name a group of volume faders and/or pan pots that will move together when you move any member of the group. To add or remove items from the group, choose the *Edit Group* command after creating it.

Delete Group: Discards a fader or knob group that you created.

Attach MIDI Controller: Lets you connect a mixing board fader or knob to an external MIDI controller, such as a mod wheel.

Clear MIDI Controller: Removes the connection to an external controller from the knob or fader that you select with the cursor.

Auto Punch-In/Out: A special record mode for volume faders and pan pots which causes them to record data into their track only when the control item is moved, either with the mouse or an external source.

Auto Punch-Out Delay: Allows you to adjust the delay before punch-out when you are in Auto Punch-In/Out mode and are controlling a control item from an external MIDI source. The Punch-Out time is the amount of time (in tenths of a second) after the last event is received by a control item from its external source before the control item drops out of Record.

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, choose the Mixing Board command from the Windows menu. If you have tracks selected at the time, the mixing board will appear with only those tracks showing. If you have multiple sequences in the file, it chooses the sequence to open by the front-most window on the screen, or alternately, by which sequence is currently play-enabled.

Showing and hiding tracks

To choose which tracks you want to display, click the track list button in the title bar as shown below to open the track list. Then just click tracks to either show them or hide them. Option-click to hide all except the track you click; command-click to show all except the track you click.

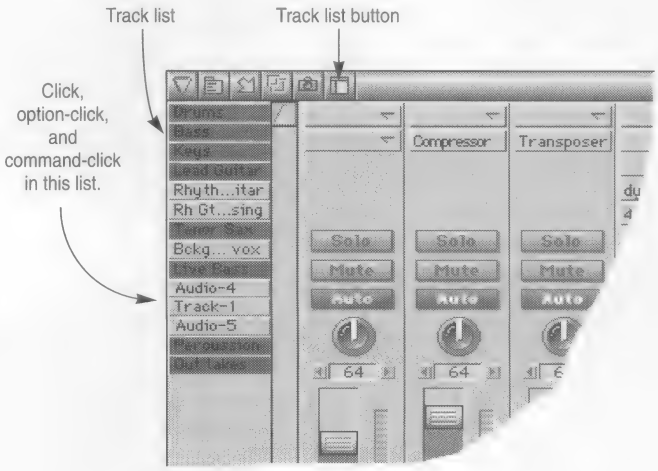


Figure 15-1: Showing and hiding tracks.

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 mini-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 key to hide all sections except the one you choose; use the command 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.

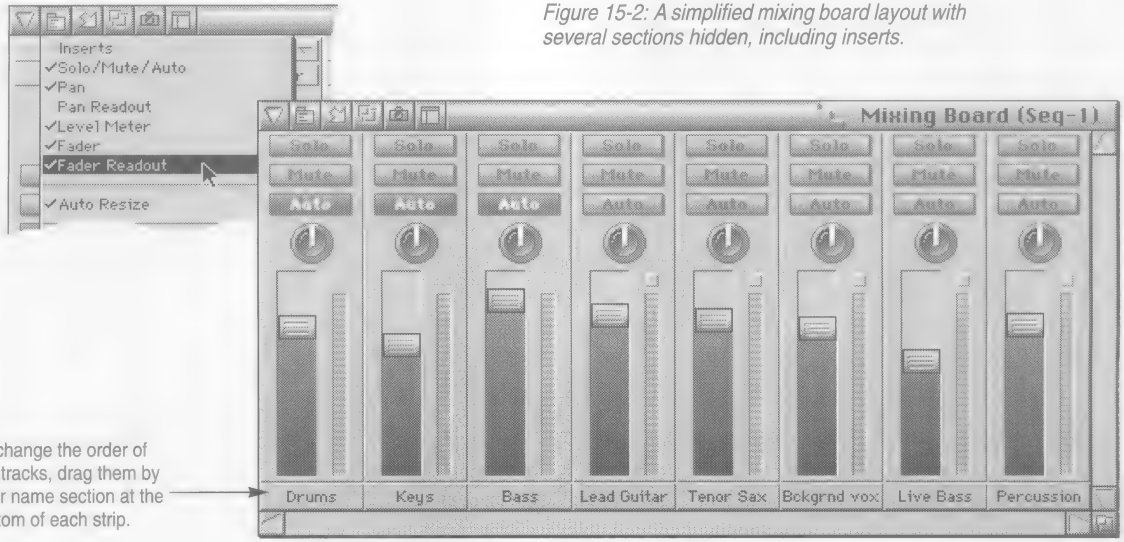


Figure 15-2: A simplified mixing board layout with several sections hidden, including inserts.

Saving custom board layouts

If you have favorite board layouts that you use frequently, you can save them and later recall them by name. To create a custom board layout:

1. **Using the window's show/hide track list, show the tracks you want to include in the layout; hide tracks you don't.**
2. **Using the show/hide section mini-menu commands, show the sections you want to include and hide the ones you don't.**
3. **Choose Save Board Layout from the mini-menu.**
4. **Type in a name for the layout and click OK.**

Switching board layouts

There are several ways to change board layouts:

- Choose the layout you want from the Load Board Layout mini-menu command
- Option-click the Mixing Board window title bar and choose the layout you want from the pop-up menu

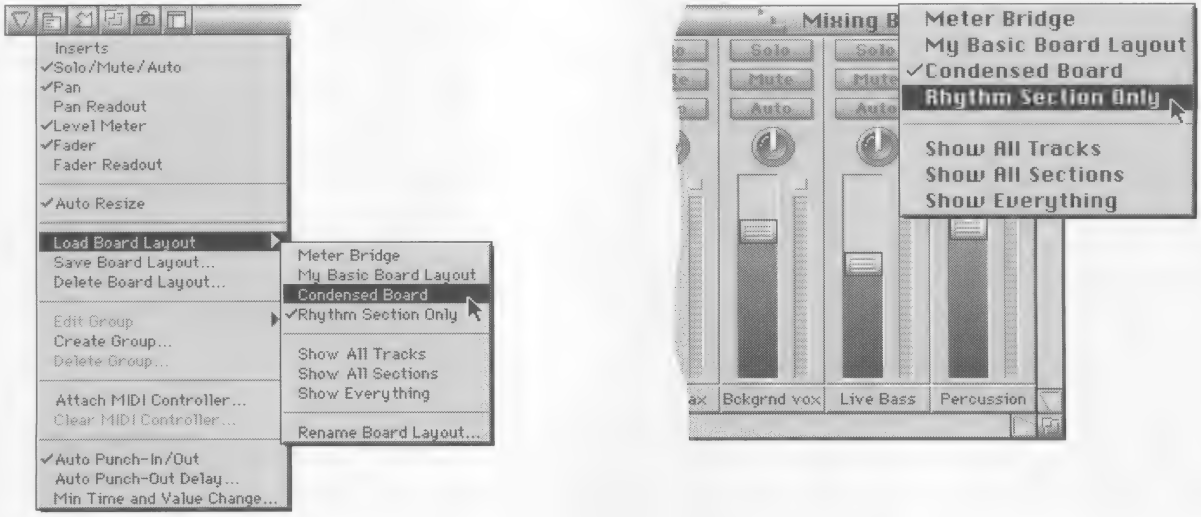


Figure 15-3: Switching mixing board layouts.

Renaming board layouts

To rename a board layout, choose the *Rename Board Layout* sub-menu item from the Load Board Layout mini-menu command.

Manually resizing the Mixing Board window

You may notice that the mixing board window automatically resizes itself when you add or remove tracks, show or hide sections, or switch board layouts. This is because the *Auto Resize* mini-menu command is checked. If you would prefer to resize the window manually using the grow box in the lower right corner, uncheck Auto Resize.

Switching sequences

To quickly switch the sequence you are looking at in the Mixing Board window, command-click the window's title bar and choose the desired sequence from the pop-up menu. The tracks shown in the Mixing Board will change when you change the play-enabled sequence.

Track strips

Each MIDI and audio track strip has the sections shown below.

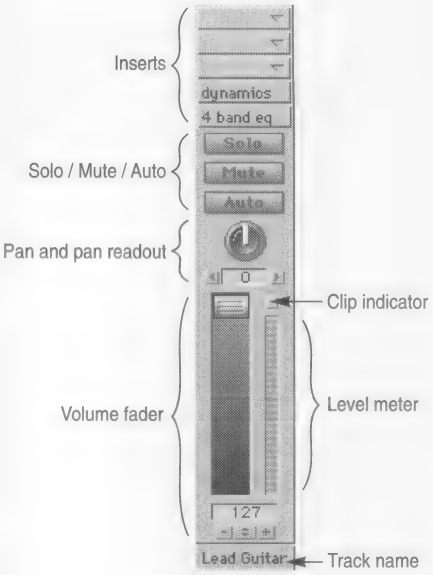


Figure 15-4: A Mixing Board track strip.

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 a velocity compressor or a transposer. (Look for more MIDI processing effects in future versions of Performer.) Audio tracks can be processed by built-in EQ (with audio hardware that supports it) or by TDM plug-ins (with hardware that supports TDM) such as reverb, dynamics, delays, or any TDM-compatible plug-ins you currently have installed in your system.

Each insert in the track is represented as a pop-up menu from which you can choose the desired affect. Audio tracks have 5 inserts. MIDI tracks have 2 inserts (with more becoming available in future versions of Digital Performer as more MIDI processing modules become available). When you select the desired processor type from a pop-up menu, the Effects window opens to display the selected processor's parameters. See "The Effects window" on page 194 for more information.

☛ Selecting audio effects during playback causes audio playback to pause while the change is being made. This is normal.

The audio signal 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.

Audio effects are applied *pre-fader*, so it is possible to accidentally cause clipping if you boost insert gains too high. Be careful when setting insert levels in the Effects window.

Insert settings apply globally to the entire track and are remembered until you change them, even if you open the file using a non-TDM system and then re-open it again on a TDM system. Effects cannot be automated in Digital Performer Version 1.6. Look for this feature in a future update.

Solo and 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 in the Tracks List window. For example, when you mute a track in the Mixing Board, its play-enable button becomes disabled in the Tracks List window.

When soloing and muting, the volume fader background color changes to indicate the playback state of the track as follows:

Fader background color		Meaning
Color screen	**Black & white**	
Blue	Dark gray	Track can play
Orange	Light gray	Track cannot play because at least one other track is soloed
Gray	White	Track is muted

Auto buttons

When the Auto button is turned off, volume and pan automation data in the track — including controller chasing — is temporarily disabled, allowing you to override the automation data with the current pan knob and volume fader setting.

☛ Auto buttons cannot be turned on and off during playback or recording.

Button shortcuts

The table below describes several shortcuts for the Solo, Mute, and Auto buttons:

To do this:	Do this:
To solo or mute all tracks except the one you click	Command-click the track's solo or mute button
To unsolo or unmute all tracks except the one you click	Option-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

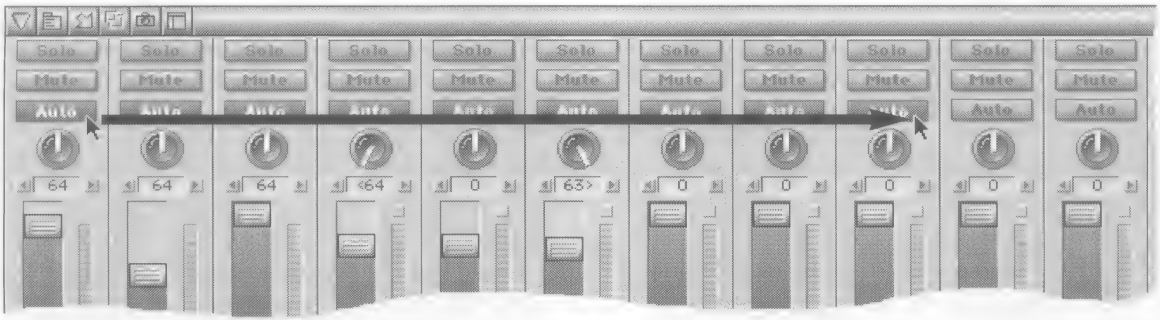


Figure 15-5: Gliding across the Solo, Mute, and Auto buttons. You can combine gliding with the command and option key modifiers as described in the table above.

Panning

Pan knobs pan an audio track across its pair of outputs, as assigned in the Tracks list window. 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. For MIDI tracks, these pan pots generate standard MIDI panning data.

The data range for MIDI tracks is zero to 127, where zero is hard left. The data range for audio tracks is <64 (hard left) to 63> (hard right).

Below is a summary of techniques for pan knobs:

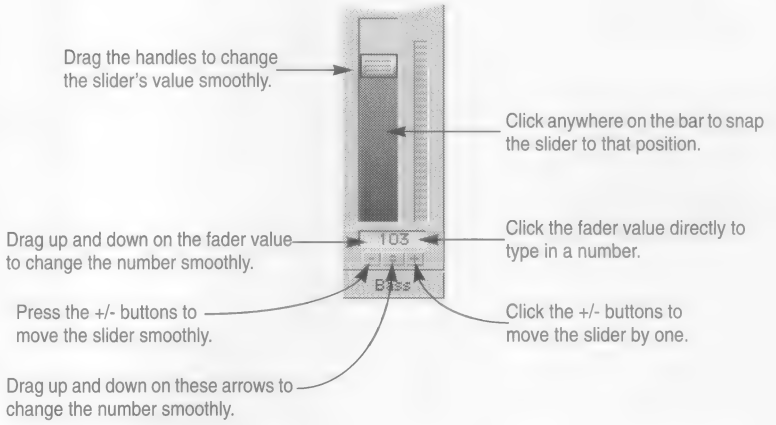
To do this:	Do this:
Change panning smoothly over time	Drag the pan knob up and down or left and right, or click on the number in the value readout and drag up or down
Go directly to pan center	Double-click the knob
Increment or decrement the pan setting by one	Click the left or right arrow button

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 Auto button is enabled).

The background color of volume faders changes depending on the solo and mute state of the track. See "Solo and Mute buttons" on page 183 for details.

Below is a summary of mousing techniques for changing the values of Mixing Board volume faders:



Controlling pan and volume from an external MIDI controller

To control a volume fader or pan knob from an external MIDI controller such as a mod wheel on a keyboard, use the *Attach MIDI Controller* command in the Mixing Board window mini-menu as described later in this chapter in "Remote control" on page 192.

Level meters

For audio tracks, the level meters display the audio output level for the track as determined by the soundbite velocities and volume controller data in the track. For MIDI tracks, the level meters indicate MIDI note-on velocities only (the fader indicates controller #7 MIDI volume).

The *Set Level Meter Range* mini-menu command in the Audio Monitor window controls the dynamic range displayed in the Mixing Board level meters. For details, see "Adjusting the level meter range" on page 89.

Option-selecting the level meter mini-menu command in the Mixing Board window creates a meter bridge, which you can save as a custom board layout.

Monitoring input levels on TDM systems

When recording audio tracks in TDM systems, the input level is monitored in the Mixing Board output level meter for the currently record-enabled track (see the note below, however). This means that you can control the monitor level and pan position from the Mixing Board window and can apply effects to the monitored signal as well.

> ☛ Due to the way DAE works, *input is not necessarily monitored out the track that is record-enabled*. If another track exists that is assigned to the same voice AND has higher priority (i.e. is higher in the list), then that track will monitor the input instead. To work-around this situation, you can move the record-enabled track to the top of the list or you can make sure that the record-enabled track is the only track assigned to that particular voice.

Clip indicators

Audio tracks display a clip indicator above their level meter as shown in Figure 15-4 on page 182. If the *Retain Clip* mini-menu command in the Audio Monitor window is checked (see "Retain clip" on page 90 for details), these clip indicators will remain illuminated until you click them. Double-click to clear all clip indicators.

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.

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.

> ☛ Most of these procedures are identical to working with sliders in Performer's custom console feature.

The importance of event chasing

Automated mixing in Digital Performer is heavily dependent on audio and MIDI controller event chasing. Event chasing causes Digital Performer to always scan tracks for controller events to make sure that playback levels are correct, regardless of where you start playback. (For complete information, see "Event Chasing" on page 116 of the Performer Reference Guide.)

For a consistency during the mixing process, it is best to enable event chasing for audio volume, audio pan, and MIDI controllers. To do so, choose the *Set Event Chasing* command from the Basics 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 Digital Performer or externally using an automated mixing console or other hardware automation system, it is always best to set initial volume and pan settings in all of your tracks. This ensures consistency in your mix, gives Digital Performer an initial setting to chase to, and gives you a basis for any changes made later in each track.

In Digital Performer's MIDI tracks, there is no default volume or pan setting per se, which means that when you first open a new or existing Digital Performer file, the pan and volume settings for each track will be in whatever state they were last left in the MIDI device itself. Setting initial levels takes care of the consistency problems that arise from this situation.

In audio tracks, Digital Performer defaults to pan center and unity gain. For example, if you open a new file, open the mixing console, and press play, the volume faders for the audio tracks will snap to their maximum position (assuming that their Auto buttons and event chasing haven't been turned off). Obviously, you'll want to set initial lower levels so that you have room to mix.

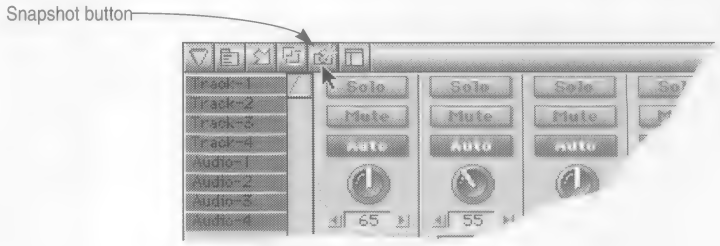
The procedure for setting initial values is simple:

1. **Open the Mixing Board.**
2. **Show all tracks you wish to initialize; hide ones you don't.**

   Use the show/hide track list as shown in Figure 15-1 on page 179. Tracks don't actually have to be *visible on the screen*, just selected in the track list.
3. **Rewind Digital Performer to the beginning of the sequence (or locate to wherever you'd like to place the initial settings).**
4. **Make the desired volume and pan settings for each track.**

5. **Click the Snapshot button in the Mixing Board window title bar.**

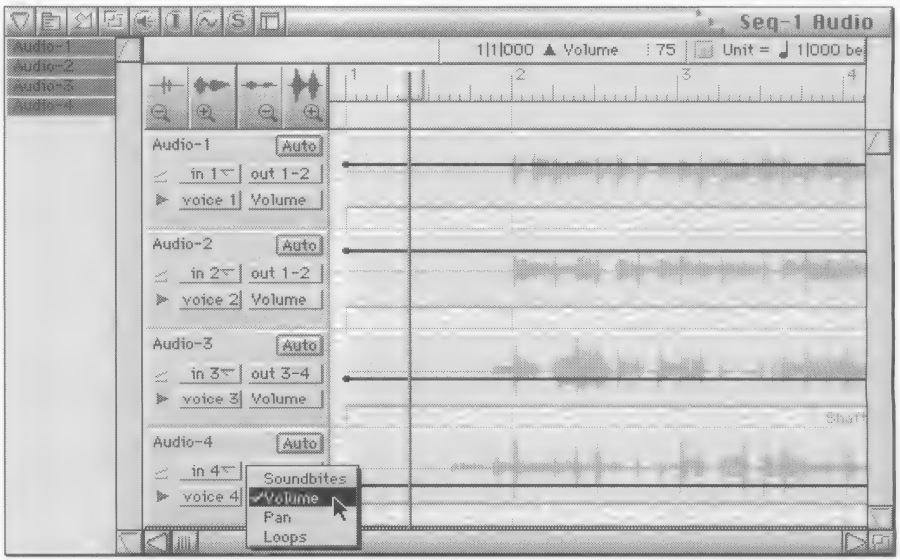
   Command-click the button to capture *all* controls, including ones that are not currently showing in the window.



If you change your mind, you can undo the snapshot.

Viewing initial settings

You can view the initial settings for audio tracks in the Audio Graphic Editor by opening it and selecting volume or pan from one of the track display pop-up menus with the option 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 Digital Performer 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

Once you have set initial levels, you have established a basis from which to create automated changes in the mix by recording in real time. The next few sections explain how to do so.

Turn off all track record-enable buttons before you start recording a mix

When the Mixing Board window is the front-most (active) window, Digital Performer allows you to start recording without having a track record-enabled. But be sure to turn off all record-enable buttons in the Tracks window before you begin recording a mix to avoid accidentally erasing notes, soundbites, or other data.

After doing so, click the Mixing Board window title bar (or choose it by name from the Windows menu) to make it the active window.

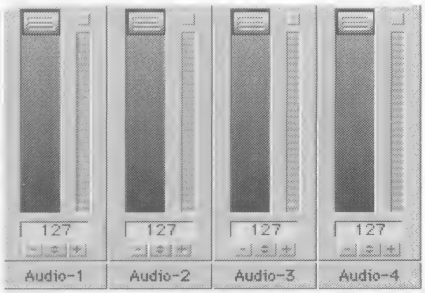
Recording fader moves

Once you've made the above preparations, you are ready to record. Just press the record button in the Consolidated Control panel and drag faders as desired. All of your moves will be recorded in real time, including entire fader groups when you move them.

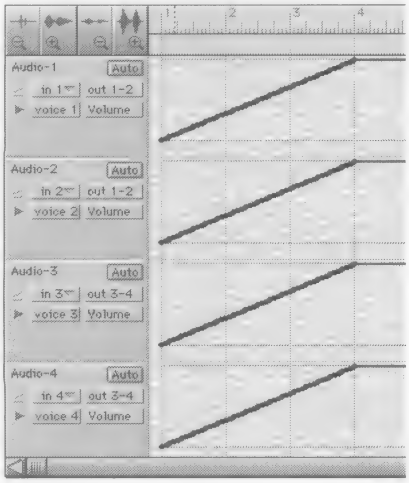
Faders automatically punch in when you drag them and punch out when you release them, so you can punch in on top of existing automation data on the fly. If you want, you can disable automatic punch in as described in the next section.

Recording with Auto Punch-In/Out turned off

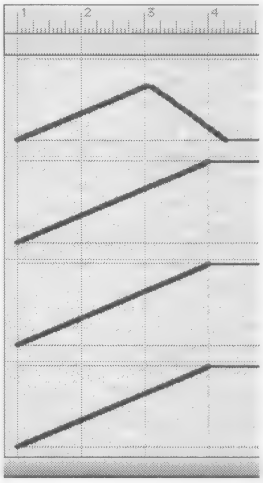
When you uncheck the Auto Punch-In/Out command in the Mixing Board mini-menu, and the Mixing Board window is open, all faders and knobs currently visible in the window punch in as soon as you begin recording. As recording continues, they continuously wipe out any existing automation data in the tracks as shown in Figure 15-6 on page 190. This is useful for "wiping out" existing automation data on multiple tracks in one record pass.



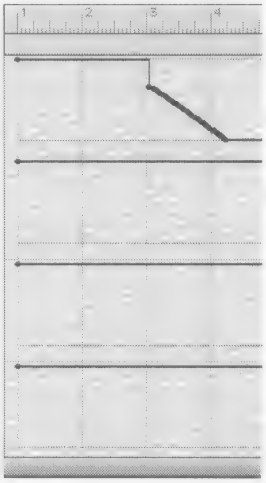
Initial fader positions at 1|1|000 before recording begins.



Existing Data
Existing volume automation data in tracks.



Auto Punch-In/Out turned on
Results after recording a 2-measure fade out at bar 3 with Auto Punch-In/Out turned on.



Auto Punch-In/Out turned off
Results after recording a 2-measure fade out at bar 3 with Auto Punch-In/Out turned off.

Figure 15-6: Recording faders with Auto Punch-In/Out turned off.

Controlling data density

The *Min Time and Value Range* mini-menu command in the Mixing Board window lets you control the density of the automation data events generated by the Mixing Board faders and knobs. Higher minimum values produce lower density, which places less strain on the audio playback engine (DAE), 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.

Editing your mix graphically

Keep in mind that all of the procedures above describe the mixing process from the standpoint of the Mixing Board. You can also edit your mix graphically in the Audio Graphic Editor. For details, see "Editing volume, pan, and loops graphically" on page 149.

Grouping

The Mixing Board allows you to create an unlimited number of fader and/or knob groups. Once a group is created, dragging any fader within the group moves all members of the group, scaling them proportionally to their current values. Option-dragging temporarily overrides the group to adjust a control relative to the group.

Creating a new group or modifying an existing one

To create a fader group or modify an existing one:

1. **If you are creating a new group, first choose Create Group from the Mixing Board mini-menu, type in a name for the group, and click OK.**

2. **If you are modifying an existing group, choose Edit Group from the Mixing Board mini-menu and select the group you just created from the sub-menu.**

   After either step 1 or 2, the cursor turns into a plus sign to indicate that you are now ready to add (or remove) faders and/or knobs from the group. Existing faders in the group display a flashing green (or black) box.

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

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

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

5. **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-period, the escape key (esc), or click elsewhere in the window (such as the title bar).

Temporarily overriding the group on the fly

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

Deleting and renaming groups

To delete or rename a group, use the *Delete Group* and *Edit Group/ Rename Group* mini-menu commands.

Temporarily disabling automation

You can temporarily disable the automation data in a track by turning off the track's Auto button in the Mixing Board (shown in Figure 15-4 on page 182) or the Audio Graphic Editor.

Remote control

You can control any of the faders or knobs in the Mixing Board from any external source that can generate MIDI controller data, such as a mod wheel on your controller keyboard, a MIDI fader box such as JL Cooper's FaderMaster™, or a battery of faders on a MIDI-controlling mixing console such as Yamaha's ProMix 01™.

Attaching a MIDI controller to faders and knobs

Use the *Attach MIDI Controller* command to set up external control of faders and knobs as follows:

1. **Choose Attach MIDI Controller.**

   The cursor changes to a plus sign.

2. **Click the fader or knob you wish to control externally.**

   A red box appears around the control indicating that Digital Performer 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 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.**

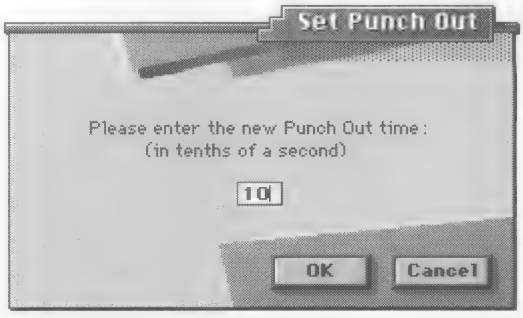
   To cancel, press command-period, the escape key (esc), or click elsewhere in the window (such as the title bar).

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-period to cancel.

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 Digital Performer 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 Digital Performer punches out with the *Auto Punch-Out Delay* command in the Mixing Board window mini-menu.



The Effects window

The Effects window is a like a "floating palette" for Digital Performer's real-time MIDI and audio processing effects. 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.

MIDI, audio, and TDM effects

The Effects window provides velocity compression and transposition for MIDI tracks (with more MIDI effects on the way in future updates). Built-in EQ is available for hardware configurations that support it. For example, AudioMedia II has one EQ, and Pro Tools has two. The Effects window also provides access to all TDM-compatible plug-ins installed in your system for audio hardware systems that support TDM.

EQ for Audiomedia II and non-TDM Pro Tools systems

Digital Performer provides access to the built-in EQ capabilities of Audiomedia II systems and non-TDM Pro Tools. Audiomedia II provides one EQ and Pro Tools (without TDM) provides two. These built-in effects are accessed in the usual way via the insert pop-up menus and Effects window as described in this section.

How effects settings apply to a track

Effects settings apply globally to the entire track and are remembered until you change them, even if you open the file using a non-TDM system and then re-open it again on a TDM system. Effects cannot be automated in Digital Performer Version 1.6. Look for this feature in a future update.

Opening the effects window

There are several ways to open the effects window:

- Choose an effect from any insert pop-up menu in the Mixing Board window
- Click an insert pop-up menu that already has an effect
- Choose Effects from the Windows menu

Quick reference

Below are the basic controls in the effects window. The controls for each specific effect will, of course, vary.

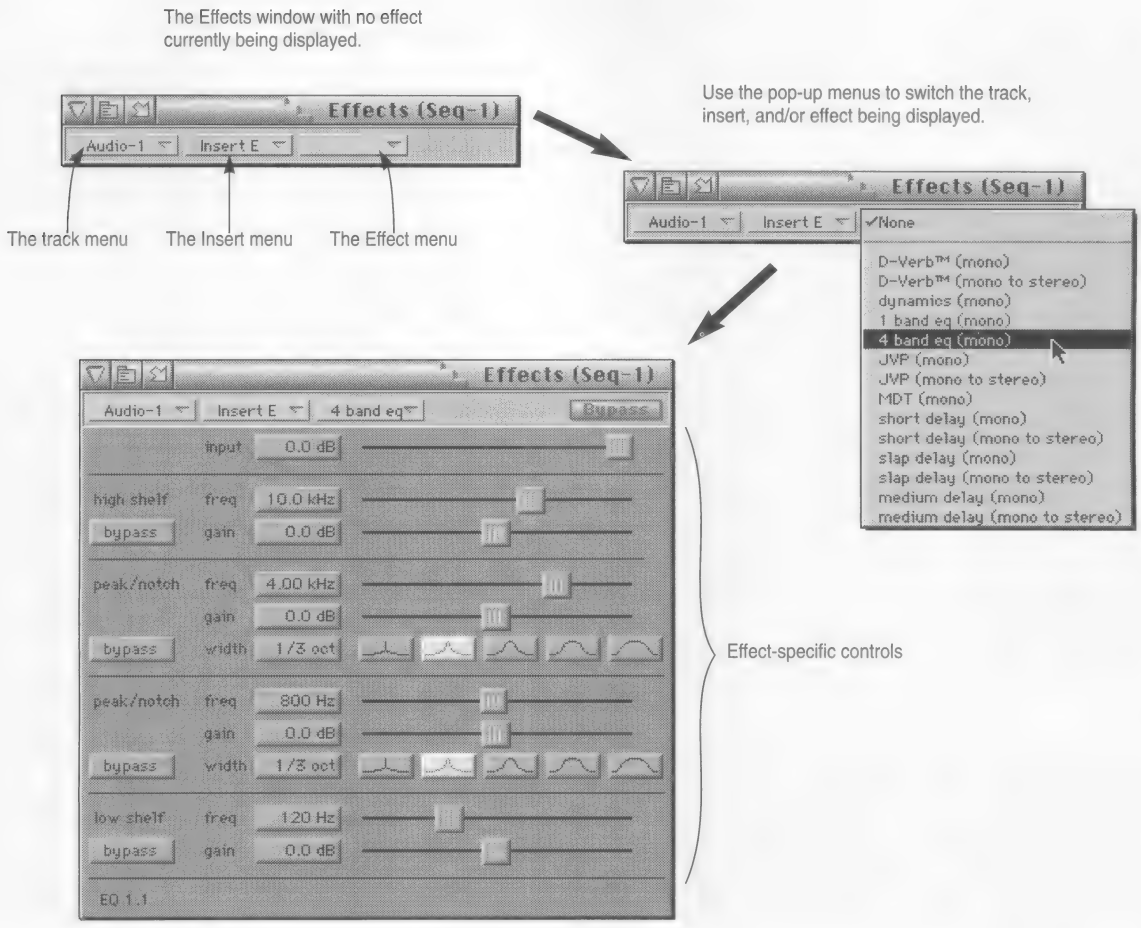


Figure 15-7: Digital Performer's Effects window.

Choosing a new effect for an insert

To choose an effect for an insert, select the desired effect from the insert pop-up menu. When creating a new effect, Digital Performer uses the most recent settings for that effect. For example, if you tweak EQ parameters on one track until they are just right, adding the EQ effect to another track will initially apply the same settings.

Opening an existing effect on an insert

To open an existing effect on an insert, click the insert pop-up menu.

Copying and pasting parameters from one insert to another

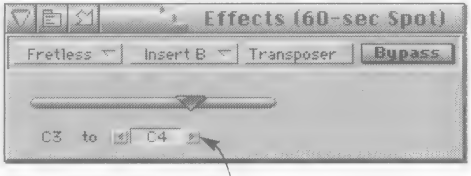
You can copy and paste effects parameters from one insert to another. Just choose Copy from the Edit menu while a specific insert's effect is being displayed, switch to a different insert with that same effect, and choose Paste.

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. For example, if you add TDM effects, switch to a non-TDM system and save the file, the TDM effects remain saved with the file, so that they will still be there when you switch back to a TDM system.

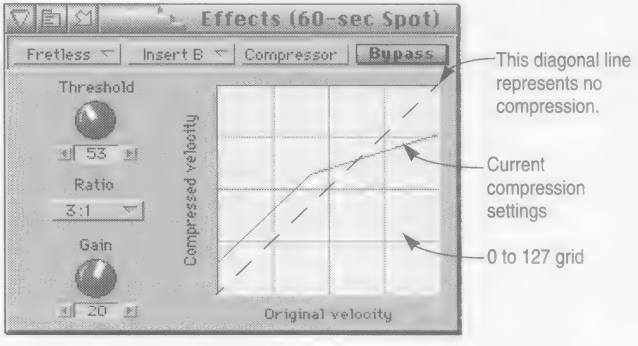
MIDI Effects: the velocity compressor and transposer

Digital Performer currently provides two MIDI effects: a velocity compressor and transposer, which are described below.



Transposer

Choose any interval of chromatic transposition using the slider or by editing the pitch text box (type, drag up/down, or click the arrow buttons). 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.



Velocity compressor

The graph shows the result of the compression settings. A diagonal line from lower left to upper right represents no compression. The higher the **ratio**, the higher compression. **Gain** allows you to raise or lower the overall level while compressing. **Threshold** sets a cutoff value, below which no compression will occur.

Working with TDM

TDM is Digidesign's virtual mixing and routing environment for Pro Tools™ systems. If you have TDM hardware and software installed in your system, the Effects window provides access to all of the TDM-compatible plug-ins currently installed in your system.

Consult your TDM User's Guide for complete information about TDM installation and setup, as well as general information about what TDM is and how it works. The sections below explain how you access and use TDM within the Digital Performer environment.

When TDM is installed, it provides the following features to Digital Performer:

- Virtual mixing
- TDM effects plug-ins

These features are discussed in the following sections.

Virtual mixing with TDM

TDM's virtual mixing capabilities are employed when you make output assignments for audio tracks in the Tracks window. For example, if you assign several audio tracks to outputs 1 and 2, TDM takes care of the mixing necessary to merge the tracks to a single stereo output pair.

The impact of mixing on effects

From the standpoint of Digital Performer, the only thing you need to know about TDM mixing is that it requires DSP resources. The more mixing that TDM has to do, the less DSP power is left over for TDM effects such as EQ, reverb, etc. For a "guerilla guide", see "Managing your DSP resources" below. For a complete understanding of this topic, consult your TDM manual.

Using TDM effects

One of the best things about TDM is how powerful — and yet easy to use — it is. Basically, all you have to do is choose the TDM plug-in effect(s) you want for each track. The Effects window displays the parameters for the effect, exactly as they are implemented by Digidesign or third-party TDM developers. For information about specific effects, consult the documentation for the effect.

Mono versus stereo effects

TDM effects can be either mono, stereo or mono-to-stereo. By default, audio tracks are mono and are panned across the output pair assigned to the track in the Tracks window. If you assign mono TDM effects, the track remains mono. However, as soon as you choose either a stereo or mono-to-stereo effect, the track's output becomes

stereo. In addition, all other effects currently assigned to the track will dynamically switch to stereo as well. If you remove the stereo effect, the track will then dynamically revert to mono.

Be careful when boosting gain

Some TDM plug-ins provide volume controls of their own. Because Digital Performer's effects inserts are pre-fader, it is possible to boost level above unity gain with a plug-in's volume control. Because everything is happening digitally, there is no headroom *at all*, and distortion will occur immediately past zero dB, so be careful.

Panning with stereo effects

Stereo effects cause the track's pan knob to become "stereo pan". The following chart explains 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
		
		
		

Managing your DSP resources

The trickiest part about using TDM effects in Digital Performer (or any TDM system) is managing your DSP resources. TDM hardware has limits to the amount of mixing and effects processing it can provide at one time. Fortunately, TDM has an open architecture, allowing you — finances permitting — to purchase extra DSP farm boards to extend the capabilities of your system. But regardless of your hardware configuration, the following pointers will help you best manage your processing resources.

Each DSP chip can only do one type of processing

Each DSP chip in your system can only do one type of processing (mixing, EQ, reverb, dynamics, delays, etc.) at a time. On the other hand, one chip can share several similar types of processing. For example, one chip might be able to process several different types of EQ's. So, for example, when you choose an EQ plug-in for the first time, you have just dedicated an entire DSP to EQ — even if the EQ

you choose doesn't require all of the DSP's power. If you then choose a reverb effect, another DSP chip is then allocated for reverb-type effects.

A single DSP can hold many simple plug-ins or a single complicated plug-in

For example, a DSP may be able to hold seven 4-band EQ plug-ins, but only one reverb plug-in.

At least one chip is always dedicated to mixing

The diagram below shows the minimum allocation for disk I/O and mixing in a core Pro Tools system and a core Pro Tools III system. The other DSPs are available for any other type of TDM effect that you have.

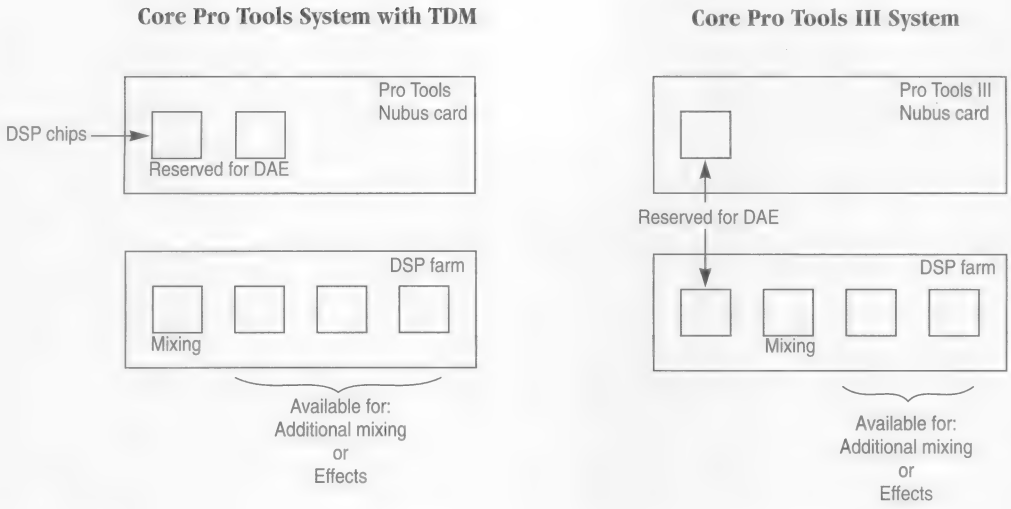
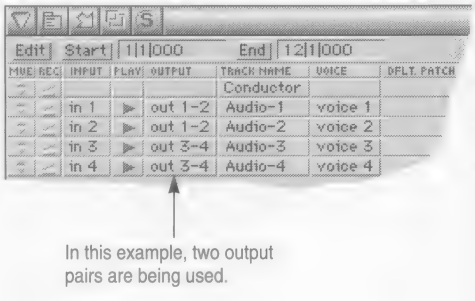


Figure 15-8: DSP allocation in the core Pro Tools I and III systems.

Audio track output assignments affect DSP usage

The number of different output pairs you use, in addition to the number of audio tracks you have assigned to them, affects the amount of DSP processing power used for mixing. The table below in Figure 15-9 shows the maximum number of output pairs and tracks a single DSP chip can hold for mixing. If you go over these limits in your audio track assignments, then mixing will spill over into a

second, additional DSP chip. Mono audio tracks consist of one TDM mixer input; tracks with stereo TDM effects on them take up two TDM mixer inputs. Audio voice assignments have no impact on DSP allocation.



Number of output pairs used for audio tracks	Maximum number of TDM mixer inputs possible on one DSP chip
1 output pair	24 inputs
2 output pairs	22 inputs
3 output pairs	19 inputs
4 output pairs	16 inputs
5 output pairs	13 inputs
6 output pairs	10 inputs
7 output pairs	8 inputs

Figure 15-9: The maximum number of output pairs and tracks that a single DSP can support. Mono tracks consist of one TDM mixer input; tracks with stereo TDM effects on them take up two TDM mixer inputs.

Additional considerations

Here are a few additional things to keep in mind:

- A single DSP can support up to 28 bands of mono EQ
- A single DSP can support up to 8 mono dynamics plug-ins or 4 stereo plug-ins
- A single DSP will support a maximum of 2 short, 2 slap, and 2 medium mono delays
- Stereo DSP plugs-ins use twice as much DSP as mono plug-ins

Digital Performer warns you when resources are exceeded

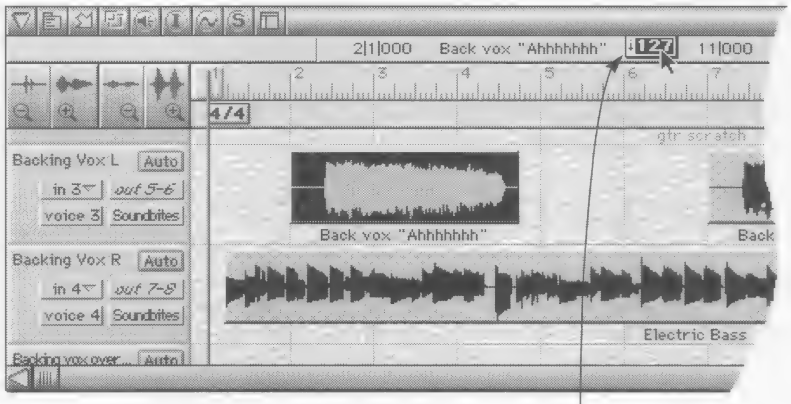
Don't worry about accidentally exceeding your DSP resources. Digital Performer will warn you if it cannot successfully allocate resources as a result of something that you do, such as add more audio tracks or choose a new type of effect.

Additional mixing techniques

In addition to the powerful features in the Mixing Board, Digital Performer provides a host of other techniques to handle mixing tasks. Volume control in audio tracks is very similarly to the volume control of MIDI notes: on-velocities and audio volume continuous controllers. The following sections provide an overview of ways to edit them, along with references to further information elsewhere in this manual and the *Performer Reference Manual*.

Using soundbite velocities to control volume

Soundbites have on-velocities that affect their volume, just like notes. The range is from zero to 127. You can edit velocities individually in the Event Editing windows, or you can use the Change Velocity command in the Region menu to edit a region of them. You can even select audio tracks together with MIDI tracks to change the velocity.



Pop-editing a soundbite velocity in the Graphic Editing window info bar.

Keep in mind, however, that velocity only affects the initial volume of the soundbite and offers no way to change the soundbite's volume while the soundbite is playing. Digital Performer provides audio controller events to give you continuous control of volume and pan, as described in the next section.

Creating volume changes and crossfades with audio volume controllers

Digital Performer provides audio volume continuous controller events to create volume and crossfade effects in audio tracks. Audio volume controllers can be inserted, generated, drawn, reshaped, and otherwise handled just like MIDI volume controllers. Similar to MIDI volume controllers, audio controllers have a range from zero to 127.

Unlike soundbite velocities, which only affect the initial volume of the soundbite, audio volume controllers can affect the soundbite's volume at any time while it is playing. For example, you could use audio volume data to create volume changes during a soundbite as shown below in Figure 15-10:

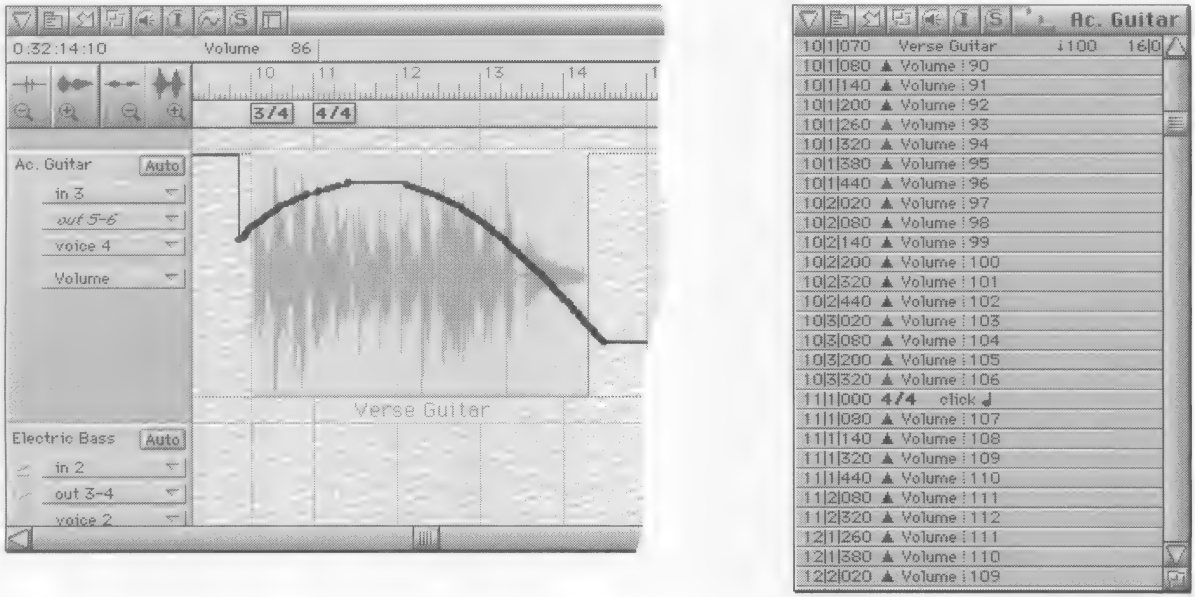


Figure 15-10: Audio volume controllers. This smooth volume curve is shown in both the graphic editing window and the event list.

Inserting audio volume controllers

You can insert volume controller events into a track using the methods summarized below. If you need more information about them, refer to the Performer MIDI sequencing reference manual.

Inserting an individual audio volume event

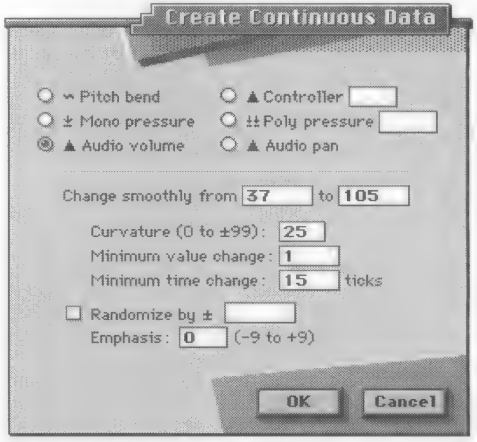
You can insert an individual audio volume event in the event list using the insert menu in the title bar. Or you can do so in the Audio Graphic Editor as described in the section "Inserting a control point to create a sudden change" on page 150.

Drawing volume curves

You can draw volume curves in the Audio graphic editor as explained in "Inserting a line or curve to create a smooth change" on page 151 and "Reshaping an existing line or curve" on page 153.

Generating volume curves

You can generate volume curves using the Create 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.

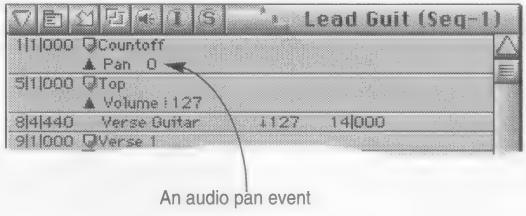


Recording volume changes with audio volume faders

As described earlier in this chapter, you can easily record volume changes for audio tracks using the faders in the Mixing Board window. Record fader moves in real time or instantaneous snapshots using the console.

Controlling audio pan

Audio pan controllers are similar to audio volume (and MIDI) continuous controllers. They can be identified by their name and continuous controller icon in the event list.



Audio pan events control the output of the track across its two corresponding audio outputs on your audio hardware. Audio outputs are grouped in pairs, starting with 1 and 2 as a left/right pair. Each pan controller can have a value between -64 and +63, where 0 is dead center, -64 is pan left, and 63 is pan right. Pan controllers can be used one at a time to make a sudden change, or as an stream of events changing gradually to create smooth panning effects, just like continuous MIDI controllers.

You can insert, draw, generate, edit, and otherwise handle pan controllers in the same manner as audio volume (and MIDI) controllers. See "Inserting audio volume controllers" on page 202 for a summary of insertion techniques.

Working in stereo

As of this writing, the Digidesign Audio Engine (DAE) does not support the recording or playback of interleaved stereo audio files. As a result, if you want to record and playback audio in stereo, you must do so by recording separate mono audio files into a pair of audio tracks as shown below Figure 15-11. (If you import a stereo audio file, you are given the opportunity to de-interleave it into two separate mono audio files.)

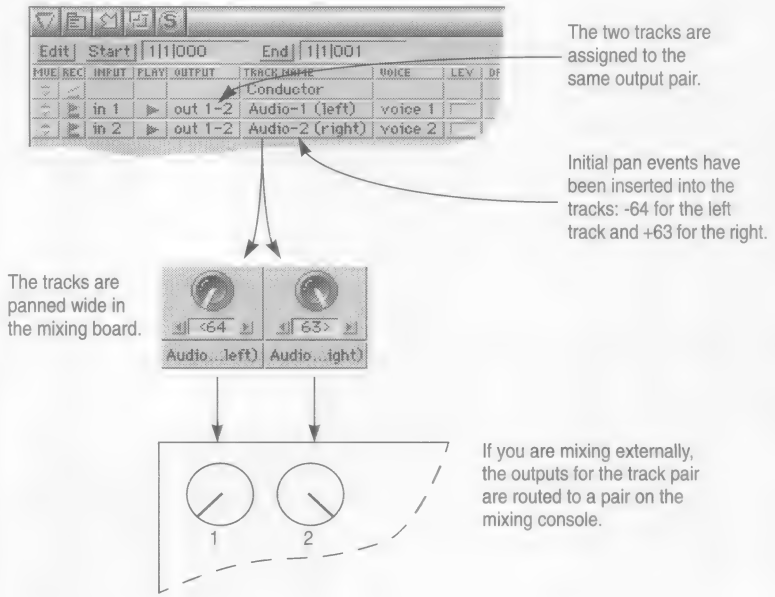


Figure 15-11: A typical track setup for stereo recording and playback.

Volume control for a stereo pair

Most of the time, you will want both channels of a stereo track pair to have the same level. One of the easiest ways to handle this is to group the two faders in the Mixing Board. This allows you to exactly match control changes in both tracks at the same time.

A somewhat less convenient way to match level settings is to generate volume control data in one of the two tracks as described in "Inserting audio volume controllers" on page 202 and then copy and paste the resulting volume data to the second track in the pair.

Future enhancements

Look for future support of interleaved stereo audio files in DAE, as well as feature enhancements in Digital Performer to support stereo.

Hints and tips

The following sections briefly give you suggestions for mixing in Digital Performer.

Audio volume and pan controllers are track-specific

Audio volume and pan controllers only affect the audio track in which they reside. They will not affect audio in other tracks assigned to the same audio voice or outputs. If you have multiple tracks assigned to the same voice, only one track has playback priority at a time, and the priority is determined by the order of the tracks in the list. For complete information, see "Overlapping soundbites and track priority" on page 63.

Inserting initial volume and pan settings

It is useful to insert volume and pan events at the beginning of each audio track to initialize their values. This ensures that each time you play back the track, it begins with the pan and volume settings that you want. If you enable event chasing (described in the next section), inserting an initial value gives Digital Performer a level and pan setting to which it can always chase. See "Setting initial levels with the Mixing Board" on page 187.

Don't record over these initial controllers after inserting them. Use Overdub record mode to avoid doing so.

Event Chasing

If you always want audio tracks to play at the proper volume and pan setting, no matter where you begin playback in the sequence, use Event Chasing.

To enable Event Chasing:

1. **Choose Set Event Chasing from the Basics menu.**
2. **Choose the audio volume and/or audio pan options as desired.**
3. **Click OK.**

Chapter 16 *Tempo and Digital Audio*

This chapter explains how to handle tempos when working with digital audio.

Audio isn't as flexible as MIDI

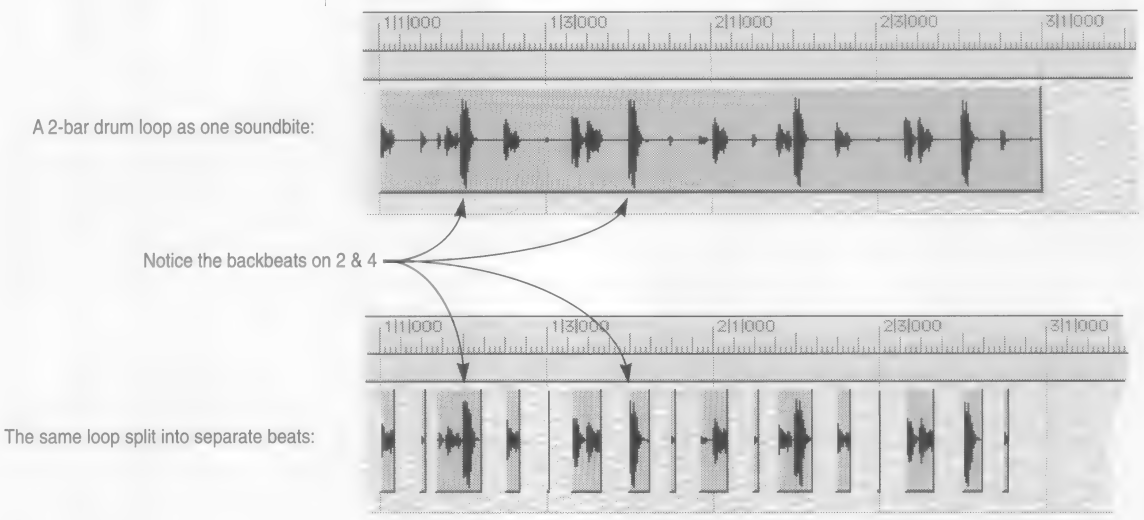
One of the most flexible things about MIDI is tempo: you can easily change the playback tempo of MIDI data by simply dragging Digital Performer's main tempo slider —even drastically so — and the music always stays at the same pitch. The notes (and other data) just play slower or faster.

This is not the case with audio data. Digital Performer always plays audio at the speed (samples per second) at which it was originally recorded. Digital Performer never speeds up or slows down the sample rate because, although the tempo would change, the *pitch* of the audio would change, too. To change tempo *and* maintain the same pitch, the audio data needs to be processed by sophisticated digital signal processing (DSP) procedures that preserve the original pitch at a comparable level of sound quality. This type of processing is so intensive that it can only be performed in real time by powerful, dedicated hardware. Similar results can be achieved by software, too, but not in real time.

How Digital Performer handles tempo

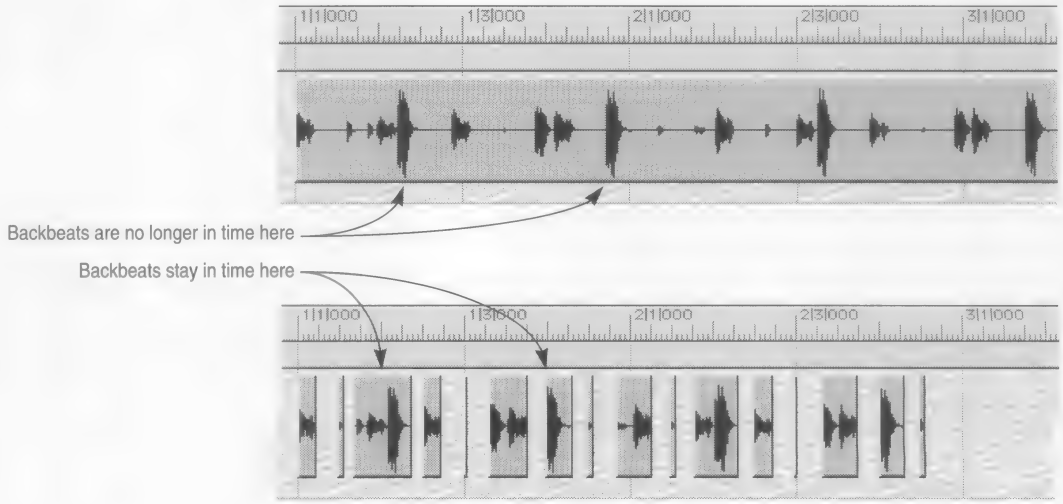
Digital Performer always plays audio at the tempo it was originally recorded. If you change the tempo slider in Digital Performer, soundbites will *start* at their original location in the sequence, but they will *play back* at their original tempo.

Depending on the situation, this may or may not be a problem. Take the two-bar drum loop shown below, for example. On top, it is shown as a single soundbite. On the bottom, it has been split up into a separate soundbite for each beat using the Strip Silence command.



When we change the tempo from 78 bpm to 96 bpm, the single-soundbite loop won't play in tempo because the audio inside it doesn't change tempo.

The split-up loop, however, changes tempo and sounds fine because each beat independently maintains its position relative to Digital Performer's time ruler.



How soundbites are affected when you change the tempo

As you can see from the example in the previous section, short soundbites can often survive "after-the-fact" tempo changing, but even short ones can sound wrong if the change is fairly large. The same is true on both counts for soundbites that have no inherent tempo (such as speech).

You can also see that changing the tempo does not impact the *attack times* of soundbites. If a soundbite occurs at 3|3|240 before you change the tempo, it will still occur at 3|3|240 afterwards, too. The same is true for the soundbite's SMPTE time code frame location.

Try to set tempos before recording audio

The earlier example also shows that it is often undesirable to change tempo after you have recorded audio. Therefore, you should try to determine your tempos before you record any audio and set them beforehand.

Get in the habit of programming tempos in the conductor track

As a rule of thumb, it is advisable to program tempos in the Conductor track instead of just setting them manually with the tempo slider. This permanently stores the tempos in a way that you will never loose them. If you use the tempo slider instead, you run the risk of changing the tempo slider setting after you've recorded audio, which throws off the timing between audio and MIDI tracks — timing that is very hard to get back.

Aligning the tempo to existing audio

Often you may start with digital audio and want to align Digital Performer's tempo with the inherent tempo in the audio. To do so:

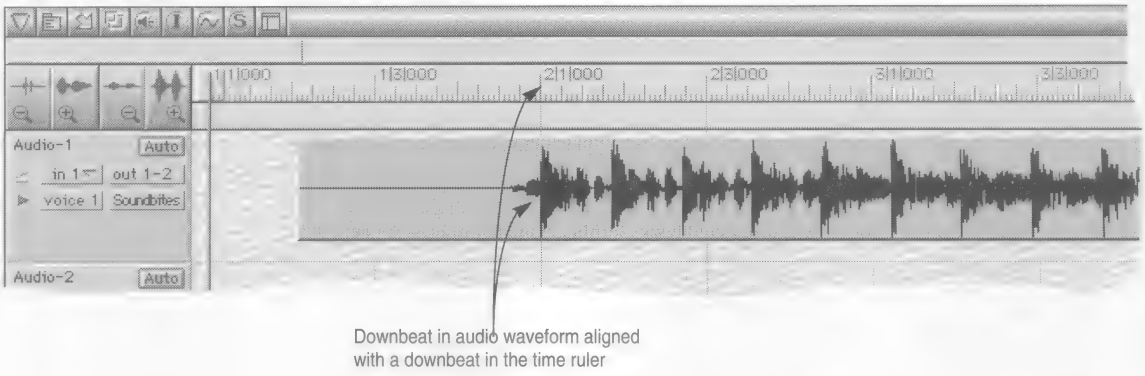
1. **Import the audio into Digital Performer and place it in a track.**

   For information, see "Importing soundbites, playlists, audio files" on page 95.

2. **Open the Graphic Editing window for the track if it isn't already.**

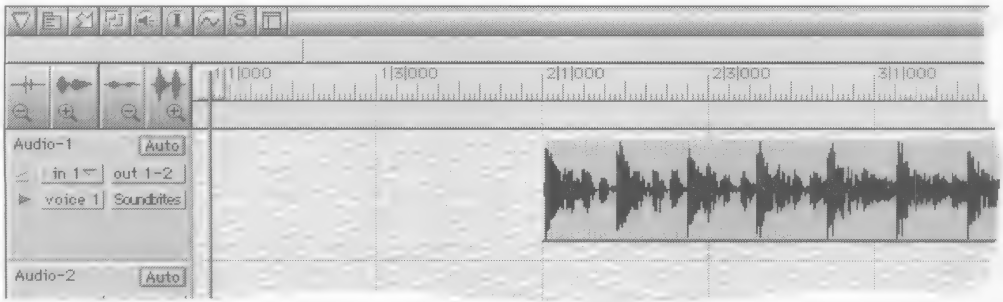
3. **Identify the first downbeat in the audio waveform and align it with a downbeat in the time ruler as shown below.**

   Zoom in if necessary to get accurate placement.



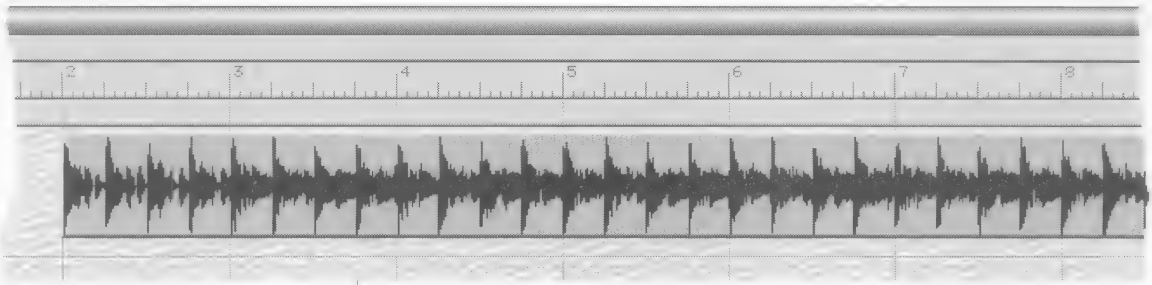
Downbeat in audio waveform aligned with a downbeat in the time ruler

4. **If the soundbite begins before the waveform downbeat, drag the soundbite's left edge over to the downbeat.**



5. **Adjust Digital Performer's tempo slider until the other beats in the waveform line up with the appropriate beat in the tempo ruler.**

   This can't be done while playing back, but playback isn't necessary. You can drag the slider to get close and then type in tempos (up to a hundredth of a decimal) to fine-tune the alignment.



6. **If the soundbite is long, scroll to a point near the end of it to check if the waveform beats line up with the time ruler.**

   Use hundredth of a bpm adjustments to fine tune the alignment.

7. **When you are done, program the resulting tempo into the Conductor track using the Change Tempo command in the Change menu.**

Using other programs to change the tempo of audio

Changing the tempo of audio data without changing its pitch and without compromising audio quality requires sophisticated digital signal processing (DSP) technology. Several Macintosh programs offer this capability, including Digidesign's Sound Designer II™, Steinberg's Time Bandit™, and others. These programs also allow you to change the pitch of audio — and even harmonize it — with or without changing tempo. You can use these programs together with Digital Performer in cases where you need to change the tempo of audio data after it has been recorded. In the case of Sound Designer II, you can do so from within Digital Performer using the Edit in Waveform Editor command. For information, see "Edit in Waveform Editor" on page 174.

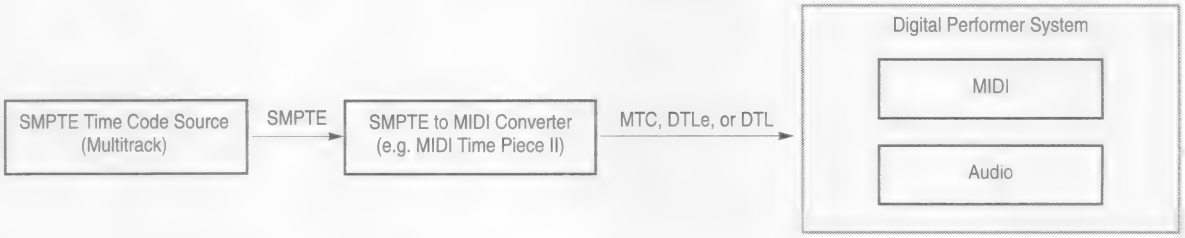
Chapter 17 Synchronizing Audio to SMPTE Time Code

Digital Performer provides accurate and reliable synchronization to SMPTE time code using MIDI Time Code (MTC), Direct Time Lock (DTL), or Direct Time Lock Enhanced (DTLe). The section below explains how to set things up, followed by a discussion of the *Audio Sync to Time Code* command in the Audio menu, which plays an important role in audio synchronization.

Preparing Digital Performer for SMPTE sync

First, slave Digital Performer to SMPTE time code in the usual fashion as described in the *Receive Sync* chapter of the Performer Sequencing reference manual. In review, the basic steps are:

1. **Set up a SMPTE-to-MIDI converter (such as the MIDI Time Piece II) to send MTC, DTLe, or DTL to Digital Performer.**



2. **Click the SMPTE Start Time button in Digital Performer's main counter to set the start frame for the sequence.**
3. **Choose Receive Sync from Digital Performer's Basics menu and choose the "MTC, DTL, or DTLe" option.**
4. **Check the "Slave to External Sync" command in the Basics menu.**
5. **Check or uncheck the "Audio Sync to Time Code" option in the Audio menu as desired.**

   If this option is grayed out, go to the Basics menu and check "Slave to External Sync". See the next section for an explanation of this option.

Digital Performer is now ready to record and playback while slaved to incoming time code. Just start the time code and Digital Performer will chase.

Software sync versus hardware sync

There are two approaches to synchronizing MIDI and audio to external SMPTE time code: *software sync* and *hardware sync*. Software sync provides continuous, accurate, high-quality synchronization without additional hardware. Hardware sync involves an extra piece of fairly costly gear, but it produces the highest possible quality and the tightest possible lockup. With products like Mark of the Unicorn's *Digital Time Piece*™ audio synchronizer, the cost of these audio sync devices is now well within the reach of most of us.

Software sync

The sections below discuss software synchronization in Digital Performer without extra digital audio synchronization hardware. Hardware sync is discussed in "Hardware sync: the best of both worlds" on page 215.

The Audio Sync to Time Code command

The Audio Sync to Time Code command in the Audio menu lets you turn Digital Performer's software synchronization on and off. Digital Performer's software sync lets you choose between two trade-offs:

- Best possible synchronization

  versus

- Highest possible audio quality

These two scenarios are discussed below.

Best possible synchronization

When *Audio Sync to Time Code* is checked and Digital Performer is slaved to SMPTE time code, Digital Performer (DAE) performs an advanced form of real-time sample rate conversion on the audio data to either slow it down or speed it up as necessary to keep audio in sync with SMPTE. This continuous form of synchronization is very tight, but it does affect the audio samples occasionally. How much depends on how stable the time code is. Under normal circumstances you won't hear any artifacts in the digital audio, thanks to DAE's advanced DSP algorithms, which provide one of the best solutions for audio sync short of the expensive word clock converters discussed in the next section.

Highest possible audio quality

When *Audio Sync to Time Code* is unchecked, audio may not play precisely in time with MIDI, and sometimes you may hear them drift apart. The advantage, however, is that no signal processing occurs, so the audio data remains completely pristine—exactly as recorded.

Recommendations

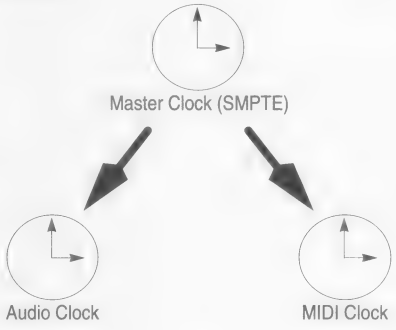
Under most circumstances, you can leave Audio Sync to Time Code checked without any noticeable effect on your audio. This is especially desirable for long soundbites, which otherwise drift noticeably.

You can uncheck Audio Sync to Time Code in some situations, such as when precise timing is not critical (e.g. triggering ambient sounds). Or you may be working with short soundbites (several measures or less) that won't noticeably drift. You can also try recording with Audio Sync unchecked and then play back with it checked, which reduces the effects of continuous resyncing.

Hardware sync: the best of both worlds

Several Digidesign audio cards provide a third scenario for locking audio to SMPTE time code: these systems can slave to *word clock*, a form of digital audio synchronization that provides sample-accurate resolution. These systems offer the best solution for synchronization because they lock digital audio to SMPTE without affecting the digital audio samples with real-time sample rate conversion. Instead, they adjust the overall sample rate using a continuous calibration scheme. These systems never modify the actual audio samples, while at the same time providing continuous re-sync.

In this scenario, synchronization is handled as shown below. The master clock source drives both audio and MIDI independently, and audio and MIDI stay in sync because they are locked to the same timing source. Digital Performer does not control the timing of audio in this case, and the *Audio Sync to Time Code* command should be turned *off* (unchecked).



A few examples of systems that have word clock synchronization capabilities are Digidesign's Sound Tools II™, Pro Tools™, and Pro Tools III™ systems.

Syncing to blackburst

If you are working with video, you need an additional hardware device that converts *video blackburst* (a master video timing source)—referred to as *house sync*—into word clock. The word clock is then passed onto the digital audio hardware.

Digidesign's Pro Tools Video Slave Driver™, TimeLine's MicroLynx™ (with the word clock option), and Mark of the Unicorn's soon to be released Digital Time Piece™ are examples of such a converter. Below is an example of how a system like this is configured with Pro Tools:

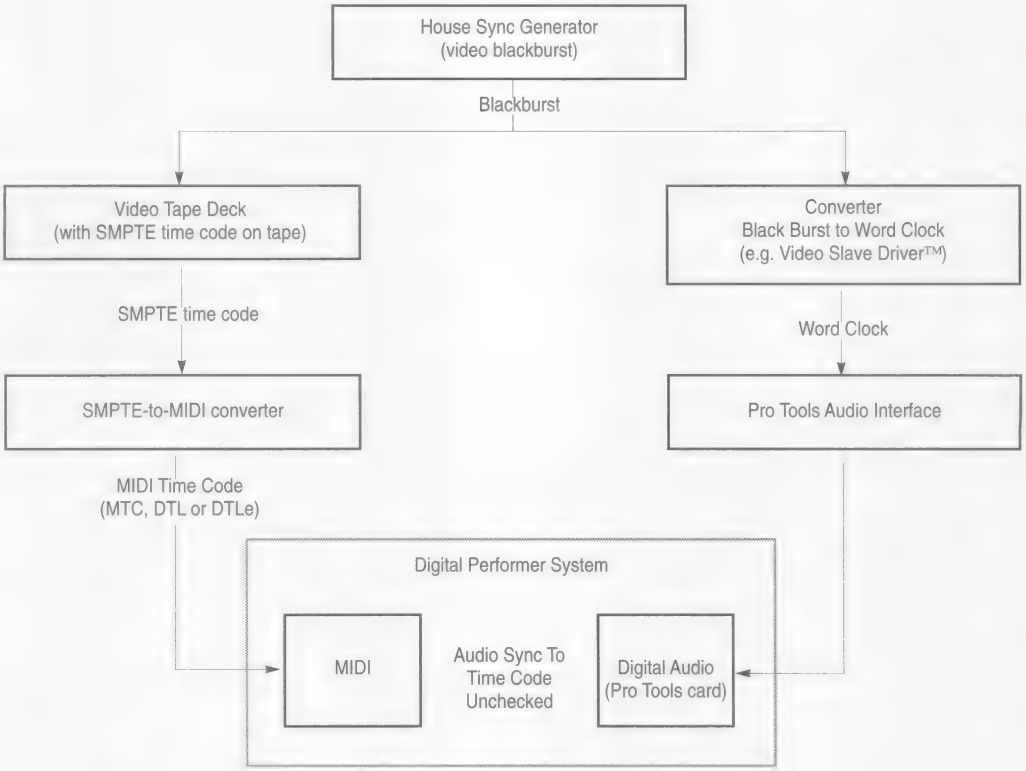


Figure 17-1: Slaving digital audio hardware to video house sync via word clock.

Syncing to a SMPTE time code source

If you use SMPTE time code as a master sync source (such as LTC recorded on a multi-track) instead of video black burst, you can use a device that converts SMPTE time code into word clock, such as the TimeLine MicroLynx, Digidesign's SMPTE Slave Driver™, or Mark of the Unicorn's Digital Time Piece™.

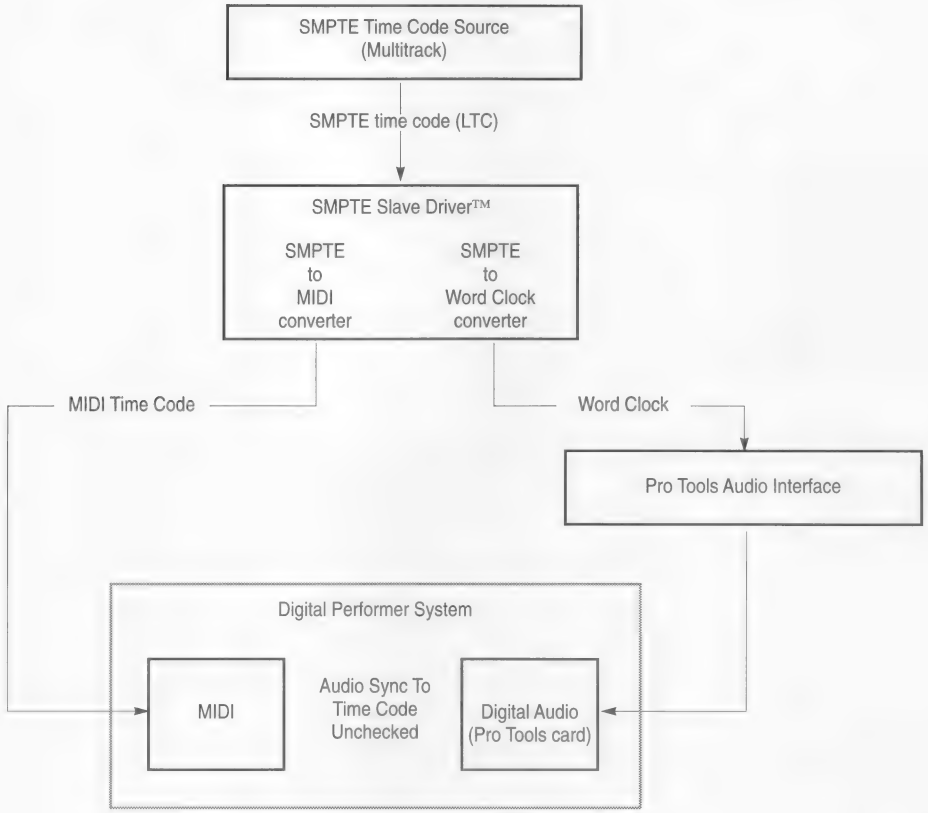


Figure 17-2: Slaving digital audio hardware to SMPTE via word clock.

Summary

Here is a summary of the information in this chapter regarding Audio Sync to Time Code:

Situation:	What happens:
Digital Performer is not synced to SMPTE ("Slave to external sync" in the Basics menu is unchecked).	MIDI always stays perfectly in time with audio. *Audio Sync to Time Code* command is grayed out to indicate that it is not needed and is not being used. No sample-rate conversion or other DSP is applied to digital audio; 100% pristine audio quality is achieved.
Digital Performer is slaved to SMPTE time code with the Audio Sync to Time Code command checked.	Audio slaves to Digital Performer's clock. Some DSP sample-rate conversion occurs in the audio during recording and playback to maintain tight synchronization with MIDI, but it is not noticeable under normal synchronization conditions.
Digital audio hardware and Digital Performer are separately slaved to a master clock source (video black burst or SMPTE). Audio hardware is slaved via a word clock converter.	*Audio Sync to Time Code* command is turned off (unchecked). Everything is slaved to a master clock source, either video black burst or SMPTE time code. Synchronization with digital audio is maintained by a word clock converter that employs a continuous calibration scheme instead of sample rate conversion. Highest audio quality and tightest synchronization are both achieved.

Chapter 18 *The Mix Command*

The Mix command in the Audio menu allows you to merge the audio of one or more soundbites, along with any volume data, to a single soundbite that is the sum of all the sound and controller data within a region that you select.

The Mix command can be used to simulate an analog multitrack technique called ping-ponging or bouncing to free an audio voice for playing or recording more digital audio data.

It can also be used to create a soundbite into which volume control is built from a soundbite which has its volume controlled by volume events. For example, this technique can be used for creating soundbites that fade in or out.

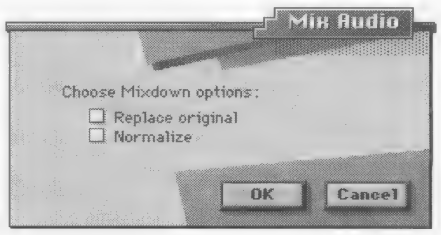
To Mix soundbites:

1. **Select a region containing soundbites just as you would select a region of MIDI data from one or more tracks.**

   You can select the region from an Event List, the Graphic Editing window, or the Tracks window. You can even select a region in the middle of a long soundbite; Digital Performer will automatically perform a split command if necessary to mix a portion of a soundbite.

2. **Choose Mix from the Audio menu.**

   The Mix dialog box appears.



3. **Select a option as desired.**

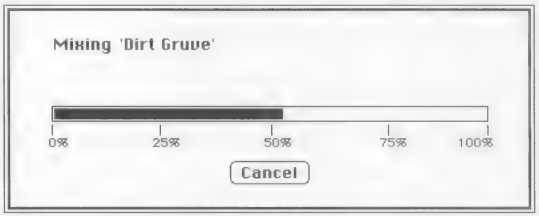
   See the following sections for details.

4. **Click OK.**

   After okaying the dialog, a standard save dialog appears allowing you to name the mix soundbite and save it into a desired folder.

5. **After okaying the save dialog, a mix progress window appears for every soundbite in the selected region.**

   The mix can be cancelled at anytime by clicking the Cancel button or typing command-period.

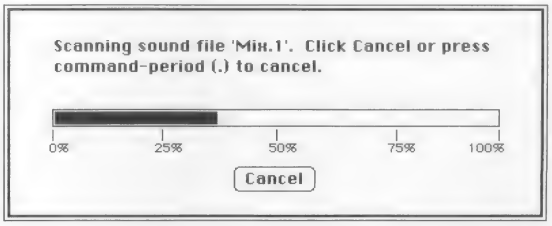


6. **A new audio track is added to the tracks list, and the newly created soundbite is placed in the new track at the same time location as the original mixed data.**

   If the "Replace original" option is unchecked or grayed, the audio data in the original tracks is left untouched. If this option is checked, the original data is removed.

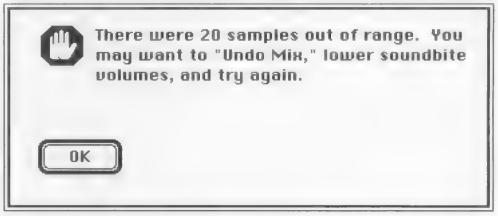
7. **After the mix is completed, the "scanning sound file" progress window appears as Digital Performer scans each new mix soundbite so that it can display its waveform in the Graphic Editing window.**

   Cancelling this window does not affect the mix; doing so causes the resulting soundbite to be displayed without its waveform in the Graphic Editing window.



Undoing an out-of-range mix

Since all the sound data from the selected region is added together when it is mixed, occasionally the resulting soundbite will contain some sound data whose gain is greater than the maximum allowed by the resolution of the digital recording hardware. Such soundbites contain clipping and may sound distorted. The Mix command warns you when this occurs.



You can Undo the Mix and lower the volumes of the soundbites to be mixed. Or you can use the Normalize option to automatically scale the sound data of the newly created soundbite.

See the following sections for information about the Normalize option.

When undoing the Mix command, any newly created soundbites will be removed from tracks that they occupy, but they will remain in the Soundbites window for easy deletion from the hard disk.

The results

The Mix command creates a new track with a single new soundfile into which all the sound data from the selected region is mixed. The Mix command disregards any pan data that is in the selected region. However, volume data and soundbite velocities are taken into account.

The Replace Original option

If the region you select to mix is within a single track, the Replace Original option is available.

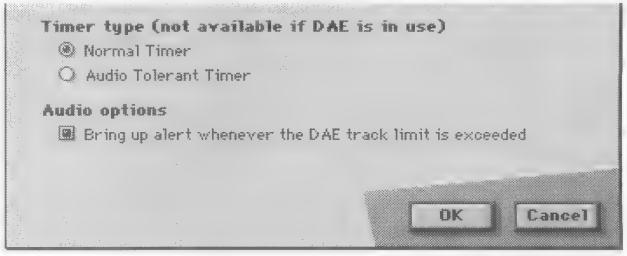
Check this box if you want the new mixed soundbite to replace the original soundbite(s) and volume events in the selected region.

The Normalize option

The Normalize option causes the resulting mixed soundbite to be normalized: the peak of the resulting audio data is scaled to maximum gain (with no clipping) and all the rest of the audio data is scaled proportionally.

Chapter 19 *Audio Preferences*

There are two audio-related options in the Preferences dialog box, which can be opened by choosing Preferences from the File menu.



Timer type

Digital Performer has the ability to run simultaneously with other audio applications, such as Digidesign's Pro Tools™ and OSC's DECK II™. On most Macintosh models, you can improve Digital Performer's timing performance by choosing the *Audio Tolerant Timer* option (as shown above). This option is only available when Digital Performer is *not* using DAE; when Digital Performer is using DAE, it will gray out. If you are not running other audio applications, use the *Normal Timer* option. For more information, see "If timing problems arise when running with another audio application" on page 230.

Audio options

The *Bring up alert whenever the DAE track limit is exceeded* option causes Digital Performer to present you with a dialog box whenever the current DAE track limit is exceeded. This is a helpful reminder, because Digital Performer has to un-play-enable existing tracks in order to comply with your last requested action (usually adding tracks). Without this reminder, track may become muted without your being aware of it. If you are well aware of your current track limits, and you do not need this reminder, you can disable it by unchecking this preference.

For more information about rack limits, see "Managing voice and track limits" on page 62.

Chapter 20 *Audio Troubleshooting*

Isolate the problem

Remember that Digital Performer's audio capability is based on the Digidesign Audio Engine and the recording hardware in your system. Consider the nature of the problem to determine if it may have to do with DAE or your hardware. For example, if the problem is that you cannot hear anything when you try to play back soundfiles from within Digital Performer, quit Digital Performer and try playing back the audio file in Sound Designer II. This approach will help you isolate and solve the problem quickly.

Simplify your setup

One of the most common causes of problems is a conflict with other software in the System. You can often solve problems quickly by starting up the computer with a "generic" System. A generic system consists of:

- A fresh System Folder installed from Apple installer disks that are appropriate for your model of the Macintosh
- No additional system extensions or control panels except for those necessary to run Digital Performer (such as FreeMIDI, DAE, A/ROSE, the DigiSystem INIT, etc.)

Check version numbers of everything

Digital Performer, as well as DAE and other Digidesign-related system extensions, are continually being updated. In addition, chances are that you are running more than one DAE-dependent program on your system. If you experience problems with Digital Performer, check the Read Me notes that ship with the current version you are using to find out the required versions of DAE, etc. Always avoid running earlier versions than those recommended.

☛ Digital Performer 1.6 ships with DAE version 1.32. Digital Performer may not work properly with higher versions of DAE. If you have a higher version of DAE and are experiencing problems, try going back to DAE version 1.32.

If Digital Performer can't find the card

If you launch Digital Performer and see a warning box that says that there is no audio hardware, when actually there is, quit Digital Performer, shut down your computer, and make sure that the audio recording card is seated properly in its slot. Make sure you have the correct version of the DigiSystem INIT in the Extensions Folder and the DAE in the DAE Folder in you System Folder. For expansion chassis owners, make sure that the chassis and cable are properly seated and connected.

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 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 the Mixing Board chapter for details.
- If you don't hear sound while recording, make sure the patch thru button is on in the Audio Monitor title bar.

If you *still* don't hear sound, and you have Sound Designer II (2.5 or higher), quit Digital Performer and try playing back from Sound Designer II. If it plays back and Digital Performer doesn't, and you double-checked the things in the above list, call the technical support department at (617) 576-3066.

If you see an error message after playback or recording

Digital Performer 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 Digital Performer 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 soundfiles on the hard disk
- A hard disk with an access time that is too slow (check with Digidesign for compatibility)

- AppleTalk (This is a major cause of problems! AppleTalk must be disabled when you are working with digital audio.)
- Other background software interruptions (such as FAX modem software, etc.)
- Other third party software

If you get such an error message, try removing all third party software from the System folder and turn off AppleTalk in the Chooser in the Apple menu. If this doesn't work, optimize the hard disk with defragmentation software. You can also try adjusting the buffer size of DAE as described below.

Adjusting DAE's buffer size to avoid playback error messages

The *Configure Buffer Size* command in Digital Performer's Audio menu allows you to change the DAE's playback buffer size. According to Digidesign, the buffer size is factory-set to '1' and should not require adjustment on most systems. This command is only for non-System Accelerator systems. If you experience unwanted audio artifacts such as skipping or clicks, or if the "disk too slow or fragmented" dialog appears, set the buffer size to the next higher value. Verify that your disk is not heavily fragmented before adjusting the buffer setting. If the drive is fragmented, use an optimization program, such as Norton's Speed Disk, to de-fragment the disk. It should not be necessary to go beyond '2'.

If you do decide to reconfigure the DAE's buffer size in this dialog box, Digital Performer must quit and relaunch the DAE to affect the change. If other applications besides Digital Performer are using the DAE, Digital Performer will not be able to quit the DAE and, as a result, will not be able to reconfigure the buffers. An alert appears when this happens to warn you that this is the case.

If audio doesn't sync with MIDI

See the discussion of tempo "Tempo and Digital Audio" on page 207. You can't successfully change the metronome setting of a sequence after you have already recorded audio and sequenced MIDI to it. The audio data does not change tempo.

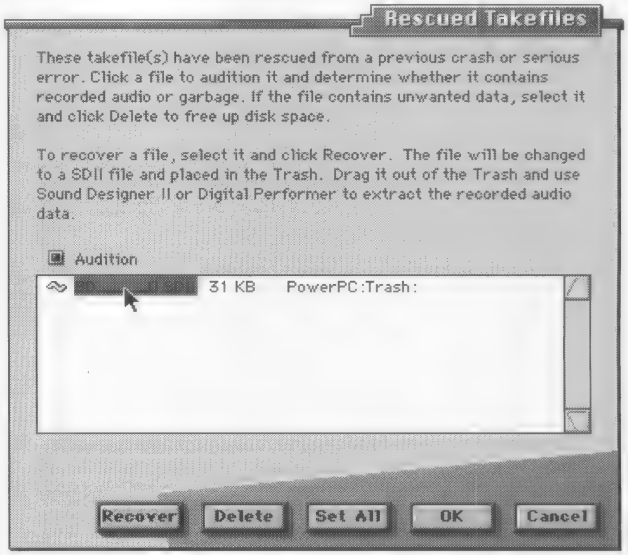
If you haven't changed the tempo, and things aren't lining up, try thinning as much MIDI and audio controller (volume and pan) data as possible. Also try turning off AppleTalk in the Chooser in the Apple menu, which can interfere with MIDI data transmission.

If you get an error message while scrubbing audio

DAE error -9073 can appear when you pop up a soundbite for scrubbing and begin scrubbing quickly by immediately command-dragging the cursor. To avoid this error, wait a moment before command-dragging left or right.

If you experience a crash or other interruption while playing or recording

When Digital Performer begins recording or playback, it allocates a large amount of the free space on your audio hard disk to the current take file(s) in the Audio Monitor. 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 Digital Performer is launched, it displays the Rescued Takefiles dialog as shown below.



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 file(s). If you believe that important audio data exists in the file(s), use the Recover button to move the file into the Trash. You can then drag the file out of the Trash (double-click the Trash can to open it) and then use Sound Designer II to extract the important audio data from the file. You should choose to either recover or delete these file(s). Otherwise, they will needlessly take up precious 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 Digital Performer crashes on a Mac IIfx, Quadra 900 or 950

Open the Serial Switch Control Panel in the Apple menu and set it to *Compatible*. Then restart the computer before running Digital Performer again.

If the screen redisplay gets jerky

During playback, Digital Performer does its best to update items on the Macintosh screen, such as the Counter and scrolling windows. However, audio recording and playback places a high demand on the computing power of the machine, and Digital Performer 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 such as Quadras and Power PC Macintoshes.

If you run out of disk space

If you run out of hard disk space, compact existing soundfiles and delete unused soundfiles. For details, read the *Soundfile Management* chapter.

If you experience problems recording into tracks with loops

Recording audio into tracks containing loops does not work well. We recommend only inserting loops into audio tracks after recording is completed. This problem will be addressed in a future version of Digital Performer.

If you get error messages while editing audio during playback

Making any type of edit to audio data during playback can sometimes result in an error message appearing after stopping the transport. This includes such actions as inserting/deleting soundbites and Cutting, Copying, Splitting, and Trimming soundbites. The frequency of these error messages appearing after such edits depends upon the location and type of the edit. These error messages generally state that a soundbite could not be "queued for playback". These messages can be ignored. This problem will be addressed in a future version of Digital Performer.

If you experience problems when playing back

Are you playing back a playlist that was created in Sound Designer II? If you load a playlist that was created in Sound Designer II, and the playlist has crossfades (to smooth out the transitions between soundbites in the playlist), the crossfades do *not* get loaded into

Digital Performer—only the soundbites get loaded. Thus, you may hear brief gaps or other glitches when playing the playlist in Digital Performer due to the missing crossfades.

There have been unconfirmed reports of problems with partitioned hard drives. Drives that have partitions may cause playback glitching. If you are experiencing playback glitching, try removing the partitions from your hard drive.

Apple's MIDI Manager can cause serious audio playback problems. If you have MIDI Manager in your system, remove it completely. (Remove both the "Apple MIDI Driver" icon and the "MIDI Manager" icon.)

If Digital Performer freezes during playback, and you have a CD-ROM drive attached to your computer, the problem is most likely caused by the fact that the CD-ROM drive does not have a disc in it. Either remove it from the chain, or place a cartridge in it.

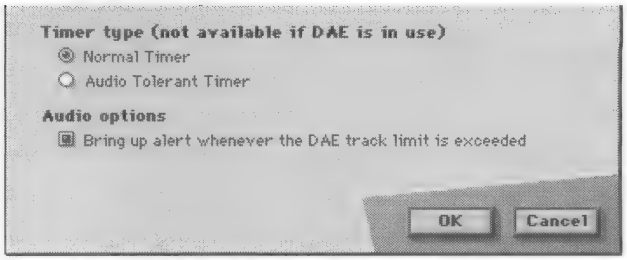
If timing problems arise when running with another audio application

You can run (and synchronize) Digital Performer simultaneously with another audio application such as Digidesign's Pro Tools™ or OSC's DECK II™ by running Digital Performer without DAE (as a MIDI only application). There are two different ways of doing so.

- Drag DAE out of your System Folder, launch Digital Performer (which will run MIDI only), put DAE back, and, finally, launch the other audio program, which will log into DAE.

- (This method works for Pro Tools only.) Launch Pro Tools, turn on the *Active in Background* command in the Options menu, and then launch Digital Performer, which will run as a MIDI only application because Pro Tools is already logged into DAE.

If you experience timing problems in Digital Performer when running audio simultaneously (in real time) in another audio application, the *Audio Tolerant Timer* option in the Preferences dialog box (in the File menu) modifies Digital Performer's timer to enhance timing when another application is using up large amounts of CPU bandwidth for digital audio. Try enabling this option, but please note that it may not work on some Macintosh models. If you are not running other audio applications, use the *Normal Timer* option. For more information, see chapter 19, "Audio Preferences" (page 223).



If audio data is garbled upon recording

If audio data is garbled when it is recorded in Digital Performer, and you have a CD-ROM drive attached to your computer, the problem is most likely caused by the fact that the CD-ROM drive does not have a disc in it. Either place a disc in the drive, or remove the drive completely from the chain.

If you have a Jambox

The Jambox DA must be setup as follows to sync Digital Performer to SMPTE with it: Setup Parameters window should be set with "use Cable 4 in/out for MTC." However, there is no need for an actual physical connection required on cable 4.

The Sync Window Time Reference should be set to "SMPTE" and the Tempo Source should be set to "MAC".

Contacting Mark of the Unicorn for technical support

We hope that you enjoy using Digital Performer. We look forward to hearing from you about your experiences. We are always reviewing and prioritizing feedback from all our users.

Meanwhile, if you have questions, our technical support line is open between 9 am and 8 pm Eastern time, Monday through Friday, at (617)-576-3066.

You can also reach the technical support department at our dedicated technical support fax number: (617) 354-3068, AppleLink at UNICORN, CompuServe E-mail at 71333,3666, or America On Line (AOL) at "MOTUTEC".

You can send e-mail via the Internet to either the AppleLink, CompuServe, or AOL addresses with the following addressing:

CompuServe: 71333.3666@compuserve.com

AppleLink: unicorn@applelink.apple.com

AOL: MotUTEC@aol.com

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:Performer Reference Manual

THE MIDI SEQUENCER SOFTWARE

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In order to be eligible to obtain updates of the program, you must complete and return the attached Mark of the Unicorn Purchaser Registration Card to MOTU.

General

This License Agreement shall be governed by the laws of the Commonwealth of Massachusetts and shall innure to the benefit of MOTU, its successors, administrators, heirs and assigns.

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Performer
Reference Manual


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Chapter 1 *About Performer*

Mail in the Registration Card

Performer is a powerful MIDI sequencer designed for the music professional. It provides a comprehensive MIDI recording, playback, and editing environment for a large variety of applications. Its speed, accuracy and flexibility make it the sequencer of choice for working musicians the world over.

Take a moment now to fill in and mail the registration card found at the very beginning of this manual. Doing so entitles you to:

- A free backup master disk
- Free, unlimited technical support
- Free newsletters and software updates
- Announcements about major software upgrades and new products

Leave the rest of the cardboard page in the manual for your future reference. Since Mark of the Unicorn can provide customer service only to registered users, please be sure to send the card in immediately after purchase.

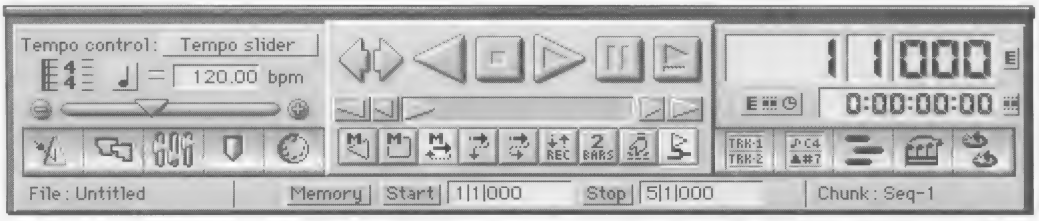
To use Performer, you must have a Macintosh computer, a MIDI interface and a MIDI instrument (most probably a synthesizer). This is the minimal setup you will need, although Performer can support any configuration of MIDI instruments, including NuBus devices such as the MacProteus™, SampleCell™, and SampleCell II™. Performer works well with all MIDI instruments and is capable of handling the most complex MIDI situations. It is compatible with any MIDI-equipped device, such as synthesizers, drum machines, hardware sequencers, synchronization devices and more.

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 numerical

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 is loaded with features, structured in a layered fashion such that you can use the ones you want and not worry about the others. This is helpful for those of you who are new to the program, as well as experienced users who need functional power without unnecessary complexity. The rest of this chapter provides a brief description of some of Performer's salient features.

The basic recording and playback functions are very straightforward, modeled after tape deck functions. They are located in Performer's main control panel:



Music recorded with Performer is played back exactly as entered: the resolution of 480 ticks per quarter note assures accuracy. As many tracks as you need for recording and playback are available to you. Several tracks can be recorded onto simultaneously from multiple MIDI channels. Both the modem and printer ports can be used simultaneously for input and output of data as well as timing information. Performer's Patch Thru utility allows you to either echo incoming data directly or channelize it. Any track can be assigned to play back from one or more of sixteen channels on either port, giving you 32 separate channels for playback. If you have a multi-port interface

such as the MIDI Time Piece II or MIDI Express, Performer provides as many channels as the interface allows (128 or 96, respectively). Since many of Performer's operations can be done while the sequence is playing back or recording, you don't have to stop the music to get things done.

A flexible step-recording mode precisely enters passages too fast or complex to be recorded in real time, plus there are several auto-locator features such as punch-in/out and auto stop/rewind to make real-time recording easier.

Once 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 whole region of data. Single events or entire regions 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 Humanize and Groove Quantize help you perfect the rhythmic nuance in your sequences.

To access the data that makes up your sequence, Performer offers three powerful event-editing environments on top of standard Event List window editing: the Graphic Editing window, the Notation Editing window, and the QuickScribe Notation window. All windows support single-event and region editing as described above, and every track in your sequence can be viewed and edited in either window at any time.

The *Graphic Editing* window plots the elements of your sequence on a scrolling, piano-roll graph that makes melodies, chords, dynamics and tempo changes easy to recognize and adjust. As in the Event List window, you can choose from measure, real, or SMPTE time display, and edit any visible event from your Macintosh or MIDI controller. Unlike the Event List, however, to edit events or groups of events you simply drag them to a new location in time, pitch (or controller value), or both. You can even create continuous data by drawing the desired curve on screen.

The *QuickScribe* Notation Editing window displays as many tracks as you want together in one window, formatted on a page exactly as it will print. The notation can be edited with all of Performer's powerful editing commands. You can drag notes vertically and horizontally to change pitch, location and duration. You can also step-enter notes directly in the notation window.

Performer has extensive synchronization capabilities, including Tap tempo. This type of sync allows you not only to control the tempo of an existing sequence as it plays back, but to create a tempo map in real time *before, during, or after recording* — all by simply tapping the tempo on your MIDI controller. For example, you can tap along to a prerecorded acoustic performance, creating a precise tempo map complete with accelerandos, ritards, and rubato passages, then sync your Performer sequence to the recording. Once you've got a tempo map, the powerful Scale Tempos command provides you with every conceivable way of tweaking your tempo map, including scaling tempos to fit time.

Since its inception, Performer has supported standard MIDI clock signals, allowing you to sync to FSK or SMPTE time code. SMPTE locations can be referenced and displayed directly on screen, and lockup is simple and clean. Performer can serve as an intelligent master or slave because it sends and receives Song Position Pointer. Coupled with its flexible tempo features, Performer's synchronization capabilities make it the sequencer of choice for musicians working in the film/video medium.

Performer has expanded the art of sequencing with powerful Chunking™ and cueing functions. The Chunks window introduces a whole new type of sequence: the song. Songs allows you to create simple or complex arrangements of multiple Chunks (sequences and other songs). Chunks can be graphically arranged in any order, vertically and horizontally to quickly build entire songs with other sequences and songs.

Sequences and songs can be automatically chained, cued up, or skipped to in real time using the Chain Chunks, Cue Chunks, and Skip buttons. These convenient controls come in handy—especially during live performance, where you need quick response and complete flexibility in choosing the next song.

To further enhance Performer's Chunking capabilities, the Remote Controls window allows you to trigger any Performer transport function or song select procedure, such as play, pause, stop, etc., from your MIDI controller. Now you can control Performer from your MIDI instrument—without ever going near your Macintosh!

Performer's Create Console feature instantly produces a mixing console customized for the track layout in your Tracks window. Use knobs and faders to automate your entire mix, including volume and panning. Best of all, Performer's consoles are can be completely customized to fit your sequencing needs. You can build a console from scratch, adding buttons, knobs, sliders, LCD readouts, and more. And you can program them to generate any type of MIDI data, including sysex. Other professional mixing console features include flexible grouped and master controls, as well as adjustable fader null points.

Performer offers sophisticated rhythmic correction (quantizing) features. 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. The powerful Humanize command can produce more human feel in a part that may have been over-quantized. In fact, most of Performer's powerful editing commands provide humanization options that can loosen up the feel just right.

Performer takes full advantage of Mark of the Unicorn's MIDI operating system, FreeMIDI. FreeMIDI provides an intuitive, convenient, and consistent way for you to interact with the hardware in your MIDI studio. Together, Performer and FreeMIDI provide you with many benefits, such as intuitive pop-up menus for device selection, and the ability to select patches on your synths by name from within Performer, as well as other FreeMIDI-compatible applications. Perhaps the most important benefit is sound management: FreeMIDI provides built-in librarian support for many popular synths. FreeMIDI's PatchList Manager™ program can get a bulk dump and automatically display the patch names that are currently available in the synth. The patch names appear as a convenient pop-up menu directly in Performer, and it all happens automatically.

For more powerful sound management, Performer provides full integration with Mark of the Unicorn's new, state-of-the-art universal editor and librarian software, Unisyn™. Performer can play back in the background when you switch into Unisyn to select sounds, edit a patch, etc. Also, Unisyn automatically provides up-to-date patch lists for FreeMIDI, so that patch names in Performer are always accurate.

Performer also provides convenient printing capabilities for both list windows and music notation. The Print command prints the contents of Performer's list windows, such as the Tracks List, Markers window, and Event Lists. The QuickScribe notation window displays any combination of tracks as music notation on screen exactly as it will print out. Select any region to display, from a single measure to an entire piece. QuickScribe is ideal for lead sheets, instrument parts, or scores, which can be printed on any Macintosh-compatible printer.

If you want to transfer your sequence to a dedicated notation program, such as Mark of the Unicorn's Mosaic® software, simply save your work as a standard MIDI file. The process transferring is simple and fast.

Performer can be customized to fit your needs more than ever before. In the Tracks window, each track has a bar-graph style meter that indicates MIDI activity during playback and recording. Configure the meters to display either data density or note velocities. You can drag tracks window columns left or right to place them in any order you wish. Double-click (or option-click) the column headings to show/hide any column. Even basic features like soloing can be customized to fit your exact needs. For example, Partial Solo mode brings muted tracks down part way instead of total muting them, so you can focus on a certain musical element while still referencing others.

Version 5, as with its predecessors, is filled with our obsessive attention to detail. You'll enjoy features like pop-up menus in title bars to quickly switch tracks, a customizable Tracks window, a scrolling highlight in tracks overview to indicate the current playback location, double-clicking in any time ruler to auto-locate, and more.

We hope you enjoy using Performer's state-of-the-art sequencing environment!

About this manual

This manual provides a complete explanation for all of Performer's features. For an introduction to Performer, refer to the *Getting Started* booklet that accompanies this manual.

Each section of this reference manual contains a step-by-step procedural description and an in-depth explanation of each aspect of Performer's operation. Each feature description is self-contained, enabling you to learn about Performer one piece at a time, at your own rate.

We strongly recommend that you read the section on Performer's user interface thoroughly. The standard Macintosh user interface is extended in Performer to provide a more streamlined and functional working environment. This knowledge is essential when working with Performer: otherwise you may overlook some of the program's features.

Because Performer has extensive synchronization abilities, we've marked those sections pertaining to the film and video mediums with a film icon.

Chapter 2 *On-Line Help*

Performer's On-Line Help provides you with brief, on-screen explanations of each feature in the program. You can get help on any item in Performer, including menu items, greyed out (unavailable) menu items, mini-menus, windows, and buttons simply by clicking the item with Performer's Help cursor.

About the Performer Help file

Performer™ Help

The Help information in Performer is stored separately in a special file called the *Performer Help* file. This file is automatically installed in the same folder as Performer, and no further preparation is necessary on your part.

☛ The Performer Help file must be present on your hard disk in order for you to be able to get help when running Performer. If it is not present for some reason, you can run the installer on the Performer master disk to make a copy of it on your hard disk.

Using the Help cursor

When you are running Performer, you can get help on anything on Performer's screen with the Help cursor. To turn the arrow cursor into Performer's Help cursor, hold down the *command*, *option*, and *shift* keys together. When you release the keys, the cursor will turn back into an arrow.

To get help on something, just click it with the Help cursor. If it's a menu item, select it from the menu with the Help cursor. When you release the mouse button, a help window will appear that briefly explains the item.

To make the help window disappear, click anywhere.

All major features in Performer have a help item. Some specific items do not and are explained within the description of a corresponding feature. If you can't get help on something, consult the index in this manual.

What should you click on to get help?

In general, click directly on the item you wish to get help on. For things like buttons, pop-up menus, and text boxes, click directly on the button itself rather than its label or associated text. If you don't get a help window the first time, try a few more times, as you might miss the "hot spot" the first time.

> ☛ The basic rule of thumb is: click all over the place with the help balloon cursor. You are bound to get a useful help balloon eventually, and it doesn't hurt to click as many times as you are inclined to.

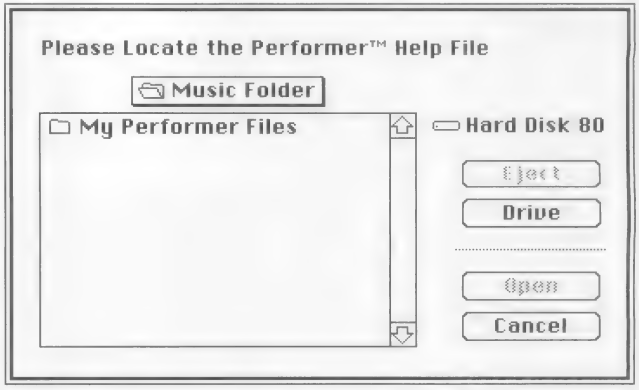
For mini-menus in windows, click anywhere in the title bar of the window.

Getting help on menu commands and dialog boxes

For general information about menu commands, choose the command from the menu with the help cursor. For specific information about the menu command, choose it with the arrow cursor first to open its dialog box, and then click specific buttons, text boxes, pop-up menus, and other items in the dialog box with the help balloon cursor.

Loading the Help file

If you click with the Help cursor, you may get the dialog box shown below:



This means that the Performer Help file is not in the same folder as Performer, and Performer is asking you to locate and open the Help File. To do so:

1. **Press the directory pop-up menu to open the folder that you installed the Help file in.**

   The directory pop-up menu is the button labelled "Music Folder" in the picture above. The window below shows the contents of the Folder listed on that button. Select the bottom item in the menu to work your way back to the top level of your hard disk. If you are working with floppy disks, click the Drive button to look on another disk.

2. **If you can't find the Help file or have not installed it yet, click Cancel, Quit Performer, and follow the procedure above for installing the Help File.**

3. **If you can find the Help file, click its name in the list to highlight the name and click the Open button.**

   Performer will remember the location of the Help file so that you won't have to find it each time you click the Help cursor. However, in some cases Performer may forget the location, so we recommend that you place the Help file icon in the same Folder as Performer so that Performer can always find it.

The Help menu

The Help menu contains two items: *About Help* and *Show Balloons*.

Choosing *About Help* opens a help window that describes how to use the On-line Help feature. You can choose About Help anytime—even when the Help file or a Performer file is not currently open.

Choosing *Show Balloons* makes the arrow cursor turn into the Help cursor without holding down any keys. This is convenient when you would like to browse several features. In Show Balloons mode, any item that you click on or select from a menu will open a help window.

In Show Balloons mode, you can temporarily turn the cursor back into the arrow by holding down the *command-option-shift* key combination.

To permanently turn the cursor back into the arrow, choose *Hide Balloons* from the Help menu.

To toggle the Show/Hide Balloons command from the Macintosh extended keyboard, press the Help key.

Getting help on greyed menu items

Greyed menu items are commands that are not currently available for one reason or another. For example, Region menu items are greyed unless a region has been selected. If a region is selected, they become black.

To get help on a greyed menu item, simply hold down the command-option-shift key combination while selecting the item from the menu. The item will not highlight as you select it, but a help window will appear anyway.

Please note that it is not possible to get help on greyed menu items when you are running Performer on a Macintosh with a 68000-based CPU such as the Macintosh Plus, SE or Classic.

A word to the wise

Help descriptions do not take the place of the Performer manual. Unfortunately, there is not enough space to cover all the intricacies of every Performer feature in the space of a Help window. *Therefore, we strongly recommend that you refer to your Performer manual and update documentation for a complete explanation of features that you would like to learn more about.* Then you won't miss things that the Help window doesn't cover, and you will get the most out of Performer.

Chapter 3 *Performer's User Interface*

The user interface encompasses everything that you do to interact with the program: what you see on the screen and how you use the mouse, keyboard and peripheral devices. In this section you'll find information about Performer's windows, dialog boxes, mouse and keyboard actions and how to specify and locate regions using units of time. This section also describes Performer's enhancements to the standard Macintosh user interface.

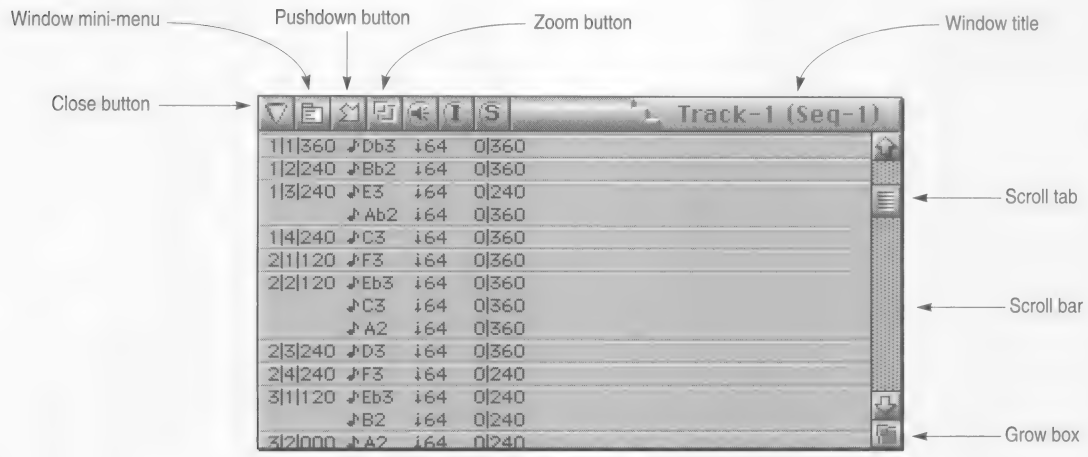
> ☛ The examples of Performer's windows that you see in this manual are what you see when you are running Performer on a Macintosh with a color monitor (in either 16-level greyscale or 256-colors). If you have a black and white monitor, what appears on your screen will be somewhat different than what you see printed in this book.

Before using Performer, please review the standard Macintosh user interface conventions. If any of them seem unfamiliar, please refer to the Macintosh owner's manual for a full explanation. Be sure you are familiar with the following:

- How to use the mouse and keyboard
- How to open, copy and delete files from the Finder
- How to choose commands from menus
- How to select options using push buttons, radio buttons and check boxes
- How to respond to dialog boxes
- How to use Command key shortcuts for menu commands
- How to enter and edit text

Windows

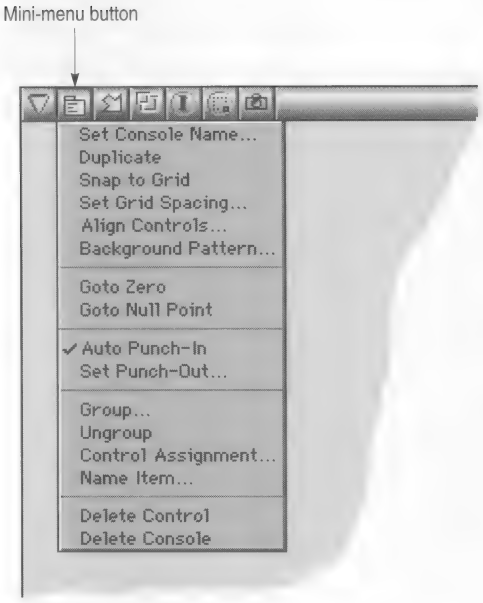
To start with, here's an example of a Performer window:



The Close button is shaped differently from the standard one but works just the same: click in it to close the window.

The Scroll Bar works exactly the same as the standard one: to move directly to a desired location in the window, drag the Scroll tab to the desired location. Press on the arrows to scroll continuously, or click once on them to scroll one line at a time; click in the grey region to scroll a screenful at a time.

The Window Mini-Menu resembles the standard menus on the top of the screen. It contains commands pertinent to that particular window. To pull it down, press on the menu icon and then select a menu option as you would on a standard menu at the top of the screen.



A Performer mini-menu

Window title shows the name of the window, and often the track or sequence that it pertains to. Command-click the title to switch to a different track, sequence, etc.

The Pushdown Button will put the window behind all other windows on the screen. This is useful when you are finished with a window but don't want to close it.

The Zoom Button will enlarge or shrink the window. Clicking in the zoom box will enlarge a window to a larger size; clicking in the zoom box a second time will return it to its original size.

The Grow Box lets you adjust the size of the window. Dragging the grow box will continuously adjust the size of the window. Note that it is possible to have names or other information extend past the right edge of the window; if you need to see this information use the grow box to expand the window appropriately.

The active window

Most of the time, the window in which you are currently working is the *active window*. The active window is indicated by fully detailed borders; when a window is inactive its top border and scroll bar are blank. To activate a window so that you can work in it, simply click anywhere on it. The main control panel is always active; it is not necessary to click on it before using it.

A single click on an inactive window makes that window active, and in addition, the item in the window that was clicked responds, except for clicking the title bar, scroll bar or re-size button. This speeds up working with Performer because less clicks are necessary.

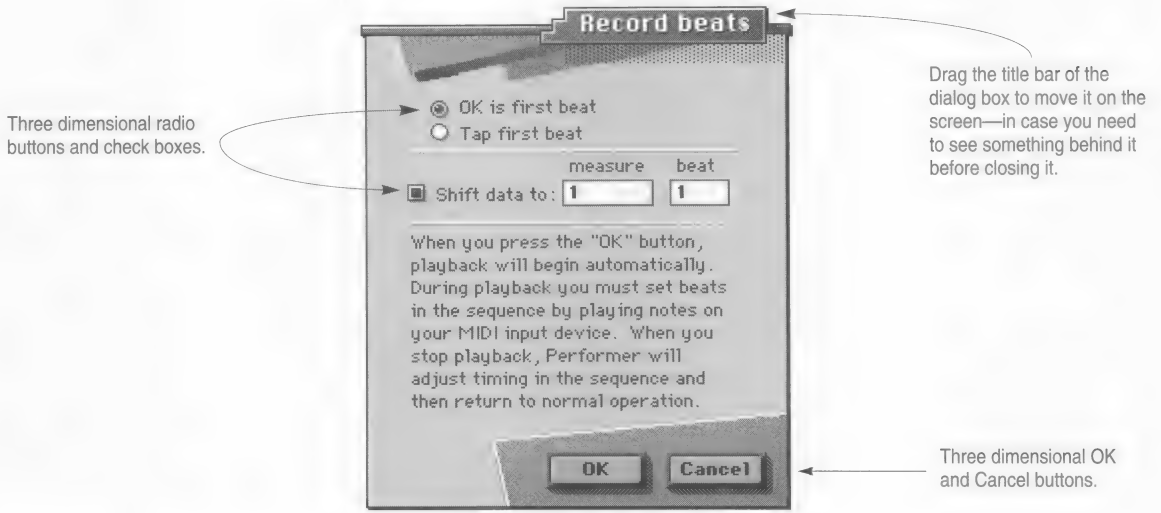
Closing all edit windows

Performer provides several shortcuts for closing all open edit windows (Event Lists, Graphic Editing windows, and QuickScribe notation window):

- Press command-option-W.
- Option-click the close triangle in any edit window.
- Press the option key and the Close command in the Windows menu changes to Close All Edit windows.

Dialog boxes

Performer's dialog boxes look more three dimensional than the standard Macintosh ones:



Even though these buttons look different, the act like standard Macintosh check boxes, radio buttons, and push buttons. For example, the text labels for radio button and check box options can be clicked to check the box or push the button. In addition, if you type in a text box, its corresponding radio button selects automatically.

Clicking shortcuts

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

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

Mouse techniques

Here are the mouse actions you'll use in Performer:

To click, move the mouse to position the arrow cursor on the object then press and quickly release the mouse button. Single clicks are generally used to select an action, confirm a selection or to select something for editing.

To double-click, move the mouse to position the arrow cursor on the object then click the mouse button twice in quick succession. The interval between the two mouse clicks can be set on the Control Panel on the Apple menu (refer to your Macintosh owner's manual about this). Double-clicking is generally used for opening things such as windows.

To press, move the mouse to position the arrow cursor on the object, press the mouse button and hold it down.

To drag, move the mouse to position the arrow cursor on the object, press the mouse button and, holding it down, move the mouse in the desired direction. Dragging is used to increase the size of a window, to move indicators (such as the tempo slider in the Metronome panel), to select multiple names, events or objects, or to select a region.

To scroll, press on the scroll box in the scroll bar and drag it in the desired direction. Scrolling can also be done by clicking or pressing on the arrows on the top and bottom of the scroll bar.

To learn more about mouse actions, consult the Macintosh Owner's manual.

Keyboard and mouse actions

Some actions are done with the mouse and keyboard in conjunction:

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 noncontiguous items; for example, you would use Shift-click to select several independent events in an Event Editing window.

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

To Command-click, hold down the command key, move the mouse to position the arrow cursor on the object and click the mouse. Command-click is used for selecting regions larger than can be

displayed on the screen. To do so, highlight an item or event at the start of the region, scroll with the scroll bars until the end of the region is visible, then Command-click at the end of the region.

Keyboard commands

The following keyboard commands are applicable to dialog boxes and pop-up 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.

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 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.

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 from field to field in the event list, confirming the current selection and advancing to the next one in the arrow direction.

Cut	⌘X
Copy	⌘C
Paste	⌘U
Erase	⌘B
Repeat...	⌘N
Merge	⌘M

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 key and press the indicated key. For example, command-X is the shortcut for the Cut command. Instead of pulling down the Edit menu and selecting Cut, hold down the Command key and press the *X* key.

is the shortcut for the Cut command. Instead of pulling down the Edit menu and selecting Cut, hold down the Command key and press the *X* key.

Specification of time units

In Performer, you will always be dealing with time specifications. Performer gives you the option of using *measure time* (measure | beat | tick), *real time* (minutes:seconds.hundredths) and *frame time* (hours:minutes:seconds:frames). Full understanding of the time specifications you are using is essential. Below is a concise explanation of each of them:

Measure time (measure|beat|tick): A specification of measure-oriented musical location. The number of beats in the measure depends on the specified meter: 4/4 will define 4 beats per measure, for example. Subdivisions of the beat vary, according to the 480-ticks-per-quarter note constant. Thus, a beat in 6/8 time (an eighth note) will have 240 tick subdivisions, a beat in 2/2 time (a half note) will have 960 tick subdivisions and so forth. Measure time is useful since it is the most musical.

Real time (minutes:seconds.hundredths): Measurement in standard clock time. This is a simple, already familiar method for location.

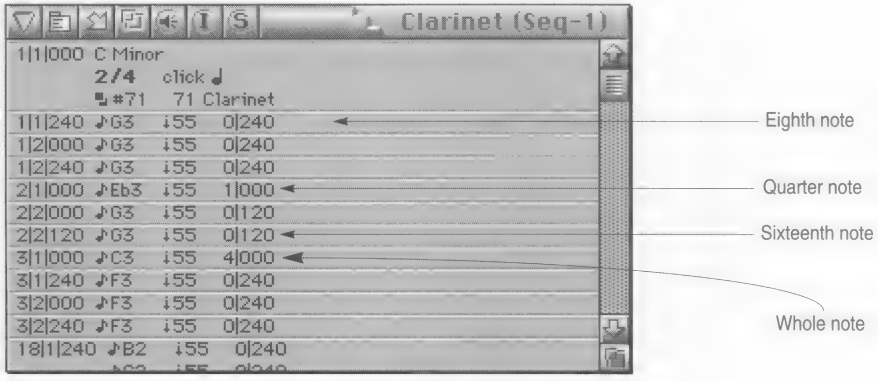
Frame time (hours:minutes:second:frames): Frame time is a special type of real-time measurement. With it, you can synchronize Performer (via a SMPTE to MIDI converter) to a device that uses SMPTE time code as a time reference. Unlike measure time, frame time is used when absolute time location is necessary.

SMPTE stands for Society of Motion Picture and Television Engineers. Although SMPTE time code is used mostly in film and video work, it is increasingly used for audio applications. One SMPTE frame

corresponds to one film or video frame. The number of frames per second depends on the equipment you are working with; Performer supports 24, 25, 30 drop frame, and 30 frames per second. SMPTE is useful as a standardized location scheme when synchronizing to production devices such as a tape deck or video deck. See the chapters called *Receive Sync* and the appendix *Synchronization Specifications* for a more detailed explanation.

Durations used in specifying note lengths

Times used in Event Editing windows and elsewhere to specify durations are displayed in quarter notes and ticks. Since Performer allows different meters in a sequence, it is necessary to use a comprehensible, easily divisible format to insure clarity and a lack of confusion. The quarters | ticks format fulfills this requirement, making it easy to understand durations without having to specify a measure value. For instance, a whole note is 4 | 000 (four quarter notes and no ticks), and a dotted quarter note is 1 | 240 (one quarter and 240 ticks).



Editing the Counter

The current playback location can be changed at any time by editing the Counter. You can edit the counter even while the sequence is playing back. To edit the current Counter location in Performer:

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.

Pressing the Tab or the decimal key on the keypad will cycle through each field of a time display, highlighting each so that you can type in a value. For example, to enter the time 0:07.13 as shown in the example above:

1. **Click on the minute field to highlight it.**
2. **Press 0.**
3. **Press the Tab or decimal key.**
4. **Press 0 and 7.**
5. **Press the Tab or decimal key.**
6. **Press 1 and 3.**
7. **Press the Return key.**

As a shortcut, you can press the decimal key on the Macintosh keypad. To cancel the edit, press command-period.

Editing during playback

Many of Performer'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. So, the next time you are listening to your music and 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 (in an Event List, Tracks Window, etc.).
- Edit a region with the Edit or Region menu commands
- Rearrange Chunks in the Song window

- Cut, copy, drag, option-drag (copy), etc. notes and data in Graphic Editing and QuickScribe notation windows
- Reassign the playback channel for a track
- Add, delete, rename, or reposition a track
- Access a mini-menu command such as Set View Filter

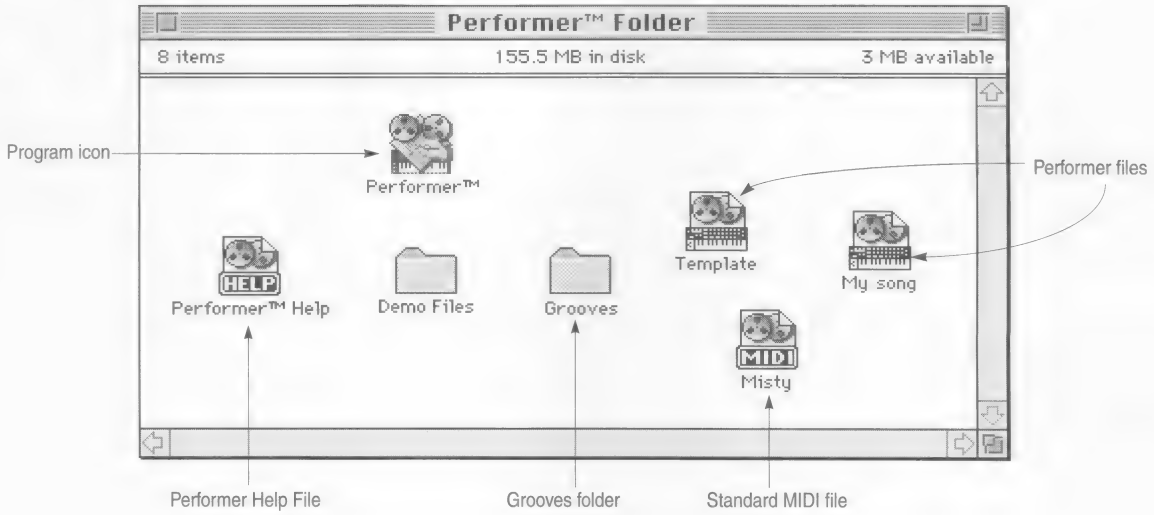
During playback and recording, the Counter and other displays may become irregular and seem to skip beats. This is due to Performer's primary obligation which is to receive and output MIDI data on time. Performer may have to devote all of the computer's resources towards this end and thus may not be able to keep the screen display completely smooth and current. The Click and Flash will provide an accurate determination of the tempo. In addition, editing commands may sometimes take longer due to the amount of processor time required to deal with playback.

Some features, because of their nature, cannot be accessed during playback. These features are either greyed out (unaccessible) during playback or will have no effect unless you press the Stop button before using them. Examples are:

- Using the MIDI Interface dialog box
- Save or close a file

Chapter 4 *Working With Files*

A single Performer file can contain one or more sequences and songs. It is represented in the Macintosh Finder by the Performer file icon.



Opening a new file

To open a new file, you must first start Performer.

1. **Double-click on the Performer program icon.**

   You can also click once on the Performer icon and choose Open from the File menu.

2. **If you see a new file appear on the screen, with the tape-deck style control panel and Tracks window, you are ready to go.**

3. **If you see the standard Macintosh dialog box for opening files, click the New button (or press command-N).**

If you are already in Performer:

1. **Select Close from the File menu.**

   This closes the file that is currently open. If you have modified the data in the file, Performer asks if you would like to save changes. The various windows will disappear and the file will close.

2. **Select New from the File menu.**

   A new file will be created and the main control panel appears, along with the Tracks window. (You can customize the New command using Save as 'New' Template, described later in this chapter).

Opening a new file automatically opens a new sequence. This sequence is ready to record into right away. You can create other new sequences by choosing *Add Sequence* from the Chunks window mini-menu.

Opening an existing file

To open an existing file from the Finder:

1. **Double-click on the file icon.**

   You can also click once on the file and choose Open from the File menu. This will start Performer and bring up the selected file.

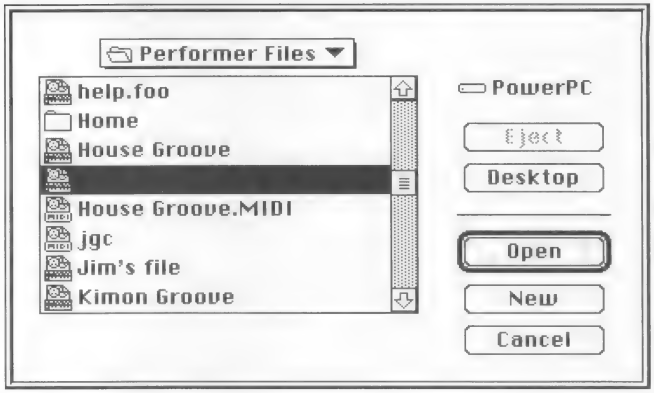
To open an existing file from within Performer:

1. **If a file is already open, close it by selecting Close from the File menu.**

   You are given the option of saving changes in this file. The Performer windows will all disappear and the file will close.

2. **Select Open from the File menu.**

   A dialog box will appear, containing a list of files on the selected disk. To see the files on a disk in a different drive, click on the Desktop button. To view files on another disk which is not currently in a drive, click on the Eject button and insert the other disk.



3. **Click on the name of the file you wish to open.**

4. **Click on the Open button.**

   The file you selected will be opened. Double-clicking on the name of the file will also open the file.

Opening files in other formats

Performer can open files in the Professional Composer® and MIDI file formats. To open a file in one of these formats, simply select it from the Open dialog box as normal. A message will appear informing you that Performer is converting file formats. The file will open as a Performer file; if you want to save it back into the Professional Composer or MIDI file format you must use the procedure described later in this chapter.

In addition, files created in older versions of Performer can be opened in the new version; simply select the old file from the Open dialog box as normal.

Performer cannot open Mosaic files directly. To open a Mosaic file, save it as a MIDI file from within Mosaic using the Save As command in Mosaic's File menu. Once the file is saved in the MIDI file format, you can then open it in Performer.

Loading a chunk from another file

Once you have opened a file, the Load command in the File menu lets you load Chunks (sequences and songs) from other files directly into the open file without closing it.

Your Macintosh must have enough RAM available to support the load operation. Be sure to open and watch the Memory window, available in the Windows menu, whenever you load Chunks or Remote Controls. Try to have at least 100K available at all times.

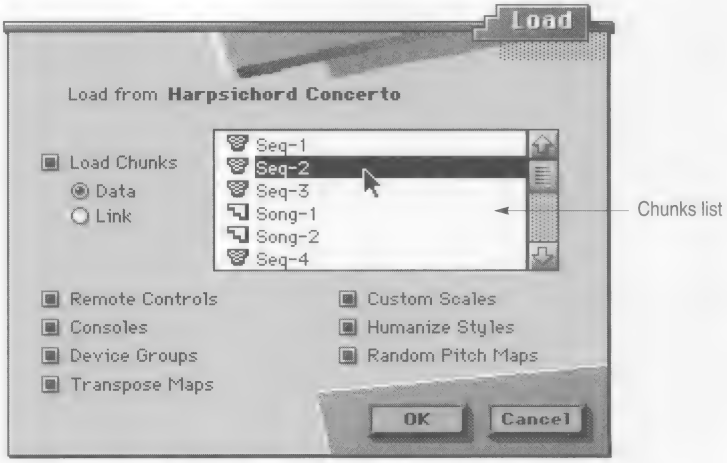
To load a Chunk into an open file:

1. **Choose *Load* from the File menu.**

   The standard Macintosh Open dialog box appears.

2. **Click the file containing the Chunk you wish to load, then click Open.**

   Alternately, you can double-click the file name. Performer's Load dialog box appears, displaying the file name at the top.



3. **Make sure the *Load Chunks* option is checked.**

   If it is not, click its check box. The Chunks list displays all Chunks in the selected file.

4. **Choose the *Data* sub-option.**

5. **Select the Chunk(s) you wish to load.**

   Click the Chunk name to select it. If you wish to load more than one Chunk, drag to select contiguous Chunks and shift-click to select discontiguous Chunks.

6. **Optional: If you wish to load any other items from the selected file, select the appropriate option.**

7. **Click OK to confirm your choice or Cancel to withdraw the Load command.**

   Clicking OK causes the selected Chunk(s) to be placed in the Chunks window. You can change each Chunk's position in the Chunks list by dragging its Type icon.

Loading a song Chunk automatically loads its component Chunks. For example, you choose to load Song-1, which contains Seq-1, Seq-2, and Song-2. Song 2 contains Seq-3 and Seq-4. When you execute the Load command, all six Chunks (two songs and four sequences) will be loaded in and added to the Chunks list of the open file.

Linking sequence chunks from another file

A memory-saving option in the Load command is to **Link** a sequence Chunk instead of actually loading it. A Link serves as a reference to a Chunk in a different file. Since a Link requires far less memory than the Chunk it references, you can build an extensive list of Chunks without running out of memory in your Macintosh.

Because a song in Performer is a collection of Chunks, song Chunks cannot be linked. Instead, just load the song using the procedure described in the previous section. Performer will automatically load the song's component Chunks. Alternately, you could open that song's file and use the *Merge Chunks to Sequence* command to transform the song into a sequence. The new sequence could then be linked. For more information about converting a song into a sequence, please refer to the chapter *The Song Window*.

For successful playback of links, the linked Chunk's file must reside in a folder with Performer or, if Performer is on the desktop, the file must also be on the desktop.

To link a Chunk from another file:

1. **Choose *Load* from the File menu.**

   The standard Macintosh Open dialog box appears. If necessary, click the Drive button repeatedly to view each drive present.

2. **Click the file containing the sequence you wish to link, then click Open.**

   Alternately, you can double-click the file name. Performer's Load dialog box appears, displaying the file name at the top.

3. **Make sure the *Load Chunks* option is checked.**

   If it is not, click its check box. The Chunks list displays all Chunks in the selected file.

4. **Choose the *Link* sub-option.**

   Any song Chunks in the window become italicized, indicating that they cannot be linked.

5. **Click the sequence(s) you wish to link.**

   If you wish to Link more than one sequence, you can drag to select contiguous Chunks and shift-click to select discontiguous sequences.

6. **Optional: If you wish the Chunk's Remote Controls assignments to be loaded with the Chunk, choose the *Load Remote Controls* option.**

   Deselecting this option loads only the Chunk's song or sequence data.

7. **Click OK to confirm your choice(s) or Cancel to withdraw the Load command.**

   Clicking OK places a Link to each selected Chunk in the Chunks window and a corresponding Chunk Select control in the Remote Controls window.

After you have linked a Chunk, its name appears italicized in the Chunks window of the current file. The Link's Comment field displays the file from which the Linked Chunk will be loaded. When the Link is play-enabled, Performer will take a few moments to load it; the amount of time this takes depends on the size of the Chunk.

☛ Please remember: *for successful playback of links, the linked Chunk's file must reside in a folder with Performer or, if Performer is on the desktop, the file must also be on the desktop.*

Saving files

Please read this section carefully! When you open a file from a disk, Performer makes a copy of that file and puts it in the Macintosh's temporary memory (called Random Access Memory, or RAM). When you work with the file, you are actually working with the copy that is in RAM, not the original file on the disk. If you choose *Save* from the File menu, Performer writes the changes you have made into the original 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 files should be saved frequently. If Performer or your Macintosh should malfunction, all of the work you have accomplished since you last saved may be lost! However, if the file was recently saved, you can retrieve the latest version from the disk and proceed without having lost much work.

Always be sure that the disk you are saving the file on has enough room! Files can be saved to any disk with sufficient space for the file. They can also be saved with different names.

Here's the basic procedure to save a file:

1. **Choose the Save command from the File menu.**

   Your file is saved on the 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.

If you are saving the file for the first time, a dialog box will appear prompting you for a 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 on the Save button.**

   Pressing the Return key will do the same as clicking on the Save button. If you want to save the file to a different disk, click on the Eject button, insert a new disk and, after typing in the name, press the Save button. Pressing Cancel withdraws the Save command.

Saving a file under a different name

The Save As command is used to save a file under a different name or to a different disk:

1. **Choose *Save As* from the File menu.**

   The Save As dialog box will appear.

2. **Type in the new name for the 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 on the Save button.**

   Your file is saved on the disk in its current state under the new name.

Saving a file to a disk not currently in a drive

To save a file to a disk not currently in a drive:

1. **Choose the Save As command from the File menu.**
2. **The Save As dialog box will appear.**
3. **Click on Eject.**

   The disk that is currently displayed in the dialog box window will be ejected. If you want to use the other drive, click on Drive before clicking on Eject.

4. **Insert the disk you wish to save the file on.**
5. **Click on the Save button.**

   The file is saved on the disk you selected.

Performer saves almost every attribute of your file, including open windows and their screen positions, the on/off status of such features as Audible Mode and Patch Thru, your current choice of Event Editing display, your Chunk Start Times, and many others. If you find that your files often have very similar setups, use the Save As 'New' Template command, described later in this chapter, to customize your new files.

Saving a sequence in another format

Performer can save sequences in several other file formats:

- Standard MIDI file
- Performer Version 2.41 file
- Professional Composer™ file

Only sequences can be saved in these other file formats. If you wish to save a song, you can do so by converting it into a sequence beforehand. Please refer to the *Chunks Window* chapter later in this manual for information about converting a song into a sequence.

To save a Performer sequence in a different file format:

1. **Play-enable the sequence that you wish to save.**

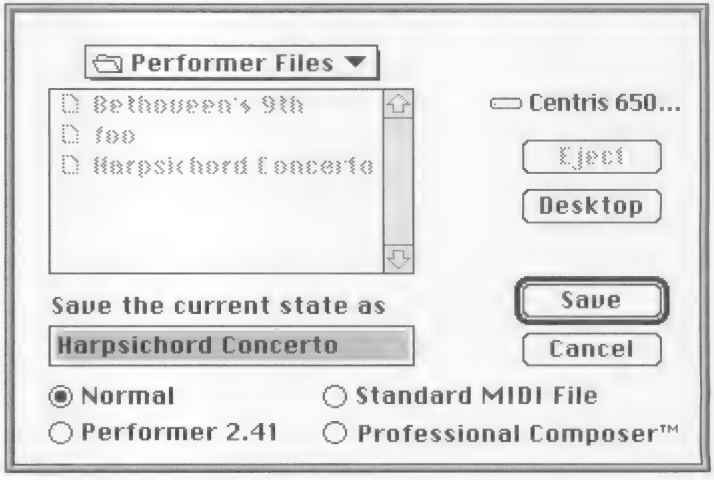
   Do so by clicking the play-enable button next to the sequence in the Chunks window.

2. **If you are saving a MIDI file, and you want the tempo and meter map of the sequence to be saved with the MIDI data, choose *Conductor Track* from the Metronome tempo control pop-up menu in the main control panel.**

   Do so by choosing Conductor Track in the Tempo Control pop-up menu in the Metronome.

3. **Choose *Save As* from the File menu.**

   The Save As dialog box appears with four options: Normal, Performer 2.41, Standard MIDI File, and Professional Composer.



4. **Click the desired file format.**

5. **Click *Save* to activate the conversion.**

6. **If you are saving a standard MIDI file, the MIDI File Options dialog box appears.**

   See "Saving as a standard MIDI file" on page 53 for more information about these options.

Saving as a standard MIDI file

Use the procedure explained in "Saving a sequence in another format" on page 51. Music saved in the MIDI file format can be opened with any program that also reads and writes MIDI files—even programs that run on other types of computers.

MIDI File Format options

When you save a file as a standard MIDI file, the following dialog box appears:

- **Format 1:** separate tracks with tempo and meter information as the first track
- **Format 0:** one multi-channel track with tempo/meter information at the beginning
- **Format 0:** tempo/meter map only

Save track names as plain text

When selected, the *Save track names as plain text* option causes only plain text events, such as track names, to be saved. No special text events, such as track comments, are saved. This option is necessary

when transferring files to programs that do not support special text events. If you discover inconsistencies when transferring text in MIDI files, try using this option.

Expand Loops

Standard MIDI files cannot contain loops. The *Expand loops* option addresses this problem by converting each loop into a region of repeated data in the same way as Performer's *Repeat* command. The *End file at time* option allows you to specify the end time of the sequence in the box provided. For convenience, the box appears with the sequence's current end time.

My Song

Performer automatically opens MIDI files. For more information, see the *Open* section earlier in this chapter.

Saving as a Performer 2.41 file

Performer's file format is constantly developing as new features are added. Due to these changes, files saved in the current format cannot be loaded into earlier versions of Performer. If for some reason you need to work with a file in an earlier version of Performer (2.41 or later), Performer lets you save sequences in the version 2.41 format:

To save a file in the 2.41 format, use the procedure described in "Saving a sequence in another format" on page 51.

When you Save As 2.41, songs in the file will not be saved. This is because Version 2.41 does not support songs. Therefore, any songs in the file you save will not be present in the 2.41 version of the file. If you don't want to lose the song when converting to the 2.41 format, you can easily convert it into a sequence, which *will* get saved in the 2.41 file. To do so, open the song's Song window, Select All, and choose *Merge Chunks to sequence* from the mini-menu. A new sequence, which is identical to the song, will appear at the bottom of the Chunks window list and get saved in the 2.41 file.

Saving as a Professional Composer file

A Performer sequence can be converted into a format that is readable by Professional Composer®, an earlier score editing software package from Mark of the Unicorn.

To save a file in the Professional Composer file format, use the procedure described in "Saving a sequence in another format" on page 51. Make sure that you quantize both attacks and releases of all the notes in the sequence beforehand. Otherwise, the transcription in

Professional Composer will be filled with unwanted 32nd and 64th notes and rests. See the section on quantization for further information.

Once you have converted the file, quit Performer, start up Professional Composer, and open the newly created Composer file.

Transferring a sequence to Mosaic™

To transfer a sequence to Mosaic, Mark of the Unicorn's latest notation software package, save it as a Format 1 MIDI file. No quantization or other preparation is necessary because Mosaic does its own quantizing when you open the MIDI file in Mosaic. See "Saving as a standard MIDI file" on page 53 for information about saving standard MIDI files.

Reverting to a previously saved version of the file

If you've made unwanted changes to a file, you can undo the changes you've made by returning to the last saved version. This operation is identical to closing the file and opening it from the disk 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 file means that all changes you've made since you opened or last saved the file will be lost.

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

Saving a file as a 'New' template

The Save As 'New' Template command, found in the File menu, allows you to customize your copy of Performer. You control what appears on the screen when you open a new file, by creating your own New file template. A template is a "skeleton" file, a framework designed to save you time when building your files.

For example, let's say you typically work in files with one sequence, the same number of tracks, Auto Channelize, measure time and SMPTE displays in the Counter window, and a Sequence Start Time of -1. In addition, you arrange Performer's windows to suit your screen size and style of working.

You can use the Save As 'New' Template command to give your 'New' files all of these characteristics *automatically*.

When you choose Save As 'New' Template from the File menu, Performer remembers the exact state of the file and reproduces it next time you request a new file. The New command, also in the File menu, will produce an untitled, empty new file identical to the source file.

To use the Save As 'New' Template command:

1. **If you aren't already in a Performer file, open one or choose New from the File menu.**

2. **Configure Performer's windows, their contents, and any other features as you find most useful.**

   This file will be your template source file: Performer will remember your exact track setup, window layout, Patch Thru setting, and so on.

3. **Choose Save As 'New' Template from the File menu.**

   A dialog box will ask you to confirm or cancel your request.

4. **Click OK to confirm the command, Cancel to withdraw it.**

   If you confirm the command, Performer redefines your 'New' template based on the current file. All attributes specific to the current file, except for MIDI and Conductor track data, now comprise a New file in the copy of Performer you are using.

To see the effects of Save as 'New' Template, close the current file and choose New from the File menu. A new, empty, untitled file will appear, identical to the last file you saved as 'New'.

Hints for using Save As 'New' Template

Remember that the Save As 'New' Template command customizes only the copy of Performer in which it is used. Every copy of the program has its own template; a fresh copy of Performer will yield the default New file setup.

For this reason, make a spare copy of your template source file using the Save As command described earlier in this chapter. Pick a suitably descriptive name for the file, like "Perf Template". This way you can retrieve your preferred setup into any copy of Performer by opening "Perf Template" and immediately choosing Save As 'New' Template from the File menu.

Redefining your New file template is easy. For example, you've used the Save As 'New' Template command in a file that contains only one track.

To quickly add more tracks to your template:

1. **If you are in a Performer file, choose Close from the File menu to close it.**

   If you've made any changes to the file, you'll be prompted to save them.

2. **Choose *New* from the File menu.**

   A new file will open, identical to the file you saved as New.

3. **Activate the Tracks window if it is not already active.**

   Click anywhere in the window to activate it.

4. **Hold down the Option key on your Macintosh keyboard and choose Add from the Tracks window mini-menu.**

   A small dialog box will prompt you for the number of tracks to be added. Type in the desired number.

5. **Choose *Save As 'New' Template* from the File menu.**

   The existing file will become the new template.

Quitting Performer

Quitting Performer returns you to the Finder.

Choose *Quit* from the File menu.

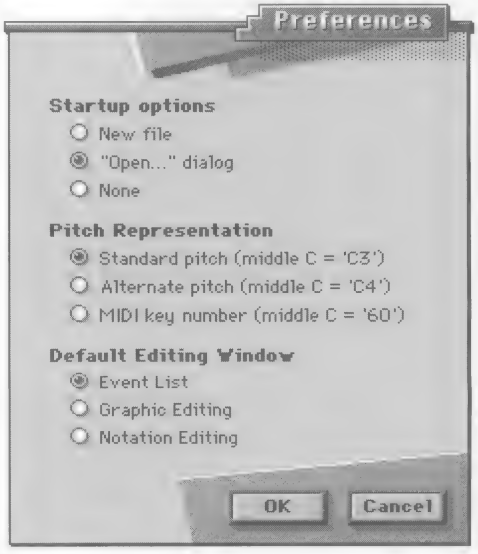
A dialog box may appear asking you if you want to save changes made to the file. To save the changes, press Yes. If you don't want to save changes, press No. To withdraw the Quit command and return to your Performer file, press Cancel.

Setting Performer's startup preferences

When Performer first opens, you have three choices for what it can do:

- Open a new file
- Present you with the Open file dialog box, which lets you open either an existing file or a new file with the "New" button
- Neither of the above, which lets you either choose Open or New from the file menu

To set this preference, choose Preferences from the File menu and choose the desired setting. This setting is remembered in the Performer Preferences file in the Preferences Folder inside the System Folder on your hard disk.



File and disk errors

The following are a few file and disk errors that commonly occur. *Always keep plenty of up-to-date backups of your important files as you work. Almost any software problem is survivable as long as you have kept backups of your work.* See *Appendix B: Troubleshooting and Customer Support* for more information about problems you may encounter with Performer files.

There isn't enough room on the disk. Your disk is too full. Eject the disk and insert one with plenty of free space on it. Note: If Performer runs out of disk space while saving a file, the file on disk will be damaged. If this happens, *immediately use the Save As command to save the file to a disk with more space available.* If you fail to do this, and you have not made a backup file, you will have lost an entire file. As a rule, before opening an existing file, be sure the disk on which it is stored has enough free memory to hold the information you expect to add.

An error occurred while writing the file. This is a dangerous situation. In all probability, the existing copy of the file on the disk has already been erased so that the new copy could be saved. Because of the error, any partial file that has been saved cannot be read. At this point, the only good copy of the file is in memory. Immediately try to save the file on another disk. *Do not* attempt to use the Revert to Saved command on the File menu; the saved copy is damaged and you will lose the file in memory.

You tried to open a Professional Composer file made by using the Save as Composer command in Performer and didn't get what you expected. If the file has all sorts of very small note values, try quantizing the Performer file to a larger note value. Make sure that you quantize both attacks and release of all the notes. To confirm that you have successfully quantized, check attack times and durations of notes in the Event Editing window of each track. If correctly quantized, all durations will be rounded values such as 1/000 (quarter note), or 0/240 (eighth note). See the section on quantization for more details. Once you have successfully quantized the sequence, save it as a Professional Composer file and try opening it in Professional Composer again.

The computer ran out of memory. Either the data you were recording filled up memory or you edited the file quite a bit. Try recording smaller segments and saving the file more often.

The disk is locked. Unlock the disk by sliding the small tab on the back of the disk in the upper left-hand corner down so that it covers the small hole.

The disk can't be read. The disk itself may be damaged. Return to the Finder and try inserting the disk again. If it still can't be read, it may be irretrievable.

Helpful file and disk hints

File menu commands 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 file.

Always keep backup copies of your important files. 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. This way, if anything should happen to your original, you will have fully updated backup of the file.

If you are working with floppy disks, you should store your files on a disk separate from Performer. This gives you lots of room for saving files.

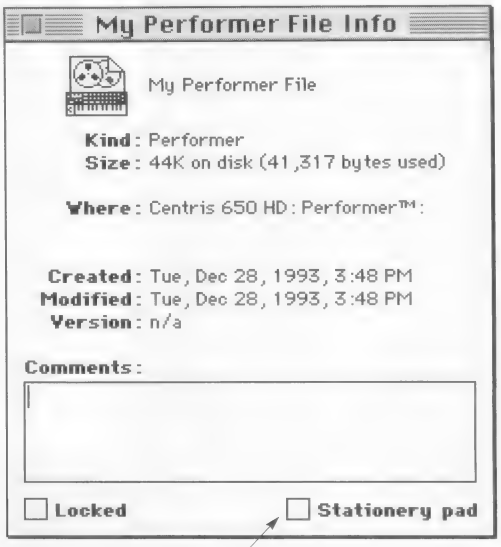
Saving a file under a different name while working can be useful when you want to keep a record of earlier versions.

When saving files during a working session, it is a good idea to save alternately under different file names; if something should happen to one of the files, the other will be a recent version. For example, a file can first be saved under the name "Session1". The next time it is saved, choose the Save As command from the File menu and save it as "Session2". The following time, it is saved as "Session1" again, then "Session2" and so forth. To be even more careful, save a file to different disks during a working session.

Hard disk users should make sure to backup their files to floppy disks. This should be done 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 floppy backups are severe: if your hard disk is damaged, some or all of the files may be lost forever.

Using System 7's stationery feature

Performer supports System 7's "Stationery pad" feature in the Get Info window for a file as shown below:



Stationery pad option in the Get Info window.

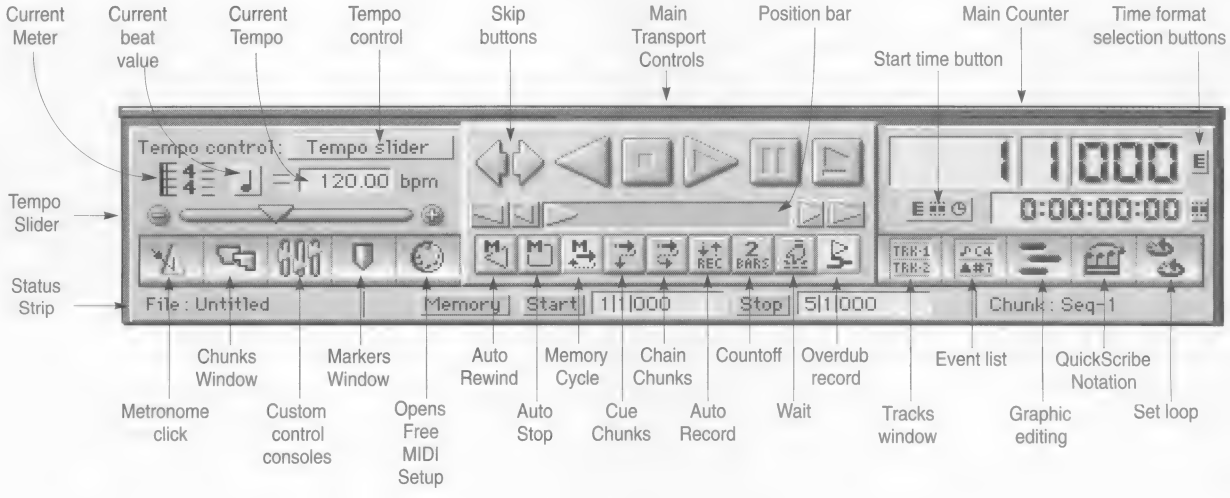
When this option is checked, the file can be opened, but System 7 will prevent you from modifying the original file by forcing you to Save As when you attempt to save the file. This option is great for preserving files that you do not want to modify and that you use regularly as a "template" from which to build other files. For more information about the Stationery pad option, consult your System 7 documentation.

Chapter 5 The Consolidated Controls Panel

Performer's Consolidated Controls panel contains all the functions that make Performer "go": buttons to record, play, rewind, set tempo, and more. The main transport controls look and act much like the transport controls for a tape recorder. Additional buttons provide immediate access to many of Performer's significant features. The panel can be opened by choosing *Consolidated Controls* from the Windows menu.

To conserve screen space, the Consolidated Controls panel does not have a title bar. To move the panel, hold down the shift key and drag. If the panel is behind other windows, choose Consolidated Controls from the windows menu to bring it to the front.

Quick reference



Tempo Slider: Displays the current tempo in beats per minute. When the Tempo Control pop-up menu is set to *Metronome*, drag the triangular indicator or press on the plus/minus buttons to change the tempo (+ to increase the tempo, – to decrease it).

Current Meter: Displays the meter at the current location in the Chunk. To change the meter, you must use the Change Meter command on the Change menu or insert a Meter change event in the Conductor track.

Current Beat Value: Displays which note value gets the beat in the beats-per-minute tempo indicator. Click on it to change it.

Current Tempo: Displays the current tempo in beats per minute. Click on it and type in a new tempo or drag the Tempo slider.

Tempo Control: Selects the current source of the tempo from a pop-up menu. Tempo can be controlled from the Tempo slider, the Conductor track, or remotely from a MIDI controller such as a mod wheel.

Skip buttons: If you have more than one sequence or song in the file, these buttons skip to the next or previous one, much like the skip buttons on a CD player. To view sequences and songs, open the Chunks window.

Main Transport Controls: These are Performer's main controls for playback, recording, etc. The Skip buttons change the currently play-enabled sequence to the next or previous Chunk in the list. The Position Bar indicates the current playback position of the currently play-enabled sequence. Use the Position Bar arrows to quickly advance or rewind the current location while in playback.

Position bar: Indicates the current playback location with a scrolling arrow. Scroll buttons on either side of the bar provide fast forwarding and rewinding.

Start time button: Opens a dialog box which allows you to set the start time for the Main Counter's three time formats: measure time, SMPTE time, and real time.

Main Counter: Displays the current playback position in one of Performer's three time formats: measures | beats | ticks, real time, or SMPTE time. Click the time format icon to the right to cycle through the three formats. Click the numbers and type to change the playback location. For more information about editing times in the Main Counter, refer to the *Counter Window* chapter.

Time format buttons: Cycles the display in the counter through Performer's three time formats: measures | beats | ticks, real time, or SMPTE time.

Set Loop button: Creates a loop over the selected region in the Tracks List or Tracks Overview. Select a region and click this button to create a loop. At least one track name or track segment must be highlighted to create a loop with this button.

QuickScribe Notation Window button: Opens the QuickScribe Notation window for the currently selected track(s) in the Tracks List or Tracks Overview. At least one track name or track segment must be highlighted to open Notation Editing with this button. Provides notation editing and printing.

Graphic Editing Window button: Opens the Graphic Editing window for the currently selected track(s) in the Tracks List or Tracks Overview. At least one track name or track segment must be highlighted to open Graphic Editing with this button.

Event List Window button: Opens the Event List window for the currently selected track(s) in the Tracks List or Tracks Overview. At least one track name or track segment must be highlighted to open Event List with this button.

Tracks Window button: Opens the Tracks window or brings it to the front if it is already open.

Overdub record button: Toggles overdub record mode, in which newly recorded data merges with existing data instead of replacing it.

Wait button: Causes Performer to wait for a keystroke from a MIDI or Macintosh keyboard as a signal to start playing back or recording.

Countoff button: Causes a number of measures to countoff before playback or recording. The button denotes the number of measures, which can be set by double-clicking the button.

Auto-Record button: Causes automatic punch in and punch out during recording at the start and end times specified in the Auto Record Bar.

Chain Chunks button: When highlighted, starts playback of the next Chunk in the list after the current playback Chunk reaches its End time.

Cue Chunks button: When highlighted, it play-enables the next Chunk in the Chunks list after the current playback Chunk reaches its End time and stops. To begin playback of the next Chunk, press the Play button, or a remote control for the Play button.

Memory-cycle button: Causes the region between the Memory Start and Stop points to seamlessly repeat. In the Tracks overview, repeat barlines appear in the time ruler to indicate the repeat points.

Auto-Rewind button: Causes automatic rewinding to the Memory Start location any time playback is stopped (for any reason).

Auto-Stop button: Causes playback or recording to automatically stop at the Stop location in the Memory Bar.

FreeMIDI button: Opens the FreeMIDI setup program, in which you can make changes to FreeMIDI's representation of your current MIDI studio setup.

Markers Window button: Opens the Markers window for the currently play-enabled Chunk or brings it to the front if it is already open.

Custom Consoles Window button: Opens the Sliders window or brings it to the front if it is already open.

Chunks Window button: Opens the Chunks window, which displays all of the sequences and songs currently stored in the file.

Metronome click button: Turns the audible metronome click on or off.

Status Strip: Displays the name of the currently open file and currently play-enabled Chunk. Also displays the Memory bar, which allows you to set start and stop times for the Auto-Stop, Auto-Rewind, and Memory-cycle functions.

Main Transport Controls

The Main Transport Controls are the buttons that make Performer "go": with them you can record, play, rewind and more. The Main Transport Controls are enabled by clicking on 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. In some situations (when in external sync, for instance) buttons may turn grey signifying that they cannot be used.

Think of Performer's motion controls as similar to tape recorder transport controls. But Performer's motion controls are more flexible than their hardware counterparts in that they are programmable via the Memory buttons (on the left of the window), utility buttons (on the right) and menu commands.

The Play button and playback

Clicking on the Play button starts playback of the currently play-enabled sequence or song. Playback will begin from the current time specified in the Counter. Playback can be delayed by the Countoff button and held by the Pause and Wait buttons.

The Play button is highlighted while the sequence is playing. It flashes (or turns gray on a black and white display) when waiting for synchronization in the External Sync mode or when the wait button is on.

The Position Bar arrows can be used to quickly advance or rewind the current location while in playback.

If you start playback in the middle of a sequence, you may not hear exactly what you expect. This is because Performer moves forward through the stream of data stored in each track, sending each event that it encounters, such as note–on and note–off commands. If you start playback in the middle of a sequence, notes which are sustaining at that point will not sound because their note-on occurred before the point at which playback began. Performer has a specially designed feature called *Event Chasing* to avoid this problem. To learn how to enable Event Chasing, see the section called *Event Chasing* at the end of the *Playback* chapter.

During playback, some Performer features become unaccessible, such as the Save command in the File menu. Many other features, however, including all editing commands, can be used even during playback. As a general rule, commands that cannot be used will either appear greyed out during playback or they will have no effect.

The Rewind button

Clicking on the Rewind button sets the current location to the start of the sequence. If the Memory Bar is showing, clicking on the Rewind button will rewind to the Memory Start location. Double-clicking the button will always rewind to the start of the sequence or song.

If the Rewind button is clicked during playback, playback is held for a moment while the sequence rewinds. Playback then resumes from the rewind location.

If the Rewind button is clicked during recording, the record button is turned off. The sequence rewinds normally and resumes in playback mode.

Although Performer rewinds much faster than a tape deck, long sequences may take one or two seconds to rewind.

Using the Auto-Rewind function is a fast way of locating a frequent rewind location. See *The Auto-Rewind button* below.

The Stop button

Clicking on 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.

The Stop button turns off all notes currently on. If the Auto-Rewind feature is on, Performer will rewind to the Memory Start location when the Stop button is clicked.

The Pause button

Clicking on the Pause button once turns it on; clicking on it a second time turns it off. The Pause button is highlighted when it is on.

Turning the Pause button on during playback will cause playback to be suspended without turning any notes off. Turning it off will cause playback to resume.

If the Pause button is turned on before playback, playback will be suspended until the Pause button is turned off.

While the Pause button is on, you can use the Rewind button, Position Bar, and Counter window to adjust the current playback location. You may also set times in the Edit, Memory, and Auto-Record bars.

The Record button and recording

Clicking on the Record button turns it on and begins recording in the currently play-enabled sequence from the current location in the counter. When it is on, the Record button is highlighted and can be turned off by clicking on 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. 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 on the Record-Enable button for the desired track (or tracks). Record-enabling a track makes it the destination for incoming recorded data.

If the Auto-Record button is enabled, the Record button will flash when clicked on (or turn grey on a black and white display). It will then turn red (or black on a black and white display) when the Punch In location is reached. When the Punch Out location is reached, the Record button returns to "record-ready" mode.

If the Record button is enabled and grey due to Auto Record, clicking on it will turn it off, cancelling the punch-in.

When slaved to external sync, stopping or rewinding the master device will turn off the record button except in the case of Tap tempo sync, which requires that you click the Stop button.

Overdub record mode

If you click the Overdub button, Performer goes into Overdub record mode. Overdub mode causes all recorded data to merge with, instead of replace, pre-existing data on the record-selected track. The pre-existing data on the track is not erased.

The word overdub is used in a very specific sense in Performer: real-time merging of incoming data with data already on 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 should turn off Overdub when you are finished using it since it can produce unwanted effects if left on by mistake. You can use the Overdub mode in conjunction with memory cycle to build patterns in multiple passes over a region. This method is similar to that used with many drum machines. (Overdub

does not function on the Conductor Track; specifically, recording on the Conductor Track while slaved to Tap tempo sync always erases existing tempo events.)

Undo Record

By choosing *Undo Record* from the File menu, the track you recorded into will be restored to its state before recording. The Redo command returns the track to its state after recording. Going back and forth between the two states allows you to do A/B comparisons. Note that only the last command can be undone; if you edit your data after recording you will no longer be able to undo the Record command.

The Position bar

The Position Bar indicates the current position in the sequence. The indicator can be moved to change the location: left to rewind, right to advance. The far left is the beginning of the sequence, the far right is the end.

To change the current position in the sequence, drag the scroll triangle to the desired location. If you press on the grey bar, the scroll triangle will move to that spot. If you keep pressing, you can drag it to a new location.

The position bar can be used during playback as well as when the sequence is stopped.

The same applies to the Position Bar Arrows. Using them during playback is called "cueing". The right set of arrows cues forward in time, the left set cues backwards. The smaller arrows cue slowly, the larger ones cue faster. The left arrows cause playback to pause while cueing backwards until the arrow is released. If used during recording, the Record button will be turned off before cueing. The Position Bar can also be used while the Pause button is on during playback.

The Position Bar can be used to find a relative location in a sequence. It may not be useful for finding exact locations (use the Counter or Markers instead) but is perfectly suited for finding the beginning and end of a sequence: simply drag the scroll triangle to the far left or right.

Use the Position Bar to move short distances quickly in a sequence. Since forward cueing is audible, you can use it to accurately locate a particular note event or region.

The Memory buttons

The Memory buttons (Auto-Rewind, Auto-Stop and Memory-cycle) allow you to automate the primary motion controls. By using the Memory buttons, you can program the motion controls to activate at times specified in the Status Strip.

The Auto-Stop button

Enabling the Auto-Stop button causes playback of the sequence to automatically stop at the Stop location on the Memory Bar. Clicking on the Auto-Stop button enables it; when enabled, it is highlighted.

Clicking on the Auto-Stop button causes the Memory Bar to appear if it is not already present.

The Memory-cycle button and the Auto-Stop button cannot be enabled at the same time.

The Auto-Rewind button

Enabling the Auto-Rewind button causes the sequence to automatically rewind to the Start location on the Memory Bar. This occurs when the Stop button is pressed or when playback reaches the end position in the Memory Bar in Auto-stop mode. Clicking on the Auto-Rewind button enables and highlights it.

Clicking on the Auto-Rewind button causes the Memory Bar to appear if it is not already present.

Auto-Rewind is useful for returning to a particular location after stopping. It saves you from having to stop and rewind manually.

The Memory-cycle button

The memory-cycle button is a cycle-playback and cycle-recording feature that causes a region 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 region. When the Counter reaches the end of the region, it seamlessly returns to the beginning and will continue to do so until you press the stop button, unhighlight the Memory-cycle button, or cue past the end time.

Use Memory-cycle for multiple consecutive playbacks of a particular region. 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 region of a performance.

When cycle-recording, you add a new part to the loop with each consecutive pass. Before doing so, be sure Performer is in overdub record mode so that each new pass doesn't erase the last one.

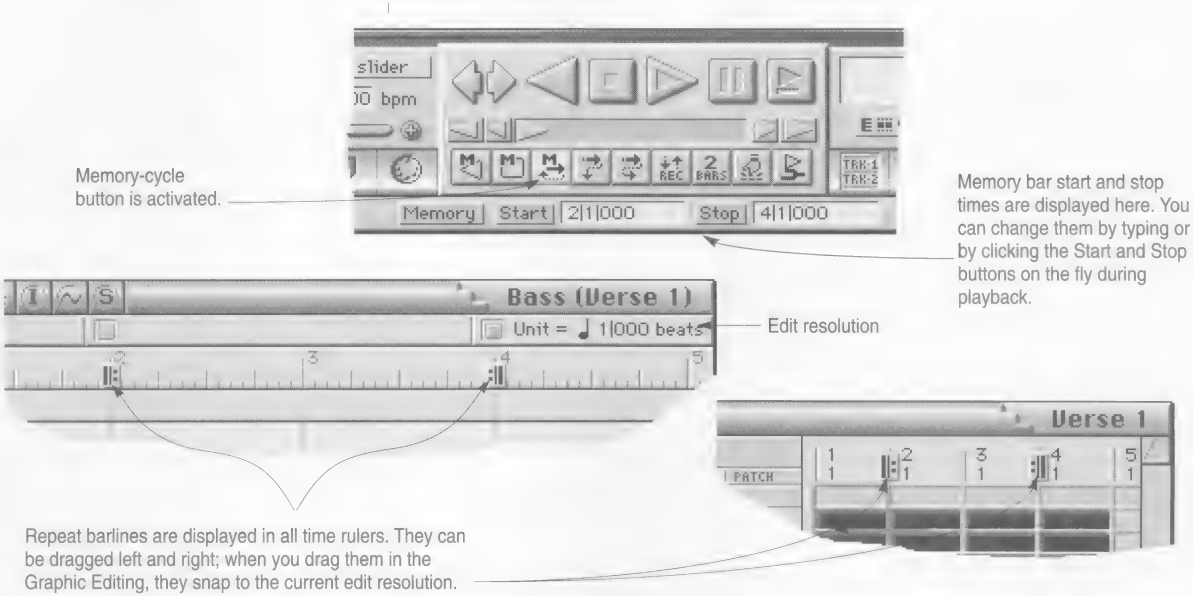
If you want to permanently loop a region in one or more tracks and specify the number of times the loop will repeat, insert a loop as described in chapter 13, "Looping".

Click on the Memory-cycle button to enable it. This highlights it, and causes the Start and Stop times to appear in the Memory Bar if they are not already present. The next section discusses several ways to set the start and stop times.

The Memory-cycle button and the Auto-Stop button cannot be enabled at the same time.

Viewing Memory-Cycle points graphically

When Memory Cycle is enabled, the start and stop times appear numerically in the Memory bar just below the Memory buttons. They also appear graphically as repeat barlines in the Time Ruler of the Tracks Overview and Graphic Editing windows at the Start and Stop time as shown below:



Playback cycles between these points seamlessly. You can drag the repeat barlines left and right with the mouse to change the cycle points. If the edit resolution check box is checked, the barlines snap to the current resolution setting (such as 8th notes, for example) as you drag them. For an explanation of edit resolution, see "The Edit Resolution Box" on page 292.

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.

Setting Memory-cycle points

The Memory-cycle region is defined by the Start and Stop times in the Memory Bar. You can set these points by typing them into the memory bar. You can also set them by selecting a region in the time ruler of the Tracks overview or any Graphic Editing window. To do so:

1. **Set the Edit resolution in the time ruler.**

   If you want the end points to land directly on beat or measure boundaries, the easiest way to do so is to set the edit resolution to an appropriate value, such as eighth notes or quarter notes. If you want to be able to set the loop points with no constraints whatsoever, uncheck the edit resolution box.

2. **Drag over the desired region in any time ruler.**

3. **Choose Remember Times from the Basics menu, or press command-R.**

   Doing so causes Performer to store the end-points of the region you have selected.

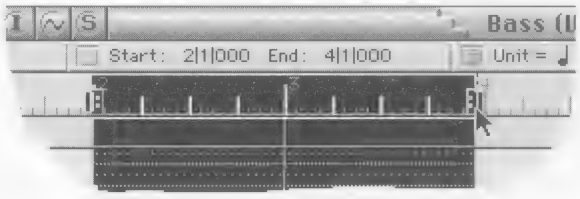
4. **Highlight the Memory-cycle button if it is not already highlighted.**

5. **Click the word "Memory" in the memory bar.**

   The region is loaded into the Memory Start and Stop times. In addition, the Memory-cycle repeat barlines appear in the time rulers at the beginning and end of the region you highlighted. Now Performer will cycle between them during playback and recording.

Selecting the Memory-cycle region for editing

If you would like to quickly select the region within the Memory-cycle repeat barlines to insert a loop, quantize, or any other editing operation, double-click one of the two repeat barlines.



The Countoff button

Enabling the Countoff button causes a countoff of a specified number of measures before playback or recording. The Counter does not move forward until after the countoff. Clicking on the Countoff button enables and highlights it. You must enable the Click or Flash (in the Basics menu) to hear or see the countoff.

To set the number of countoff measures, either double-click or Option-click on the Countoff button. A dialog box appears in which you can enter the number of measures and specify whether the countoff should occur only when recording. If the *Countoff only when recording* option is chosen, there will be a countoff before recording, but not before playback or any other function.

The countoff bars are in the same meter as the first measure of the sequence. See the *Change Meter* chapter for information on changing meters.

Use the Countoff button to give yourself time to adjust to the current tempo and prepare for recording. Using the Countoff and Wait buttons allows ample preparation for a recording pass; this is particularly useful in situations where the computer and keyboard are not adjacent.

The Wait button

Enabling the Wait button causes Performer to wait until it receives a keystroke from a MIDI or Macintosh keyboard before playback or recording.

To enable the Wait button, click on it; it will highlight. Then, press either the Record or Play buttons. The wait button will then begin to flash, signaling that it is waiting for a keystroke. To start playback or recording, press a key on the Macintosh keyboard or your MIDI controller instrument. If recording is enabled, the MIDI event you send to turn off Wait will be recorded.

The Wait button will remain enabled until it is clicked off. Thus, it will be in effect every time the Record or Play button is clicked on.

Use Wait to give yourself a moment to ready yourself at your keyboard or other input instrument before recording. Using Countoff and Wait together allow you as much time as you need to prepare for recording.

While the Wait button is on, you can use the Rewind button, Position Bar, and Counter window to adjust the current playback location. You may also set times in the Edit, Memory, and Auto-Record bars.

The Auto-Record button

Auto-Record causes recording to automatically turn on and off in a specific region. 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 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 is slaved to external sync; see the chapter *Receive Sync* for details on recording while slaved to each type of sync.

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. **Activate the Tracks window by clicking in it.**
2. **Click on the Record-Enable button of a track.**
3. **Press the Auto-Record button, which is located below the transport controls.**

   The button highlights to signify that Auto-Record is on.

4. **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 enter them in numerically in the Auto Record Bar. You can also set them up graphically. See "The Memory and Auto Record Bars" on page 81 and "Setting the punch-in and punch-out points graphically" on page 77.

5. **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 bars before the Punch In point.

6. **Get ready to record.**

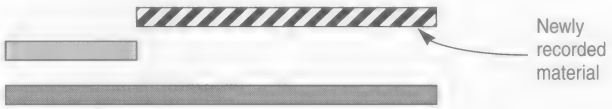
7. **Press the Record button.**

   The sequence plays from the current location in the Counter. The Record button is initially flashing (or greyed out on a black and white screen). When the Punch In time is reached, the button becomes highlighted. When this happens, Performer is recording and you can enter the new material. When the Punch Out time is reached, the Record button will revert to flashing or (being gray on a black and white screen).

8. **Press the Stop button when you are finished.**

If Performer starts recording while a pre-existing note is sustaining, it does not cut off that note. Only notes with attack times after the punch in time are erased. For example, the two notes represented by light grey bars begin within the punch in region, but the sustained note represented by the dark grey bar begins before the punch in point:

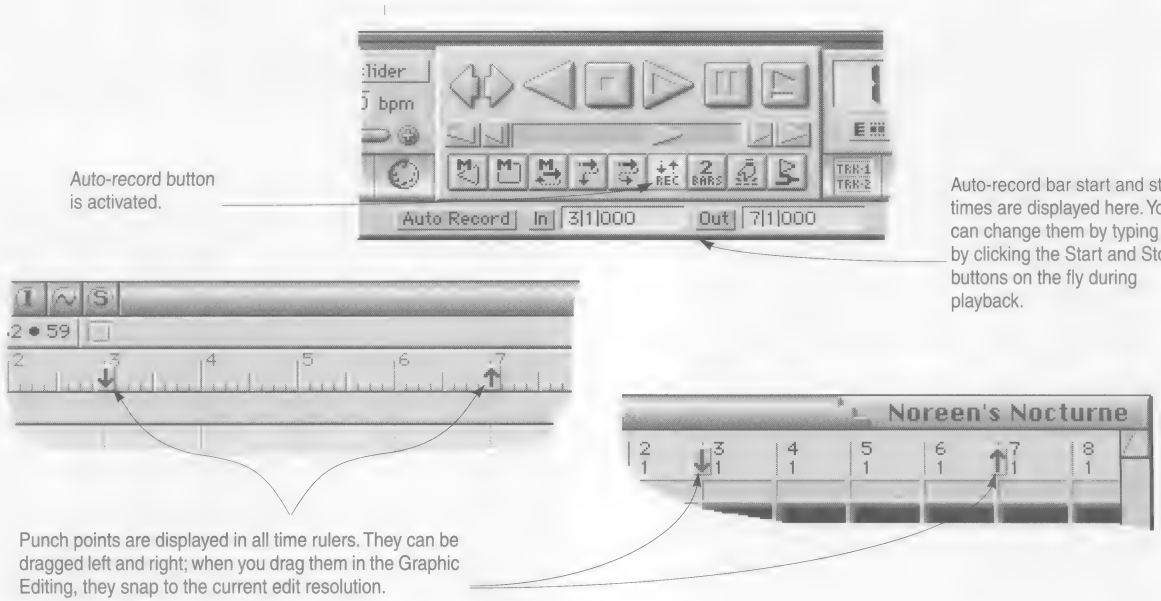
After recording, the notes that began before punch in remain, but the notes that begin within the recorded region are replaced by the new material:



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.

Setting the punch-in and punch-out points graphically

When Auto-Record is enabled, the punch-in and punch-out times are displayed graphically as arrows in the time ruler of the Tracks Overview, as well as the time ruler in any Graphic Editing window.



You can drag the arrows left and right with the mouse to change the punch-in and punch-out points. If the edit resolution check box is checked, the arrows snap to the current resolution setting (such as 8th notes, for example) as you drag them. For an explanation of edit resolution, see "The Edit Resolution Box" on page 292.

You can adjust the arrows 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.

Quickly selecting what you have recorded

You can quickly select the region between the punch points by double-clicking one of the arrows. This is a handy shortcut for editing what you have just recorded with auto-record.

The Chunk Control buttons

The Skip Forward and Backwards buttons play-enable the next or previous Chunk (sequence or song) listed in the Chunks window. The Cue Chunks button play-enables the next Chunk in the list after the current Chunk plays to its end time and stops. The Chain Chunks button causes the next Chunk in the list to automatically begin playing when the current Chunk finishes playback.

Chaining using the Controls window

The Chunk cueing buttons in the Controls window allow automatic and real-time cueing of Chunks, and automatic playback of cued Chunks. The Cue Chunks, Chain Chunks, and Skip Forward and Backwards buttons let you play Chunks from the Chunks window, moving up or down the list at your command.

Chunk cueing does not yield seamless transitions between Chunks. Use them for cueing situations where a pause between Chunks—either brief or indefinite—is acceptable or preferred.

For example, the Chunk Controls buttons are perfect for live performance. Before a set, you could organize the Chunks list in the order you wish for the set. Then, before you begin, you could enable the Wait button. To begin the set, you simply press play. When the first song ends, the next song automatically cues up, and you can trigger it at your leisure from your MIDI keyboard. Or, without the Wait button, you can have Performer go right into the next song without waiting.

It is also possible to cue and play Chunks remotely from your MIDI controller. For more information, please refer to *The Remote Controls Window* chapter.

Clicking either the Cue Chunks or Chain Chunks button causes the Memory Bar to appear in the Status Strip. The Stop time displayed in the Memory Bar indicates the measure time at which the current Chunk will stop playing and the next Chunk will be cued. This time appears automatically when a Chunk is cued; it corresponds to the Chunk's End time in the Chunks window.

You can edit the Memory Bar time by clicking it, but this change lasts only until the next Chunk is enabled. If you wish a different End time to appear in the Memory Bar automatically for a particular Chunk, pop-edit the End time in the Chunks window. Simply click the Chunk name and choose *Auto/manual end time* from the Chunks window mini-menu. The time becomes bold and editable. *Remember that the End time only affects a sequence's playback length when using the Chunk control buttons, not when the Chunk is played as part of a song.*

The Cue Chunks button

The Cue Chunks button, when highlighted, play-enables the next Chunk in the Chunks list after the current playback Chunk reaches its End time and stops.

To begin playback of the next Chunk, press the Play button, or a remote control for the Play button.

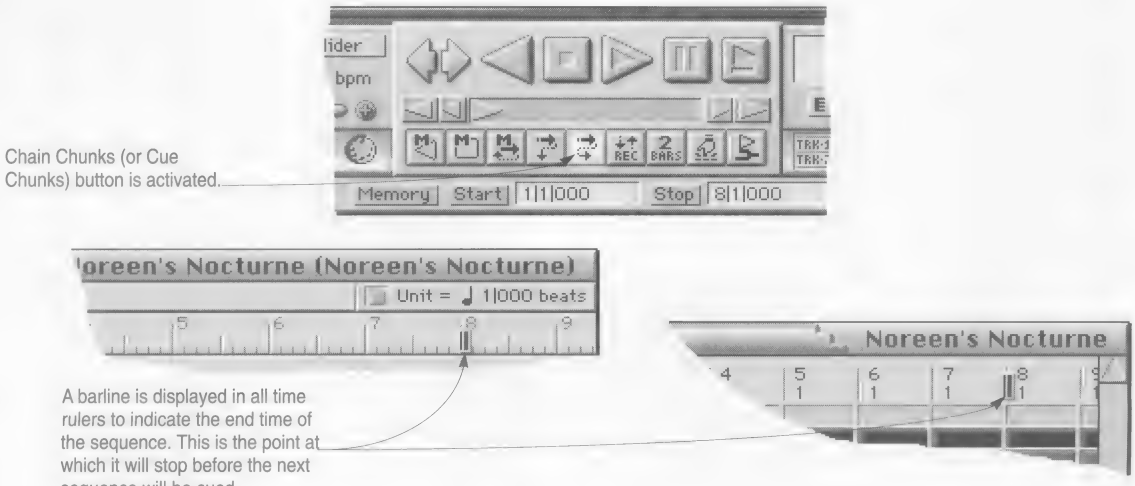
The Chain Chunks button

The Chain Chunks button, when highlighted, starts playback of the next Chunk in the list after the current playback Chunk reaches its End time. This is a simple way of automatically chaining Chunks in their Chunks list order.

Chaining with this button does not yield seamless transitions between Chunks. Use it for cueing situations where a brief pause between Chunks is acceptable or preferred. For seamless chaining, assemble Chunks in a Song window. For more information, please refer to the *Song window* chapter.

Viewing the Chunk End Time

When the Cue Chunks or Chain Chunks button is highlighted, the end time of the sequence is graphically displayed as a final barline in the time ruler of the Tracks Overview or any Graphic Editing window.



The Skip Forward and Backwards buttons

The Skip buttons enable the next or previous Chunk for playback. Clicking these buttons is similar to pressing the skip buttons on a typical compact disc player: Performer stops playback of the current Chunk and starts playback of the next or previous Chunk. Chaining Chunks in this manner does not yield seamless transitions between Chunks. To chain Chunks seamlessly, chain them inside a song as described in the *Song Window* chapter.

The Status Strip

The Status Strip has three segments that display information. The left-hand segment displays the name of the file. The middle segment contains the Memory and Auto record bars, which contain locations for Memory functions and Auto-Record. The right-hand segment displays the currently play-enabled Chunk.

The Memory and Auto Record Bars

The Memory and Auto-Record bars appear in the Status Strip when you click one of the memory buttons or the Auto-Record button.

Clicking directly on the measure-time fields (measure|beat|tick) in either bar will highlight them for editing as shown below.

Click on the desired field and type in a number. The Tab key advances to the next field to the right. The Return key confirms the entry. It is important to remember that these bars are displayed only when their respective function is enabled. For example, the Auto-Record bar is only visible when Auto-Record is enabled. If both are enabled, both bars will appear in the Status Strip.

The Memory Bar

The Memory Bar displays the start and stop times for Auto-Stop, Auto-Rewind, and Memory-cycle (see above). To deactivate the Memory Bar, turn off the currently enabled Memory button by clicking it.

Each of the words in the Memory Bar can be clicked on as a shortcut for entering times:

Clicking on the word "Start" or "Stop" will load them with the current play location in the Counter.

Double-clicking on the word "Start" will load it with the start time of the current sequence.

Double-clicking on the word "Stop" will load it with the end time of the current sequence.

Clicking on the word "Memory" will set both the Start and Stop times to the remembered times. Remembered times are Start and Stop times stored with the Remember Times command in the Basics menu. For more information, see *Remember Times* in the *Event List Window* chapter.

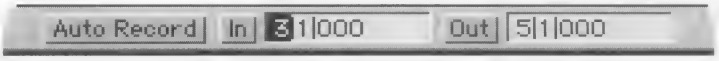
Double-clicking on the word "Memory" is a shortcut for double-clicking on both the Start and Stop times: it loads them with the start and end times of the current sequence.

The Rewind button works differently when the Memory Bar is visible: clicking on the Rewind button once will rewind to the Start time in the Memory Bar; clicking on it again will rewind to the beginning of the sequence.

Memory bar times can also be loaded by selecting the region graphically. See "Setting Memory-cycle points" on page 73.

The Auto Record Bar

The Auto Record Bar will appear when the Auto Record button is enabled. When it is visible, Auto Record is in effect.



Each of the words in the Auto Record Bar can be clicked on as a shortcut for entering times:

Clicking on the words "In" or "Out" will load them with the current play location in the Counter.

Double-clicking on the word "In" will load it with the start time of the current sequence.

Double-clicking on the word "Out" will load it with the end time of the current sequence.

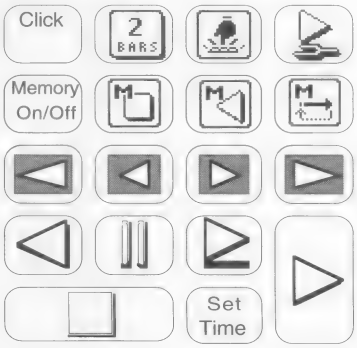
Clicking on the words "Auto Record" will set both the In and Out times to the remembered times. For more information about remembered times, see the *Event List Window* chapter section on *Remember Times*.

Double-clicking on the words "Auto Record" is a shortcut for double-clicking on both the In and Out times: it loads them with the start and end times of the current sequence.

Auto Record bar times can also be loaded by selecting the region graphically. See "Setting the punch-in and punch-out points graphically" on page 77.

Macintosh keyboard controls

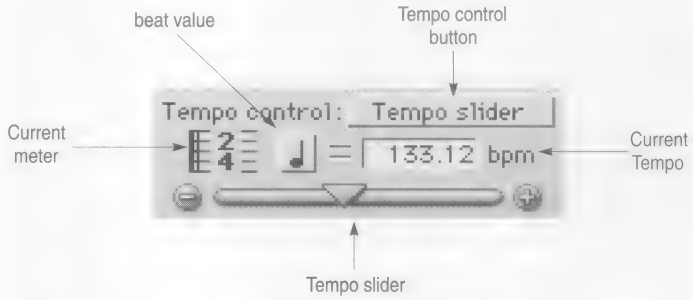
The main Controls window functions can be operated from the numeric keypad on the Macintosh extended keyboard.



In addition, the space bar acts as a play/stop toggle. These key assignments are provided for your convenience. However, you can create your own customize key assignments using the Remote Controls window. Please refer to the chapter called *The Remote Controls Window* for more information.

The Metronome panel

The Metronome panel displays the tempo and meter of the currently play-enabled Chunk (sequence or song).



The Tempo Control button

Tempo can be controlled by one of three possible sources:

- The Tempo slider
- The Conductor track
- By remote control from an external MIDI controller, such as a modulation wheel

The Tempo Control button displays the current tempo source. Click it to change it. You can change the tempo source at any time, and the tempos you set in each mode are remembered. In addition, the tempo control settings saved with each Chunk.

Tempo slider

When the Tempo Control is set to Tempo Slider, you can change tempo by entering a value in the tempo box in the Metronome window or by dragging the slider with the mouse or by pressing the + and - buttons. 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 and slider. This mode is useful for Chunks with one constant tempo or for temporarily adjusting tempos when working on a Chunk.

Conductor Track

When the Tempo Control is set to Conductor Track, you cannot use the tempo box or slider to set the tempo. Instead, the tempo map in the Conductor track takes control of the Chunk. In this mode, the

tempo slider is merely an indicator of the current tempo; the plus/minus buttons become disabled and 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.

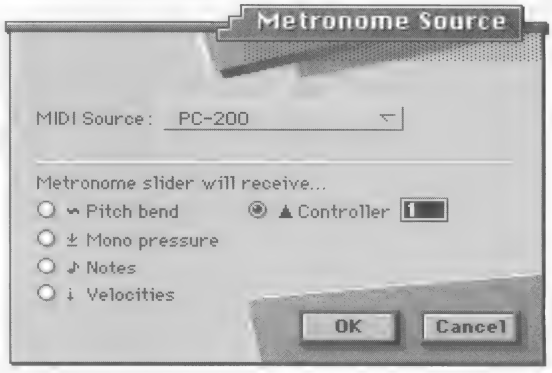
Remote control of the tempo

When the Tempo Control is set to *Remote Control*, the tempo slider 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 slider for external MIDI control:

1. **Choose Remote Control from the Tempo Control pop-up menu.**
2. **Choose Set Remote Source from the Tempo Control pop-up menu.**

   A dialog box appears.



3. **Select the MIDI device from which the external control data will be received from the pop-up 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.**

The current meter display

The meter at the current location is displayed for your reference. To change meter, you must use the Change Meter command on the Change menu.

The beat value

The beat value is the note duration that "gets the beat" in a given meter. In 4/4, for example, 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 on the Change 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 tempo slider

When the Tempo Control pop-up menu is set to *Tempo Slider*, the tempo slider is used to display and change the tempo. To change tempo, drag the triangular indicator along the slider: to the left decreases the tempo, to the right increases it. You can also use the plus/minus buttons at either end of the slider: the + (plus) button increases the tempo and the – (minus) button decreases it.

When the Tempo Control pop-up menu is set to *Conductor track*, the tempo slider serves only as an indicator of the current programmed tempo; it cannot be dragged with the mouse.

The current tempo

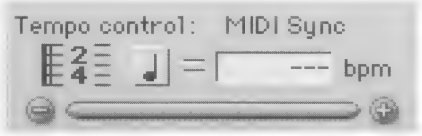
Tempos are displayed in beats per minute (bpm). The beat value can be any standard musical duration between a sixteenth and whole note. All beat values can be dotted. A dotted value is equivalent to one and a half times the value of the duration. (A dotted quarter note is equivalent to one and a half quarter notes, for example.) 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. In

addition to providing you with a high degree of resolution, this also allows you to easily enter tempos that match standard frame click metronome values.

When the tempo slider is controlling tempo, you can enter the tempo directly into the Current tempo box. To change the tempo, click the current tempo box to edit the tempo. If necessary, click the current beat value to change it.

Tempo Control during external synchronization

When Performer is slaved to external sync using the Standard MIDI beat clocks mode, the master device generates the tempo. The tempo slider acts solely as an indicator in this case: the master device (drum machine, a hardware sequencer, etc.) has complete control over Performer's tempo, and the tempo control displays the phrase *MIDI Sync* to remind you that the Tempo slider is disabled because tempos are being generated externally by the master device:



When synchronizing to time code (such as SMPTE) using the Indirect or Direct lock modes, Performer follows its own internal tempo. Set the desired tempo in the normal fashion, or set the Tempo Control pop-up menu to *Conductor track* to use a tempo map you have programmed into the Conductor track.

When synchronizing to Tap tempo sync, you control the tempo in real time by tapping (sending a MIDI event to Performer), using any MIDI controller. For details on creating a tempo map using Tap tempo sync, refer to the chapter *Receive Sync*. When you choose Tap tempo and check the Slave to external sync command in the Basics menu, the Tempo slider is disabled and it reminds you why:

Performer automatically adjusts real time and frame locations when the current tempo is changed.

The Counter

The Counter displays the current playback position in the currently play-enabled Chunk (sequence or song), expressed in three different forms: *measure time* (measure | beat | tick), *real time* (minutes:seconds.hundredths) and *frame time* (hours:minutes:seconds:frames). Two of these formats can be displayed at the same time: one as a main counter and the other as an auxiliary counter. These time standards are explained in detail in the next few sections.

You can edit the counter fields to change the current location. You can change which time formats are displayed by clicking the time format icons.

Measure Time

Measure time is the most musical of the time formats. Locations are displayed in standard measures and beats, with an additional unit called the tick. Unless you are doing film or video work, it is probably the only time representation you will need (though you may want to use real time for an objective measurement of the length of your sequence). The three units are separated by vertical bars. The example shown below shows measure 4, beat 3, tick 130.

Performer uses a resolution of 480 ticks per quarter note. Events can thus be recorded and played back with an accuracy of 1/480 of a quarter note.

Real Time

Real time is clock time, i.e. time expressed in minutes:seconds.hundredths of a second. Real time is useful to measure elapsed time for your sequence. By default, the sequence begins at time 0:00.00; this can be changed with the Set Sequence Start command described later in this chapter.

Frame Time

Frame time is a visual display of SMPTE (Society of Motion Picture and Television Engineers) time code. It is generally used in film and video work, but is increasingly used for synchronization in audio production. It is displayed similarly to real time, in hours, minutes, seconds, and frames. Frames are subdivisions of a second. The first frame number in a second is zero. Performer supports four frame formats: 24 frames per second (fps), 25 fps, 30 fps, and 30 drop frame.

When synchronizing to an external time code source, the counter will always display the same frame time that is being received from the external source. You may specify the SMPTE location at which the first measure of the sequence or song starts.

Using the Counter to change the current playback location

The *current playback location* is the position where the Chunk 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 Chunk (sequence or song) by editing the counter numbers. This can be done while the Chunk is stopped or playing. If you edit the counter while the Chunk 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.**

   You can only enter valid values (e.g. you can't enter 27 frames if you've chosen a 25-frame standard). 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. If you make a mistake in entering a value, press the Backspace 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-T to edit SMPTE main counter

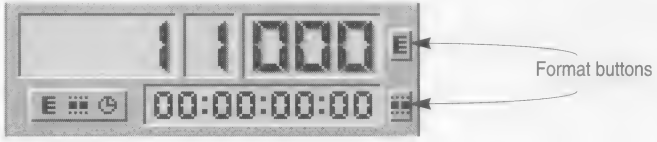
The decimal key on the Mac keypad will now highlight the main counter, even if it is SMPTE time or Real time.

There is a shortcut for setting the measure time: using command-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 main the counter, even when it is set to SMPTE time or Real time.

Setting the Counter Display

To change which time format is shown in the Main or Auxiliary Counter, click the time format button in the right-hand side of the Counter.



The Counter displays dashes when no sequence or song is play-enabled in the file. To display numbers, play-enable a Chunk in the Chunks window.

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 on the Change menu.

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 or song is measure time 1 | 1 | 000, real time 0:00.00 and frame time 0:00:00:00.

You can, however, use the Start Time button to change these start times to anything you want.

Start time button

If you are synchronizing Performer to SMPTE time code, you'll need to set the SMPTE start time according to SMPTE frame at which you want the Performer to begin playing. For example, you may want the downbeat of the first measure in the sequence to begin playing when the time code reaches 1:00:20:00.

The following are other examples of situations in which you might want to change the sequence start time:

- You would like to create one or more pickup measures before measure 1 (1|1|000).
- Your sequence should begin with a measure time other than measure 1 to match its location in a song. (For more information, see "Matching chunk start times with their location in a song" on page 230.)

The start times you enter for measure and real time are arbitrary and only affect the display of time locations. The SMPTE time code start time, however, determines the frame at which the sequence will actually begin playing while Performer is slaved to external time code.

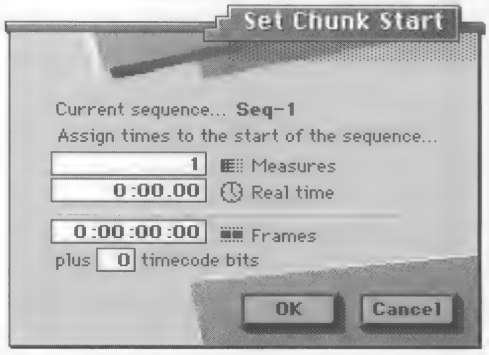
To set the start times of a sequence or song:

1. **If you have more than one sequence or song in the file, make sure it is the currently play-enabled chunk.**

   To do so, look at the current chunk indicator in the main control panel. If you need to switch sequences, use the Skip buttons.

2. **Click the Start Time button in the main counter.**

   A dialog box appears. The current Chunk name is displayed near the top of the dialog box.



3. **Click on the value(s) you wish to change.**

4. **Enter the new value(s).**

You may enter a value for each of the three 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.

5. **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 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 Receive Sync command in the Basics menu. See "Slaving to SMPTE with MTC, DTL, or DTLe" on page 609.

Creating pickup measures before 1|1|000

Normally, when you rewind Performer 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 bars, 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, use the Shift command to shift it back to where it was before.

4. **Highlight all track names in the Tracks window and double-click the word "Edit" in the Edit bar.**

   This selects the entire sequence.

5. **Choose Shift from the Edit menu.**

6. **Choose the Delay option and type in the number of pickup measures that you previously added.**

   If you added 1 pickup measure by setting the start time to 0|1|000, shift by 1 measure here.

7. **Click OK.**

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.

The accuracy of the counter display

Performer's first priority is to keep up with the flow of MIDI data. If it encounters a great deal of data, it selectively ignores its graphic display until the microprocessor load decreases. This may keep the counters from updating and they may skip beats during these times. This is Performer's way of keeping up, and does not necessarily mean that MIDI data is being transmitted inaccurately.

A side effect of this is that the counter may not always be accurate. It should therefore not be used as a metronome. In general, the counter display should not be used as a visual indication of tempo. Use the Flash on the Basics menu instead.

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 on the Change menu.

Negative numbers in the counter display

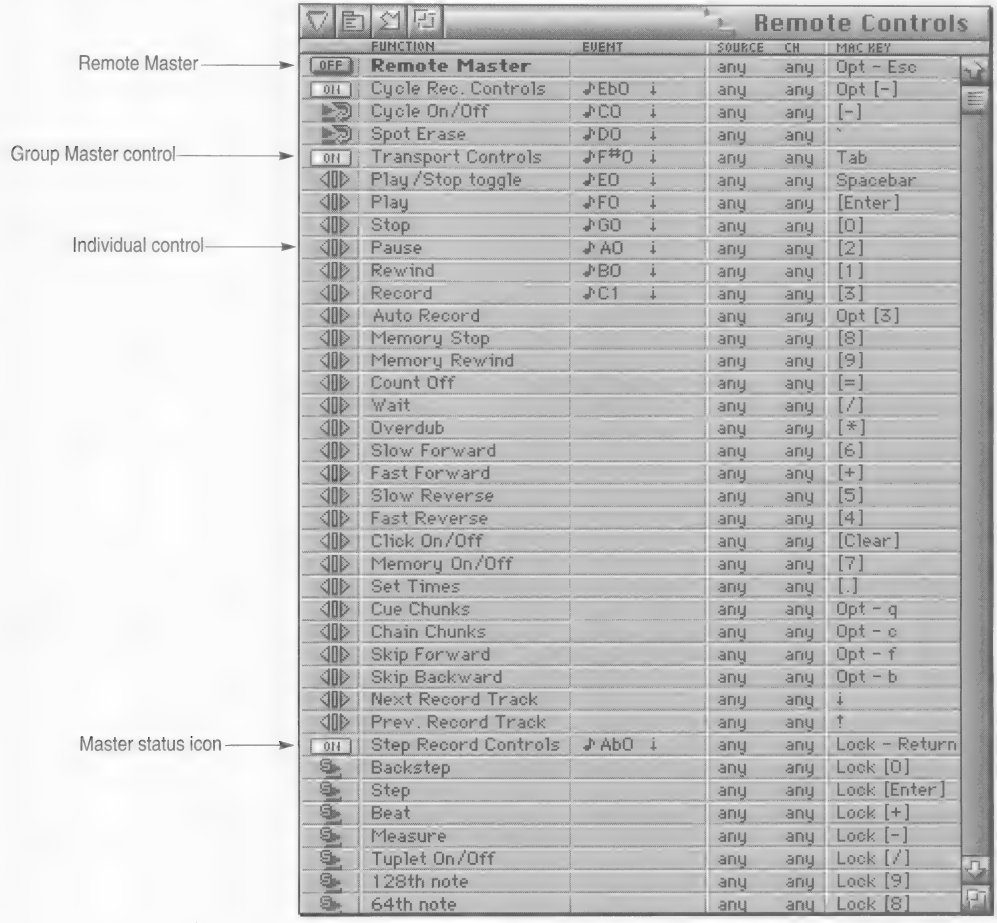
When using an external sync source, Performer may run for a little while before the sequence actually starts. During this time, you may see negative bar numbers. These increase in value (towards zero) until the start measure is reached.

Chapter 6 *The Remote Controls Window*

The Remote Controls window lets you access all of Performer's transport functions, such as play, stop, rewind, and so on from a MIDI controller. For example, a note value of C0 could operate the Stop button in the Controls window; controller 64 On could operate the Skip Forward button. In addition, each Performer function has a reassignable Macintosh keyboard equivalent.

The Remote Controls window also allows you to cue sequence and song Chunks for playback from your MIDI controller. Each Chunk in the file appears as a Function in the Remote Control window with a MIDI and Macintosh key to play-enable that Chunk.

Quick Reference



The Remote Controls window is opened by choosing it from the Windows menu. For your convenience, new Performer files contain both the Transport and Chunk Select controls with default MIDI and Macintosh key assignments ready to use.

Remote Master: Enables or disables all MIDI Remote Controls and Master Controls. It remains at the top of the list and cannot be moved or deleted.

Group Master Control: Enables or disables an entire group of MIDI Remote Controls with a single MIDI or Macintosh keystroke. Master controls can be moved, added, deleted, and renamed.

Individual Control: Displays a specific Performer function, and the MIDI event and Macintosh key assigned to trigger the function. An individual control is available when the Master above it is On; if a control has no Master, it is always on.

Master Control Status Icon: Indicates the Master's current status, either On or Off. The current mode is indicated by the text and color of the status icon: *On* and highlighted, or *Off* and white.

Function: Defines the Performer function to be triggered.

Event: Defines the MIDI event that will trigger the Performer function. To edit the event, click the field and play the new event, then press the Return, Enter, or arrow keys.

MIDI Controller: This is the MIDI device in your studio from which you would like to trigger the remote controls. A pop-up menu of devices is provided in this column by FreeMIDI.

Mac Key: Defines the Macintosh key (or keys) that will trigger the Performer function. To change the key, click it, press the new key(s), and click outside the box to confirm your choice.

The Remote Controls Window Mini-menu

The Remote Controls window mini-menu contains the following items.

Add Defaults: Adds the Transport Master and group members, and the Chunk Select Master with a control for each Chunk in the file.

Add Master: Adds a Master control to the bottom of the functions list. This new Master can be moved and assigned MIDI and Macintosh triggers.

Duplicate: Add a duplicate of the selected item(s) to the bottom of the Remote Controls function list.

Delete: Deletes the highlighted Masters and controls. Select functions by clicking them. Select contiguous functions by dragging. Select discontiguous functions by shift-clicking.

Basics

The Remote Controls window lists each Performer function along with its assignments, and allows you to edit these assignments to completely customize your Remote Controls. Further, you can load the assignments you make into any other Performer file, or even make them part of every new file using the Save As 'New' Template command.

There are two types of controls: individual, for example Play or Stop, and Master, such as the Transport Controls Master. Individual controls are grouped under Master controls, which enable and disable their group when toggled with a MIDI event or a key on your Macintosh keyboard. Individual controls actually operate Performer functions, whereas Master controls make a group of individual controls available or unavailable.

Master Controls

Every new Performer file automatically contains several Master controls: the Remote Master, the Transport Controls Master, the Step Record Controls Master, and the Chunk Select Master. Each one serves as a toggle, rendering its sub-group of controls available or unavailable. To customize Remote Controls, you can add your own Masters and change their assignments whenever you wish.

A Master's control group is displayed as an indented list beneath that Master. Each indented control can be moved into another indented group, thereby redefining which Master will affect it, by simply dragging the control's icon up or down in the window. Likewise a Master can be dragged to a different position to redefine its control group.

At any given time, a Master control is either On or Off. Correspondingly, the Master's status icon displays *On* and is highlighted, or *Off* and is dark.

On and inverted means that the functions under that Master are available. When the Master icon is **Off** and highlighted, the MIDI controls of the group under that Master are unavailable; each function's trigger acts as a normal MIDI event. Macintosh controls are always available, regardless of the On/Off status.

The combinations of Master status and individual control status make Performer's Remote Controls extremely flexible. Here are some typical Remote Controls setups:

- The controls occupy an infrequently used range of your MIDI controller, and are always on. You don't typically use this octave in your sequences.
- The controls occupy several keys of a MIDI controller transmitting on one channel, and on another channel you have a second controller for recording.
- The controls occupy the entire span of keys on your controller, and you can toggle them on and off with a single key at the very top of the keyboard. The entire keyboard can switch instantly between remote controls and MIDI notes.

Enabling and Disabling Remote Controls

You can turn on and off the MIDI Remote Controls in the following ways:

- Press option-escape (esc)
- Click the Remote Master icon in the Remote Controls window
- Play the MIDI event you have assigned to it

Changing a Control's Remote Assignments

Performer comes with a pre-defined set of Remote Controls for the Transport and Chunk Select functions. You might find these defaults suitable for your working style. But should you wish to completely customize your Remote Controls, Performer makes it easy.

To change the event assignments of a Performer function or Chunk select control:

1. **Choose *Remote Controls* from the Windows menu.**

   The Remote Controls window opens or, if already open, becomes active.

2. **Click the MIDI assignment that you wish to change.**

   The field pops up. If you wish to enter a note-off event, you must play and hold the note, then click the assignment.

3. **Play the MIDI event on the instrument you plan to use as the remote control device.**

   Any MIDI event from any connected MIDI controller is suitable, although notes and switch controllers are easiest to use. The highlighted field updates to display the event you just played.

4. **Type Return or click anywhere outside the pop-up box to confirm the change.**

   Typing the up or down arrow confirms the change and pops up the previous or next event, respectively.

5. **Choose the MIIDI device and channel that you will be triggering the remote from.**

6. **Click the Macintosh keyboard equivalent that you wish to change.**

   The field highlights.

7. **Type the new key combination on your Macintosh keyboard.**

   Any key or combination of normal and modifier keys is suitable.

8. **Click anywhere else on the screen.**

   Because of its unique function, this pop-up box cannot be confirmed using the Enter or Return key. The box can be exited only by clicking and cannot be canceled.

Disabling a Single Control

To turn off an individual control click the MIDI assignment for a remote control and then backspace in the pop-up box.

This is especially helpful with the Remote Master to avoid enabling the remote controls by accident over MIDI. Also, having lots of MIDI assignments in the Remote Controls window can sometimes cause delays when using Patch Thru. If you delete unused MIDI assignments from remote controls, you can prevent delays.

Creating Custom Control Groups

Performer lets you add your own Master controls, which you can use to toggle on and off whole groups of individual controls. Just like the default Masters that Performer provides (Remote, Transport, and Chunk Select), the Master you add governs all controls indented beneath it. You can drag both Master and individual controls up or down in the Remote Controls window to determine their grouping.

To add a new Master control:

1. **Click anywhere in the Remote Controls window to activate it.**
2. **Choose *Add Master* from the Remote Controls window mini-menu.**

   The added Master control appears at the bottom of the Function list.
3. **Option-click the name of the added Master to change it.**

   Type Return to confirm the change.
4. **Click the Event field of the new Master to assign a MIDI event.**

   The field pops up.
5. **Assign MIDI and Macintosh key events to the new Master.**

   Refer to the section called *Changing a control's remote assignments* for details.
6. **As mentioned, the position of a Master determines what group of controls it will affect. Since a newly added Master appears at the bottom of the Functions list, you will need to reposition the added Master using its icon. You can also drag individual controls from Master to Master.**

To reposition a Master or individual control:

1. **Drag the control's icon to the desired group.**
2. **Release a Master just above the group; release an individual control beneath the Master that should control it.**

   An individual control dragged above the first group's Master will be controlled by the Remote Master.

Deleting Controls

To delete a control or group of controls:

1. **Click the name of the control to select it.**

   Drag to select several contiguous controls; shift-click and shift-drag to select discontiguous controls.

2. **Choose *Delete* from the Remote Controls window mini-menu.**

   The selected controls disappear from the list. Their MIDI and Macintosh keyboard assignments cannot be retrieved.

Restoring Deleted Controls

In the event that you delete controls during a session and then decide you'd like to retrieve them, Performer provides a quick mini-menu command to regenerate both sets of default controls. Choosing *Add Defaults* places the Transport and Chunk controls at the bottom of the functions list; you can arrange, reassign, and delete them to your satisfaction.

The MIDI and Macintosh key event assignments of controls that you delete are not held in memory. Once you delete a control, restoring it using *Add Defaults* will produce the default controls with the default assignments. If you wish to save your custom event assignments, just make sure they are present when you close the file. The next time you open the file, your customized controls will be intact.

Loading Remote Controls Assignments From Another File

Remote Controls assignments from one Performer file can be imported into any other Performer file using the Load command, found in the File menu. This means you can set up the Controls the way you like them, once, and they'll be available for importing into any of your files.

The Remote Controls assignments that you make in a file are automatically saved as part of that file. The Load dialog box, however, enables you to extract assignments from an unopened file, then load them into the file in which you are working.

To load Remote Controls assignments into an open file:

1. **Choose *Load* from the File menu.**

   The standard Macintosh Open dialog box appears.

2. **Click the file containing the assignments you wish to load, then click Open.**

   Alternately, you can double-click the file name. Performer's Load dialog box appears, displaying the file name at top.

3. **Choose the *Load Remote Controls* option.**

4. **Optional: If you wish to load any Chunks from the selected file, choose the *Load Chunks* option and the *Data* or *Link* sub-option.**

   If you wish to load more than one Chunk, you can drag to select contiguous Chunks and shift-click to select discontiguous Chunks. Deselecting this option loads only the file's Remote Controls assignments.

5. **Click OK to confirm your choice(s) or Cancel to withdraw the Load command.**

   Clicking OK causes the selected file's Remote Controls assignments, as well as any selected Chunks, to be loaded into the open file. The imported assignments appear at the bottom of the Remote Controls window.

Remote Controls Hints

Performer has a default New file format that contains the Remote Master, the Transport Controls Master and functions, and the Chunk Select Master and individual functions. However, the *Save as 'New' Template* command in the File menu lets you define Performer's New file as you like.

Customizing Controls in New Files

To customize your New files:

1. **Configure Performer's windows, their contents, and any other features as you find most useful.**

   This file will be your template source file: Performer will remember your exact track setup and layout as well as many other features. MIDI and Conductor track data will not be included in the New template.

2. **Choose *Save as 'New' Template* from the File menu.**

3. **Click OK to confirm the command, Cancel to withdraw it.**

   If you confirm the command, the New template of the open copy of Performer is redefined based on the current file.

Spot-erase

Performer's spot-erase feature consists of the spot-erase remote control. Spot-erasing works like most conventional drum machines: you hold down the spot-erase key and then hold down the pitch of the note(s) you want to erase.

To spot-erase:

1. **Start playback or overdub recording.**

   You can spot-erase while playing or overdub recording. You can spot-erase while using memory-cycle and while looping.

2. **Record-enable the track in which you want to spot-erase.**

3. **Hold down the tilde key (`) and, while holding it down, hold down the notes you want to erase.**

   If you like, you can reassign spot-erase to a different key. Alternately, you can hold down the spot-erase MIDI remote, which is D0 (D-zero). Notice that you can spot-erase several notes at the same time—as many as you can manage, in fact.

4. **As Performer continues to play (or overdub record), keep holding down the note(s) you want to erase for as long as you want to erase them.**

   If you want, you can release the spot erase key, even while you continue to hold down the notes you are erasing. The spot-erase key only needs to be held down when you first hold down the pitch(es) you want to erase. Once you've held down a pitch, you can release the spot-erase key.

5. **Release the key(s) when you want to finish spot-erasing.**

You can freely "punch-in" and out of spot-erase mode. Spot-erase is undoable.

Notice that you can spot-erase directly from your MIDI controller using the MIDI event assignment for it. If you don't normally use Performer's Remote Controls feature, you can still use spot-erase without using any other remote controls because spot erase has its own group master. You can even trigger the spot erase using a foot switch, a data slider or wheel on your MIDI controller, or anything that can send MIDI data. That way, you can configure spot-erase as conveniently as possible.

Switching MIDI devices, channels and patches

The Sound Selection group of remote controls lets you choose the next or previous device, MIDI channel, or default patch for the currently selected track. If no track is selected, these commands affect

the currently record-enabled track. Along with the "record next/previous track" remote, you can easily change tracks, devices, channels and sounds, all from your controller keyboard while recording.

ON	Sound Selection	♪BbO ↓	any	any	⌘ Shift Opt - ↓
	Next Device		any	any	Shift - ↓
	Previous Device		any	any	Shift - ↑
	Next Channel		any	any	Opt - ↑
	Previous Channel		any	any	Opt - ↓
	Next Patch		any	any	⌘ - ↑
	Previous Patch		any	any	⌘ - ↓

Creating Remote Control Macros

Several commands can be triggered in succession with one keystroke by assigning them to the same MIDI event. For example, you can create the following three-step sequence of remote controls: Stop, Chunk select, and Play. If you place them in that order in the Remote Controls List and assign them to the same key, Performer will execute the topmost control first. The current sequence will stop, and the specified Chunk will cue up and begin playing—all with one keystroke!

Similarly, you can assign all of your Master controls to the same MIDI or Mac key event — that event now turns on and off your MIDI Remote Controls.

Remote Chunk Cueing with MIDI Song Select Messages

In addition to Chunk select Remote Controls, Performer also allows you to cue Chunks for playback by sending a Song Select message from a MIDI controller. The Chunks window column *S#* displays the Song Select number that, when received, will cue the corresponding Chunk for playback. If a Chunk 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 Chunk assigned to the Song number in the message, that Chunk will be play-enabled. If more than one Chunk has the same Song number assigned, the one highest in the Chunks list will be cued.

When used in combination with the Chunk Chaining buttons in the Controls window, a Song Select message cues the corresponding Chunk to be play-enabled or played back. The information bar in the Consolidated Control panel indicates which Chunk has been cued.

Chapter 7 *Playback*

When Performer is "playing" music, it is sending out stored MIDI data at specified times to MIDI-equipped instruments. These instruments use the data as instructions for when to turn notes on and off, etc. Conceptually, it 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 or sound module produces the actual sound, and Performer tells it when and how to do so.

To play a sequence or a song:

1. **Open a Performer file.**

   Choose Open from the File menu. A dialog box will appear. Select the file you wish to open by clicking on it and pressing the Open button.

2. **Choose *Chunks* from the Windows menu.**

   The Chunks window will open or, if it is already open, come to the front.

3. **Play-enable the Chunk you wish to play back.**

   Since a file can contain several Chunks (sequences or songs), you must play-enable the one you want.

4. **Set the location from which you want playback to begin.**

   To simply rewind to the beginning of the sequence, click the Rewind button. To choose a general location, drag the Position Bar below the main transport controls; to start at a specific location other than the beginning, type in the location in the main counter. Or double-click at the desired playback location inside the time ruler in a Graphic Editing window. You can double-click in the Tracks overview time ruler as well.

5. **Play-enable the tracks you wish to play back.**

   If you are playing a sequence, double-click its name to open its Tracks window and click the Play-enable button to the left of the track name(s) you wish to hear. If the track is not play enabled, you will hear nothing from the track. If you are playing a song, play-enable the tracks in each sequence that the song contains.

6. **Choose a MIDI playback device for each track.**

   A track can be assigned to one channel on a single MIDI device. It can also be assigned to several different MIDI devices simultaneously. Devices can be set by clicking on the play destination in the Tracks window next to the track name. A pop-up menu appears. The devices in the list are provided by FreeMIDI. If a device you want is not present in the list, use the FreeMIDI Setup program to add the device to your MIDI configuration.

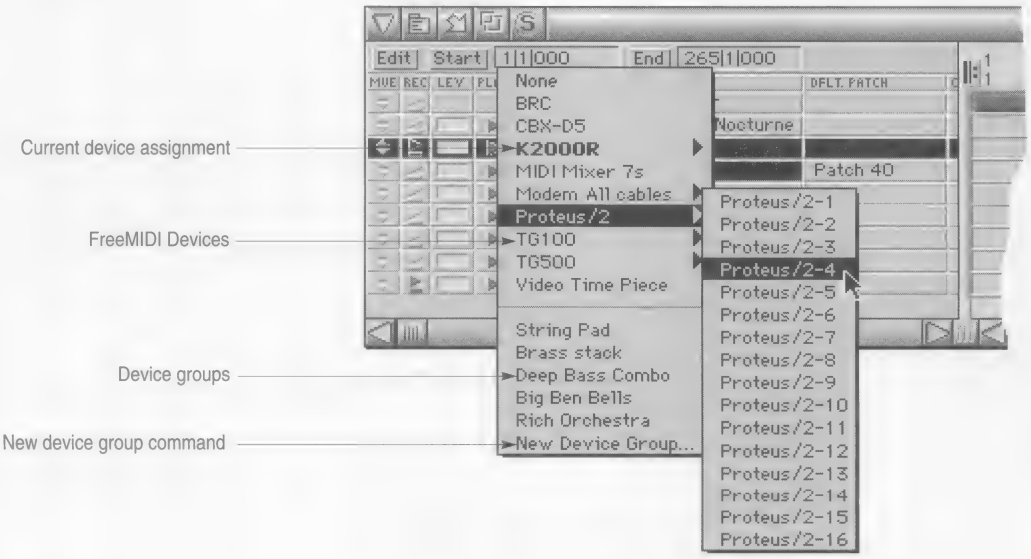
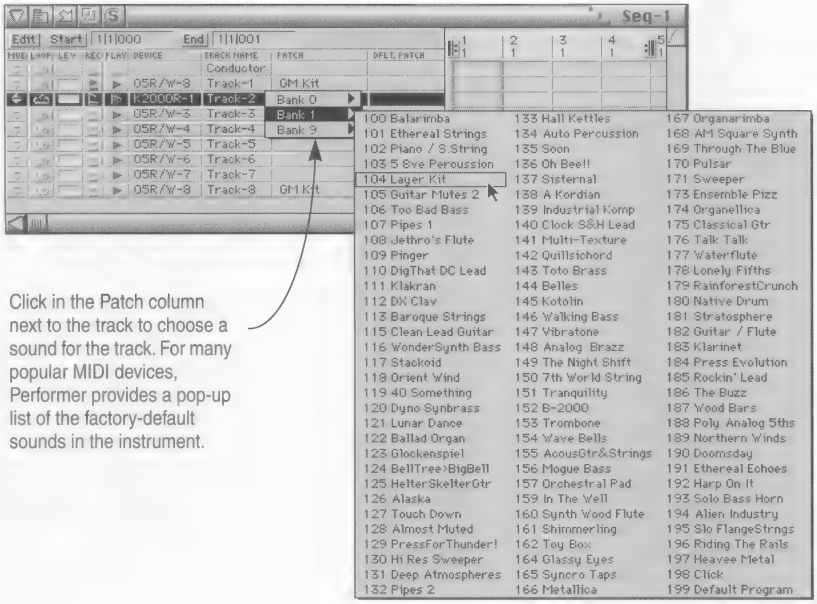


Figure 7-1: Selecting a playback device from the pop-up menu in the Device column next to the track name.

You can change a track's playback channel or Device at any time––even while the sequence is playing back.

7. **Choose a sound from the track's patch list by clicking in the Patch column next to the track name as shown below.**



Click in the Patch column next to the track to choose a sound for the track. For many popular MIDI devices, Performer provides a pop-up list of the factory-default sounds in the instrument.

Patch 0	Patch 32	Patch 64	Patch 96
Patch 1	Patch 33	Patch 65	Patch 97
Patch 2	Patch 34	Patch 66	Patch 98
Patch 3	Patch 35	Patch 67	Patch 99
Patch 4	Patch 36	Patch 68	Patch 100
Patch 5	Patch 37	Patch 69	Patch 101
Patch 6	Patch 38	Patch 70	Patch 102
Patch 7	Patch 39	Patch 71	Patch 103
Patch 8	Patch 40	Patch 72	Patch 104
Patch 9	Patch 41	Patch 73	Patch 105
Patch 10	Patch 42	Patch 74	Patch 106
Patch 11	Patch 43	Patch 75	Patch 107
Patch 12	Patch 44	Patch 76	Patch 108
Patch 13	Patch 45	Patch 77	Patch 109
Patch 14	Patch 46	Patch 78	Patch 110
Patch 15	Patch 47	Patch 79	Patch 111
Patch 16	Patch 48	Patch 80	Patch 112
Patch 17	Patch 49	Patch 81	Patch 113
Patch 18	Patch 50	Patch 82	Patch 114
Patch 19	Patch 51	Patch 83	Patch 115
Patch 20	Patch 52	Patch 84	Patch 116
Patch 21	Patch 53	Patch 85	Patch 117
Patch 22	Patch 54	Patch 86	Patch 118
Patch 23	Patch 55	Patch 87	Patch 119
Patch 24	Patch 56	Patch 88	Patch 120
Patch 25	Patch 57	Patch 89	Patch 121
Patch 26	Patch 58	Patch 90	Patch 122
Patch 27	Patch 59	Patch 91	Patch 123
Patch 28	Patch 60	Patch 92	Patch 124
Patch 29	Patch 61	Patch 93	Patch 125
Patch 30	Patch 62	Patch 94	Patch 126
Patch 31	Patch 63	Patch 95	Patch 127

If you see generic names like this, you can go ahead and use them anyway, as long as you know what sounds correspond with each patch change number. Or you can modify the list so that it shows the actual sound names. For details, see chapter 48, "Using PatchList Manager" (page 725).

8. **Press the Play button.**

   The sequence will begin to play. The Counter advances.

9. **When finished playing back, press the Stop button.**

   When the sequence is finished, Performer will keep playing indefinitely until you press the Stop button. (This doesn't endanger your sequence, though it is best to stop playback when the sequence is done.)

Choosing a device for playback

To choose a playback device, choose it from the pop-up menu provided in the *Device* column next to the track name as shown in Figure 7-1 on page 110. You can also do so from your Mac keyboard. See "Switching MIDI devices, channels and patches" on page 106.

Choosing multiple playback devices for a single track

To assign a track to multiple playback devices, you need to assign it to a device group. You can either choose an existing device group as shown in Figure 7-1 on page 110, or create a new one by choosing *New Device Group*, which opens the Device Groups window (described in the next section). A device group can contain up to ten MIDI channels from any combination of devices in your MIDI setup. To create a device group, read the next section.

> ☛ Hint: if a track is currently assigned to a device group, and you want to make changes to the device group, option-click the device group name in the Tracks window next to the track and the Device Groups window will automatically open and scroll to the group. You can then make whatever changes you want.

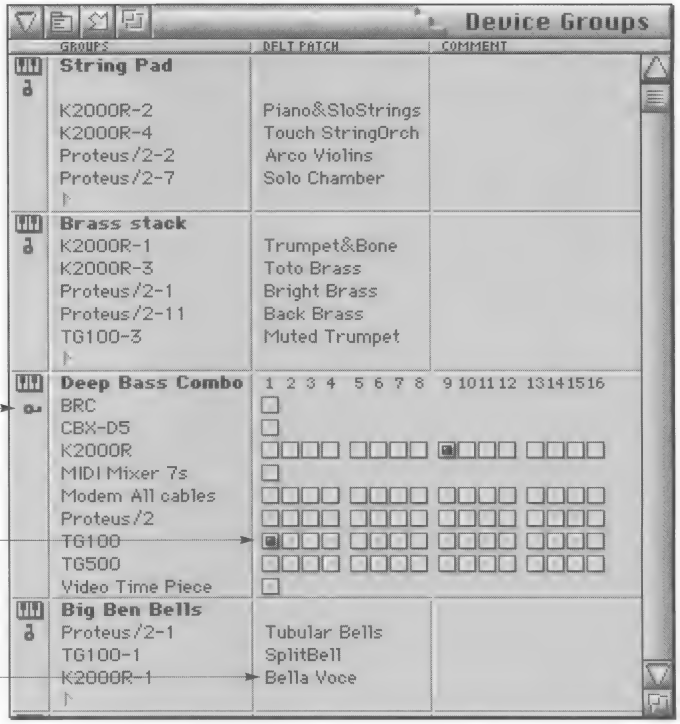
Creating a device group

A *device group* is a collection of individual FreeMIDI devices—or more specifically, *MIDI channels* from FreeMIDI devices. For example, a device group called *Massive String Pad* might include the following device channels: Kurzweil K2000 channel 1, Korg 01/W channel 5, Akai S1000 channel 3, and Proteus/2 channel 13. As a result, the device group produces a combination of the sounds currently playing on each of these MIDI channels. A device group can contain up to 10 MIDI channels.

Devices groups appear in the same pop-up list as all the rest of your FreeMIDI configuration devices, and they are used to assign multiple MIDI channels to a single track in the Tracks window.

To create a device group:

1. **Choose Device Groups from the Windows menu to open the Device Groups window.**



Click this expand/ compress icon to toggle the check box display shown here.

Click the check boxes to quickly add MIDI channels to the device group.

Click the expand/compress icon again to return to the normal display, which allows you to a default patch for each channel.

2. Choose Add Device Group from the mini-menu.

If you would like to add more than one at a time, hold down the option key while selecting the command from the mini-menu.

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

To do this:	Do this:
Change the device group name	Option-click the name to pop-edit it.
Add a device to the group	Click the pop-up menu arrow beneath the device group name and choose the desired device and MIDI channel from the pop-up menu.
Add several devices quickly	Click the Expand/Compress icon below the device group name to open up a display of all the devices in you studio. Then click the check boxes that corresponds to the MIDI channels you want to add to the group.
Close the check box display	Click the Expand/Compress icon below the device group name again.
Remove a device	Click the device and choose None from the pop-up menu.
Set a default patch for a device	If the device is currently expanded, close it first by clicking the Expand/ Compress icon below the device group name. Then click in the default patch column to the right of the device and choose the desired patch from the pop-up menu.
Clear a default patch	Click the device name to select it and choose Clear Default Patch from the mini-menu.
Remove a device or device group from the list	Click the name to select it and choose Delete from the mini-menu.
Duplicate a device group	Click the name to select it and choose Duplicate from the mini-menu.

Changing your playback device list

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

reflected in your FreeMIDI configuration, then the device shows up in the pop-up list with the same name it has been given in FreeMIDI. To make any changes to the playback device list, choose Edit FreeMIDI Configuration from the Basics menu. This command automatically opens FreeMIDI Setup, which lets you make changes to your device configuration.

Editing during playback

Many of Performer'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. So, the next time you are listening to your music and 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 (in an Event List, Tracks Window, etc.)
- Edit a region with the Edit or Region menu commands
- Rearrange Chunks in the Song window
- Cut, copy, drag, option-drag (copy), etc. notes and data in Graphic Editing and QuickScribe notation windows
- Reassign the playback channel for a track
- Add, delete, rename, or reposition a track
- Access a mini-menu command such as Set View Filter

During playback and recording, the Counter and other displays may become irregular and seem to skip beats. This is due to Performer's primary obligation which is to receive and output MIDI data on time. Performer may have to 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. The click and flash will provide an accurate determination of the tempo. In addition, editing commands may sometimes take longer due to the amount of processor time required to deal playback.

Some features, because of their nature, cannot be accessed during playback. These features are either greyed out (unaccessible) during playback or will have no effect unless you press the Stop button before using them. Examples are:

- Using the MIDI Interface dialog box
- Save or close a file

Soloing tracks

Using Solo allows you to easily select a subgroup of tracks to be heard during playback. This allows you to focus your attention on one or more tracks without disrupting playback in any way. The solo tracks group can be changed during playback, making it possible to hear many combinations of tracks without having to stop playback. The procedure for soloing tracks is described in detail in *The Tracks Window* chapter.

Looping playback

Playback of the entire sequence can be looped seamlessly between any two points. For information see "The Memory-cycle button" on page 71.

Event Chasing

Event chasing addresses a common problem with playback: hearing the wrong patch (sound) when you begin playback in the middle of your sequence. This happens because MIDI data consists of a stream of single events. If a patch change occurs early in the stream, say at measure five, but you start playback later on, say at measure twenty, the patch change will not be played and your synth will not be set to the proper sound.

Here's how event chasing fixes this problem. Every time you click Play, Performer searches backward in each track for the last patch change, volume controller, and so on. If it finds one, it transmits the event before playback begins, setting the synth to the correct patch, volume, etc. Performer can chase all types of data, including notes which may be playing at the current location.

Enabling Event Chasing

Performer allows you to choose which types of MIDI data will be chased. To enable Event Chasing:

1. **Choose *Set Event Chasing* from the Basics menu.**

   The Set Event Chasing dialog appears.

2. **Select the types of data you wish Performer to chase.**

   Click *Set All* to enable chasing of all MIDI events. Deselecting unnecessary types reduces chase time after the Play button is clicked.

3. **Click OK to confirm your choice or Cancel to cancel it.**

To disable Event Chasing, click Clear to deselect all data types for chasing.

In general, it is best to chase only types of data that need to be chased. In particular, notes add considerably to the time it takes Performer to chase.

Event chasing and loops

Event chasing cannot recognize loops in a track. If you have loops in a track, and the loops contain patch changes or other data that you are chasing, you may get unexpected results when you begin playback during or after the loop.

Auto-Scrolling

With the Auto-Scroll command in the Basics menu, windows with the ability to scroll will update during playback or recording. You can choose whether all windows on the screen will scroll, or only the top window. In addition, you can choose what kinds of Performer windows will scroll.

When Performer windows scroll, they "page" along with the music. That is, when playback reaches the last measure or event in the current window, the window jumps to the next windowful of data, just like clicking in the grey area of a scroll bar.

With Auto-Scrolling enabled, windows will update any time you change playback location, even when Performer is not playing back or recording. For example, if Performer is stopped and you press Rewind, all Auto-Scrolling windows will scroll to the new location indicated in the Counter window. Auto-Scrolling occurs when pressing the cueing buttons, dragging the arrow in the position bar, typing a new location into the Counter window, or cueing to a marker in the Markers window.

When Auto-Scroll is enabled, Graphic Editing, QuickScribe notation, and Event List windows open to the current playback location.

Auto-scrolling will only occur in windows related to the currently play-enabled Chunk. For example, if a Song window is open, it will not Auto-Scroll unless the song is play-enabled in the Chunks window. Windows associated with Chunks inside the song will not scroll when the song is play-enabled. Only the Song window and its Markers window will scroll.

To enable Auto-Scrolling:

1. **Choose *Auto-Scroll* from the Basics menu.**

   The Auto-Scroll dialog box will appear.

2. **If you would only like the top window to scroll, click the Top window only option.**

   This option causes only the top window to scroll when you have more than one window open on the screen. This option also reduces Performer's processing load. If your Macintosh has a 68000-based CPU, or if your sequences tend to contain large amounts of dense MIDI data, this option will ensure accurate playback and responsive scrolling.

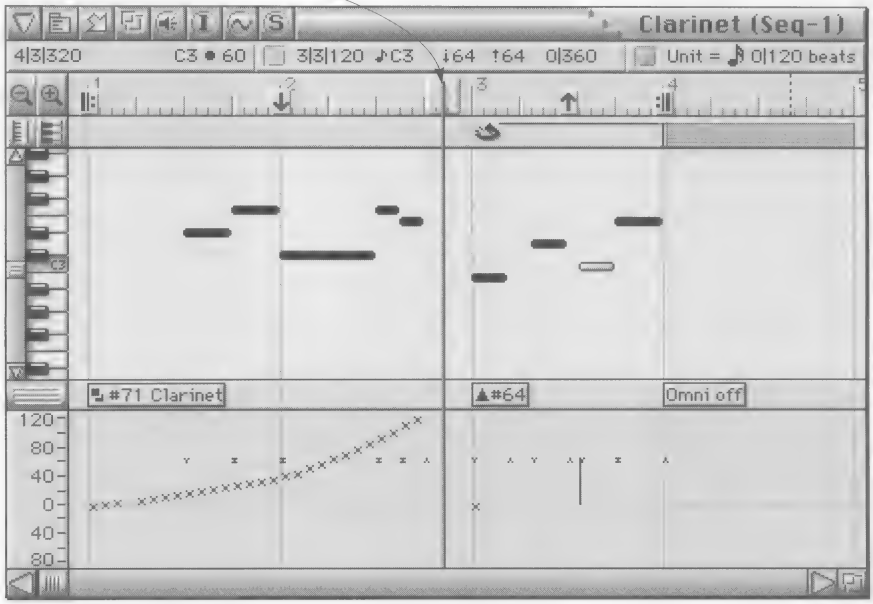
3. **Choose which types of windows you prefer to Auto-Scroll.**

   Click the check box next to the window type to select it. Use the Set All and Clear buttons to select or deselect all window types.

4. **If you would like a scrolling cursor, select the cursor option(s).**

   The scrolling cursors display the current playback location as shown in the main counter. They can also be dragged left or right to change the current playback location. They can be dragged when Performer is stopped or while it is playing back.

With the Cursor option checked, a "wiper" appears in the Graphic Editing and Tracks Overview windows to show the currently playback location of the sequence. This wiper scrolls during playback and 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.



5. **Click OK.**

To disable Auto-Scrolling:

1. **Choose Auto-Scroll from the Basics menu.**

   The Auto-Scroll dialog box will appear.

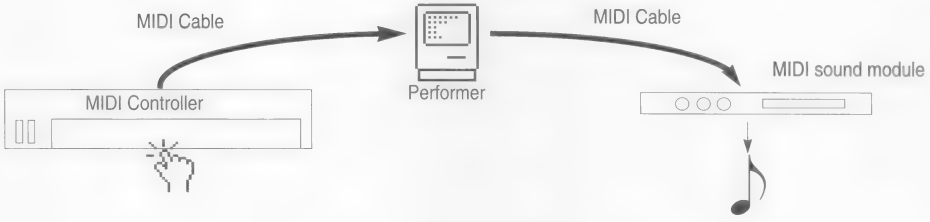
2. **Click the Clear button.**

   This deselects all window types.

3. **Click OK.**

Chapter 8 *Patch Thru*

Patch Thru allows you to hear incoming MIDI data from your MIDI controller instrument played back on your output synthesizers. More technically, Patch Thru echoes MIDI data received by Performer to any MIDI device in your studio that you choose. You'll want to use Patch Thru when 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.



Here is an overview of how Patch Thru works. You press a key on your controller keyboard. The note gets sent to Performer. Performer determines which device (MIDI channel) the note will be echoed to by the track is currently record-enabled in the Tracks window. It then sends the note to the device assigned to that track, which plays the note using whatever sound (patch) is currently selected on that channel.

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 Patch Thru

To turn on Patch Thru, choose it from the Basics menu and select either *Direct Echo* or *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. The Input Filter settings do not affect direct-echoed data; information is simply echoed straight through, by-passing most of Performer'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 back out to the device and channel for the currently record-enabled track in the Tracks window. The following sections discuss several scenarios that affect Auto Channelize.

Auto Channelizing in a Sequence

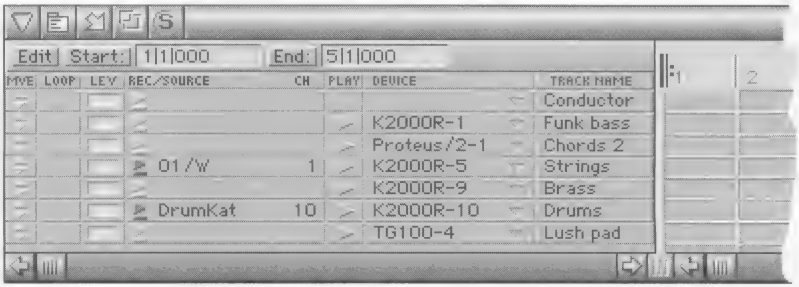
When a sequence is play-enabled in the Chunks window, here is how Auto Channelize Patch Thru works. In normal recording mode (MultiRecord off), incoming data is echoed to the device specified for the record-enabled track in the currently play-enabled sequence. In the example shown below, any incoming data received by Performer will be sent to the Kurzweil K2000R channel one. This is because the Funk Bass track is record-enabled, and its play destination is channel one on theK2000R:

Every time you change the record-enable track, Patch Thru repatches your controller instrument to echo out to the specified device for that track. Thus you always hear your incoming data as it would be played back.

If the record-enabled track is assigned to several playback devices at the same time, all of the devices will receive the patched thru data.

Auto Channelizing with Multi-record turned on

If MultiRecord is on, only MIDI data received on the specified recording Device for a track will be echoed to the corresponding playback channels for that track. In the following example, notes played on the Korg 01/W will be heard on the K2000R, channel 5. Notes played from the DrumKat will be heard on the K2000R channel 10.



In the above example, the two controller instruments will be rechannelized separately. If two different tracks had the same input recording channel and had a common output channel, the incoming data will be echoed twice to that output channel. This may cause

problems with some synthesizers; caution is advised. Note that when in MultiRecord mode, the recording channel specified in the Input Filter will be ignored.

Since Patch Thru works even when you're not recording, you can use Performer as a sophisticated MIDI merger, mapper, or rechannelizer when in playback or when stopped (as well as during recording). Patch Thru allows you to route MIDI 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 in a Song

If a song is play-enabled in the Chunks window instead of a sequence, the following two conditions are necessary for Auto Channelizing to occur: 1) a sequence *within the song* must be record-enabled, and 2) a track within that sequence must also be record-enabled. If both are true, then Patch Thru will operate in the same manner as described above. For information about record-enabling sequences in a song, please refer to the *Chunks Window* chapter.

Auto Channelizing and the Input Filter

The Input Filter affects incoming data in 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 Patch Thru.

Be Careful

If you use 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 the chapter called *Transmit Sync* chapter.

Using Patch Thru will cause a small delay (up to three milliseconds) since Performer must read all incoming data before sending it out again.

Some MIDI interfaces, such as the MIDI Time Piece II, have a patch thru option built into them. The MIDI delay factor will be smaller when using this option since it is closer to the MIDI signals. If you choose to use the echo feature, turn off Patch Thru on Performer or

incoming data will be echoed twice. If you choose to use Patch Thru in Performer, turn off the echo feature on the interface for the same reason.

Chapter 9 Recording

Performer records very much like a multi-track tape deck: you make the right connections, specify the tracks onto which to record and push the record button. Performer, however, has a great deal more flexibility than a tape deck. There are many options you can use while recording that affect which types of data are recorded and the time span in which recording takes place.

Recording is the main method by which MIDI data is input into the sequence. There are two types of recording: real-time recording and step recording. This chapter describes the basics of both methods and discusses real-time recording; the next chapter describes step recording in detail.

Real-time Recording

Real-time recording has two modes: standard and MultiRecord. In standard mode you can record on one track at a time. Data incoming on all channels (or the one you specify) is sent to this track. MultiRecord mode allows you to record on several tracks simultaneously, each receiving data from a different incoming MIDI channel.

Before recording in either mode, you should do the following things:

1. **Make sure your MIDI instruments are connected and configured the way you want them.**

   Set the correct patches on your controller and playback instruments.

2. **(Optional) Check to make sure that Patch Thru is turned on so that you'll record the track with the same sound as it will play back with.**

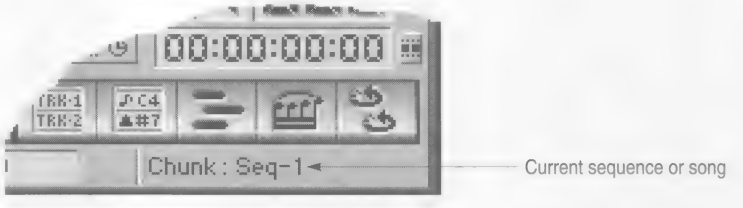
   Patch Thru echoes incoming data to any device you choose in your MIDI studio. This is essential when using a separate MIDI controller instrument: it allows you to hear what you are playing while it is being recorded. Patch Thru is also useful to check whether your instruments are working and connected correctly.

3. **(Optional) Set the Input Filter if needed.**

   If you wish to filter out some MIDI data when recording or record only from one specific channel, use the Input Filter from the Basics menu. The Input Filter defaults to notes, velocities, pitch bend, patch and song changes, and controller data checked.

4. **If you have more than one sequence or song in the file, make sure it is the currently play-enabled chunk.**

   To do so, look at the current chunk indicator in the main control panel. If you need to switch sequences, use the Skip buttons.



   If the sequence is inside a song, open the song's window by double-clicking on the song, highlight the sequence, and choose *Set Record Sequence* from the Song window mini-menu.

5. **(Optional) Choose the starting meter or set up a meter map.**

   A meter map is the layout of meters for the entire sequence. If you have a number of meter changes in your sequence, it is a good idea to set these up beforehand; it will make recording much smoother and more musical. A meter map can be made with the Change Meter command on the Change menu. Consult the *Change Meter* chapter for more on this command.

6. **(Optional) Set the tempo with the metronome in the main control panel.**

   To set the tempo manually, choose *Tempo Slider* from the Tempo Control pop-up menu and drag the tempo slider to the desired tempo. Using the tempo slider is handy for quickly setting a straight tempo. A tempo map is the layout of all tempo changes for the entire sequence. If you have a number of tempos in your sequence, especially ones that change over time (such as an accelerando), you may prefer to set these up before actually

recording any MIDI data. A tempo map can be made with the Change Tempo command on the Change menu. Consult the *Change Tempo* chapter for more on this command. Tap Tempo is a way to tap the tempo manually while you record, such as with a foot pedal. For more information, please refer to the *Tap Tempo* section in the chapter called *Receive Sync*.

7. **Record-enable the track(s) you wish to record on.**

   To do this, open the Tracks window of the sequence you are recording into by double-clicking its name. In the Tracks window, click the Record-Enable button next to the track. If the button is red (or black on a black and white screen), the track is record-enabled. In standard record mode, only one track can be record-enabled. In MultiRecord mode, several may be record-enabled (more on this below).

8. **Select the playback device(s) for the track being recorded.**

   See "Choosing a device for playback" on page 111 for details.

9. **Select a location at which 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 window.

10. **(Optional) Select the Wait and Countoff features if desired.**

    The Wait feature holds recording until you hit a key on your MIDI keyboard or the Macintosh keyboard. Countoff gives you a number of measures of countoff in the starting tempo before recording begins. Wait and Countoff can be activated in the Consolidated Controls window. See the *Consolidated Controls Panel* chapter for specific details.

11. **To begin recording, press the Record button in the main transport controls.**

    The Record button will turn solid black, signalling that Performer is recording in real-time. You can also trigger recording by pressing the 3 key on the Macintosh keypad or, if you have already set up a MIDI remote control, by sending a MIDI event

from your controller. For more information about setting up MIDI remote controls, please refer to the chapter called *The Remote Controls Window*.

12. To stop recording, press the Stop button.

Or, press the zero key on the Macintosh keypad. Stop can also be mapped to a MIDI remote control. To hold recording, you can press the Wait or Pause button.

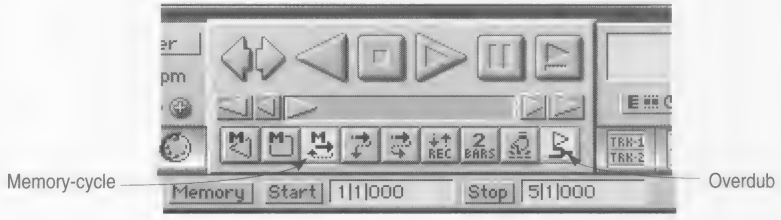
The above steps are used for standard recording mode. MultiRecord mode requires a few additional steps.

Cycle-recording

Several of Performer's features can be combined to provide comprehensive cycle-recording, complete with spot-erase and erasing the last pass. To get basic cycle-recording going:

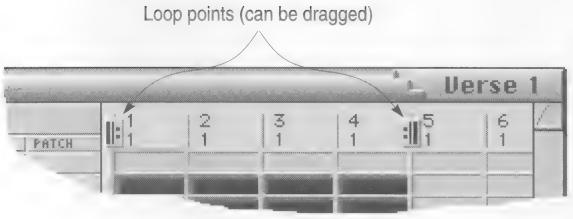
1. **Click the Memory-cycle and Overdub record buttons in the Consolidated Controls panel.**

   The memory-cycle button causes Performer to loop a section indefinitely. Overdub prevents each new pass from erasing the last one.



2. **Set the start and end times of the region you want to loop in the Memory bar.**

   For a two bar loop, make the stop time 3|1|000. For a four bar 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 Tracks overview as shown below.



3. **Check Auto Scroll in the Basics menu to make sure that the cursor option is checked for the Tracks Overview.**

   This option provides a scrolling "wiper" to show you where playback is during looping.

4. **Set the tempo in the tempo slider.**

5. **If needed, make sure that the Click is enabled in the Basics menu.**

6. **Cue Performer to the beginning of the loop region.**

7. **Click the record button in the main transport controls and begin recording.**

MIDI data appears immediately during recording

In Performer, recorded data appears immediately as you record it, before you press the Stop button. This allows you to edit the data (erase, transpose, quantize, etc.) without stopping cycle-recording.

Erasing the last pass and spot-erasing

You can easily accomplish common cycle-recording tasks such as erasing the last pass and spot-erasing by opening an event editing 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 region, as well as continuous controllers such as volume controllers.

To quickly erase the last pass while recording a drum track, open the Graphic Editing window and double-click the 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 remote controls, including a a spot-erase function, is included in the Remote Controls 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. See "Spot-erase" on page 105 for more information.

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/Prevous item	Key to press
Device	Shift up-arrow Shift down-arrow
MIDI channel	Option up-arrow Option down-arrow
Default patch (sound)	Command up-arrow Command down-arrow

You can also map these remote controls to MIDI keys on your MIDI controller, so that you can do everything from your MIDI controller during recording. See chapter 6, "The Remote Controls Window" for details.

Creating a permanent loop

Once you are satisfied with the loop, you can make it permanent by inserting a loop into one or more tracks. To insert a loop over all the tracks, double-click one of the two repeat barline loop points in the Tracks Overview to select the loop region and choose Set Loop from the Change menu. To insert a loop over only one track, select the appropriate track segments in the Tracks Overview before choosing Set Loop.

MultiRecord Mode

MultiRecord mode is used to record from several devices simultaneously; each channel may be recorded on a separate track. This is very useful in transferring data from another sequencer or when recording from several MIDI instruments simultaneously. MultiRecord is also useful for recording music while slaved to Tap tempo. Refer to the chapter *Receive Sync* for more information on Tap tempo synchronization.

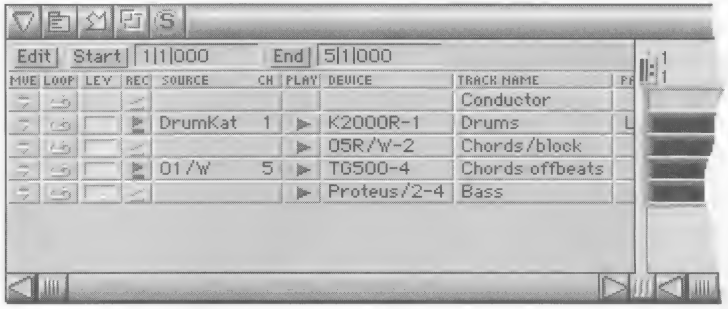
In addition to the steps listed in *Real-time recording* above, you need to do the following to prepare for recording in MultiRecord mode:

1. **Find out what the current transmit channel is on your controller keyboard(s) or devices.**

   If you are recording from multiple sources, you may want to set each instrument or source sequencer track to transmit on a different channel. This helps avoid accidently merging them.

2. **Choose MultiRecord from the Tracks window mini-menu to check the menu item.**

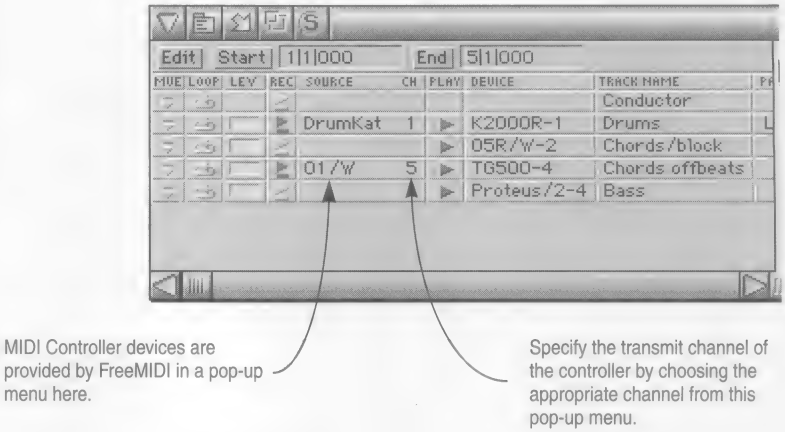
   The Rec/Source column appears.



3. **Record-Enable the tracks that you wish to record on.**

   Click on the Record-Enable button next to the track.

4. **Select the input device and channel for each track from the pop-up menus provided in the Rec/Source column.**



5. Get ready to record.

If you are sending data from another sequencer or a time-based MIDI device, you will probably want Performer to synchronize with it. To put Performer in External Sync mode, see the *Receive Sync* chapter. Also refer to the *Receive Sync* chapter for information on recording while slaved to Tap tempo sync.

Step Recording

In step recording, MIDI note events are input one at a time, not in real-time. Step recording is done with the Step Record command on the Basics menu. Step recording is very useful for entering music which is too fast or complex to play accurately in real time. It is also useful when entering a score to be converted to music notation programs. For details about step recording, see the *Step Record* chapter.

The Input Filter

The Input Filter allows you to specify what types of MIDI information are recorded.

To use the Input Filter:

1. Choose Set Input Filter from the Basics menu.

A dialog box appears.

2. **Choose the types of data to be input by clicking on the corresponding check box(es).**

   You can choose multiple types of data. You can choose all types of data at once by clicking on the Set All button. You can uncheck all the check boxes by clicking on the Clear button. Use Option-click to check only the check box you click on, unchecking all others; use Command-click to check all boxes except the one you click on.

3. **Press OK to confirm your choice or Cancel to cancel it.**

   ☛ Caution! *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 loose valuable data in the future during recording.

Specifying Controller Numbers in the Input Filter

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 enter controller numbers for the *All except* and *Only* options, click in the text boxes next to the option and type in the numbers. You can use the Tab key to move between boxes in the same option.

Auto-Record

Auto-Record automatically turns on and off the record function at locations you specify. This allows you to record without having to manually click the Record button on and off.

In audio recording, this process in called "punching in" and "punching out". A recording engineer is relied upon to listen for musical cues or watch for tape counter numbers to know exactly when to enable and disable recording. Performer allows you to pre-program these actions.

Typically, Auto-Record is used to re-record, overdub or "drop in" a part to an existing sequence. Recording is automatically enabled at the designated "Punch In" location, and disabled at the "Punch Out" location. You can play along with the sequence up until punch in without recording. Likewise, anything you play after the punch out location will not be recorded. This feature is useful for correcting notes or passages without affecting the surrounding MIDI data. Auto-Record can also be used in combination with Tap tempo synchronization, to "punch-in" a discrete passage of tempo information on the Conductor Track.

To use Auto-Record, see "The Auto-Record button" on page 76 detailed information about how to use Auto-record. Consult the *Receive Sync* chapter for information on the use of Auto-Record while slaved to Tap tempo sync.

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. To record in external sync, start the master device, wait for Performer to lock up, and then press the record button. Refer to the *Receive Sync* chapter for details on recording while slaved to each type of external sync.

Recording while still-framed

If you are slaving to video with a VITC converter such as Mark of the Unicorn's Video Time Piece, Performer 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 dialog box in the Basics menu.

Input Quantize

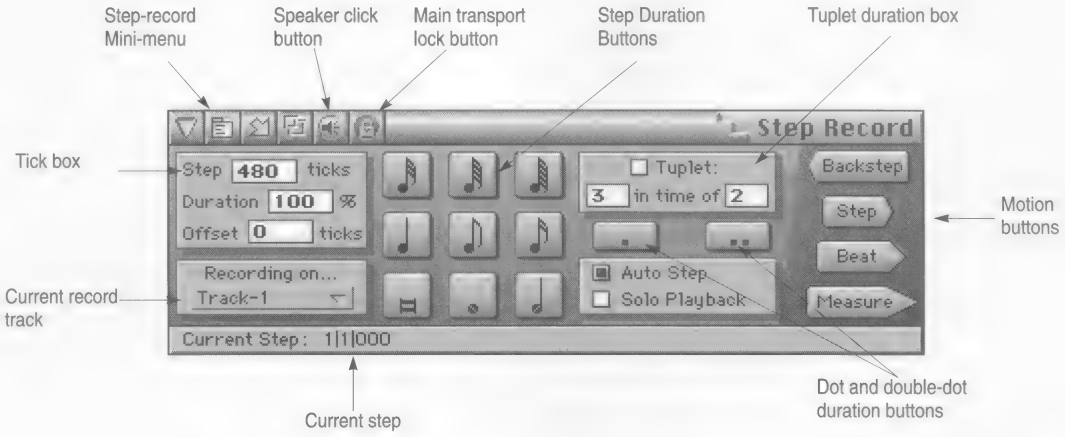
Performer's Input Quantize feature quantizes notes during recording in the same fashion as a standard drum machine. Notes get quantized immediately as they are being received and appear quantized in the track afterwards. If you are loop recording, the notes will play back quantized the next time through the loop.

For more information, please refer to the Input Quantize section in the Region Commands 1 chapter.

Chapter 10 *Step Record*

Step Record, available in the Basics menu, is an alternative to real-time recording: it waits for you to enter notes one at a time and allows you to specify the duration of each. With it, you can enter passages too complex for real-time entry. Whatever you enter in Step Record will be rhythmically accurate (it won't need quantizing). This is particularly useful for entering music for conversion to music notation by Mosaic or other music notation software.

Quick Reference



The **Current record track** is selected from this pop-up menu and displayed for reference. This is the track that is being recorded into.

The **Step Duration buttons** allow you to set the duration for the step.

The **Dot and Double Dot buttons** extend the duration chosen with the step duration boxes by one half or three quarters of the selected value, respectively.

The **Tick box** displays the duration in ticks for the step. You can enter the duration for the step directly by clicking in this box and typing in the number of ticks.

The **Tuplet duration box** allows you to enter any kind of tuplet: triplets, quintuplets, etc.

The **Backstep button** erases the previous step.

The **Step button** records the current step with the chosen duration.

The **Beat button** records the current step and advances you to the next beat.

The **Measure button** records the current step and advances you to the next measure.

Checking the **Auto Step check box** causes the current step to be recorded each time a key is let up on the MIDI controller.

Checking the **Speaker click button** causes a click to sound when a step is recorded.

The **Transport lock button** connects or disconnects the Step Record window to or from the main transport controls and counter. When connected, Performer plays all tracks as you step, and the main Counter follows the current step. When disconnected, the Step Record window steps independently of the main Counter. While disconnected, you can step record while Performer is playing back.

The **Duration box** sets the duration of the notes being entered, where 100% is the length of the current step.

The **Offset box** shifts the attack time of the note being entered earlier or later than the current step.

The **Solo Playback** check box option solos the track being step-recorded into. When unchecked, all play-enabled tracks will play as you step.

Step Record Mini-menu

Note Durations: lets you assign a MIDI controller such as a modulation wheel to control note durations as you enter them.

Note Offset: Lets you assign a MIDI controller such as a pitch bend wheel to control the note offset as you enter notes.

Clear MIDI Events: Clears any events that are currently shown in the step bar.

Basics

Step Record is primarily used to enter notes and rests. For information about how to step record controllers, pitch bend, and patch changes, see "Step Recording Controllers, Patch Changes, or Pitch Bend" on page 153 in this chapter.

Step Recording Notes and Rests

A step consists of a particular duration (an eighth note, for example). In addition, a step can contain one or more notes that are being held over from previous steps. All notes in a step last for the complete duration of that step.

A step recorded passage contains a series of adjacent steps. Each step has a duration specified by the user. A step can contain:

- *nothing:* i.e. a rest
- *struck notes:* Notes with attacks at the beginning of the step. Unless held into the next step, these will be released at the end of the step.
- *held notes:* Notes with attacks in a previous step. Unless held into the next step, these will be released at the end of the current step.

In Step Record, the time at the beginning of a step is represented in measure time. In 4/4 time, a quarter note beginning at 1|2|000 will last for 480 ticks, ending just before 1|3|000. If a second quarter note directly follows the first, it will begin on 1|3|000. Two eighth notes following just after will begin on 1|4|000 and 1|4|240, respectively.

A rest is a step containing no notes. It is an "empty" duration. Although rests are registered in the Step Record window, they do not appear in the Event Editing windows: they are the spaces between note events.

Velocity information is recorded in Step Record unless specifically disabled by the Input Filter available from the Basics menu.

Getting Ready

Before selecting Step Record, you should do the following:

1. **Select a sequence to record into.**

   Play-enable the sequence in the Chunks window. If the sequence is inside a song, open the song's window by double-clicking on the song, highlight the sequence, and choose *Set Record Sequence* from the Song window mini-menu.

2. **Select the track you wish to record on just as you would for real-time recording.**

   To do this, open the Tracks window of the sequence you are recording into by double-clicking its name. In the Tracks window, click the Record-enable button next to the track. When the button is highlighted (solid black), the track is record-enabled. In MultiRecord mode, the first record-enabled track in the track list will receive incoming data. You cannot step-record into the Conductor Track.

3. **(Optional) Open the Event List, Graphic Editing, or QuickScribe notation window for the track on which you are recording.**

   You can open all three, if you like. We highly recommend doing so because it allows you to see what you are step recording as you go.

4. **If you are using the Graphic Editing or QuickScribe notation windows, choose Auto Scroll from the Basics menu.**

   Select the appropriate option. We also recommend that you choose the cursor option, which produces a scrolling cursor in the window, which clearly indicates the current step location.

5. **Set the Counter to the time you wish to start recording.**

   If you want to start at the beginning of the sequence, set the Counter to 1|1|000.

6. **If you don't want to erase pre-existing music on the track and want to merge new material with old, click the Overdub record mode button located just below the main transport controls.**

   If there are meter changes in the passage you are about to record, create them with the Change Meter command.

7. **If you want to include key signatures in the passage you are about to record, create them with the Change Key command.**

   Note that key signatures do not affect the actual data; they only affect the display in the Event List window and while step recording.

8. **Select Step Record from the Basics menu.**

   The Step Record window appears.

The current step indicator in the Step Record window displays the starting location for the first step; this is automatically set to the current Counter location.

When you are finished setting up, you will see the Step Record window, along with one or more of the event editing windows for the track. The notes that you step record will appear in the event editing windows as you proceed with step recording.

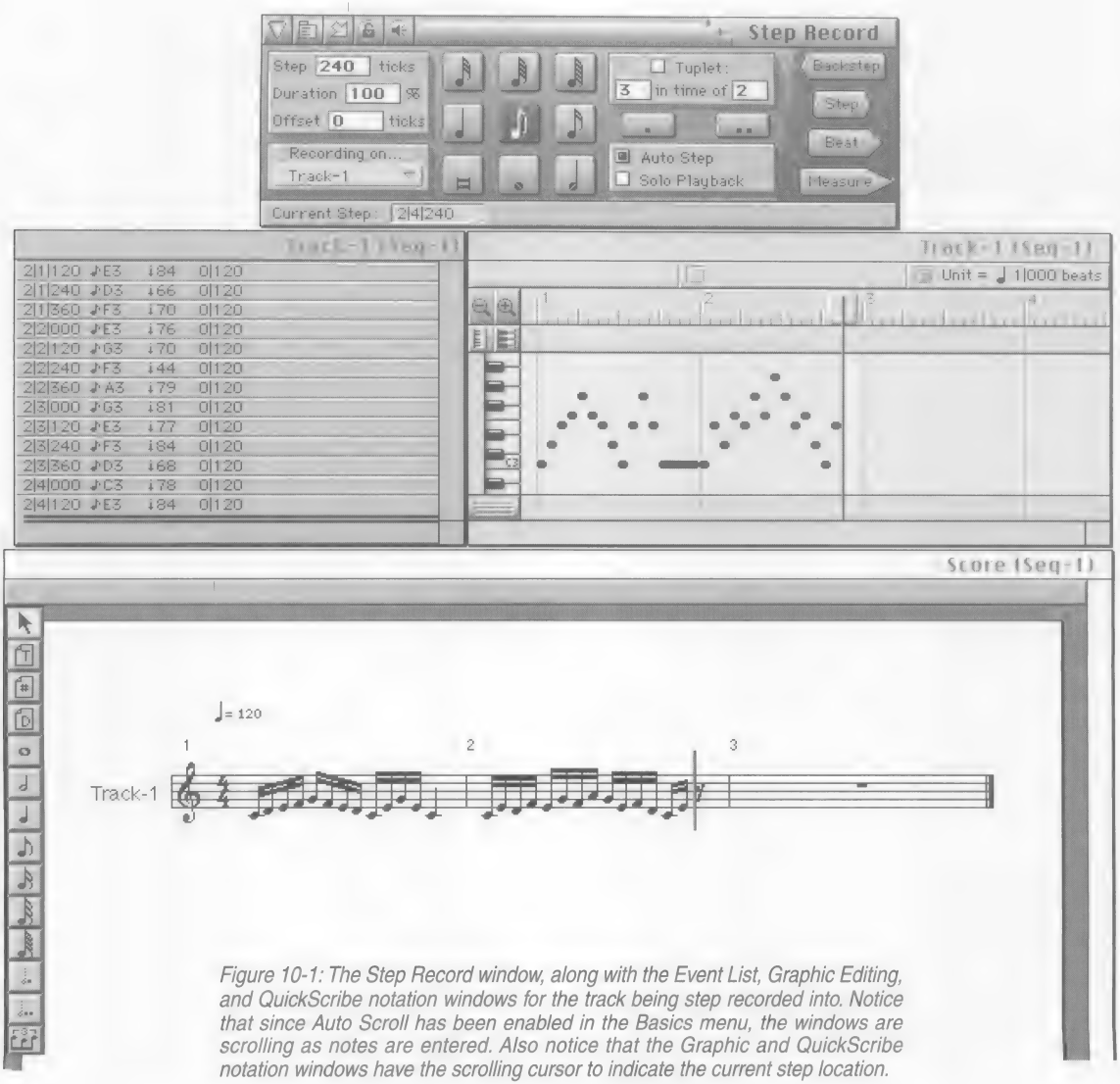


Figure 10-1: The Step Record window, along with the Event List, Graphic Editing, and QuickScribe notation windows for the track being step recorded into. Notice that since Auto Scroll has been enabled in the Basics menu, the windows are scrolling as notes are entered. Also notice that the Graphic and QuickScribe notation windows have the scrolling cursor to indicate the current step location.

Setting Step Durations

The duration buttons are used to set step durations. Clicking on a duration button will highlight it and assign that duration to the step. Durations remain set until changed, allowing you to enter a stream of notes with the same duration very quickly.

To select more than one duration box at once, hold down the shift key while clicking on the desired duration box(es). When more than one box is selected, the step duration is equal to the sum of the selected values.

You can also select durations using the Macintosh extended keypad. To do so, press the caps lock key to toggle the keypad from its standard transport functions to the step-record note-duration functions. (You can customize how this is done in the Remote Controls window if you like.) Press one of the number keys to select a duration. It remains selected until you deselect it. To deselect it, press it again.

Setting Dotted Durations

The dot and double dot boxes can be used to modify the selected step duration. If the dot box is selected, it signifies a dotted step duration, i.e. one and one half the value of the highlighted duration(s). If an eighth note and dot are selected, the step duration will be a dotted eighth note, i.e. a metrical value of an eighth plus a sixteenth. If the double-dot box is selected, it signifies a double-dotted step duration, i.e. one and three quarters the value of the highlighted durations. If a quarter note and double dot are selected, the step duration will be a double-dotted quarter note, i.e. a metrical value of a quarter plus an eighth plus a sixteenth. Only one of the dot boxes may be active at a time.

Entering a Tuplet Duration

The tuplet box can be used to set the step duration to a tuplet value, allowing you to enter triplets, quintuplets, septuplets, etc. These values are expressed in the standard way, *x* in the time of *y* durations. The tuplet box, when active, actually *modifies the duration you choose in the duration boxes* (including the dot and double dot modifiers). For example, an eighth note duration is equivalent to 240 ticks. If the tuplet box is set to "3 in the time of 2", step duration (displayed in the tick box) becomes 160 ticks, one third of a quarter note.

To set the tuplet value:

1. **Click on the Tuplet check box next to the word "Tuplet".**
2. **Enter the number of tuplet notes to be entered in the first box.**
3. **This is the box to the left of the words "in the time of".**

4. **Enter the number of regular notes the tuplet replaces in the second box.**

Eighth note triplets, for example, are three equal duration notes in the time of two eighth notes. Quintuplet sixteenth notes are five equal notes in the time of four sixteenth notes.

The tuplet box is active when the check box next to the word "Tuplet" is highlighted: make sure to deselect it when you have finished entering the tuplet values. You may enter any number of notes in the space of any other number. Performer does all the necessary calculations for the proper durations; you needn't worry about the exact number of ticks a single tuplet duration will require.

Specifying an Exact Number of Ticks for a Step

Performer computes the number of ticks for each duration automatically when you click on the boxes. You can directly specify the exact number of ticks for a step by clicking on the tick box. The equals sign will disappear and all duration boxes will be deselected to indicate that you are entering the number of ticks directly. At this time, you can type in a new duration value. Click on any duration box to return to specifying durations as note values.

Choosing a Note Duration

Normally, the duration of the note being step-entered is 100%, which makes it exactly as long as the step itself. For example, if the step was a quarter note, the note would be 480 ticks long.

Often, however, you might want to choose a different duration than the length of the step. For example, you might want to enter staccato quarter notes: the step duration is 480 ticks, but the duration of the notes should be much shorter—say around 60 ticks.

To set a duration that is longer or shorter than the current step duration, type in a percentage below or above 100%.

The duration can be controlled on the fly using a pitch bend or modulation wheel. For more information, see the remote control section at the end of this chapter.

Generating Random Note Durations within a Range

Note durations can be generated randomly within a range. To do so:

1. **Choose Note Durations from the Step Record mini-menu.**

2. **In the duration range, enter the lowest and highest percentage that you would like to use.**

   100% equals the current step duration, so if you'd like to be able to enter notes longer than the step duration, make the top value be above 100%.

3. **Check the "Randomize Durations within a range" option.**

4. **Click OK.**

Setting Default Step-Record Durations

Performer allows you to control the duration of the notes that you are step-entering independently of the step duration. For example, if you are entering quarter notes, the step duration is 480 ticks. However, if you would like the quarter notes to be played in a staccato fashion, you would probably set the duration to approximately 120 ticks or some other value less than 480 ticks.

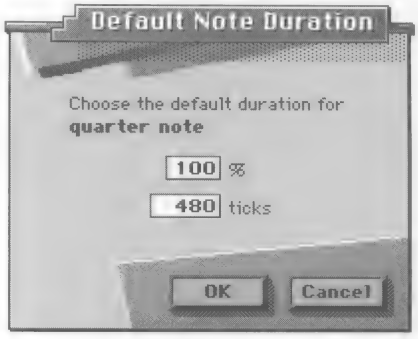
One way to control the duration is with the duration option described in the section called "Choosing a Note Duration" on page 146.

Often, however, you might like to select a different duration for each type of note (quarter note, half note, whole note, sixteenth, etc.). For example, you might want quarter notes to be 80% of their step duration, half notes to be 100%, and sixteenth notes to be 65%, where each duration has an independent duration.

You can set up default durations for each note duration as follows:

1. **Double-click the duration button that you would like to set.**

   A dialog box appears in which you can set the default duration for that note.



2. **Type in the desired duration.**

   You can either type a percentage or a number of ticks. In either case, the other text box will update to reflect the value you enter. For example, if you entered 50% in the box above, the tick value box would change automatically to 240.

3. **Click OK.**

4. **Repeat this procedure for each desired duration.**

Choosing a Note Offset

Normally, step entered notes are inserted exactly at the tick location of the current step. The offset option allows you shift their entry a few ticks before or after the current step location. Offset is ideal for passages in which you'd like to push or lay back the feel.

To place notes a certain number of ticks *before* the current step location, type in a negative number of ticks in the offset text box.

To place the notes a certain number of ticks *after* the current step location, type in a positive number of ticks.

The offset can be controlled on the fly using a pitch bend or modulation wheel. For more information, see the remote control section at the end of this chapter.

Generating Random Note Offsets within a Range

Note offsets can be generated randomly within a range. To do so:

1. **Choose Note Offsets from the Step Record mini-menu.**

2. **In the offset range, enter the earliest and latest offset that you would like to use.**

   Use a negative number to indicate the earliest offset, such as -15.

3. **Check the "Randomize Durations within a range" option.**

4. **Click OK.**

Soloing the Record Track

Normally, all play-enabled tracks play along with you as you step record. However, if you want to mute all other tracks in order to solo the one being recorded into, click the Solo Playback check box.

Performing Step Entry

After setting the step duration, you are ready to enter notes. When entering them, you can proceed to each next step automatically (with the Auto Step option checked) or manually (with the option unchecked).

Stepping Automatically

Enter one or more enter notes with Auto Step in the following manner:

1. **Hold down one or more notes on your MIDI controller.**

2. **Release the note(s) to enter the step.**

When Auto Step is enabled, a step is automatically recorded when you release a key on your MIDI input keyboard, just as if you had pressed the Step button. This makes entry quick and easy.

For example, using Auto Step, you could enter an eighth note scale without using the step button: just set the duration to an eighth note and play the scale on your MIDI keyboard.

When using Auto Step, be aware of the following things:

Play staccato: make sure that the notes for each step are attacked and released crisply, with clean gaps between the notes. If the release of a note overlaps with the attack of the next one, you may get two notes in a step in which only one was intended. Don't worry about the duration. Remember, it is determined by the duration option.

Wrong notes will be recorded automatically. If you hit a wrong note, you must use the Backstep button to erase it and re-enter the note or chord. This differs from manual step mode in which you can replay

the notes as many times as you like before you click on the Step button, and only those notes being played at the moment you click on the button are recorded.

Stepping Manually

At times, you may wish to choose when to proceed to the next step, such as when you are holding a note or chord through several steps. To do so:

1. **Hold down one or more notes on your MIDI input keyboard.**
2. **Click on the Step button.**
3. **Release the note(s).**

This will cause one step to be recorded containing the notes you played. Clicking on the Step button will record those notes which are being held down on the controller keyboard. The step will not be completed until you press the Step button. If you continue to hold the same notes down and press the Step button again, the notes will be recorded as "held" since they were not released in the previous step.

You can use the space bar on the Macintosh keyboard instead of pressing the Step button.

If you play a wrong note, simply play the correct one before pressing the Step button.

Entering Rests

Rests are entered by pressing the step, beat, or measure buttons with no notes held down. This records a step with no notes for the chosen duration.

Hearing a Click After Each Step

Click the speaker click button to highlight it. When highlighted, it causes a click to sound every time a step is entered. This is highly recommended when using Auto Step, as it is a useful indicator of step completions. The volume of this click can be adjusted with the *Speaker Volume* feature on the Control Panel desk accessory; any adjustment to the click volume must be made from the Finder.

Listening to What You Have Recorded

When you are finished step recording, and you'd like to hear what you have done, press Rewind, or cue to the desired start measure. Then press Play.

Disconnecting the Counter From Step Record

Connecting the Main Counter to Step Record

Changing the Current Step Location

Notice that when you rewind and play back, or do just about anything else besides step-recording, the Transport Lock button in the title bar of the Step Record window unhighlights. (You can also unhighlight it by clicking it.) This indicates that the main Counter in the Controls Window is no longer locked to the current step location in the Step Record window.

In this mode, the Step Record window acts entirely independently of Performer's main transports (play, stop, rewind, etc.), as well as the main Counter. Thus, you can play, rewind, fast forward, stop, and otherwise cue around in the sequence completely independently of where you are step recording.

In this mode, other tracks do not play along with the track that you are step recording into. To get them to play along, click the Transport Lock button again to highlight it. Doing so locks the transports to Step Record.

If, as you Step Record, you would like other tracks to step along with you, highlight the Transport Lock button before you begin. Doing so causes Performer's main Counter to follow the current step indicator in the Step Record window. All play-enabled tracks will play as you step through the sequence.

To change the current step location:

1. **Click the Current Step location to edit it.**

2. **Type in the desired location.**

3. **Press the return key.**

4. **If you wish to connect the main Counter to the new Step Record location, highlight the Transport Lock button.**

   Doing so causes the main Counter to follow you as you step, and all play-enabled tracks will play with you as you step.

Displaying Notes as You Step Enter

Notes that you step enter appear in the event editing windows of the track as you enter them. To view them either during or after entry, open the Event List, Graphic Editing, and/or QuickScribe notation window for the track on which you are recording. See Figure 10-1 on page 144.

Erasing the Last Step with the Backstep Button

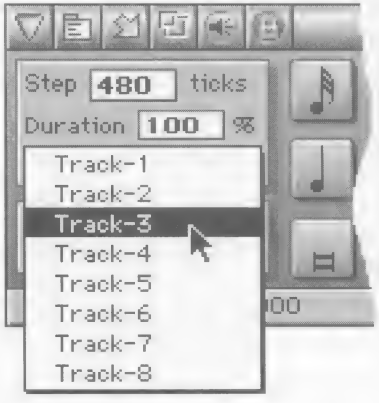
Pressing the Backstep button will erase the step you just entered (the one displayed just above the current step bar). After pressing the Backstep button, the time in the current step bar will be the exact starting time of the step erased with the Backstep button.

Stepping to the Next Beat or Measure

The Beat and Measure buttons are special step advance buttons. They compute the duration necessary to get to the next beat or measure: the step is recorded using that duration and you are advanced to the next beat or measure for the next step. For example, if the current step is on 2|1|212 and the meter is 4/4, when the Beat button is pressed, a step of 268 ticks will be recorded and the next step will be entered at 2|2|000. If the Measure button is pressed, a step of 2|268 (2 quarter notes and 268 ticks) will be entered and the next step will be entered at 3|1|000.

Changing the Current Record Track

To change the current record track, click the "Recording on..." pop-up menu and select a different track.



Adding to Existing Material in a Track

You can add to existing material in a track as long as you first turn on Overdub record mode with the Overdube record button in below th main transport controls. Otherwise, the newly step recorded data will replace existing data in the track.

Step Recording Controllers, Patch Changes, or Pitch Bend

To step record a controller event, patch change, or pitch bend event:

1. **Play the event.**

   The event appears in the current step bar.

2. **Press the Step button or any other motion button to record the event.**

   Events, such as patch changes, controllers, and pitch bend do not trigger auto step. In these cases, play the event and proceed to the next step by pressing the Step button (or any other motion control button.)

Step Recording During Playback

Step recording can be done during playback. For example, you can step record notes into a loop and have Performer play back the loop in real time as you build the loop. This can be ideal for building drum loops with Step Record.

To Step Record into a loop during playback:

1. **Choose Step Record from the Basics menu and unhighlight the Transport Lock button in the title bar of the Step Record window.**

   This disconnects the main Counter from Step Record.

2. **Set up a loop in a track.**

   If necessary, you can initially make the loop repeat infinitely while you are building it and later on change it to the desired number of repetitions.

3. **Choose the track with the loop from the "Recording on" pop-up menu in the Step Record window.**

4. **Click the Overdub record button located just below the main transport controls to enable Overdub record mode.**

   This allows you to step record over the same region in the loop without erasing existing material in the region.

5. **Set up any other Step Record options as desired, such as Solo Playback and Auto Step.**

6. **Press the Play button to begin Playback.**

   As the sequence plays, notice that the Current Step in the Step Record window remains where you begin.

7. **Pop-edit the current step counter to set it to the location where you want to begin step-recording.**

8. **Begin Step Recording as desired.**

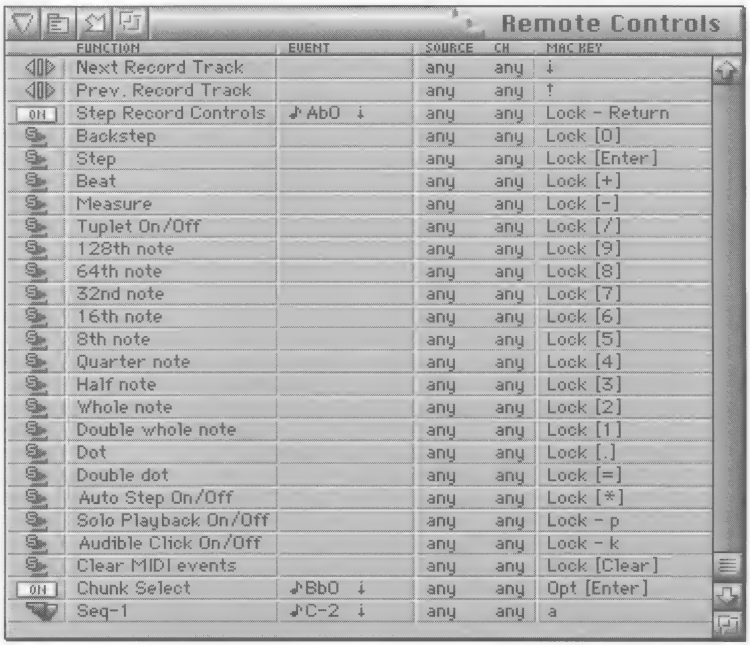
9. **When you reach the end of the loop, pop-edit the current step indicator to step record the next pass through the loop.**

   As Performer keeps playing, you can repeat this step as many times as necessary as you build the loop. As you build it, you will continue to hear it playback.

10. **When you are finished, press Stop.**

Using the Step Record Remote Controls

All of the functions in the Step Record window are available as remote controls in the Remote Controls window. This allows you to map them to your MIDI controller so that you can perform the entire step recording process from in front of your MIDI instrument, rather than in front of your computer screen.



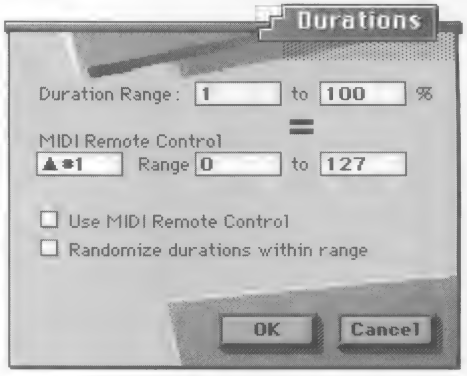
☛ Important note! Be careful about the other Remote Controls, such as the Transport controls or the Chunk Select controls. Be sure that you have either disabled them (with their group master) or remapped them so that they do not interfere with the notes that you are step recording. See the Remote Controls chapter for information about how to remap and disable groups of remote controls.

Controlling Duration with a MIDI Controller

You can set up Step Recording such that a mod wheel or other continuous controller controls the duration of the notes being inserted.

To assign a pitch bend wheel, mod wheel, or data slider to the duration:

1. Choose Note Durations from the Step Record window mini-menu.



2. **For duration range, enter the lowest and highest percentage that you would like to use.**

   100% equals the current step duration, so if you'd like to be able to enter notes longer than the step duration, make the top value be above 100%. The maximum value you can enter is 200%.

3. **For the MIDI Remote Control, enter the controller type, and enter a range of controller values that will be mapped to the duration range you specified above.**

   For example, if you specify a duration range of 50% to 150%, and you specify a controller range of 0 to 100, when you move the mod wheel (pitch bend wheel, or data slider) to 100, the duration will be set to 150%. Likewise, if you move the controller to 0, the duration value will be set to 50%. You can enter any of the above values by highlighting the text box with the tab key and moving the controller wheel or slider.

4. **To enable MIDI Remote Control, click the MIDI Remote Control check box.**

5. **If you wish notes to be assigned a random duration within the duration range you've chosen, click the "Random Duration within range" check box.**

6. **Click OK to confirm your choices.**

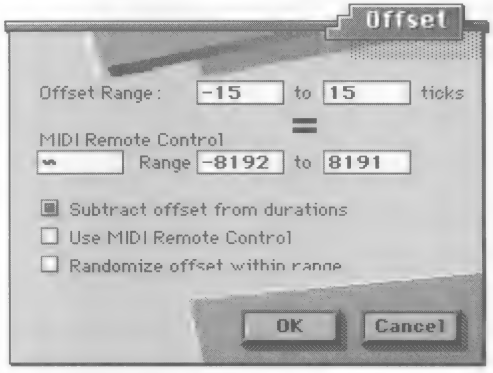
Now you can control the duration with your mod wheel. As you move the wheel, notice that the duration value changes in the Step Record window.

Controlling the Offset with a MIDI Controller

You can set up Step Recording such that a mod wheel or other continuous controller controls the offset of the notes being inserted.

To assign a pitch bend wheel, mod wheel, or data slider to the offset:

1. **Choose Note Offset from the Step Record window mini-menu.**



2. **For the offset range, enter the earliest and latest value over which you would like to set the offset.**

   Type a negative tick value in the first text box for the earliest value; type a positive tick value in the second box for the latest value.

3. **For the MIDI Remote Control, enter the controller type, and enter a range of controller values that will be mapped to the offset range you specified above.**

   For example, if you specify an offset range of -15 to 15, and you specify a controller range of 0 to 100, when you move the mod wheel (pitch bend wheel, or data slider) to 100, the offset will be set to 15. Likewise, if you move the controller to 0, the offset value will be set to -15. You can enter any of the above values by highlighting the text box with the tab key and moving the controller wheel or slider. The minimum is -240 ticks and the maximum is 240 ticks.

4. **If you would like the note's duration to be maintained, check the "Subtract offset from durations" option.**

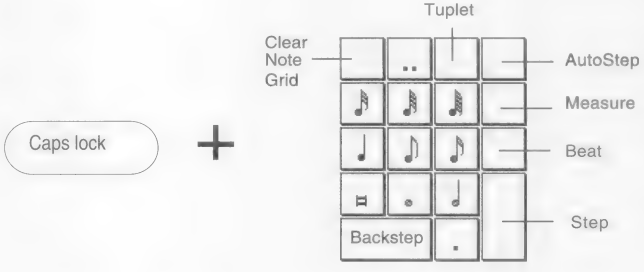
5. **To enable MIDI Remote Control, click the "Use MIDI Remote Control" check box.**

6. **If you wish notes to be assigned a random offset within the range you've chosen, click the "Randomize offset within range" check box.**

7. **Click OK to confirm your choices.**

Using the Macintosh Keypad

In addition, the step record commands are mapped to the Macintosh keypad as shown below. The caps lock key must be down to use these key assignments. Pressing the key performs the same actions as pushing the buttons in the Step Record window, with one exception: a duration remains selected until you press it again; pressing a different duration does not deselect currently selected durations. This allows you to easily specify a composite duration (such as an eighth and a quarter). To clear all durations, use the *Clear Note Grid* key: the Clear key on the keypad.



Be Careful

Step recording will record over previously recorded material in the same time span in the track. Use Overdub record in the Consolidated Controls Panel if you want to merge your step recorded material with what is already on the track in that time span.

If you enter notes or backstep quickly, the display might temporarily be suspended in order to accurately process the events. Don't worry: as soon as you slow down or stop entering or backstepping, the display will catch up.

You may find that velocities recorded in step record are uneven. If this occurs, you can edit them by selecting the step recorded region and using the Change Velocity command in the Region menu to set all velocities to the desired values.

Hints

Be sure to uncheck the tuplet box as soon as you are through with it; otherwise, subsequent durations will be incorrect.

If you discover that you've left out a note after step recording, use the Shift command on the Edit menu to remove or add extra space to avoid having to re-enter the entire passage again.

To enter a chord with staggered releases, use manual stepping.

You can enter chords with more than five notes (one hand's worth) by making two or more recording passes, for instance, one for each hand of a piano part. This can be done by recording on separate tracks or by using overdub record to merge in the second part.

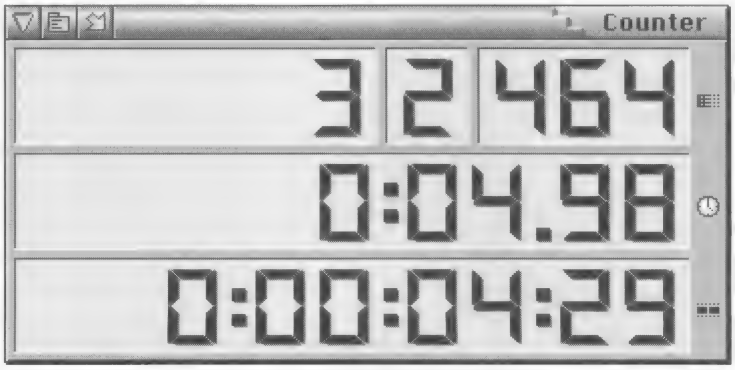
If there are a number of duration changes in a step record passage, it may be easier to choose the smallest common duration value and hold notes through steps to create longer durations. For example, a half note can be entered by holding an eighth note over four steps. If the passage you are entering is rhythmically complex, it may be best to use manual stepping (Auto Step off) in order to keep track of each step entered.

Chapter 11 *The Counter Window*

The Counter Window is identical to the main counter in the Consolidated Controls Panel, except that it is a large, separate window, and it can display all three time formats at once. For complete information about using either counter, see "The Counter" on page 88.

Setting the Counter window display

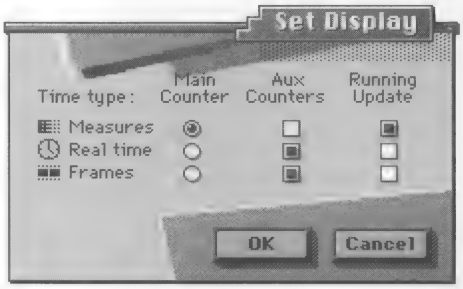
The counter window can display one or more of the three time formats in any combination. One format is designated as the Main Counter. It will appear at the top of the window. You can also specify two "Aux" (auxiliary) Counters which appear below the Main display. The format is identified by a small icon positioned just to the right of it in the Counter window:



Counters can continuously display the current location of the sequence or song or can update the location only after the stop button is pressed. The former mode requires some microprocessor overhead; turning off the continuous update option will improve the program's responsiveness during recording and playback.

To set the counter display:

1. **Choose the Set Display command from the Counter window mini-menu.**



2. **Choose the time display for the main counter by pressing the desired button in the Main Counter column.**
3. **Choose zero, one, or two other time formats by clicking on the desired box(es) in the Aux Counter column.**
4. **Specify which of the displays will be continuously updated by clicking in the desired box in the Running Update column.**

   If the Running Update box is not checked, the corresponding time display will change to dashes while the sequence is playing or recording.

5. **Press the OK button to confirm your choice or the Cancel button to cancel it.**

Counter window mini-menu

In addition to the Set Display command mentioned in the previous section, the Counter window mini-menu has two other commands.

Set Frame Rate

For complete information about setting the SMPTE frame rate, see "Slaving to SMPTE with MTC, DTL, or DTLe" on page 609.

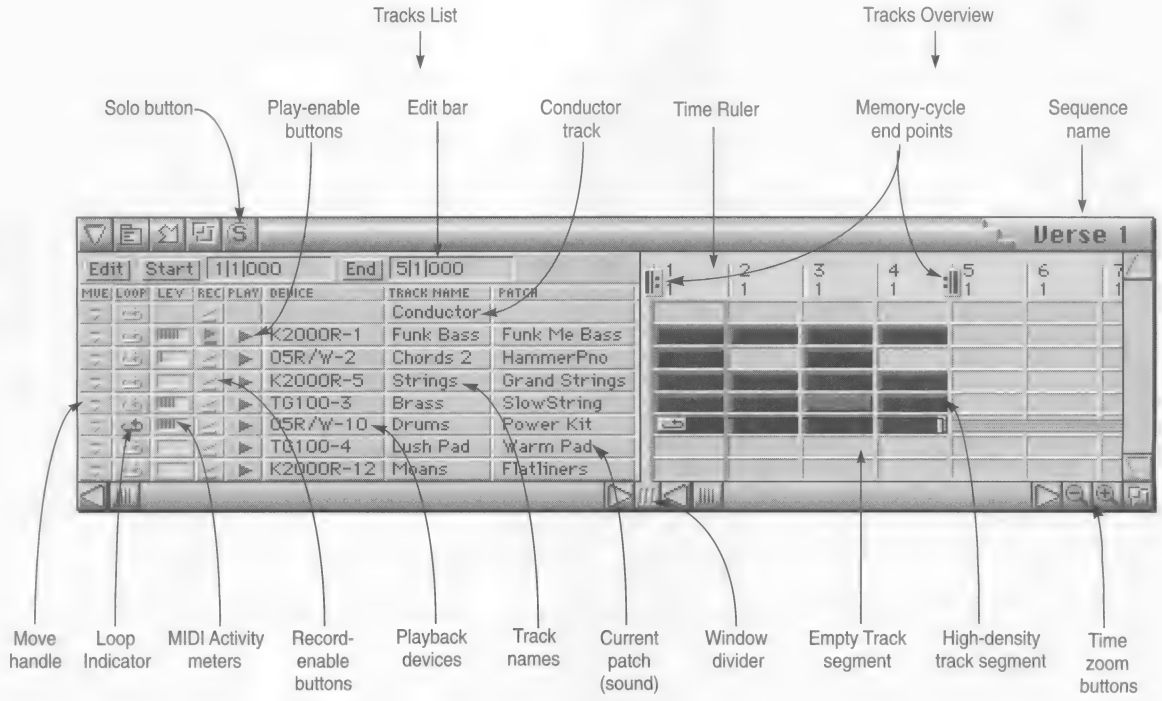
Set Chunk Start

For complete information about setting the start time of a sequence or song (chunk), see "Setting the start time" on page 90.

Chapter 12 *The Tracks Window*

The Tracks window is one of the most important features in Performer: it allows you to define and organize the contents of each sequence in your Performer file. It is also perhaps the most powerful and flexible window in Performer. The Tracks List portion of the window allows you to create tracks, assign MIDI channels for recording and playback, set regions for editing, customize track names, add comments, and more. The Tracks Overview portion allows you to view, select, and edit the data in each track.

Quick Reference



Tracks List: Displays the track names and important information about each track: the play channel or device assignment, the play and record buttons, the current patch setting, and comments. Option-click the track name to pop-edit it.

Tracks Overview: Displays each track in equal-length segments, which can be zoomed to show as much as 16 measures per segment or as little as 30 ticks. Each segment displays how much data is present in that segment. To view the data in a segment, double-click, command-double-click, or option/command-double-click to open the Event List, Graphic Editing, or QuickScribe notation window.

Solo Button: Enabling this button by clicking it puts Performer into Solo mode—the same as using the Solo command in the Tracks window mini-menu. Highlighted tracks play; unhighlighted tracks are muted.

Playback device: Each track has a playback device (or a combination of several devices), which can be selected from a pop-up menu by clicking in this column next to the track. Devices in the menu are provided by FreeMIDI.

Edit Bar: Determines the start and end times of the current selection region in any tracks whose names are currently highlighted. Click the values to edit them. Click the words "Start" or "End" to load the current Counter location. Double-click the word "Start" to automatically load the beginning of the sequence; double-click the word "End" to automatically load the end. Double-click the word "Edit" to automatically select the entire length of the sequence. Single-click the word "Edit" to load remembered times.

Loop Indicator: Shows whether a loop exists in the track.

Time Ruler: Displays the location of each segment in any combination of Performer's three time formats: measures | beats | ticks, SMPTE time, or real time.

Memory-cycle loop points: These repeat barline icons indicate the points where the entire sequence will loop when the Memory-cycle button is highlighted.

Sequence Name: Displays the name of the sequence. A Performer file can contain any number of sequences, each with their own Tracks window. Command-click to switch between sequences.

Time Zoom Buttons: Zooms in the Time Ruler so that each segment represents a smaller or larger duration. For example, in the Quick Reference diagram, each segment currently represents one *measure* of music. Clicking the Zoom In button will cause each segment to represent one *quarter note* (480 ticks). Other zoom-in levels are: 240, 120, 60, and 30 ticks per segment. Other zoom-out levels are: 4, 8, and 16 measures per segment.

High-Density Track Segment: Indicates that the segment contains more than 10 MIDI events. Segments can display several degrees of data density. The threshold between density levels can be adjusted with the *Set Density Threshold* mini-menu command.

Empty Track Segment: Indicates that the segment contains no MIDI data.

Window Divider: Separates the Tracks list from the Tracks Overview. Drag the divider left to see more of the Tracks Overview or right to see more of the Tracks List, comments, etc.

Track Comments: Display remarks that you can type in for the track. To enter or change a comment, simply click on it and enter or edit the text. Press OK or the Enter key to confirm your entry, or press the up or down arrow keys to confirm your entry and move to adjacent tracks, or press Cancel or command-period to cancel it.

Current Patch: Displays the name of the currently selected patch (sound) for the Device.

Default patch: Displays the name of the patch that will initially be called up when the sequence starts playing. This is saved with the file.

Conductor Track: A special track that contains the tempo map, meter changes, and key signatures for the sequence. The Conductor track also contains Markers. Data in the Conductor track can be edited just like MIDI data in regular tracks.

Playback Device: Displays the playback assignment for the track. The list of devices matches your MIDI studio. Device names are set up in the FreeMIDI Setup software.

Play-Enable button: Enables or disables a track for playback. To toggle its play status, simply click the button. Any number of tracks may be play-enabled. Most commonly, all tracks will be play-enabled. When solid black, the track is play-enabled and will be audible. If hollow, the track will be muted or silent. If muted, the data for the track is still there; you are just "turning off" the track during playback.

Record-Enable button: Selects a track for recording. In normal recording mode (MultiRecord off), only one track may be recorded into at once; when you record-enable a track, the previous record-enabled track will be automatically disabled. Record-Enable buttons are only present if the sequence is selected for playback in the Chunks window or it is record-enabled in a Song window.

Move Handle: Drag up or down to change the position of a track in the tracks list.

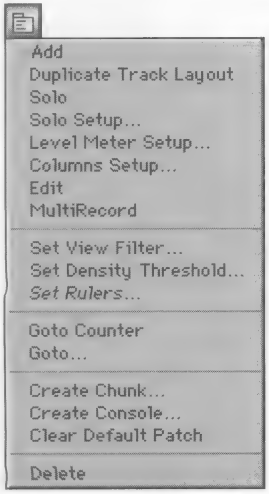
MIDI Activity Meters: Indicate the intensity of MIDI playback coming from the track. They monitor either note-on velocities or amount of data. When monitoring amount of data, level meters monitor any type of data.

Tracks Window Mini-menu

Add: Adds a track to the track list. There is no limit to the number of tracks you can add. Hold down the option key while choosing Add to add more than one track at a time. New tracks are added to the bottom of the list or just below the currently highlighted track name.

Duplicate track layout: Selecting a track or multiple tracks and choosing this command duplicates the selected tracks and their playback assignments. The word *copy* is appended to each new track's name. This command does not copy the data in the track; instead, it copies only the track's name and playback assignment. Use the option key while selecting the command to make more than one duplicate copy.

Solo: Enables Solo mode. In Solo mode, only tracks whose names are highlighted will play. To disable Solo mode, choose Solo again to uncheck it.



Solo Setup: Calls up a dialog box that lets you configure solo mode. Solo mode can be configured so that muted tracks are not muted all the way. Instead, their volume is brought down part way by reducing their note-on velocities by a percentage that you choose.

Level Meter Setup: Provides several different ways to configure the level meters. See "Configuring the MIDI level meters" on page 193.

Columns setup: Lets you choose which columns to show and hide in the Tracks list.

Edit: Opens the Event List for the currently highlighted tracks.

MultiRecord: Enables MultiRecord mode. In MultiRecord, more than one track can be record enabled at a time with a separate record channel for each one. To disable MultiRecord mode, choose the MultiRecord menu item to uncheck it.

Set View Filter: Calls up a dialog box in which you specify types of events to be visible in the Tracks Overview window. The View Filter applies to all tracks and the Event List, Graphic Editing, and QuickScribe notation windows.

Set Density Threshold: Calls up a dialog box in which you specify the difference between low-density and high-density track segments. The default value is 10 MIDI events. You can set the threshold to any value between 1 and 999.

Set Rulers: Allows you to configure the Time Ruler in any combination of Performer's three time formats: measures | beats | ticks, SMPTE time, or real time. The main ruler is displayed lowest.

Goto Counter: Scrolls the graphic display to the time currently displayed in the Counter. The counter location will appear at the left-most position in the window.

Goto: Scrolls the graphic display to a time you specify, which will appear at the left-most position in the window.

Create Chunk: Creates a sequence chunk made up of the currently selected segments and places it at the end of the list in the Chunks window. In the new sequence, the earliest selected segment will be placed at measure one.

Create Console: Creates a Slider console for the currently selected tracks. A dialog box will appear asking what type of console, e.g. volume, pan, etc.

Clear default patch: Removes the default patch assignment in the Default patch column for the currently selected tracks.

Delete: Removes the currently selected tracks from the Tracks window.

Tracks Window Basics

A track in Performer stores a series of MIDI events within a sequence. Each sequence contains its own set of tracks. Performer allows you create as many tracks as you like, each holding a separate stream of MIDI events. The only limitation to the number of tracks is the amount of random access memory in your computer. (We've seen some sequences with over 300 tracks!)

The Conductor Track is the exception; it stores meter, key, tempo, and marker information. For more information, see the chapter *The Conductor Track.*

In Performer, MIDI data is stored in the track without channel information. Instead, each track in Performer can be assigned to one or more MIDI channels. During playback, or while recording using the auto-channelize Patch Thru feature, the MIDI data in the track is sent out through the assigned channels. Any MIDI instrument that is listening to (receiving on) that same channel will respond to the MIDI information it receives.

In summary, each sequence in a file has its own Tracks window, which lists all of the tracks in the sequence. Each track has a MIDI channel assignment consisting of one or more channels. The data in the track is played on whatever the playback channels the track is assigned to.

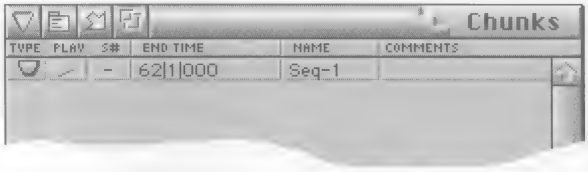
Opening a New Tracks Window

When you select New from the File menu, a new file containing a single sequence is created. (See the *Working with Files* and *Chunks Window* chapters for more information.) The Tracks window for this new sequence is already open by default.

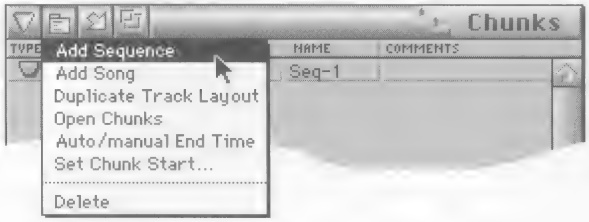
If you wish to add another sequence and display its track window:

1. **Open the Chunks window by choosing *Chunks* from the Windows menu.**

   The Chunks window appears:



2. **Choose *Add Sequence* from the Chunks window mini-menu.**



   A new sequence appears in the Chunks list.

3. **Double-click the name of the new sequence.**

   A new Tracks window will appear for that sequence. The name of the sequence will appear in the title bar of the window.

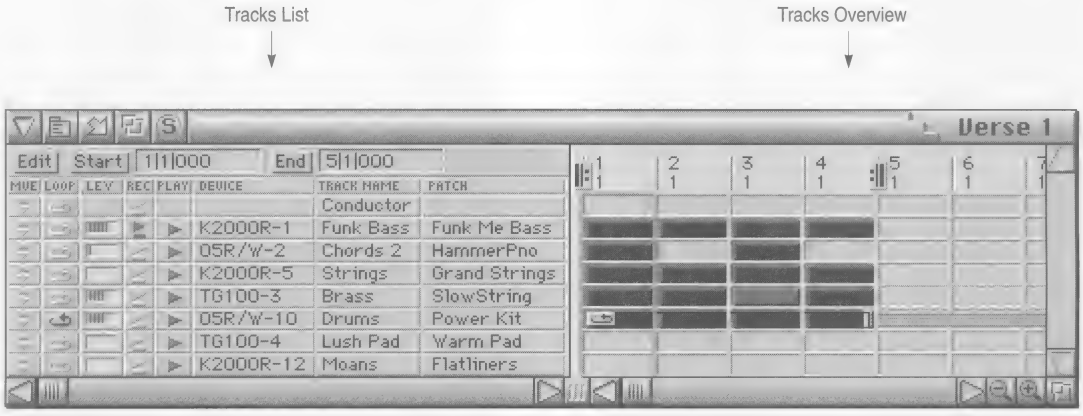
To open a new file with a new, empty sequence:

1. **If a file is open, close it by choosing Close from the File menu.**
2. **Choose New from the File menu.**

   A new file opens with one sequence and a Tracks window for that sequence.

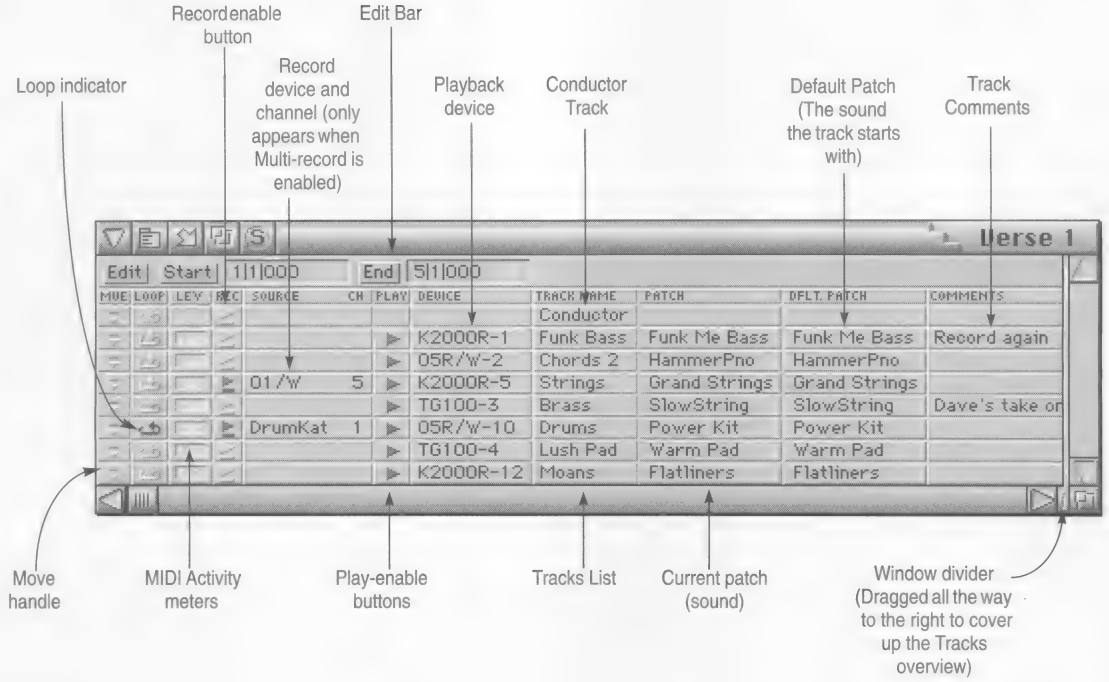
The Tracks List & Overview

The Tracks window is divided into two portions: the Tracks List on the left and the Tracks Overview on the right. This section discusses the Tracks List. The Tracks Overview is discussed later in the chapter.



Tracks List Quick Reference

The Tracks List provides a list of all the tracks in the sequence. In addition, it provides useful information about each track, such as what MIDI devices the track is playing on. This information is shown in the same row as the track.



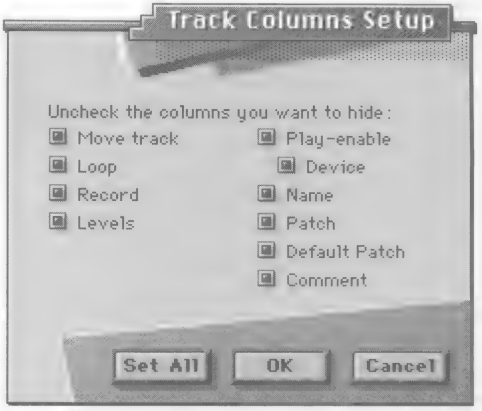
Hiding Columns in the Tracks List

Even though The Tracks List has a lot of columns of information in it, you can completely customize the display to suit your tastes. You can hide columns you don't need to look at, and you can rearrange the order of the columns. For example, if you don't have any comments, you don't need to display the column.

To hide or show columns in the Tracks List:

1. **Choose Columns Setup from the Tracks window mini-menu.**

   As a shortcut, you can double-click any column heading instead. The column Setup window appears.

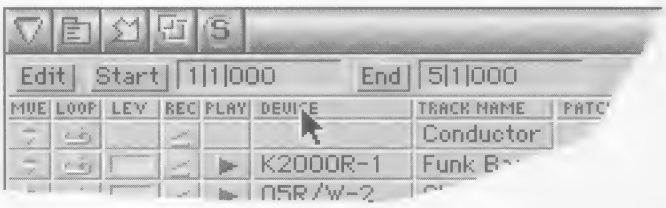


2. **Uncheck the columns you want to hide, and check the ones you want to see.**

3. **Click OK.**

Rearranging the order of the columns

You can rearrange the order of the columns simply by dragging the title of the column left or right.



See "Customizing the Tracks Window" on page 192 for an example of a more compact, customized Tracks List.

The Move Handle

The Move Handle allows you to shift the position of a track in the tracks list. Use it to rearrange the tracks in an order that is most useful to you. To use the Move Handle, press on it and drag the track where you want it to go. A dotted outline of the track will follow your mouse movements. The track will be moved to the position in the

tracks list where you release the mouse. If you drag the track above the top or below the bottom of the Tracks List, it will scroll until it reaches the top or bottom of the list.

The Loop Indicator

This column displays a loop icon if the track contains one or more loops.

MIDI Activity Meters

The MIDI Activity Meters act very much like the level meters on a tape deck: when there is signal on the channel, the level meter registers the signal. Similarly, at the moment the track is playing MIDI data, the MIDI activity meter registers the outgoing MIDI data.

You can configure how the level meters operate. For details, see "Configuring the MIDI level meters" on page 193.

The Record-Enable Button

The Record-Enable button selects a track for recording. In normal recording mode (MultiRecord off), only one track may be recorded into at once; when you record-enable a track, the previous record-enabled track will be automatically disabled. Record-Enable buttons are only present if the sequence is selected for playback in the Chunks window or it is record-enabled in a Song window.

The Conductor Track has a record-enable button, which is used to record tempo information while slaved to Tap tempo synchronization. See the chapter *Receive Sync* and *Tap Tempo While Slaved to Tape* for details on using Tap tempo to record a tempo map in real time.

The Record Device

Normally, the record-enabled track will record data from all channels. In MultiRecord mode (set in the Tracks window mini-menu), you can record from individual MIDI device on a particular MIDI channel into a particular track. This lets you record into several independent tracks from several independent sources all at once. Each track has its own incoming MIDI device and channel number displayed next to its Record-Enable button. Recording channel assignments are only present in MultiRecord mode. See the *Recording* section for details about using MultiRecord.

The Recording Channels display consists of a device name followed by a channel number. Click them to change them. If the record device is blank, click in the blank space next to the record button to open a pop-up menu of devices. You can select only one device and channel for each track.

The Play-Enable Button

The Play-Enable button readies a track for playback. To toggle its play status, simply click the button. Any number of tracks may be play-enabled. Most commonly, all tracks will be play-enabled. When blue (or solid black on a black and white screen), the track is play-enabled and will be audible. If gray (or hollow on a black and white screen), the track will be muted or silent. If muted, the data for the track is still there; you are just "turning off" the track during playback. The Play-Enable button turns grey when the track is temporarily muted due to Solo mode. The Conductor track contains no standard MIDI data, therefore it has no Play-Enable button.

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-click the track's play-enable button. This convention also applies to track record-enable buttons in Multi-record mode, the Sliders window record-enable buttons, and the Lock icons in the Markers window.

The Playback Device(s)

The Playback device consists of the name of one of the MIDI devices in your studio followed by a dash and a MIDI channel number (between 1 and 16). It can also consist of several devices.

For information about how to change playback assignments, see "Choosing a device for playback" on page 111.

For information about how to assign a track to more than once device at a time, see "Choosing multiple playback devices for a single track" on page 112.

For information about how to add, remove, or rename devices in the list, see "Changing your playback device list" on page 114.

The Track Name

To change the name of a track, click it while holding down the Option key. A box will pop up: click in it and use the Macintosh keyboard to edit the name. To confirm your change, press the Return key. To cancel the change, press the Command and period keys. You

must do one of these two things to terminate track name editing (otherwise, the pop up box will remain.) Use the Enter or down arrow key to OK the name change and move to the next track in the list. Use the up arrow key to OK the name change and move to the previous name in the list. The Conductor Track's name cannot be changed.

The Conductor Track

The conductor track contains meter changes, tempo changes, key changes, and markers. See the Conductor track chapter for more information.

The Current Patch

This column displays the name of the currently selected patch for the Device that is assigned to the track. If a patch has not been selected, no patch name appears in the column.

> ☛ The FreeMIDI option called *Monitor Patch Changes* in the FreeMIDI Setup Preferences command affects this column. When the option is turned on, this column will show the current patch change sent by any FreeMIDI application. If it is unchecked, it will not give you a running update of the current patch, even with patch changes sent from Performer.

To select a patch for a track, click in the patch column next to the track and select the desired patch from the pop-up menu provided. Its name then appears in the column.

If you have patch changes in the track, the Device Patch column will update during playback to show the current patch (and the *Monitor Patch Changes* command is turned on in FreeMIDI Setup).

The list of patches you see in the pop-up menu in this column is provided by FreeMIDI. By default, the factory default sounds names for most popular synths are provided. In some cases, patches are given the generic name "Patch-1", "Patch-2", etc. However, you can use the PatchList Manager program, Unisyn, or any other FreeMIDI compatible librarian software to provide the actual names of the sounds in each one of your MIDI instruments. See chapter 48, "Using PatchList Manager" (page 725) for details.

The Default Patch

The Default patch is the patch the track always begins with. It is remembered when you save the Performer file so that the next time you open the file 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, click in the default patch column next to the track and select the desired patch from the pop-up menu provided. Its name then appears in the default patch column.

The list of patches in the pop-up menu is provided by FreeMIDI. As mentioned in the previous section, this list can display the actual sound names in the synth if you use PatchList Manager, Unisyn, or any other FreeMIDI-compatible librarian software.

The Comment

The Comment is a remark that you can display for the track. It is simply a space for text that you can use for whatever purposes you wish. To enter or change a comment, click on it and enter or edit the text. Press OK or the Enter key to confirm your entry, or press Cancel or command-period to cancel it. As much of the comment as possible is displayed in the Tracks window. If you wish to see the entire comment, click on it. The comment box will appear. Press the Enter key to get rid of the box. When entering or editing a comment, the Return key starts a new line of text instead of approving the changes as usual in Performer's user interface.

You can edit the comments for each track in succession: after bringing up a comment box, press the down arrow key to approve the changes you've made and move to the comment for the next track. The up arrow key likewise moves to the comment for the previous track.

The Scroll Bar

The horizontal scroll bar allows you to scroll the Track List display when part of it is obscured by the Tracks Overview.

The vertical scroll bar allows you to scroll up and down through the Tracks List. Clicking or pressing the Scroll Arrows scrolls by single tracks. Clicking the grey part of the bar scrolls by several tracks at once. Use the scroll box to move to a particular location in the track list.

The Window Divider

The Window Divider separates the Tracks List from the Tracks Overview. You can then drag the divider handle (at the bottom) left or right to resize each portion of the window proportionally. If you drag all the way to the right, the scroll bar disappears (the divider remains).

The Grow Box

The Grow Box allows you to resize the Tracks window. It works just like a regular Macintosh window grow box: press and drag it to change the size of the window.

Soloing Tracks

Soloing tracks allows you to isolate tracks for playback. Only selected tracks (i.e. those that are highlighted) will be audible when Solo is on. 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. Solo is turned on and off from the Tracks window mini-menu or by pressing the solo button in the Tracks window title bar; its status can be changed during playback. You may also select and deselect tracks during playback to change the solo group.

Individual tracks can be soloed when their edit window is open (Event List, Graphic Editing, or QuickScribe notation window) by pressing the solo button in the title bar.

Tracks chosen for soloing must be play-enabled. If the current Tracks window is deactivated (for instance, if another window such as the Counter window is activated), the solo tracks remain in effect during playback even though the tracks lose their highlighting (unless a track edit window becomes active, in which case it becomes soloed). The highlighting will return when the Tracks window is activated again. If the Tracks window is closed, solo is automatically turned off. Tracks which are temporarily muted due to soloing have orange Play-Enable buttons (or grayed-out buttons on a black and white screen).

When tracks are muted during soloing, Performer continues to process the MIDI data contained in them. This allows tracks to be soloed and unsoloed during playback without pauses or glitching. If you want to entirely turn off tracks during playback, deselect their Play-Enable buttons. To solo tracks:

1. **Select the tracks you wish to solo by clicking on their names.**

   You can change track selection during playback. Use Shift-click to select non-contiguous tracks.

2. **Press the Solo button in the Tracks window title bar.**

   The Solo button becomes highlighted.

3. **To turn Solo off, click the Solo button again.**

   You can turn Solo on and off during playback.

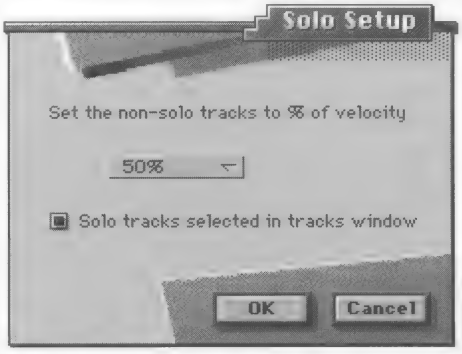
"Partial-solo" mode

The solo command (and button) provides an additional capability: "partial solo mode". In this mode, tracks that are being muted are not muted all the way. Instead, their volume is brought down part way by reducing their note-on velocities by a percentage that you choose.

To enable partial-solo mode:

1. **Option-click the "S" button in any Edit window title bar, or choose "Solo Setup" from the Tracks window mini-menu.**

   The Solo Setup dialog appears.



2. **Choose a percentage from the pop-up menu.**

   The value you choose is the percent that note velocities in each muted track will be reduced to when muted. (Velocities are not permanently changed; they are only modified temporarily during playback.)

3. **If desired, check the "Solo tracks selected in Tracks window" option.**

   This option determines what is soloed when you are editing a track in an event editing window (i.e. an Event List, Graphic Editing, or QuickScribe notation window is open and active). When this check box is *unchecked*, the solo button in event edit window title bar solos the track you are editing. When this option is *checked*, the solo button in the event edit window solos the tracks that are currently selected in the Tracks window (instead of just the one track you are editing).

4. **Click OK.**

   Now, when you click the solo button, muted tracks will be lowered in volume instead of being totally silenced. To bring them back up, just unmute.

To disable "partial-solo" mode, option-click the solo button and set the pop-up menu to "Off".

Adding Tracks

You can add as many tracks as you wish to the track list. When a track is added, its name will be "Track-*n*", *n* being a number.

To add a new, empty track, simply choose Add from the Tracks window mini-menu and the new track will appear on the track list. To add several tracks at once, hold down the Option key while choosing Add. You will be prompted for the number of tracks to add.

When you use the *Add* mini-menu command in the Tracks, Chunks, or Sliders windows, Performer adds the new item to the bottom of the list. However, if you would like to add an item to a spot in the middle of the list, simply highlight an item in the list first. When you use *Add*, the new item will be added just beneath the highlighted item.

This can also be done with the *Duplicate* mini-menu command in the Sliders window.

Duplicating Tracks

You can add new, empty tracks by duplicating existing tracks. To duplicate one or more tracks:

1. **Select the desired track(s).**

   See "Selecting Tracks" on page 180.

2. **Choose Duplicate track layout from the Tracks window mini-menu.**

   The duplicate track appears in the Tracks window with the word *copy* is appended to its name. This command does not copy the data in the track; instead, it copies only the track's name and playback assignment.

If you would like to make more than one duplicate, hold down the option key while choosing Duplicate Track Layout from the mini-menu. A dialog asks you how many duplicates you would like. Enter the desired number and click OK (or press return).

Selecting Tracks

If you want to select a region in a track, change a track name, 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.

To select several non-adjacent tracks, hold down the Shift 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 Shift key and click on the tracks you wish to deselect. They will unhighlight.

To select an extended number of tracks, click on a track name, press and drag over the tracks you want to select. The track list will scroll, selecting all tracks dragged over.

Deleting Tracks

To delete a track, select it by clicking on its name and choose Delete from the Tracks window mini-menu. The track will disappear from the track list. Delete several tracks at once by selecting them all before choosing the Delete command. When a track is deleted, all of its data is gone. You can undo the Delete command.

Looping Tracks

Each track can be looped independently. If there are loops in a track, the looping indicator is visible in the Tracks Overview. For a detailed discussion of loops, see the *Looping* chapter.

Opening an Event Editing Window for a Track

The Event Editing windows contain a display of all events in a track. Each track has four event editing environments to choose from: the Event List window, the Graphic Editing window, the Notation Editing window, and the QuickScribe notation window. In these windows the time, event type and specific event information (on and off velocities, controller values, duration, etc.) for each event are expressed numerically, graphically, or as music notation. You can edit, add and delete events in these windows as well as select regions of events to be modified by commands from the Region menu.

To open an Event Editing window from the Consolidated Controls window: highlight the track name and click the Event List, Graphic Editing, or QuickScribe notation button in the Consolidated Controls Panel to open the desired window. Or click a track name or track segment as follows:

Do this	To open this
Double-click	The event list (or whatever you have set in the Preferences command—see below)
Command double-click	Graphic Editing window
Option-command double-click	Notation Editing window

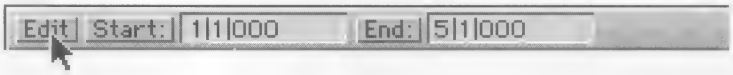
For your convenience, the Preferences command in the File menu lets you decide which window opens when you double-click a track. For more information, see "Preferences" on page 680.

For a detailed explanation of event editing in the Event List, Graphic Editing, and QuickScribe notation windows, see the *Event List Window*, *Graphic Editing*, and *Notation Editing* chapters.

Using the Edit Bar

The Edit Bar holds the starting and ending locations for a region. To enter a starting location, click in a field in the Start time and enter a value; to enter an ending location, click in a field in the End time 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.

There are several quick ways to load times into the Edit Bar.



Clicking on the word "Edit" loads remembered times into the Edit Bar. To "remember" a pair of Start and End times, activate the window containing the times and choose Remember Times from the Basics menu (or press command-R). Times are remembered for each type of window as follows:

- *in a Markers window*, the times of the first and last highlighted markers are remembered.
- *in an Event Editing window*, the times of the first and last highlighted events are remembered.
- *in a Tracks window*, the times in the Edit Bar are remembered.
- *in the Consolidated Controls panel*, the times in either the Memory or Auto Record bar are remembered, whichever is visible.

Clicking on the word "Start" enters the current time as displayed in the Counter window as the Start time. Clicking on the word "End" enters the current time as displayed in the Counter window as the End time.

Double-clicking on the word "Start" enters the beginning time of the sequence as the Start time. Double clicking on the word "End" enters the end time of the sequence as the End time.

Double-clicking on the word "Edit" set the Start and End times to the beginning and end of the sequence. This is equivalent to double clicking on both the "Start" and "End" words.

Selecting a Region Using the Tracks List

This method of region selection allows you to select a region containing several tracks at once.

1. **Click the Tracks window of the sequence you wish to modify to activate it.**

2. **Enter the Start time of the region in the Edit bar.**

   See the preceding section, *Using the Edit Bar* for details on entering the Start time in the Edit Bar.

3. **Enter the End time of the region in the Edit Bar.**

   See the preceding section, *Using the Edit Bar* for details on entering the End time in the Edit Bar.

4. **Select the track or tracks that contain the region.**

   Consult the *Selecting Tracks* section above for the details about track selection. The region is now selected in all the highlighted tracks.

Events occurring *on* or *after* the Start time and *before* the End time will be affected by a region command. For example, in 4/4 time, if the Start time is 9|1|000 and the End time is 13|1|000 all events starting on the very first tick of the first beat of bar 9 through the very last tick of the fourth beat of bar 12 (12|4|479) will be modified. An event occurring directly on 13|1|000 (the very first tick of the first beat of measure 13) will not be modified.

The Conductor Track

The Conductor track is a special track containing markers, meter, tempo and key change information. Every sequence always has a Conductor track; it cannot be deleted. In the Tracks window, the Conductor track has a Move Handle and Comments. The Conductor track cannot be looped. Certain editing commands can be used on the Conductor track. For more information, see the chapter called *The Conductor Track*.

Creating a Slider Console from the Tracks List

A convenient way to create consoles is with the *Create Consoles* command in the Tracks window mini-menu. This command can automatically create volume, pan, modulation, and other consoles all at once for the tracks you select.

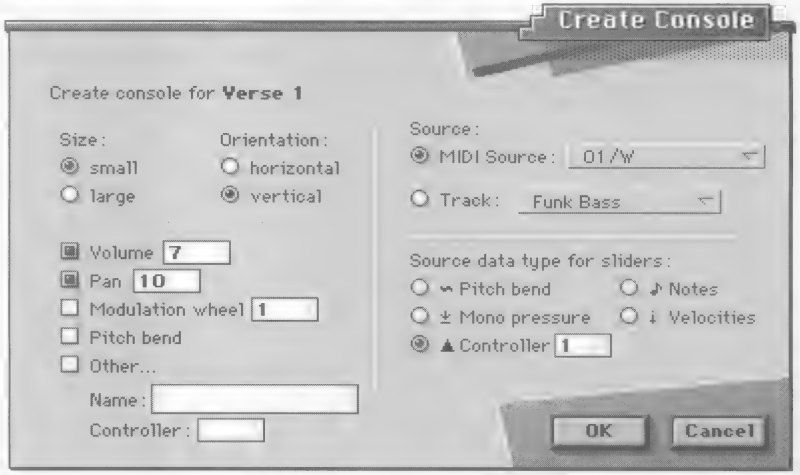
To create one or more consoles from the Tracks window:

1. **Highlight the Track(s) for which you wish to make consoles.**

   Click each track name to highlight it. Shift-click to select tracks not next to one another.

2. **Choose Create Consoles from the Sliders window mini-menu.**

   The Create Consoles dialog box appears.



3. **Select the dimensions, type, and (optionally) the source setup of the sliders for each console.**

   You can create more than one type of console. You can even enter a custom console name and data type using the *Other* option.

4. **Click OK to create the console.**

   The Console is created and its name is added to the Windows menu.

Tracks List Hints

There is a difference between using Solo and the Play-Enable Button to turn off a track. If a track is muted with Solo, Performer continues to scan through the data for that track so that it may resume playback of the track at any moment. If the Play-Enable Button for a track is disabled, the data for that track is not scanned during playback, resulting in slightly less overhead for the computer. Disabling tracks may thus result in slightly better performance in playback. If one or more tracks are not needed for a particular playback pass, it is best to

disable them. A pertinent example is transferring tracks to a multi-track tape recorder one at a time: rather than using Solo to mute the other tracks, use the Play-Enable buttons to enable one at a time. There may be an audible glitch if you re-enable a track during playback.

It is easier to split drum and percussion parts into separate tracks because you can quickly and easily select them individually. If all the drums are in one track, you have to go into the Graphic Editing window to select individual drum parts (snare, bass, high hat, etc.) By splitting them into separate tracks, you can simply highlight the track name and do your editing. You can split them easily either during recording or afterwards with the Split Notes command.

The Tracks Overview

The Tracks Overview portion of the Tracks window provides you with a global view of the MIDI data in a sequence. It is useful for arranging parts among tracks, using edit commands such as Cut and Paste, and other region operations that affect more than one track at a time. It allows you to view and edit the data in your sequence all at once instead of one track at a time.

Basics

The Tracks Overview divides each track into equal-length segments, which can be zoomed to show as much as 16 measures per segment or as little as 30 ticks. Each segment displays how much data is present in that segment. Blank segments contain no data. Purple segments (or gray ones on a black and white screen) contain between 1 and 9 MIDI events, and dark purple (or black) segments contain 10 or more events. The threshold between low-density and high-density segments (10 events) can be adjusted with the *Set Density Threshold* mini-menu command.

The Time Ruler shows the time span of each segment.

Segments can be selected for editing by commands from the Edit and Region menus. In addition, Event Editing windows can be opened from the segment by clicking as described in the next section.

Scrolling During Playback

The *Auto-Scroll* command in the Basics menu can make the Tracks Overview window scroll during playback. In addition, the window will automatically open to the current playback location of the

sequence. A scrolling "wiper" can be displayed as well to indicate the current playback location. Please refer to the *Auto-Scrolling* section in the *Playback* chapter for more information.

Opening an Event Editing Window From a Segment

The contents of a track segment can be view with any of Performer's three Event Editing windows. To open a window double-click the segment as shown below:

To open this:	Do this:
Event List	Double-click (depending on how you've set the preferences—see below)
Graphic editing	Command double-click
Notation editing	Option-command double-click

For your convenience, the Preferences command in the File menu lets you decide which window opens when you double-click a track. For more information, see "Preferences" on page 680.

The Time Ruler

The Time Ruler displays the time of each segment in any one of Performer's three time formats. To change time formats, choose Set Rulers from the mini-menu.

Using the time ruler to select a playback point

You can double-click a segment in the time ruler to make Performer jump to that location for playback. You can do so when Performer is stopped or during playback. This is an ideal way to quickly locate to a desired point with the mouse.

Zooming

Zooming the Time Ruler in the Tracks Overview changes the amount of time shown in each segment. If you zoom out, each segment represents a longer duration, resulting in a more global view of the sequence. If you zoom in, each segment represents a shorter duration, allowing for more detailed work.

The Tracks Overview window defaults to showing one measure per segment. Zoom-Out levels zoom up to 2, 4, 8, and 16 measures per segment (regardless of meter). Zoom-In levels zoom from 1 measure down to a quarter note (480 ticks), an eighth note (240 ticks), a sixteenth note (120 ticks), a thirty-second note (60 ticks), and a sixty-fourth note (30 ticks).

To zoom in, click once (or repeatedly) on the magnifying glass with the plus sign (+). To zoom out, click once (or repeatedly) on the magnifying glass with the minus sign (-).

Selecting Segments for Editing

To edit the data in a segment, you must first select the segment. When a segment is selected, it highlights, and its contents can be edited with any Edit menu or Region menu command.

Segment selection is exclusive from track name selection in the Tracks List. If you select segments, any highlighted track names will deselect.

Below are several convenient shortcuts for selecting segments:

To select a single segment, click it.

To select several adjacent segments, drag over them. If the segments are in several adjacent tracks, drag over them in a diagonal fashion.

To select several non-adjacent segments, hold down the Shift key and click the segments you wish to select. They will highlight.

To deselect segments when more than one are highlighted, hold down the Shift key and click the segments you wish to deselect. They will unhighlight.

To select a segment in all tracks, click the segment in the Time Ruler. All segments beneath will highlight.

To select one or more segments in all tracks, drag in the Time Ruler.

After you select one or more segments, Performer loads the start and end times of the region into the Edit bar for convenient selection in the Tracks List.

Clicking anywhere below the tracks in the Tracks Overview deselects all currently selected segments.

Using the View Filter

The View Filter allows you to choose what types of MIDI events are displayed in the Tracks Overview window. For example, if you would momentarily like to see which segments contain patch changes, you can open the View Filter and option-click the patch change check box (to select it and deselect all others). With only patch changes selected, only segments that contain a patch change will become grey. As you can see, the View Filter can be an effective tool for working with only a few types of data at a time. The View Filter affects all Event Editing windows as well as the Tracks Overview window.

The View Filter also determines which types of events are affected by Edit menu commands when the data is selected in the Tracks Overview window. Here's a simple rule to remember: if you can see data in the Tracks Overview window, it will be affected by edit commands.

Please note that Conductor track data such as Markers and Meter changes, which are displayed in the Event Edit windows of regular tracks, are displayed only in the Conductor track in the Tracks Overview.

To use the View Filter from an Event List window:

1. **Choose Set View Filter from the Event List mini-menu.**

   A dialog box will appear.

2. **Choose the data types to be displayed by checking the box for each.**

   You can choose all types of data at once by clicking on the "Set All" button. You can uncheck all the check boxes by clicking on the "Clear" button. Option-click to check only the check box you click on, unchecking all others; command-click to check all boxes except the one you click on. Use the *Controllers* option to specify which controller information is displayed.

3. **Press OK to confirm your choice or Cancel to cancel it.**

When using the View Filter, keep these rules in mind: The View Filter settings you select will stay in effect until you change them. They affect all open Event Editing windows. The View Filter settings will affect all edit operations done in the Event Editing windows.

Setting the Density Threshold

The *Set Density Threshold* mini-menu command allows you to specify the difference between low-density and high-density track segments. The default value is 10 MIDI events, so that a segment containing between 1 and 10 MIDI events will appear purple (or gray on a black and white screen), and a segment containing 10 or more will appear dark purple (or black). You can change the 10–event threshold to any value between 1 and 999 events.

In general, the lower the threshold value, the easier it is for Performer to count events and display segments. Higher thresholds may cause Performer to redraw the segments a little more slowly. However, if you have a fast Macintosh (68020 or 68030 CPU), you probably won't notice much of a difference between low and high thresholds.

Setting a Loop in the Tracks Overview

To set a loop in the Tracks Overview:

1. **Select the segments that you wish to loop.**

   Drag over them. You can select segments in more than one track if you like. If you select different time regions in more than one track, the loop region will in every track will be the earliest selected time to the latest selected time.

2. **Choose Set Loop from the Change menu or click the Loop button in the Consolidated Controls window.**

   The Set Loop dialog box will appear.

3. **Choose the number of times that you would like the loop to repeat.**

4. **Click OK to create the loop or Cancel to withdraw the loop command.**

Creating Sequence Chunks

The Create Chunk mini-menu command in the Tracks Overview window takes selected segments in the Tracks Overview window and turns them into their own sequence Chunk in the Chunks List window.

The Create Chunk command makes it easy to break up a sequence into separate pieces (Chunks) in order to rearrange them more freely in a Song window. For example, let's say that you have built several phrases that are a few bars long in a Sequence. But now you want to rearrange them and try different combinations. To do so, you can select the segments of a phrase and choose Create Chunk from the mini-menu for each one. Then, you can drag the resulting sequence Chunks from the Chunks list window into an empty Song window to try different orders and combinations.

Once you have arranged the Song as you like, you can even convert it back into a sequence using the Song window mini-menu command called Merge Chunks to Sequence. This command takes the separate Chunks inside the Song window and reduces them to a single sequence Chunk.

At any time, you can take your music freely back and forth from Sequence form to Song form with these two commands to help you create your music.

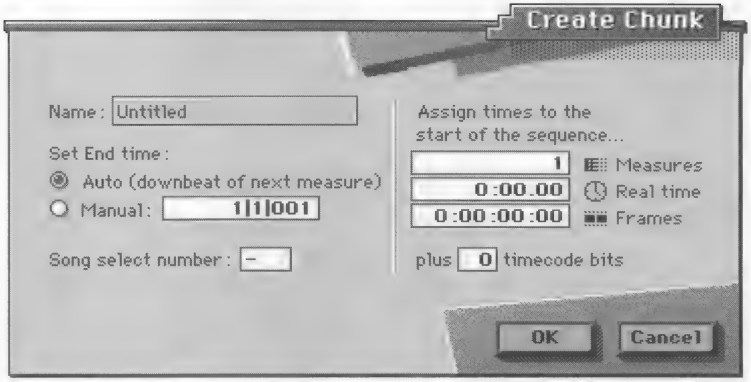
To create a sequence Chunk from the Tracks Overview window:

1. **Select the Segments that you wish to be in the Chunk.**

   Alternately, you can select the region from the Tracks List by highlighting track names and setting a region in the Edit bar. See the section earlier for information about selecting segments. You can even select non-adjacent segments.

2. **Choose Create Chunk from the Tracks Overview window mini-menu.**

   A dialog box appears.



3. **Type in a name for the Chunk.**

4. **Type in an End Time to determine the length of the Chunk.**

   By default, the end time is determined by the length of the selected region.

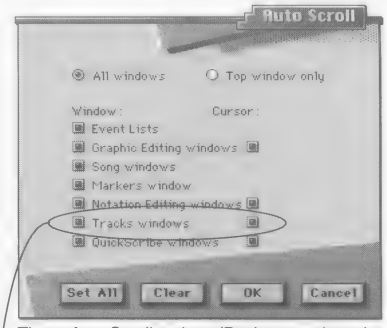
5. **(Optional) Type in any other information you wish about the Chunk.**

6. **Press OK to confirm your choice or Cancel to withdraw the command.**

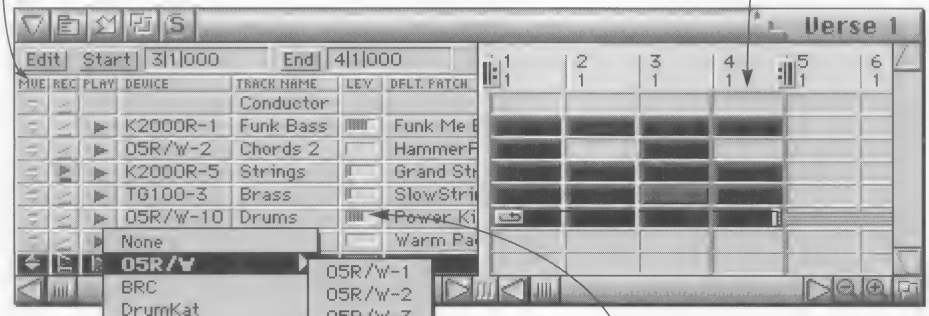
Customizing the Tracks Window

The Tracks window can be completely customized. This allows you to set it up in the way that best suits the way you work. The diagram below summarizes what you can do.

Double-click the column headings to open the dialog box shown to the left (or choose "Columns Setup" from the mini-menu), which lets you choose the columns you want to see. Below, only the record-enable buttons, playback assignment, track names, and MIDI level meters are displayed. The rest of the columns are being hidden. Reorder the columns by dragging the column heading left or right.

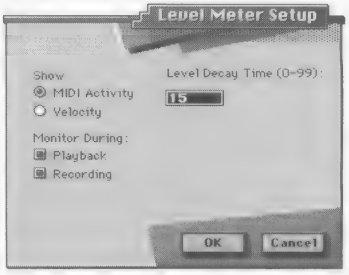


These Auto Scroll options (Basics menu) produce this scrolling highlight, which clearly indicates track playback position in the Tracks Overview.



The devices that appear in this list are provided by FreeMIDI. You can customize your FreeMIDI device configuration to exactly match your MIDI studio. You can even make customized device groups.

MIDI level meters display degree of MIDI activity or note-on velocities in each track during playback. To configure the meters in the setup dialog shown to the right, choose "Level Meter Setup" from the mini-menu, or double-click any level meter.



For details about these options, see "Configuring the MIDI level meters" on page 193.

Configuring the MIDI level meters

The MIDI level meters in the Tracks window can be configured in several ways. To set these options, double-click any level meter (or choose Level Meters Setup from the mini-menu) to open the Level Meters Setup dialog box shown below. Settings in this dialog box are global across files and are automatically saved in the Performer Preferences file in the System Folder.

Showing MIDI activity or velocity

Level meters can show either MIDI activity or velocity. With MIDI activity, the meter is triggered every time a MIDI event is played back from the track. It can be any type of MIDI data, including notes, controllers, pitch bend, sysex data, etc. With velocity, the level meter reflects the note-on velocity of each note at the instant the note is triggered during playback.

> ☛ MIDI level meters do *not* function like *audio* level meters. For both MIDI activity and velocity, the MIDI level meter is triggered by a MIDI data byte, such as a note-on event or controller, at the time it is played back. The level does not sustain during the duration of the note.

Monitoring

Level meters can monitor MIDI data being played back, recorded, or both. With both options checked, the meters monitor playback when you are playing back, and they monitor recorded material on the

current record-enabled track during recording. If you are in overdub record mode, both recording and playback are monitored at the same time for the record-enabled track.

We recommend using both options because this gives you the greatest amount of feedback about what is going on in your tracks.

Level Decay Time

Level Decay Time refers to how quickly the meters return to zero. The decay amount is expressed as an arbitrary value between zero and 99. For music that consists mostly of sixteenth notes, eighth notes, quarter notes, and longer, try level decay time values between 5 and 20 at tempos between approximately 80 and 160 bpm. If the tempos are extreme, or if notes are particularly dense or sparse, you might find it helpful to use level decay times below 5 or above 20.

In general, shorter decay times are better for fast tempos and/or dense passages of notes. Longer decay times are better for slower tempos and/or sparse passages. If you find that the meters don't stay up long enough for you to see them, try a higher value; lower the decay time if levels go up and then don't change very much. Decay times above 30 are *very* slow and would probably only be useful in extreme cases (very slow music, lighting control sequences, etc.)

Hiding level meters to reduce overhead

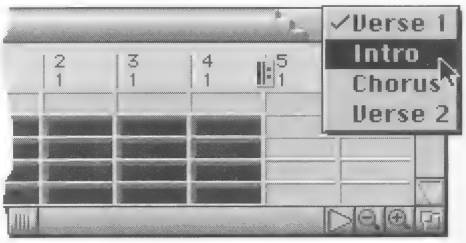
Performer goes to great lengths to preserve the integrity of MIDI playback. Screen display takes a back seat to the more important function of playing back the sequence with as accurate timing as possible. However, the level meters do require some effort from Performer. In some situations, such as running Performer on a slower Macintosh, it may be desirable to hide the level meters to ensure the highest playback performance. The Performer installation guide booklet has a chart that ranks Macintoshes by power and speed. If you have the equivalent of a Mac IIsi or above, you shouldn't need to hide the meters, unless you have an unusually large number of tracks—more than a hundred.

To hide the level meters, double-click the track column heading above the level meters (labelled "LEV") to open the Track Columns Setup dialog box as shown on page 192. Uncheck the Levels option.

If you'd rather not hide the meters, another overhead-reducing tactic is to monitor MIDI activity instead of velocities because MIDI activity monitoring requires less effort. Open the Level Meters Setup dialog as explained on page 192 and select the MIDI Activity option.

Switching to a different sequence within the same window

If you are working with multiple sequences in a file, you can switch between them in the same Tracks window by command-clicking the sequence name in the title bar. A pop-up menu appears from which you can choose the sequence you'd like to see.



Chapter 13 *Looping*

A loop is a region of data in a track that is played repeatedly. The result is similar to using the Repeat command on the Edit menu to insert multiple copies of a region. Instead of actually copying the data, however, the loop feature simply replays the region over and over. Looping is thus more memory-efficient than making repeated copies of a region. Also, making a change in a looped section is easy: instead of changing every repeat of the data as you would if you had copied and pasted it, you simply change the data in the looped region. Tracks or sections of tracks can be looped independently; it is thus possible to build a complex sequence out of a small number of events.

A loop is different from the Memory-cycle button because a loop is a permanent addition to a track. In addition, the loop only loops one track, whereas Memory-cycle loops the entire sequence. For information about Memory-cycle looping, see "The Memory-cycle button" on page 71.

Basics

A loop has three components: a start point, an end point and a number of repetitions. When a loop starts, it plays through its data normally. When the end point is reached, the region is played again from the start point. This cycle repeats for the specified number of repetitions, or indefinitely if an infinite loop is specified.

When the loop finishes its number of repetitions, the next data played will correspond to the location on the Counter. For example, the region from measure 1|1|000 to 4|1|000 is looped four times. After the loop finishes, the Counter will be at measure 13 (four times three measures is twelve: measure 13 comes after measure 12). The data in the track continues playing from measure 13, not from measure 4. If there is any data in measures 4 through 12, it is skipped. The loop takes precedence over any intervening data.

The reason that the data is skipped is so that there is no ambiguity about the current location being played. If the Counter were to display 20|1|000 and three tracks are playing back data at that spot

and another has finished its looping and is playing back at 15|3|000 and another at 12|2|240 and another at 3|4|000... things could get very confusing. Therefore, the location in the Counter applies to all tracks; it is not affected by loops.

When moving to a location in a sequence, Performer figures out whether any tracks are in the middle of a loop and keeps count of where in the looping process these tracks are. This allows you to begin playing or recording from any location and be sure that the loops will all play correctly.

Notes can be sustained across loop boundaries: if a note is inside a loop, it will always sound for its specified duration.

Tracks and Looping

Each track has its own set of loops. This means that each track can be looped independently of others. The Conductor track cannot be looped. (You can, however, temporarily loop the entire sequence using the Memory-cycle button.)

A loop starts right on its Start time and ends just before its End time. For example, a loop set from 1|1|000 to 4|1|000 would play the data from 1|1|000 to 3|4|479; the next repetition would play the same data immediately at 4|1|000. The number of repetitions equals the total number of times you want the region to play; this includes the first pass.

A loop need not be set on measure boundaries (i.e. on beat one, tick zero of the measure). They can start anywhere in a measure. We'll use loops starting on measure boundaries as examples to keep things clear. In practice, any location is fine.

If you want to set a loop in several tracks at once, just highlight all of the desired tracks at once before you set the loop.

If a track contains loops, a looping indicator appears in the Loop column next to the track name and in the track segment in which it begins This indicator can't be used to change anything: it is merely a reminder that the track contains loops.

Each track may can contain multiple loops. You can even have nested loops in a track, i.e. loops within loops. Here's an example of nested loops, all in the same track:

- Bars 1 to 3 played 8 times (lasting from bar 1 to 17)
- Bars 17 to 19 played 4 times (lasting from bar 17 to 25)
- Bars 25 to 27 played 4 times (lasting from bar 25 to 33)
- Then the whole 32 bar section is looped:
- Bars 1 to 33 played 4 times (lasting from bar 1 to 129)

When bar 33 is reached, bars 1 to 3 will be played another 8 times, bars 17 to 19 another 4 times, and bars 25 to 27 another four times. Then this whole process will repeat twice more until bar 129 is reached.

When Loops Conflict

It is possible to set up loops such that they overlap with each other or otherwise conflict in the same track. When this happens, the first loop in the track takes precedence. When two conflicting loops start at the same time, the one that has a later ending time takes precedence.

Here are some examples of the effects of conflicting loops:

- Bars 1 to 9 played four times, bars 5 to 13 played four times.

  The first loop takes precedence. Bars 1 to 9 are played and the loop repeats back to bar 1. The second loop is ignored.

- Bars 1 to 17 played four times, bars 1 to 3 looped infinitely.

  Bars 1 to 3 are played eight times, lasting until bar 17. Then the "outer" loop (the one with the later end time) takes over, terminating the "inner" loop. This returns to bar 1, playing the inner loop eight times again. This cycle repeats four times until the outer loop is finished. At that point, the sequence is at bar 65 and it continues playing from there, all previous loops done.

- Bars 1 to 5 played four times, bars 5 to 7 played eight times.

The second loop is completely ignored since its time is skipped while executing the first loop. When a loop begins at a time that is skipped after executing a previous loop, that loop is ignored (like all other data in the skipped region).

Creating a Loop

Setting a Loop

There are two ways to create loops: the Set Loop command, and the Insert button in the title bar of Event Editing windows.

To use the Set Loop Command:

1. **Activate the Tracks window for the sequence in which you wish to set the loop.**

   Double-click the name of the sequence in the Chunks window or, if it is already open, click the window once.

2. **Select the track(s) or track segments in which you wish to set the loop.**

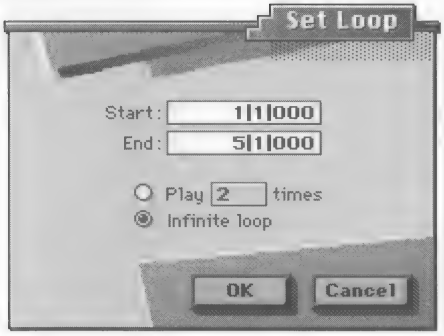
   Highlight the desired track names, or drag over the desired track segments. If several tracks are selected, each will have the same loop set for it. You may not loop the Conductor track.

3. **Optional: Enter the Start and End times of the loop region in the Edit Bar.**

   Remember Times, documented in the Event List Window chapter, is useful for entering times in the Edit Bar. The loop boundaries can also be entered in the Set Loop dialog box.

4. **Choose Set Loop from the Change menu.**

   A dialog box appears.



5. **Edit the Start and End times if necessary, then enter the number of times you want the loop region to be played.**

   The number you enter will be the total number of times the region is played. If you want it to play indefinitely, choose the Infinite loop option.

6. **Press the OK button to confirm your entry or the Cancel button to cancel it.**

Inserting Loops in the Event Editing Windows

Loops can be inserted directly into a track from either the Event List window or the Graphic Editing window.

To insert a loop into a track using the Event List window:

1. **Open the Event List containing the passage you'd like to loop.**

2. **Press the Insert button in the title bar and choose *Loop* from the menu.**

   A new loop event pops up.

3. **Enter the start and end locations and the number of repetitions for the loop.**

   Use the Tab key to move from field to field. If you type "i" in the repetitions field, Performer will fill in the word "infinite".

4. **To enter the loop, press Return. To cancel, click anywhere with the mouse.**

   If you'd like to insert another loop, press the Enter key. This enters your loop and produces another new loop event.

To insert a loop in a track's Graphic Editing window:

1. **Press on the Insert button in the title bar of the Graphic Editing window and choose *Loop* from the menu.**

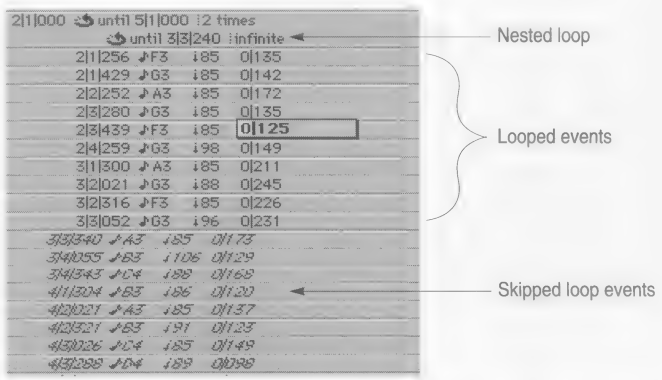
   The menu will disappear and the mouse pointer will turn into a cross-hair.

2. **Click at the desired start location in the Marker Strip, drag to the right to draw the desired length, and release the mouse at the end location.**

   A loop will appear. Use the dotted hairlines in the Time Ruler to align the beginning and end of the loop while inserting it. Information about the loop will appear in the Information bar.

Viewing and Editing Loops in an Event Editing Window

Loops can be viewed and edited in the Event List window for the track that contains them. Viewing loops in event lists is a good way to see them in context. This will help you to see when they occur, what data they cause to be skipped, etc.



Events in a loop are indented to the right in the Event List window. Events in nested loops are indented further to the right. Events that are skipped due to loops are displayed in italics. These display

features will let you see immediately which events are within loops, what level of loop nesting is happening at any given location and what the effect of the loop is, i.e. what data will be skipped.

You can edit loops in the Event List window just like any other parameter. Simply click on the data in the loop you wish to change and enter a new value. To clear a loop or loops from an event list, simply highlight the loop event(s) and select Erase from the Edit menu.

Loops can also be edited in the Graphic Editing window for each track. For more information, see the chapter The Graphic Editing Window.

Editing Loops with the Edit Menu

Loops can be edited like any other event with the commands on the Edit menu. If you Cut, Paste, or otherwise edit a region that contains loops, the loops will be edited along with the other events.

To edit loops using the Tracks window and the Edit menu, first make sure Loops are checked in the Edit Filter. Then select the track(s) to be edited, define the region using the Edit Bar Start and End times, and choose the desired command from the Edit menu. Checking only Loops in the Filter is useful for editing loops without altering the MIDI data in the selected region; this is similar to using the Clear Loops command. Note that by default, loops are unchecked in the Edit Filter.

To remove a loop or loops, select a region that contains the loops and select Erase from the Edit menu, or use the Clear Loops command.

Removing Loops Using the Clear Loops Command

The Clear Loops command in the Changes menu is used with the Tracks window Edit Bar, and is a handy shortcut for removing loops.

To remove a loop or loops, select a region that contains the loops using the Edit Bar Start and End times, and choose the Clear Loops command from the Change menu. Loops that begin inside the specified region are erased; MIDI data is unaffected.

For example, Track-1 contains loops at measures 1 to 4 and measures 3 to 9. If the Edit Bar Start and End times are 2|1|000 and 9|1|000, only the second loop will be cleared.

Loop Recording

"Loop recording" is the process of overdub recording into a region over and over again to build up a pattern. This is best done with the Memory-cycle feature in Performer. See "The Memory-cycle button" on page 71 for detailed information. Once you have built a pattern using Memory-cycle, you can insert a permanent loop over the region. See "Quickly selecting what you have recorded" on page 78.

By using Memory-cycle with overdub recording, Performer can function in a manner very similar to the way most commercial drum machine sequencers work: by building up patterns in multiple passes through a section.

Chapter 14 *The Chunks Window*

Quick Reference

The Chunks window displays the Chunks in a Performer file. A Chunk is either a sequence (a collection of tracks) or a song (a collection of sequences and other songs). A Performer file can contain as many Chunks as memory in your Macintosh will allow. Chunks can be cued for playback, either automatically or manually, in order or at random. You can also build an entire song out of other sequences and songs by chaining and stacking Chunks in the Song window, which provides seamless, simultaneous playback of Chunks in any order and combination.

Type: Displays each Chunk's type by icon, either Song or Sequence. This icon is used to drag Chunks into Song windows and to change the order of Chunks in the Chunks window.

Play: Shows the play-enable button for each Chunk. When a Chunk's play-enable button is black, the Chunk is play-enabled. Only one Chunk can be play-enabled at a time.

S# (Song Select Number): Displays the song select number that will play-enable the Chunk when received from a MIDI controller. Song select numbers range from 0-127. If a Chunk has no song number assigned, the column displays a single dash (-).

If Performer receives a song select number that is assigned to two or more Chunks, Performer will cue the Chunk that appears highest in the list. For this reason, it is best to assign a unique Song Select number to each Chunk.

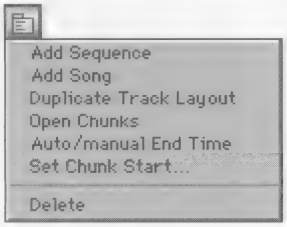
End time: Displays each Chunk's End time. In automatic mode, End time is the downbeat of the measure following the last complete measure in the Chunk. When a Chunk's End time is in manual mode, it is bold and can be pop-edited to any length.

Name: Displays the name of the Chunk. Click the name to select the Chunk. Option-click the name to change it. Double-click the name to open the Tracks or Song window belonging to the Chunk.

Because Chunks can be imported into other files, dragged without limit into Song windows, and duplicated very easily, always use the most descriptive Chunk name possible to avoid confusion.

Comments: Displays as much as possible of your comments for each Chunk. View and edit the comments by clicking them.

The Chunks Window Mini-menu



The Chunks window mini-menu contains the following commands:

Add Sequence: Adds a sequence to the Chunk list. To add several sequences at once, press the Option key while choosing Add.

Add Song: Adds a song to the Chunk list. To add several songs at once, press the Option key while choosing Add.

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.

Open Chunks: Opens a Song window for each highlighted song and a Tracks window for each highlighted sequence.

Auto/manual end time: Toggles the Auto/manual status of the selected Chunks. Automatic mode locks the Chunk's End time at the downbeat of the measure following the last complete measure in the Chunk. Manual mode changes the time to boldface and allows it to be pop-edited.

Set Chunk Start: Establishes the start times of the currently selected Chunk(s) in each of Performer's three time formats: measures, real time, and SMPTE time. The start times are what you see in the Counter window when you rewind back to the beginning of the Chunk. This is the same window that appears when you click the Start Time button in the main counter.

Delete: Deletes the selected Chunks. If you attempt to delete a Chunk that is part of a song in the open file, a dialog box appears, prompting you to confirm your decision.

Basics

The Chunks window lists the Chunks in a file and provides useful features to manage them, such as adding, deleting, and other operations. In addition, Chunks can be dragged from the Chunks window into a Song window to build a song. For more information, see the chapter *The Song Window*. Chunks can also be automatically cued to playback in the order in which they are listed in the Chunks window. For more information about cueing, see "The Chunk Control buttons" on page 78. Chunks can also be cued remotely from your MIDI controller. For more information, refer to *The Remote Controls Window* chapter.

Opening the Chunks Window

To open the Chunks window, choose Chunks from the Windows menu. The Chunks window will appear, displaying a list of all sequences and songs in the open file. Within the Chunks window, songs and sequences have different icons but behave identically.

Sequences

A sequence is a complete MIDI performance consisting of any number of tracks, which are listed in that sequence's Tracks window. Each track contains MIDI data which may be assigned to any combination of channels. A sequence also has a Conductor track, which contains meter, key, and tempo information.

Many essential operations on tracks are done in the Tracks window: tracks are added and deleted, editing regions within tracks are specified, Event Editing windows for tracks are opened and much more. See *The Tracks Window* chapter for complete details about its operation.

Each sequence also has its own Markers window. See *The Markers Window* section for details about it.

Songs

A song is a collection of Chunks that you organize to play back in the preferred order and combination. Each song has its own Conductor track, End time, and markers. Each song has its own Song window, where you arrange the Chunks that comprise the song. The Song window is described later in this manual.

Selecting Chunks

There are several methods of selecting Chunks:

To select a single Chunk, click on its name. The name will highlight.

To select several adjacent Chunks, click a Chunk name and drag over the desired names. All Chunks dragged over will highlight.

To select several non-adjacent Chunks, hold down the Shift key and click on the names of the Chunks you wish to select. They will highlight.

To deselect Chunks when more than one are highlighted, hold down the Shift key and click on the Chunks you wish to deselect. They will unhighlight.

Creating New Chunks

To create a new, empty sequence, choose *Add Sequence* from the Chunks window mini-menu. To add several new sequences at once, hold down the Option key while choosing *Add Sequence*. 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 Chunks window mini-menu. A new sequence will be added with the same name as the sequence you highlighted preceded by the words *Copy of*. It will have the same track layout as the highlighted sequence: the number of tracks, the track names, and the track playback channel assignments will be identical to the original.

To create a new, empty song, choose *Add Song* from the Chunks window mini-menu. To add several new songs at once, hold down the Option key while choosing *Add Song*. You will be prompted for the number of songs to add.

Duplicating Existing Sequences

Sometimes you may want to duplicate a sequence to experiment with changes or for some other reason. Be sure that the Memory window shows plenty of free memory before you duplicate. To duplicate a sequence:

1. **Highlight the sequence's name in the Chunks window.**
2. **Choose Copy from the Edit menu.**
3. **Choose Paste from the Edit menu.**

   An exact copy of the sequence, including all the data in the tracks, will be placed at the end of the list in the Chunks window. Rename it immediately so that you do not get the copy and the original mixed up.

Loading and Linking Chunks from Another File

Performer's Load command allows you to quickly import Chunks into an open file from another, unopened Performer file.

It's easy to run low on memory when working with several sequences and songs. So that you aren't restricted by memory when loading Chunks, Performer lets you load either a Chunk's actual data, or just a Link to that data. The *Data* and *Link* sub-options determine which will be loaded. Loading a link to a Chunk instead of the Chunk itself saves a great deal of memory, allowing even a two Megabyte Macintosh to support a long list of Chunks.

For step-by-step instructions to load and link Chunks, please refer to the chapter *Working With Files*.

Splitting Up an Existing Sequence into Separate Chunks

The Create Chunk mini-menu command in the Tracks Overview window takes selected segments in the Tracks Overview window and turns them into their own sequence Chunk in the Chunks List window.

The Create Chunk command makes it easy to break up a sequence into separate pieces (Chunks) in order to rearrange them more freely in a Song window. For example, let's say that you have built several phrases that are a few bars long in a Sequence. But now you want to rearrange them and try different combinations. To do so, you can select the segments of a phrase and choose Create Chunk from the

mini-menu for each one. Then, you can drag the resulting sequence Chunks from the Chunks list window into an empty Song window to try different orders and combinations.

Once you have arranged the Song as you like, you can even convert it back into a sequence using the Song window mini-menu command called Merge Chunks to Sequence. This command takes the separate Chunks inside the Song window and reduces them to a single sequence Chunk.

At any time, you can take your music freely back and forth from Sequence form to Song form with these two commands to help you create your music.

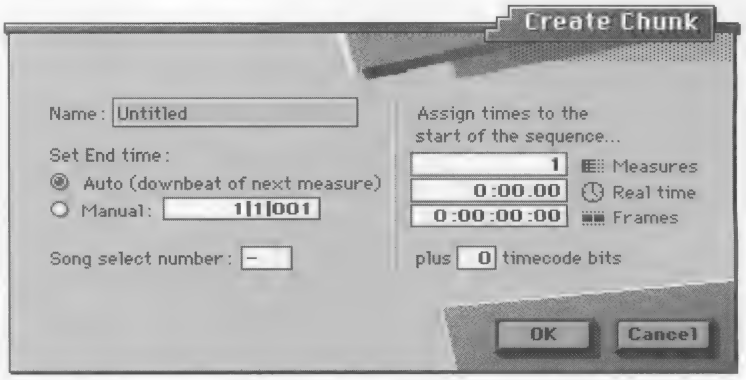
To create a sequence Chunk from the Tracks Overview window:

1. **Select the Segments that you wish to be in the Chunk.**

   Alternately, you can select the region from the Tracks List by highlighting track names and setting a region in the Edit bar. See the section earlier for information about selecting segments. You can even select non-adjacent segments.

2. **Choose Create Chunk from the Tracks Overview window mini-menu.**

   A dialog box appears.



3. **Type in a name for the Chunk.**

4. **Type in an End Time to determine the length of the Chunk.**

   By default, the end time is determined by the length of the selected region.

5. **(Optional) Type in any other information you wish about the Chunk.**

6. **Press OK to confirm your choice or Cancel to withdraw the command.**

Deleting Chunks

To delete a Chunk, click its name to highlight it and choose *Delete* from the Chunks window mini-menu. To delete several Chunks at once, highlight the name of each one as described in the *Selecting Chunks* section above. You can Undo this command.

Choosing the Current Playback Chunk

At any given time, one Chunk is designated as the current playback Chunk. This Chunk is the only one you can play and record into. Certain functions, such as recording, are available only to the currently play-enabled Chunk. For example, if a sequence is play-enabled, its Tracks window has record-enable buttons by its tracks. If a song is play-enabled, one of its component sequences can be record-enabled. Only that sequence's Tracks window will have record-enable buttons.

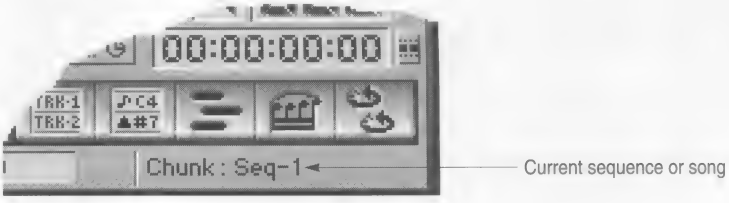
You may edit any Chunk in the file at any time regardless of whether it is play-enabled or not.

To play-enable a Chunk:

- Click the play-enable button to the left of the Chunk name. It will turn solid black. The play-enable buttons of the other Chunks will be hollow.

OR

- Click the Skip buttons as needed until the chunk's name is displayed in the Info bar in the Consolidated Controls panel



Performer also provides two different methods of play-enabling Chunks from a remote device.

The first method is with the Chunk select remote controls found in the Remote Controls window, where each Chunk is assigned a Macintosh key and MIDI event. You play-enable a Chunk by pressing its corresponding Macintosh key or sending its corresponding MIDI event from your MIDI keyboard (or controller). Please refer to the chapter *The Remote Controls Window* for more information.

The second method is Chunk Select, which allows you to cue Chunks for playback by sending a MIDI Song Select message from a MIDI controller. The Chunks window column *S#* displays the Song Select number that, when received, will cue the corresponding Chunk for playback. If a Chunk 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 Chunk assigned to the Song number in the message, that Chunk will be play-enabled. If more than one Chunk has the same Song number assigned, the one highest in the Chunks list will be cued.

When used in combination with the Chunk Chaining buttons in the Consolidated Controls panel, a Song Select message cues the corresponding Chunk to be play-enabled or played back.

Opening Chunks

Each sequence Chunk has its own Tracks window, and each song Chunk has its own Song window. To see a Chunk's Tracks or Song window, click the Chunk's name to highlight it and choose *Open Chunks* from the Chunk window mini-menu. Or just double-click the Chunk name.

Rearranging the Order of Chunks

You may rearrange the Chunks in whatever order is most meaningful to you. To change the position of a Chunk in the Chunks list:

1. **Press the type icon of the Chunk you want to move.**

   A grey outline appears delineating the Chunk.

2. **Drag the mouse to the position where you want the Chunk.**

   You can use the grey outline to determine the position of the Chunk.

3. **Release the mouse button.**

   The Chunk will appear in its new position.

Rearranging the order of the Chunks is a useful organizational tool. In addition, it lets you determine the Chunks' default cueing order when using the Skip, Cue Chunks, and Chain Chunks buttons described later in this chapter.

Changing the Name of a Chunk

To change the name of a Chunk:

4. **Option-click the name of the Chunk.**

   A small box will pop up.

5. **Type the Chunk name in the box.**

6. **Press the Return key to confirm the name or Command-period to cancel it.**

   You can use the Enter or down arrow key to approve the change and edit the next Chunk name in the list. You can also use the up arrow key to approve the change and edit the previous Chunk name in the list.

Entering Comments

To enter or modify comments for a Chunk:

1. **Click in the comments field to the right of the Chunk name.**

   A box appears. If you've already entered a comment for the Chunk, 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 Chunk. The up arrow key likewise moves to the comment for the previous Chunk.

When entering or editing a comment, the Return key starts a new line of text instead of approving the changes as usual in Performer's user interface.

Auto Versus Manual End Time

The Chunks window field *End Time* displays either the automatic, Performer-generated ending time of the Chunk, or a time that you have entered manually. It's important to understand how this time affects your music.

Performer offers two ways of playing Chunks sequentially: by arranging Chunks vertically and horizontally in the Song window, and by Chunk Chaining using the Cue Chunks, Chain Chunks, and Skip buttons in the Consolidated Controls panel. The End time shown for each Chunk in the Chunks window affects these two types of chaining differently.

When a Chunk is in a Song window, the Chunks window End time does not affect the playback length of the Chunk. Within a song, a Chunk will play every note it contains, regardless of its Chunks window End time. What it *does* affect is column placement. Columns appear automatically at the End time of each Chunk dragged into the Song window. This makes it easy to place Chunks end to end.

For example, a Chunk whose last attack is at 4|4|322 will have an automatic End time of 5|1|000. When this Chunk is dragged into a Song window at time 1|1|000, a column will appear at 5|1|000, making it very easy for you to place the next Chunk in a metrically logical location. If you prefer a 5-bar phrase, just change the End time to 6|1|000. The end column will appear at 6|1|000, even though the Chunk only plays through four measures.

Again, remember that the Chunk End time does not affect playback in the Song window, only the column placement.

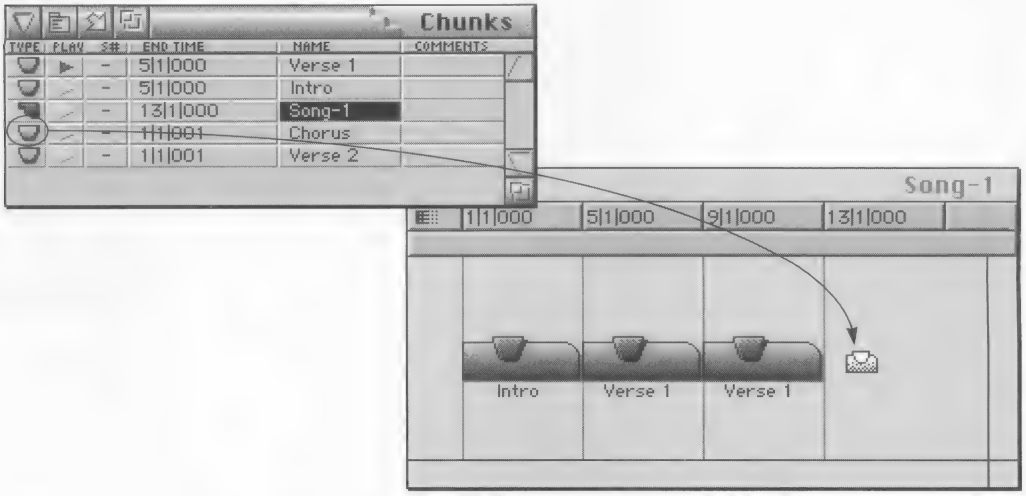
When using the Chunk controls in the Consolidated Controls panel, you'll find that each Chunk's End time does affect its playback length. For example, clicking Play with the Chain Chunks button enabled causes playback of one Chunk after another, each Chunk playing until the Counter reaches that Chunk's End time. Phrases, even notes that normally would last through the End time will be cut off. You can avoid this by setting a Chunk's End time to be later, thereby building sustain into the Chunk's play length.

In summary: regardless of auto/manual status, in the Song window the End time determines the Chunk's ending column location but not its playback length. During Chunk Chaining, playback actually stops at the End time.

For more information about the Song window and Chunk cueing, please refer to the chapter, *The Song Window* and *"The Chunk Control buttons" on page 78*, respectively.

Building a Song with Chunks

To build a Song out of Chunks in the Chunks window, drag their type icon into a Song Window. For complete information, please refer to the next chapter, *The Song Window*.



Copying tracks From One Sequence Chunk to Another

Use the following procedure to copy between sequences that have the same track layout (i.e. the same number of tracks, preferably with the same MIDI channel assignments). *If the sequences have different track layouts, this procedure will not work correctly.* See the chapter *The Tracks Window* for more information.

To copy from sequence A and paste into sequence B:

1. **Activate the Tracks window of sequence A.**

   Click anywhere in it to activate it.

2. **Set the start and end times in the Edit bar to define the region you wish to copy.**

   To select the entire sequence, simply double-click the word *Edit* in the Edit bar.

3. **Highlight all the track names in Sequence A.**

   Either click and drag over them, or choose *Select All* from the Edit menu.

4. **Select *Copy* from the Edit menu.**

   As a short cut, press command-C.

5. **Activate the Tracks window of Sequence B.**

6. **Set the Start Time in the Edit bar to the time at which you want to paste the material into sequence B.**

7. **Highlight all the track names in Sequence B.**

8. **Select Paste from the Edit menu.**

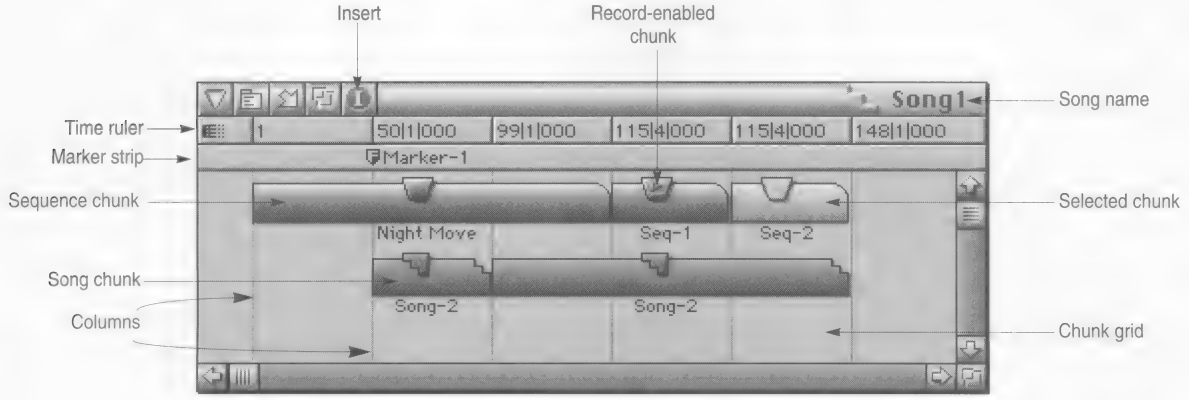
   The information from Sequence A is pasted into Sequence B at the Edit Bar Start Time of Sequence B.

Chapter 15 *The Song Window*

In Performer, a **song** is a collection of Chunks. The Chunks that make up a song are displayed in that song's window, plotted on a grid beneath a horizontal, non-linear time ruler. The Song window is the work space in which you arrange the Chunks in time and in relation to other Chunks.

By dragging and using standard Edit commands on the Chunks, you can arrange them to graphically represent the order and combinations in which you want them to play back. What you see is what you will hear: adjacent Chunks will play one after the other, and stacked (vertically aligned) Chunks will play simultaneously. Arranging in the Song window can done in real time while the song is playing back.

Quick Reference



Chunk Grid: Serves as a workspace in which you arrange Chunks. The grid will not scroll when you drag a Chunk to one of the borders; this allows you to delete a Chunk by dragging it out of the window, or to drag a Chunk to another Song window.

Song Chunks and Sequence Chunks: Represent songs and sequences that have been dragged into the Song window. Click a Chunk once to select it, twice to open its Song or Tracks window. Change a Chunk's name by option-clicking it in the Chunks window. If a Chunk's name is longer than its Chunk icon, the first several letters will be followed by an ellipsis.

A Chunk's size in the Song window is relative to that of the other Chunks in the window, rather than absolute. Chunks shorten and lengthen so that within a region, the longest Chunk always appears longest in the Song window. A Chunk's length can be changed in the Chunks window by setting the Chunk's End time to manual mode and typing in the new value.

The standard Edit commands (Cut, Copy, Paste, Erase, and Undo) and dragging operations can be used on Chunks in the Song window.

Marker Strip: Displays the Markers associated with the open song. Every marker in a song automatically produces a column at the same time location in the Song window.

Time Ruler: Indicates the position of each Chunk in any combination of measure | beat | tick, real, and SMPTE time formats. The Ruler is non-linear, meaning the ruler markings denote Chunk Start and End times rather than regular time units. Choose which time formats are displayed using the Song window mini-menu selections *Measures*, *Real time*, and *Frames*.

Insert button: Produces a dialog box prompting for a measure | beat | tick, real, or SMPTE time at which a column should be inserted. Clicking this button is a shortcut for choosing *Insert Column* from the Song window mini-menu.

Song name: Displays the name of the song to which the window belongs. The song name can be changed by option-clicking it in the Chunks window.

Record-enabled Chunk: Displays a record-enable button in its handle, indicating that if the Song is play-enabled and the Record button is pressed, it will begin to record data at its start time. Only sequence Chunks can be record-enabled.

Column: Serves as a placement guide for Chunks. Columns appear automatically at the end of each Chunk, and can be inserted manually by choosing *Insert* from the Song window mini-menu or by clicking the Insert button in the Song window title bar.

Selected Chunk: Appears inverted to indicate that it has been selected. Selected Chunks are subject to Edit commands as well as several Song window mini-menu commands.

The Song Window Mini-menu

The Song window has the following mini-menu items:

Copy Conductor Tracks: Copies the Conductor tracks of the selected Chunks into the song's Conductor track. In time regions where two or more Chunks are selected, the information from the uppermost Chunk is used. Markers are not included in the copy; use the *Merge markers* command to copy Chunk markers into a song.

Edit Conductor Track: Opens a Graphic or Event list editing window of the song's Conductor track.

Record-enable Conductor: Enables the Conductor track of the song for recording Tap Tempo information.

Insert Column: Produces a dialog box prompting for a measure, real, or SMPTE time at which to insert a new column. Clicking the Insert button in the Song window title bar is a shortcut for choosing this item.

Set Record Sequence: Enables or disables the selected sequence for recording within the song. Only one sequence can be record-enabled at a time. Choosing this item with more than one Chunk selected, or with a Song selected, produces a warning message.

Merge Markers: Merges the markers of all selected Chunks into the song's marker list. Locked markers are not included in the merge.

Delete Markers: Deletes from the song's marker list any markers that are identical to markers in the selected Chunks.

Merge Chunks to Sequence...: Produces the Merge Chunks dialog box, which contains the following options:

Copy all tracks creates a sequence containing all tracks of the selected Chunks, and places this new sequence in the Chunks window.

Merge tracks with identical names creates a sequence containing all tracks in the selected Chunks, merges any tracks with identical names, and places this new sequence in the Chunks window.

Measures/Real time/Frames: Determine which time formats should be displayed in the Song window Time ruler. Choosing a format checks or unchecks it; the checked formats are displayed.

Columns

When you place a Chunk in the Song window, its Start and End times are marked with **columns**. Columns serve as Chunk placement guides. A column following a Chunk does not necessarily mean that the Chunk will stop playing back at that point.

For example, Sequence-1 is four measures long and has an End time of 5|1|000. Dragging it into a Song window produces a column at the End time, and playback stops there as well.

Now let's say that Sequence-1 contains ten bars of music, but the End time has been manually set to 5|1|000. Dragging the sequence into a Song window still produces a 4-bar Chunk and a column at 5|1|000, but the Chunk plays back all the way to measure ten.

Inserting Columns

Before you can place a Chunk at a time location in the Song window, there must be a column at that location. Columns appear automatically at the Song's Start time, at each marker in the Song, and at the end of each Chunk dragged into the Song window. You can also insert columns manually.

To insert a column manually:

1. **Click the Insert button in the Song window title bar.**

   You can also choose *Insert Column* from the Song window mini-menu. A dialog box appears, prompting you for a location in measure|beat|tick, real, or SMPTE time.

2. **Click the radio button next to the time format you wish to use, and enter the time.**

3. **Click OK to confirm your entry or Cancel to cancel the Insert.**

   If you click OK, the dialog box disappears and a column appears at the time you specified. If you click Cancel, the dialog box disappears and the Song window is unchanged.

4. **Place a Chunk at the new column location.**

   Performer automatically eliminates columns that do not have an associated Chunk or marker. So, if you don't place a Chunk at the new column you have just inserted, the column will disappear when the grid redraws.

Creating a Song

Songs are created by dragging Chunk icons from the Chunks window into a Song window, then arranging the Chunks in any playback order and combination you wish. This can be done before or during playback of the Song. To create a song:

1. **Choose Add Song from the Chunks window mini-menu.**

   A new, empty song is added to the Chunks list.

2. **If necessary, add other songs and sequences to the Chunks list.**

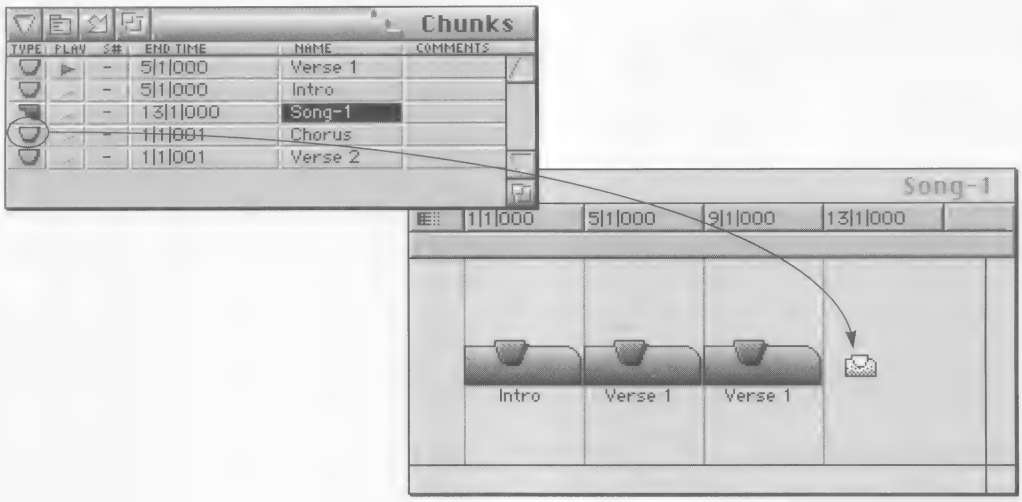
   For this example we'll assume you have at least two Chunks in addition to the song just added.

3. **Open the Song window by double-clicking the song's name in the Chunks window.**

   The song's window opens. Alternately, you can open the Song window by clicking its name, then choosing *Open Chunks* from the Chunks window mini-menu.

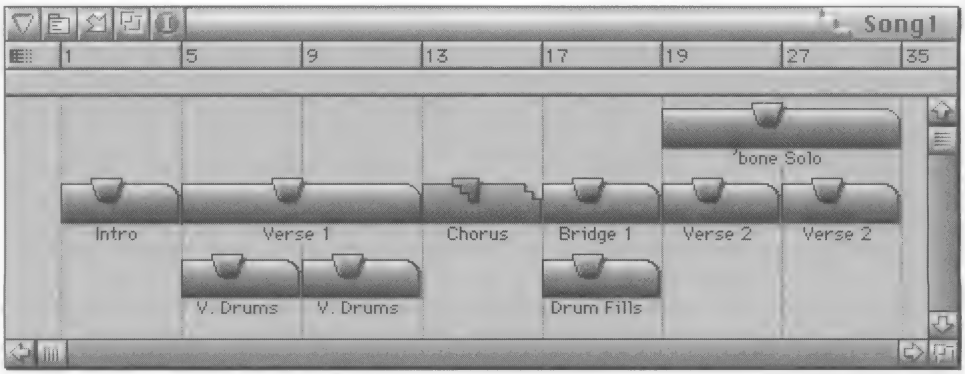
4. **Grab a Chunk by clicking the icon to the left of its name in the Chunks window.**

   Release the Chunk in the Chunk Grid beneath the ruler. The Chunk left-justifies to the column at 1|1|000, and a new column appears to the right of the Chunk. Note that you cannot drag the song into its own Song window.



5. **Continue dragging, option-dragging, and editing Chunks in the Song window to arrange them as desired.**

   Chunks that you place end to end will play sequentially; stacked Chunks will play simultaneously.



When placing Chunks into songs, keep the following in mind. Every Chunk has its own Chunk Start time. Every copy of the Chunk uses this time and will reflect any changes made to the original.

Specifically, a Chunk's Event List window times relate to its own start time, say 1|1|000, even if that Chunk has been dragged into a song to start playing at measure 300.

Similarly, each sequence Chunk has its own Tracks and Event Editing windows, and each song Chunk has its own Song window. Every copy of a Chunk is affected by the edits performed in these windows.

Playing Back a Song

To play a song:

1. **Click the title bar of the Chunks window to activate it.**
2. **Click the play-enable button of the song you wish to play.**
3. **In the Consolidated Controls panel, click Play.**

   Adjacent Chunks in the song play sequentially; stacked Chunks play simultaneously.

For another method of playing Chunks one after the other, see "The Chunk Control buttons" on page 78.

Scrolling During Playback

The *Auto-Scroll* command in the Basics menu can make the Song window scroll during playback. In addition, the window will automatically open to the current playback location of the sequence. Please refer to the Auto-Scrolling section in the *Playback* chapter for more information.

Editing in the Song Window

Once you've placed a few Chunks into a song, the Song window offers powerful editing capabilities to help you arrange your music. These operations can be done before or during playback.

Select the Chunk by clicking it, or by dragging a marquee around it.

Open a Chunk's Song or Tracks window by double-clicking its icon.

The standard Macintosh Edit commands (Cut, Copy, Paste, Erase, and Undo) can all be used on Chunks selected in a Song window, with the following results.

Cut: Removes each selected Chunk from the Chunk Grid and places a copy on the Clipboard.

Copy: Places a copy of each selected Chunk on the Clipboard.

Paste: Makes the cursor change to a mini-likeness of the chunk to be pasted. Click at the desired column location in a Song window to complete the paste operation.

Erase: Removes each selected Chunk from the Chunk Grid; nothing is placed on the Clipboard. You can also delete a Chunk from a Song window by dragging it out of the window.

Undo: Returns the Song window to its state prior to the last Edit or dragging operation. For example, dragging a Chunk to a different column enables the Undo command and updates it to *Undo Drag*. Choosing *Undo Drag* returns the dragged Chunk to its original position.

Dragging the Chunk to a different column changes its playback start time. Dragging a Chunk out of the Song window deletes it from the Song. You can drag a Chunk from one Song window to another.

Option-dragging, consistent with Performer's graphic track editing, leaves a copy of the Chunk at its original location. Option-dragging a Chunk out of the Song window does not affect that Song window; you can option-drag a Chunk into another Song window, resulting in a copy in each window.

Dragging and Option-dragging do not cause the Song window to scroll. This allows you to drag a Chunk out of a Song window, either to delete it or to move it to another song. If you need to place a Chunk at a time location not displayed in the Song window, Cut or Copy the Chunk, use the scroll bars to move to the desired location, insert a column if necessary, and Paste.

Recording MIDI into a Song

Performer lets you record both MIDI and tempo information into a song. MIDI information can be recorded into any sequence Chunk contained in the song, and tempo information can be recorded into the song's Conductor track.

To record MIDI information into a song's component sequence:

1. **In the Chunks window, play-enable the Song into which you wish to record.**

2. **Double-click the song's name to open its Song window.**

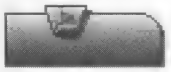
   If the song's window was already open, the window activates.

3. **In the Song window, click the sequence Chunk into which you wish to record.**

   The Chunk highlights; any Chunks that were selected are deselected.

4. **Choose *Set Record Sequence* from the Song window mini-menu.**

   The highlighted sequence now has a record-enable indicator in its handle. If you change your mind, choose *Set Record Sequence* again to disable the Chunk.



5. **Double-click the record-enabled Chunk.**

   The Tracks window for the Chunk opens. Each track has a record-enable button.

6. **Record-enable one of the sequence's tracks by clicking its record-enable button.**

   If you wish to record on several tracks, use Multi-Record as described in the *Recording* chapter.

7. **Locate the point in the song at which you want to begin recording.**

   Use the motion controls in the transport controls or set the Counter directly.

8. **Click Record.**

   The song begins to playback. Performer starts recording at the record-enabled Chunk's starting time or the Auto-Record In time and continues indefinitely or until the Auto-Record Out time.

9. **When you are finished, click Stop.**

   To hear the recorded material, rewind as necessary and click Play.

Recording Tempo Information into a Song

Performer also lets you record tempo information into a song. Say you've created a song in which you'd like to have several tempo changes, even rubato passages. Tap Tempo is the most musical way to add these changes to your song — you don't need to guess at the beats per minute, or even the measure numbers where the changes should occur.

Each Chunk has its own Conductor track, containing the tempo, key, and meter information for that Chunk. Instead of recording MIDI events, the Conductor track records tempo information while slaved to Tap Tempo. Tap Tempo lets you control the beat by simply playing a MIDI event like a metronome that Performer follows and can record. If recorded, the information becomes a tempo map that can be edited in the Conductor track and that Performer will follow during subsequent playbacks of the sequence.

You can even record tempo information into the song's Conductor track while recording music into one of the song's component sequences.

To record tempo information into a song's Conductor track:

1. **In the Chunks window, play-enable the Song into which you wish to record.**

2. **Double-click the song's name to open its Song window.**

   If the song's window was already open, the window activates.

3. **Choose *Record-Enable Conductor* from the Song window mini-menu.**

   The song's Conductor track is now record-enabled; this is indicated by a check mark in the mini-menu next to *Record-Enable Conductor.*

4. **Choose *Receive Sync* from the Basics menu.**

   The Receive Sync dialog box appears.

5. **Click the radio button next to *Tap Tempo*, then choose the port, MIDI channel, MIDI event, and countoff beats you wish to use.**

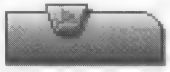
   Choose an event/channel combination that you are not using as a Remote Control. Refer to the *Remote Controls* chapter for information on Remote Controls assignments, and to the *Receive Sync* chapter for specific information on Tap Tempo.

6. **Optional: Click the sequence Chunk into which you wish to record.**

   If you wish to record MIDI data while recording tempo information, you must record-enable the desired sequence within the song, and track(s) within that sequence.

7. **Choose *Set Record Sequence* from the Song Window mini-menu.**

   The highlighted sequence now has a record-enable indicator in its handle. If you change your mind, choose *Set Record Sequence* again to disable the Chunk.



8. **Double-click the record-enabled Chunk.**

   The Tracks window for the Chunk opens. Each track has a record-enable button.

9. **Record-enable one of the sequence's tracks by clicking its record-enable button.**

   If you wish to record on several tracks, use Multi-Record as described in the *Recording* chapter.

10. **Choose *Slave to External Sync* from the Basics menu.**

11. **Click Record and begin tapping the specified tap event at the desired tempo.**

    The Play button remains grey until you have tapped the specified number of countoff beats. Performer starts recording at the record-enabled Chunk's starting time and continues indefinitely or until the Auto-Record Out time, whichever is sooner.

12. **When you are finished, click Stop.**

    To hear the recorded material, rewind as necessary and click Play.

Chunking Hints

Creating an Echo Effect

The Song window can be used to quickly create special effects. Try some of the suggestions here to get started.

To add an echo effect to part of a song, try the following.

1. **Find the Chunk(s) that you wish to echo.**

   Note the starting time of each according to the Song window Time Ruler.

2. **Click the Insert button in the Song window title bar.**

   The Insert Column dialog box appears, prompting you for the measure, real, or frame time at which a column should be inserted.

3. **Enter a measure time about 50 ticks after the original Chunk's starting time within the Song.**

   To create an echo that plays in rhythm with the original Chunk, use divisions of the beat (for example, a quarter note=480 ticks so try 60, 120, or 240). A column will appear in the Song window at the time you specify.

4. **While holding down the Option key on your Macintosh keyboard, drag the Chunk to the new column.**

   A copy of the Chunk remains at the original location.

5. **Play back the song to hear the result.**

   Experiment with different amounts of delay to achieve the best effect.

Exporting a song to other music software programs

Song Chunks cannot be directly converted to other file formats, but you can use the *Merge Chunks to sequence* command in the Song window mini-menu to convert the song into a sequence. The resulting sequence can be converted to any alternative file format available in the Save As command dialog box. See "Saving a sequence in another format" on page 51.

Managing Markers in a Song

Every Chunk has its own Markers list. (See "The Markers Window" on page 245 for an introduction to markers.) Markers serve many functions, from simple references to auto-locators. 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.

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 compares the song's markers to those of the selected Chunks, and removes any that match up. The marker list of the Chunk is not affected. Keep in mind that once 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 are no longer associated with the Chunk.

Markers can be of great help when building a song or score because Performer automatically generates a column in the Song window for each marker. 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 found in the Markers window mini-menu for each Chunk.

Chunking and Synchronization

Chunking (arranging Chunks in the Song window) is the ideal method of playing multiple Chunks while slaved to external sync. Firstly, Chunking allows seamless transitions between Chunks within a song. What's more, these Chunks can be edited independently even after they have been dragged into a song.

Secondly, rather than having a different Start time and tempo map for each Chunk within a song, the song itself has one Start time and one Conductor track to govern all component Chunks. In fact, when placing Chunks into a song you could use *Set Chunk Start*, found in the Chunks window mini-menu, to change each Chunk's start time to correspond with its playback location in the song. The Chunk's SMPTE start times will shift accordingly, matching those in the Song window Time Ruler. If a Chunk contains tempo changes, you can use the *Copy Conductor tracks* mini-menu command to make every SMPTE time of a component Chunk match those of the song that contains it.

Finally, film scoring applications benefit greatly from the Song window. Using the Record Hits feature in the Markers window, you can create a series of SMPTE hit points associated with a song. Each hit point becomes a marker. Because Performer inserts a column in the Song window for each Marker, you automatically have a Chunk placement guide at each hit point in the song.

Matching chunk start times with their location in a song

When Chunks are placed in a song, the song itself has one Start time and one Conductor track to govern all component Chunks. When placing Chunks into a song, you may want to change each component Chunk's start time to match its playback location in the song. Then, the SMPTE start time of the component Chunk will be the same as its SMPTE location with respect to the song.

To match a component Chunk's SMPTE start time with the song that contains it, look at the column where the Chunk starts in the Song window and make a note of the SMPTE time of the column. Then, set the Chunk's start time to be the same SMPTE time location. For information about how to set the start time, see "Setting the start time" on page 90.

If the component Chunk contains tempo changes, you can use the *Copy Conductor tracks* mini-menu command to copy all of its tempo changes into the song's Conductor track, making *every SMPTE hit point* of a component Chunk match its SMPTE time in the song that contains it.

Auto Versus Manual End Time

The Chunks window field *End time* displays either the automatic, Performer-generated ending time of the Chunk, or a time that you have entered manually. It's important to understand how this *time* affects your music.

Performer offers two ways of playing Chunks sequentially: by arranging Chunks vertically and horizontally in the Song window, and by Chunk Chaining using the Cue Chunks, Chain Chunks, and Skip buttons in the Consolidated Controls panel. The End time shown for each Chunk in the Chunks window affects these two types of chaining differently.

When a Chunk is in a Song window, the Chunks window End time does not affect the playback length of the Chunk. Within a song, a Chunk will play every note it contains, regardless of its Chunks window End time. What it *does* affect is column placement. Columns appear automatically at the End time of each Chunk dragged into the Song window. This makes it easy to place Chunks end to end.

For example, a Chunk whose last attack is at 4|4|322 will have an automatic End time of 5|1|000. When this Chunk is dragged into a Song window at time 1|1|000, a column will appear at 5|1|000, making it very easy for you to place the next Chunk in a metrically logical location. If you prefer a 5-bar phrase, just change the End time to 6|1|000. The end column will appear at 6|1|000, even though the Chunk only plays through four measures.

Again, remember that the Chunk End time does not affect playback in the Song window, only the column placement.

When using the Chunk controls in the Consolidated Controls panel, you'll find that each Chunk's End time does affect its playback length. For example, clicking Play with the Chain Chunks button enabled causes playback of one Chunk after another, each Chunk playing until the Counter reaches that Chunk'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 Chunk's End time to be later, thereby building sustain into the Chunk's play length.

In summary: regardless of auto/manual status, in the Song window the End time determines the Chunk's ending column location but not its playback length. During Chunk Chaining, playback actually stops at the End time.

Chapter 16 *Click and Flash*

The Click is the audible indication of the Metronome beat; the Flash is the visible indication. The Click is produced on the Macintosh's internal speaker or through MIDI on a drum machine or other sound module; the Flash appears in a small box on the screen. Both are accessible via commands on the Basics menu. The Click & Countoff Options feature in the Basics Menu allows you to control the click's source and volume. In addition, it provides options for when the click occurs e.g. only while recording or only during the countoff.

The Click

The Click "clicks" on the beat. The beat is determined by each meter change in the Conductor track. If the Click is on, Performer 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 33, "Change Meter".

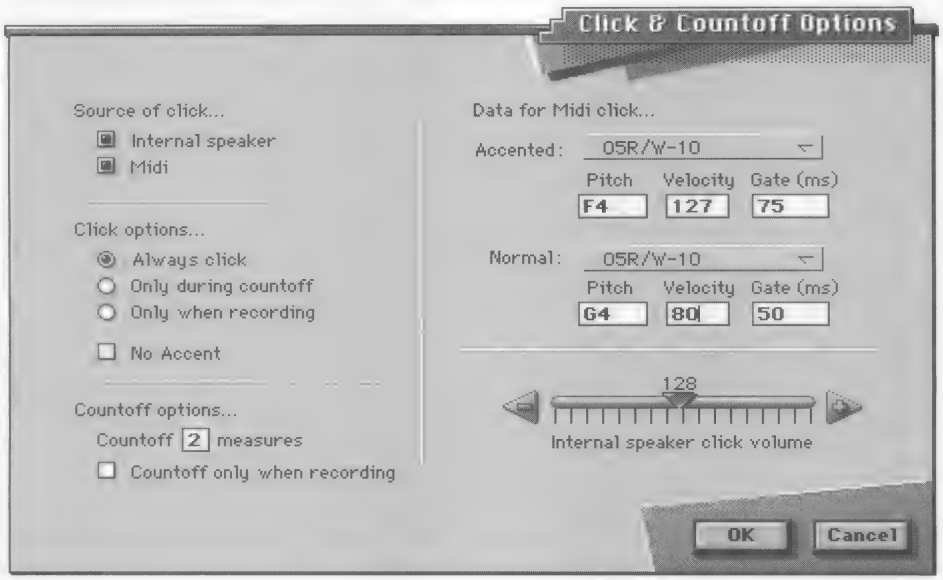
Enabling the Click

To turn on the Click, choose *Click* from the Basics menu or press command-5. To turn off the Click, choose it again. When the Click is on, the *Click* menu item will be checked.

To adjust the Click volume *independently* of the Macintosh beep sound, use the Click & Countoff Options dialog box described in the next section. You can also amplify the Click by routing the audio output from the speaker jack on the rear of your Macintosh to your sound system. See the following two sections for more information.

Click & Countoff Options

The Click & Countoff Options dialog box, chosen from the Basics menu, provides several options for controlling the click.



You can also open this dialog by double-clicking the Count-off button.

Source of Click

Source of click specifies how the click is generated. Select one or both options.

The **Internal speaker** option produces a click sound from the computer's internal speaker.

> ☛ (*Note:* the internal speaker click does not work on some Macintosh models with certain system configurations.)

The **MIDI** option will send a MIDI note for every click. For this option, you must set up an instrument to receive these notes and play a 'click' sound of your choosing. For example, a drum machine could play rim shots, or a synthesizer could play short beeps.

Click options

Always click makes the click audible whenever Performer is counting off, playing or recording.

Only during countoff makes the click audible only during countoff measures. When playback or recording begins, the click will fall silent. See *"The Countoff button" on page 74* for more information about the countoff.

Only when recording makes the click audible only when Performer is in record mode. If the Countoff button is enabled, Performer 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 internal speaker click and the MIDI click.

Countoff options

Countoff n measures lets you type in the number of measures you want for the countoff. The countoff will be in the same meter as the current playback location in the main counter.

Countoff only when recording causes the countoff to occur only before recording, not before playback or any other function.

Data for MIDI Click

These options define what notes are played if the **MIDI** option is selected. The **Accented** note is played on the first beat of each measure; the **Normal** note is played at all other times. Each note has four parameters:

First, you specify the device that will play the accented and unaccented click by choosing it from the pop-up menu provided. The list of devices in the menu is provided by FreeMIDI.

Pitch is the pitch of the note, expressed as a scale letter (A-G) (use the number sign # to represent a sharp, or a small letter 'b' to represent a flat) and an octave number. For example, C3 means middle C.

Velocity is the attack (on) velocity, expressed as a number from 0-127.

Gate specifies the length of the note in milliseconds (thousandths of a second).

Internal Speaker Click Volume

The *Internal speaker click volume* slider controls the volume of the Macintosh speaker click. To increase the click volume, drag the slider to the right; to reduce volume, drag to the left. Or, press the + or - buttons at each end of the slider.

Performer's click volume is not affected by the volume slider in the Control Panel. This allows you to attenuate (or turn off) the warning 'beep' sound and turn up the click. See the section later in this chapter called *Routing the Internal Speaker Click to Your Sound System* for information about how to set the system beep and speaker click to different volumes.

☛ On some models of the Macintosh, this slider has no effect.

Setting Click & Countoff Options

To set the Click & Countoff Options dialog box:

1. **Select Click & Countoff Options... from the Basics menu.**

2. **Select *Internal speaker* and/or *MIDI* mode.**

   Click in the corresponding check box to select a mode. Both modes can be selected simultaneously. If both modes are turned off, no click will be generated, even if Click is selected from the Basics menu.

3. **Select a preference for when the click occurs.**

   Refer to the beginning of the *Click & Countoff Options* section for an explanation of each option.

4. **Adjust the Internal speaker click volume, if necessary.**

   Drag the slider to the right to increase the click volume; drag it to the left to decrease volume. This slider controls the click volume and is independent of the speaker volume setting in the Control Panel.

5. **Set the MIDI click parameters, if necessary.**

   To change a parameter, click in its box, then type in the new values. You can also set the value over MIDI from your controller keyboard.

6. **Click on the OK button to confirm your settings, or on the Cancel button to cancel the changes.**

Routing the Internal Speaker Click to Your Sound System

You can amplify the Internal speaker click by routing the audio output from the speaker jack on the rear of your Macintosh to your sound system. When this is done, the Macintosh warning beep sound, which is much louder than the click, will also become amplified. To avoid an over-amplified beep, you can turn down (or turn off) the beep sound using the Macintosh speaker volume slider in the Control Panel in the Apple menu.

To turn down the system beep sound:

1. **If you are currently running Performer, save your work and choose Quit from the File menu.**

   The Macintosh will return to the Finder.

2. **Choose Control Panels from the Apple menu.**

   Important: this must be done *before* you start up Performer. The Control Panel volume cannot be adjusted when Performer is running.

3. **Open the Sound control panel.**

4. **Drag the Speaker volume slider down as low as you wish.**

   If you drag the volume to zero, the system beep will be turned off, and the menu bar will flash in its place.

5. **Close the Control Panel by clicking in the close box in the upper left corner.**

After the above procedure, re-start Performer and turn up the speaker click volume slider in the Click & Countoff Options dialog box.

The Flash

The Flash is the visual counterpart to the Click: it "flashes" on the beat. This is a silent way of giving you the current tempo.

To turn on the Flash, choose Flash from the Basics menu or press command 6. The Flash window will appear.

The Flash gives you the tempo by alternating the highlighting (the black rectangle) from side to side. When the Flash is on, the command will be checked on the Basics menu.

☛ The Flash only works when the computer screen is set to black and white.

☛ The Flash feature may not work on some models of the Macintosh. If this is true for the Macintosh you are currently running Performer on, the Flash menu item will be grayed out.

Placing the Flash on Top of Windows

The Flash window is different than other windows in Performer: when enabled, it will always appear on top of all other windows. This is necessary to keep the Flash window timing completely accurate.

To move the Flash window, press the mouse anywhere in the window and drag the window to a new location. Performer *will* remember where you place it when you save the file.

Sometimes when the Flash is in front of another window, it will not move when you try to grab it with the mouse. In this situation, click on the push down box of each window *behind* the flash. It will then move freely.

To close the Flash window, choose Flash on the Basics menu again.

Chapter 17 The Memory Window

As you record and edit music in Performer, more and more of the Macintosh's RAM (random access memory) is required to store it. If a great deal of recording or editing is done in a file, or if you are loading sequences from other files, it is possible to run out of memory. It is therefore desirable to monitor how much memory is being used to keep this from occurring.

Basics

The Memory window displays the current amount of free memory. It is constantly updated to supply you with a running status of available memory.

The Macintosh's memory usage is dynamic: it changes according to the current task. The memory profile will vary widely with different activities. For instance, if you use a section of the program for the first time, you may find that you suddenly have 30K less of memory. This is the space that the program utilizes for that particular part of the program.

For these reasons, it is a good idea to keep a watchful eye on the Memory window. If you have 150K or less memory free, save often; a long recording or editing pass may use up all your free memory. Also, avoid editing and recording large regions; instead, work with smaller sections. Performer does its best when memory is low but in such circumstances there is a possibility of a system crash and the loss of any work you haven't saved.

Using the Memory Window

To open the Memory window, choose Memory from the Windows menu. The window appears.

To move the window, click in any part of it except the close button and drag it to the desired location. To save space, the Memory window has no title bar.

To close the Memory window, click in the window's close button.

Chapter 18 *The MIDI Monitor Window*

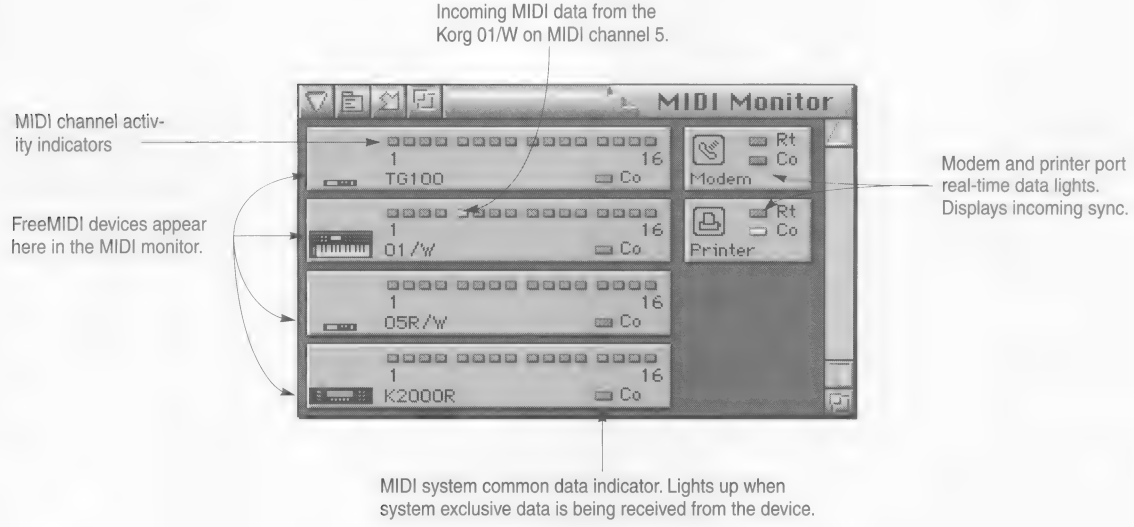
The MIDI Monitor window displays incoming MIDI activity, broken down by input device, MIDI channel, and type of data. This feature is handy when testing hardware, tracing problems in your MIDI system, or monitoring time codes or other special MIDI data. The MIDI Monitor window will function whether active or inactive.

Opening the MIDI Monitor Window

Choose MIDI Monitor from the Windows menu; the window will appear. To move it, click in the title bar and drag to the desired location. To close the MIDI Monitor window, click in the window's close button.

Basics

The MIDI Monitor window consists of one panel for each FreeMIDI system device that has its MIDI OUT connected to the MIDI interface in your current FreeMIDI configuration. It therefore displays any devices that have the ability to send MIDI data to Performer. Each panel contains 16 MIDI channel indicators that are normally unhighlighted; they highlight to indicate incoming MIDI data.



The window includes real-time indicators for the modem port and printer port.

- ☛ The Input Filter has no impact on the MIDI Monitor window's display.
- ☛ The MIDI Monitor window only displays *incoming* MIDI activity—only data being received by Performer from somewhere else—not *outgoing* data being sent by Performer.

Channel Activity indicators display MIDI activity by MIDI channel. Most normal MIDI data will cause one of these indicators to light up; for example, pressing a key or moving the pitch bend wheel on a controller keyboard will cause the corresponding Channel Activity Indicator to turn black.

The *System Common indicator,* labelled "**Co**", indicates incoming system common data, such as system exclusive data, tune request, Song Position Pointer, and Song Select commands.

The *System Real-Time indicator,* labelled "**Rt**", includes MIDI beat clocks, DTL (Direct Time Lock), DTLe (Direct Time Lock enhanced), and System Reset commands. This type of data is used to synchronize devices, and is generated by most sequencers, drum machines, and SMPTE-to-MIDI converters. System real-time data is not assigned to a particular channel and therefore has just one indicator per port.

Active sensing messages, which are sent by some brands of MIDI equipment, are ignored by the MIDI Monitor window. To see if your equipment is "on-line" and working correctly, send note data and observe the Channel Activity indicators, or test it in the FreeMIDI Setup application.

Reordering Devices in the MIDI Monitor

To rearrange the order of the devices in the MIDI Monitor, just drag the panels up or down.

MIDI Monitor window mini-menu

The MIDI Monitor window has the following mini-menu commands:

Show all input devices

This command makes the MIDI Monitor display all devices in your FreeMIDI configuration file that have a MIDI OUT connected to a MIDI IN on the interface.

Show controllers only

This menu command makes the MIDI Monitor display only those devices in your FreeMIDI configuration file that have the *Controller* device property assigned to them.

Clear all devices

Removes all devices from the MIDI Monitor display so you can start from scratch again.

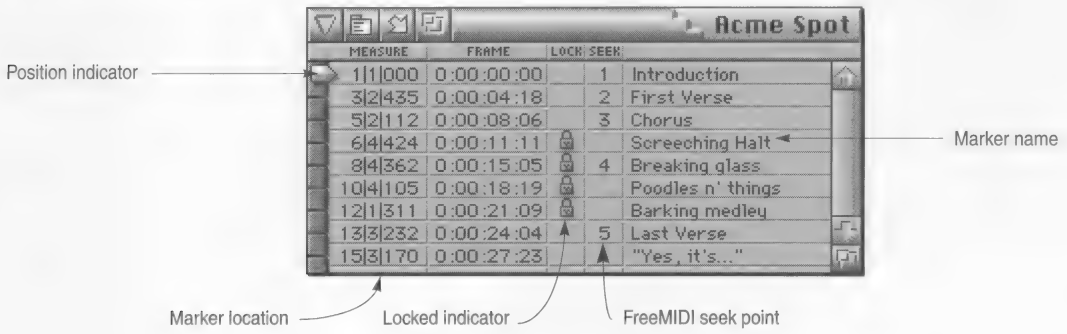
Individual Device names

The mini-menu also displays the name of each device in your studio. Select the name to individually display it. Select it again to hide it.

Chapter 19 *The Markers Window*

The Markers window allows you to display and edit the markers for a Chunk (sequence or song). A marker is a name attached to a particular location in a Chunk. 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 the Event Editing windows for each track, 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 Change menu you can then adjust meters and tempos to automatically align musical cues to the hit points.

Quick Reference



Time display: Displays the marker locations in your choice of measure, real or frame time. Click on a location to change it. Select the formats you wish to use from the bottom of the mini-menu.

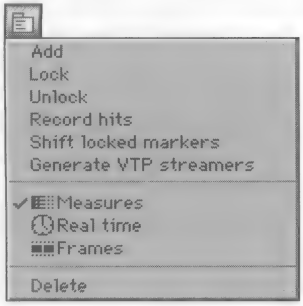
Locked indicator: Indicates that the marker is locked to real/frame time. Toggle from locked to unlocked and back by clicking in the lock column next to the marker name.

FreeMIDI Seek point: FreeMIDI provides eight seek points to which it will cue all FreeMIDI applications. You can designate up to eight markers as FreeMIDI seek points. Type in the desired seek point number in this column.

Names: Click on a marker's name to select it. Option-click on the name to change it. Drag over several names to select several markers. Use Shift-click to select or deselect several non-contiguous markers.

Position indicator: Displays the current location in the Chunk. Drag on the indicator to move it. Click anywhere in the grey region to move the indicator to a marker. Moving the indicator changes the current location in the Chunk.

Mini-menu



Add: Adds a new marker at the current location. Hold down the Option key while choosing Add to add several markers at once. A dialog box will appear, prompting you for the number of markers to be added.

Delete: Deletes the highlighted markers.

Lock: 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: Unlocks the highlighted markers.

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.

Shift locked markers: Shifts all highlighted locked markers by a time offset.

Generate VTP Streamers: Causes Performer to trigger a Video Time Piece streamer for each designated marker in the Markers list.

Measures/real time/frames: Choosing these will determine what type of time will be displayed in the marker list. When chosen, the menu entry becomes checked. Choosing it again unchecks it.

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 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 and frame time.

Normally a marker remains at the same measure time location when you change the tempo of the sequence. In this case, changes in tempo or structure will affect the real and frame time 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 necessarily attached to real or frame time locations. Since the location of the event in the film or video will not change, the location of the marker must not either, even if you change the tempo of the music. Performer lets you 'lock' markers to real/frame time locations. When you change tempos or edit your Chunk, the real/frame time location of locked markers will stay the same and the measure location will change to reflect the new tempo or structure.

Opening a Markers Window

Each Chunk has its own set of markers in the Markers window. To open the Markers window for a Chunk:

1. **Open the Chunks window.**

   Do so by choosing *Chunks* from the Windows menu.

2. **Make sure no Chunks are highlighted.**

   To unhighlight them, briefly click a type icon in the left column. If a Chunk is highlighted, a Markers window will be opened for that Chunk.

3. **Play-enable the Chunk whose Markers window you wish to open.**

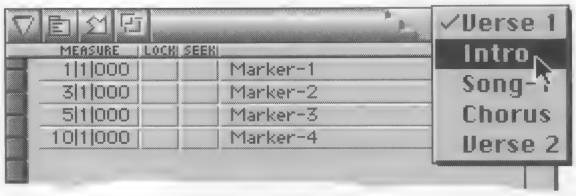
   Do so by clicking the play-enable button to the left of the Chunk name.

4. **Choose *Markers* from the Windows menu.**

The title bar 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 and songs in a file, you can easily switch between them by command-clicking the name of the sequence in the Marker window title bar as shown below:



Scrolling During Playback

The *Auto-Scroll* command in the Basics menu can make the Markers window scroll during playback. In addition, the window will automatically open to the current playback location of the sequence.

Adding Markers

To add a marker, choose Add from the Markers window mini-menu. The marker's location will be the same as that showing in the Counter. To add several markers at once, hold down the Option key while choosing Add from the mini-menu. A dialog box will appear prompting you for the number of markers to be added.

Changing the Name of a Marker

The size of the name box is limited by the size of the Markers window. If you wish to enter a lot of text for a marker name, resize the window first.

To change the name of a marker:

1. **Option-click on the marker name.**

   A small box will pop up.

2. **Type in the name for the marker.**

3. **Press the Return key to approve the change or the Command and period keys to cancel it.**

   You can 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:

1. **Click the time location you wish to change to pop-edit the value.**
2. **Enter the new values.**

   Use the Tab key to move between time fields.

3. **Press the Return key to enter the time or the Command and period keys to cancel your change.**

   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.

Setting the Counter to a Marker Location

You can easily set the current location displayed in the Counter window to the location of a marker. This lets you to 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.

Or

- ☛ Click in the grey area of the position bar to the left of the desired marker. The indicator will appear at that position. The position indicator will appear under the pointer and you can drag it to the desired marker. This saves you having to scroll around to find the position indicator.

Selecting Markers

To select a marker, 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 Shift 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 Shift 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.

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 Edit Bar of the Tracks window, you can use the Markers window and Remember Times command on the Basics 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 Remember Times from the Basics menu.**

   Pressing Command-R is the keyboard equivalent for Remember Times. The locations of the starting and ending marker are remembered.

3. **Activate the Tracks window.**

   Click once on it.

4. **Click once on the word Edit in the Edit Bar.**

   The location of the first highlighted marker will be entered into the Start time and the location of the last highlighted marker will be entered into the End time in the Edit Bar.

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 Consolidated Controls panel.

Markers in the Event Editing Window

Markers appear in the Event Editing windows for each track in a sequence. The name and location may not be edited in any of the Event Editing windows. However, commands on the Edit menu may be applied to markers only in the Conductor track Event Editing windows.

You can use the View Filter to determine whether or not markers are displayed in the Event Editing windows.

Markers in the Song Window

Markers in a song are displayed in the Markers Strip in the song window. Performer 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 compares the song's markers to those of the selected Chunks, and removes any that match up by both

name and location. The marker list of the Chunk is not affected. Keep in mind that once 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 Chunk. Select the Conductor track in the Tracks window and set the Start and End times in the Edit bar before invoking one of the Edit commands. Locked markers cannot be edited in the Conductor track. See the *The Conductor Track* and *Edit Commands* chapters for more information.

Locking and Unlocking Markers

Markers can be connected to a real or frame time 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 sticks to a specific *measure/beat/tick*, and its real time location is flexible. When a marker is locked, it sticks to a specific *real/SMPTE* time, and its measure location is flexible.

To lock a marker, click on it to select it and choose Lock from the Markers window mini-menu. You can lock several markers at once. To unlock a marker, select it and choose Unlock from the Markers window mini-menu. To toggle a single marker between locked and unlocked states, click in the lock column next to the marker's name.

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 real/frame time locations of markers by a uniform amount.

To shift the times of locked markers:

1. **Select the markers you wish to shift.**

   Unlocked markers will not be affected by this command. You can include them in your selected markers group without affecting them.

2. **Choose Shift Locked Markers from the Markers window mini-menu.**

   A dialog box will appear.

3. **Specify whether to advance or delay the markers.**

   Advancing markers moves them to earlier times, delaying them moves them to later times. Click on the radio button next to the desired option.

4. **Choose whether to enter the shift amount in real or frame time.**

   Click on the radio button next to the desired option.

5. **Enter the amount of time by which you wish to shift.**

   Click in the text box and type in the number.

6. **Click on OK to confirm your entry or Cancel to ignore it.**

   You can use the Enter or Return key to confirm the entry or the Command and period keys to cancel it.

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 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.**

   Once you press OK, Performer will start playback. If in external sync mode, the Play button will turn grey 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 Consolidated Controls 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 out of the Record Hits mode; you must press stop in Performer to end recording hits.

Hints

Composing and Arranging

Below are some helpful hints for using Markers.

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 Edit Filter to specify if markers can be affected by Edit menu commands. In general, it is best to keep the markers box unchecked in the Edit Filter. Check the box only when you know you will be cutting, pasting, etc. markers; uncheck it after you have finished to prevent unwanted changes.

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 adjust meters and tempos until the metrical beats of the sequence line up satisfactorily with important visual events. This can all be done before recording a note of music.

In addition to using markers to define the structure 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. Once locked, the measure time location of the marker will be updated if you change the tempo and meter. The frame location will not change.

If the time code on the film or video should change due to restriping after assembly or editing, you can use the Shift Locked Markers command on the Markers window mini-menu to adjust the times of the hit points you've already labeled with markers.

If you have Mark of the Unicorn's Video Time Piece, you will definitely want to read the next section, which explains how markers can be used to trigger streamers.

Streamers and the Video Time Piece™

The Markers window has an additional capability designed for Mark of the Unicorn's video post-production device, the Video Time Piece. The Video Time Piece is a hardware device that can superimpose graphic images on a video picture, including *streamers*. A streamer is a solid white bar that travels across a video screen from left to right to reach the right-hand side of the screen at an exact hit point. Streamers help studio musicians and sound effects engineers to anticipate hit points during video post-production.

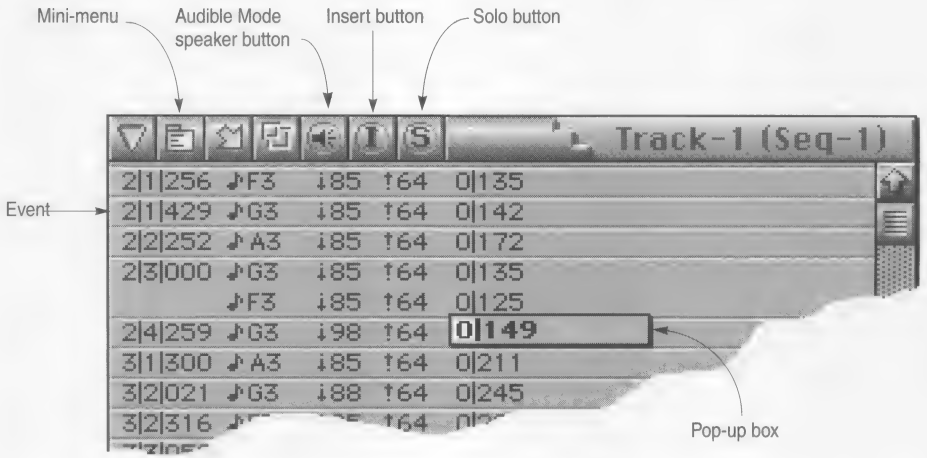
For more information, please refer to the chapter called *Performer and the Video Time Piece*.

Chapter 20 *The Event List Window*

Performer provides four ways to display and edit the data in each track of a sequence: the Event List window, the Graphic Editing window, the Notation Editing window, and the QuickScribe notation window, together referred to as the Event Editing windows. All of these windows can be open at the same time for a track, and any number of tracks can have windows open at any time. This chapter describes the Event List window. See the next two chapters for information on the Graphic Editing and QuickScribe notation windows.

The Event List window displays the MIDI data and other information in a track as a chronological list of "events". Examples of events are notes, controller data, and program (patch) changes. Other information that occurs in specific time locations can be displayed in an Event List as well: markers, meter changes, key changes, tempo changes, and loop points. The Event List window can be used to edit individual events or select a region of events for editing with menu commands. Event List windows for different tracks can be open at one time. Event List windows can be opened, scrolled, and edited during playback.

Quick Reference



Event: A row of information concerning a single MIDI message or Performer command. Events at different locations are separated by a dotted line. The information displayed for an event depends on its type; see the section *The Event List Display* below for more information.

Mini-menu: Choose items from the mini-menu in the same way as regular menus. The Event List mini-menu contains commands for inserting, controlling the display, and more. See the section called *Mini-menu* for more information.

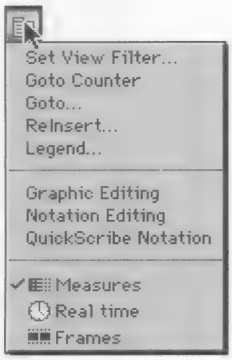
Audible Mode speaker icon: Click on this button to activate Audible Mode. Audible Mode plays back notes one at a time as you click on them in the Event List. An entire phrase can be played back by highlighting a region and option-clicking on the speaker icon.

Insert button: Inserts MIDI events into the Event List. Pressing this button produces a menu of items the can be inserted.

Solo Button: Mutes all other tracks during playback.

Pop-up box: A box that appears when you double-click or option-click on a field of an event. You can enter a new value for the field.

Mini-menu Quick Reference



Grow box: Drag this box to resize the Event List window.

Set View Filter: Calls up a dialog box from which you select the types of events which are visible in the Event List window. The View Filter applies to all open Event Editing windows.

Goto Counter: Automatically scrolls to the time currently displayed in the Counter.

Goto: Automatically scrolls the Event List display to a time you specify.

ReInsert: Inserts an event of the same type that you last inserted.

Legend: Opens a window that shows what each kind of MIDI event looks like in the Event List.

Graphic Editing: Opens the Graphic Editing window for the track.

Notation Editing: Opens the notation editing window for the track.

QuickScribe Notation: Opens the QuickScribe notation window for the track.

Measures/Real time/Frames: These checkable entries control the types of time displayed in the Event List.

Opening an Event List Window

If the Event List is already open for a track, you can simply click on it to activate it. If not, you'll want to open one.

To open an Event List window for a track:

1. **Open or activate the Tracks list window containing the track you wish to edit.**

   To open a Tracks window, choose Tracks from the Windows menu. To activate a window already open, click on it.

2. **Double-click on the track name.**

   The track's Event List window will appear.

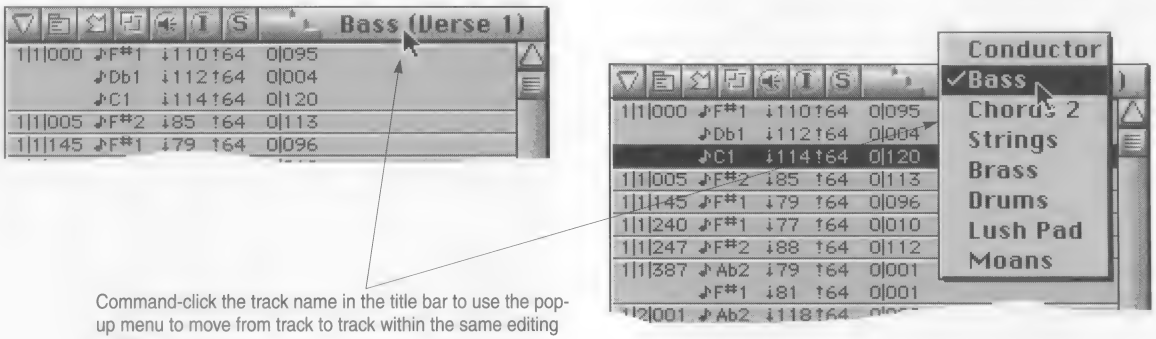
You can also open the Event List window by choosing Event List from the Graphic or Notation Editing window mini-menus.

Switching to a Different Track Using the Title Bar Pop-up Menu

If you have an event list window open for a track, you can switch to a different track in the same window. To do so:

1. **Command-click the track name in the title bar.**

   A pop-up menu appears as shown below.



Command-click the track name in the title bar to use the pop-up menu to move from track to track within the same editing window.

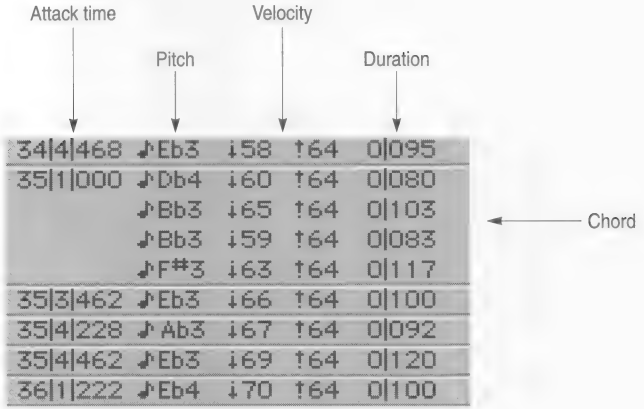
2. **Choose the desired track.**

   The contents of the window changes to the track you select.

The Event List Display

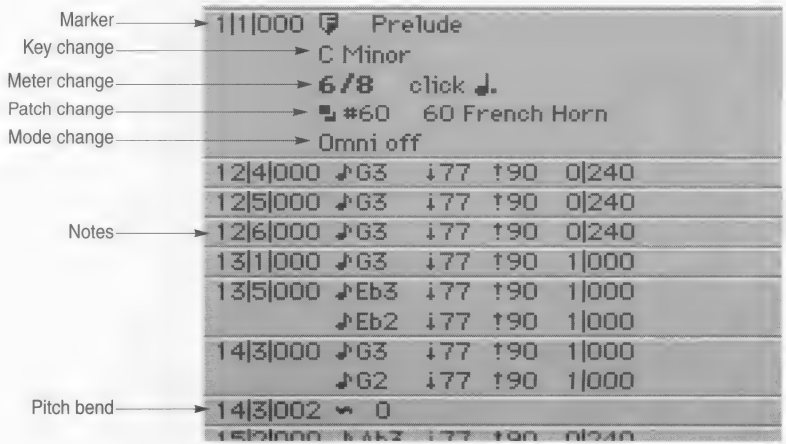
The Event List window displays MIDI data and other events sequentially. There is one event per line in the display. Events which occur at the same time (such as notes in a chord) will be grouped together between horizontal dotted lines. The starting time is listed only for the first event of these groups. Each note is defined by its attack time, pitch, on velocity, off velocity, and duration.

This example shows nine notes:



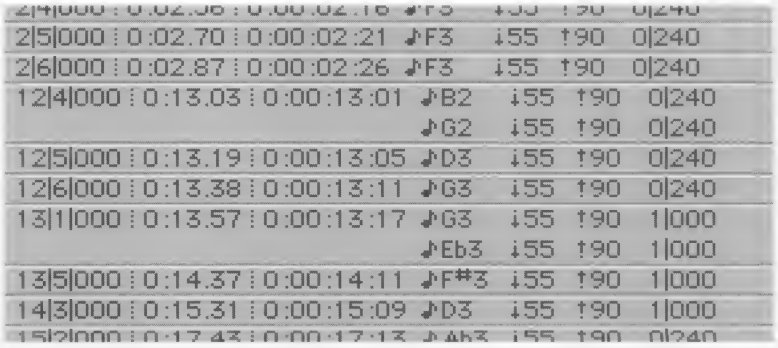
In addition to MIDI note events, there are other types of events that are displayed in the Event List as well. These events include other MIDI commands, like patch changes, and events unique to Performer, like markers and tempo changes.

The next example shows several different types of events. Some are MIDI data, like the patch change event, notes, and pitch bend. Others are Performer-related events, like the marker, key change, and meter change.



Looping points are also displayed on the Event List. Events within loop boundaries are indented. Events that will not be played due to the duration of a previous loop are in italics. See the *Looping* chapter for details.

Event locations can be displayed in measure|beat|tick, real time, or frame time formats. Any combination of the three types of times can be displayed simultaneously. To display a certain type of time, simply check its menu entry on the Event List window mini-menu. To turn off a format, reselect it from the mini-menu.



Scrolling During Playback

The Auto-Scroll command in the Basics menu can make the Event List window scroll during playback. In addition, the window will automatically open to the current playback location of the sequence. Please refer to the Auto-Scrolling section in the Playback chapter for more information.

Selecting Events in the Event List Window

The following actions select events:

To select a single event, click once on it.

To select several adjacent events, drag over the desired events. All events dragged over will highlight.

To select several non-adjacent events, hold down the Shift key and click on the events you wish to select. They will highlight.

To deselect events, hold down the Shift key and click on the event(s) you wish to deselect. They will unhighlight.

To extend the currently selected region, Command-click or Command-drag at the desired end location.

To edit an event, double-click or Option-click on the field you want to modify. A pop-up box appears in which you can edit the value in the field.

Tab approves the change you made and moves to the next field in the same event.

Return approves and completes the changes you made.

Enter approves the changes you make and moves to the same field in the next event.

the up or down arrow keys approve the changes you make and move to the same field in the next or previous event.

the left or right arrow keys move from field to field in the event box.

The View Filter

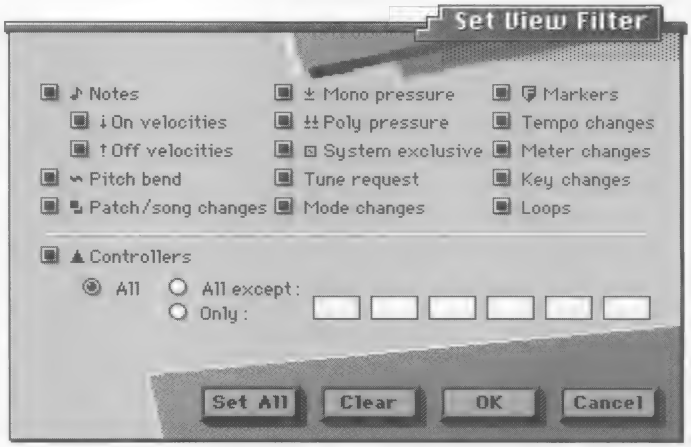
The View Filter allows you to specify what types of MIDI information are displayed in the Event Editing windows. You can open the View Filter dialog box from the mini-menu in any Event Editing window. The View Filter affects all Event Editing windows.

The View Filter also determines which types of events are affected by Edit menu commands when the data is selected in the Event Editing window. Here's a simple rule to remember: if you can see an event in the Event Editing window, it will be affected by edit commands.

To use the View Filter from an Event List window:

1. **Choose View Filter from the Event List mini-menu.**

   A dialog box appears.



2. **Choose the types of data to be displayed by checking the check box for each.**

   You can choose all types of data at once by clicking on the "Set All" button. You can uncheck all the check boxes by clicking on the "Clear" button. Option-click to check only the check box you click on, unchecking all others; command-click to check all boxes except the one you click on. Use the *Controllers* option to specify which controller information is displayed.

3. **Press OK to confirm your choice or Cancel to cancel it.**

When using the View Filter, keep these rules in mind: *The View Filter settings you select will stay in effect until you change them. They affect all open Event Editing windows. The View Filter settings will affect all edit operations done in the Event Editing windows.*

Specifying Controller Numbers in the View Filter

The buttons under the Controller check box in the View Filter allow you to quickly choose which controller data to be displayed. Click in the Controllers check box, click on the type of option you wish and then enter the controller numbers if necessary.

- *All:* displays *all* controllers.
- *All except*: displays all controllers *except* the numbers you enter.
- *Only:* displays *only* the controller numbers you enter.

To enter controller numbers for the *All except* and *Only* options, click in the text boxes next to the option and type in the numbers. You can use the Tab key to move between boxes in the same option.

Goto Counter

Choosing Goto Counter automatically scrolls the Event List to the location currently displayed in the Counter window. This command is a quick and useful tool for locating specific events in an Event List. For example, if you hear a wrong note in your music during playback, stop playback at that point, and then select Goto Counter in the Event List for the track. This immediately scrolls the Event List to the point where you stopped, allowing you to find and correct the mistake quickly.

To use the Goto Counter command:

1. **Activate the Event List window for the desired track by clicking on it.**
2. **Choose Goto Counter from the Event List window mini-menu.**

   The list will automatically scroll to the event closest to the time in the Counter window.

Goto

The Goto command on the Event List window mini-menu scrolls the Event List display to the specified location. It is a quick way to locate a region of events without having to manually scroll through the Event List.

To use the Goto command:

1. **Activate the Event List window for the desired track by clicking on it.**
2. **Choose Goto from the Event List window mini-menu.**

   You will be prompted for a location to scroll to.

3. **Enter a time location to scroll to.**

4. **Press OK.**

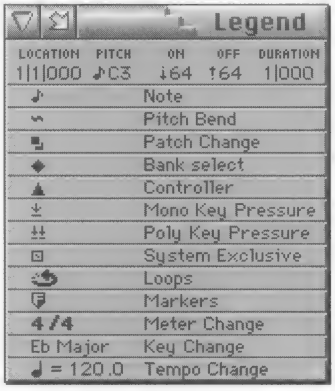
   The list will automatically scroll so that the event closest to the time you entered will be at the top.

ReInsert

The ReInsert command inserts an event of the type last chosen with the Insert command. It works exactly like the Insert button except that you don't need to select a type of event from a menu. For example, if you insert a patch change with the Insert button, the next ReInsert command will insert a patch change as well. For more information, see the section called *"Inserting events with the insert button" on page 272.* As a shortcut for choosing Reinsert from the mini-menu, option-click the Insert button.

Legend

The legend window can be opened by choosing *Legend* from the Event List mini-menu. The legend window defines each icon found in the Event List.



Graphic and Notation Editing

The Graphic Editing and Notation Editing commands open the Graphic Editing or QuickScribe notation windows. Data in the track can be viewed in any one of these three windows. Editing in a window will affect the data in the track, regardless of which window you have activated. For example, if you edit a note while in the Event List window, the change will be displayed in the Graphic Editing window as well.

Types of Events

There are several types of events displayed in the Event List window. Most are MIDI data; some are events internal to Performer such as tempo and meter changes. The type of each event is identified by a small icon. The following section describes the appearance and parameters of each type of event.

Notes

A note event comprises a start time, a pitch, an on velocity, an off velocity and a duration. The pitch is expressed as a note name and an octave, e.g. C#4. C3 is middle C on a keyboard, although with some patches it might sound in another octave. The spelling of the note name is determined by the key signature you choose.

On velocity is a value that represents how hard a note is struck. The harder you strike a note, the faster you are pressing it down, hence the term "velocity". Off velocity is a value that represents the speed at which a note is released. Many synthesizers don't respond to off velocities, but some use this information to determine envelope decay parameters or other effects. Values of on and off velocities range from zero to 127. You can omit on and off velocities from the Event List display by unchecking them in the View Filter.

Duration is the time between the attack and release of the note. It is displayed in quarter notes and ticks, e.g. 3|240. Note that this is different from measure time, displayed in measures, beats and ticks. There are 480 ticks per quarter note. A note must have a minimum duration of one tick (0|001).

Pitch Bend

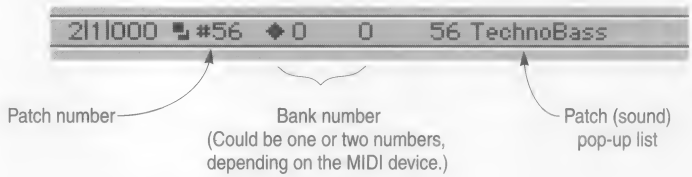
A pitch bend event comprises a start time and a value. Pitch bend data causes the pitch of notes being played to change. When a stream of pitch bend data occurs, a smooth pitch change can be approximated. A value of zero signifies no bend, increasing values bend the pitch up, and decreasing values bend it down. Values are in the range -8192 to 8191.

There is no specific MIDI standard for how much of a bend specific pitch bend data causes: each synthesizer may be different. Also, some synthesizers do not respond to all 16,384 values; adjacent values may produce the same result.

Patch Change

A patch change event has a start time and a patch change number. When a synthesizer receives a patch change, it changes to the patch specified by that number.

Patch changes are generally in the range 0 to 127. Some MIDI devices use the range 1 to 128. In such cases, the patch number displayed in Performer may be one less than the number on the MIDI module. Performer thus would display a zero when a 1 was sent, a 9 when a 10 was sent, etc. Some units have more than 128 patches. Since MIDI only allows for 128 different patch values to be sent, there is no direct way to access patches above the 127th one. In this case, there is usually some way to set up banks (groups) of patches and switch banks via a "bank select" MIDI command. If this is the case, and the device has been set up with bank select messages in FreeMIDI, patch change messages for the device appear with the appropriate bank select number as shown below. The bank number automatically appears in tracks assigned to a device that was given the bank select property in FreeMIDI Setup. (See "Setting up bank select devices in FreeMIDI" on page 749.) If the track is assigned to a non-bank select device, no bank number is shown.



Song Change

1|1|000 Song #127

Song changes, also called *song select*, select songs (a collection of rhythmic patterns) on drum machines. They have a value range of zero to 127. Song changes have no channel number when sent over MIDI: all connected instruments receive them.

Mono Key Pressure

± 56

Also known as aftertouch or channel pressure, this is actually a special kind of controller. A mono key pressure event has a start time and a value between zero and 127. If you continue to press down a key after you play a note, mono key pressure information is sent. The harder you press, the higher the value. Mono key pressure can be used for such things as changing the timbre (tone quality) of a sound or controlling the amount and depth of vibrato.

Mono key pressure data can be voluminous, filling up memory very quickly. If you aren't using mono key pressure information, it is best to use the Input Filter to filter it out while recording. Because of its

great volume, mono key pressure data can sometimes cause the playback speed to slow down when output with a fair amount of other MIDI data.

Poly Key Pressure

This is similar to mono key pressure except that each key can generate its own pressure information instead of one pressure level for the whole instrument. This allows for much more subtle and complicated effects using aftertouch. A poly key pressure event has a start time, a pitch and a value between zero and 127.

Controllers

A controller event has a start time, a controller number which identifies the device being used (on the MIDI input keyboard), and a value. Continuous controllers (such as wheels and sliders) are generally numbered in the range zero to 63. These have value ranges from zero to 127. Switch controllers (on/off types like a sustain pedal) are numbered from 64 to 93 and have values of either On or Off. Controllers from 93 to 127 are reserved for future definitions.

Each MIDI device can interpret controller data differently. Thus, data from the same controller might be used differently on two different synthesizers. To determine how a controller behaves on a particular unit, consult the owner's manual, and see the *Hints* section below.

System Exclusive

System exclusive data can be used for a variety of purposes. Each musical instrument manufacturer defines special kinds of data that are particular to specific instruments: patch dumps, drum machine patterns, tuning information, sample data and so forth. System exclusive data begins with an ID code specifying the manufacturer followed by the actual data.

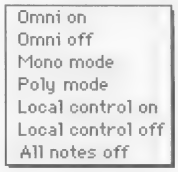
Performer lets you view and edit system exclusive data in hexadecimal (base 16) notation. See the *System Exclusive* chapter for more information.

Tune Request

The tune request is used for analog synthesizers, prompting them to tune their oscillators. It has no value and does not have a channel number when sent over MIDI: all connected MIDI instruments will respond to it if applicable.

Mode Changes

MIDI modes are used to set synthesizers to respond to MIDI data in different ways. Not all synthesizers respond to all MIDI modes.



Omni Mode

A synthesizer is always in either omni on or omni off mode. In omni on, a synthesizer responds to all data on any channel, i.e. all 16 channels at once. In omni off, a synthesizer responds to data only on its assigned channel. Usually, you can change this mode on the synthesizer's front panel. Some synthesizers allow you to change this mode via MIDI.

Mono Mode

In mono mode with omni off, a synthesizer splits itself into a number of independent monophonic synthesizers, each responding to one channel. The assigned channel number of the synthesizer determines the channels it responds to. If you had an eight-voice synthesizer assigned to channel 2, it would respond to data on channels 2, 3, 4, 5, 6, 7, 8, and 9.

In mono mode with omni on, a synthesizer receives data from *all* channels but acts as a single voice synthesizer. This combination is not very useful.

Local Control

A synthesizer is always in either local control on or local control off mode. In local control on mode, the synthesizer works normally: notes pressed on the keyboard are played by the synthesizer unit. In local control off mode, the keyboard is disconnected from the synthesizer unit. The keyboard sends out data directly through MIDI; the synthesizer only plays data received over MIDI. This allows you to use a synthesizer as a controller while simultaneously using its synthesizer unit to play something else.

All Notes Off

The all notes off message causes all notes that are currently sustaining to be shut off.

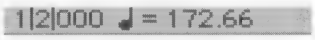
Markers

Markers are displayed for reference in the Event Editing windows for all tracks in a sequence. They cannot be edited in the Event Editing windows for normal tracks. Unlocked markers can be edited in the Conductor track. Locked markers can only be edited in the Conductor track. Locked markers can only be edited in the Markers window.

Meter Changes

Meter changes are displayed for reference in the Event Editing windows for all tracks in a sequence. They can only be edited in the Event Editing windows for the Conductor track. Meter change events display the time signature (the number of beats per bar, over the duration value which gets the beat) and the click value (the duration value between metronome clicks). See the *Change Meter* chapter for more information.

Tempo Changes



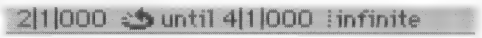
Tempo changes can be displayed and edited in the Event Editing windows for the Conductor track. Tempo change events display the duration value for the tempo marking, i.e. which value the tempo is measured in (quarter note = 90 for example), and the tempo value itself, which signifies the number of beats per minute. See the *Change Tempo* chapter for more information.

Key Changes

Key changes are displayed for reference in the Event Editing windows for all tracks in a sequence. They can only be edited in the Event Editing windows for the Conductor track. Key change events display the name of the key. See the *Change Key* chapter for more information.

Loops

The loops for each track are displayed in the Event Editing windows for that track. A loop event displays the start and end time of the loop and the number of times the loop is played. A loop event can be edited in the Event Editing windows for the track that contains it. Events within loops are indented to the right for clarity. See the chapter *Looping* for more details.



Editing in an Event List

Commands in the Edit and Region menus work on events in Event List windows. This gives you the ability to precisely specify which events to modify. Using the Event List window to edit events allows you to work with one track at a time.

To edit events in an Event List window, you must first select them, and then execute an edit or region command. For information on selecting events, refer to the *Quick Reference* section at beginning of this chapter. Selected events turn black to indicate that they are selected. Here are a few important things to remember when editing in the Event List.

- **Only highlighted events will be affected by the command.** Also, events not visible due to the View Filter setting will not be affected.
- **The Edit Filter has no effect on highlighted events.** Use the View Filter to display and edit only those events which you wish to edit. If you wish to use the Edit Filter, select events using the Edit bar in the Tracks window.
- **The Paste and Merge commands on the Edit menu work as follows:** If one or more events are highlighted, the contents of the Clipboard are pasted at the time of the first highlighted event. If no events are highlighted, you will be asked for the time at which the contents of the Clipboard should be inserted.
- **The Snip, Repeat, and Retrograde commands do not affect highlighted events.** When using these commands, you must use the Edit bar in the Tracks window to select events.
- **Markers, key changes, meter changes, and tempo changes can be edited only in the Conductor track.** They are not affected when highlighted or when you attempt to edit them directly in normal Event Lists. This allows you to select large regions of events without having to worry about excluding these events.

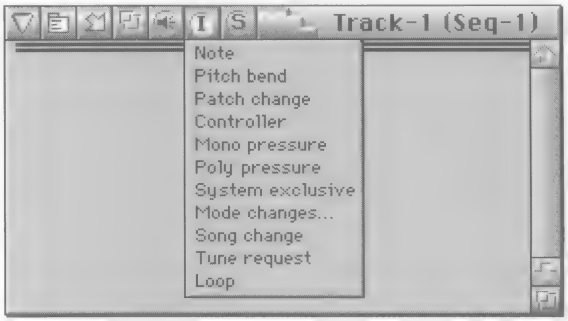
Inserting events with the insert button

The Insert button on the Event List window title bar inserts an event of the specified type. To insert an event:

1. **Activate the Event List window for the desired track by clicking on it.**

2. **Press the insert button in the title bar.**

   A menu will appear containing the different types of events you can insert.



3. **Choose the type of event you wish to insert.**

   An event will pop up in front of the Event List.

4. **Specify the time at which the event is to be inserted.**

   If you wish to change other values for the event, use the Tab or the left and right arrow keys to move between the value fields. For example, tabbing 3 times in the above example moves the active field as shown below.

5. **To enter the event, press Return.**

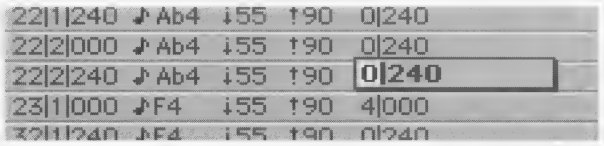
   The event will be inserted into the Event List. If you will be inserting another event of the same kind, press the Enter key instead of Return. This will insert the event and present you with another to be inserted. Click outside of the event to cancel the Insert.

When inserting Mode changes, or System Exclusive data, extra steps are required. To insert a Mode change, select Mode changes from the pop-up Insert menu. The pop-up menu will change to display the options for Mode changes; select the desired command and continue as described above.

See the *System Exclusive* chapter for information on inserting this type of data. See the chapter *Change Key* for information on inserting key changes.

Editing Individual Events

To edit any parameter field of an event in the Event List window, hold down the Option key and click on the field. You can also double-click on the field. In most cases, a pop-up box will appear surrounding that field in which you can enter the value you want; some events display a dialog box.



Once you begin to edit events by using pop-up boxes, you can use the Tab, Enter, and arrow keys to move between fields and events.

Here is a list of the keys you can use when a pop-up box is present:

- *Return* enters the value and closes the pop-up box.
- *Command-period* cancels the entry.
- *The Enter and Down Arrow keys* enter the value and highlight the same field in the next event.
- *The Up Arrow key* enters the value and highlights same field in the previous event.

- *Tab and the Right and Left Arrow keys* move through each field of an event.

Changing Event Values from a MIDI Controller

You can use your MIDI input keyboard to enter values for events. When a pop-up box is present for a parameter field, if you send an event over MIDI of the same type as the parameter, it will be entered into the field. For example, if the pitch field of a note event is highlighted, playing a note on your MIDI controller will set the corresponding pitch for the event in Performer.

This technique is particularly useful when you are uncertain of a value. For example, you can set an on velocity for a note by double-clicking on the on velocity field so that it pops up, then hitting a key on your controller until the note velocity sounds correct. Each time you hit the key, the new velocity appears in the pop up box; when you hear the one you want, simply press the Return key to save the value in the Event List.

Remember Times

The Remember Times command is used to remember the beginning and end times of selected regions in the Tracks, Event Editing, and Markers windows.

To remember the beginning and end times of a selected region:

1. **Activate the window with the times you wish to be remembered.**

2. **Select the region whose beginning and end times are to be remembered.**

   In a Tracks window, specify the Start and End times of the region in the Edit bar; these will be remembered. In an Event Editing window, select a region of events (see the section earlier in this chapter on how to select a region of events in the Event List window; also see the chapter *The Graphic Editing Window*): the times of the first and last events in the selected region will be remembered. In a Markers window, select a region of markers (see the chapter *The Markers Window*): the times of the first and last markers in the selected region will be remembered.

3. **Choose Remember Times from the Basics menu.**

   The beginning and end times are now remembered.

4. **To insert the remembered times into the Edit, Memory, or Auto Record Bars, click on the Edit button in the Tracks window edit bar, or clock on the Memory or Auto Record button in the Consolidated Control Panel.**

The remembered times will be loaded into the Edit Bar of the Tracks window if the word "Edit" is clicked on; they will be loaded into the Memory Bar in the Consolidated Controls panel if the word "Memory" is clicked on; they will be loaded into the Auto Record Bar in the Tracks window if the words "Auto Record" are clicked on.

Audible Mode

Audible Mode allows you to listen to notes one at a time, or phrase by phrase, as you highlight them in a Performer track. This feature appears as a speaker icon in the title bar of each track's Event Editing windows. Audible Mode provides an easy, intuitive way to see *and hear* an individual note or phrase while you are working in Performer's editing windows. Notes can be played back one at a time by clicking on them individually or as a phrase by highlighting a region.

Audible Mode playback is similar to pressing the Play button in the Consolidated Controls panel, including MIDI channel assignment and velocity information. If you click on a note and don't hear anything when Audible Mode is activated, make sure that your MIDI connections are set up properly and that your synthesizer is ready to receive MIDI data. If MIDI data in a track plays back correctly when you press the Play button in the Consolidated Controls panel, it will play back properly in Audible Mode as well.

Enabling Audible Mode

To enable Audible Mode:

1. **Open the Event List or Graphic Editing window for a track.**

   Either double-click on the track name in the Tracks window, or click on the track name once and chose *Edit* from the mini-menu.

2. **To turn on Audible Mode, click once on the speaker icon in the title bar.**

   The icon will highlight to indicate that Audible Mode is activated. When Audible Mode is activated, it affects all Event Editing windows.

3. **To turn off Audible Mode, click on the speaker icon again.**

   The icon will deselect to indicate that Audible Mode is turned off.

Playing Individual Notes

When Audible Mode is enabled and you click on a note in the Event Editing Window, the note will simultaneously select and play back on your MIDI instrument. The note will sustain for as long as you hold down the mouse button. When you release the mouse, the note will stop. If you click on a note and drag up or down to highlight adjacent notes, each note will play individually as it highlights. Notes will play in the same fashion when you shift-click to highlight discontiguous (non-adjacent) notes. If you shift-click to deselect an already highlighted note, the note will play when it unhighlights. In general, when you highlight or unhighlight a note, it will play back for as long as you hold down the mouse.

Playing Phrases

Using the Audible Mode speaker icon, it is also possible to play a *group* of notes that are highlighted in the Event List.

To play a phrase:

1. **Highlight one or more MIDI events in the Event List window.**

   You can highlight the events by clicking and dragging, or by shift-clicking on discontiguous events.

2. **Option-click on the speaker icon on the Event List title bar.**

   The speaker icon does not have to be highlighted. Option-clicking—even if Audible Mode is not currently enabled—will cause the highlighted events to play back.

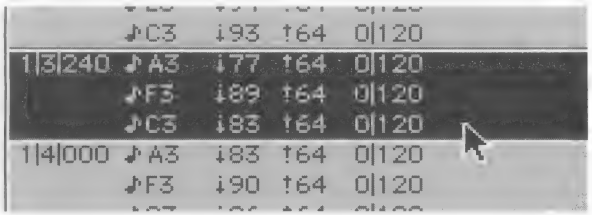
When you option-click on the speaker icon, all MIDI data that are currently highlighted will play back with the proper duration and velocities. The tempo of the phrase is determined by the current

tempo slider setting in the Metronome panel. Playback can be stopped at any time by clicking the mouse or striking a key on the Macintosh keyboard.

The phrase can be a contiguous (adjacent) group of notes that you have highlighted by clicking and dragging or a discontiguous group of notes that you have selected by shift-clicking. Notes that are not highlighted will not play.

Playing Chords

Audible Mode allows you to hear chords one note at a time, all at once, or only with selected notes. To listen to a chord one note at a time, enable Audible Mode by clicking on the speaker icon. Click on the first note of the chord and drag downward while holding down the mouse button. Or you can start on the last note and drag upward. Each note in the chord will play as it highlights.



To hear the entire chord at once, highlight all of the notes and option-click on the speaker icon. To hear only selected notes within the chord, highlight only the notes you wish to hear and option-click on the speaker icon.

Playing MIDI Data Other Than Notes

Only notes will play back when you highlight them in Audible Mode. Other MIDI events such as controllers or pitch bend can be played with the play-phrase feature. For example, to send a patch change to a synthesizer directly from the Event List, highlight the patch change and option-click on the Audible Mode speaker icon. System exclusive data cannot be played back in Audible Mode. To play back a system exclusive event, press the Play button in the Consolidated Controls panel.

Hints

You can use the Event List to find out useful information about the way your MIDI instruments output data. For example, you can use the Event List window to determine the controller number for a wheel, slider, foot pedal, etc. Make sure that the MIDI output from the device in question connects to the MIDI input of your interface; then:

1. **Locate a controller event in an Event Edit window.**

   If you can't find one, insert one.

2. **Option-click on the controller number field to make a pop-up box appear.**

3. **Move the controller on your input keyboard.**

   The controller number will be displayed in the pop-up box.

4. **Press the Return key to save the event, or the Command and period keys to close the pop-up box without making any changes.**

You can use a similar technique to find the patch numbers that correspond to each preset on a MIDI module. Make sure that the MIDI output from the device in question connects to the MIDI input of your interface; then:

1. **Find a Patch Change event in an Event List window.**

   If you can't find one, insert one.

2. **Option-click on the patch number field to make a pop-up box appear.**

3. **Select the preset or patch on the MIDI module.**

   The patch number box in Performer will display the MIDI patch number corresponding to the preset.

4. **Press the Return key to save the event, or the Command and period keys to close the pop-up box without making any changes.**

You can insert multiple events of the same type quickly by first inserting the event, selecting a region including the event by setting the Edit bar in the Tracks window, and then choosing Repeat from

the Edit menu. This will effectively duplicate the event the specified number of times. You can then go back and edit the locations and values of each event.

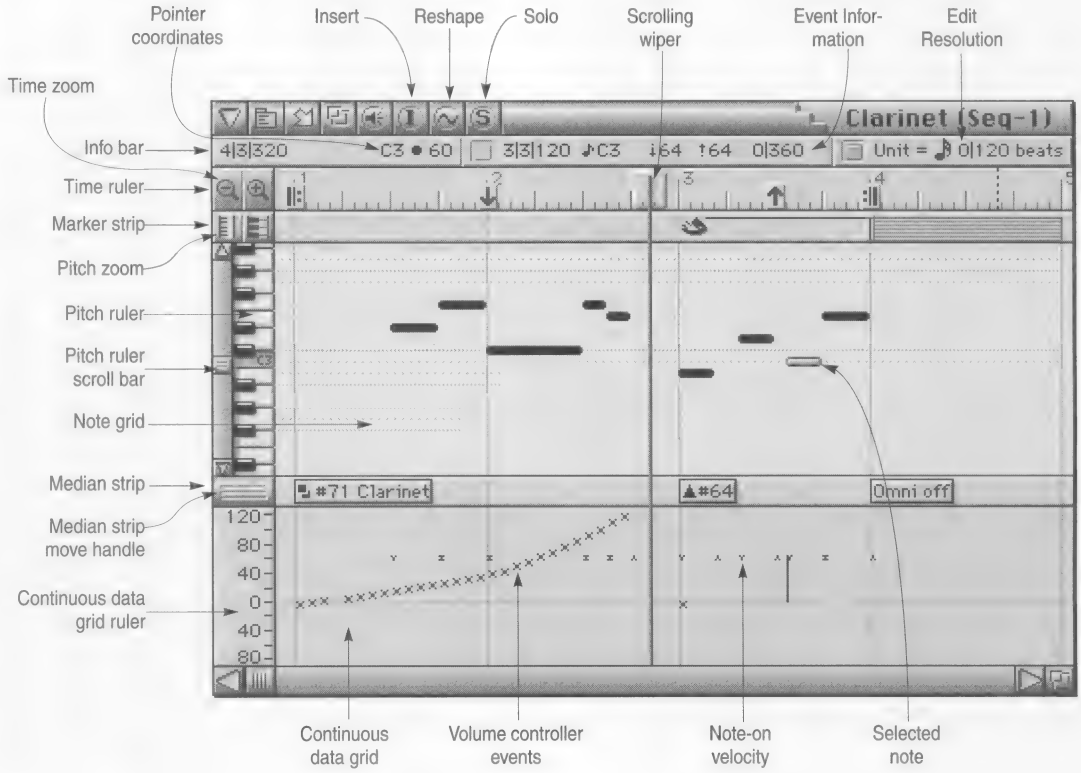
Chapter 21 *The Graphic Editing Window*

Each track in a Performer sequence can be viewed with the Graphic Editing window. The Graphic Editing window plots notes, velocities, and MIDI controller data on a scrolling, piano-roll graph that makes melodies, chords, dynamics, and tempo changes easy to recognize. Graphic editing is provided as a visual alternative to the numeric display in Performer's Event List window. All tracks can be viewed with either window at any time.

The Graphic Editing window clearly organizes information by displaying MIDI data in the center of the window and then surrounding the data with descriptive information such as loop indicators, markers, key changes, and meter changes. MIDI data is placed on two grids flanked by rulers that precisely measure location and value. Best of all, Performer's Graphic Editing window lets you see all types of data—notes, controllers, and pitch bend—in one window.

Quick Reference

The diagram below and the following *Quick Reference* section describe the basic features of the Graphic Editing window:



Information bar: Displays precise information about mouse pointer location, currently selected MIDI data, and editing resolution. The bar is divided into three boxes: the Pointer Coordinates Box, the Event Information Box, and the Edit Resolution Box.

Pointer Coordinates Box: Displays the mouse pointer's current location with respect to the Time, Pitch and Continuous Data rulers.

Insert Button: Pops up the *Insert* menu when clicked, from which any type of MIDI event can be chosen for insertion.

Reshape Button: Changes the mouse pointer to a cross hair that reshapes continuous data curves when you drag over them in the Continuous Data Grid.

Solo button: Mutes all other tracks during playback.

Event Information Box: Displays the currently selected note as it would appear in the Event List window. If a region is selected by dragging in the Time Ruler, this box shows the region's start and end time. If a group of events is selected, this box displays information about the last event that was selected. If a continuous data event is selected, events of that data type can be viewed alone by clicking the accompanying Quick-Filter check box.

Edit Resolution Box: Displays the current time resolution for editing. When the check box is selected, notes and data will 'snap' to locations that correspond to the resolution displayed. If the check box is deselected, data will not 'snap to grid'. Edit resolution can be changed by typing in a different number of beats | ticks, or by clicking on the note and selecting a duration from the resulting pop-up menu.

Time Ruler: Measures time in any combination of Performer's three time formats: measures | beats | ticks, SMPTE time, and real time. The Time Ruler can zoom in and out to enlarge or reduce the Note Grid and Continuous Data Grid.

Main Ruler Selector: Changes an auxiliary ruler into the main ruler. The main ruler is the lowest ruler displayed and determines the time format for editing. Auxiliary rulers are for visual reference only.

Marker Strip: Displays markers, meter changes, key changes, and loops. Loops can be edited in this strip. Markers and meter changes must be edited in the Conductor track or Markers window. No MIDI data appears in the Marker Strip.

Note Grid: Displays notes as horizontal bars on a time vs. pitch grid. Only notes are displayed on this 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. Notes can be edited with the mouse one at a time, in a group, or by region.

Selected Note: When a note is selected, it highlights. Complete information about the selected note will automatically appear in the Event Information box at the top of the window. Drag the end of the note to change its duration.

Median Strip: Displays discrete MIDI events such as patch changes, mode changes, switch controllers like #64 (sustain), and system exclusive events. Each type is displayed as an icon, defined by the Legend window. The Median Strip serves as a border between the Note Grid and the Continuous Data grid; it can be dragged up and down with the handles at either end to proportionally resize the grids.

Median Strip Move Handle: Moves the Median Strip up or down. Dragging up will shrink the Note Grid and enlarge the Continuous Data Grid; dragging down will enlarge the Note Grid and shrink the Continuous Data Grid.

Continuous Data Grid: Displays continuous data as small icons on a time vs. value grid. Pitch bend, key pressure, controllers, and note velocities are displayed simultaneously on this grid. An event's location is measured by the Time Ruler at the top of the window. Value is determined by the Continuous Data Ruler on the left. Each type of continuous data has a unique icon.

Continuous Data Ruler: Measures continuous data events. This ruler can be toggled between three scales: a controller scale from 0 to 127, whose origin rests at the bottom of the window; a pitch bend scale from -8192 to 8191, whose origin appears in the middle of the grid; and a combination scale that shows both pitch bend and controller data at once on a -80 to 127 scale. Toggle among the three scales by clicking on the ruler.

Pitch Ruler: Measures pitch along the vertical axis with a standard keyboard format. Each C-natural indicates the octave. For clarity, dotted lines extend to the right from each key: a heavy dotted line for black keys and a light dotted line for white keys. With the Pitch Zoom icon, this ruler can zoom in or out to increase or decrease the number of visible octaves.

Pitch Zoom Icon: Zooms the pitch ruler in or out. Click on the large keys to zoom in; click on the smaller keys to zoom out. Four pitch zoom settings are available. Zooming out allows you to see more octaves at once. Zooming in allows you to focus on a particular pitch range.

Time Zoom Icon: Zooms the Time Ruler in or out. Click on the 'in-pointing' arrows in the upper half to zoom in; click on the 'out-pointing' arrows in the lower half to zoom out. Eight time-zoom levels are available. 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.

Basics

Graphic Editing is available in all tracks, including the Conductor Track. The piano-roll display of notes and the Continuous Data Grid allows you to manipulate MIDI data using many of the conventions established by Macintosh paint programs. For example, you can drag a note to change its location; you can lengthen the note by dragging its handle. If the Edit Resolution feature is enabled, the note, when moved, will 'snap' to a time grid. You can select a group of notes by dragging a selection box over them. When you release the mouse, notes inside the box will become selected. Most of the features described in this chapter can be used during playback.

Viewing Data three different ways

Each track in a Performer sequence contains MIDI data. This data can be viewed with the Event List window, the Graphic Editing window, or the QuickScribe notation window. The data in the track is the same regardless of which window you use. For example, if you edit data in the Graphic Editing window, the changes you make will be immediately reflected in the track's Event List window.

Opening the Graphic Editing Window

To open the Graphic Editing window for a track:

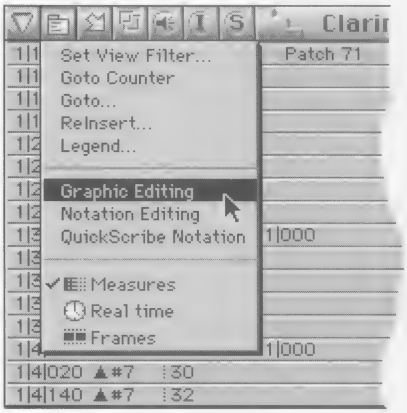
1. **Activate the Tracks window that contains the track you wish to edit.**

   Click once on the Track window to activate it.

2. **Command-double-click the track name.**

   The Graphic Editing window will appear.

You can also open the Graphic Editing window by choosing Graphic Editing from the Event List window mini-menu.



Displaying More Than One Event Editing Window at a Time

All three types of Event Editing windows for a single track can be open at the same time. Changes in one window are immediately reflected in the other. The current position of each window is remembered when you save the file.

Scrolling During Playback

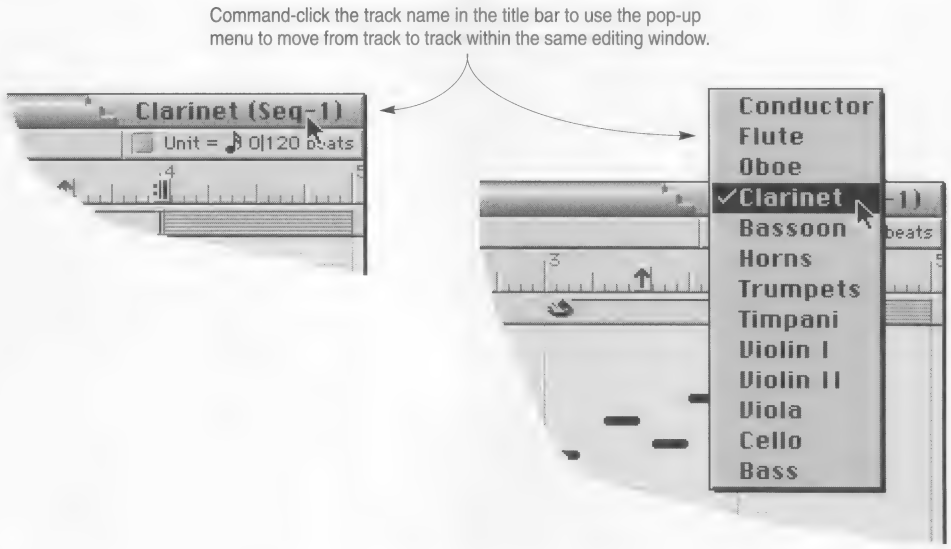
The *Auto-Scroll* command in the Basics menu can make the Graphic Editing window scroll during playback. In addition, the window will automatically open to the current playback location of the sequence. Please refer to the Auto-Scrolling section in the *Playback* chapter for more information.

Switching to a Different Track Using the Title Bar Pop-up Menu

If you have an event editing window open for a track, you can switch to a different track in the same window. To do so:

1. **Command-click the track name in the title bar.**

   A pop-up menu appears as shown below.



2. **Choose the desired track.**

   The contents of the window changes to the track you select.

The Graphic Editing Window Mini-menu

This menu is available in the title bar of every track's Graphic Editing window.

Set View Filter: Calls up a dialog box in which you specify types of events to be visible in the Graphic Editing window. The View Filter applies to all tracks and affects both the Graphic Editing and Event List windows.

Goto Counter: Automatically scrolls the graphic display to the time currently displayed in the Counter. The counter location will appear at the left-most position in the window.

Goto: Automatically scrolls the graphic display to a time you specify, which will appear at the left-most position in the window.

ReInsert: Inserts an event of the same type that you last inserted. This is the same as the Insert command but you are not prompted for the type of event. This command can also be invoked by option-clicking on the Insert (I) button on the Graphic Editing window title bar.

Reshape: Changes the mouse pointer to a cross hair that reshapes selected continuous data curves when you drag over them in the Continuous Data Grid. This command can also be invoked by clicking the Reshape button in the title bar.

Legend: Produces a window that shows the icon representing each type of MIDI event.

Set Rulers: Allows you to configure the Time Ruler in any combination of Performer's three time formats: measures | beats | ticks, SMPTE time, and real time. The main ruler is displayed lowest and determines the time format for editing.

Cont. Data Icons: Opens the Continuous Data Icons window, which displays icons for each type of continuous data. This window also allows you to reassign controller icons.

Set Ptr. Coords...(Set Pointer Coordinates): Allows you to choose what time and pitch formats will be displayed in the Pointer Coordinates Box.

MIDI Edit: Allows data in the graphic editing window to be edited from a MIDI controller.

Switches are Cont. Data: Causes all controllers, including switch controllers #64 and above, to be displayed and edited as continuous controllers. This is useful for MIDI devices, such as MIDI-controlled lighting consoles, that use all MIDI controllers as continuous controllers.

Selections use Edit Resolution: Causes the cursor to snap to the edit resolution when dragging to make selections in the note grid, time ruler, and continuous data grid.

Event List: Opens the track's Event List window.

Notation Editing: Opens the track's Notation Editing window.

QuickScribe Notation: Opens the QuickScribe notation window with the track displayed in it by itself.

Measures|Real time|Frames: These checkable entries control which time formats are displayed in the Information Bar and Event List.

The Insert Button

The Insert button appears in the title bar of the Graphic Editing window. It only appears when the window is in Graphic Editing mode. When the Insert button is clicked, the Insert menu appears, from which you can choose the desired event to be inserted by clicking once on the event type. An event will pop up to be inserted.

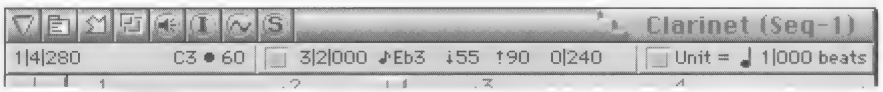
Option-clicking the Insert button is just like choosing ReInsert from the mini-menu.

The Reshape Button

The Reshape button appears next to the Insert button. When the Reshape button is clicked, the mouse pointer changes to a cross hair. When you drag the cross hair over a selected curve in the Continuous Data Grid, the curve will reshape as you drag. For more information about reshaping continuous data, see the section later in this chapter called *Reshaping a Continuous Data Curve.*

The Information Bar

The Information Bar at the top of the Graphic Editing window appears just below the title bar and is divided into three sections separated by doubled lines. The sections display precise, numeric information about mouse location, currently selected data, and minimum editing resolution. MIDI data in the bar is displayed as it would appear in the Event List window.



Sometimes, information in each box may extend beyond the space provided and will be clipped on the right side of the box. If so, enlarge the Information Bar by dragging the window's grow box to the right.

The Pointer Coordinates Box

The Pointer Coordinates box is the left-most section in the Information Bar. It displays the current location of the mouse pointer with respect to the Time, Pitch and Continuous Data rulers. Values in this box are continually updated as the mouse pointer moves over the Note Grid and Continuous Data grid, giving you immediate, numerical accuracy when manipulating data with the mouse.

The pointer's horizontal coordinate can be expressed in measures | beats | ticks, SMPTE time, or real time. Which time formats are shown is determined by the Set Pointer Coordinates menu item in the Graphic Editing window mini-menu.

To set the Pointer Coordinates box display:

1. **Choose Set Ptr. Coords... from the Graphic Editing window mini-menu.**

A dialog box appears.

2. **Check the time and pitch formats you prefer.**

   You can select any time format combination, independent of the Time rulers that are displayed.

3. **Click OK to confirm your choice or Cancel to cancel it.**

The pointer's time and pitch coordinates will be expressed in each selected format. For example, if both Measures and Frames are checked in the mini-menu, the mouse position will be displayed in both measures and SMPTE time.

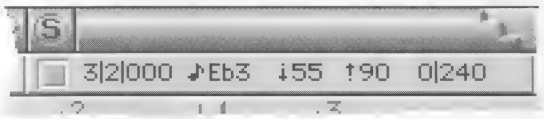
The pointer's vertical coordinate depends on its location: if it is in the Note Grid, the vertical coordinate may be expressed as a pitch, such as C3, and its MIDI note number, 60.

If the pointer is in the Continuous Data Grid, the vertical coordinate is expressed as a continuous data value on one of three scales: 0 to 127, -8192 to 8191, or -80 to 127, depending which is currently displayed by the Continuous Data Ruler.

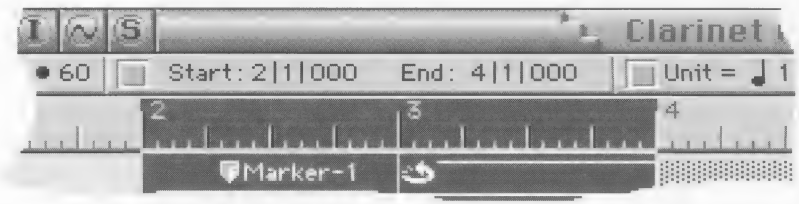
If the pointer is in the Median Strip, no vertical coordinate is shown.

The Event Information Box

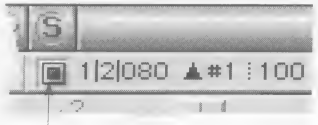
The Event Information box displays numerical information about a single event or region that has been selected. This box displays data in the same way as it appears in the Event List window. For example, a selected note will appear with its measures | beats | ticks location, pitch, on and off velocity, and duration.



If a region is selected by dragging in the Time Ruler, the Event Information box displays the start and end locations of the selected region.



If more than one event is selected by shift-clicking or dragging, the box displays information about the event that was last clicked.



Quick Filter check box

When a continuous data event is selected in the Continuous Data Grid, the *Quick-Filter* check box appears next to the event's data. When clicked, the check box causes all other data types to temporarily disappear from the Continuous Data Grid; the selected type remains visible. For example, if you select a controller #3 event and click the Quick-Filter check box, all controller #3's will remain visible and other data types, such as pitch bend and velocities, will disappear. To make the other data types reappear, deselect the check box.

Information displayed in the Event Information box can be pop-edited by clicking an item. As normal, the Tab key and arrow keys move from field to field. Press Return to confirm any changes you have made, and the event's graphic display will change to reflect the modifications.

Sometimes, information in this box may extend beyond the space provided and will be clipped on the right side of the box. If so, enlarge the Information Bar by dragging the window's grow box to the right.

The Edit Resolution Box

The Edit Resolution box determines the minimum time unit for editing. The minimum time unit consists of a duration, such as 240 ticks, or one eighth note. MIDI events, note durations, loops, region boundaries, Memory-cycle repeat barlines, or any object that can be dragged horizontally will only move in time increments equal to the value of the edit resolution unit. Edit resolution only affects MIDI data when the data is moved horizontally with the mouse.

The Edit Resolution box can be enabled or disabled with the check box provided. When the check box is selected, the current resolution unit is shown as a note duration accompanied by a number of beats and ticks. When disabled, the *Unit* = and *beats* indicators become greyed out and editing occurs at maximum resolution, which is either one tick, one frame, or one screen pixel depending on the time zoom setting.

You can change the edit resolution at any time. To change the edit resolution:

1. **Click on the note displayed in the Edit Resolution box.**

   A pop-up menu will appear that displays note durations.

2. **Select a note duration from the pop-up menu and release the mouse.**

   The duration you chose will now be displayed in the box. Note also that the number of beats and ticks now equals the note duration.

   OR

3. **Click on the beats\ticks values.**

   A pop-up box will appear.

4. **Type in a number of beats and ticks in the box provided and press Return to confirm your choice.**

Note that when you type in a number of beats and/or ticks, the note displayed next to the ticks box will grey out if the tick value does not equal a standard duration, such as 120 or 240 ticks.

Also note that when you zoom in the Time ruler, Edit Resolution 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 Edit Resolution is larger than the distance you are dragging. To "unstick" the data, deselect the Edit Resolution check box. Or hold down the option key while dragging. Doing so overrides the edit resolution temporarily. The option key temporarily overrides the current setting of the Edit Resolution check box.

The Edit Resolution box affects all Graphic Editing windows. It does not affect the Event List window.

The Time Ruler

The Time Ruler measures time horizontally for all MIDI data in the Note Grid, the Median Strip, and the Continuous Data Grid.

The Time Ruler consists of a main ruler, which appears just above the Marker Strip. Auxiliary rulers that display other time formats can also be displayed above the main ruler.

To help line up MIDI events with the ruler, vertical grid lines extend downwards from the main ruler, through both grids and the Median Strip, to the bottom of the window. These hairlines are placed at regular intervals such that they remain a similar distance apart between zoom levels.

To help align the mouse pointer with the Time Ruler, a dotted hairline inside the Time Ruler indicates the current position of the mouse.

Using the time ruler to select a playback point

You can double-click a segment in the time ruler to make Performer jump to that location for playback. You can do so when Performer is stopped or during playback. This is an ideal way to quickly locate to a desired point with the mouse.

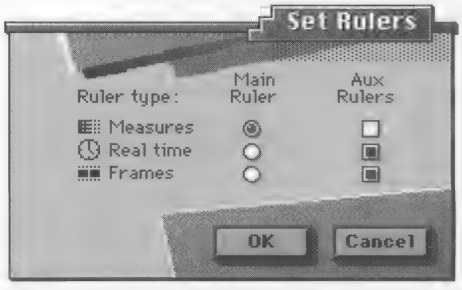
Choosing Time Formats

The Time Ruler can display time in any combination of Performer's three time formats: measures | beats | ticks, SMPTE, and real time. You can choose which formats to display with the Set Rulers dialog box.

To choose the time format(s) for the Time Ruler:

1. **Choose *Set Rulers* from the Graphic Editing window mini-menu.**

   The Set Rulers dialog box will appear.



2. **Choose a main ruler and any auxiliary rulers that you prefer.**

   The main ruler appears lowest and determines the time format for editing. Auxiliary rulers appear above the main ruler. If the Tempo Control setting is currently set to the Conductor track, only Measures can be displayed as the main time ruler.

3. **Click OK to confirm your choice or Cancel to cancel it.**

Changing an Auxiliary Ruler into the Main Ruler

To quickly switch an auxiliary ruler into the Main Ruler:

- Click the auxiliary ruler's time format icon in the Main Ruler Selector.

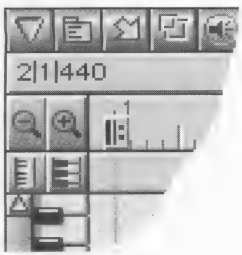
The ruler will become the main ruler and appear at the bottom. If the Tempo Control setting is currently set to the Conductor track, only Measures can be displayed as the main time ruler.

Zooming the Time Ruler

The Time Ruler can be zoomed in or out with the Time Ruler Zoom icon to the left of the ruler. Zooming out gives you an overview by compressing greater amounts of time into the window; zooming in focuses on a shorter period of time at higher resolution. See the following section called *Zooming* for more information.

Zooming

The Time Zoom and Pitch Zoom icons allow you to 'zoom' the time and pitch rulers in and out. Zooming in Performer is similar to the magnification feature found in most Macintosh 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.



Performer's zoom feature is based on the same idea; however, the Time and Pitch Zoom icons allow the time and pitch axes to zoom *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.

Because pitch and time zooming are exclusive from one another, notes on the Note Grid will not magnify or shrink in the same manner as a standard zoom feature. In addition, the grid lines remain approximately the same distance apart, regardless of the zoom setting.

Zooming the Time Ruler

The Time Zoom icons zooms the Time Ruler. They appear just to the left of the Time Ruler. Zooming out gives you an overview by compressing more measures into the window; zooming in focuses on a shorter period of time at a higher viewing resolution. The dotted hairlines extending from the Time Ruler remain approximately the same distance apart, regardless of the zoom setting.

The Time Ruler provides 8 zoom levels if the main ruler is displaying measures and beats or real time. It provides 7 zoom levels when the main ruler displays SMPTE time. When zooming out, notes with extremely short durations will remain visible.

Editing is allowed at any time zoom setting. However, the current zoom level may affect the resolution at which events can be edited. For example, let's say that the edit resolution unit is set to 20 ticks in the Edit Resolution box. If you zoom the Time Ruler out as far as it can go, 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 Macintosh 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.

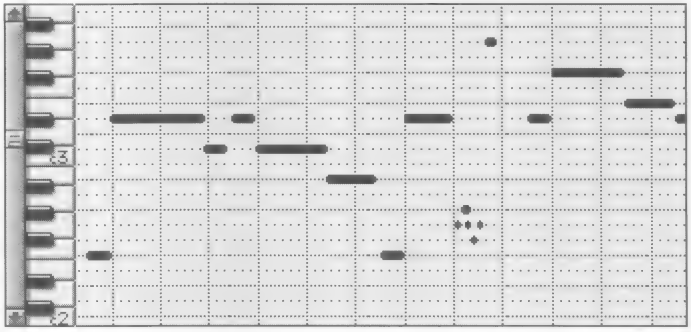
In the example above, Performer handles the situation by constraining location to *multiples* of 20 ticks. When you move the note, its new location will become the nearest multiple of 20 ticks, such as 80, 140, or 420 ticks.

To zoom out, click once (or repeatedly) on the magnifying glass icon with the minus sign (-). To zoom in, click once (or repeatedly) on the magnifying glass icon with the plus sign (+).

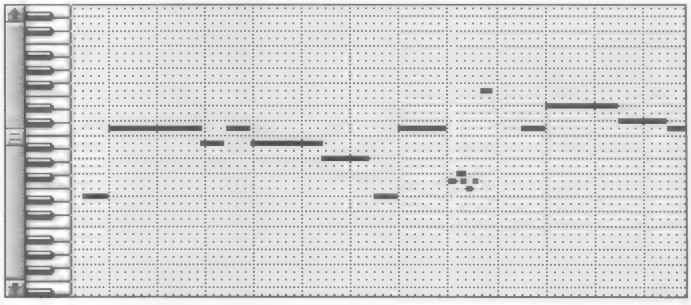
Zooming the Pitch Ruler

The Pitch Zoom icon zooms the pitch ruler and provides four zoom settings. Zooming out reduces the size of the keys on the ruler, allowing you to see more octaves at once; zooming in enlarges the keys, allowing you to focus on a particular pitch range.

When the Pitch Ruler is zoomed in, notes become larger and the grid displays a smaller pitch range:



When the Pitch Ruler is zoomed out, notes become slightly smaller and the grid displays several octaves:



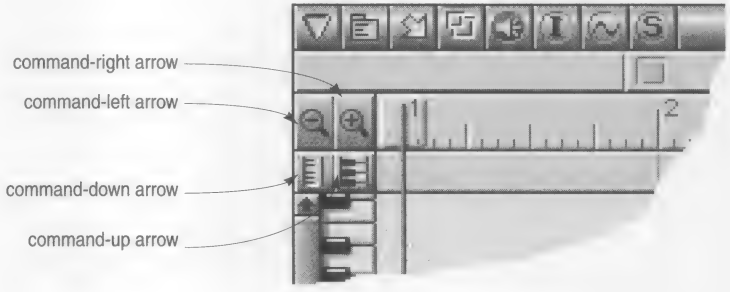
To see smaller notes and larger pitch range, click once (or repeatedly) on the small keys in the icon. To see larger notes (and a smaller pitch range), click once (or repeatedly) on the large keys in the icon.

Zooming shortcuts

Here are some zooming shortcuts:

Do this:	To zoom as follows:
Command-drag	To fill the window with the region you select
Command-click	To zoom out to the next standard zoom level
Option-click the zoom out button	To zoom all the way out
Option-click the zoom in button	To zoom all the way in

The time ruler zoom buttons in the Graphic Editing and Notation Editing window, as well as the pitch ruler zoom buttons, have the keyboard shortcuts as shown below.



Graphic Editing Basics

All of Performer's powerful editing features are available in the Graphic Editing window. 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's graphic environment.

Using the Shift Key to Constrain Dragging

If you hold down the Shift key just before you begin to drag the mouse, 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.

To constrain the movement of the mouse:

1. **Press on an event without moving the mouse.**

2. **Press the Shift key.**

   It is very important to press the mouse *first* and *then* press the shift key. If you press the Shift key first, you will Shift-click, which produces a different action (described in the next section).

3. **Drag in the direction you wish.**

   If you drag up or down, the mouse will only move on a vertical axis. If you drag left or right, the mouse will only move on a horizontal axis. Movement will be constrained until you release the mouse.

Option-dragging to Make Copies

Similar to Macintosh graphics programs, option-dragging in the Graphic Editing window leaves the original data unchanged and places a copy of the data at the destination. Option-dragging is a convenient shortcut for copying and pasting.

Shift-clicking to Select Non-adjacent Events

Holding down the Shift key *before* you click 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. It will highlight, and the first note will remain highlighted.

Dragging Multiple Data Types

The shift-click method of selection allows you to simultaneously select and drag multiple data types horizontally in the Note grid, Continuous Data grid, Median strip, and Marker strip.

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.

Using Edit Resolution

When the Edit Resolution check box is selected, MIDI data that is moved or inserted will 'snap' to positions corresponding to the edit resolution unit shown in the box. For example, if the current edit resolution unit is 240 ticks, events that are moved with the mouse will snap to eighth note positions (every 240 ticks) on the grid. If the Edit Resolution check box is not checked, events will move freely. For more information about the Edit Resolution box, please refer to the section earlier in this chapter called *The Edit Resolution Box*.

Selecting a Region Using the Time Ruler

In the Graphic Editing window, a region can be selected by dragging to the left or right in the Main Time Ruler. The region inside the ruler highlights, as well as the entire grid beneath, and all visible data within the region becomes selected. In addition, the start and end locations of the region are displayed in the Information Bar. Selecting a region in this fashion is similar to setting the Start and End times in the Tracks window Edit Bar.

Highlighting a region in this way allows the following commands to function from the Graphic Editing window: *Set Loop*, *Repeat*, *Snip* and *Retrograde*.

Dragging in the Time Ruler is constrained by the current editing resolution.

To select a region with the Time Ruler:

1. **Select the desired edit resolution.**
2. **Click and drag on the Main Time Ruler.**

   The start and end locations of the region are constrained by the current edit resolution. You can drag to the left or right.

Using the Undo Command

The Undo command in the Edit menu will undo the last action you executed in the Graphic Editing window. 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 pop back to its original position. The Undo command is also useful when drawing or redrawing continuous data curves. If you modify a curve and are not satisfied with the results, simply choose Undo from the Edit menu or press command-Z and try again.

The View Filter

In the Graphic Editing window, the View Filter serves two useful functions. It allows you to control what types of data you can *see* and *edit* in the window. In essence, the View Filter acts like an edit filter: if a type of data, such as pitch bend, is visible in the window, it will be affected by editing commands. If the data type is *not* visible in the window, it cannot be edited.

The View Filter consists of a dialog box with each type of data listed next to a check box. If the check box is highlighted, the type of data will be visible. If the check box is not highlighted, the data type will not be visible.

To use the View Filter:

1. **Choose Set View Filter from the Graphic Editing window mini-menu.**

   The View Filter dialog box will appear.

2. **Select the check box next to the data types you wish to see.**

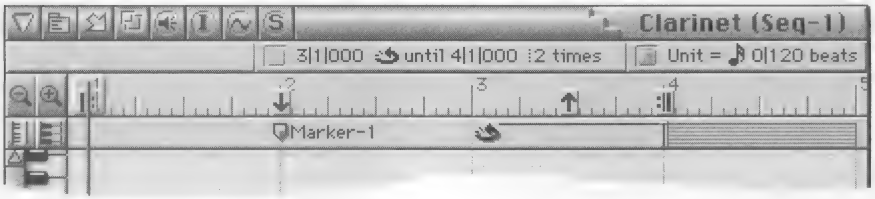
   If you wish to see all data types, click the Set All button. If you option-click a check box, it will highlight and all other boxes will deselect. If you command-click a check box, it will deselect and all other boxes will highlight. If you press the clear button, all check boxes will deselect.

3. **Click Okay to confirm your choice or click Cancel to cancel.**

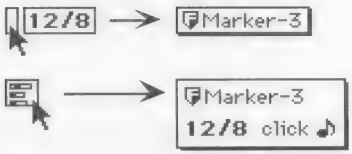
   You can change the View Filter at any time.

The Marker Strip

The Marker Strip appears just below the Time Ruler. It displays markers, meter changes, key changes and loops. It is always visible and is not affected by vertical scrolling.



The Marker Strip shares the Time Ruler with the Note Grid, the Median Strip, and the Continuous Data Grid. Therefore, the location of items in the Marker Strip will correspond with MIDI data displayed below.



Markers, meter changes, and key changes often occur very close together or at the same location. In the first example to the left, the meter change is preceded by a marker, which appears as a bar just to its left. If you would like to see the entire marker, press it, and the marker will highlight and pop to the front. If the marker and meter change occur exactly at the same tick, they are displayed with a list icon, shown in the second example. If you would like to see the list, press the list icon, drag downwards and a pull-down menu will pop open.

Markers

In the Marker Strip, a marker appears as a pointer, followed by the marker's name. The pointer indicates the marker's exact location. If the marker is locked, a lock icon will appear between the pointer and the marker name.

Markers cannot be edited in the Marker Strip; instead, they can be edited in the Conductor track or the Markers window. Please refer to the chapter on the Markers window for more information about editing markers.

In the Conductor track, markers are displayed in the Median Strip. Please refer to the section later in this chapter called *Graphic Editing in the Conductor Track* for more information.

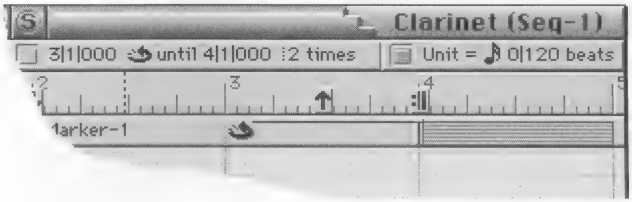
Meter and Key Changes

Meter and key changes appear in the Marker Strip in much the same way as they do in the event list window. (Tempo changes are not displayed in the Marker Strip.) Similarly, they can only be edited in the Conductor track. Please refer to the section later in this chapter called *Graphic Editing in the Conductor Track* for more information.

Loops

Loops appear in the Marker Strip as a loop icon followed by a line that ends in a bracket. The loop icon indicates the beginning of the loop; the line and bracket represent the duration and end of the loop.

Following the loop, the Marker Strip contains a greyed-out region that represents the time during which the loop plays. Just like italicized notes in the Event List display, MIDI data within the greyed-out region will not play back because data inside the loop plays instead. Data within the greyed-out region can, however, be edited normally.



When a loop is selected, the Marker Strip area inside of the loop will highlight, indicating that the loop is selected. Numerical data about the loop will be displayed in the Event Information bar. When loops are nested inside one another, the outer-most loop appears above the loops nested inside it.

Working with Loops

Loops can be edited by dragging the loop icon in the Marker Strip with the mouse or by editing the numbers displayed in the Information Bar.

To insert a Loop

To insert a loop:

1. **Press on the Insert button in the title bar of the Graphic Editing window and choose Loop from the menu.**

   The mouse pointer turns into a cross hair.

2. **Click at the desired start location in the Marker Strip, drag to the right to draw the desired length, and release the mouse at the end location.**

   A loop will appear. Use the dotted hairlines in the Time Ruler to align the beginning and end of the loop while inserting it. Information about the loop will appear in the Information bar.

To Edit a Loop

To change the location of a loop:

1. **Click the loop icon in the Marker Strip and drag left or right to advance or delay the loop.**

   The entire loop, from beginning to end, will move when you drag the loop icon in this fashion. You can align the start or end point of the loop by watching the hairlines provided in the ruler.

To change the length of a loop:

1. **Select the loop by clicking on its loop icon in the Marker Strip.**

   The loop will highlight.

2. **Click the end bracket of the loop and drag left or right to shorten or lengthen the loop.**

   Align the end bracket by watching the hairline provided in the ruler.

The Note Grid

Basics

The Note Grid is the region in the Graphic Editing window between the Marker Strip and the Median Strip. It is flanked by the Pitch Ruler on the left and a vertical scroll bar on the right.

The Note Grid functions like a standard graph. 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.

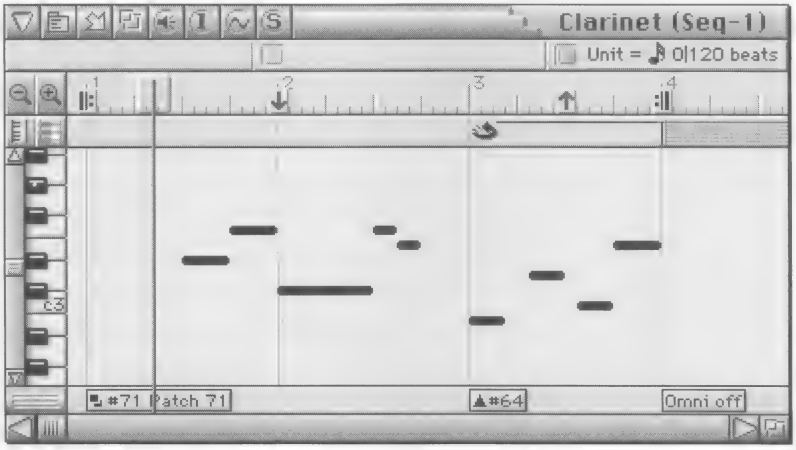
The time and pitch axes are measured with a Time Ruler above the grid and a Pitch Ruler to the left of the grid. The rulers indicate the exact location and pitch of notes. Grid hairlines extend from each ruler to aid you in determining a note's position.

Scrolling in the Note Grid

Because the size of the Graphic Editing window is restricted, the Note Grid usually displays only a portion of the track at one time. The horizontal scroll bar at the bottom of the window moves the Note Grid to the left and right. The vertical scroll bar just to the right of the Note Grid moves the pitch axis up and down over the entire MIDI note range. By scrolling, you can view any region of the track at any pitch range.

Controlling the Dimensions of the Note Grid

The size of the Note Grid is controlled by the Graphic Editing window grow box in the lower right hand corner of the window, and by the Median Strip just below the Note Grid. Drag the grow box to resize the entire window. Drag the Median Strip up or down with the move handles provided at either end to decrease or increase the size of the Note Grid and Continuous Data Grid respectively. For example, if you drag the Median Strip down as far as it will go, you will see just the Note Grid:



Displaying Notes

Only notes are displayed on the Note Grid, and they appear 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.

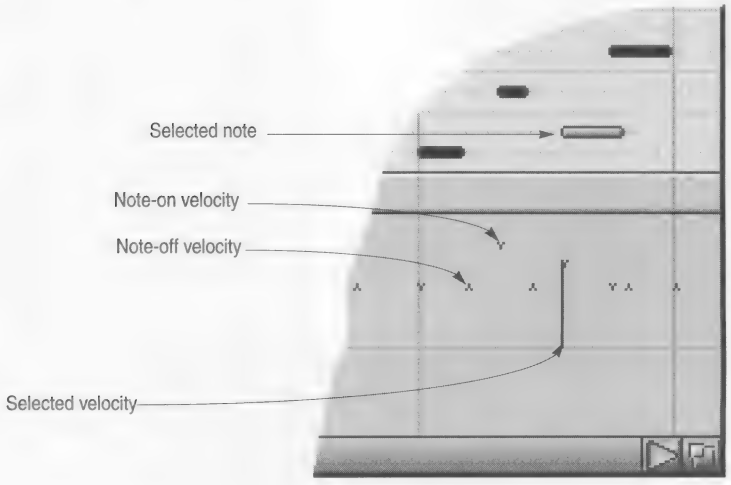
When the Pitch Ruler is zoomed in, each bar tapers at the ends to distinguish it from adjacent notes. When the Pitch Ruler is zoomed out, notes become smaller and do not taper. Sometimes, adjacent notes of the same pitch will look like one long note. The example below shows two adjacent notes when the Pitch Ruler is zoomed out. When zoomed in, the notes are easily distinguished, as shown to the right:

Two notes, zoomed out

The same notes, zoomed in

Displaying On and Off Velocities

The on and off velocities of notes are not displayed in the Note Grid. Instead, they are displayed in the Continuous Data Grid directly below the note. An on velocity appears as a small "v" directly below the beginning of the note bar, and an off velocity appears as a small "^" directly below the release. If a note is selected, its velocity icons will be selected with the note.



Displaying on-velocities in this manner allows you to edit them in the same ways as continuous data. For example, you can create a crescendo or decrescendo simply by editing on-velocities in the Continuous Data Grid. See *Editing Continuous Data* later in this chapter called for more information.

Off-velocities are displayed in the continuous data grid for reference only; they cannot be graphically edited. On-velocities can be fully edited.

Controlling the Display of Notes with the View Filter

The View Filter, found in the Graphic Window mini-menu, allows you to choose whether or not notes are displayed in the Note Grid. If you have MIDI data in a track, but you cannot see the notes in the Note Grid, check the View Filter and make sure that the *Notes* check box is selected.

The View Filter also controls whether on and off velocities will be displayed. For example, if the *On Velocities* check box is deselected in the View Filter, the "V" icons will not appear on the Continuous Data Grid.

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 right of the note grid to allow you to scroll up and down through the entire MIDI pitch range. Octaves are indicated on each C-natural key.

To help align notes to the ruler, hairlines extend to the right from each note, a heavier line for black keys and a lighter line for white keys.

To help align the mouse pointer with the Pitch Ruler, a moving dotted hairline inside the Pitch Ruler follows the current position of the mouse.

Listening to the Pitch Ruler

When the Audible Mode button (labelled with the speaker icon) is pressed in the title bar of the Graphic Editing window, the keys on the pitch ruler play their pitch over MIDI when you click on them. When you click on a Pitch Ruler key, a MIDI note with that pitch is transmitted from Performer to the MIDI channel(s) that the track is assigned to.

Playback from a track's Pitch Ruler has the same requirements as regular playback: the track must be assigned to a MIDI channel and a synthesizer must be set up to receive MIDI on that channel. If you click on a Pitch Ruler key and don't hear anything, make sure that your MIDI connections are set up properly and that your synthesizer is ready to receive MIDI data. If MIDI data in the track plays back properly when you press the Play button in the Consolidated Controls panel, the Pitch Ruler keys will play back properly as well.

If you are having trouble getting the Pitch Ruler keys to play, refer to the *Getting Started* booklet that accompanies this reference guide.

Zooming the Pitch Ruler

The Pitch Ruler can be zoomed in or out with the Pitch Zoom icon, which provides four zoom settings. Zooming out reduces the size of the keys on the pitch ruler, allowing you to see more octaves at once. Zooming in enlarges the keys, allowing you to focus on a particular pitch range.

For more information about zooming the Note Grid with the Pitch Ruler, please refer to the section earlier in this chapter called *Zooming*.

Lengthening the Pitch Ruler

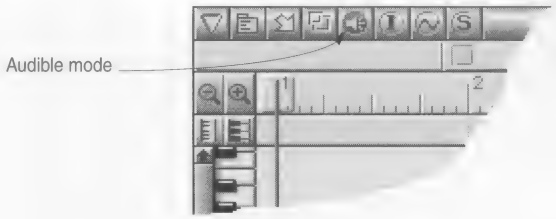
The pitch ruler only displays as many keys as will fit in the window at the current zoom setting. If you wish to see more keys, resize the Graphic Editing window and drag the Median Strip down.

You can also view more keys at a time by zooming out the pitch ruler as described in the previous section.

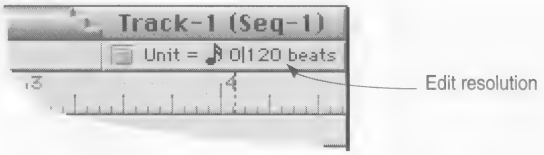
Inserting Notes

To insert a note:

1. **If you'd like to be able to hear the pitch as you insert the note, make sure Audible mode is turned on in the title bar.**



2. **If desired, set the edit resolution.**



3. **From the insert menu in the title bar, choose Note.**
4. **Press on the grid at the desired location, and then drag up and down to specify the pitch and drag to the right to specify the duration.**

   Keep dragging until you get the pitch and duration you want.
5. **When you have got the pitch and duration you want, release the mouse to insert the note.**

Note insertion always starts with the last duration you inserted.

If you want to insert multiple notes quickly, hold down the shift key when you first click on the grid each time. This preserves the note insertion cross-hair cursor rather than switching back to the arrow cursor.

Inserting a Note Using a MIDI Controller

To determine the pitch of a note by playing the note when you insert it:

1. **Make sure that MIDI Edit is checked in the Graphic Editing Window mini-menu.**

   If it is not checked, choose it.
2. **Press on the Insert button in the title bar of the Graphic Editing window,**
3. **Choose Note from the menu.**

   The menu will disappear and the pointer will turn into a cross hair.

4. **Click at the desired time location on the Note Grid, drag to the right to draw the desired duration, and release the mouse.**

   You do not need to be careful about pitch location, which is taken care of in the next step.

5. **With the inserted note still selected, press any key on your MIDI controller.**

   The inserted note will pop 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 Using a MIDI Controller

To insert a chord:

1. **Press the Insert button in the Graphic Editing window title bar.**

2. **Choose Note from the menu.**

   The Cursor will turn into a cross-hair.

3. **If you would like to insert more than one chord, either hold down the shift key, or push down the caps lock key.**

   This will keep Performer in insertion mode after you insert the chord.

4. **Play the chord you wish to insert on your MIDI controller and, while holding the chord, click where you want the chord to *begin and* drag from left to right to the appropriate duration.**

   The vertical position of your click is not important; the notes are determined by what you play on your controller. Only the attack and release of the chord is affect by the cross-hair.

As long as you remain in insertion mode, you can enter chords in this fashion for as long as you like. You can even alternate between entering notes with the mouse only or the mouse with a MIDI controller.

Selecting Notes

This section describes how to select notes on the Note Grid. To learn how to select an entire region by dragging in the Time Ruler, refer the section earlier in this chapter called *Selecting a Region Using the Time Ruler.*

Selecting a Single Note

To select a note on the Note Grid:

1. **Click once on the note to select it.**

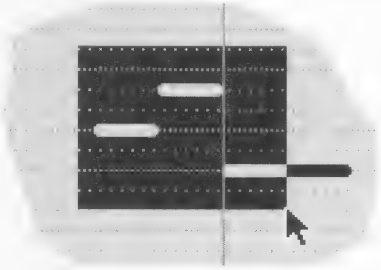
The note becomes highlighted to indicate that it is selected.

Selecting a Group of Notes

To select a group of events:

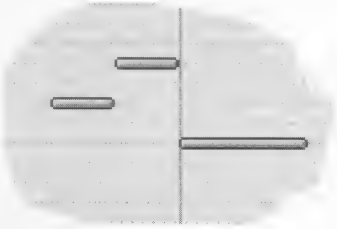
1. **Drag out a selection box over the events to be selected.**

A highlighted box indicates the selection area.



2. **Release the mouse.**

Only events whose attack occurs inside the selection box will select.



Selecting all Notes of a Single Pitch

You can quickly select all notes of a specific 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.

This feature is extremely handy when working with drum tracks. For example, if you would like to select all snare drum notes in a track:

1. **Click the Audible Mode button.**
2. **Click the pitch keys on the Pitch Ruler to locate the key that corresponds to the snare drum.**
3. **Once you find the snare drum sound, double-click the key.**

   All the snare drum notes will highlight in the track. You can then delete them, copy them, drag them up or down to a different note (sound), etc.

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 Continuous Data Grid.

Changing a Note's Pitch or Location

To change a note's pitch or location:

1. **Click the note.**
2. **Drag the note to a different position and release the mouse.**

   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 without changing its time location, for example.

Changing a Note's Duration

To change the duration of a note:

1. **Click the note once to select it.**
2. **Position the cursor near the right-hand tip of the note.**

3. **Drag left or right to shorten or lengthen the note.**

Changing a Note's Pitch Using a MIDI Controller

To change the pitch of a note with your MIDI controller:

1. **Make sure that MIDI Edit is checked in the Graphic Editing Window mini-menu.**

   If it is not checked, choose it.

2. **Click the note once to select it.**

   A handle appears at the end of the note to indicate that it is selected.

3. **Press any note on your MIDI 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.**

   To select them, drag out a selection box or shift-click each note.

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. Dragging notes vertically changes their pitch. Dragging notes horizontally changes their time location. When you release the mouse, the notes will pop to their new locations.

To help position the notes in time, hairlines appear in the Time Ruler to indicate the attack of the first selected note and the release of the last selected note. In addition, the Pitch Ruler key corresponding to the note you click highlights. If notes of more than one pitch are selected, the Pitch Ruler keys that correspond to the highest and lowest selected notes appear greyed.

Converting More Than One Note 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 Graphic Editing Window mini-menu.**

   If it is not checked, choose it.

2. **Select the notes.**

   You can select a group of notes by shift-clicking each one or by dragging out a selection box. A square handle will appear at the end of each note to indicate that it is highlighted.

3. **Press any note on your MIDI controller.**

   The selected notes will change to the pitch you play.

Using Audible Mode

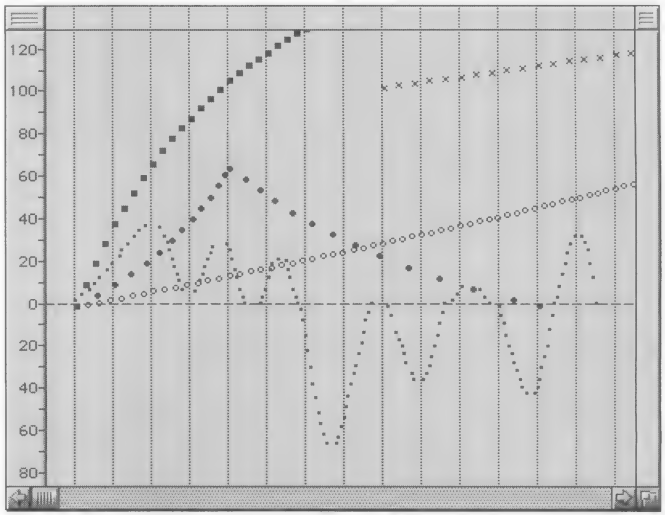
In the Graphic Editing window, Audible Mode functions similarly to the Event List Window: if the speaker icon is highlighted and you click a note, the note will play back over MIDI.

If you select a group of notes or other MIDI data and option-click the Audible Mode button, the selected data will play back as a phrase.

For more information about Audible Mode, see the section called *Audible Mode* in the *Event List Window* chapter.

The Continuous Data Grid

The Continuous Data Grid is the region at the bottom of the Graphic Editing window below the Median Strip and above the horizontal scroll bar. It is flanked by the Continuous Data Ruler on the left and an empty margin on the right.



Basics

The Continuous Data Grid displays MIDI controllers, pitch bend, mono and poly key pressure, and note-on/off velocities. The grid 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 continuous 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.

Location and value are measured with the Time Ruler and the Continuous Data Ruler respectively. Grid lines extend from the Time ruler to help in determining an event's position.

The Continuous Data Grid has no vertical scroll bar. Instead, the grid automatically compresses or expands to fit in the current space between the Median Strip and the bottom of the window. The grid can be stretched (or compressed) vertically by dragging the Median Strip up (or down). To make more room for both the Continuous Data Grid and Note Grid, simply enlarge the entire window with the grow box.

A continuous data event is displayed on the grid as a small icon, such as a square or a circle. Pitch bend data, aftertouch, velocities, and controllers each have a unique icon. The icons are defined in the Continuous Data Icons window, which can be opened from the Graphic Editing window mini-menu.

Eight different icons are available for the display of Controllers. Controllers can be assigned to icons in the Continuous Data Icons window. For more information, see the section later in this chapter called *The Continuous Data Icons Window*.

Viewing Continuous Data Types One at a Time

The expression *continuous data type* refers to a *kind* of continuous data. For example, pitch bend is one kind of continuous data. MIDI controllers between 0 and 63 are each considered a continuous data type.

Continuous data types can be viewed simultaneously in the Continuous Data Grid. Sometimes, however, you may wish to see only one type (or several) at a time. Performer offers several ways to temporarily isolate continuous data types for viewing and editing.

To view pitch bend data by itself, click on the Continuous Data Ruler. Doing so toggles the ruler among three displays, one which displays pitch bend data by itself. For more information about this feature, refer to the next section called *The Continuous Data Ruler*.

To view a controller data type by itself, click an event of that type and click the Quick-Filter check box that appears in the Information Bar next to the event's numerical data. Clicking the Quick-Filter box causes all other data types to temporarily disappear until you click it again. For more information, refer to the section later in this chapter called *Editing Continuous Data*.

The Quick-Filter is useful for *temporarily* isolating continuous data types. However, data types can also be filtered with the View Filter in the Graphic Editing window mini-menu. Data types that are selected in the View Filter will be displayed; ones that are not selected will not be displayed. To view all data types, click the *Set All* button in the View Filter.

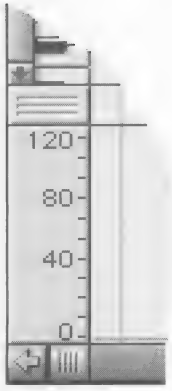
Like the Quick-Filter, the View Filter affects selecting and editing. For example, if note velocity data has been filtered from the display, it cannot be selected for editing. All *visible* data types *can* be selected for editing.

For information about editing continuous data, see the section later in this chapter called *Editing Continuous Data*.

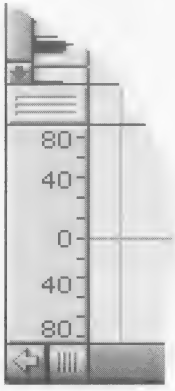
The Continuous Data Ruler

All continuous MIDI data has a value range from 0 to 127 except pitch bend, which has a value range from -8192 to 8191. Because of these two separate scales, the Continuous Data Ruler provides three different scales:

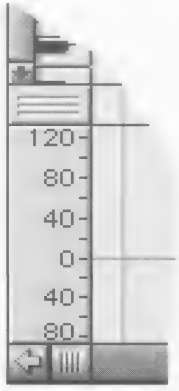
1. a **controller scale** from 0 to 127, whose origin rests at the bottom of the window:
2. a **pitch bend scale** from -8192 to 8191, whose origin appears in the middle of the window:
3. a **combination scale** from -80 to 127, which combines the above two scales and whose origin appears just below the middle of the window.



Controller scale



Pitch bend scale



Combination scale

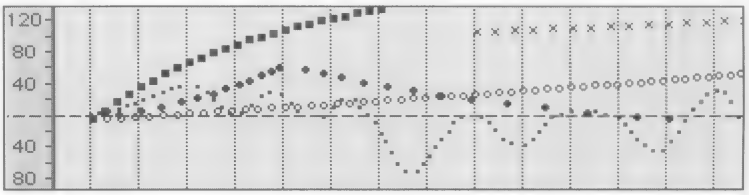
To switch from one scale to another, click in the ruler. Doing so toggles from the currenΩt scale to the next. Each scale displays data appropriate to that scale. The controller scale (0 to 127) displays controller data only. The pitch bend scale (-8192 to 8191) displays

pitch bend only. The combination scale (-80 to 127) displays controller data *and* pitch bend together. Note velocities, if selected in the View Filter, appear in the controller and combination scales. The pitch bend scale displays pitch bend even if it is deselected in the View Filter.

All three scales provide numbered marks in the ruler and an origin line extending to the right that indicates where zero is on the ruler.

Controlling the Length of the Continuous Data Ruler

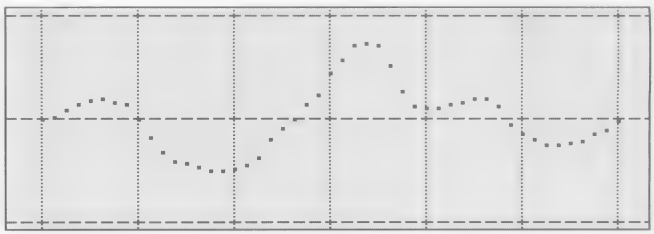
The entire Continuous Data Ruler is always visible. If you resize the grid using the Median Strip or the Graphic Editing window's grow box, the Continuous Data Ruler will compress or expand to fit in the available space. The data within the grid will also compress or expand to conform to the ruler.



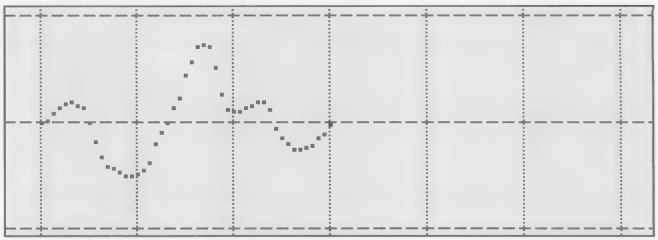
If you wish to enlarge the view of the Continuous Data Grid, resize the Graphic Editing window and drag up the Median Strip. If you move the Median Strip *all* the way up, the Continuous Data Grid will occupy the entire window.

Zooming the Continuous Data Grid

The Continuous Data Grid can be zoomed along the time (horizontal) axis. Time zooming has the visual effect of expanding or compressing a continuous data curve in the window. If you zoom in, the curve spreads out:



If you zoom out, the same curve compresses:



The data that comprises the curve does not change between these two views: only its appearance changes. Time zooming allows up to eight different settings. For more information about zooming the Time Ruler, refer to the section earlier in this chapter called *Zooming*.

Editing Continuous Data

The Continuous Data Grid displays more than one type of continuous data at a time. For example, the grid can display pitch bend, controller #7, and mono key pressure all at once. Each type is distinguished by the shape of its icon.

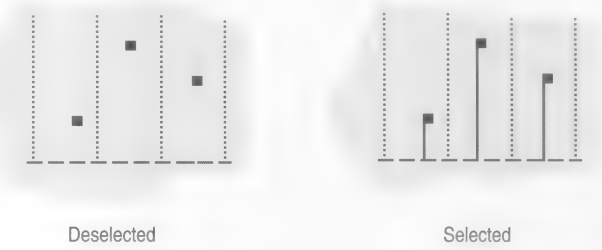
Because data types are displayed simultaneously, they can be selected and edited together. Sometimes, however, you may wish to edit only one type (or several) at a time. Performer provides two ways to isolate continuous data types for viewing and editing. For example, if the Continuous Data Grid currently displays the three types of data mentioned above, you can filter out pitch bend and key pressure to view controller #7 data by itself.

The most convenient way to filter data is with the Quick-Filter check box. To view controller number #7's only, click any controller #7 event to select it and click the Quick-Filter check box next to the event's numerical data in the Information Bar. All other data types will temporarily disappear, and you can then easily select controller #7's without inadvertently selecting other data types. To make other data types reappear, click the Quick-Filter check box again.

The regular View Filter, found in the mini-menu, also filters data types. In the View Filter dialog box, select the continuous data type(s) you wish to see and deselect all others. Only *visible* data can be selected for editing.

When a continuous data event is selected, a line extends from the icon to the origin line on the continuous data grid. Once events are selected, they can be edited.

The diagram below shows three deselected controller events on the left. To the right the events are selected: a line extends to the origin line; selected events can be edited.



Events selected in this fashion can be edited with the following commands in the Edit menu: Cut, Copy, Paste, Erase, Merge, Splice, and Shift. To Snip or Repeat, you must select a region by dragging in the Time Ruler.

Quick-Filtering Data Types

To view certain continuous data types and quickly filter the rest:

1. **Select an event of each data type that you want to see.**

   Click the event, or drag a selection box over it. To select more than one data type, shift-click an event of each type.

2. **Click the Quick-Filter check box that appears next to the numerical data in the Information Bar.**

   All data types will disappear except those that you selected. To make all data types reappear, click the Quick-Filter check box again. You can toggle freely between filtered and unfiltered mode.

Selecting a Single Continuous Data Event

To select an event:

1. **Click the event.**

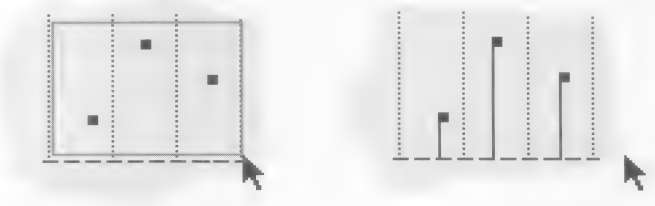
   The event will become selected. The selected event displays a vertical line extending from its icon to the origin line.

Selecting a Group of Continuous Data Events

To select a group of continuous data events:

1. **Drag a selection box over the events and release the mouse.**

   When you release, any events inside the dotted selection box will be selected. All other highlighted events will deselect. If other events are selected before you drag and you want them to remain selected, hold down the shift key before you drag out the selection box.



Drag out a selection box... ...and release.

To select *all* events of a single data type:

1. **Double-click an event of that type.**

   All events of that type will become selected. All events of other types will deselect. If events of other types are selected beforehand and you want them to remain selected, shift-double-click and the other events will remain selected.

To deselect *all* events of a single data type:

1. **Shift-double-click a selected event of that type.**

   All events of that type will deselect.

Inserting a Single Continuous Data Event

To insert an event on the Continuous Data Grid:

1. **Press the Insert button in the title bar of the Graphic Editing window,**
2. **Choose the type of event you wish to insert from the menu.**

   The mouse pointer will turn into a cross hair. For some types of data, an additional box may appear requesting further information.

3. **Click the cross hair once at the desired time location and value.**

   The event will appear where you click, and the mouse will switch back to an arrow. If you wish to insert multiple events, press the shift key before you click and the cursor will remain a cross hair.

Editing a Single Continuous Data Event

To change the value or location of a single continuous data event:

1. **Click the event and drag it to a different position or value.**

   Drag vertically to change its value. Drag horizontally to change its location. Press the shift key after you click to constrain the mouse vertically or horizontally. For exact positioning, refer to the Pointer Coordinates Box and the rulers.

Editing the Value of an Event Using a MIDI Controller

To change the value of an event with your MIDI controller:

1. **Make sure that MIDI Edit is checked in the Graphic Editing Window mini-menu.**

   If it is not checked, choose it.

2. **Click the event to select it.**
3. **Transmit a corresponding event from your MIDI 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.**

Working With Continuous Data Curves

A continuous data curve is a group of many individual events. Events that form a curve can be edited together in much the same way as a single event. The only difference is that more than one event is selected.

Selecting a Continuous Data Curve

To select a continuous data curve:

1. **Filter other data types, if necessary.**

   Click an event in the curve you wish to select and click the Quick-Filter check box in the Information Bar. Filtering is only necessary if the region that the curve occupies contains other data types that you do not want to select.

2. **Drag a selection box over the curve and release the mouse.**

   The portion of the curve inside the selection box will become selected. All other events will deselect. If you want other events to remain selected, press the shift key while you drag out the selection box.

To select all events of a continuous data type:

1. **Double-click an event of the desired type.**

To *de*select all, shift-double-click a selected event.

Shift-double-clicking selects or deselects all without affecting the status of other types.

Inserting a Continuous Data Curve

To insert a curve of continuous data:

1. **Press the Insert button in the title bar of the Graphic Editing window.**

2. **Choose the type of event you wish to insert from the menu.**

   The mouse pointer will turn into a cross hair. For some types of data, an additional box may appear requesting further information.

3. **Click on the grid where you want the curve to begin and drag the desired shape of the curve over the region.**

   Events will appear at regular intervals as you drag the mouse. The events will be spaced according to the current edit resolution. The value of events is determined by the vertical position of the mouse. If you wish to insert multiple curves, press the shift key before you drag; the cross hair will remain, indicating that you are still in Insert mode.

   OR

4. **Option-drag from the start point to the end point of the curve.**

   A straight line will appear with handles on either end and a handle at its midpoint. This line represents a curve to which continuous data events will be fitted. You can adjust the location and shape of the line by dragging its handles. The end-point handles can be dragged both vertically and horizontally to position the start and end point of the curve. The middle handle sets the curvature.

5. **Once you have adjusted the line as you wish, click anywhere else on the screen or press the Return key.**

   The line will disappear and events creating a curve with the same shape as the line will appear.

Reshaping a Continuous Data Curve

To reshape a continuous data curve:

1. **Select the curve you wish to reshape.**

   You can either double-click an event of that type to select all or drag out a selection box over a portion of the curve. If the curve intermingles with other visible data types, use the Quick-Filter before selecting to avoid inadvertently selecting events of other types.

2. **Click the Reshape button in the title bar of the Graphic Editing window or choose Reshape from the Graphic Editing window mini-menu.**

   In both cases, the mouse pointer will turn into a cross hair.

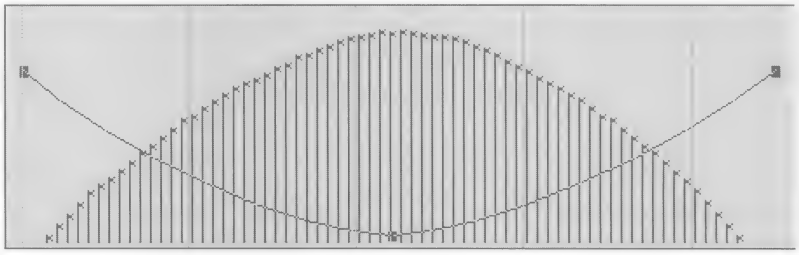
3. **Drag above or below the selected events to change their values to the position of the mouse.**

   Each event will snap to the position of the mouse as the mouse passes over it. The location of events will not change. If you like, you can deselect the Quick-Filter before dragging to view other data types while dragging. If you wish to remain in Reshape mode, press the shift key before you drag; the cross hair will remain when you finish dragging, indicating that you are still in Reshape mode.

   OR

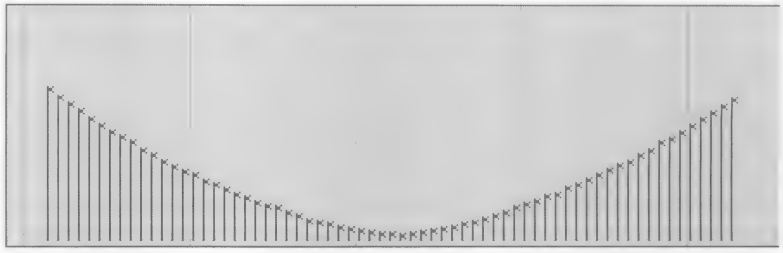
4. **Option-drag along the selected region of the curve.**

   A straight line will appear with handles on either end and a handle at its midpoint. This line represents a curve to which continuous data events will be fitted. You can adjust the location and shape of the line by dragging its handles. The end-point handles can be dragged both vertically and horizontally to position the start and end point of the curve. The middle handle can be dragged to set the curvature.



5. **Once you have adjusted the line as you wish, click anywhere else on the screen or press the Return key.**

   The line will disappear and selected events above or below the line will adjust their values to match the shape of the line.



Offsetting or Scaling a Continuous Data Curve

You can *offset* a continuous data curve by dragging it in any direction. Offsetting modifies events in the curve by a constant amount: dragging up or down changes events' values; dragging left or right changes their location. For example, dragging a curve up by a value of 30 will add that amount to all events in the curve.

You can *scale* a continuous data curve by command-dragging it in any direction. Scaling modifies events in the curve proportionally: dragging up or down scales *values* proportionally; dragging left or right scales *time*. For example, when a bell-shaped curve is scaled up, the start and end points of the curve remain at zero, and the slopes become steeper as the top of the curve rises. Scaling is a useful way to exaggerate or diminish a curve's musical effect without changing its fundamental nature. For example, you can scale an existing crescendo so that it swells in the same manner but ends at a softer volume.

To offset or scale a continuous data curve:

1. **Select the curve you wish to modify.**

   You can either double-click an event of that type to select all or drag a selection box over a portion of the curve.

2. **Click (to offset) or command-click (to scale) a selected event and drag in the direction you wish.**

   Press the shift key before dragging if you wish to constrain motion horizontally or vertically. As usual, horizontal position (location) is constrained by the current edit resolution.

Cancelling Lengthy Editing Operations

A wristwatch icon may appear when Performer executes a continuous data edit operation. To cancel an operation in progress, press command-period (command-.). The operation will abort. Data modification that occurred before cancelling will not be undone unless you choose Undo from the Edit menu.

Summary of Continuous Data Editing Features

This section summarizes features available when working with the Continuous Data Grid.

Selecting

Select a *single event* by clicking it.

Select *several events* by dragging a selection box over them.

Select *all events* of a single data type by double-clicking an event of that type.

Select *all events of several types* by shift-double-clicking an event of each type.

Select *all continuous data* by choosing Select All from the Edit menu or pressing command-A. All other MIDI events in the track will become selected as well, including notes and data in the Median Strip.

Deselecting

Deselect a *single event* by shift-clicking it.

Deselect *all events* of a single data type by shift-double-clicking a *selected* event.

Deselect *all continuous data* by clicking in an empty area on the Continuous Data Grid.

Quick-Filtering

Quickly isolate a data type by clicking an event of that type and then clicking the Quick-Filter check box in the Information Bar. Isolate more than one type by shift-clicking an event of each type before clicking the Quick-Filter check box. To unfilter, deselect the Quick-Filter check box.

Offsetting

Offset the location or value of selected events by dragging horizontally or vertically.

Offset the location of a *copy* of all selected events by pressing the option key and dragging horizontally.

Scaling

Scale the time or value of selected events by pressing the command key and dragging horizontally or vertically.

Constraining

Constrain the movement of the mouse vertically or horizontally while scaling or offsetting by pressing the shift key after clicking and before dragging.

Inserting and Reshaping

Click the Insert and Reshape buttons (or choose Insert or Reshape from the mini-menu) to change the mouse cursor to a cross hair.

Insert events or *Reshape* existing selected events in any shape you wish by dragging the cross hair.

Insert or *Reshape* events against an adjustable curve outline by pressing the option key before dragging the cross hair. A straight line with moveable handles will appear to which events will be fitted when you click elsewhere on the grid.

Remain in Insert or Reshape mode by pressing the shift key before dragging the cross hair.

The Continuous Data Icons Window

The Continuous Data Icons window serves as a legend for the icons you see in the Continuous Data Grid. In addition, it allows you to assign controller data types to eight unique icons to help differentiate between them on the grid.

To open the Continuous Data Icons window, choose Cont. Data Icons from the Graphic Editing window mini-menu. The window remains until you click its close box and serves as a handy reference when working with continuous data.

Assigning Icons to Controllers

The Continuous Data Icons window offers eight different icons to represent controllers. Because more than eight types of controllers exist, the most commonly used controllers have been assigned to icons by default. However, you can change which controller an icon represents. For example, a square can represent controller #7 or controller #38. All controllers that have not been assigned to one of the first seven icons are automatically assigned to the last "u"-shaped icon. The icons for pitch bend, velocity, and key pressure cannot be changed and are displayed for reference.

To assign a controller to an icon:

1. **Open the Continuous Data Icons window.**

   Select Cont. Data Icons from the Graphic Editing window mini-menu.

2. **Click in the box to the right of the icon of your choice.**

   The box will highlight.

3. **Type in the controller number that you wish to assign to that icon.**

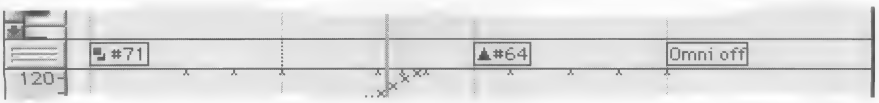
   The number you type must be between 0 and 63. Controllers 64 through 127 are switch controllers and will appear in the Median Strip.

4. **Press the Return key or click anywhere to confirm your choice.**

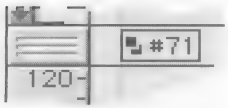
   The Continuous Data Grid will reflect any changes you have made.

The Median Strip

The Median Strip separates the Note Grid from the Continuous Data Grid. It contains only the following discrete MIDI events: patch changes, mode changes, switch controllers like #64 (sustain pedal), tune requests, song changes, and system exclusive events. Notes and continuous data do not appear in the Median Strip.



Moving the Median Strip



The Median Strip serves as the border between the Note Grid and the Continuous Data Grid. It can be dragged up and down by grabbing the handles at either end. Moving the Median Strip resizes the Note Grid and the Continuous Data Grid proportionally. For example, if you drag the Median Strip down as far as it will go, you will see only the Note Grid. If you drag the Median Strip all the way up, you will see only the Continuous Data Grid.

The Median Strip is a convenient way to quickly adjust the size of one grid or the other to suit your immediate needs.

Working with Discrete MIDI Events in The Median Strip

Events in the Median Strip do not have durations. Each event is therefore displayed as a single item inside a small box. Patch changes, system exclusive events, and controllers are displayed with their event list icon; mode changes are displayed as text, such as "Poly" or "Omni on". An event may be pop-edited in the Information bar in the same fashion as in the event list window. Location is determined by the Main Time Ruler. To indicate time location, the vertical grid lines from the Main Ruler extend through the Median Strip.

Inserting an Event in the Median Strip

Discrete MIDI events that are not continuous data, such as patch changes, mode changes, switch controllers like #64 (sustain pedal), and system exclusive events, appear in the Median Strip. To insert such an event:

1. **Press the Insert button in the title bar of the Graphic Editing window.**

2. **Choose the type of event you wish to insert from the menu.**

   The mouse pointer will turn into a cross hair. For system exclusive events, an additional box will appear requesting further information.

3. **Click once at the desired time location in the Median Strip.**

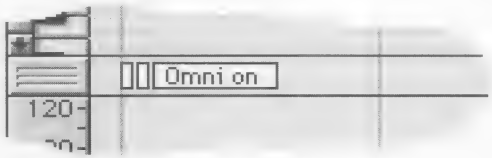
   The event will appear where you clicked.

Editing an Event in the Median Strip

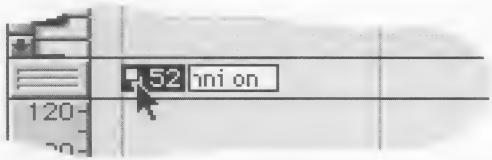
Events in the Median Strip can be pop-edited in the Information bar. For example, to select such an event, click it and the event will highlight. Click the event in the Information bar and a pop-up box will appear that you can type in. When system exclusive events are pop-edited in this manner, a dialog box will appear.

Dragging an event in the Median Strip left or right will change its location.

If two or more events occur at the same time, they will overlap in the Median Strip. Overlapping events are displayed as shown in the example below:



In this example, the Omni on message occurs near two other events. The other events are indicated by boxes preceding the Omni on box. To see the other events, click their box. To select the second event displayed in the example above, click the second rectangle. The event will pop to the front and become highlighted:



If two or more events occur at the exact same location, a list icon appears. If you press on it and drag downwards, a small pull-down menu shows all events at that location. Events in the pull-down menu can be selected and then edited. For example, if you select the third item in the menu, the list icon becomes highlighted. If you then drag the list icon left or right, you will only drag the third item that you had selected. To select more than one item in the menu, shift click to select each item.

Graphic Editing in the Conductor Track

The Conductor Track Graphic Editing window is similar to a regular track but has several differences. It does not have a Note Grid because the Conductor Track cannot contain notes. In addition, the Median Strip is wider and fixed at the top of the window just below the Time Ruler. Finally, the Conductor Track has a Tempo Change Grid similar to the Continuous Data Grid that displays tempo changes only.

Meter changes, key changes, and markers are displayed in the Median Strip.

The Conductor Track Median Strip

The Median Strip in the Conductor Track functions much like the Median Strip in a regular track. Each meter change, key change, and marker is displayed as a single item. The Conductor Track Median Strip is wide enough to accommodate all three kinds of events without overlapping them.

Editing in the Conductor Track Median Strip works the same as editing MIDI data in a regular track's median strip: click an item to make it appear in the Information bar and click in the Information bar to pop-edit its value(s); drag the item left or right to change its location.

Note that only *unlocked* markers can be edited in the Conductor Track window; to unlock a marker, do so in the Markers window.

Inserting a Meter/Key Change or Marker

To insert a meter change, key change, or marker:

1. **Press the Insert button in the Conductor Track title bar,**
2. **Choose the item you wish to enter.**

   The pointer will turn into a cross hair.

3. **Click in the median strip at the location you desire.**

   The event will appear at the location.

Editing the Location of a Meter Change, Key Change, or Marker

To change the location of an item in the median strip:

1. **Click the item you wish to move and drag left to advance it or drag right to delay it.**

   The event will move to the new location when you release the mouse.

The Tempo Change Grid

Tempo changes are displayed and edited on the Tempo Change grid in the same fashion as continuous data. Each tempo change event is displayed on the grid as a small icon. 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 an active continuous data type. For more information, see *Editing Continuous Data* earlier in this chapter.

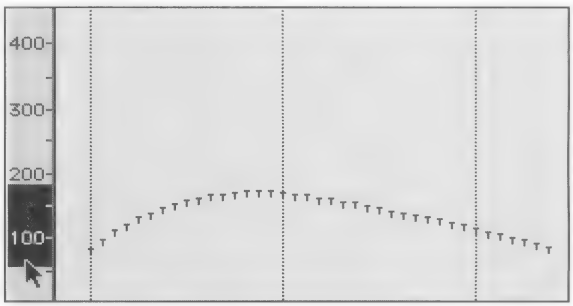
Zooming the Tempo Ruler

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:

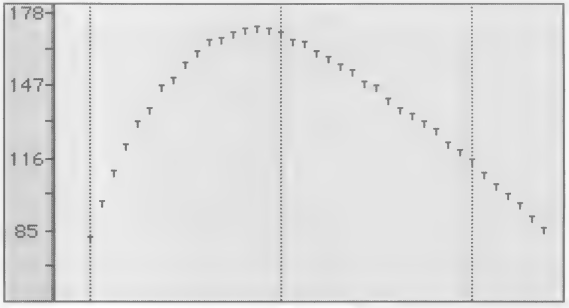
1. **Highlight the range of values you wish to zoom to by dragging in the Tempo ruler.**

   The Tempo ruler will zoom in on the range that you select.



2. **Click the Tempo ruler to toggle between your custom zoom scale and the normal scale.**

   At the zoomed in scale, dragging tempos up or down can be done to a higher degree of resolution.



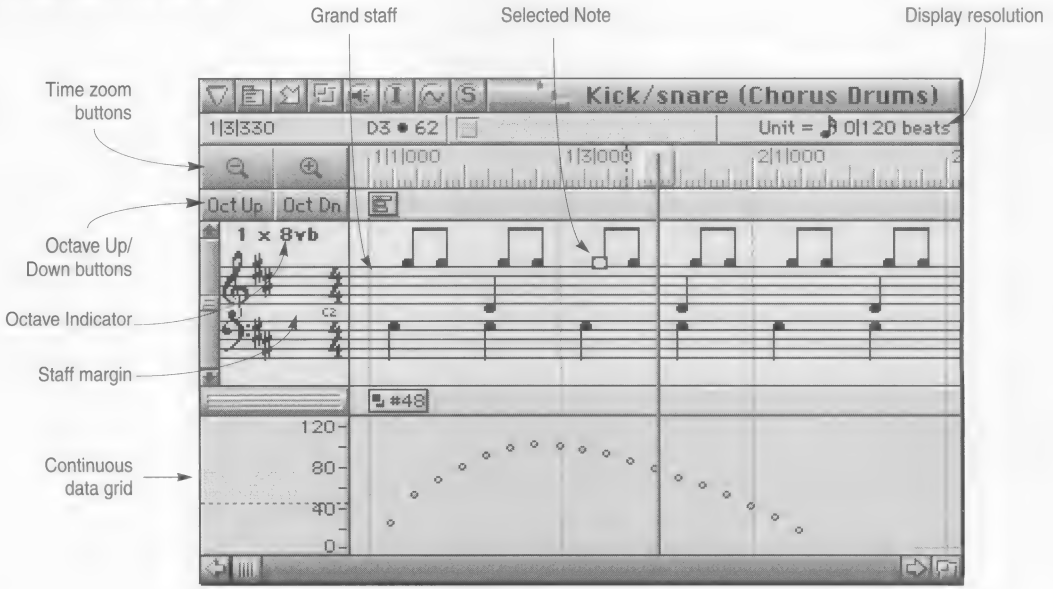
☛ The resolution at which you can insert and edit tempo events is one screen pixel (72 dots per inch). Therefore, you have a higher degree of resolution when you zoom in.

Chapter 22 *The Notation Editing Window*

Performer offers four windows in which to edit data in a track: the Event List, Graphic Editing, Notation Editing, and QuickScribe notation. To open the Notation Editing window, hold down the command and option keys and double-click the track name. Or choose Notation Editing from the Event List or Graphic Editing window mini-menus. You can also option-click the Notation button in the main control panel.

The Notation Editing window provides a scrolling window of a single track, very similar to the Graphic Editing window. This chapter covers features unique to the Notation Editing window. To display several tracks, use QuickScribe notation as described in chapter 23, "QuickScribe Notation" (page 345).

Quick Reference



Display Resolution: Determines the shortest duration that will be used to display note data on the Grand Staff. Actual attack and release times are not affected by Display Resolution.

Selected Note: Click once to select the note. While the note is selected, its information will appear in the Information Box above. Shift-click or drag a selection box to select more than one. Drag the note up or down to change pitch; drag left or right to change time location.

Grand Staff: Displays notes on standard treble and bass clef staves. By default, middle C between the staves is C3. Click the Octave Up/Down buttons to change middle C to a different octave to place notes in higher or lower octaves on the staff.

Time Zoom Buttons: Contract or expand the Time Ruler, Grand Staff, and Continuous Data Grid to display more or less measures at a time. The left button zooms out (more measures), and the right button zooms in closer (less measures).

Octave Up/Down Buttons: Transpose the display of notes on the Grand Staff by octaves. When untransposed, middle C on the Grand Staff is C3. For example, in a bass track, low notes are displayed many ledger lines below the staff. To distinguish the pitches, click the Octave Down button; middle C will become C2 and the bass notes will be displayed an octave higher on the grand staff. The octave indicator in the Staff Margin indicates the degree of transposition.

Octave Indicator: Indicates the octave being displayed on the Grand Staff.

Staff Margin: A non-scrolling region of the Grand Staff that displays clefs, key signature, and meter.

Continuous Data Grid: Displays continuous data in the same manner as the Graphic Editing window.

Notation Editing Window Mini-menu

Set View Filter: Calls up a dialog box in which you specify types of events to be visible in the Notation Editing window. The View Filter applies to all tracks and affects the Graphic Editing, Notation Editing, and Event List windows.

Goto Counter: Automatically scrolls the graphic display to the time currently displayed in the Counter. The counter location will appear at the left-most position in the window.

Goto: Automatically scrolls the graphic display to a time you specify, which will appear at the left-most position in the window.

ReInsert: Inserts an event of the same type that you last inserted. This is the same as the Insert command but you are not prompted for the type of event. This command can also be invoked by option-clicking the Insert (I) button in the Notation Editing window title bar.

Reshape: Changes the mouse pointer to a cross hair that reshapes selected continuous data curves when you drag over them in the Continuous Data Grid. This command can also be invoked by clicking the Reshape button in the title bar.

Legend: Produces a window that shows the icon representing each type of MIDI event.

Set Rulers: Allows you to configure the Time Ruler in any combination of Performer's three time formats: measures | beats | ticks, SMPTE time, and real time. The main ruler is displayed lowest and determines the time format for editing.

Cont. Data Icons: Opens the Continuous Data Icons window, which displays icons for each type of continuous data. This window also allows you to reassign controller icons.

Set Ptr. Coords...(Set Pointer Coordinates): Allows you to choose what time and pitch formats will be displayed in the Pointer Coordinates Box.

MIDI Edit: Allows data in the graphic editing window to be edited from a MIDI controller.

Switches are Cont. Data: Causes all controllers, including switch controllers #64 and above, to be displayed and edited as continuous controllers. This is useful for MIDI devices, such as MIDI-controlled lighting consoles, that use all MIDI controllers as continuous controllers.

Selections use Edit Resolution: Causes the cursor to snap to the edit resolution when dragging to make selections in the note grid, time ruler, and continuous data grid.

Event List: Opens the track's Event List window.

Graphic Editing: Opens the track's Graphic Editing window.

QuickScribe Notation: Opens the QuickScribe Notation window.

Measures|Real time|Frames: These checkable entries control which time formats are displayed in the Information Bar and Event List.

Basics

The Notation Window is similar to the Graphic Editing window. It has a Time Ruler, a Markers Strip, a Median Strip, and a Continuous Data Grid, features that are identical to those found in the Graphic Editing window. Instead of a pitch ruler and note grid, however, the Notation Editing window displays notes on a grand staff in standard music notation. Octave Up/Down buttons are provided to center any octave on the grand staff, and a non-scrolling staff margin on the left displays clefs, key signature, and meter.

For further information about the Time Ruler, Markers Strip, Median Strip, and Continuous Data grid, refer to chapter 21, "The Graphic Editing Window" (page 281) in the Reference Manual.

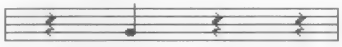
Features that are unique to the Notation Editing window are discussed below.

Display Resolution

Internally, Performer accurately records the attack and release times of notes at a resolution of 480 ticks per quarter note. For example, a quarter note that you attempted to play on beat two of measure three, 3|2|000, may have actually occurred a split second after the beat at 3|2|073, which is 73 ticks after the downbeat:

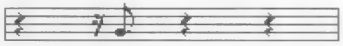
Even though the note is a little late, it may sound like it is right on the beat because of the sound used, the nature of the music, etc.

Instead, Performer internally sets up an evenly spaced grid of note durations, finds the nearest grid location, and displays the note as if it began at the grid location. For example, at a quarter-note grid resolution, the above note at 3|2|073 is displayed on the nearest downbeat at 3|2|000 (as a much more recognizable quarter note!)



Even though the note actually occurs after the downbeat, it gets displayed on the downbeat, which is the nearest grid location.

The Display Resolution box allows you to choose at which grid resolution notes will be displayed. If the note above is displayed with a sixteenth note display resolution, which sets up a grid every 120 ticks, the note will be notated as a sixteenth rest followed by a dotted eighth note because its attack is closer to 3|2|120 than it is to 3|2|000:

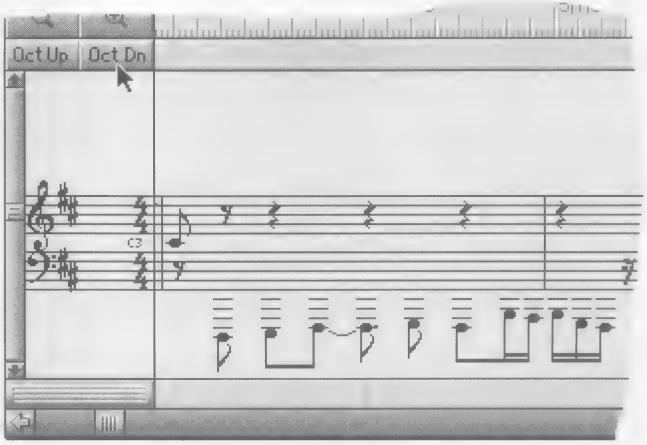


As you can see, the Display Resolution box determines the shortest duration that will be used to display notes and rests in the track. In general, a shorter duration produces a more accurate (but maybe not as conventional) notational display of the notes in the track.

Display Resolution does not affect the actual location or playback of the notes. Don't worry about affecting the notes in the track when using the Display Resolution: it only affects their display. If you would like to make the note data more rhythmically accurate, use the Quantize or Smart Quantize commands.

Octave Up/Down Buttons

The Octave Up and Octave Down buttons change the octave of middle C, the pitch directly between the treble and bass staves. By default, middle C is MIDI note number 60, or C3. If the notes in the track fall well below middle C, they will be displayed on ledger lines below the grand staff. To raise the display of the notes and make them more legible, click the Octave Down button:



The result is that the entire Grand Staff display is transposed, as indicated above the treble clef, and the notes are displayed within the staff. Only the display gets transposed; the actual notes maintain their original pitches.

Basics

Inserting Notes

The following sections describe basic procedures in the Notation Editing window.

To insert a note on the grand staff:

1. **Choose a Display Resolution.**

   To do so, click the Display Resolution note and choose the desired duration. The Display resolution affects the resolution at which you can insert the note.

2. **Click the Insert button in the title bar or choose Insert from the mini-menu.**

   In both cases, the Insert menu will appear.

3. **Choose Note from the menu.**

   The menu will disappear and the mouse pointer will turn into a cross hair.

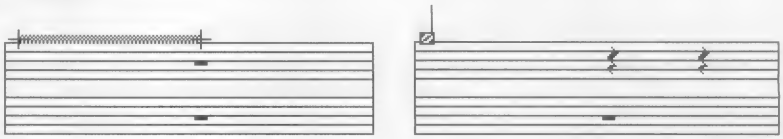
4. **(Optional) Press the Shift key.**

   This is only necessary if you wish to insert more than one note.

5. **Click at the desired pitch and location on the Grand Staff, drag to the right to draw the desired duration, and release the mouse.**

   The note's attack will begin at the nearest grid location. The duration is shown as a grey bar extending to the right. As you drag to the right, the duration of the note increases in increments of the

display resolution. For example, to enter a half-note with 16th note resolution, drag eight increments to the right as shown below.



To insert a note, drag to the right... ...and a note will be inserted.

If you press the shift key to insert multiple notes, simply click on the desired pitch to insert another note of the same duration. To insert a note with a different duration, click and drag a new duration. You will remain in insert mode as long as you hold down the Shift key.

Inserting a Chord Using a MIDI Controller

To insert a chord:

1. **Choose "Note" from the Insert button pop-up menu in the title bar.**

   The Cursor will turn into a cross-hair.

2. **If you would like to insert more than one chord, either hold down the shift key, or push down the caps lock key.**

   This will keep Performer in insertion mode after you insert the chord.

3. **Play the chord you wish to insert on your MIDI controller and, while holding the chord, click where you want the chord to begin and drag from left to right to the appropriate duration.**

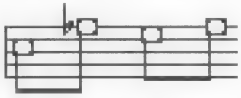
   The vertical position of your click is not important; the notes are determined by what you play on your controller. Only the attack and release of the chord is affect by the cross-hair.

As long as you remain in insertion mode, you can enter chords in this fashion for as long as you like. You can even alternate between entering notes with the mouse only or the mouse with a MIDI controller.

Selecting Notes for Editing

Selecting notes on the Grand Staff works the same way as selecting notes in the Graphic Editing window. To select a single note for editing, just click the note. The notehead will invert to indicate that

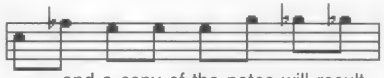
the note is selected. To select several notes, shift-click each one. Or, drag a selection box over them. Shift-click to select non-contiguous notes. To select all notes in the track, double-click any note.



Dragging Notes

To change the location or the pitch of a note, simply drag the note to the desired pitch or location. This can also be done with more than one note selected. As usual, option-dragging will produce a copy of the originally selected notes, which can be used to quickly generate repeated phrases or chords.

To copy notes, option-drag...



...and a copy of the notes will result.

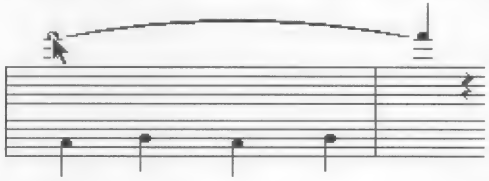
If a note is displayed as several tied notes, you must click the first of the tied notes.

Editing Durations

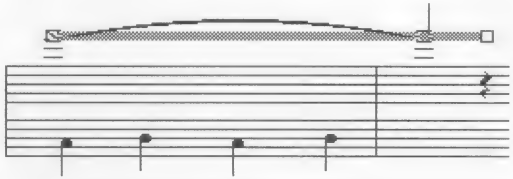
To change the duration of a note:

1. **Command-click the note.**

   If the note consists of several tied notes, you must click the first of the tied notes. A grey bar will appear to indicate the current duration of the note with respect to the Time Ruler.



To change a duration, command-click the note...



...and drag the handle of the grey bar left or right.

2. **Drag the handle of the grey bar to the left to shorten the note or to the right to lengthen it.**

   The grey bar will show you the change in duration.

To change the duration of more than one note, select them first and command-drag any one of them.

When changing a duration in the Notation Editing window, the new duration maintains any differences between its actual length and its displayed length. For example, if a quarter note ends 17 ticks after beat 2, and you lengthen it by one beat to beat 3, the release will still be 17 ticks after beat 3.

Scrolling During Playback

The *Auto-Scroll* command in the Basics menu can make the Notation Editing window scroll during playback. In addition, the window will automatically open to the current playback location of the sequence. Please refer to the Auto-Scrolling section in the *Playback* chapter for more information.

Zooming Shortcuts

Here are some zooming shortcuts:

Do this:	To zoom as follows:
Command-drag in the Time Ruler	To fill the window with the region you select
Option-click the zoom out button	To zoom all the way out
Option-click the zoom in button	To zoom all the way in

Chapter 23 *QuickScribe Notation*

This chapter explains how to use Performer's QuickScribe™ notation window. The notation window allows you to view and edit any number of tracks as standard music notation.

Performer interprets unquantized MIDI data, notating it in a readable fashion without permanently quantizing the data, so your original performance is always preserved. Music is displayed and edited on a page on the screen exactly as it will print on your Macintosh-compatible printer.

Notes can be inserted with the mouse, Macintosh keyboard, or via MIDI step entry. You can also transpose and edit using all of Performer's powerful commands in the Edit and Region menus.

The QuickScribe window provides intuitive text entry for preparing title pages, headers, footers, and page numbers. It lets you adjust system margins, staff spacing, measure spacing, and other aspects of formatting.

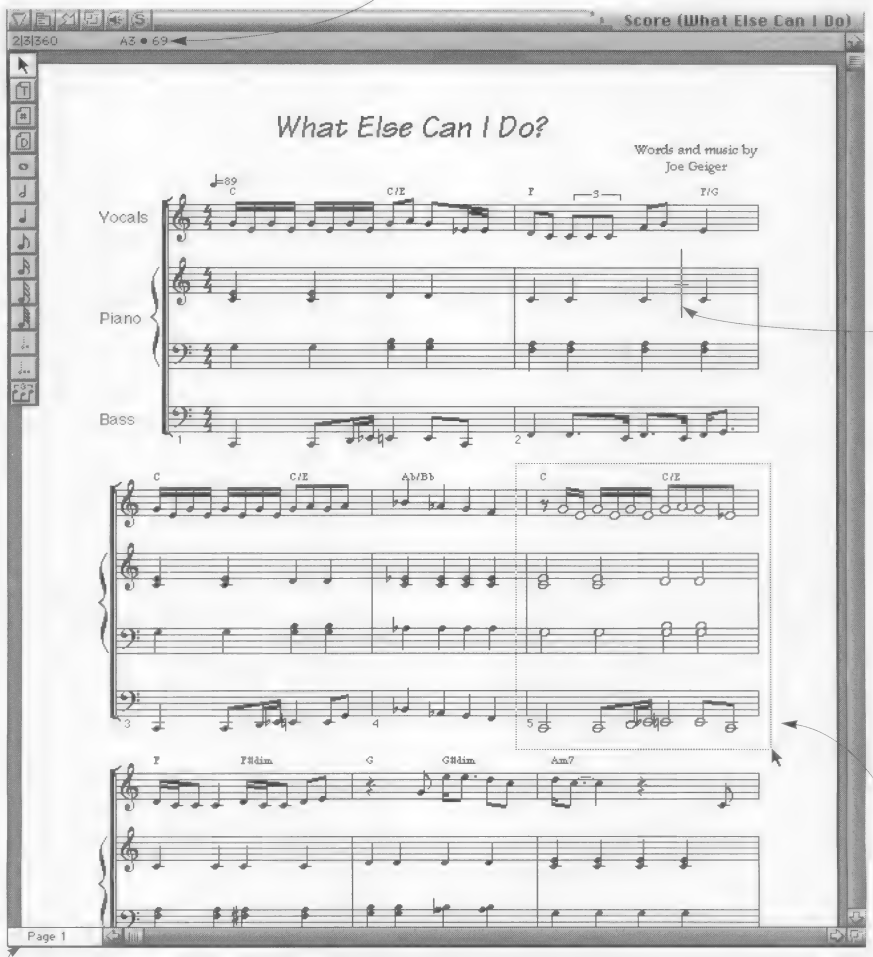
QuickScribe window basics

Performer provides one QuickScribe notation window per sequence (and you can have an unlimited number of sequences in a Performer file). The QuickScribe window can display any combination of tracks in the sequence, and you can easily change what is displayed. Page formatting is preserved, even if you decide to change what is displayed in the window. The QuickScribe window is ideal for quickly printing scores and parts. Best of all, you can choose to display any region, from a single measure to the entire sequence. In either case, Performer quickly formats the music.

Unlike the Notation Editing window, the QuickScribe notation window uses engraver spacing so that the notation looks more natural for printing. The contents of the QuickScribe notation window can be printed at any time. This chapter explains all about preparing the appearance of the score. For information about printing it, see chapter 43, "Printing" (page 665) in the Reference Manual.

Notation window Quick Reference

Below is a brief overview of the QuickScribe window.



Choosing what tracks to display

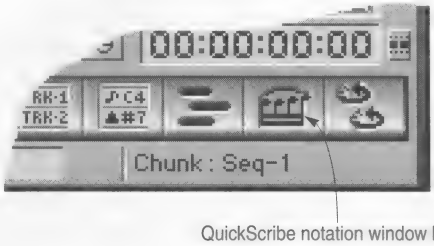
The QuickScribe notation window can display any region of time in any combination of tracks. To choose what to display in the QuickScribe notation window:

1. **Select one or more tracks in the Tracks window, and set the time region in the Tracks window Edit bar (to the nearest measure).**

   Actually, you can use any of the many selection methods that are available in Performer, which are fully explained in chapter 25, "Selecting Regions" (page 387) in the Reference Manual. For your convenience, several common selection methods are suggested on the following page. If nothing is currently selected, Performer displays the entire contents of the sequence (i.e., the currently play-enabled sequence in the Chunks window).

2. **Click the QuickScribe notation window button in the Consolidated Control panel or choose QuickScribe from the Windows menu.**

   Alternately, you can choose the QuickScribe Notation mini-menu command from any edit window.



3. **The Notation window appears.**

4. **To make adjustments to the formatting, use the Score Options, Tracks options, and other mini-menu commands.**

   In particular, you may want to change the way the music is spaced, which has a large impact on the efficiency of editing, as well as how good the music looks. For details, see "Measure spacing" on page 356.

5. **To add a title, use the Text tool in the palette.**

   For more information, see "Working with text" on page 367.

The selection methods below are interchangeable, and not every method is covered here. For more information, see chapter 25, "Selecting Regions" (page 387) in the Reference Manual.

To display this:	Select this:
A few notes or measures in a track	Drag over them in the Event List, Graphic Editing or Notation Editing window.
Several measures in a single track	Drag over the measures in the Tracks overview. Or, click the track name to highlight it and type in the start and end time of the region in the Edit bar.
One or more measures in several tracks	Drag over the region in the Tracks overview. Be sure to highlight a track segment region only for the tracks you want to include. Or you can highlight the track names and set the region with the Edit bar start and end times. When you select more than one track using either method, the resulting staves are placed together in the same staff system.
An entire track	Double-click the word "Edit" in the Tracks window Edit Bar to select the entire length of the sequence and then click the track name to highlight it. Or, open an event editing window for the track and choose Select All from the Edit menu.
All tracks for the entire sequence	Double-click the word "Edit" in the Tracks window Edit Bar to select the entire sequence and choose Select All from the Edit menu to highlight all the track names. Or, as a shortcut, don't select anything.

☛ The Remember Times command in the Basics menu is a time-saving tool for selecting with the Edit bar. See "Remember Times" on page 275 of the Reference Manual.

Changing what is displayed

To change what tracks are displayed in the QuickScribe notation window, or to change the region of time:

1. **Close the QuickScribe window.**

   Click its close button at the far left of the title bar.

2. **Select the tracks and time region you wish to display.**

3. **Click the QuickScribe notation window button in the Consolidated Control panel or choose QuickScribe from the Windows menu.**

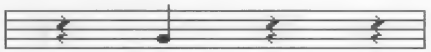
You don't need to quantize tracks to get good-looking notation

Performer does an admirable job of notating music, even though the music may not be quantized. Performer accurately records the attack and release times of notes at a resolution of 480 ticks per quarter note. For example, a note that you attempted to play on beat two of measure three, 3|2|000, may have actually occurred a split second after the beat at 3|2|073, which is 73 ticks after the downbeat:

Even though the note is a little late, it may sound like it is right on the beat because of the sound used, the tempo, and so on.

If Performer tried to take into account the 73 ticks when displaying the note in standard music notation, the result would be many 64th and 128th rests followed by lots of tied 64th and 128th notes—certainly not a recognizable quarter note!

Instead, Performer internally sets up an evenly spaced grid of note durations, finds the nearest grid location, and displays the note as if it began at the grid location. For example, the above note at 3|2|073 is displayed on the nearest downbeat at 3|2|000 (as a much more recognizable quarter note!)



Even though the note actually occurs slightly after the downbeat in the track, it gets displayed on the downbeat, which is the nearest grid location. As a result, you get the best of both worlds: your original performance of the music is preserved, and Performer makes the notation display look readable.

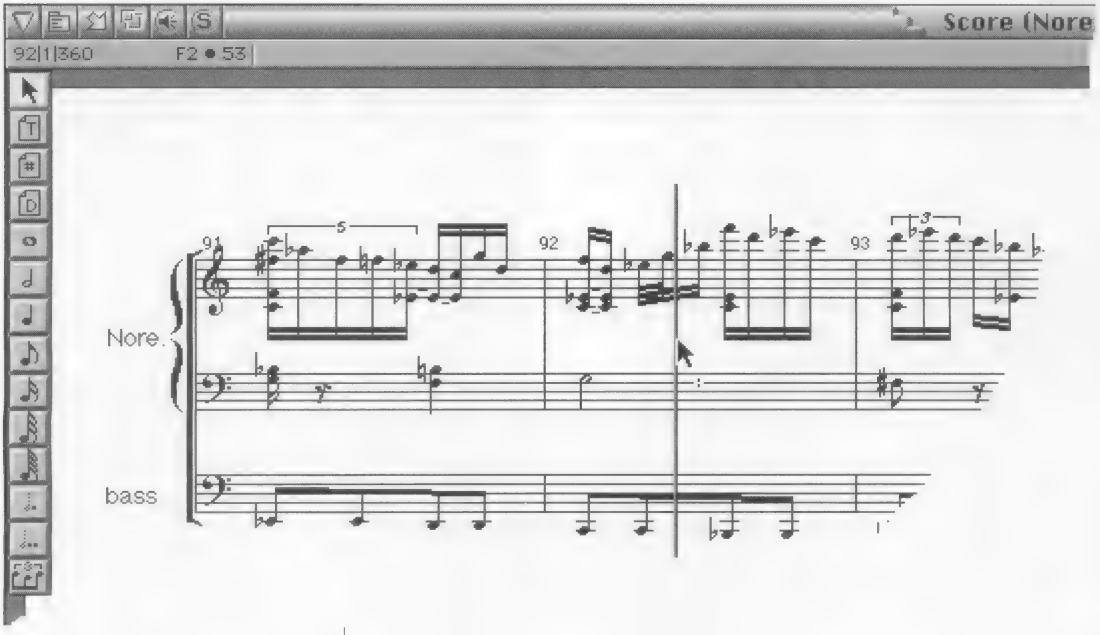
Displaying triplets and tuplets

In addition to being able to properly display unquantized data, Performer 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 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 that 100%, as the tuplet does not need to be fully quantized for Performer to recognize it.

The scrolling playback wiper

A playback wiper is provided in the QuickScribe window to indicate the current playback location. This wiper can be dragged as well to change Performer's current playback location in the main counter. You can drag it left or right; you can also drag it up and down to jump from system to system.

Double-clicking anywhere on a staff to make the playback wiper jump immediately to that location. To turn off the wiper, uncheck it in the Auto Scroll command in the Basics menu.



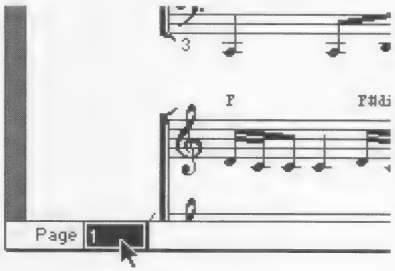
Getting around in the QuickScribe window

Use the commands in the QuickScribe notation window mini-menu to scroll through each page and go to the first or last page.

The mini-menu commands have the following keyboard shortcuts:

Mini-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.

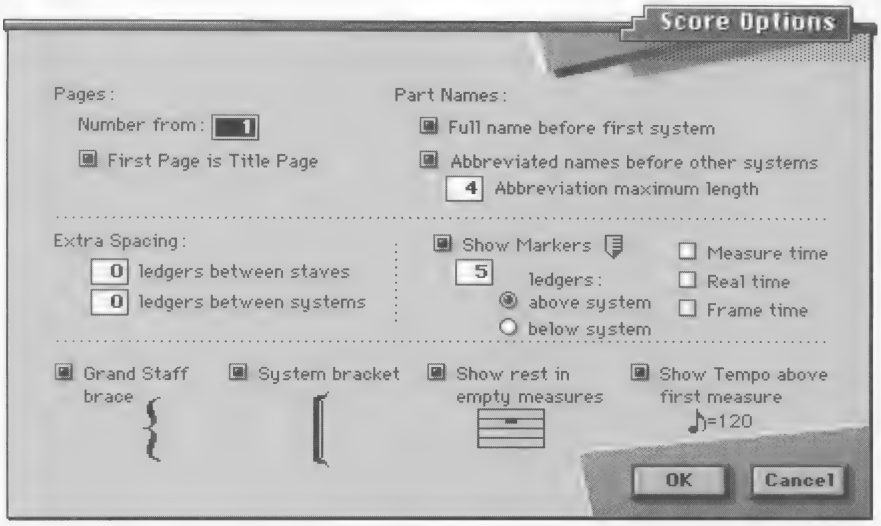


Pop-edit the page number display to go to any page.

To scroll up and down by one windowful (instead of an entire page), use option-page up and option-page down.

Setting the Score Options

Choose Score Options from the QuickScribe window mini-menu to open the Score Options dialog box:



All print option settings are saved with the file, and they can be included in your New file template.

Starting page number

This option allows you to enter the starting page number for the piece. Its default value is page 1.

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.

Full part names/Abbreviated part names

Two options are provided for displaying staff names, which appear between 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, called "Show Full Part Names before first System", to display the full

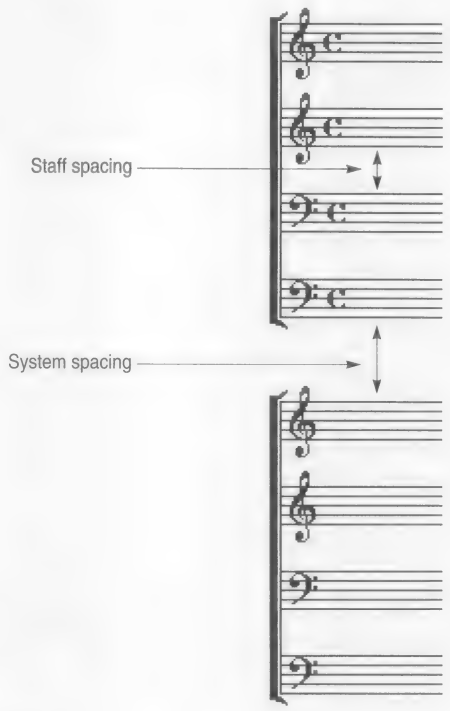
track name to the left of the first staff. Check the second option, called "Show abbreviated part names before other systems", if you would like an abbreviated name to appear next to each staff after the first one. The abbreviation is the first four letters of the staff name. If you don't want staff names, uncheck both options.

The *Abbreviation maximum length* option lets you choose the maximum length of 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.

Making more 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.



Markers

Markers can be displayed 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.

You can also choose to show the exact location of markers along with their name in any combination of Performer's three time formats. Just check the box next to the time format you wish.

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.

System Bracket/Grand Staff Brace options

These two options let you choose whether to show a system bracket and grand staff braces.

Show rests in empty measures

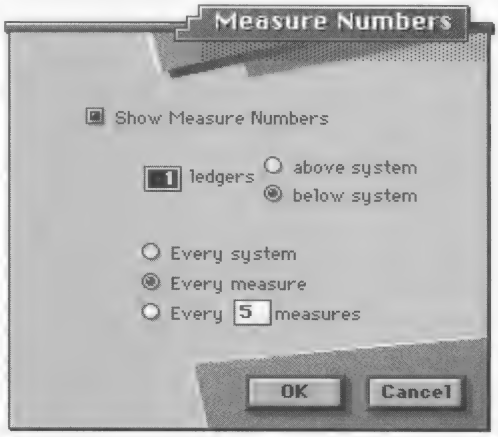
You may choose whether or not to show a whole rest in empty measures (measures with no note data in them).

Show tempo marking above first measure

Performer 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 tempo slider, the current tempo slider setting is used. If tempo control is set to the Conductor track, the current tempo setting in the Conductor track is used.

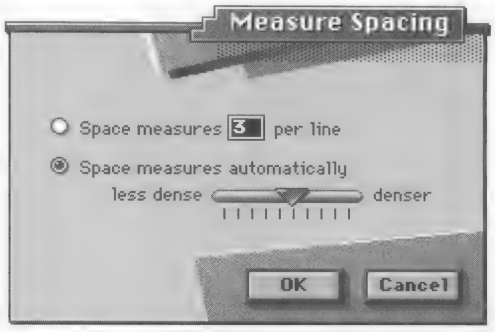
Measure numbers

The Measure numbers mini-menu command, shown below, sets the frequency and position of measure numbers in the score.



Measure spacing

The measure spacing mini-menu command 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 4 or 5. You can type in the desired number. With this option, each bar is the same size no matter what notes are in the measures.

Performer can format pages much faster when measure spacing is fixed. As a result, fixed measure spacing is preferable over natural spacing if you plan to do a lot of cutting and pasting in the QuickScribe notation window because pages need to be reformatted every time you cut or paste data. On the other hand, if measures have lots of notes in them, use automatic spacing for best results.

Space measures automatically

This option lets Performer 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.

In many cases (depending on the music itself), automatic spacing produces the best-looking results. It can, however, make cut and paste operations slow because these operations require page reformatting, and page reformatting takes longer with automatic spacing. In addition, you'll often need to manually repaginate the score after cutting and pasting to properly format the music. If you

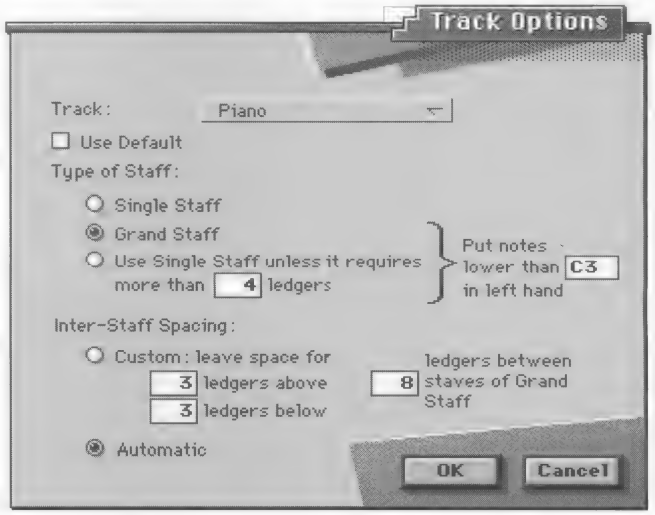
plan to use the QuickScribe notation window for cut and paste editing, you'll find it to be much faster to use fixed measure spacing (discussed in the previous section).

The effect measure spacing has on scrolling

Another thing you may notice when using automatic measure spacing is that a progress window may appear when you are scrolling around in the file. This happens when Performer has not yet calculated the pagination for all of the pages. Once the pagination has been calculated, scrolling from page to page is virtually instantaneous and you will no longer see the "Preparing to display page" progress window. If you make changes to your music that change the pagination, Performer will need to recalculate the page breaks again. If you would like to avoid this process entirely, and you would always like to be able to jump around instantaneously, use fixed measure spacing.

Track options

When displaying a track in the QuickScribe notation window, the Track options mini-menu command 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.



Track pop-up menu

Choose each track one at a time from this pop-up menu and, below, give it the settings you want. Each track can have its own settings, and the settings are remembered. You can change them at any time. The "Default" item in this pop-up 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 pop-up menu at the top of the dialog box.

Type of staff

The *Single staff* option causes the track to be displayed on its own staff, regardless of what notes are in the track. When using a single staff, Performer 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.

The *grand staff* option causes each track to be displayed on a grand staff, regardless of the notes in the track. To set the split point between the staves, see the "Put notes lower than ___ in left hand" section below.

Put notes lower than ___ in left hand

When a track is displayed on a grand staff, this option lets you specify what notes will be displayed on the treble staff and what notes will be displayed on the bass staff. For example, traditionally, notes are split at middle C (C3). If you would like to follow this convention, leave the value set to C3. The Split pitch itself always gets included in top staff.

Use single staff unless it requires more than ___ ledgers

This option causes Performer 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.

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 "Making more space between staves and staff systems" on page 353.

Controlling page size

The size of the page in the QuickScribe notation window is controlled by the Page Setup command in the File menu. Custom page sizes are not supported.

Adjusting system margins

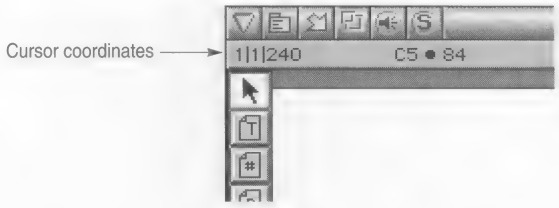
System margins can be adjusted graphically by choosing the Show System margins mini-menu command in the QuickScribe notation window. Doing so causes system margins to appear on each page. The adjustments you make on any page will automatically be reflected on all other pages, except for the title page if there is one. If the "First page is title page" option is checked under the Score options mini-menu command, 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.

Setting the score length

The *Set Score Length* mini-menu command lets you show or hide measures at the end of the score by increasing or decreasing the total number of measures shown. Choose the command and enter the desired number of measures.

Setting the cursor coordinates

The Set Pointer Coordinates mini-menu command lets you set the display for the cursor coordinates shown in the status bar at the top of the QuickScribe notation window. Choose the desired time formats and pitch representation.



Repaginating

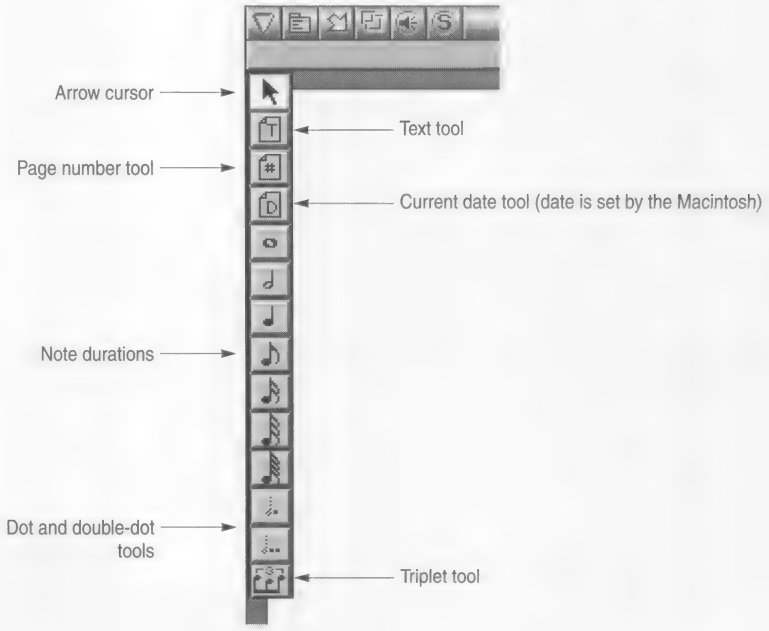
The Repaginate mini-menu command completely reformats the music on each page to achieve the most appropriate-looking layout of the measures. If you have made any changes to the music that require it

to be re-spaced or reformatted in any way on the page, the reformatting takes place when you choose this command (or close and then reopen the window).

Repaginate is especially useful after you copy and paste sections of music to restore appropriate measure spacing. If you plan to do a lot of cutting and pasting in the QuickScribe notation window, you may want to try using the fixed measure spacing option instead of natural spacing. Cutting and pasting can be much faster with fixed spacing. When you are done editing, you can return to using natural spacing.

The tool palette

The QuickScribe window tool palette allows you to insert notes, text, and tuplets. The Tools in this palette are explained at length in the rest of this chapter.



Working with notes

The QuickScribe notation window allows you to do basic sequencing tasks, including inserting, step-recording, transposing, and editing notes. The following sections describe what you can do in this window.

In the QuickScribe notation window, you can insert notes with:

- The mouse
- The Macintosh keyboard
- A MIDI keyboard

All three methods involve using the tool palette.

Rests are automatic

Rests are handled automatically by Performer's transcription algorithms. You do not need to enter them.

Inserting notes with the mouse

Insert notes and other symbols 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 coordinates 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.
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 arrow cursor. Command-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	Click the arrow cursor and then drag the note as desired. To drag multiple notes, select them before dragging.

Inserting notes with the Macintosh keyboard

To insert notes and other symbols with the Macintosh keyboard:

1. **Click the arrow cursor tool in the palette.**
2. **Click on the staff at the desired pitch and location for the symbol.**

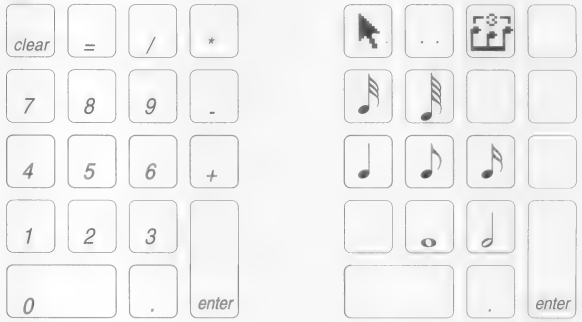
   A blinking insertion cursor appears on the staff.

3. **Once 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 coordinates display in the status bar at the top of the 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 364). Or click the desired duration in the palette.
To insert a note	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 following keys can be used on the Macintosh extended keypad to select durations in the QuickScribe tool palette. These are the same duration keys used for the Step Record command in the Basics menu.



The QuickScribe duration selection keys on the Macintosh extended keypad.

Using the keyboard when the QuickScribe window is active

When the QuickScribe window is active (the front-most window), several keys on the Macintosh keyboard change their function to features that are specific to the QuickScribe window.

For example, the up and down arrow keys, which normally change the currently record-enabled track in the Tracks window (unless you programmed them for something else in the Remote Controls window), move the note insertion cursor up and down instead.

To temporarily suspend the QuickScribe key bindings and return to the normal bindings (in the Remote Controls window), hold down the shift key, or press caps lock. If you use caps lock, the shift key temporarily switches back to the QuickScribe key bindings.

Hearing notes while inserting them with the mouse

To hear notes played back on a MIDI device as you insert them, click the Audible mode button in the title bar of the QuickScribe notation window. Notes are played on the instrument that the staff (track) is currently assigned to in the Tracks window.

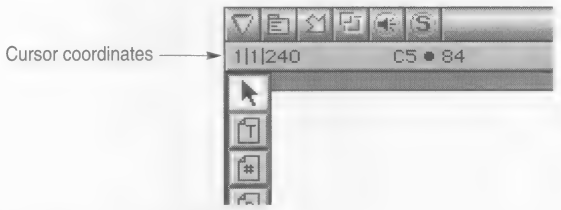
Step Recording notes with a MIDI controller

To insert notes with a MIDI controller:

1. **Click the arrow cursor 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 coordinates to determine the exact location in the measure. If necessary, use the left 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 Macintosh keyboard repeatedly, or 3) use the extended keypad as described in "Selecting durations with the extended keypad" on page 364. 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 in as many notes and chords as you'd like.**

   Change durations as needed. Step Recording uses many of the same keyboard actions as Macintosh keyboard entry, so you may want to review the section "Inserting notes with the Macintosh keyboard" on page 362.

Getting the arrow cursor temporarily

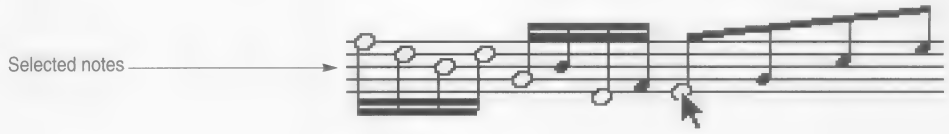
While working with the tools in the palette, you may want to temporarily restore the arrow cursor for selecting or some other purpose. To do so, press the option key. While you hold it down, the cursor turns into an arrow. When you release the option key, the cursor switches back to whatever it was.

Selecting notes for editing

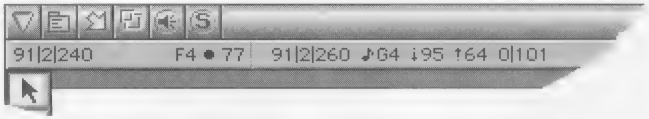
Below is a summary of how to select notes for editing in the QuickScribe notation window. Notes are selected with the arrow cursor.

To select this:	Do this:
A single note	Click the item once.
Several notes that are not next to one another	Shift-click each item.
The notes in several measures	Drag a selection box over the measures.
A region of notes	Drag a selection box over them.

☛ 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 info bar. This information can be edited as usual.



Cutting, copying & pasting notes

Once 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 arrow cursor on the location at which you would like to paste the material. Watch the cursor coordinates box (see "Notation window

Quick Reference" on page 346) to specify the exact beat location at which you will paste. You can copy and paste between other editing windows as well.

> ☛ Cutting and pasting can be slow if you are using natural measure spacing. You can used fixed measure spacing to speed things up. See "Measure spacing" on page 356 for more information.

After cutting and pasting, you can reformat the pages using the Repaginate mini-menu command to clean up the display.

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

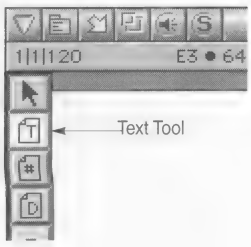
To change a note duration, click the desired duration from the tool palette and click on the note you wish to change. To change several notes at once, select them and then command-click the desired duration in the tool palette.

Working with text

The QuickScribe window 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 Macintosh 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 MacDraw, SuperPaint, or similar graphics software, you are already familiar with how to use text boxes in Performer.

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.**

3. **Drag out a text box on the page.**

1. **Choose the desired text attributes from the Text menu.**

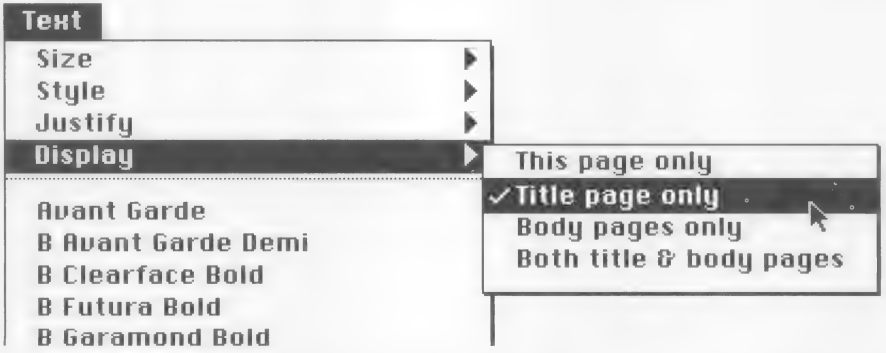
   Choose the desired font, point size, style, justification, and display properties from the Text menu. For details about the *Display* text attribute, see "Making titles, headers, and footers" on page 368.

2. **Type the desired text.**

3. **Click anywhere outside the text box to complete the text entry.**

Making titles, headers, and footers

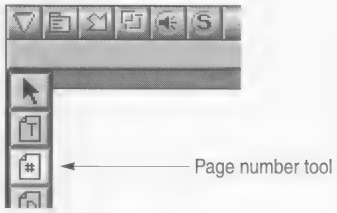
Titles, headers, and footers are inserted in the manner described in the previous section. Just choose the appropriate *Display* attribute in the Text menu as shown below.



If the *Title page only* and *Body pages only* menu items are greyed out, check the *First page is title page* option in the Score options command located in the notation view mini-menu. For more information about this option, see "Creating a title page" on page 352.

Making page numbers

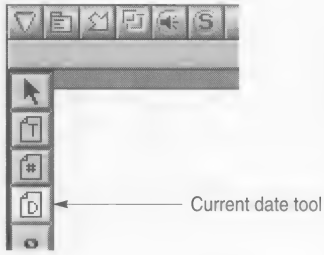
Page numbers are inserted using the page number tool in the tool palette.



Using this tool, insert them in the same manner as described in "Inserting text" on page 367. 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 "Making titles, headers, and footers" on page 368 for more information.

Displaying the current date

The current date can be inserted using the Date Tool in the Tool palette.



Using this tool, insert the date in the same manner as described in "Inserting text" on page 367. The current date (as specified by your Macintosh) 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. Handles appear to indicate that it is selected.

To select individual words within a text box:

1. **Double-click the text box to edit it.**
2. **Select the desired text by dragging over it**

Once text is selected, it can be cut, copied, or deleted. You can also change the font, style, and other attributes of the text.

Typing and editing text inside a text box

To edit text, double-click it to get an insertion cursor inside the text box. Once 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
Cancel text editing	Type command-period
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 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 QuickScribe notation window. Just copy the text from the other program, switch into Performer, 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, etc.) can be changed after text has been entered.

To change the attributes of an entire text box, click the text once to select all of the text in the box. Then choose the desired attributes in the Text menu. This works for staff names, staff abbreviations, and marker text as well.

To change the attributes of individual words within a text box:

1. **Double-click the text box to edit it.**
2. **Select the desired text by dragging over it**

3. **Choose the desired text attribute from the Text menu.**
4. **Click anywhere outside the text box to complete the text entry.**

Play *very* fast

Installing fonts in the Text menu

The fonts that you see in the Text menu are the fonts that you have installed in your Macintosh system. If you are not familiar with how to install text fonts in your Macintosh system, refer to your Macintosh documentation.

> ☛ When troubleshooting font problems in Performer, determine if the problem occurs in your word-processing software, 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 know that the problem lies somewhere in the Macintosh system.

Printing a track as a single instrument part

To print a track as a single instrument part:

1. **Select the entire track.**

   If you need help with this, see "Choosing what tracks to display" on page 347.

2. **Click the QuickScribe notation button to open the notation window.**

3. **As described in this chapter, add text to the title page and set the Score Options in the mini-menu as desired.**

4. **To display the track name in front of the staff as the instrument name, use the Part Names option in the Score Options mini-menu command.**

5. **If you are printing several instrument parts, repeat this procedure for each track.**

   You won't need to change the Score options because the formatting is remembered when you change tracks. Just close the current part, select the next track and click the QuickScribe notation window button to view and print the next part.

If you want to preserve the notation window separately for each track, you can do so by copying each track into its own separate sequence. Since each sequence has its own separate QuickScribe notation window, each part will be preserved.

Printing a keyboard part on a piano staff

Use the procedure in the previous section to print a keyboard part (which is in a single track). To display the track on a grand staff:

1. **Choose Track Options in the QuickScribe notation window mini-menu).**

2. **Choose the track that contains the keyboard part from the pop-up list.**

3. **Uncheck the Use Default check box, if necessary.**

4. **Choose the Grand Staff option.**

5. **Set the spacing options as desired.**

6. **Click OK.**

Printing a score

When you select multiple tracks, Performer places them together in the same staff system. So, to print a score, select all the tracks you want to include in the staff system for the score, and then open the QuickScribe notation window. To adjust the spacing between the staves in the system, as well as the spacing between systems, choose Score Options (score window mini-menu) and set the spacing options as needed.

Creating blank staff paper

To create blank staff paper:

1. **Select empty tracks.**

   Select as many empty tracks as you'd like staves in the systems on the page.

2. **Open QuickScribe notation window.**

3. **Use the Measure spacing and Set Score Length mini-menu commands to determine the number of empty measures.**

Controlling note spellings

Accidentals in the QuickScribe window are governed by the curr key signature in the Conductor track. To change the way notes a spelled, use the Change Key command in the Change menu. Fo more information, see chapter 32, "Change Key" (page 547).

Chapter 24 *System Exclusive*

Performer allows you to record, playback, and edit MIDI System Exclusive messages. Common types of System Exclusive messages include patch dumps, preset selections, editing parameters, etc. Performer 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

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. While there are some standards for the format of System Exclusive information, 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 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 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 will scroll to and highlight any bytes that violate the conditions just stated.

Recording and Playing System Exclusive 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. Note that a long System Exclusive message can briefly halt recording or playback as Performer 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 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 the Macintosh MIDI interface, to prevent interaction with other equipment.

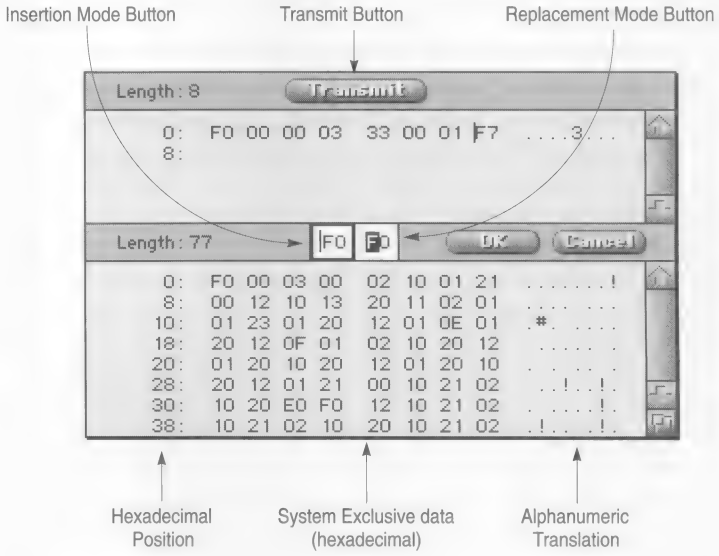
Note that the Input Filter, found in Performer's Basics menu, defaults to System Exclusive unchecked. Unless you explicitly check the box next to System Exclusive, you will be unable to record System Exclusive messages.

Viewing & Editing System Exclusive Data

System Exclusive data can be viewed and edited in the Event Editing window for the track on which it is recorded. In an Event List, a System Exclusive message will consist of the System Exclusive symbol and as much data as can fit on one line:

⧈ F0 43 01 05 7C 28 32 F7

To see the entire message, option-click or double-click on the System Exclusive event. A window appears:



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 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 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 Macintosh 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 Macintosh 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, as the display requires less updating while typing new values.

To edit a System Exclusive event:

1. **Activate the Event Editing window that contains the System Exclusive event.**

   If neither Event Editing window for the track is open, double-click on the track name and an editing window will appear. If one is open, simply click on it.

2. **Double-click on the System Exclusive event.**

   The System Exclusive window appears.

3. **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.

4. **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.

5. **Press OK to confirm your changes and close the window, or Cancel to close the window without making any changes to the data.**

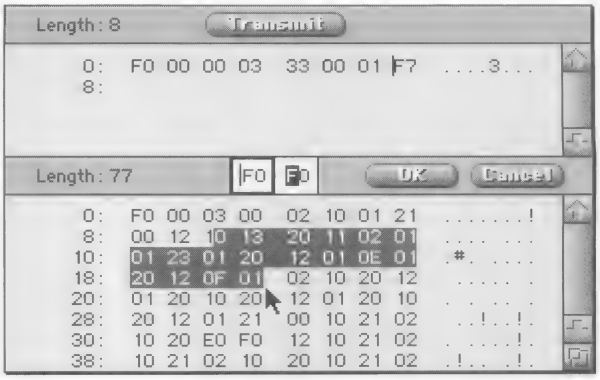
   If you press OK, Performer will scroll to and highlight any byte that does not conform to MIDI specification requirements.

Cutting, Copying, and Pasting

To Cut, Copy, or Paste a region 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 selected region.**

   To Cut or Copy, press command-X or command-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 System Exclusive Data in an Event Editing Window

You can insert system exclusive data into an Event Editing window. This is handy for inserting a short system exclusive message, like a parameter change or dump request, without having to record it. The following steps apply to System Exclusive insertion in an Event List window. Refer also to the chapter *The Graphic Editing Window*.

To insert a System Exclusive event into an Event List window:

1. **Activate the Event List window into which you want to insert the System Exclusive event.**

   If the Event List window is not open, double-click on the track name to open it. If it is open, simply click on it.

2. **Press the Insert button in the title bar of the Event List window.**

3. **Select System Exclusive from the menu.**

   A new system exclusive event pops up.

4. **Enter the location for the system exclusive event.**

5. **Press the Tab key to move to the data field.**

   The System Exclusive window appears.

6. **Select Insertion mode.**

   Click on the left button at the top center of the window.

7. **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.

8. **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 will scroll to and highlight any byte that does not conform to MIDI specification requirements.

Editing System Exclusive 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 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 treats the message as a single event.

Transmitting a System Exclusive 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. **If Performer is in MultiRecord mode, switch to regular record mode to avoid problems.**

   To do so, select MultiRecord in the Tracks window mini-menu to uncheck it.

3. **Open an Event Editing window for a track and press the Insert button in the title bar.**

4. **Choose System Exclusive from the menu.**

   A system exclusive pop-up event will appear.

5. **Type in the measure, beat and tick location for the event, using the tab key to move from one field to the next.**

6. **Press tab one more time to open the System Exclusive Editor window.**

   The system exclusive editor window will appear.

7. **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.

8. **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.

9. **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 System Exclusive into a Track

As with earlier versions of Performer, you can also record system exclusive data 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. **Choose Set Input Filter from the Basics menu in Performer and check the System Exclusive option.**

   If the System Exclusive option is not checked, system exclusive data will be filtered on input and will not be recorded.

3. **If Performer is in MultiRecord mode, switch to regular record mode to avoid problems.**

   To do so, select MultiRecord in the Tracks window mini-menu to uncheck it.

4. **Record-enable a track in the Tracks window.**

5. **Start recording.**

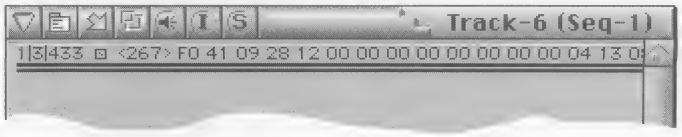
6. **Send the system exclusive data from your MIDI device.**

   To do so, press the button on the device—or whatever is needed—to cause it to transmit the desired system exclusive dump. If you have the MIDI Monitor window open, you will see the MIDI System Common light (labelled *Co*) turn black while the data is being received by Performer.

7. **Wait a few seconds, longer if it is a large bulk dump, and then stop recording.**

8. **Open the Event List window to view the System Exclusive event in the track.**

   What you should see is something like this:



If the Event List window is empty, or you do not see a System Exclusive event, check the Input Filter and cable connections and try again. You may also want to open the MIDI Monitor window to see if the data is actually being received by the Macintosh. If the *Co* light doesn't turn black when you send the data from the device, then there is a problem with the MIDI connections or with the device that is transmitting the system exclusive.

Hints

Most synthesizers and many other MIDI devices allow you to dump patch settings as System Exclusive messages. You can use Performer 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, and use the Load command to quickly access them. To restore a patch or bank, load the desired sequence and play it.

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 Chunks and Tracks windows 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 with 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 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.

Chapter 25 Selecting Regions

This chapter explains how to unleash Performer's powerful Edit menu and Region menu commands. Specifically, it tells you how to select regions of data. Once selected, the region can be modified with any command in the Edit menu or Region menu.

Selecting a Region to Edit

The commands in the Region menu and Edit menu change data in a selected region of a single sequence. This region *must* be specified before selecting a command from one of these two menus. Otherwise, Performer won't know where to make the changes to the data. We'll refer to this area as the "selected region".

A region can be selected in the Tracks List, the Tracks Overview, or in the Event Editing window for a track. Each track has three available Event Editing windows: the Event List window, the Graphic Editing window, the Notation Editing window, and the QuickScribe notation window.

> ☛ *Once you have selected a region in one of these windows, the window must remain active when you choose the desired Edit menu or Region menu command.* If the window containing the selected region is not activated, either no data will be changed or unwanted data will be changed. To activate a window, click its title bar anywhere.

Selecting a Region Using the Tracks List and the Edit Bar

This method of region selection allows you to select a region 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.

Another advantage of this method is that the region remains selected after you choose an edit command. This allows you to do multiple operations on the same region without resetting its Start and End times.

1. **Activate the Tracks window for the sequence you wish to modify by clicking on it.**

   The title bar of the window will activate.

2. **Enter the Start time of the region in the Edit Bar.**

   See the preceding section, *Using the Edit Bar* for details on entering the Start time in the Edit Bar.

3. **Enter the End time of the region in the Edit Bar.**

   See the next section, *"Shortcuts for using the Edit Bar"* for details on entering the End time in the Edit Bar.

4. **Select the track or tracks that contain the region.**

   Click on a track name to select a track, or drag over a set of tracks. Use Shift-click to select non-contiguous tracks.

The region is now selected.

Events occurring *on or after* the Start time and *before* the End time will be affected by a region command. For example, in 4/4 time, if the Start time is 9|1|000 and the End time is 13|1|000, all events starting on the very first tick of the first beat of bar 9 through the very last tick of the fourth beat of bar 12 (12|4|479) will be modified. An event occurring directly on 13|1|000 (the very first tick of the first beat of measure 13) will not be modified.

Shortcuts for using the Edit Bar

The Edit Bar holds the beginning and end times for the selected region in the Tracks List. To enter a beginning time, click in a field in the Start time and enter a value; to enter the end time, click in a field

in the End time 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.

Clicking on the word "Start" enters the current time displayed in the Counter as the Start time. Clicking on the word "End" enters the current time as displayed in the Counter window as the End time.

Double-clicking on the word "Start" enters the beginning time of the sequence as the Start time. Double-clicking on the word "End" enters the end time of the sequence as the End time.

Double-clicking on the word *Edit* sets the Start and End times to the beginning and end of the sequence. This is equivalent to double-clicking on both the *Start* and *End* words. There are several quick ways to load times into the Edit Bar.

The Remember Times command is a powerful way to set the edit bar. If you have a region selected in another window besides the Tracks window, and you want to load that region's start and end time into the Edit bar in the Tracks window, use Remember Times. To "remember" a pair of Start and End times, activate the window containing the times and choose Remember Times from the Basics menu (or press command-R).

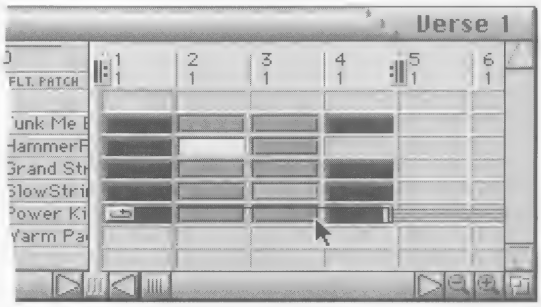
Times are remembered for each type of window as follows:

- *Markers window:* the times of the first and last highlighted markers are remembered.
- *Event Editing windows:* the times of the first and last highlighted events are remembered.
- *Tracks window:* the times in the Edit Bar are remembered.
- *Consolidated Controls panel:* the times in either the Memory Bar or Auto Record Bar are remembered, whichever is visible. If both are, the Memory Bar times are remembered.

Once you have used Remember Times, click the word "Edit" in the Edit bar. The remembered times are loaded into the Edit Bar.

Selecting a Region in the Tracks Overview

To edit the data in a segment, you must first select it. When a segment is selected, it highlights. Segment selection is exclusive from track name selection in the Tracks List. If you select segments, any highlighted track names will deselect.



Below are several convenient shortcuts for selecting segments:

To select this:	Do this:
A single segment	Click it.
Several adjacent segments	Drag over them. If the segments are in several adjacent tracks, drag over them in a diagonal fashion.
Several non-adjacent segments	Hold down the Shift key and click the segments you wish to select. They will highlight.
A segment in all tracks	Click the segment in the Time Ruler. All segments beneath will highlight.
One or more segments in all tracks	Drag in the Time Ruler.
Deselect segments when more than one are highlighted	Hold down the Shift key and click the segments you wish to deselect. They will unhighlight.

After you select one or more segments, Performer loads the start and end times of the region into the Edit bar for convenient selection in the Tracks List.

Selecting a Region Using Event Editing Windows

Selecting data in an Event Editing window allows you to precisely specify the region's boundaries; you can even select a single event if you want.

Each track has four available Event Editing windows: the Event List window, the Graphic Editing window, the Notation Editing window, or the QuickScribe notation window. The data in the track is the same regardless of which window you use. For example, if you edit data in the Graphic Editing window, the changes you make will be immediately reflected in the track's Event List window.

Selecting a Region Using the Event List Window

This method of region selection allows you to precisely specify the region's boundaries; you can even select a single event if you want. The Snip, Repeat, and Retrograde commands do not affect events highlighted in the event list. All other edit and region commands do.

If the Event List window for the track you wish to modify isn't already open:

1. **Click on the track name containing the region to highlight it.**

   This selects the track.

2. **Choose Edit from the Tracks window mini- menu.**

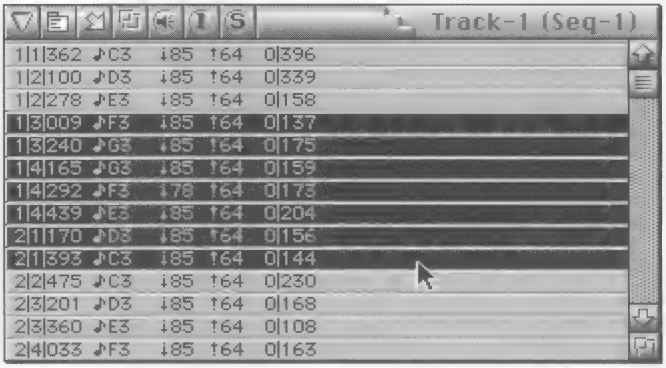
   An Event Editing window for that track will appear. If the Graphic Editing window appears, go to the mini-menu on its title bar and choose Event List. The Event List window for the track will appear. Alternatively, you can just double-click on the name of the track you wish to modify. If the Event List window is open but not active (i.e. its title bar isn't visible), simply click on the Event List window to activate it.

3. **Select the region of events you wish to change.**

   Below is a summary of how to select events in the Event List.

To select this:	Do this:
A single event	Click on it.
Several adjacent events	Drag over the desired events. All events dragged over will highlight.
Several non-adjacent events	Hold down the Shift key and click on the events you wish to select. They will highlight.
Deselect events	Hold down the Shift key and click on the event(s) you wish to deselect. They will unhighlight.
Extend the currently selected region	Command-click or Command-drag at the desired end location.

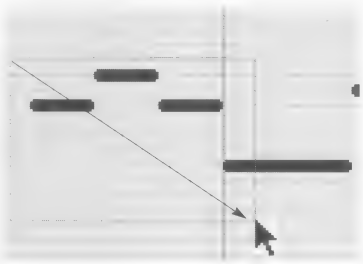
This defines a region of events which will be affected by the next command on the Edit or Region menus.



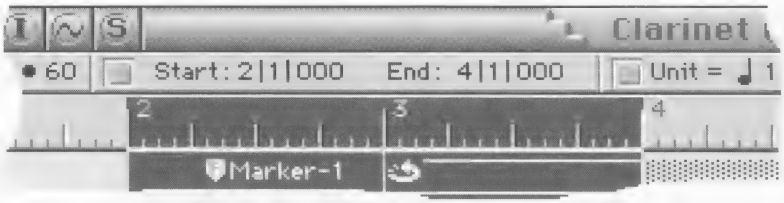
Selecting a Region Using the Graphic Editing window

There are two ways to select data in the Graphic Editing window:

1. Drag a selection box over the desired notes (or other data)



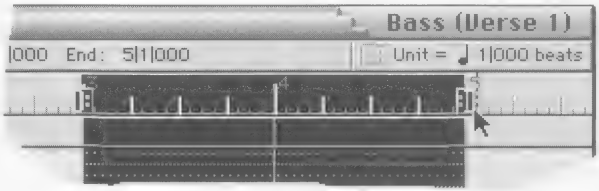
2. Drag horizontally in the Time ruler at the top of the window



For more information about selecting a region using the Graphic Editing window, see "Selecting Notes" on page 311.

Selecting a region using the Memory-cycle repeat barlines

If you would like to quickly select the region within the Memory-cycle repeat barlines to insert a loop, quantize, or any other editing operation, double-click one of the two repeat barlines in the Tracks Overview or Graphic Editing windows.



Selecting Chunks in the Song Window

A Chunk in a song window can be selected by clicking it once. To select several adjacent Chunks, either drag over them or shift-click each one. To select non-adjacent Chunks, shift-click each one.

Selecting in the QuickScribe notation window

For information about selecting notes in the QuickScribe notation window, see "Selecting notes for editing" on page 366.

Chapter 26 *Edit Commands*

After you've recorded your music, Performer's powerful editing commands are at your disposal to add, remove, and otherwise rearrange data in a sequence or song. You can edit any amount of data from single events to large regions.

Editing During Playback

Almost all of the editing operations discussed in this chapter can be done while the music is playing back so that you don't have to stop and start the music 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 a Region

The commands in this chapter act on the a selected region in the Tracks List, the Tracks Overview, or one of Performer's track edit windows. Without a selected region, the commands in this chapter do nothing. So be sure to learn how to select a region by reading chapter 25, "Selecting Regions". It contains many powerful shortcuts that will speed up your work.

Editing Commands and the Song Window

The following Edit commands can be used in the Song window: Cut, Copy, Paste, Erase, and Select All. Other Edit commands such as Snip, Splice and Repeat have no effect on Chunks in the Song window.

Setting the Edit Filter

The Edit Filter allows you to specify what types of MIDI information are affected by commands from the Edit menu. It is in effect only when you select a region from the Tracks window. (When editing a region in an Event Editing window, use the View Filter instead.) Using this feature, you can extract different types of information from a region without having to laboriously edit out events that you don't want. For example, if you wanted to copy only patch changes and aftertouch from a track, you could select only those items in the Edit Filter. Only the selected data would be copied to the clipboard. As another example, if you were editing Tempo changes in the Conductor track, you could set the Edit Filter for Tempo changes only. You could then cut and paste Tempo changes without erasing or in any way affecting meter and key changes in the same region.

Remember, the Edit Filter setting you make will affect *all* the commands from the Edit menu, and *all* editing from the tracks window. You should therefore make sure to change it back after doing a specific editing task since it may cause unwanted effects the next time you use the Edit commands.

To set the Edit Filter:

1. **Choose Set Edit Filter from the Edit menu, or press command-F.**

   A dialog box appears.

2. **Choose the types of data to be edited by checking the check box for each.**

   You can choose multiple types of data. You can choose all types of data at once by clicking on the "Set All" button. You can uncheck all the check boxes by clicking on the "Clear" button. Using option-click will check only the check box you click on, unchecking all others; using command-click will check all boxes except the one you click on. Use the Controllers box and its options buttons to select which controllers are affected by Edit operations.

3. **Press OK to confirm your choice or Cancel to cancel it.**

The types of data you select will stay in effect until you change the Edit Filter setting. When you are done using the Edit Filter, you should reset it.

Specifying Controller Numbers in the Edit Filter

The buttons under the Controllers check box in the Edit Filter allow you to quickly choose which controller data to include in Edit operations. Click in the Controllers check box, click on the type of option you wish and then enter the controller numbers if necessary.

- *All:* All controllers will be affected by Edit operations.
- *All except:* All controllers *except* the controller numbers you enter will be affected by Edit operations.
- *Only:* Only the controller numbers you enter will be affected by Edit operations.

To enter controller numbers for the *All except* and *Only* options, click in the text boxes next to the option and type in the numbers. You can use the Tab key to move between boxes in the same option.

The Clipboard

The Clipboard is a temporary storage place that holds data that is cut or copied. All data that is cut or copied is put on the Clipboard. When you paste, the data to be pasted comes from the Clipboard.

The Clipboard retains data until a new cut or copy action is made. This means that you can cut or copy a region of data once and paste this same information as many times as you like. *The Clipboard retains its data between files*. You can therefore copy data from one file and paste it into another.

To view the Clipboard, choose the Show Clipboard command from the Edit menu. To close the Clipboard, choose the Hide Clipboard command from the Edit menu.

Undo/Redo

The Undo command will undo the effects of both real-time and step recording. Undo will also undo the effects of most commands and actions that add, delete, move, or otherwise modify data.

The Undo command will change to reflect the name of the command just invoked. For example, if Transpose were chosen from the Region menu, *Undo Transpose* would be displayed on the Edit menu when next pulled down.

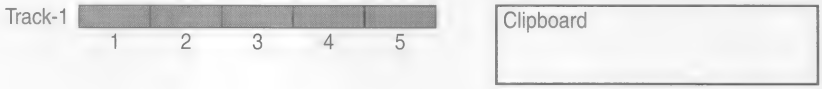
When the Undo command is used, it will generally change to *Redo*. Redo will reinstate the recording or changes to the data you have made. This allows you to effectively undo the Undo, that is, return the sequence to its state before the Undo command was invoked.

You can go back and forth between the Undo and Redo commands as many times as you like. This allows you to make A/B comparisons between the original and modified versions of the region.

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), without MIDI events. The type of information that is cut is determined by the Edit Filter. The Cut command is undoable.

Before measure 3 is cut:



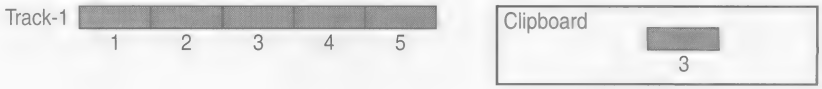
After measure 3 is cut:
(The length of the music is the same.)

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 type of information that is copied is determined by the Edit Filter. The Copy command is undoable.

Before measure 3 is copied:

After measure 3 is copied:
(The length of the music is the same.)



Paste

The Paste command inserts the contents of the Clipboard (i.e. whatever was most recently cut or copied) at the Start point in the Tracks window, replacing what was previously there. The End time in the Edit bar has no effect. 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). The types of information pasted from the Clipboard are determined by the Edit Filter. In addition, only the types of data selected in the Edit Filter are replaced; all other data is unaffected. The Paste command is undoable.

Measure 3 from Track-1 is copied into the clipboard:

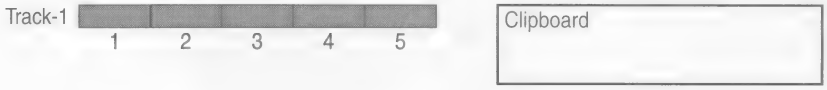
Track-2 before measure 3 is pasted:

Track-2 after measure 3 is pasted:

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 types of data erased are determined by the Edit Filter setting. The Erase command is undoable.

Before measure 3 is erased:



After measure 3 is erased:
(The clipboard remains empty.)

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 bars 1-3 three times places a copy of bars 1-3 in bars 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 Edit bar would be set to 1|1|000

and 4|1|000, respectively. The entire three bar 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.

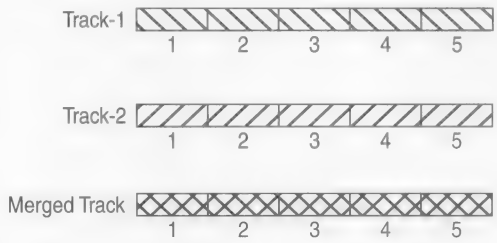
You must select a region with the Tracks window and Edit bar to use the Repeat command; this command will have no effect on a region selected within an Event Editing window.

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. The types of data repeated are determined by the Edit Filter setting, as are the types replaced by the Paste option and shifted by the Shift option.

Merge

The Merge command combines the contents of the clipboard with pre-existing data in the selected tracks. The new data is inserted at the Start time in the Tracks window, mixing together the data already in the region and the new material. You need only specify a Start time in the Edit Bar of the Tracks window; the End time has no effect. The types of data merged from the Clipboard are determined by the Edit Filter setting. The Merge command is undoable.

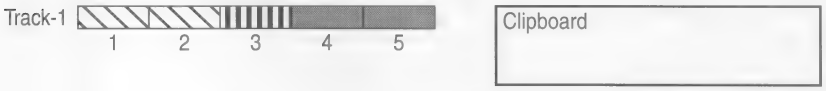
Since Performer allows unlimited tracks assigned to one channel, the Merge command isn't always necessary. You should use it only when you are certain that data in two tracks should be merged together (this is often true when you create a track during editing for the express purpose of merging it with another track later). Once tracks are merged, they cannot be separated later.



Snip

The Snip command removes data in the selected region and places it on the Clipboard. The time region containing the data is removed as well, closing up the gap between the beginning and end of the region: events at the End time are moved to the Start time. The types of data snipped are determined by the Edit Filter setting. The Snip command is undoable.

Before measure 3 is snipped:



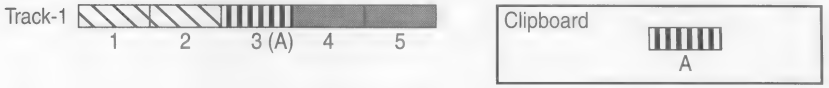
After measure 3 is snipped:
(Measures 4 & 5 are shifted to 3 & 4.)

Splice

The Splice command inserts data on the Clipboard in the selected region, making a gap for the new data and moving pre-existing data later in time to make room for the new material. The event just after the Start time moves forward the amount of time of the region on the Clipboard. Thus, if a one-measure section is copied to the Clipboard and spliced at measure 3, the old events starting at measure 3 shift to measure 4. The types of data spliced from the Clipboard are determined by the Edit Filter setting, as are the types shifted to make room. The Splice command is undoable.

Before measure A is spliced:

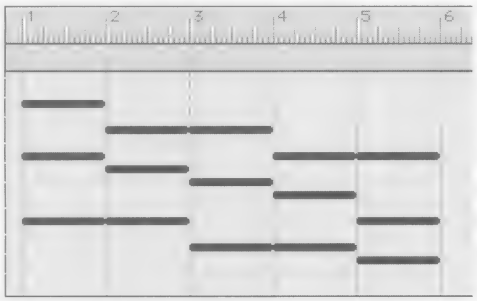
After measure A is spliced:
(Measures 3 & 4 are shifted to 4 & 5.)



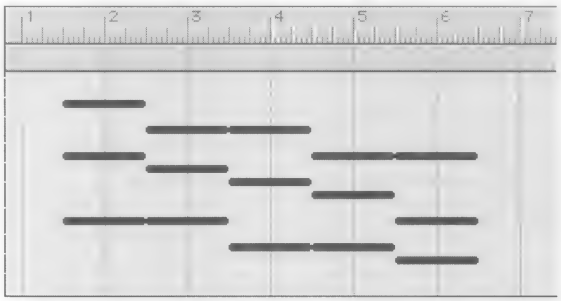
Shift

The Shift command moves the selected region ahead or back in time. The shift distance is specified by a number of measures and/or a quarter notes | ticks duration, entered into a dialog box. Measures are computed based upon the meter marking at the start point of the selected region. To move the region ahead, select the Advance

option; to move it back, select the Delay option. The region will be shifted in time by the amount you enter. The types of data shifted are determined by the Edit Filter setting. The Shift command is undoable.



Original track



Delayed by a half of a measure

Show/Hide Clipboard

Choosing Show Clipboard from the Edit menu brings up a window which describes the contents of the Clipboard (in text). When the Clipboard is showing, the menu entry changes to Hide Clipboard. When you choose this, the Clipboard window is closed. For a description of the Clipboard, see the section *The Clipboard* earlier in this chapter.

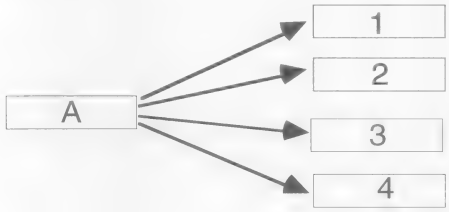
Select All

This command generally selects all items in the active window. If a Tracks window is active, choosing Select All will select all the tracks (thus highlighting all track names). If an Event List window is active, choosing Select All will select all events in it.

Editing Between Several Tracks

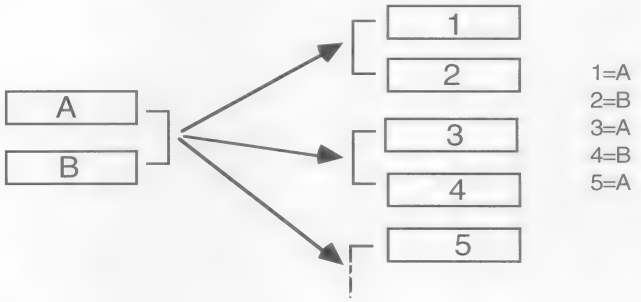
You can use the Edit commands to move or change data from one or more original tracks to one or more target tracks (even in another file). The number of original and target tracks doesn't have to be the same. If they are unequal, Performer will cycle through the target tracks, pasting and merging from the original to the target tracks until all original material is placed. Three examples are given. In the first there is one original track and several destination tracks. In the second the number of original tracks is less than the number of target tracks. In the third the number of original tracks is greater than the number of target tracks.

Example one: You have copied data from one track and paste or merge it to four destination tracks:



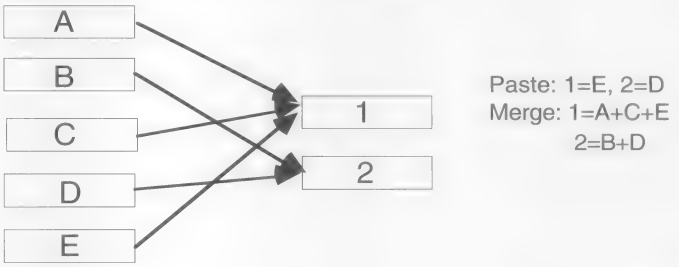
If pasted or merged, the data from the one original track is placed in each destination track.

Example two: You have cut information from two tracks and paste or merge it to five destination tracks:



If pasted or merged, track A's information goes to track 1, then track B's goes to track 2. The process proceeds in the same manner until track 5: track A goes to 3, B to 4, and A to 5.

Example three: You have copied information from five tracks and paste or merge it to two destination tracks:



If pasted, track A's data will go to track 1, track B's data will go to track 2, track C's data will go to track 1, etc. This will result in track 1 containing data from track E, and track 2 containing data from track D. If merged, track 1 will end up with data from tracks A, C, and E, and track 2 will have data from tracks B and D.

Hints

The following examples illustrate some creative uses of the Edit commands.

Removing a Specific Type of Data From a Track

This works for removing one or more particular kinds of data from a track such a mono key pressure, patch changes, etc.

1. **Choose Edit Filter from the Edit menu, or press command-F.**
2. **Check only the check box for the type of data you wish to remove.**

   Option-click on the check box for the type of data to be removed; all other check boxes will uncheck.

3. **Select the track with the data to be removed.**

   Click on the track name; it will highlight.

4. **Enter the Start and End times of the region in the Edit bar.**
5. **Choose Erase from the Edit menu.**

   If you want to save this information for possible future use, cut it instead of erasing it, and paste the information into a new and separate storage track. You can later merge it back into the original track if you like.

Here's an alternate method for removing a specific kind of data using the Event List window:

1. **Open the Event List window for the track with the data to be removed.**

   This is done by clicking on the track name and choosing Edit from the Tracks window mini-menu.

2. **Choose View Filter from the Event List window mini-menu.**

3. **Check only the check box for the type of data you wish to remove.**

   This will display only that type of data in the Event List window. Option-click on the check box for the type of data to be removed; all other check boxes will uncheck.

4. **Select a region of events.**

   Click on the first event and drag over the rest of them.

5. **Choose Erase from the Edit menu.**

Creating an Echo Effect with a Track

Here's a method for "echoing" a track: all of the data in a track is copied to another track and shifted just slightly in time. The effect is a slight delay or echo.

1. **Activate the Tracks window for the sequence that contains the track to be echoed.**

   Click anywhere in the Tracks window.

2. **Choose Add from the Tracks window mini-menu.**

   A new track appears in the track list.

3. **Name the new track.**

   Option-click on the name. A pop-up box will appear into which you can type the new name.

4. **Select the original track by clicking on it.**

   The track name will highlight.

5. **Enter the Start and End times of the region in the Edit bar.**

6. **Choose Copy from the Edit menu.**

   The data in the selected region is placed on the Clipboard.

7. **Select the new track by clicking on it.**

   The track name will highlight.

8. **Choose Paste from the Edit menu.**

   The contents of the Clipboard are pasted into the new track. It now contains a copy of the original track.

9. **Choose Shift from the Edit menu.**

10. **Select the Delay option and enter zero bars and 0|240 duration.**

    This will delay the data in the new track by an eighth note.

A few variations on the above:

Before selecting Paste to paste the data into the new track, you could set the Start time in the Edit bar in the Tracks window to 240 ticks later. This would save you having to use the Shift command to shift the data by 240 ticks. You could use the Change Velocity command on the Region menu to decrease the velocities on the echo part to make it softer than the original. You could assign the echo part to another synthesizer or voice with a different patch or the same patch, panned in stereo.

The Repeat Command vs. Looping

The Repeat command is useful for repeating sections of music, creating the same effect as looping. The advantage of using the Repeat command over looping is that you can make each of the repeats slightly different. Loops take less memory (which is an advantage on their side) and each copy is exactly the same. Choose between them according to your needs at the time.

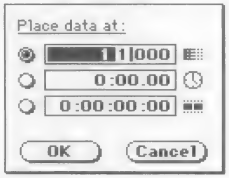
Repeat can also be used to create trills (by repeating just two very short notes) or drum rolls (by repeating just one drum note).

The Shift Command and Attack Times

You may find that certain patches on your synthesizers have quicker attack times than others. You can play two notes at exactly the same time on two different synthesizers (with two different patches) and hear them not sounding together: one seems to "play" first and the

second takes a longer time to come to full volume. The Shift command is useful for lining up attacks in situations like this one. By shifting a track forward or backwards just slightly (try a value of less than 100 ticks to start with), you can make all instruments sound as if they are attacking notes at the same time. You may want to leave some of the disparity between attack times: let your ear guide you.

Shift, Paste, Merge, & Splice Using Real Time and SMPTE Time



The Shift, Paste, Merge, and Splice commands allow you to specify Real Time, SMPTE time, or Measure/Beat/Tick time as the time unit used to perform the operation. Just click the radio button corresponding to the time unit you wish to use in the dialog box that appears when any of these commands are selected.

The dialog box shown to the left appears when you are working in an Event Editing (Graphic, Event List, or QuickScribe notation) window, no events are currently selected, and you choose Paste, Merge, or Splice.

Chapter 27 Region Commands 1

Editing During Playback

Almost all of the editing operations discussed in this chapter and the next can be done while the music is playing back so that you don't have to stop and start the music to hear the result. For example, you could change note velocities in a track while the music is playing and then use the Undo/Redo command as the music continues playing to compare the original and modified data.

Selecting a Region

The commands in this chapter act on the a selected region in the Tracks List, the Tracks Overview, or one of Performer's three track edit windows. Without a selected region, the commands in this chapter do nothing. So be sure to learn how to select a region by reading chapter 25, "Selecting Regions". It contains many powerful shortcuts that will speed up your work.

Transpose

The Transpose command transposes all notes in the selected region. For information about the Transpose command, see the chapter called *Transpose*.

Quantize

Quantizing changes the attack and release times of note events to make them more rhythmically precise. Attacks and releases 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.

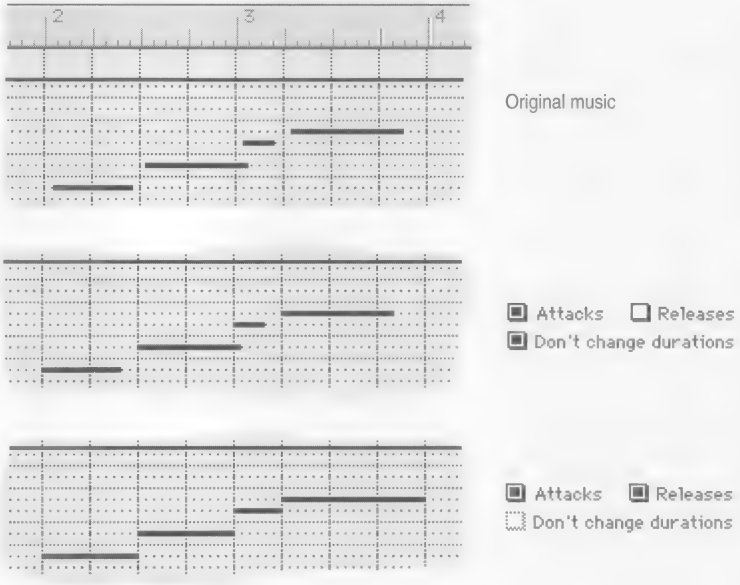
Some Inaccuracy is Good

Quantizing is, in its simplest form, a way to make all note events 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 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.

Quantize will only alter the locations and durations of note events. All other data in the selected region will be unmodified.

Quantizing a region sets up a grid of equally spaced locations. Notes are then 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.

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 Duration 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.

To Quantize

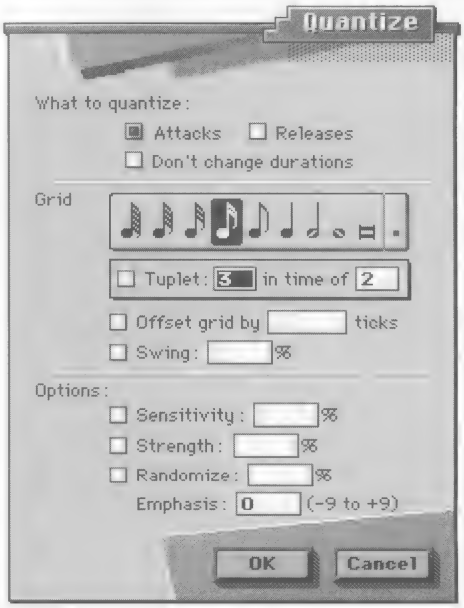
To Quantize a region:

1. **Select the region you wish to quantize.**

   See the section *Selecting a Region* at the beginning of this chapter for instructions selecting a region.

2. **Choose Quantize from the Region menu.**

   The Quantize dialog box will appear.



3. **Select Attacks, Releases or both to be quantized.**

   If you selected Attacks or Releases (not both), select the *Don't change durations* option if you wish to keep the original durations the same. If you did select both Attacks and Releases, this option will be disabled.

4. **Select a grid value.**

   Select any note value from a 128th note to a breve (a double whole note). Select the dot or Tuplet option if necessary.

5. **Set Offset, Sensitivity or Strength options.**

   Optional: see the descriptions below on these features.

6. **Press OK to confirm your choice, or Cancel to cancel it.**

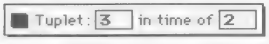
Choosing the Grid's Duration Value

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. This is similar to the way the tuplet box works in the Step Record window. 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.

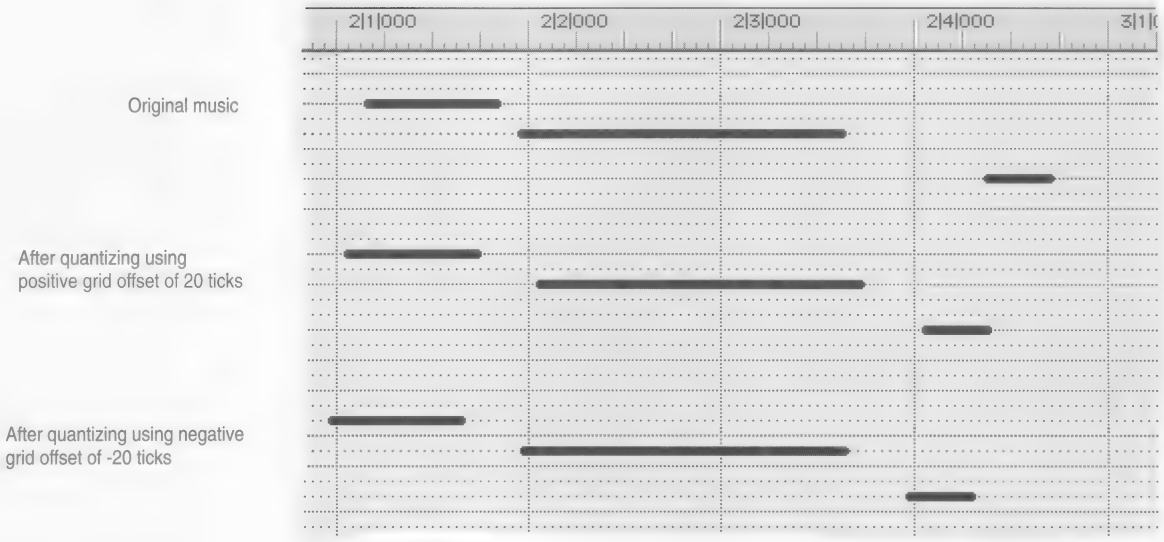
2. **Check the tuplet check box.**

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.**

Grid Offset

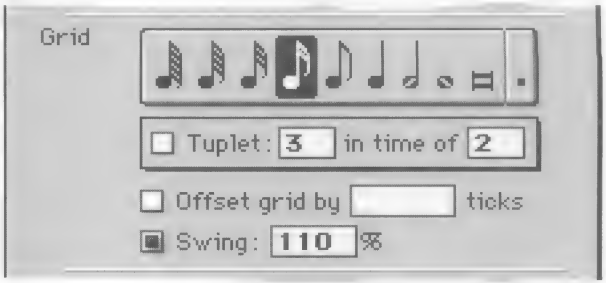
The start of the grid may be offset from its standard position on the first beat of the selected region by a number of ticks. This is done by clicking in the check box next to *Offset by n ticks* and entering a number of ticks to offset the grid by. Positive values offset the grid forward in time (after the beat), negative values offset it backward (before the beat).



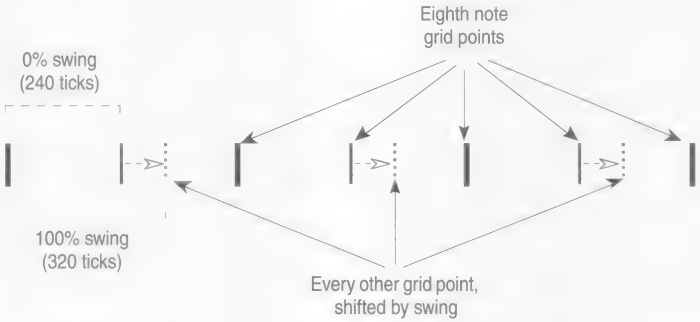
If you enter an offset greater than the distance (in ticks) between grid locations, the number will be scaled down to be less than the distance of the grid value. For example, if you are using a grid value of a quarter note (480 ticks) and you enter an offset of 500 ticks, it will be reduced to an offset 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, or "jazz", 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.

100% Sensitivity

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:

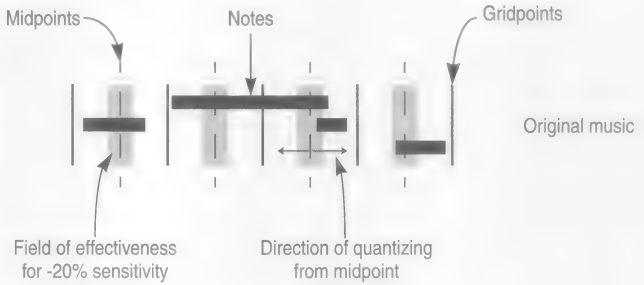
50% Sensitivity

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, 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 options 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.

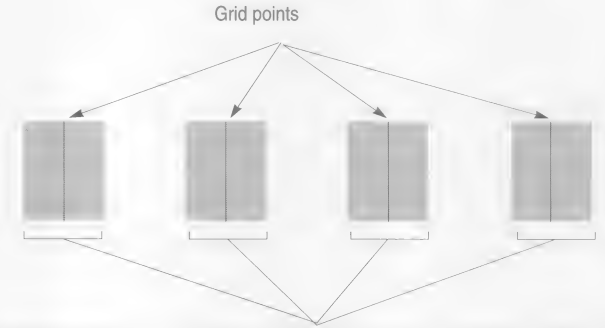
To use the Strength option:

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.



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

If you're trying to simply line up all notes with the beat and its subdivisions, selecting *Attacks* and *Don't change duration* 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 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 Event Editing Window for the track they are in.

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, 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.

Smart Quantize

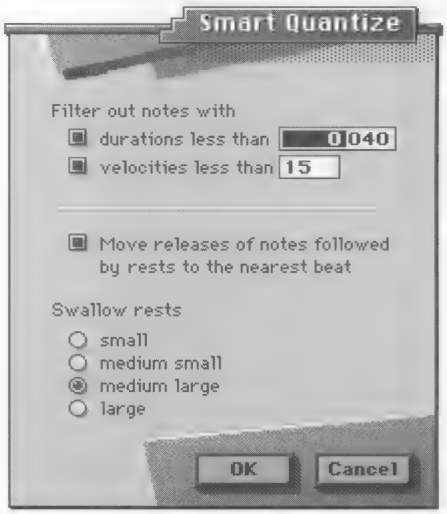
Smart Quantize is especially designed for quantizing data that will be transferred to music notation software, such as Mark of the Unicorn's Professional Composer.

- ☛ Performer's built-in QuickScribe™ notation window does not require quantization of any kind; it will notate original, unquantized MIDI data.

- ☛ Our latest notation software package, Mosaic™, does not require Smart Quantize because it uses its own quantizing algorithms when transcribing MIDI data.

Smart Quantize greatly enhances the transcription of the music when it is transferred to programs like Professional Composer, which do not have sophisticated transcription algorithms like those employed in Performer's QuickScribe notation window. Using a specially-designed, floating quantize grid, Smart Quantize quantizes both attacks and releases to ensure that notes are notated on the correct beat with the proper duration. Triplets and tuplets will be properly quantized, along with notes in straight time.

Smart Quantize also provides several options to optimize the transcription of your musical performance.



The first set of options helps to correct errors in your Performance. Often when we play a keyboard or other MIDI controller, we will accidentally tap a key next to the one we meant to play, causing an extra, short note with a low velocity. Or, we may have held a chord and not realized that we were accidentally holding down an extra key, creating a long held note, barely audible, with a very low on-velocity. Errors like these can interfere with the accurate transcription of your music.

The *Filter out notes with* options delete unwanted notes when you Smart Quantize. The *durations less than* option allows you to delete notes shorter than the duration you specify. What value you choose

should depend on the tempo and nature of the music, and your individual playing style. The *velocities less than* option deletes notes with velocities shorter than the one specified.

The second option, *Move releases of notes followed by rests to the nearest beat,* will help prevent dotted durations followed by a short rest. Use this option if you do not intend for your music to have offbeat releases. For example, if you tend to release notes a little bit early when you play, the notes may be transcribed shorter than they should, followed by a short rest. This option recognizes premature and late releases and notates them properly with their full duration. Use this option to reduce the number of rests, especially if you are transcribing music with standard durations and very few rests. Don't use this option if your music contains precise, mid-beat releases that you want transcribed precisely.

Smart Quantize tends to close gaps between attacks and releases. The *Swallow rests* options allow you to adjust the size of gaps that will be closed. There is no hard and fast rule for choosing these options. In general, if you don't want lots of short rests in the transcription, use the *larger* options. If you want a more precise transcription of your performance, which may contain dotted durations followed by rests and so on, use the *smaller* options.

To use Smart Quantize:

1. **Select the region that contains the music you will transcribe.**

   If you are transcribing an entire sequence, select all the tracks in the tracks window and set the Edit Start and End times in the Edit Bar to include the entire sequence.

2. **Choose Smart Quantize from the Region menu.**

   The Smart Quantize dialog box will appear.

3. **Set the Filter notes, Move releases, and Swallow rests options.**

   These options are discussed in detail above.

4. **Click OK to confirm your choice or Cancel to withdraw the command.**

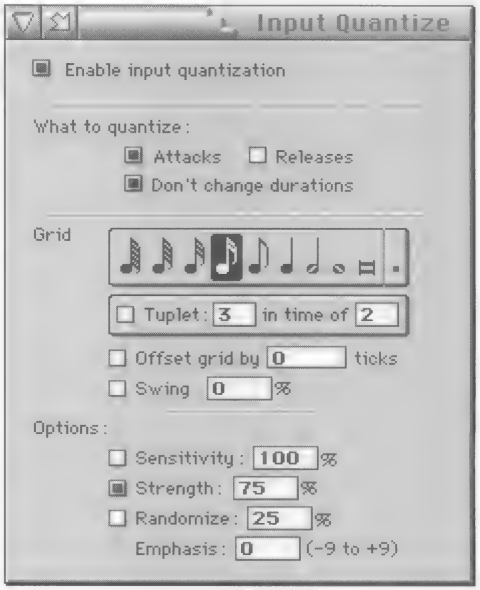
Because Smart Quantize does so many things at once, it may take longer than regular quantizing. Expect to wait for a moment if you have quantized a large region.

Input Quantize

The Input Quantize feature quantizes notes during recording in the same fashion as a standard drum machine. Notes get quantized immediately as they are being received and appear quantized in the track afterwards. If you are loop recording, the notes will play back quantized the next time through the loop.

Opening the Input Quantize Window

To open the Input Quantize window, choose Input Quantize from the Windows menu:



This is a standard Performer window that can be left open while you play back, record, edit, and use Performer's other windows and features. This allows you to make changes to Input Quantize *during recording*.

Turning Input Quantize On and Off

To turn on Input Quantize, check the Enable input quantization box. When Input Quantize is turned on, all incoming notes are quantized according to the options shown in the Input Quantize window. To turn off Input Quantize, simply uncheck the box.

Setting the Input Quantize Options

Input Quantize offers the same type of quantization as the regular Quantize command in the Region menu. The only differences are that 1) the quantization occurs in real time as data is being recorded, and 2) the options for each type of input quantization are set in the Input Quantize window rather than the Quantize dialog box. But Input Quantize options behave the same way as their counterparts in the Region menu.

For more information about the Input Quantize options, see the section earlier in this chapter regarding the *Quantize* command in the Region menu.

Changing Options During Recording

Any option in the Input Quantize window can be changed at any time, even during recording. For example, you can record several bars with quantization turned on and then turn it off on the fly as you record the next several bars. As another example, you might check the triplet check box while recording triplets and uncheck it as you switch back to straight time.

Loop Recording

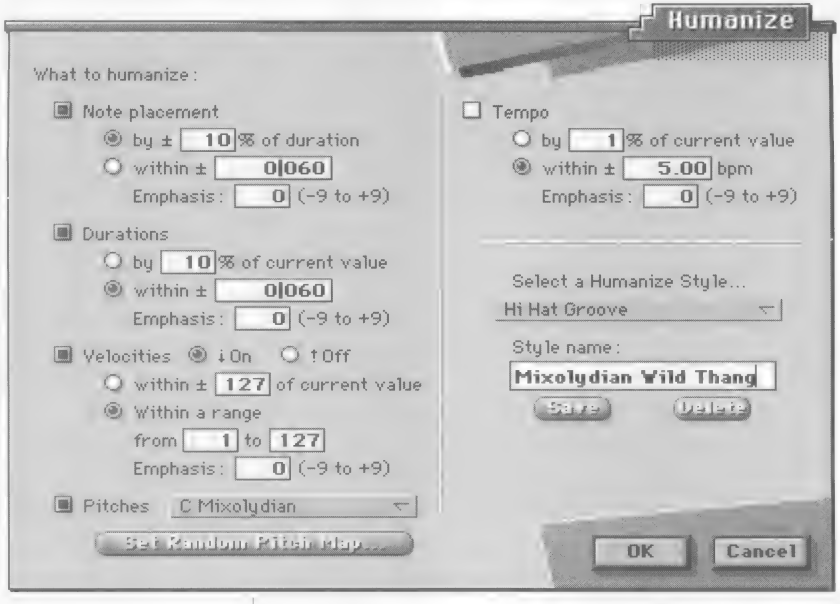
For information about how to use input quantize while loop recording, see the looping chapter.

Humanize

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 randomization elements and save it as a randomization 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.



The Humanize command combines the randomize options of the following commands: Quantize, Change Duration, Change Velocity, and Scale Tempo. And it adds the randomization of note pitches.

For even further control over the feel of your music, be sure to check out chapter 30, "Groove Quantize".

Choosing What to Humanize

Each type of musical element is a check box option in the Humanize dialog box. To randomize that element, check its box. If you don't want to randomize it, uncheck it. For example, if you want to randomize velocities, but not note placement, uncheck note placement.

Humanize Sub-options

Each element has sub-options which affect how it randomizes. These sub-options are discussed briefly below. All of the elements have an Emphasis sub-option, which is discussed in a separate section. The last section explains how to save and recall Humanize styles.

Note Placement

The Note Placement sub-option randomizes the attack times of notes within a range (in ticks) of the note's current location. You can specify the range as a number of ticks, or as a percentage of the note's duration, in which case longer notes have a larger range and shorter notes have a smaller range.

Durations

The Durations sub-option randomizes durations within a range of the current duration, which you specify in the box provided. This range can be specified as a absolute number of ticks, or by a percentage of the current duration.

Velocities

The Velocities sub-option lets you choose between on (attack) or off (release) velocities. In addition, it lets you randomize the velocity within a range of its current value, or within an absolute range. Randomizing within a range of its current value lets you preserve the overall contour of the velocities, while still mixing them up a little bit. Randomizing within an absolute range lets you limit them to a certain range of values.

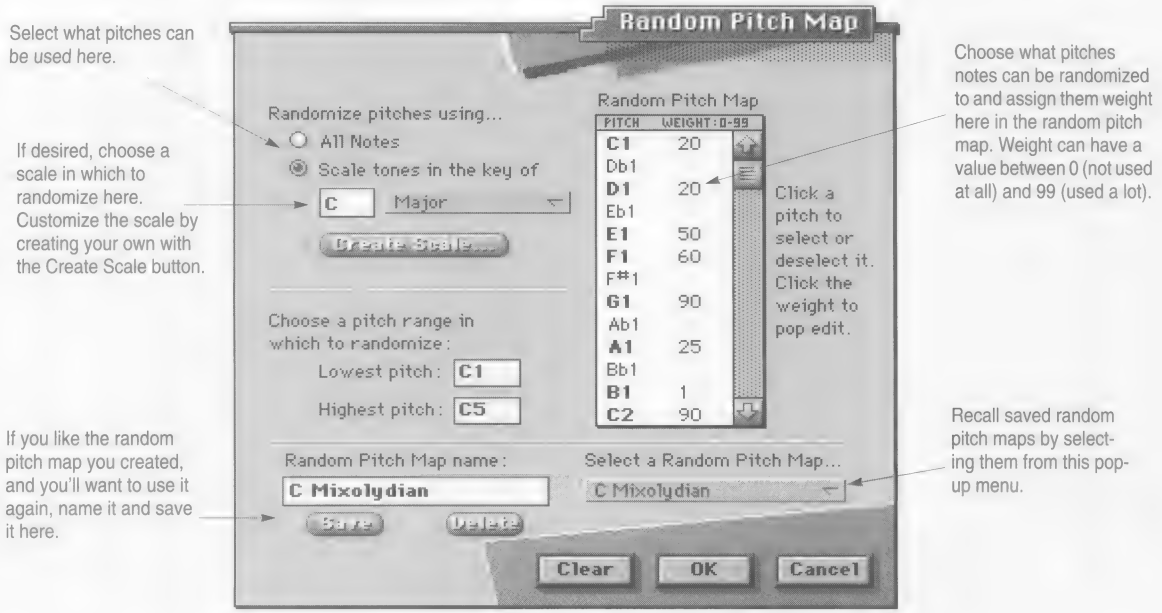
Pitches

The pitches sub-option allows you to randomize the pitch of each note within the region. You can randomize to:

- Any pitch
- A range of pitches
- Certain pitches within a range

In addition, you can assign weight to each pitch within a range so that it is used more or less often during the randomization process. For example, if you are creating a humanize style that generates a hi-hat part, you can assign more weight to the closed hi-hat pitch and less weight to the open hi-hat pitch so that the result is mostly closed hit with an occasional open one.

The Set Random Pitch Map button lets you determine what pitches notes can be randomized to:



The Create Scale button

The create scale button opens the create scale dialog box. For information about this dialog, see "Creating a Custom Scale" on page 484.

Saving, Recalling, and Deleting a Random Pitch Map

To Save a Random Pitch Map:

1. **Set up the pitch map as desired.**
2. **Type in a name for the Random Pitch Map.**
3. **Click Save.**

To recall a random pitch map, select its name from the pop-up menu.

To delete a random pitch map:

1. **Select the pitch map you wish to delete from the pop-up menu.**

2. **Click Delete.**

To rename a pitch map:

1. **Select it from the pop-up menu.**
2. **Type in the new name.**
3. **Click Save.**
4. **Delete the original one.**

Tempos

The Tempos sub-option randomizes existing tempos within the selected region. Note that it does not generate new tempo events. (To do so, use the Change Tempo command in the Change menu.) Note that this option only affects tempo events that already exist in the Conductor track. If the region you select has no tempo events in it, this option will have no effect. If so, use the Change Tempo command in the Change menu to generate tempo events.

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

Each Humanize element has an emphasis sub-option, which can be any value between -9 and +9. The emphasis value causes the tendency of the randomization to be higher or lower within the specified range. Thus, if you wish to randomize within a certain range, but you wish values 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.

Saving, Recalling, Deleting, and Renaming a Humanize Style

To Save a Humanize style:

1. **Set up the Humanize style as desired.**
2. **Type in a name for the style.**
3. **Click Save.**

To recall a Humanize style, select its name from the pop-up menu.

To delete a Humanize style:

1. **Select the pitch map you wish to delete from the pop-up menu.**
2. **Click Delete.**

To rename a Humanize style:

1. **Select it from the pop-up menu.**
2. **Type in the new name.**
3. **Click Save.**
4. **Delete the original one.**

DeFlam

The DeFlam command 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.

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:

1|4|325	♪C4	↓72	↑64	1|254
1|4|331	♪G3	↓54	↑64	1|204
1|4|336	♪G4	↓55	↑64	1|192
1|4|343	♪A3	↓74	↑64	1|209
2|4|422	♪E4	↓85	↑64	1|120
2|4|432	♪G3	↓85	↑64	1|108
2|4|436	♪B4	↓59	↑64	1|123
2|4|439	♪B3	↓79	↑64	1|108

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 20 on the above passage:

1|4|333	♪G4	↓55	↑64	1|192
	♪C4	↓72	↑64	1|254
	♪A3	↓74	↑64	1|209
	♪G3	↓54	↑64	1|204
2|4|432	♪B4	↓59	↑64	1|123
	♪E4	↓85	↑64	1|120
	♪B3	↓79	↑64	1|108
	♪G3	↓85	↑64	1|108

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

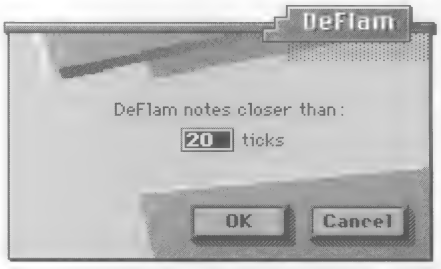
To use DeFlam:

1. **Select the region you wish to modify.**

   See *Selecting a region* at the beginning of this section. The region should include only the notes to be deflammed.

2. **Choose DeFlam from the Region menu.**

   A dialog box appears.



3. **Enter a tick value.**

   The tick value sets the "window" for the command. Notes within this window will be deflammed.

4. **Press the OK button to confirm your choice, or the Cancel button to cancel it.**

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 notes in a region. You can remove irregularities, make passages louder or softer and create crescendos, diminuendos and other similar effects. Note that not all MIDI keyboards and sound modules 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.

Using Change Velocity

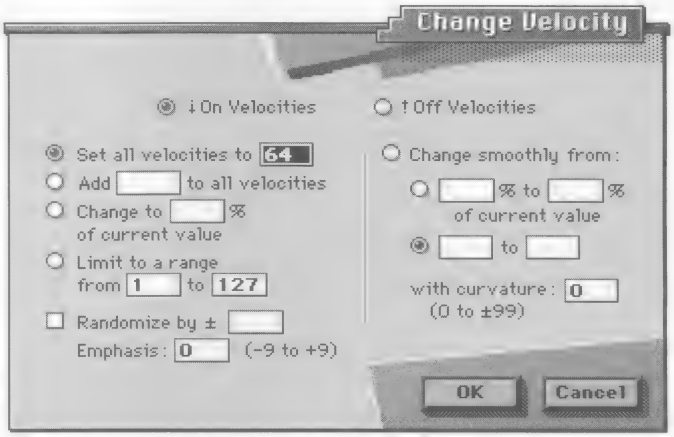
To use change velocity:

1. **Select the region you wish to modify.**

   See *Selecting a region* at the beginning of this section.

2. **Choose Change Velocity from the Region menu.**

   A dialog box appears.



3. **Choose between modifying on (attack) velocities or off (release) velocities.**

4. **Choose the desired option to alter the velocities.**

   Select from the *Set all velocities to __*, *Add __ to all velocities*, etc. options. Click on the radio button next to the option.

5. **Enter the values required by the option.**

   Click in the box and type in the value. If there are additional values to enter, use the Tab key to highlight each successive box or click in each box directly and enter or edit the value.

6. **Press the OK button to confirm your choice, or the Cancel button to cancel it.**

You can Undo/Redo the Change Velocity command.

There are a number of options in the Change Velocity dialog box. Each one allows you to modify velocity values in a different way. Don't let this complexity confuse you; once you select an option, you can ignore all information pertaining to other options.

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. At this time, very few synthesizers 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 dialog box. The default setting changes the on velocities.

Set all velocities to ___

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 ___ to all velocities

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.

Limit to a maximum of ___

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".

Limit to a minimum of ___

This option modifies all velocities in the selected region that have a velocity less than the value you enter, by changing them to that value. Enter a value between 1 and 127. A result of this option is that there will be a minimum volume level for all notes in the region. You can use this option to assure that notes that may be inaudible have sufficient velocity to be heard.

Change to ___% of current value

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.

Change smoothly from

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 *Change to ___% of current value* 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.

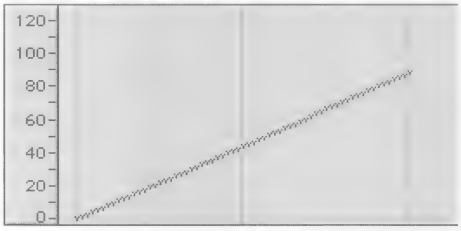
___ to ___: This sub-option assigns the first entered value to the first note velocity in the selected region and the second entered value to the last note velocity in the region. All other velocities are calculated to make a smooth transition between the first and last ones. The curvature (see below) 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

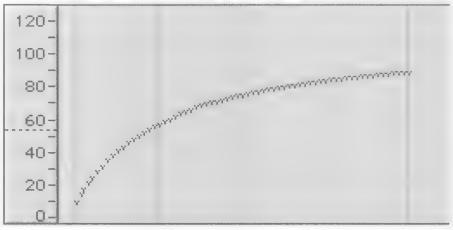
end of the region. As you increase the value negatively (with values from -1 to -99), more of the change will take place towards the beginning of the region.

Here are a few examples to clarify this option:

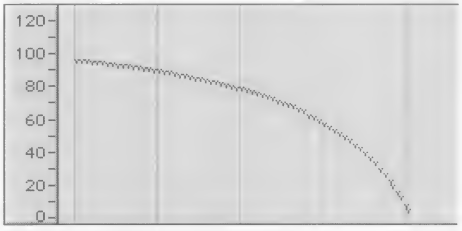
Change smoothly from 1 to 90, curvature 0. This results in a linear increase. One effect of this is a gradual, even crescendo.



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.



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.



Change 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.

Original velocities

Changed smoothly from 100% to 1% with 0 curvature

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 Synthesizer-dependent

Synthesizers vary widely in their response to velocity information. Some do not respond at all to any velocity information; most 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 synthesizer as a whole does.

Most often, you can be assured that if your synthesizer 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 synthesizers define one of the MIDI controllers as the volume control. If so, you might be able to use the Create Continuous Data command to create smooth volume changes with a controller. Some synthesizers have only a few discrete volume levels, making it hard to create smooth changes. Consult the *Hints* in the *Event List Window* section for details about determining the limits of the controller values on your instrument.

It is also possible with some synthesizers 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, 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 Create Continuous Data) to create the kind of volume changes you want.

Change Duration

The Change Duration command modifies the duration of all 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. It also provides some useful utility functions.

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 synthesizer and patch used. The attack and release sent by Performer are equivalent to manually pressing and releasing a key on the synthesizer. Also, some synthesizers 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 synthesizer.

Using Change Duration

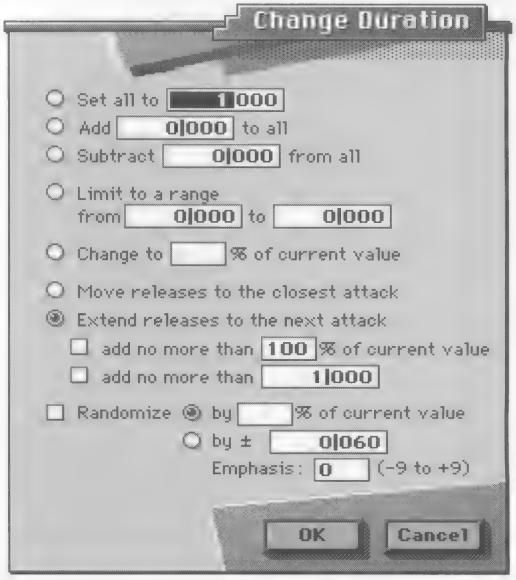
To use Change Duration:

1. **Select the region you wish to modify.**

   See the *Selecting a region* section above.

2. **Choose Change Duration from the Region menu.**

   A dialog box appears.



3. **Choose the option you want by clicking in the appropriate radio button.**

   You can only choose one option.

4. Enter the value required by the option.

Click on the box and type in the value.

5. Press OK to confirm your choices or Cancel to abort the command.

You can Undo and Redo the Change Duration command.

The following options are available:

Set all to ___

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 ___ to all

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 ___ from all

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.

Limit to a maximum of ___

Any notes in the selected region which have a duration greater than the value entered will be assigned to that value. The value entered must be between 0|001 and 9999|999.

Limit to a minimum of ___

Any notes in the selected region which have a duration less than the value entered will be assigned to that value. The value entered must be between 0|001 and 9999|999.

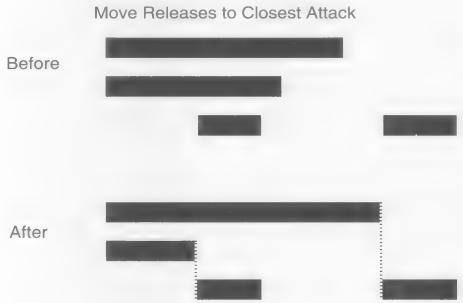
Change to ___% of current value

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.

Move releases to the 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

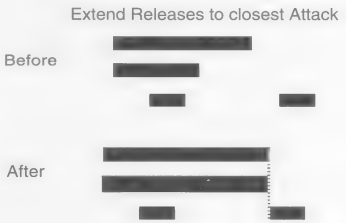
time, making the duration shorter. If the next note occurs after the release of the current one, the release of the current one will be moved forward in time, making the duration longer. If the note release is after the end of the selected region, the note is left unmodified. This option creates a legato effect, where the notes follow each other smoothly and without a gap.



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.



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 a 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. A problem also arises with Step Record: the release for each note is sent immediately before the attack of the next note. 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.

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. **Click on the *Set all to* ___ option.**

4. **Enter a value of 1 tick (0|001) and press OK.**

   This insures that durations are uniform for the next step.

5. **Choose *Change Duration* from the Region menu.**

6. **Choose the *Extend releases to the next attack* option and press the OK 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. **Click on the *Change to ___% of current value* option.**

4. **Enter a value of 50% and press the OK button.**

If you enter a part in Step Record, all durations will be as long as specified, rendering a legato effect. You can use the Change Duration command to add the articulation you want to these parts.

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 their 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 to segregate right and left hand activity, pick out and double accented or long tones, and much more. See the hints at the end of this section for some unusual effects using the Split Notes command.

Basics

Split Notes is a highly specialized version of the Cut and Copy commands on the Edit menu. Only notes in the specified 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 dialog box remembers the settings you last chose.

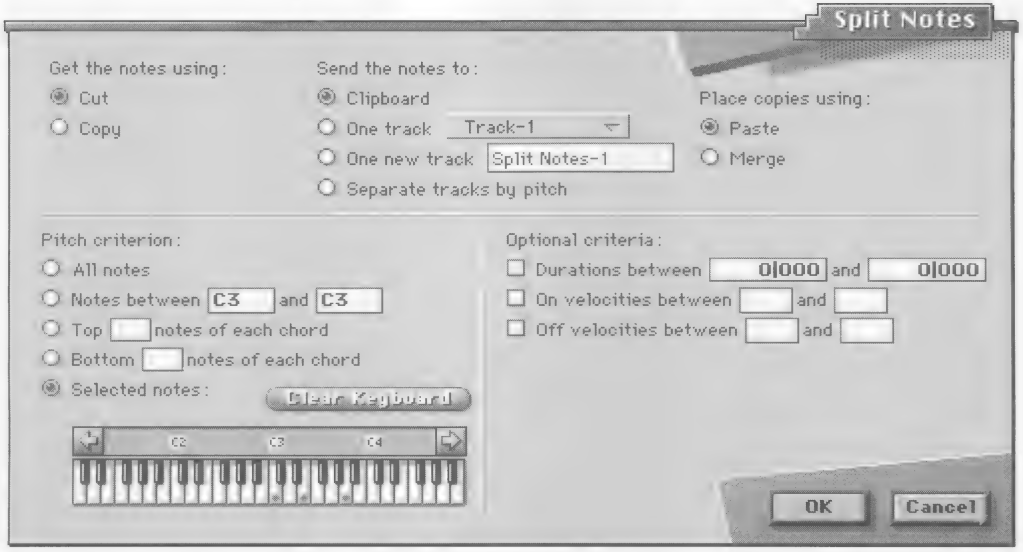
To use Split Notes:

1. **Select the region you wish to modify.**

   See the *Selecting a region* section earlier in this chapter.

2. **Choose Split Notes from the Region menu.**

   A dialog box appears.



3. **Choose the Cut or Copy option at the top.**

   This determines whether notes are cut (removed from the originally selected region) or copied by the Split Notes command.

4. **Choose a destination for the notes to be split.**

   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 pop-up 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 your tracks list. Select the *Separate tracks by pitch* option to separate out the notes by pitch and place them into new, separate 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.

5. **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.**

6. **Choose one of the five pitch selection options.**

   These options are discussed in detail in the next few sections.

7. **Enter the data required by the option.**

   Type or play in the required values.

8. **Click on the check box to the left of any desired options.**

   You can select a combination of pitch, velocity and duration options.

9. **Press OK to confirm your choices or Cancel to cancel.**

You can Undo and Redo the Split Notes command.

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.

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.

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.

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.

To extract the lead line:

1. **Select the region to extract the lead line from.**

   See *chapter 25, "Selecting Regions"* for more information.

2. **Choose Split Notes from the Region menu.**

   The dialog box appears.

3. **Choose the *Cut* option.**

   This will remove the top note of each chord and place it on the Clipboard.

4. **Choose the "One new track" option and type in a name for the new track to be created.**

5. **Click the radio button next to the *Top ___ notes* option.**

6. **Enter a value of 1 in the box for the option.**

   This specifies that only the top note of each chord will be cut or copied.

7. **Press OK to confirm your selections.**

The new track now contains the lead line. You can now use commands from the Region menu to modify the lead line.

Enhancing a Lead Line

Once 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.

1. **Extract the lead line as described above.**
2. **Select the extra track which contains only the lead line.**
3. **Enter Start and End times in the Edit bar of the Tracks window that will contain all notes in the lead line.**

   These should be the same ones used with Split Notes above.

4. **Choose a command from the Regions menu.**

   To double the lead line an octave higher, choose Transpose. To give the lead line higher velocity values, choose Change Velocity.

5. **Choose the options and values you want for the command and Press OK.**

   For Transpose, enter an octave interval (C3 to C4). For Change Velocity, choose the *Add ___ to all* option and enter a value to increase the velocities by (try a value between 10 and 30).

6. **Choose Copy from the Edit menu.**

   This puts the modified lead line on the Clipboard.

7. **Select the original track from which you extracted the lead line.**

   Click on the track name to select the track.

8. **Choose Merge from the Edit menu.**

   The modified lead line is now part of the original passage.

9. **Select the extra track containing only the lead line by clicking on it.**

10. Choose Delete from the Tracks window mini-menu.

This gets rid of the extra track.

The enhancement is now complete.

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 dialog box 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 synthesizer as well as on the synthesizer playing back the chords. This highlights the lead line through timbral or tone color means.

Doubling Accented Notes

This procedure allows you to split out only those notes which have a higher velocity in order to accent them.

1. Select the region containing the lead line.

See *Selecting a region* above.

2. Choose Split Notes from the Region menu.

The dialog box appears.

3. Choose the *Copy* option.

This will place the selected notes on the Clipboard.

4. **Choose the *All notes* option.**

   Click in the radio button next to the option.

5. **Choose the *On velocities* option.**

   Enter a range of values that will separate out accented notes in the region.

6. **Press OK to confirm your choice or Cancel to cancel.**

7. **Paste the Clipboard into a new track.**

   See the chapters on *Edit Commands* and *The Tracks Window* for help with this.

At this point, you can 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 synthesizer.

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 does this automatically in the QuickScribe notation window. 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.

Chapter 28 Region Commands 2

Editing During Playback

Almost all of the editing operations discussed in this chapter and the next can be done while the music is playing back so that you don't have to stop and start the music to hear the result. For example, you could change note velocities in a track while the music is playing and then use the Undo/Redo command as the music continues playing to compare the original and modified data.

Selecting a Region

The commands in this chapter act on the a selected region in the Tracks List, the Tracks Overview, or one of Performer's three track edit windows. Without a selected region, the commands in this chapter do nothing. So be sure to learn how to select a region by reading chapter 25, "Selecting Regions". It contains many powerful shortcuts that will speed up your work.

The Continuous Data Commands

Continuous data is data which changes smoothly over time. The continuous MIDI data types include pitch bend, mono and poly key pressure and controller information. These types of data are output rather quickly, resulting in a large amount of data. Continuous data events are closely spaced, each specifying a slightly different value for the parameter which is changing. For instance, when you move a pitch wheel, a different pitch bend value might be sent every 20 ticks, resulting in 120 continuous data events per quarter note.

Continuous data is not really continuous at all: it is approximated by large numbers of events, each of which contain a small value change. When played back, they create a change that seems smooth and continuous. The closer together in time successive values are, the smoother the change will be. If the values are too close together, delays can occur due to the baud rate (data transfer speed) limit of MIDI transmission.

There are 16,384 different pitch bend values and 128 different controller and aftertouch values. Some synthesizers do not respond to every different pitch bend value: several successive values may produce the same effect. The response to different controller values may also be hard to hear. These facts may influence your decision

about how many continuous data events to store. Performer gives you the option to decrease or increase the number of continuous data events in a region.

Types of Continuous Data

The continuous data commands require you to specify the type of continuous data to be modified. The following is a description of the different types of continuous data and how they are produced.

Pitch Bend: On most synthesizers, this controller is a wheel, joystick or ribbon controller. When moved, it "bends" or varies the pitch either up or down depending on the direction of movement. Pitch bend data indicates the movement of the pitch bend device; it does not necessarily correspond to a musical interval. When played back, this data controls the sound module's pitch bend device. Most synthesizers allow you to specify the interval by which a maximum pitch bend value will alter a pitch. Thus, moving the pitch bend device to its extreme high position can could cause a pitch to be raised by an octave, a fifth or any other interval. All other pitch bend values are scaled according to the interval the maximum value produces.

Mono key pressure: Also known as aftertouch or channel pressure, this is a special kind of controller, putting out values between zero and 127. If you continue to press down a key after you play a note, mono key pressure information is sent. The harder you press, the higher the value. Mono key pressure is useful for things like changing the tone quality of a sound or controlling the amount and depth of vibrato.

Poly key pressure: This is similar to mono key pressure except that each key can generate its own pressure information, instead of one pressure level for the whole instrument based on the key most recently pressed. Poly key pressure therefore allows for much more subtle and complicated aftertouch effects. Since each key can have its own set of key pressure data, you must specify the note name by entering a pitch value when using the Poly key pressure option in the continuous data commands. You can enter the pitch directly from your MIDI keyboard. If you don't specify a pitch, *all* keys will be affected by the command.

Controller: Foot pedals, wheels, sliders and breath controllers are common types of controller devices. Controllers are general purpose devices used to control such effects as vibrato and tremolo. They are identified by number; the number assigned to a specific controller depends on the synthesizer you are using. Continuous controllers (such as wheels and sliders) are generally numbered in the range zero to 63. Switch controllers (on-off types like a sustain pedal) use higher numbers. Synthesizers will often respond to more controllers than they have physical controls for.

When using the continuous data commands on controller data, you must specify the number of the controller whose data you wish to modify. This can be done by clicking in the box next to the controllers option and moving the correct controller on your MIDI input keyboard.

Thin Continuous Data

Synthesizers tend to send continuous data as fast as they possibly can. If you record several tracks of this and play them all back at once, Performer, your synthesizers, or MIDI itself may bog down. The Thin Continuous Data command selectively removes continuous data events, "thinning out" the amount of continuous data while retaining all of its essential characteristics. This allows you to transmit a reasonable amount of continuous data that can be handled easily by all components of your MIDI system.

Basics

The Thin Continuous Data command actually determines the contour of the continuous data in the selected region. The continuous data in this region is erased and new continuous data is generated. This new data is more sparse, reconstructing the analyzed contour with fewer events. Unless musically necessary, successive continuous data events will not occur closer together than the minimum time change and will not differ in value from adjacent events by less than the minimum value change.

Since the continuous data is regenerated, it is possible that this command will thicken the data instead of thinning it. You may find this aspect of the command useful if you have thinned out the data too much.

The appropriate minimum time change depends on the tempo of the sequence and the controller device involved. Generally, a value of 10 to 20 will work well. The minimum value change should be 1 for controllers and 4 to 8 for pitch bend. Experimentation is essential to find the best values in each instance.

Using Thin Continuous Data

To use Thin Continuous Data:

1. **Select the region you wish to modify.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Choose Thin Continuous Data from the Region menu.**

   A dialog box appears.

3. **Choose the type of data you wish to thin out.**

   Click in the radio button next to the type you want: Pitch Bend, Mono Key Pressure, Poly Key Pressure or Controller. See *The types of continuous data* above for an explanation of each type.

4. **Specify a minimum time change.**

   Click in the box for this parameter and type in a value between zero and 999.

5. **Specify a minimum value change.**

   Click in the box for this parameter and type in a value.

6. **Press the OK button to confirm your entry or the Cancel button to cancel it.**

You can Undo and Redo the Thin Continuous Data command.

After you OK this command, it may take some time to carry out the change. If you wish to terminate the command while it is working, press the Command and period keys together.

Create Continuous Data

The Create Continuous Data command creates a stream of continuous data events that change smoothly over time. You can use it to create pitch bends, crescendos and diminuendos, filter sweeps and many other effects.

Basics

This command creates continuous data events that change smoothly between the starting and ending values. All values must be within the range zero to 127, except for pitch bend data which is in the range -8192 to 8191.

The contour of the changing values is controlled by the curvature parameter. It allows you to "weight" the change. With a curvature of zero, the change is linear from the first to the second entered value. The more you increase the value positively (with values from 1 to 99), the more the change will take place towards the end of the region. The more you increase the value negatively (with values from -1 to -99), the more the change will take place towards the beginning of the region.

The number of events generated are controlled by the minimum time change and the minimum value specified: all events created will not be any closer together than the minimum time change and they won't be separated by values smaller than the minimum value change. Though Performer can create a perfectly smooth set of values, the actual result may not be perfectly smooth due to the minimum time and value changes you enter. Experimentation is the key to good results.

You can Undo and Redo the Create Continuous Data command.

Using Create Continuous Data

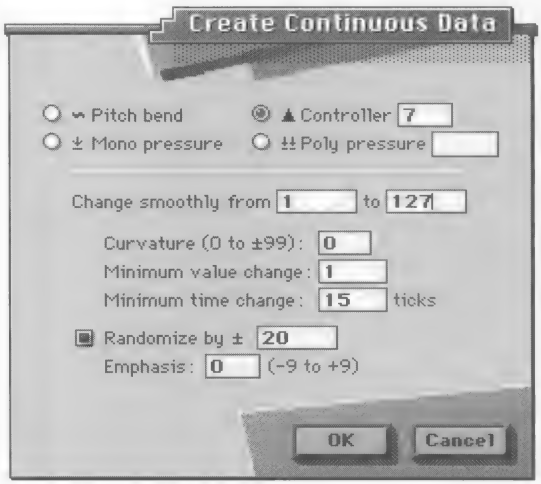
To use Create Continuous Data:

1. **Select the region you wish to modify.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Choose Create Continuous Data from the Region menu.**

   A dialog box appears.



3. **Choose the type of data you wish to create.**

   Click in the radio button next to the type you want: Pitch Bend, Mono Key Pressure, Poly Key Pressure or Controller. See *The types of continuous data* above for an explanation of each type.

4. **Specify start and end values for the data.**

   The data created will have values ranging smoothly between the start and end values.

5. **Specify a minimum time change.**

   Click in the box for this parameter and type in a value between zero and 999.

6. **Specify a minimum value change.**

   Click in the box for this parameter and type in a value between zero and 127.

7. **Press the OK button to confirm your entry or the Cancel button to cancel it.**

   After you OK this command, it may take some time to carry out the change. If you wish to terminate the command while it is working, press the Command and period keys together.

Any existing data of the type being created in the selected region is removed.

See the *Basics* section of the *Thin Continuous Data* command above for suggestions on setting the minimum time and value change parameters.

Using the Randomize Option

The Randomize option allows you to generate variability in continuous data that you create, as apposed to a perfectly smooth line or curve. Doing can introduce can add extra feel and depth to the musical effect you are creating with the continuous data.

Notice that the Randomize option is a check box, which means that it can be used with any of the radio button options above. Check the box to randomize; uncheck it for no randomization.

When this command randomizes, it choose random values within the range that you specify. Each continuous data event is first generated by the rest of the parameters above, and then the event's value is randomized within the range you specify in the range box. The result is a curve or line that is not perfectly straight:

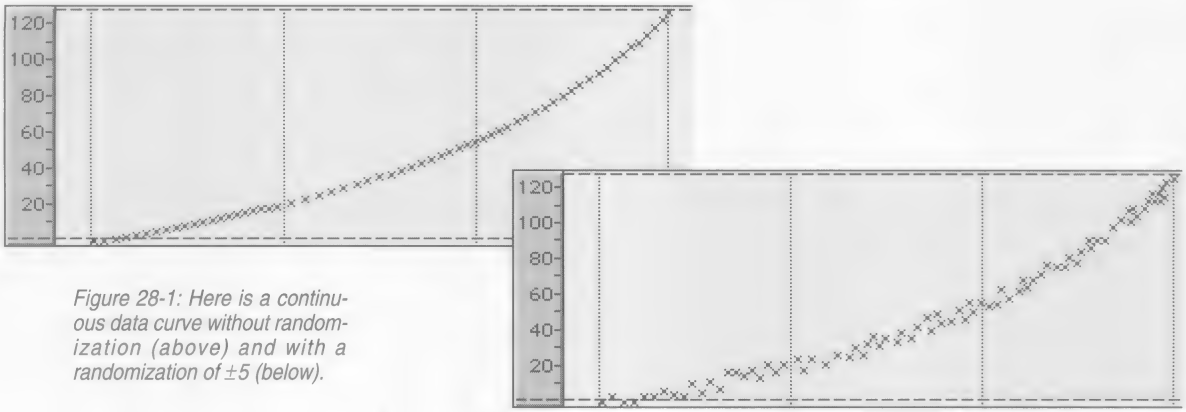


Figure 28-1: Here is a continuous data curve without randomization (above) and with a randomization of ±5 (below).

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 continuous data events 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.

Change Continuous Data

With the Change Continuous Data command, you can modify existing continuous data by scaling it or limiting it to a specific range.

Using Change Continuous Data

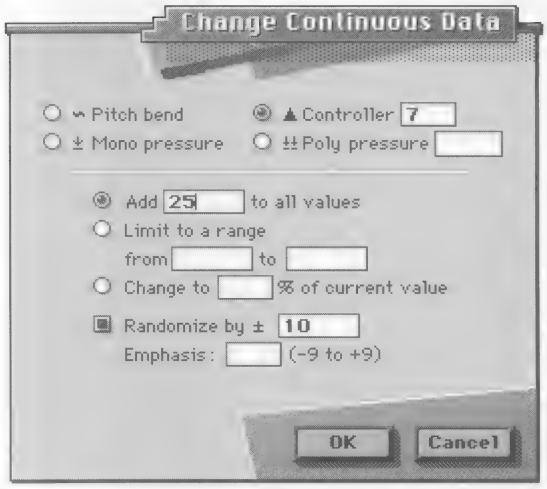
To use Change Continuous Data:

1. **Select the region you wish to modify.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Choose Change Continuous Data from the Region menu.**

   A dialog box appears.



3. **Choose the type of data you wish to change.**

   Click in the radio button next to the type you want: Pitch Bend, Mono Key Pressure, Poly Key Pressure or Controller. See *The types of continuous data* above for an explanation of each type. Only the type of data you select will be changed.

4. **Choose the change option you want.**

   Click in the radio button next to the option.

5. **Enter the value required by the option.**

   Click in the box for the option and type in the value you want. You may select only one option.

6. **If you would like to randomize the data, check the Randomize check box and enter a Randomization range and emphasis.**

   For more information about these options, see "Using the Randomize Option" on page 457, as this option works the same as the Randomize option in the Create Continuous data command, except that it changes existing data rather than newly created data.

7. **Press the OK button to confirm your entry or the Cancel button to cancel it.**

You can Undo and Redo the Change Continuous Data command.

Add ___ to all values

The entered value is added to all continuous data in the selected region. Enter a positive number if you wish to increase the values in the region or a negative number if you wish to decrease them. If a value exceeds the limit of its data type, it will be truncated at the limit value (e.g. if a pitch bend value comes out to -10,150, it will become -8192, the minimum limit for pitch bend values).

Limit to a maximum of ___

Events in the selected region whose values are greater than the entered value are changed to the maximum value.

Limit to a minimum of ___

Events in the selected region whose values are less than the entered value are changed to the minimum value.

Set to ___% of current value

The values of all events in the selected region are scaled by the entered percentage value. Thus, specifying 50% halves the values, while 200% doubles the values. If a value exceeds the limit of the its data type, it will be truncated at the limit value (e.g. if a pitch bend value comes out to -10,150, it will become -8192, the minimum limit for pitch bend values).

Reassign Continuous Data

With the Reassign Continuous Data command you can convert one type of continuous data into another. For example, you can convert pitch bend data into modulation wheel data. This command is very useful for changing the controller number of continuous data when playing back a sequence on a different synthesizer than the one it was recorded with.

Using Reassign Continuous Data

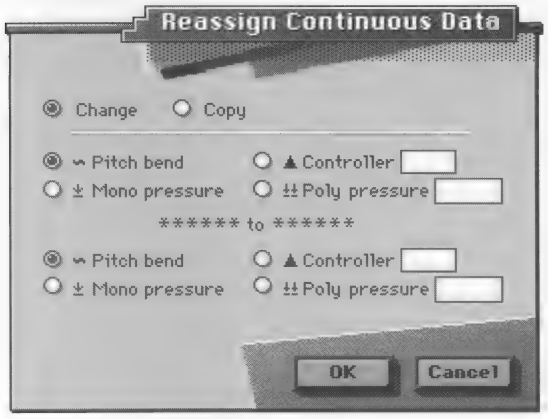
To use Reassign Continuous Data:

1. **Select the region you wish to modify.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Choose Reassign Continuous Data from the Region menu.**

   A dialog box appears.



3. **Choose either the Change or Copy option.**

   Click in the radio button next to the option. The Change option changes data from one type to another. The Copy option makes a copy of the data in the same track of the new type you specify.

4. **Enter the type of continuous data to be changed.**

   Click on the appropriate radio button.

5. **Enter the type of continuous data you wish it to be changed to.**

   Click on the appropriate radio button.

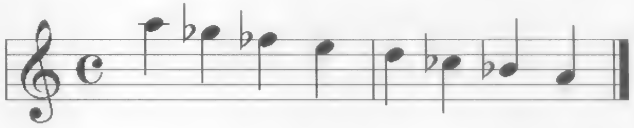
6. **Press OK to confirm your entry or Cancel to cancel it.**

You can Undo and Redo the Reassign Continuous Data command.

Invert Pitch

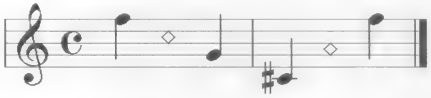
The Invert Pitch command inverts or flips notes around a specified axis. The inversion is chromatic, that is, exact. For example, if the following E major scale (starting on E3),

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.

Using Invert Pitch

To use Invert Pitch:

1. **Select the region to be inverted.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Select Invert Pitch from the Region menu.**

   A dialog box appears.

3. **Enter the axis pitch for the inversion.**

   You can use your MIDI keyboard for input. This is the center pitch around which the inversion will take place.

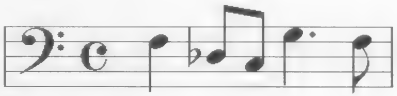
4. **Press OK to confirm your entry or Cancel to cancel it.**

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 dialog box. Then use the Transpose command on the Region menu to transpose the region by the interval between the two axis pitches.

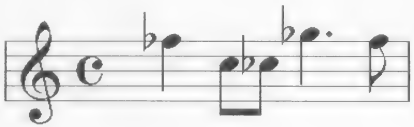
Example: You wish to transpose the following passage around the axis pitch pair C3 and E flat 3.

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:



Reverse Time and Retrograde

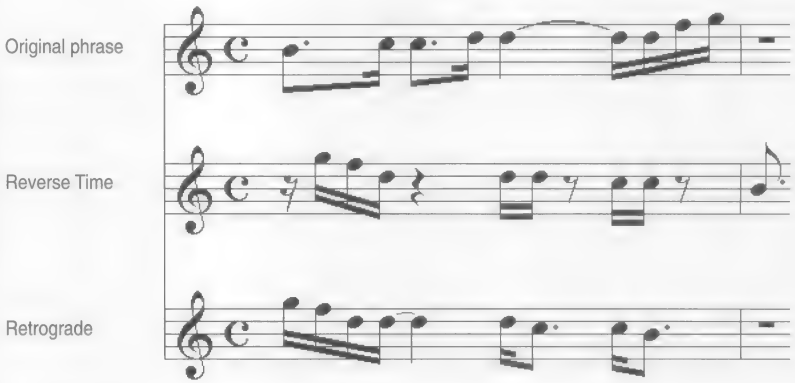
The Reverse Time and Retrograde commands reverse the order of events in a selected region. However, each command reverses notes in a slightly different way, producing much different results.

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 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 bar.

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 have selected 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 Edit bar in the Tracks window, or by dragging in the Time Ruler of the Graphic Editing window or Tracks Overview. Selecting specific events won't work because the duration of the final note is not included. (For example, if you selected the original phrase above in the Event List, the end of the region would be 1|4|361instead of 2|1|000.

Using Reverse Time

To use Reverse Time, you can select the notes in any fashion:

1. **Select the region you wish to modify.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Choose Reverse Time from the Region menu.**

   You can Undo and Redo the Reverse Time command.

Using Retrograde

When using the Retrograde command, you must select a region using the edit bar in the Tracks window. The Retrograde command will have no effect on data that has been highlighted in an Event Editing window.

1. **Select the region you wish to modify.**

   See *Selecting a region using the Tracks window* in the *Region Commands 1* chapter.

2. **Choose Retrograde from the Region menu.**

   You can Undo and Redo the Retrograde command.

Scale Time

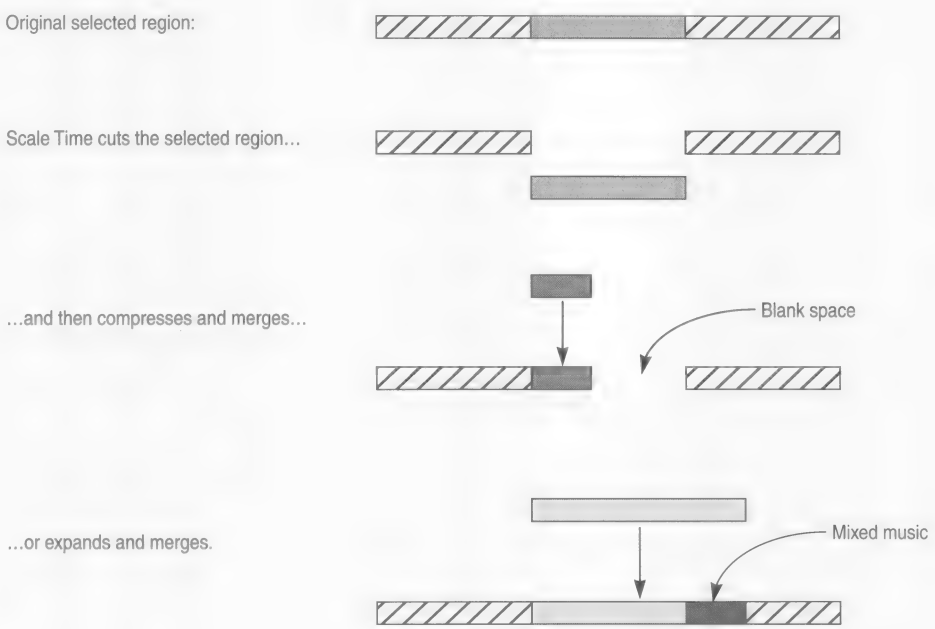
The Scale Time command expands or compresses the duration of events in the selected region by the specified ratio. This effectively changes the distance between notes, making them closer together or farther apart. Since the actual duration of events changes, the region will become smaller or larger after this command is invoked.

Basics

Scaling time allows you to double, halve or otherwise alter the amount of time an event takes. A wide range of compression or expansion of the duration of events is possible. The amount of change to the duration is specified by an integer ratio, e.g. 3:2. 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.

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.



Using Scale Time

All MIDI data events are scaled. The Scale Time command does not affect loops or any event in the Conductor track.

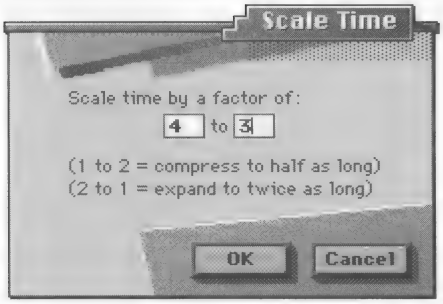
To use Scale Time:

1. **Select the region you wish to modify.**

   See *Selecting a region* in the *Region Commands 1* chapter.

2. **Choose Scale Time from the Region menu.**

   A dialog box appears.



3. **Enter the ratio values.**

   The values must be between 1 and 99.

4. **Press the OK button to confirm your entry or the Cancel button to cancel it.**

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.

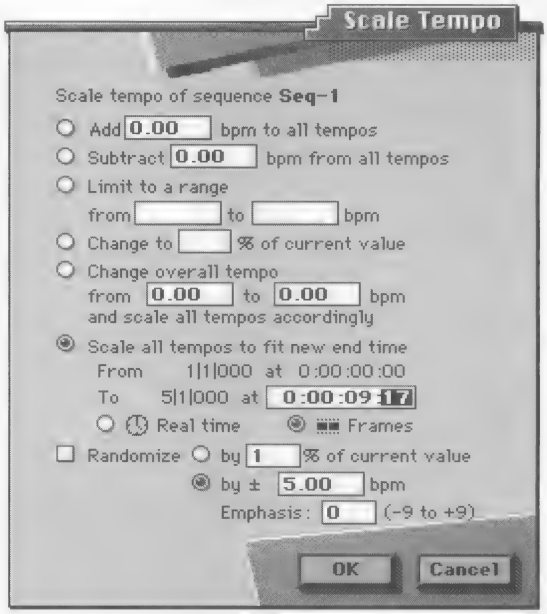
Your sequence is in 4/4 time with lots of triplets. You want to modify it to be in 12/8, converting the triplets to regular eighths. Select the entire sequence. Use Scale Time with a ratio of 3:2. Afterwards, change the meter and tempo appropriately.

You've entered a melodic idea in quarter notes and decide that it should actually be the bass line for the sequence. 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 or song. It modifies existing tempo events within the region, but it does not generate new tempo events. (To do so, use the Change Tempo command in the Change menu.) 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.



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 Change menu to generate tempo events.

There are several ways to select a region in the Conductor track. For more information, see chapter 25, "Selecting Regions".

Once you have selected the tempo events you wish to scale:

1. **Choose Scale Tempo from the Region menu.**

2. Select the desired scaling option.

Each scaling option is discussed below.

3. Click OK to confirm your choice or Cancel to withdraw it.

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 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 this scale tempo option, you can select the region with the hit as the end time of the region, choose scale the tempos, and type in the new end time where the hit should occur, changing 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.

The randomize options are explained below.

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.

Chapter 29 *Transpose*

Performer's Transpose command, found in the Region menu, transposes the pitches of all notes in a selected region. With it you can:

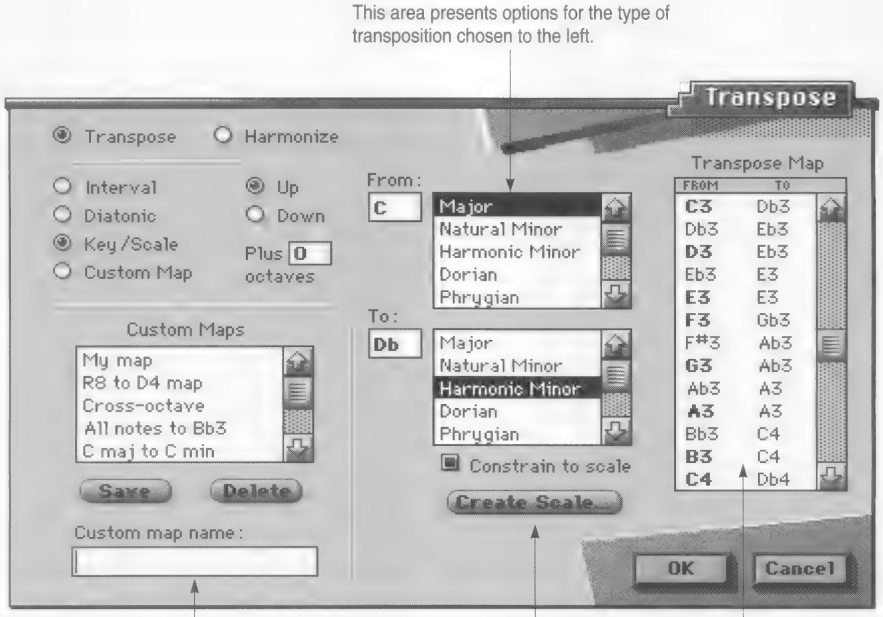
- transpose by interval
- transpose diatonically to create harmonies
- change key from any root to any other
- change key from any mode to any other
- map each pitch to any other pitch for mapping drum track note assignments from one drum machine to another
- transpose using scale sizes larger or smaller 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

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

Quick Reference

The Transpose dialog box 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.



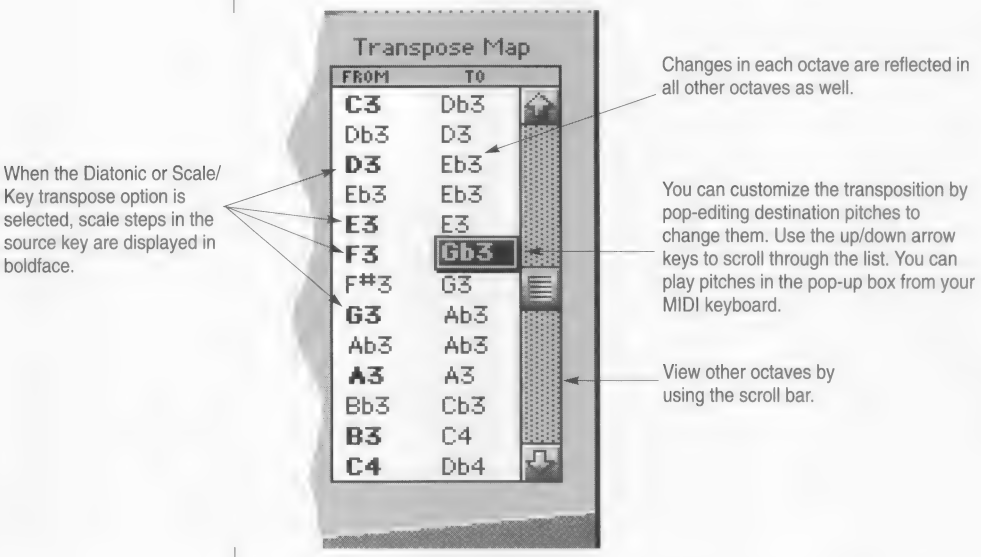
The Transpose Map is discussed next, and the four types of transposition are described in following sections.

Harmonizing instead of Transposing

The Transpose dialog box 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.

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 pop-edit values directly in the Transpose Map list as shown below to further modify the map. Changes in one octave are reflected in all other octaves.



As soon as you pop-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 pop-editing the Transpose Map, you can play in individual pitches or an entire scale from your MIDI controller. To play in a scale, double-click the first pitch to pop-edit it and then play the scale. As you play, each pitch gets entered into the current pop-up 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 and down arrow keys to move the pop-edit box.

When you are using the Custom Map option, Performer provides another intuitive way for you to play in pitches from your 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 pop-edit any values to do this.

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 file and can be loaded into other files with the Load command in the File menu.

To save a transpose map, type in a name and click Save.

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.

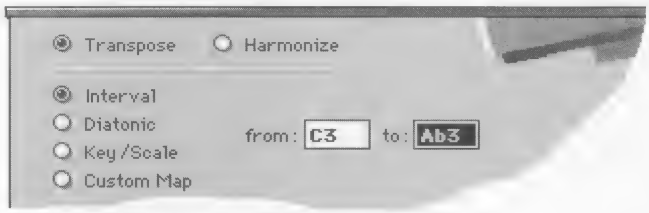
To create a new map based on an existing map:

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



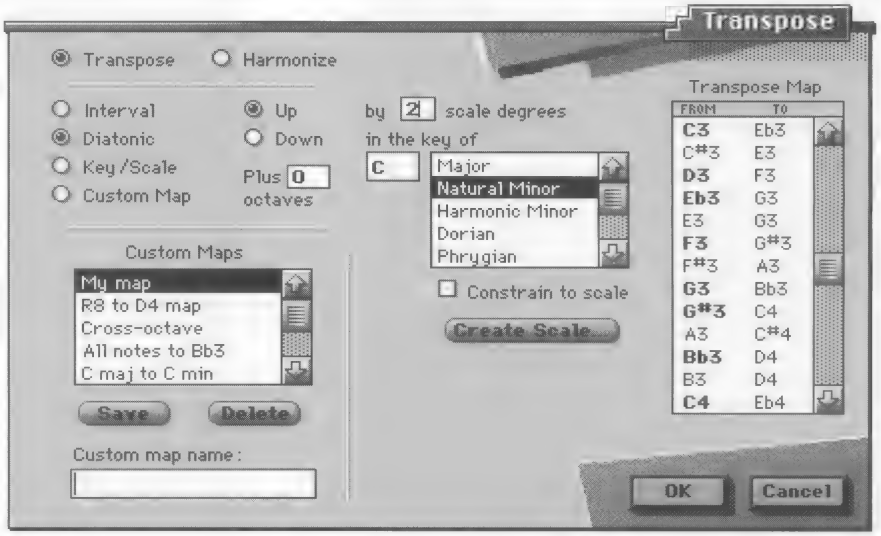
Transposing by *Interval* is chromatic, exact transposition: pitches are shifted by the number of semitones in the interval that you choose. Literally, it causes a mass shift of all pitch values in the selected region, just like dragging notes up or down in the Graphic Editing or QuickScribe notation windows. For example, chromatically transposing from C3 to E3 causes all pitches to shift up a major third (four semitones).

The only option for this type of transposition is the *from* and *to* pitches that 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.

Having chosen an interval, you can pop-edit the transpose map to make modifications to it if you like. As soon as you pop-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 Diatonically



Diatonic transposition transposes 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 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, pop-edit values in the Transpose map.**

   As soon as you pop-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 OK.**

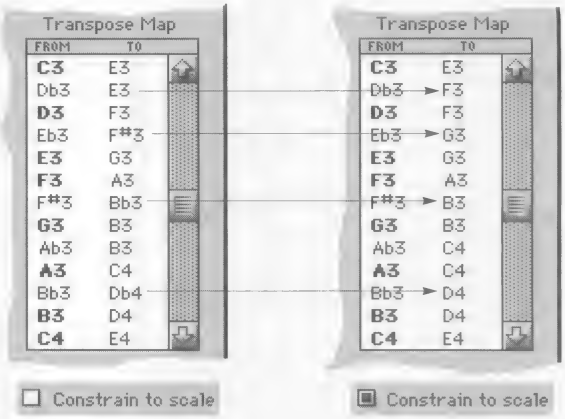
The Up and Down options determine the direction of transposition, and the Plus *n* octaves option allows you to transpose by intervals greater than one octave.

Remember that the key you choose is a way of setting up the diatonic transposition in the Transpose Map. Performer 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.

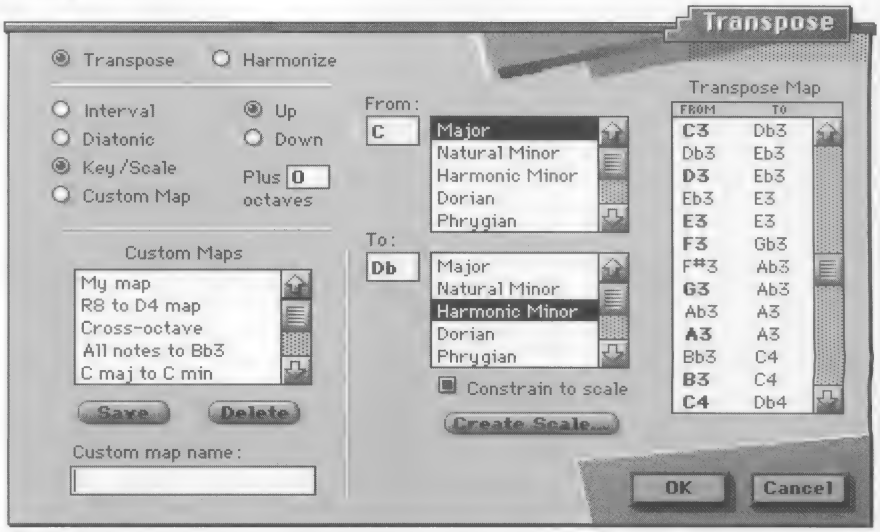
The above also holds true for how notes get spelled. The key that you choose only affects the spellings in the Transpose Map: it will not change the spellings of the actual track data. Track note data spellings are controlled by the current key signature in the Conductor track.

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



Transposing by *Key/Scale* transposes 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 Mixolydian. The Transpose Map shows each note in the key of C Major on the left and the pitch each will be transposed to in the key of Db 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, pop-edit values in the Transpose map.**

   As soon as you pop-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 OK.**

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 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 pop-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, pop-edit values in the Transpose map as needed.**

   As soon as you pop-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 OK to execute the transposition.

Custom Transposing With a Non-standard Octave Range

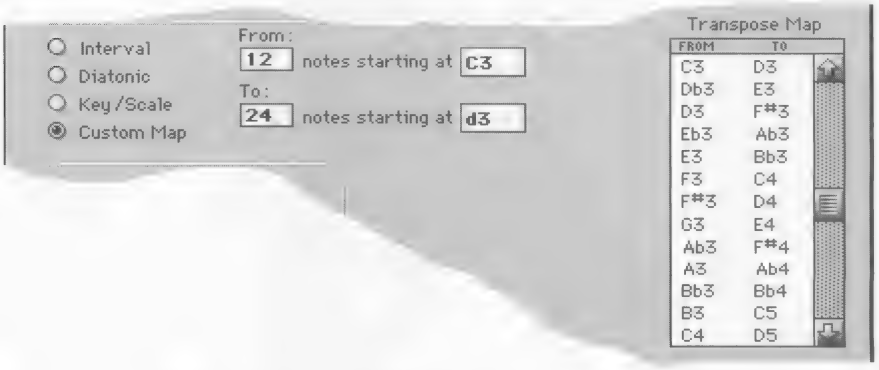
Interval, Diatonic, and Key/Scale transpose options all set up the transpose map in 12 note octaves. Changes in one octave are reflected in all other octaves. The Custom Map option can set up the transpose map in octaves that are more or less than 12 notes. For example, if you have a sampler that has 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.



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 OK 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.

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 OK 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.

3. **Pop-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 OK to execute the transposition.**

Creating a Custom Scale

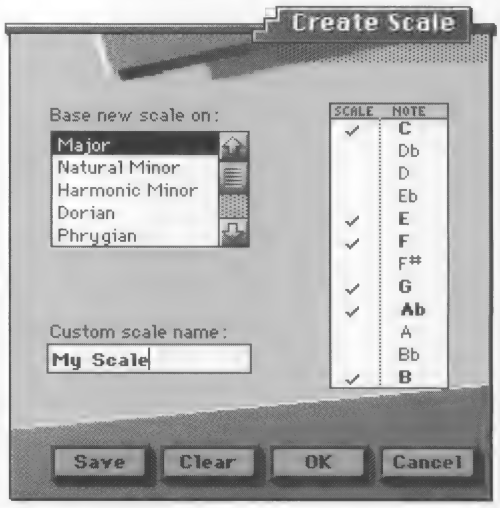
The Custom Scale option allows you to create your own scale. To do so, you select which pitches are diatonic and which ones are not.

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 Create Scale button.**

   The Create Scale dialog box appears.



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.

Chapter 30 *Groove Quantize*

Performer's Groove Quantize feature is powerful, easy to use, and—from a creative standpoint—one of Performer's most enjoyable features.

This chapter 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 a track to other tracks
- Create your own grooves, of any length, from any music you have recorded into Performer or loaded from a standard MIDI file
- Build a groove database from which you can instantly call up any groove you have created

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's powerful 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. In Performer, 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 bars, 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'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 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 dialog box appears. If you get an error message instead, then the Grooves folder is not in the same folder as Performer. If so, switch into the Macintosh Finder and move the Grooves folder into the same folder as Performer.

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 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.

7. **If you'd like to adjust the feel of the groove, click the More Choices button.**

   This option is discussed further later on in this chapter.

8. **To apply the groove, click OK.**

Instant preview

When the Instant Preview button in the Groove Quantize dialog box is checked, you can preview grooves without having to click OK 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 OK. When Instant Preview is unchecked, you won't hear the groove until after you click OK.

The Recent Files pop-up menu

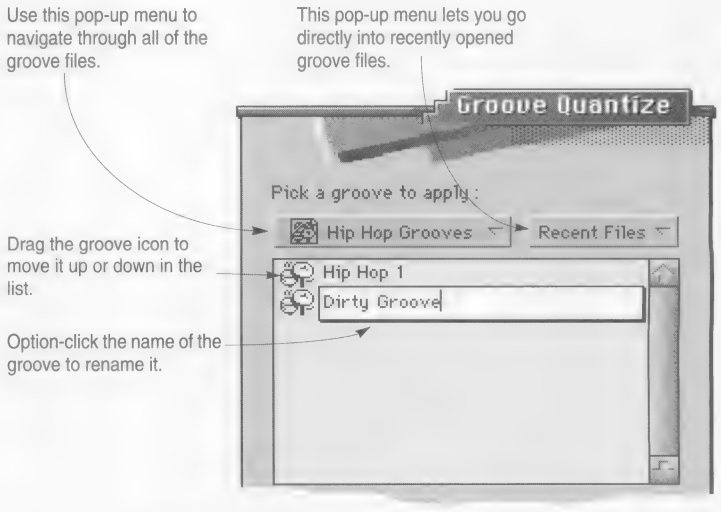
The Recent Files pop-up menu is provided for your convenience. It lets you go directly into recently opened groove files.

The More Choices button

The More Choices button causes several sliders to appear in the dialog box. A unique and powerful feature, these sliders 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 492.

Locating a groove

The groove list works like a standard Macintosh open dialog box. Use it in the standard fashion to locate grooves.



Renaming grooves

To rename a groove:

1. **Select any data or time region.**

   It doesn't matter what you select.

2. **Choose Groove Quantize from the Region menu.**

3. **Locate the groove.**

4. **Option-click its name to pop-edit the name, and press return to enter the new name.**

5. **To exit the Groove Quantize dialog box, click either OK or Cancel.**

   Click Cancel if you don't want to apply the groove. Click OK if you do.

Deleting, moving, and duplicating grooves

Grooves can be cut, copied, and pasted in the Groove Quantize dialog box. This allows you to delete them, move them from one file to another, and duplicate them.

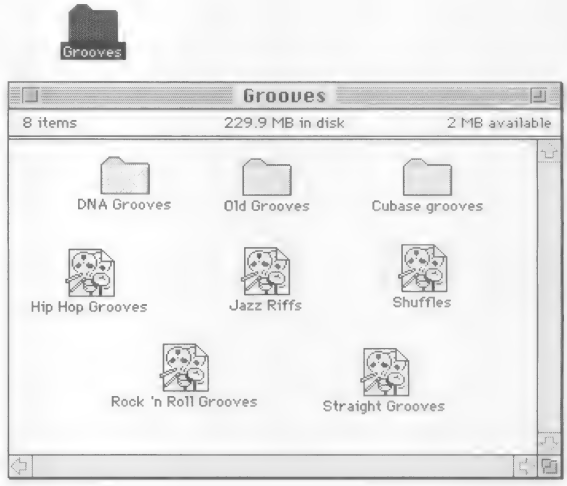
Duplicating is useful because you can make a copy of a groove and then make adjustments to the copy, which preserves the original.

To do any of these operations, you first open the Groove Quantize dialog box. 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 pop-up 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 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 in the same folder as Performer. This is all taken care of for you when you first install Performer, 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 System 7 aliases 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 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 500.

To adjust groove parameters while applying a groove:

1. **Use Performer's Memory-cycle feature to cycle playback over the region you wish to apply the groove to.**

2. **Start playback.**

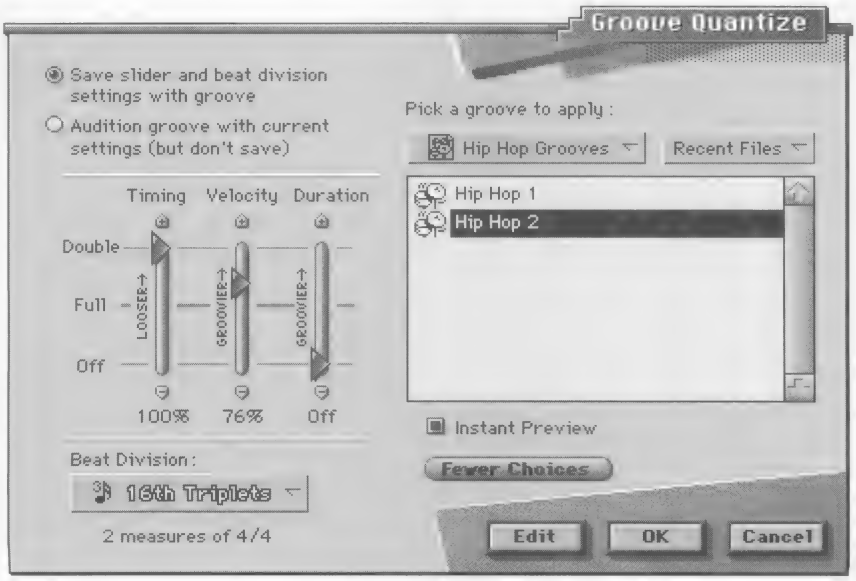
3. **Select the data you wish to apply the groove to.**

   Make sure that what you select is within the region Performer 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. **Click the More choices button.**

   Several sliders appear in the Groove Quantize dialog box, along with several other options.



6. **Select the groove you wish to apply from the list.**

7. **Make sure the Instant Preview check box is checked so you get instant feedback while adjusting the groove.**

8. **Adjust the groove as desired with the sliders.**

   These sliders are discussed in the following section.

9. **If desired, try different beat divisions by choosing them from the beat division pop-up menu.**

   Changing the beat division often has a dramatic effect on the feel of the groove. This is discussed further in a following section.

10. **Once you like the groove, click OK.**

Fewer Choices button

The Fewer Choices button in the Groove Quantize dialog box removes the groove parameter sliders from the Groove Quantize dialog box to simplify its appearance. Click this button if you do not wish to adjust the groove with the sliders.

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.

> ☛ 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.

Saving groove settings with a groove

The option called *Save slider and beat division settings with groove* causes the current slider and beat division settings to be saved with the groove. In addition, when you first select the groove in the list, the sliders will jump as necessary to reflect the currently saved slider settings for that groove.

When this option is selected, slider settings are saved immediately when you move the slider. If you want to try changing the setting without losing the saved settings, use the option called *Audition groove with current slider settings (but don't save)*, which is discussed below.

Auditioning groove settings

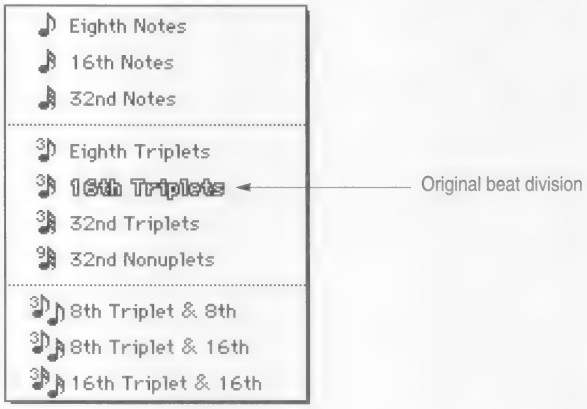
The option called *Audition groove with current settings (but don't save)* lets you adjust the sliders without affecting the settings that are currently saved with the slider. The same goes for the Beat Division pop-up menu. In addition, this option lets you quickly audition a number of different grooves 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 the *Save slider settings with groove* button.

Using different beat divisions

The beat division pop-up 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 499 for more information.

This pop-up 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 in outline format 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 502 for more information.

The beat division pop-up menu is governed by the radio button options at the top of the window. (See "Saving groove settings with a groove" on page 495.) One option saves the beat division setting with the groove. The other lets you audition different grooves with a certain beat division. 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.

Creating a groove

The Create Groove command lets you create your own Grooves from MIDI note data in any track. The source material can come from any Performer file or any standard MIDI file. Grooves can be any length.

To create a groove:

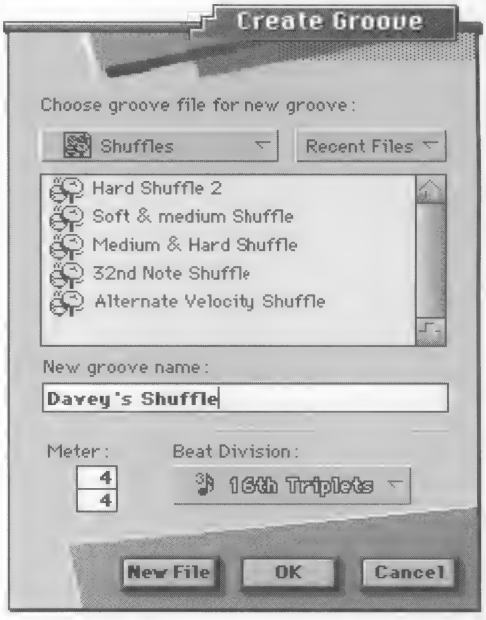
1. **Select the notes (or region of notes) you wish to use as source material for the groove.**

   You may select them in the Track list, the Tracks Overview, or any of Performer's editing windows. 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 source material for a groove, the data must be aligned with Performer's metronome (main counter). For example, you can't use a rubato passage, unless you first use the Record Beats feature to align Performer's measure and beat boundaries with the music.

2. **Choose Create Groove from the Region menu.**

   The Create Groove dialog box appears.



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 pop-up menu.**

   See "Choosing a beat division" on page 499 regarding this option.

7. **Click OK to save the groove, or click Cancel to withdraw the command.**

   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 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:

1. **Select any data or time region.**

   It doesn't matter what you select.

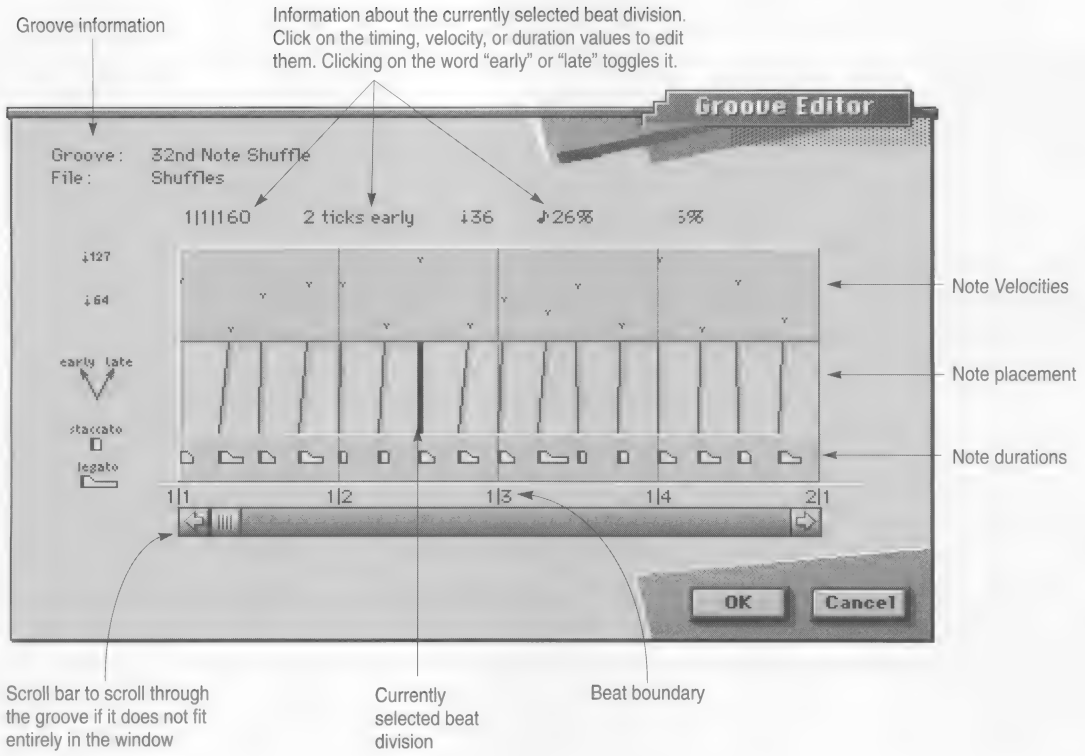
2. **Choose Groove Quantize from the Region menu.**

3. **Locate the groove.**

4. **Click the Edit button.**

Click the Edit button to edit the groove.

5. **The Groove Editor dialog box appears.**



6. 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%)

7. **Click OK to confirm your edits, or click cancel to withdraw the command.**

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 491.

Adding an additional default beat division to a groove

A groove can have several default beat divisions (as shown in the pop-up menu on page 496). 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 pop-up menu in the Groove Quantize dialog box 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 pop-up menu.

Obtaining grooves

There are many ways to obtain grooves. You can:

- Use the stock grooves provided with Performer
- Create new grooves from scratch in Performer
- "Cop" grooves from any Performer file or standard MIDI file
- Purchase commercially available standard MIDI file libraries and create grooves from the MIDI data in them
- Purchase commercially available groove libraries

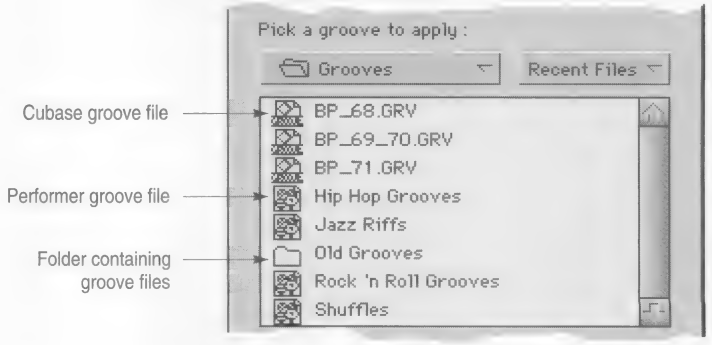
Commercially available MIDI groove libraries are similar to sample libraries; they have been painstakingly produced in the recording studio. For example, WC Research, Inc., the producers of DNA™ grooves, have pulled industry legends such as Clyde Stubblefield and Bernard Purdie into the recording studio specifically for the purpose

of encoding their unique feel. The results are stunning, and we strongly recommend that you check them out. A folder of sample DNA grooves is included with Performer.

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's Create Groove feature, consider handling it in the same fashion as you would for samples.

Cubase grooves

Performer can read Cubase groove files if they are placed in Performer's Grooves folder. They appear in the Groove Quantize list with a different icon along with all of your Performer groove files. They can be used in the same fashion as Performer grooves.



Cubase grooves can be viewed in Performer's Groove Editor, but they cannot be edited directly. To edit them, first move them into a Performer groove file using the Copy and Paste commands in the Edit menu (see "Deleting, moving, and duplicating grooves" on page 491).

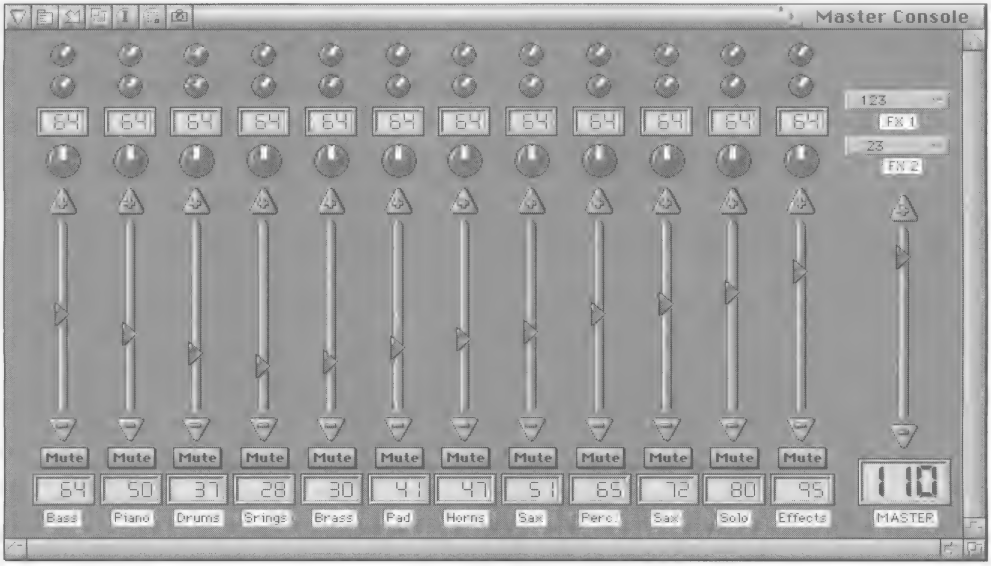
Applying the groove from one track to another

To apply a groove from one track to another, create a new groove based on the original track. Once 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.

Chapter 31 *Custom Control Consoles*

Performer's custom control consoles provide a host of control items, including:

- Sliders
- Knobs
- Buttons
- Pop-up menus



Each control item can be used for virtually any musical purpose that involves MIDI data. For example, a control item can:

- Act as a "virtual" MIDI instrument, generating continuous data which can be sent to synthesizers and recorded into tracks
- Remap data, such as velocities into controllers
- Modify velocities of notes as you play back
- Generate system exclusive data to modify synth parameters on the fly

You can build customized control consoles, such as:

- Mixing consoles with sliders and knobs that control MIDI volume and pan
- Patch editing consoles that control and shape the sounds in your synthesizers.

The sliders, knobs, and buttons can be controlled in real time, while Performer is playing back or recording, to create musical effects. In addition, they animate during playback to reflect what you have recorded.

Basics

Custom Control items serve two functions. First, they **monitor** MIDI data being played from their target track or MIDI channel, animating in real time to reflect the data's current value. For example, let's say you have a track containing a stream of controller #7 (volume) data, and the controllers increase in value (in the range from zero to 127), making a crescendo. A control item assigned to monitor controller #7 in the track will move as the track is played back, reflecting the changes in the values of the controller.

Secondly, control items **generate** new continuous MIDI controller data in real time when you take control of them, and send the data to either a FreeMIDI device or track. When you take control of a control item, the new data that it generates *overrides the data already in the track.*

To demonstrate this, let's return to the volume example above with the crescendo in the track. If you play back the track and grab the control item with the mouse half way through the crescendo, you will take over the volume of the track with the control item. The crescendo still exists in the track, but it does not get played as long

as you are gripping the control item with the mouse. If you release the control item, it will immediately begin monitoring the existing data in the track again.

In summary, control items monitor continuous data being played back from their target track or MIDI channel. Grabbing a control item generates new data which overrides the data in its target track. The new data does not modify the track; it only temporarily overrides the continuous data in the track.

Creating a Custom Console

Custom controls are created and displayed in custom console windows. You can create as many custom console windows as you like. They save, close, and open like other Performer windows.

You can create control consoles automatically or by hand.

For basic MIDI controls, such as volume sliders, pan knobs, mod wheel sliders, and pitch bend sliders, you can create them automatically using the Create Console command in the Tracks window.

Creating a MIDI Volume and Pan Control Console

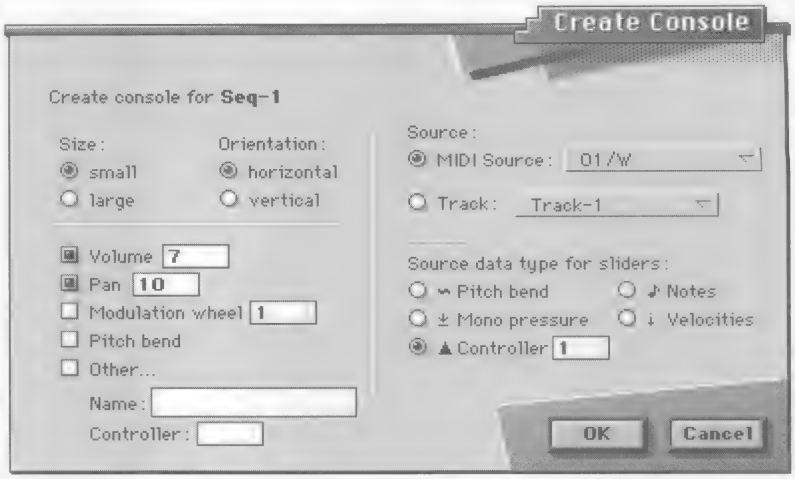
To quickly create a control console with sliders and knobs for MIDI volume and pan in the Tracks window:

1. **Highlight the Track(s) for which you wish to make a console.**

   Click each track name to highlight it. Shift-click to select tracks not next to one another.

2. **Choose Create Console from the Tracks window mini-menu.**

The Create Console dialog box appears.



3. **Select the dimensions of the sliders you will create in the console.**

   Pan control items are created as knobs. All of the other types of items are created as sliders. The slider dimensions you choose can be modified after the console is created.

4. **Select the type of control items you want to create for each track that you have selected.**

   The Other option allows you to choose a controller of your choice and name it. If you select multiple items, they are placed together in the same console. If you would like each type of item to be in a separate console, select one type at a time and repeat this entire procedure for each type. For example, if you want volume sliders in one console, and pan sliders in a different console, choose only volume, click OK and then repeat the procedure for pan.

5. **If desired, choose a source for the control items.**

   The most common form of a source is an external MIDI controller, such as the mod wheel or pitch bend wheel on your controller keyboard. This allows you to move the slider or knob with your mod wheel. If you do not need to do this, leave the source option settings as they are.

☛ Note that the control item doesn't not require a source data type to record data and animate during playback! Instead, it records and monitors the target data (volume, pan, etc.) that you have selected.

6. **If necessary, choose the source data type.**

7. **Click OK to create the console.**

   Clicking OK creates the console and adds the Console's name to the Windows menu. The console that you created will appear in the center of the screen.

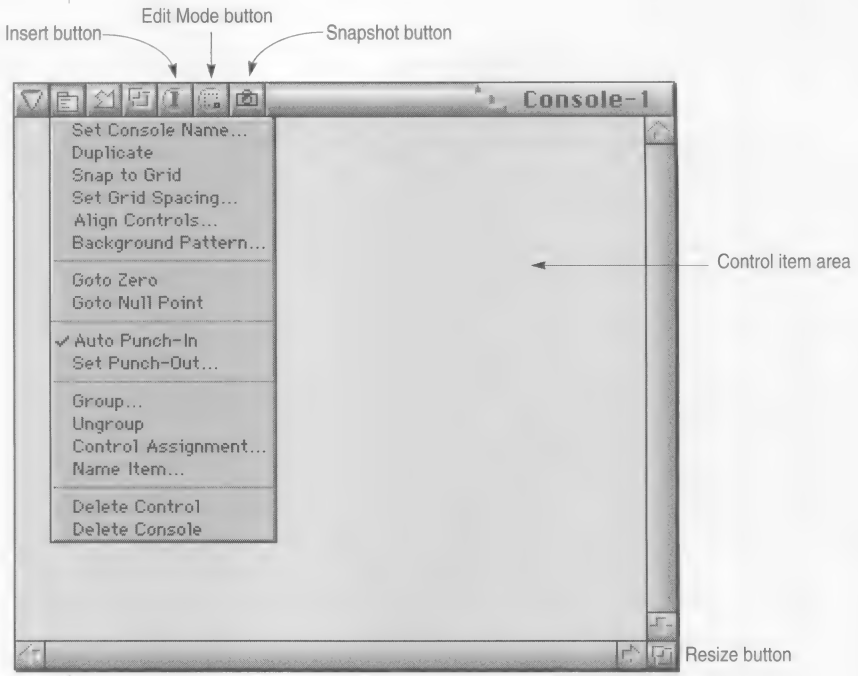
Building a Custom Console

If you would like to create your own customized console, you can open a new, blank custom console. To do so, click the Custom Consoles button in the Consolidated Controls panel.

Custom consoles button creates a new, empty console in which you can build controls.

Quick Reference

A new, empty console window appears. It has a title bar, close box, push down box, mini-menu and grow box like a standard Performer window. Drag the title bar to move it. Click the close box to close it.



Insert button: inserts a slider, knob, button, or other control item.

Edit Mode button: Toggles between two modes in the console. When Edit Mode is on (the button is highlighted), console items can be moved, resized, deleted, and otherwise graphically manipulated. When Edit mode is off, control items cannot be moved; instead, sliders slide, knobs turn, buttons push, and so on.

Snapshot button: takes a snapshot of the current knob, slider, and other control settings and records the current setting in the track at the current counter location. This can be done while Performer is stopped or playing back.

Control Items area: this is the area where you create and position the knobs, sliders, buttons, etc.

Resize button: resizes the window.

Mini-menu Quick Reference

Set Console Name: Provides a dialog box in which you can change the name that displays in the title bar of the console and in the Windows menu.

Duplicate: Makes a copy of selected control items.

Snap to Grid: Toggles whether or not control items snap to an invisible grid in the console when they are moved or resized. When checked, Grid Snap is on. When not checked, Grid Snap is off.

Set Grid Spacing: determines the resolution of the snap grid when snapping is turned on. The resolution is measured in screen pixels, which are approximately 72 dots per inch (dpi).

Align controls: Lines up selected controls to one another in a configuration that you choose. For example, you can line up the centers of several control items by selecting them and choosing this command.

Background pattern: Allows you to fill the control item area with a standard Macintosh background pattern similar to the fill patterns found in paint programs. Sliders, knobs, and buttons appear superimposed on top of the background pattern.

Goto Zero: Sets the value of the highlighted control item(s) to zero.

Goto Null Point: Sets the value of a highlighted master control item to its null point.

Auto Punch-In: A special record mode for control items which causes them to record data into their target track only when the control item is moved, either with the mouse or an external source.

Set Punch-Out: Opens the Set Punch-Out dialog box, which allows you to adjust the delay before punch-out when you are in Auto Punch-In mode and are controlling a control item from an external MIDI source. The Punch-Out time is the amount of time (in tenths of a second) between when the last event is received by a control item from its external source and the time at which the control item drops out of Record.

Group: Opens the Grouping dialog box for the highlighted control items. This command allows you to assign control items to a group all at once rather than one at a time.

Ungroup: Removes the highlighted control items from their assigned group.

Control Assignment: Opens the Control Assignment dialog box for the currently selected control item in the console. This dialog contains all of the settings for how the control item behaves.

Name item: Lets you type in a name for a currently selected control item.

Delete Control: Removes the currently selected control item(s) from the console.

Delete Console: removes the console from the screen and removes its name from the windows menu.

Creating a Slider, Knob, or Button

To create a control item:

1. **(Optional) Select the Snap to Grid menu item to turn the snap grid on or off.**

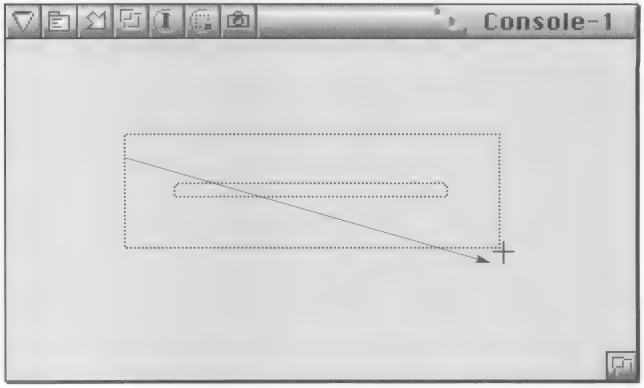
   This causes the control item to snap to an invisible grid in the console window when you create it, which can be useful for lining up multiple buttons and sliders.

1. **Press the insert button in the title bar.**
2. **Choose the item you would like to insert.**

   The cursors turns into a cross-hair.

3. **Drag across a blank portion of the console window.**

   As you drag, the item appears. You can choose any length or size that you like. You can also resize the item at any time.



4. **When you release the mouse, the control Assignment dialog box appears.**

5. **(Optional) Choose a source data type for the control item.**

See "Making the Source Assignment" on page 516 for more information.

6. **Choose the Target data type for the control item.**

   See "Making the Target Assignment" on page 515 for more information.

7. **(Optional) Set the minimum and maximum time change.**

   These two options (on the left) control the density of the data that the control item generates. The lower the values, the more dense the data. Higher values thin out the data. Try to use as high a value as you can while still maintaining the musical effect you wish to achieve. If you use values that are too high, and the data is too thinly generated, it may not sound good.

8. **Choose the minimum and maximum values for the control item.**

   These are the absolute lowest and highest values that the control item can have. For controllers, the maximum range is 0 to 127. For pitch bend, the range is -8192 to +8191.

9. **(Optional) Assign the control item to a group.**

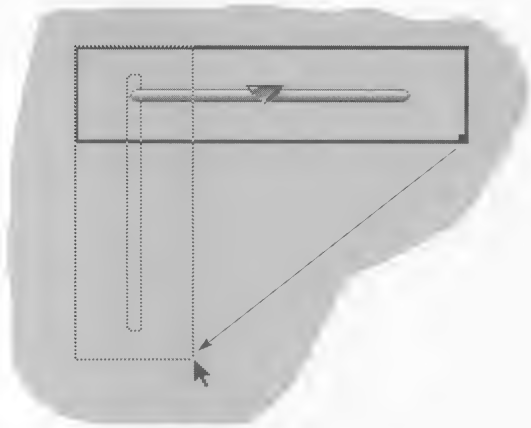
   See "Grouping Control Items" on page 533 for more information.

10. **Type in a name for the control item.**

11. **If desired, change the type of item (slider, knob, button) by choosing a different item type from the Type pop-up menu.**

12. **When you have set all of the parameters as desired, click OK.**

    The control item appears in the console. Notice that it has a box around it. You can click the handle in the lower left of the box to further reshape the item.



Making the Target Assignment

The target assignment is made in the Control Assignment dialog box when you first create the slider, knob or button as shown in the previous section. The target can changed at any time by double-clicking the control item.

The target assignment consists of two things: the *type of MIDI data* and the *target,* which is place where the data will be sent.

The **target data type** is the specific type of MIDI data that the control item will send and monitor. A control item only monitors one track and one data type at a time.

Sliders, knobs, and buttons in Performer can control just about any type of MIDI data, including:

- Continuous controllers
- Switch controllers (either as switch controllers or as continuous controllers)
- System exclusive messages
- Notes and velocities

For velocities, the slider or knob modifies the velocities of notes in the target track as they play.

The **Target** is the place where the data will be sent by the slider, knob or button. The target can be:

- A track
- A FreeMIDI device

When the target is a **track**, the data from the control item is sent to the track, which then records and plays the data. In turn, the control item monitors the material it recorded in the track, animating as it does so. However, the control item only records into that one track in that one sequence; it cannot control another track in another sequence, unless you reassign it.

When the target is a **FreeMIDI device**, the data from the control item is sent to the track in the current sequence which is assigned to that device. This is the most flexible of the target assignments because it doesn't matter what sequence is playing at the time. As long as one of its tracks is assigned to the device, the control item data will be recorded and monitored in the track.

Making the Source Assignment

The source assignment is made in the Control Assignment dialog box when you first create the slider, knob or button as described in "Creating a Slider, Knob, or Button" on page 512. The source can changed at any time by double-clicking the control item.

What is a source for the slider or knob? It is a device other than the mouse which you can use to control the slider or knob. Normally, you change the value of a slider or knob by dragging it with the mouse. At times, however, it might be useful to move it from an external controller, such as the modulation wheel or data entry slider

on your MIDI keyboard controller. To do so, set the Source assignment to match the incoming MIDI channel and data type for the controller you wish to use.

The source assignment consists of two things: a *type of MIDI data* and the *MIDI channel or track* from which the data is being generated.

Notice that the slider or knob can be controlled by notes, velocities, pitch bend, controllers, or even mono pressure.

Set the MIDI channel to match the transmit channel of the controller, pitch bend wheel, or whatever you are using.

Notice that the source can also be a track. Source data in the track then controls the slider. This allows you to create interesting effects. For example, you can assign the source of a slider to be the velocities of notes in track 3. You can then assign the target to be controller number 7 (volume) and assign it to the synth playing back the notes in track three. When you play the track, the slider reads the velocities and sends out a volume controllers to match the velocities, thus enhancing the volume change effect from the velocities.

Changing the Source or Target

To change the source or target assignment:

1. **Be sure the Edit mode button in the title bar of the console window is unhighlighted (turned off).**
2. **Click the knob or slider to select it.**
3. **Choose Control Assignment from the mini-menu.**

   As a shortcut, double-click the control item.

4. **Set the source or target assignments as needed.**

5. **Click OK.**

Adding Arrows to a Slider or Knob

To connect a scroll arrow to a slider:

1. **(Optional) Select "Snap to Grid" from the Console window mini-menu to check it.**

   Doing so causes the arrow to be lined up with the slider or knob. Otherwise, you may need to manually adjust the position of the arrow to line it up with the slider. The arrow doesn't have to be lined up, however; it will control the slider no matter where you place it.

2. **Insert the slider or knob.**

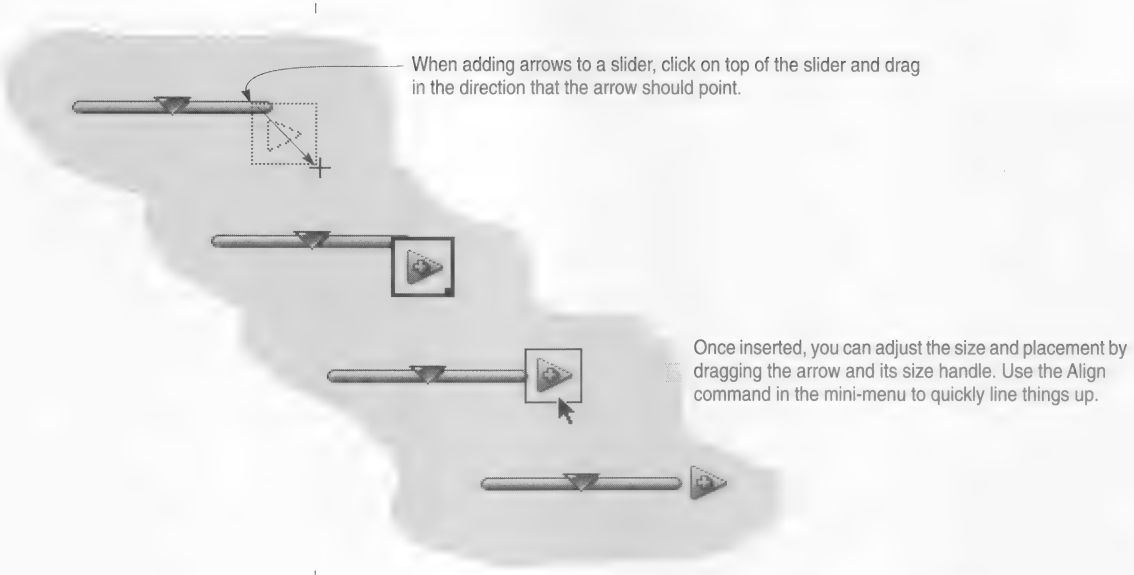
   To do so, press the insert button, choose slider (or knob), and drag out the slider. The Control Assignment dialog appears. Select the desired settings and click OK.

3. **Press the insert button again and choose "Arrow" from the menu.**

   Once you have chosen to insert an arrow, the cursor turns into a cross-hair.

4. **Click directly on top of the slider and drag in the direction to which the arrow should point.**

   Don't worry about the exact placement of the arrow yet. You can take care of that after you have inserted it. Drag up or to the right to create an increment button; drag down or to the left to create a decrement button. Control the size of the arrow with the size of the box that you drag out. Below, an increment arrow is being inserted by dragging to the right. Notice that the cross-hair was initially clicked on top of the slider.



5. **Adjust the size and placement of the arrow as needed.**

   Use the Align command in the mini-menu to automatically align the arrow with the slider.

6. **To use the arrow, click the edit button in the console title bar to unhighlight it and click the arrow button.**

Adding a Value Box to a Slider, Knob, or Button

A value box displays the current value of the slider, knob, or button, and it will update continuously as you move the slider or knob.

If you want, you can add a value box to a button. However, buttons can only send up to two values, so a value box might not be useful since it will only display two different values. (On the other hand, you might have a situation in which it *would* be useful, so that's why we mentioned it.)

To add a value box:

1. **(Optional) Select "Snap to Grid" from the Console window mini-menu to check it.**

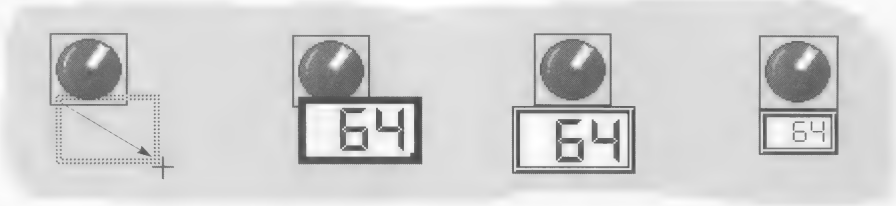
   Doing so causes the value box to be lined up with the slider or knob. Otherwise, you may need to manually adjust the position of the value box to line it up with the slider. The value box doesn't have to be lined up, however; it will be connected to the slider no matter where you place it.

1. **Insert the slider, knob, or button.**

   To do so, press the insert button, choose slider, and drag out the slider. The Control Assignment dialog appears. Select the desired settings and click OK.

2. **Press the Insert button again and choose "Value Box" from the pop-up list.**

3. **Click on top of the item to which you wish to add the value box, and drag diagonally to create the value box.**



Click on top of the knob or slider and drag out a box for the appropriate size.

Once inserted, you can adjust the size and placement.

If grid snapping is enabled, click in the corner to line up the value box with the knob or slider.

Using Value Boxes

You can enter a value into a value box just like Performer's main counter. To change the value inside an edit box:

1. **Click inside the value box.**

   The numbers inside become highlighted.

2. **Type the desired value.**

   Use the arrow keys if necessary.

3. **Press return to confirm your choice.**

Labelling a Slider, Knob, or Button

Often you will want to label the sliders, knobs, and buttons that you create. If you didn't set the name when you first created the control item, set it as follows:

1. **Click the border of the control item to select it.**

   Alternately, you can shift-click anywhere on the control item to select it.

2. **Choose "Name Item" from the mini-menu.**

3. **Type in the desired name.**

4. **Click OK to confirm your choice.**

To add a label to the control item:

1. **Press the insert button and choose "Label" from the menu.**

2. **Click directly on top of the control item.**

   The label appears.

3. **If necessary, drag the label to the desired position.**

   You can do so with grid snapping enabled or disabled.

Changing a Label

To change the text of a label:

1. **Click the label to select it, or click the border of the control item.**

2. **Choose "Name Item" from the mini-menu.**

3. **Type in the new name and click OK.**

   ☛ Note: as a shortcut, you can option-click the label.

Creating a Button

Buttons send one MIDI message at a time. For example, a button might send a patch change to a synth or a MIDI patcher.

To create a button:

1. **Press the insert button and choose "Button" or "Text Button" from the menu.**

   A text button displays its label inside the button.

2. **Drag the cross-hair across the console to insert the button.**

   The Control Assignment dialog box appears.

3. **Set the Source and Target items as desired.**

   See "Making the Target Assignment" on page 515 and "Making the Source Assignment" on page 516.

4. **Select the type of button you wish it to be.**

   There are three types of buttons:

Single-state Two-state On/off

- **Single state button:** sends a single message only.
- **Two-state button:** toggles between two messages, sending the first when it is pressed and the second when it is released. For example, you might want to create a temporary mute button that mutes the track only while you are holding down the button. If you choose this type of button, you have two values to enter to the right of the option.
- **On/off button:** toggles between two messages, sending the first when it is pressed and the second when it is pressed again, and so on. For example, the button might toggle between a volume controller of zero and 127 to mute and unmute a track. If you choose this type of button, you have two values to enter to the right of the option.

5. **If you want the button to act like a mute button, click the "M" next to off value button as shown below.**

   When this setting is enabled, the button sends the current value of its target controller type at the time the button is unmuted, instead of sending a specific maximum value. This makes a button assigned to controller #7 (volume) act just like a real mute button by returning the track to the current volume at the moment it is unmuted.

Figure 31-1

6. **If desired, choose a group for the button.**

   Buttons can be grouped, either by a master button or even by a slider or knob.

7. **If desired, type in a name for the button.**

   If it is a text button, the name will be displayed inside the button.

8. **Click OK.**

Selecting Control Items

Shift-click anywhere on a control item to select it. You can also use shift-clicking to select multiple items.

To select a group of items, drag a selection box over them.

To select all the items in the console, choose Select All from the Edit menu, or press command-A.

Cutting, Copying, and Pasting Console Controls

Console controls can be cut, copied, and pasted. This greatly facilitates the process of building a custom control console. For example, if you are creating a number of items that are similar, make one first and then copy and paste it as many times as needed. Then make the necessary minor adjustments to each copy.

To cut or copy a control item:

1. **Select the desired item(s).**

   Note that you can select more than one at a time. For information about selecting control items, see "Selecting Control Items" on page 523.

2. **Choose Cut or Copy from the Edit menu.**

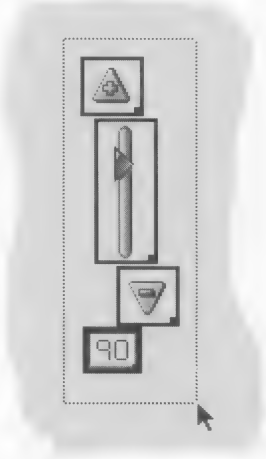
To paste a control item after cutting or copying, choose Paste from the Edit menu.

Aligning Control Items

There is an Align Controls command in the Console mini-menu to help align selected console controls.

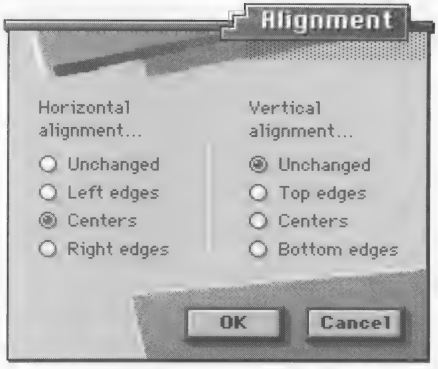
To use this command:

1. **Select the items to be aligned.**



2. **Choose Align Controls from the console mini-menu.**

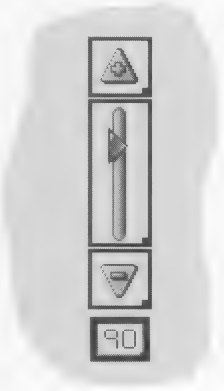
   The Align Controls dialog appears.



3. **Choose the desired options.**

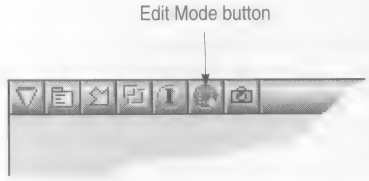
   In this example, we are aligning the centers of the objects left-to-right.

4. **Click OK.**



Nudging Control Items

Selected control items can be nudged using the arrow keys. Be sure that the item you want to nudge is selected. (You can nudge several at once, too.) Also make sure that the Edit Mode button in the title bar of the console is highlighted as shown below. Items are nudged one screen pixel each time you press an arrow key.



Moving or Removing Control Items

Once you have selected control items as described in the previous section, you can drag them anywhere in the console window. You can also remove them from the console by hitting the delete key or by choosing Erase from the Edit menu.

Duplicating a Control Item

To duplicate a control item:

1. **Select the control item.**

   See "Selecting Control Items" on page 523.

2. **Choose "Duplicate" from the Console mini-menu.**

Changing the Parameters of a Control Item

To change the source, target, grouping, and other parameters for a control item, double-click it. The Control Assignment dialog box appears. Change what you wish and then click OK.

Moving or Resizing a Control Item

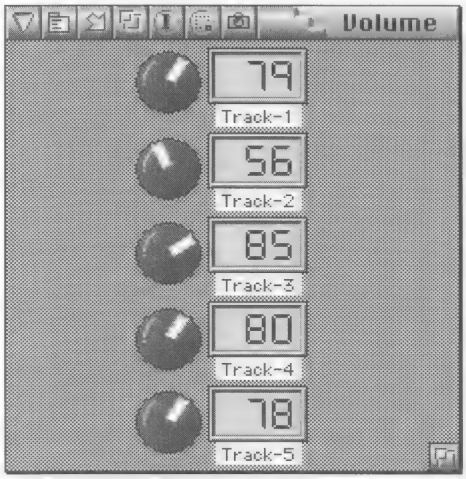
To move or resize a control item, you need to be in edit mode. To enter edit mode, click the Edit Mode button in the title bar so that it becomes highlighted. When you are in edit mode, you can only edit control items. You cannot use them, i.e. you cannot slide a slider, turn a knob, press a button, etc. To use the control items again, unhighlight the edit mode button.

As a shortcut, you can enter edit mode temporarily by holding down the command key (instead of clicking the edit button) as you click the control item. Doing so allows you to move it or resize it without clicking the Edit Mode button in the title bar.

Setting a Background Pattern for the Console

The Background Pattern command in the Console window mini-menu opens a dialog from which you can choose a foreground and background pattern for the console. Click the pattern you wish for each, and the sliders, knobs, and buttons in the console will be superimposed on top of that pattern.

You can use this feature to visually differentiate different types of consoles. For example, you could give your volume consoles a different background pattern from your effects consoles.

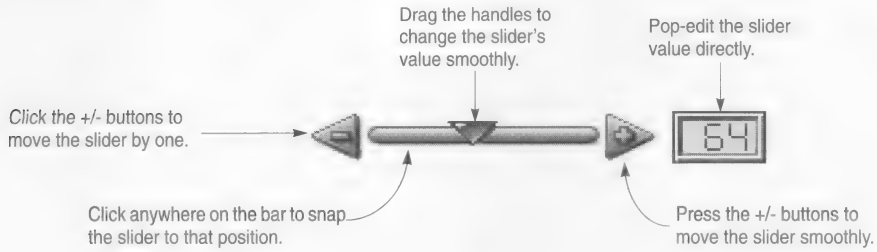


Controlling Knobs and Sliders

The following sections explain how to control sliders and knobs.

Controlling a Slider or Knob with the Mouse

Try moving the slider with the following mouse actions to familiarize yourself with them.



To move a knob, simply click on it and drag horizontally or vertically.

Controlling a Knob or Slider with a Mod or Pitch Bend Wheel

Once you have made the source assignment as described in "Making the Source Assignment" on page 516, click the slider or knob name to highlight it and move the mod wheel. You will see the slider respond as you move the wheel.

> ☛ Remember, the slider or knob must be selected for external control to work.

When a slider or knob is being controlled externally, data from the external source is exclusive to the slider; that is, the data is used solely to control the slider and will not be accidentally recorded into another track.

Remapping Data on the Fly

External control is a very powerful feature because it allows you to reassign continuous data in real time as you move the controller. For example, a volume slider that is being controlled by a mod wheel is actually receiving controller #1 data from the wheel and then converting it into controller #7 data on–the–fly.

Performer also allows you to control sliders with several types of data that you might not consider at first: notes, velocities, and aftertouch.

Moving a Slider or Knob During Playback

To move the slider during playback, simply press the play button and move the slider with the mouse or mod wheel, while the scale is playing back. Notice that the volume changes as you move the slider.

Controlling a Slider or Knob with Notes

MIDI notes are numbered from 0 to 127. C3 is note number 60, for example. Note numbers correspond exactly to controller numbers, so pressing a note on your keyboard will set the slider to its corresponding value. This is useful for creating sudden, precise changes in controller value rather than smooth changes. Keep in mind while you do this that most keyboards do not have 127 keys and therefore will not allow you to span the entire zero to 127 range of the slider.

Controlling a Slider or Knob with Velocity and Aftertouch

Note velocities can also be used to control the slider, since they also span the range from zero to 127. The harder you strike a key, the higher (or lower) the slider will go. This might be useful for setting up a slider to send a controller that, in turn, affects a synth in a certain way: as you strike the key harder, the musical effect will become stronger (or weaker).

The same applies to aftertouch data. The harder you press on the key, the higher (or lower) the control item will go.

Recording a Knob, Slider, or Button

Once a control item's target and source parameters have been set up, you can record data generated by it into its target track. Recording with custom controls is specially designed so that the data from the control item will not erase data that already exists in the track. Instead, data generated by a knob, slider, or button is merged with existing data. For example, you can record a crescendo (in the form of controller #7 data) from the control item without erasing any of the notes in the track.

On the other hand, data from the control item *replaces* any existing data *of the same type*. If a track already contains controller #7 data from measure 1 to measure 10, and you record briefly with the slider in measure 5, the new data recorded from the slider will *replace* the existing controller #7 data in measure 5.

With this in mind, sliders, knobs and buttons can be recorded in one of three ways:

- You can record a single "snapshot" of the current setting of all the sliders and buttons in a console. To do so, set up the console the way you wish, set the Main Counter to the desired location, and then click the Snapshot button in the title bar of the console. Or, click the Snapshot button during playback or recording. For more information, see "Taking a Snapshot of a Console" on page 532.
- You can record *without Punch-in mode* (unchecked in the console window mini-menu), which causes the slider or knob to record continuously, even when you are not moving the slider, so that it continually replaces its own data type in the track.
- You can record *with Punch-in mode*, which causes the slider or knob to only record when you move it. Punch-in mode is enabled by default.

Record-enabling an empty track

When recording console controls, a track has to be record-enabled. Note, however, that you do not need to record-enable the track whose fader you want to record.

To avoid accidentally erase notes and other data when recording faders, do one of the following:

- Record-enable an empty track

  OR

- Record-enable any track and turn on Overdub Record mode

Enabling Auto Punch-In Mode

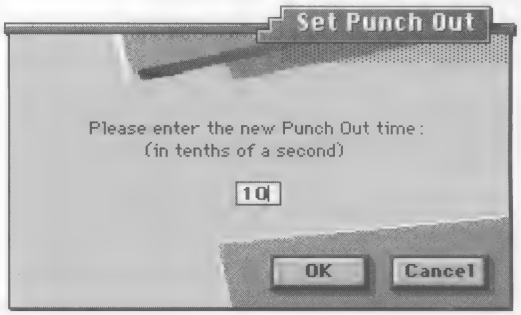
To enable Auto Punch-In mode, select it from the mini-menu. A check appears next to it indicating that it is activated.

To record data when punching in, press the Record button in the Consolidated Controls panel and move the control item. When the control item moves, data in the track of the same type as what the control item is sending will be replaced by the new control item data, just like normal control item recording. When you release the control item, recording will stop and it will return to monitoring the track.

Punch-in Recording Using an External Control

Moving the control item from an external control while punching in works much the same way: to punch in, the control item waits to receive an event from its external controller. When it does, it punches in. Punch out, however, is done automatically by Performer 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 punch out, you can lengthen the delay before Performer punches out with the Set Punch Out command in the console window mini-menu.



The Set Punch Out dialog box allows you to determine the punch out delay in tenths of a second. Usually, values between 5 and 15 work well.

Summary

Here are several situations and a description of what control items will do in each case:

Performer is not playing or recording: When the current location of the sequence is changed with the Controls or Counter Window, all control items jump to the value of their assigned parameter on their assigned track. They may then be moved; as they move they send out MIDI data of the assigned data type on the channel(s) of their assigned track.

Performer is playing back: As Performer plays, the control items animate to reflect the values of their target data type from their target. A control item may be grabbed and moved independently, either by simply grabbing the handle or by external control; it then transmits MIDI data that takes the place of out-going data from its source track. The data it generates does not get recorded. When the control item is released, it returns to tracking the target track.

Performer is recording: When Performer is recording, a control item is either in or out of Punch-in mode. Here is what happens in each condition:

- **With Punch-in mode**, the control item simply monitors its target, just like playback. When you move it with the mouse, it records your movement. Data in the target track is replaced by data generated by the control item. (Only data of the same type is replaced). When the control item handle is released, the control item starts tracking the target track again.

- **Without Punch-in mode,** a MIDI event corresponding to the current position of the control item is inserted into the target track(s). As recording continues, old data is either erased or replaced by new data of the same type generated by control item motions. Only data of the type assigned to the control item is affected. For example, recording a pitch bend control item would replace any existing pitch bend data with new data; notes, controller data, etc. would be unaffected.

Taking a Snapshot of a Console

Once you have created your custom console, you can take a snapshot of it. A snapshot captures all of the current slider and knob settings. The snapshot is placed into the tracks of the currently play-enabled sequence.

If you would like to record the snapshot, the target assignment of the sliders and knobs must be either a track or a device (instead of a MIDI channel).

To take a snapshot of the current position of the sliders, knobs, and buttons in a console:

1. **Set the main counter to the desired location at which you wish to record the snapshot.**

   You can also take the snapshot during playback or recording.

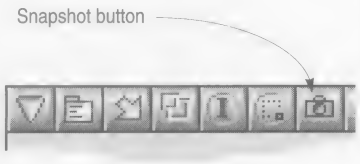
2. **Set up the sliders, knobs and other control items the way you would like them to be in the snapshot.**

3. **Select the control items in the console that you want to include in the snapshot.**

   See "Selecting Control Items" above.

4. **Click the Snapshot button in the title bar.**

   When you click the snapshot button, each control item generates a MIDI event at that instant. The value of the event, such as the level of a volume controller, is determined by the control item's position at the time the snapshot is taken. The event is inserted into the control item's target track. If you have taken the snapshot of many sliders, knobs, etc., each item places its data into its own target track.



Editing a snapshot

Once data has been inserted into one or more tracks by taking a snapshot, the data can be edited in the standard fashion in the track(s). For example, if you wanted to remove the snapshot, select the data in the tracks window and delete it.

Animation During Playback

Unless the control item is being dragged, it monitors its target track, animating during playback to reflect MIDI data that it has recorded into the track.

In general, the control item always reflects the current value of its target data type, even when cueing the sequence to a different playback location. For example, press the rewind button of the sequence. The volume control item will snap to zero. Now, type in measure 5 into the Counter window and press the return key. This sets the current playback position at measure 5. When you do so, the volume control item will snap to whatever the value of controller #7 is at measure 5.

Using Controllers Above 63

Only controllers 0 to 63 are considered to be "continuous" MIDI controllers—ones that can express any value between 0 and 127. Controllers 64 to 120 are defined by the MIDI specification as "switch" controllers—ones that are either on or off. Controllers 121 to 127 are reserved for special purposes.

Some MIDI hardware, however, treats controllers 64 to 120 as continuous controllers. Performer's control items can generate any controller from 0 to 120 as continuous data, providing you with maximum flexibility with MIDI devices that treat controllers 64 to 120 as continuous controllers.

Grouping Control Items

Performer's custom consoles provide the ability to group control items together and control them from a master control item. Grouping allows you to control an entire bank of controls at the same time from one control item. Up to 32 control items can be assigned to a single group, and Performer allows up to 26 groups, identified by a letter from A to Z. Any control item can be a master control item or a grouped control item.

In addition, a master control item that controls a group can, in turn, be a member of another group controlled by another master. This allows you to create sub-groups of control items, and sub-groups within sub-groups. There is no limit to the number of layers you can create.

Master and Slave control items

Each control item in the group can have its own, customized relation to the group's master control item. Grouping provides three ways in which a control item (slave) responds to its group master: the grouped control item can **match**, **offset**, or **scale** values received from the master.

When **matching** the master, the slave simply goes to the same value as the master. For example, if the master control item is set to 79, the slave goes to 79 as well.

When **offsetting** the master, the slave can start at a different value than the master. When the master moves, the slave moves by the same amount, or by a percentage of the amount. For example, let's say that the master is at 0, the slave is at 20, and the slave is offsetting by 100%. If you move the master to 50, the slave will move to 70. If the slave is offsetting by 50%, it will only move to 45, which is 20 plus half of 50 (25).

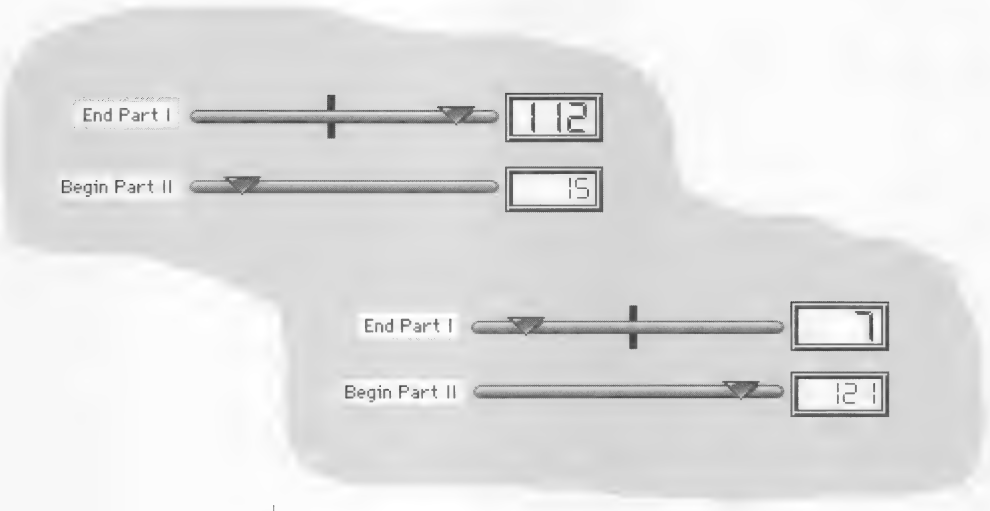
When **scaling** the master, the slave can start at a different value than the master. When the master moves, the slave moves by a percentage of the distance that the master moves in its relation to the end of the control item. For example, lets say that the master is at 0, the slave is at 64, and the slave is scaling by 100%. When the master moves to 64, which is half way to the top, the slave moves to 96, which is halfway of its distance to the top. If the master goes to 96, which is 3/4ths of its distance to the top, the slave goes to 112, which is 3/4ths of its distance to the top. By the time the master has reached 127, so has the slave.

Slaves can be offset or scaled by a percentage between 0 and 999%.

Polarity

In addition to matching, offsetting, and scaling, a slave can react positively or negatively to its master. **Positive polarity** causes the control item to move in the same direction as its master. **Negative polarity** causes the control item to move in the opposite direction from its master.

Negative polarity is extremely useful for many musical effects, such as cross-fading or panning. You can bring the volume of one track up at the same time as you bring the volume of another track down.



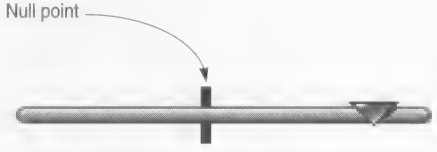
In this example, "End Part I" is the master and is being faded down from right to left. As it does, "Begin Part II" fades up from left to right.

Null Points

In the grouping offset and scaling examples above, you may have noticed that an important part of how masters and slaves work is *their initial values*. In Performer, the master's initial value is called the **null point** and the slave's initial value is called its **reference value**.

A master's null point is the value of the master slider on which changes to slaves are based. It is indicated on a slider as a bold hash mark behind the slider bar.

The slave's reference value is its value when the master is at its null point. Whenever you would like to see the reference value of a slave, move its master to its null point.



The slave responds to *changes* in the master slider's value, which are measured from the master slider's null point, and it moves from its reference point based on those changes. As the master moves from its null point, the slave moves from its reference value.

Performer's null point is similar to the null point on most recording studio mixing consoles: it is a base value from which slaved sliders are measured.

Hardware mixers usually have a fixed null point somewhere near the middle of the slider's range. The null point of Performer's sliders, however, can be set to any value on the slider, from zero to 127 (or –8192 to 8191). This provides an added level of flexibility when achieving the musical effects that you want.

Moving Slaves Independently of Their Master

Slaves always follow their master. However, a slave is not "locked" by the master; it can be moved independently at any time, regardless of the master's current value (position). When you move a slave, you are changing its reference point with respect to the master. In addition, its relation to the master is temporarily severed. The only way to reestablish the connection is to move the master, or reset the master to its current value.

If you move both a master and a slave at the same time from the same external source, you will sever the master/slave connection between them and the slave will track the external source as if it was not connected to the master.

Assigning a Control Item to a Group

To assign a control item to a group:

1. **Select one or more control items.**
2. **Choose *Group* from the console window mini-menu.**

   The Grouping dialog box will appear.

3. **Type the group letter to which you want to assign the control item.**

   The only restriction here is that a control item cannot be the member of a group if it is already the master of that group. Up to 32 control items can be included in one group.

4. **Select the polarity.**

5. **Choose whether to match, offset, or scale from the master.**

   If you want the grouped control items to reach their highest and lowest value at the same time as the master, choose scale at 100%, which is perhaps the most intuitive way to group control items.

6. **Click OK to confirm your choice or Cancel to withdraw it.**

Assigning a Master Control Item

To assign a master control item:

1. **Unhighlight the Edit Mode button in the console title bar and select the control item.**

2. **Choose Control Assignment from the mini-menu.**

3. **Type a letter in the Group text box.**

   You can enter any single letter. The only restriction is that the control item cannot be a master of its own group.

4. **Choose the Master option.**

5. **Click OK.**

Setting a Master Slider's Null Point

To change the null point of a master slider:

1. **Option-click anywhere on the slider.**

   The null point, which is indicated by a bold hash mark, will snap to the location, and you can drag it freely from there.

The null point can also be changed more precisely as follows:

1. **Select the master slider.**
2. **Choose Control Assignment from the console mini-menu.**
3. **Make sure the Master radio button option is selected.**
4. **Type in the desired null point in the box provided.**
5. **Click OK to confirm your choice or cancel to withdraw the command.**

Setting a Slave's Reference Value

To change the reference value of a slave, move the master back to its null point, and then move the slave to the desired value. It is not mandatory to move the master to its null point beforehand, but if you do not, the value you are setting is the *actual* reference value and does not reflect the current difference between the master and its null point. As soon as you move the master again, reestablishing the master/slave connection, the slave will pop to its new relative position, often causing an unexpected result.

Moving a Master to its Null Point

To move a master to its null point, either drag the master's handle to the bold hash mark, or highlight the slider and choose Goto Null Point from the Slider window or Console mini-menu.

Sending Multiple MIDI Messages At Once With Grouped Buttons

You can group buttons to a master button to send various messages to various destinations all at once. Just assign each button to the same group. Make sure each button is of the same type. Then create a master button that is also the same type. When you press the master button, the slaved buttons will be pressed and released at the same time.

☛ Please note: if you group buttons, the slaved buttons do not animate when you click the master button. They do, however, transmit data.

Generating Sysex with a Slider or Knob

Performer allows you to generate system exclusive data from a slider or knob. The slider generates a continuous stream of messages, each containing a range of bytes (up to four) that are changed incrementally by the slider or knob.

Doing so allows you to control device-specific parameters of MIDI hardware in ways that can not be achieved with continuous controller data.

> ☛ Please note! This section is not for the technically faint of heart. You should have a firm knowledge of MIDI, and you should be familiar with your hardware's MIDI implementation.

Before you begin this procedure, here's what you need to know about the sysex message:

- The message itself, or how to dump it into Performer
- Whether or not the message contains a checksum, and if so, how many bytes the checksum consists of
- What the data bit format is (7-bit or 4-bit nibble)
- Which comes first, the LSB or the MSB
- The specific bytes within the message that will be the variable bytes controlled by the control item (up to 4 bytes)

To set up a control item that generates sysex, you must first enter the sysex data into Performer, and you have two choices for how you can do so. You can:

1. Type it in by hand
2. Type in a request message and record it from the synth

To set up a sysex slider or knob:

1. Create the slider or knob.

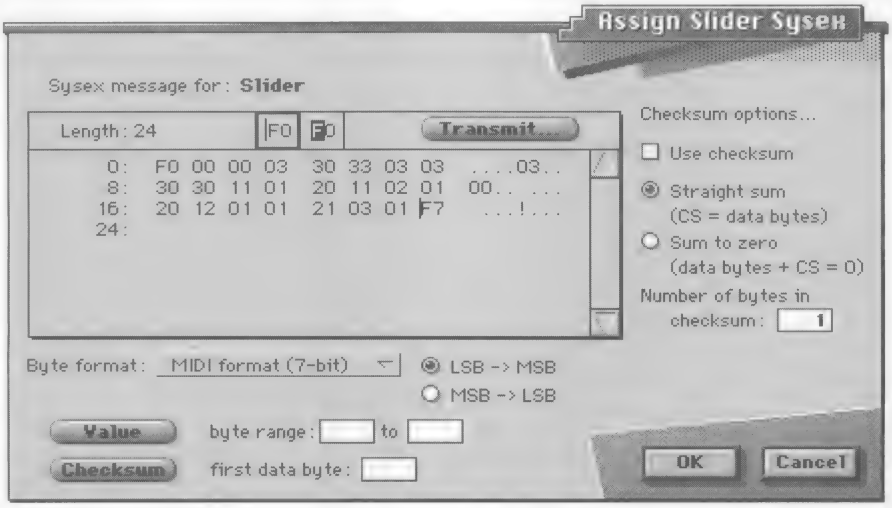
If the sysex message you'd like to control was recorded as a bulk dump into a device, be sure to assign the target to the device.

2. **Select it and choose Control Assignment from the console mini-menu.**

3. **Choose system exclusive from the Target data type pop-up menu.**

4. **Click the Sysex setup button.**

   The Assign Slider Sysex window appears.



If you want to type in the sysex message, type the message into the sysex editor. For more information about how to use this editor, see the System Exclusive chapter.

If you would like to enter a bulk dump request message, click Transmit. Performer's standard sysex editor window appears, into which you can type in the bulk dump message. See the System Exclusive chapter if you need more information.

Choosing the Variable Data Bytes

Once you have the sysex message you want in the sysex editor display, you can now select which data bytes are to be the variables that will be controlled by the slider.

To select the variable data bytes:

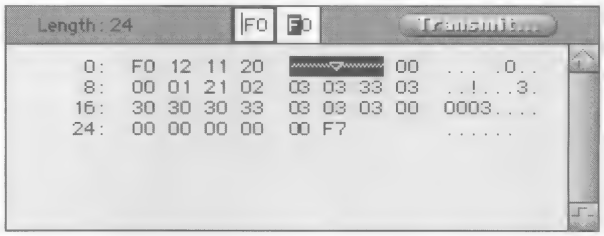
1. **Choose replacement mode for the edit cursor so that you can highlight the desired bytes.**

2. **Select the desired data bytes.**

   You can select up to four bytes.

3. **Once the bytes are selected, click the Value button.**

   Notice that the bytes now turn into a slider.



☛ Note: if the sysex message is a device bulk dump, several sliders can edit the same bulk dump message.

To see the values of the bytes being covered up by the slider, use the arrow keys to scroll the insertion cursor through the bytes. When it passes through the slider, the slider disappears for a few seconds.

Setting the Checksum

If the synth requires a checksum, Performer must generate the proper checksum as well, and it needs to know an initial value to do so.

To set the initial checksum value:

1. **Click the *Use Checksum* check box.**

2. **Select either the *Straight sum* or *Sum to zero* option.**

3. **Type in the number of bytes for the checksum value.**

4. **Identify the first data byte that is checksummed.**

   To do so, type in the byte number next to the Checksum button, or place the cursor at the first byte of checksummed data (normally the first byte immediately after the sysex header) and click the Checksum button.

Setting the Bit Formats

Select the appropriate bit format from the pop-up menu and select either LSB-->MSB or MSB-->LSB.

You are done! Click OK. The slider will now generate the sysex message. If the synth does not respond, verify the checksum values.

Monitoring a Sysex Slider During Playback

Sysex sliders cannot monitor the data they generate. This is due to the amount of data processing that would be required in real time.

Here is a work-around for this problem:

1. **Create two sliders.**
2. **Make one the master and the other a slave.**
3. **Make the Master slider generate an unused controller and assign its target to a track.**
4. **Make the slaved slider read that unused controller from the same track as its source.**
5. **Then make the slaved slider generate the sysex data.**

In this scenario, you move the master slider. It generates controller data at the same time that it is controlling the sysex slider, so that the sysex slider matches its movement. On playback, the sysex slider monitors the controller data and generates the sysex. Thus, the sysex data never gets recorded in the track; only the controller data does. But the controller data and sysex data match because the were slaved when originally recorded. The end result is that the sysex slider animates and plays back exactly as it was record.

Hints

Control items can serve many purposes. Some suggestions are discussed below.

Remapping Continuous Data

Control items can be used for remapping continuous controller data in real time. For example, you may have a synth module that responds to controller #10 (MIDI Pan), but you may not have any keyboards that can send this particular controller. A control item can solve this problem by remapping a controller that your keyboard *does* send into controller #10. To do so, assign the source of a control item to be a controller that your keyboard can transmit, such as controller #1 (mod wheel). Set the control item's target to be the Device or track that sends to the synth module. Set the target data type to controller #10. Now, when you send controller #1 data from your keyboard by moving the mod wheel, you will be controlling the Pan settings on your synth module.

Control Items also offer a way to reassign continuous data in real time instead of using the Reassign Continuous data command. For example, you may have a track of controller #3 continuous data that you wish to change to controller #7. You can set up the source of a control item to be the track containing controller #3. In turn, you can assign the target data type to be controller #7, and assign the control item to send the data to a different target track. When you press record, the control item will read in the controller #3's and generate controller #7's, which in turn will be recorded into the target track.

Improving Console Animation

Performer's first priority is to keep up with the flow of MIDI data. If it encounters a great deal of data, it selectively ignores its graphic display until the microprocessor load decreases. This may affect the animation of control items, and they may not move smoothly when lots of data is being played—especially if there are many control items on the screen. This is Performer's way of keeping up and does not necessarily mean that MIDI data is being transmitted inaccurately.

Performer gives the currently active window highest priority when animating control items. Therefore, whenever you want to watch control items while Performer is playing back, make sure their window is active. To activate the window, simply click anywhere on the window.

If the control items you want to watch are in different consoles, you may want to create another single console that contains all of the control items you wish to monitor during playback. You can then make it the active window, and all of the control items in it will animate as smoothly as possible. You will find that as long as the console is active, Performer does a pretty good job of animating control items accurately.

Another way to improve control item animation is to close as many consoles as possible.

Loading Control Items and Consoles From Another File

Consoles from one Performer file can be imported into any other Performer file using the Load command, found in the File menu. This means you can set up control items the way you like them, once, and they'll be available for importing into any of your files.

The Consoles that you create in a file are automatically saved as part of that file. The Load dialog box, however, enables you to extract them from an unopened file, then load them into the file in which you are working.

To load Consoles into an open file:

1. **Choose *Load* from the File menu.**

   The standard Macintosh Open dialog box appears.

2. **Click the file containing the assignments you wish to load, then click Open.**

   Alternately, you can double-click the file name. Performer's Load dialog box appears, displaying the file name at top.

3. **Choose the *Load Consoles* option.**

4. **Optional: If you wish to load any Chunks from the selected file, choose the *Load Chunks* option and either the *Data* or *Link* sub-option.**

   If you wish to load more than one Chunk, you can drag to select contiguous Chunks and shift-click to select discontiguous Chunks. Deselecting this option loads only the file's Control Items.

5. **Click OK to confirm your choice(s) or Cancel to withdraw the Load command.**

   Clicking OK causes the selected file's Consoles, as well as any selected Chunks, to be loaded into the open file. The imported consoles appear in the Windows menu.

Sending note-ons and note-offs with sliders, knobs, or buttons

When you program a button or slider to generate notes as shown below by the "Send" pop-up menu, you have three possibilities:

1. Send notes (both note-ons and note-offs)
2. Send note-ons only
3. Send note-offs only

For option 1, leave both check boxes unchecked. In this case, the slider, knob, or button will send a note-on when you click it, and it will send a note off when you either release it or move it to another note.

For options 2 and 3, click the appropriate check box. In this case, the slider, knob, or button sends only a note on or a note off when you click it or move it.

> ☛ Please note: note-ons and note-offs by themselves do not constitute an entire note. Therefore, they cannot be recorded into a track.

Creating a Mute Button

To create a mute button, create a button as described in the section "Creating a Button" on page 521. For the maximum value, click the "unmute button" as shown in Figure 31-1 on page 523.

Automating a Fader Group with a Master Control

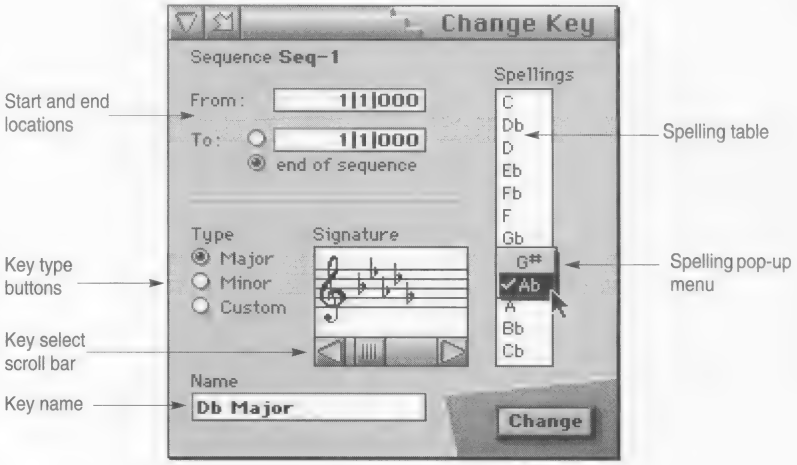
Master console controls can control their slaves while monitoring a target track. This means you can automate the movement of many slave controls at once by recording only the data of their master control. For example, you can automate a master fade-out at the end of a sequence by slaving multiple sliders (one for each track or device in your sequence) to a master slider and then recording the master slider. When you play back the result, the master slider monitors the data you recorded in its target track and simultaneously drives the volume sliders for all other tracks. To accomplish this, make sure that the master slider target assignment is a track (or a device which is assigned to a track).

☛ Remember that the master slider's track must be play-enabled for this to work. (It can't be muted.) As a result, you might consider assigning the master slider's track to a MIDI channel that you don't use. Also, since the target data type for the master slider doesn't matter (as long as it is some type of continuous controller), you might consider using a target data type for the master slider that is unlikely to affect anything else (like controller number 45).

Chapter 32 *Change Key*

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 allows you to specify key signatures in your sequences, making the display of notes in the Event Editing windows clear and musically accurate. Key signatures are also extremely important when viewing a sequence in music notation with Performer's QuickScribe notation window; setting the correct key signatures ensures that the music will be properly notated.

Quick Reference



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 appears as the key change event in the Event Editing windows. 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 pop-up menu that appears.

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 track Event Editing windows. They may be edited only in the Conductor track, either directly in the Conductor track Event Editing window or from the Tracks window. 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).

It is possible to put key changes in the Conductor track of a song, but they will have no effect on the spellings of notes in sequences contained in the song. Only key changes in the Conductor track of the sequence will affect notes within that sequence.

Performer's Key Signatures

Key signatures in Performer 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 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 QuickScribe notation window.

To set a key signature or add a key change:

1. **Specify which sequence the key change affects.**

   If a Tracks window is active, the key insertion will apply to that sequence. If the Chunks window is active, the key insertion will apply to the highlighted Chunk or, if no Chunk is highlighted, to the current play-enabled Chunk. If an Event Editing window is active, the key insertion will apply to whatever sequence it belongs to.

2. **Choose Change Key from the Change menu.**

   A dialog box will appear. Notice that the name of the sequence in which the key change will be placed is displayed at the top of the dialog box.

3. **Specify 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.

4. **Specify the type of key signature to be inserted.**

   Click the options for major, minor, or custom, as explained above.

5. **Use the Key Signature Scroll bar to select the key signature.**

   Use the scroll bar and arrows to choose the desired number of sharps or flats. The key name and spelling table are automatically updated as you scroll.

6. **Enter a name for the key change.**

   Optional: If you have chosen a Major or Minor type, the name is automatically set.

7. **Choose the note spellings for each non-diatonic note in the key.**

   Click on each note to select it and choose the desired spelling from the available ones displayed.

8. **Press the Change button to enter the change.**

   The Change button enters the key change and leaves the dialog box open so that you can insert more key changes.

You can repeat this procedure to enter as many key changes as you wish. When you are done entering changes:

9. **Click on the triangular Close box at the top left to close the dialog box.**

Viewing Key Changes

Key changes in a sequence can be viewed in two places: in the Event Editing windows for each track and in the Conductor track for that sequence. Key changes can be edited only in the Conductor track: they cannot be modified in the Event Editing windows for standard tracks. Key changes can be omitted from the editing windows by turning off their display with the View Filter.

Editing Key Changes in the Conductor Track

Key changes can be edited directly in either Event Editing window (Event List or Graphic Editing) for the Conductor track. This section discusses the editing of key changes in the Event List window. See the chapter *The Graphic Editing Window* for details on editing Conductor Track information graphically.

In the Event List for the Conductor Track, the location of a key change can be edited by altering its starting time. The key change itself may be modified by Option-clicking on it. The Change Key dialog box appears in which you can enter the modification. 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.

To edit a key change in the Event List window for the Conductor track:

1. **Double-click on the Conductor track in the Tracks window.**

   An Event Editing window will open. If the Graphic Editing window appears, go to the mini-menu on its title bar and choose Event List. The Event List window for the Conductor track will appear.

2. **Option-click on the key change event that you wish to change.**

   If necessary, use the scroll bar to locate the desired key change event. The Change Key dialog box appears.

3. **Change the key type, signature, name, and spelling as desired.**

   See the section above on entering key changes for information on these fields.

4. **Press OK to confirm your changes or Cancel to cancel them.**

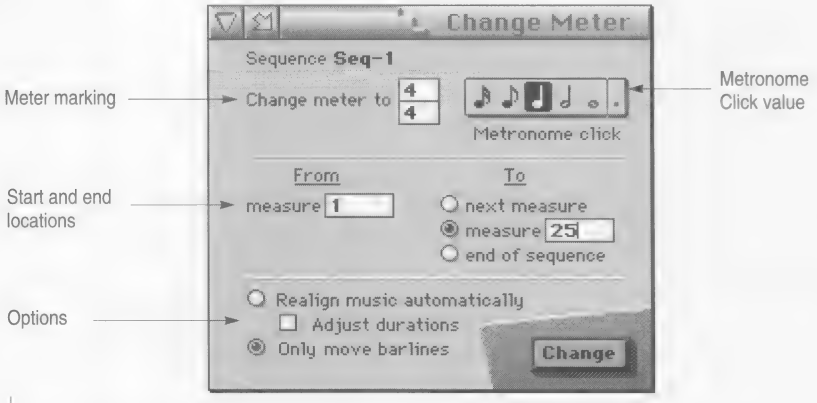
Using the Edit Commands with Key Changes

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 highlighting events in its Event Editing window or clicking on the Conductor track to highlight it and specifying a region in the Edit bar. 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 33 *Change Meter*

Meters specify the way musical time is counted and measured. In Performer, meters affect the way measure | beat | tick locations are displayed in the Counter, dialog boxes, and Event Editing windows. Meters also affect the Click and countoff. In addition, they impact the way information is displayed in Performer's QuickScribe notation window. The Change Meter command allows you to enter any number of meter changes in a sequence.

Quick Reference



Meter Marking: Displays the meter in standard musical format. Click on the numerator and/or denominator and type in new values to change it.

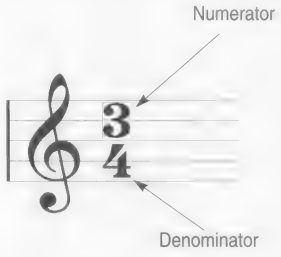
Start and End Locations: Displays the region over which the meter change takes effect. Click in the From box to set the starting location. Click in the To box to set the ending location. Click on the *end of sequence* button to extend the region to the end on the sequence.

Options: Click on the appropriate radio buttons and/or check box to select the desired 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 the duration between clicks and between counter updates. Click on the desired note value. Click on the dot for dotted durations (i.e. one and a half times the chosen note value).

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 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, 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 consists of a meter displayed in this way, along with a metronome click value. This value determines the spacing between the sounds and MIDI events produced by the Click feature. 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 metronome click value 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.

If a sequence or song 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 in the Event Editing windows for each track in the sequence. The meter changes for a given sequence or song can only be altered in its 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 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 starts a new bar 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.

Using the Change Meter Dialog Box

To enter a meter or meter change:

1. **Specify which Chunk (sequence or song) the meter insertion affects.**

   If a Tracks window is active, the meter insertion will apply to that sequence. If the Chunks window is active, the meter insertion will apply to the highlighted Chunk or, if no Chunk is highlighted, to the current play-enabled Chunk. If an Event Editing window is active, the meter insertion will apply to whatever sequence it belongs to.

2. **Choose Change Meter from the Changes menu.**

   The Change Meter dialog box will appear. The name of the Chunk in which the meter insertion will be placed is displayed at the top of the dialog box.

3. **Enter the numerator and denominator of the meter to be inserted in the boxes next to the words *Change meter to.***

   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.

4. **Choose the metronome click value.**

   Click on the note value you want the metronome to click on. If you want a dotted note value, click on the dot in addition to the note value.

5. **Enter the beginning measure of the region which the meter change should affect.**

   Click in the box under the word "From" and type in the beginning measure number. When you press the Change button the From value is automatically set to the previous To value.

6. **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 the meter changes, type in the new meter and press enter again as many times as necessary for the new meter. Keep going as long as necessary.

7. **If you are entering a meter change over a fairly long region, choose either one of the two remaining options; if necessary type in the end measure of the region.**

   There are two options here: you can either specify a particular measure or the end of the sequence (or song). Click on the button next to the option you want. If you choose the specific measure option, click in the text box next to the word *measure* and type in a measure number.

8. **Choose to realign music in the region and adjust durations if you wish.**

   To realign the music, choose the Realign music automatically option. If you wish to adjust the durations of notes in the region, click in the Adjust durations box. If you wish to leave the music unaltered, click in the Only move barlines button. A full explanation of these options is given below.

9. **Press the Change button to enter the change.**

   The Change button enters the meter insertion and leaves the dialog box open so that you can insert more meters.

10. **To close the Change Meter dialog box, click in its close box.**

The Metronome Click Value

The metronome click value you specify will be associated with the meter change you choose. You can specify a different metronome click value for each meter change. See the chapter *Click and Flash* for more on the Click feature.

The Measure Range

When you enter a range of measures, Performer 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.

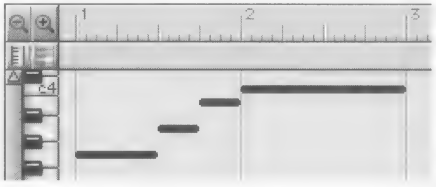
For example, assume a sequence is completely in 4/4. Entering a change to 3/4 from measure 8 to measure 12 will place a 3/4 meter change in measure 8, and a 4/4 meter change in measure 12. The result is that measures 8 through 11 are now in 3/4, and measure 12 remains in 4/4.

Realign Music Automatically

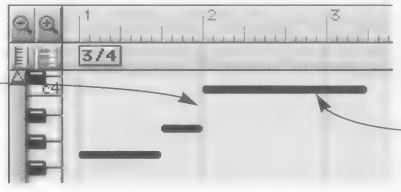
This option allows you to maintain the metrical structure of each measure by deleting some note events and changing the durations of others. There is a sub-option, Adjust durations, which is discussed below. The following assumes that the Adjust durations box is *not* checked. When you change the meter 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:



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:

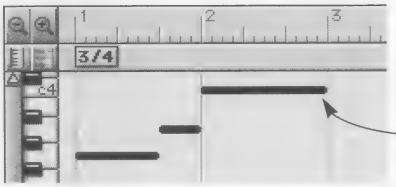


The B-natural that was on beat four is removed.

The whole note is not removed because it began before the fourth beat. Notice that it maintains its duration (four beats).

Adjust Durations

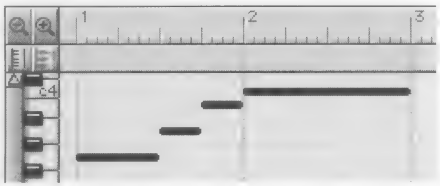
The Adjust durations sub-option can only be used when the Realign music automatically option is selected. The Adjust durations sub-option alters the durations of notes that begin before the removed or added beats. The durations are altered to conform to the new measure boundaries. In the example above, 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:



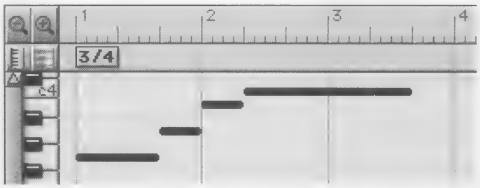
The duration of the four-beat whole note is truncated to fit the new 3/4 measure.

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:



Original music



Realigned using the *Only Move Barlines* option

Viewing Meters

The meters in a sequence can be viewed two places: in the Event Editing windows for each track and in the Conductor track for that sequence. Meters can be edited only in the Conductor track; they cannot be modified in the Event Editing windows for standard tracks.

The meters in a sequence will appear in the Event Editing windows for all tracks in that sequence. Meters can be omitted from the editing windows by turning off their display with the View Filter. Conversely, the entire meter map may be viewed alone by turning off the display of all other types of events.

Editing Meters in the Conductor Track

Meter changes can be edited directly in either Event Editing window (Event List or Graphic Editing) for the Conductor track. This section discusses the editing of meter changes in the Event List window. See the chapter *The Graphic Editing Window* for details on editing Conductor track information graphically.

To edit a meter change in the Conductor track Event List window:

1. **Double-click on the Meter Change event you wish to edit and enter the new values.**

   Use the Tab key to move from field to field. The location and meter marking fields are edited like standard event values. Editing the metronome beat value field calls up a small pop-up box with note symbols for the possible values. Click on the note corresponding to the value you desire.

2. **Press the Return key to confirm the changes, or Command-period to cancel them.**

   Clicking anywhere else on the screen will also cancel the edit.

Using the Edit 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. The region to edit in the Conductor track may be selected by highlighting events in its Event Editing window or clicking on the Conductor track to highlight it and specifying a region in the Edit bar. Meter information can be included in an edit operation involving note and other MIDI events by including the Conductor track along with the selected tracks.

Hints and Examples

Editing meter changes can be confusing. If you feel that your meter map has become too complicated, has errors that you can't easily detect, or has somehow become excessively complex, you can delete it and re-enter it correctly from the start.

To erase the current meter map:

1. **Activate the Tracks window for the sequence with the meter map you wish to erase.**

   Click in the window to activate it.

2. **Double-click on the word "Edit" in the Edit Bar.**

   This loads the start and end times of the entire sequence in the Edit Bar.

3. **Select the Conductor track by clicking on it.**

4. **Choose Edit Filter from the Edit menu.**

5. **Uncheck all check boxes except for meter changes.**

   Hold down the Option key and click on the meter change check box. Now the Edit commands will only affect meter changes.

6. **Choose Erase from the Edit menu.**

   This gets rid of all the meter changes for the sequence.

7. **Choose Edit Filter from the Edit menu.**

8. **Restore your previous Edit Filter setting.**

   You should always reset the Edit Filter after using it.

Be careful when pasting into the Conductor track: pasting *replaces* events of all types selected in the Edit Filter. This may be what you want. If, however, you are just rearranging meters and wish to leave the other data where it is, make sure to set the Edit Filter for meter changes only.

Here's a method for inserting a number of new bars with a different meter into your sequence.

1. **Shift over the sequence to make room for the new bars.**

   Enter the insertion point for the new bars in the Start time in the Edit Bar and double-click on the End time to set it to the end of the sequence. Then choose Shift from the Edit menu, and enter the number of bars you want in the current meter.

2. **Choose Change Meter from the Change menu.**

3. **Set the From and To locations for the meter change.**

   Enter the beginning location of the new bars in the From field. Add the number of bars being inserted to the beginning time. Enter this in the To field.

4. **Click on the Realign Music Automatically option.**

   Leave the Adjust durations box unchecked. This option adds or subtracts the necessary number of beats to ensure that new measures line up with the new meter.

5. **Click on the Change button.**

   This enters the meter change.

6. **Click on the close button to close the dialog box.**

Chapter 34 *Change Tempo*

Tempo is very flexible in Performer. Not only can there be several tempos in a Chunk (sequence or song) but they can change dynamically, resulting in accelerandos, ritards other programmed tempo effects.

In Performer, tempo is controlled by the Metronome panel in the Consolidated Controls panel. The metronome provides three possible settings for tempo control:

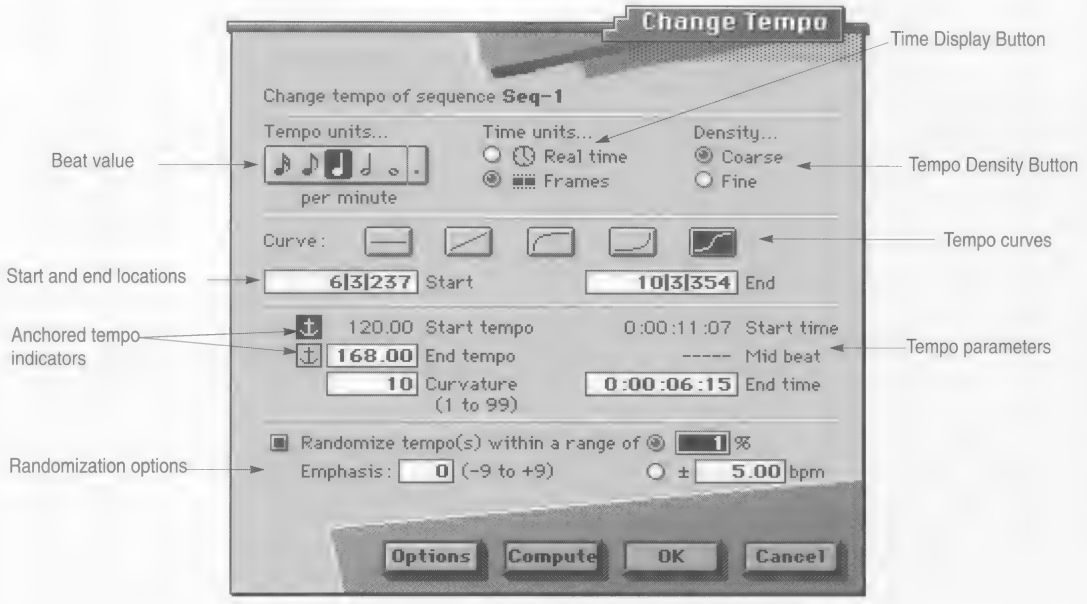
- The Tempo slider
- The Conductor track
- An external device, such as a mod wheel on a keyboard controller

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 Chunk under Conductor track tempo control.

Tempo maps can be programmed using the Change Tempo command as described in this chapter. Alternately, you can create a tempo map in real time by slaving Performer to Tap tempo synchronization. See the chapter called *Receive Sync* to learn more about creating tempo maps in real time using Tap tempo sync.

Quick Reference



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 region 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 when the Compute or OK buttons are pressed. Values that are incalculable or out of range will highlight and cause the Macintosh 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: Type a value 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.

The Compute Button: Click on this button to compute the values for parameters that are not user-definable.

The OK Button: Click on this button to enter the tempo change and close the dialog box.

The Cancel Button: Click on this button to cancel the tempo change and close the dialog box.

Basics

The Change Tempo command 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 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 region is erased and replaced by the new data generated by the command.

A *tempo map* is simply the complete set of programmed tempo changes for an entire sequence or song. These changes are displayed in the Conductor track.

☛ The tempo changes for a given Chunk can only be edited in its Conductor track.

To get a clear picture of the tempo map of a Chunk, you can use the View Filter to view only tempo changes in its Conductor track.

The tempo map specifies the relationship between real or frame time and measure time. Each tempo map consists of tempo changes occurring at measure time locations. Performer always maintains a correlation between real and measure times according to the tempo map. When you move to a measure time location, the corresponding real time is computed and vice versa. The same measure will always occur at the same real time location no matter where you start playing.

When you change the tempo map, the real times of all markers and events (viewed in Event Editing windows) are updated. The real time locations of locked markers do *not* change in this case. Rather, their measure times change.

Performer'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 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 will calculate the correct tempo to make the end of the region occur at the time you specify.

When you set the tempo control in the metronome to the Metronome 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.

The Change Tempo Command

The Change Tempo command 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.

To use the Change Tempo command:

1. **Choose the sequence or song in which you wish to insert a tempo change.**

   If a Tracks window is active, the tempo change will apply to that sequence. If the Chunks window is active, the tempo change will apply to the highlighted Chunk or, if no Chunk is highlighted, to the current play-enabled Chunk. If an Event Editing window is active, the tempo change will apply to whatever sequence it belongs to.

2. **Choose Change Tempo from the Change menu.**

   The Change Tempo dialog box appears. The name of the selected Chunk is displayed after the words "Change tempo of sequence (or song)" at the top of the dialog box.

3. **Choose the beat value of the tempo.**

   Click on the value to select it; click on the dot if you want a dotted value. For example, a tempo of dotted eighth = 90 would require you to click on the eighth note and the dot.

4. **Choose between displaying times in real or frame time.**

5. **Choose between coarse or fine tempo changes.**

   Click on the appropriate radio button.

6. **Choose the curve you want for the tempo change.**

   The curve type you select is highlighted.

7. **Enter the Start and End locations.**

   Type in the measure | beat | tick values for the start and end of the region for the tempo change.

8. **Press the Options button repeatedly until the desired combination of Start/End tempo/times have boxes around them.**

   There are several combinations of tempos and times that can be entered and computed. For each combination, the values you can set are enclosed by boxes.

9. **Enter all parameters enclosed in boxes.**

   Type in the desired values. To set a Start or Ending tempo to the current tempo, click on the anchor icon for the parameter.

10. **Press the Compute button to calculate the tempo and time values based upon the parameters you entered.**

    If the computed values are not satisfactory, enter new parameters and try again.

11. **Press OK to enter the tempo changes or Cancel to terminate the action without entering the changes.**

Tempo calculations may take some time after you press the Compute or OK button. To stop calculations in progress, press the Command and period keys at the same time.

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 (in the Metronome, in a pop-edited tempo event, 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). In addition to providing you with a high degree of resolution, this also allows you to easily enter tempos that match standard frame click metronome values.

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 box delineate the region in which the tempo change occurs. New tempo data will be inserted into this region according to your specifications.

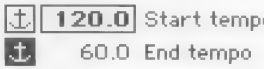
Using the Fine and Coarse Options

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, taking up memory and possibly slowing down the display of real and frame times in the Markers or Event Editing windows. 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 Chunk 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 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.

Regular Linear Curve

Flipped Linear Curve

To select a curve, click on the button containing the picture of the curve. 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, as shown to the left.

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 will compute (and that you cannot enter) are in plain type without the box.

After you enter the parameters for a curve, you must press the Compute button for the other parameters to be calculated. These calculations are not automatic: you must explicitly request them by pressing the Compute button. These calculations can take time; if you are certain about the values you have entered it is not necessary to use the Compute button. To abort a calculation in progress, press the Command and period keys at the same time.

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 one decimal place value if you wish, e.g. 89.7. 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:

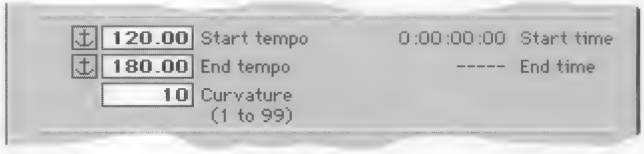
Start Tempo: This is the tempo at the Start location of the curve in beats per minute. If you anchor this value, it will be the same as the pre-existing tempo at the Start location.

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.

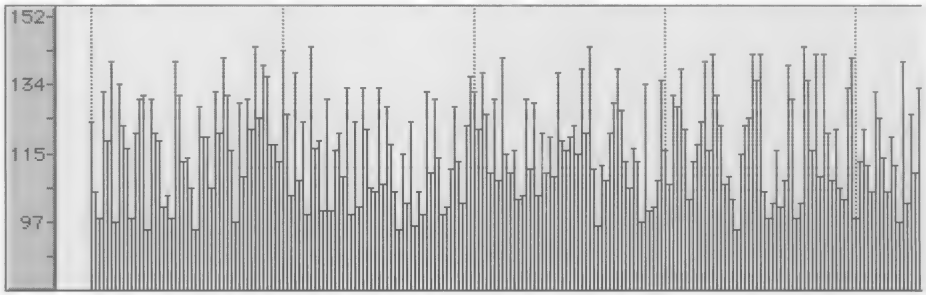
End time: This is the time at which the End location occurs.

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

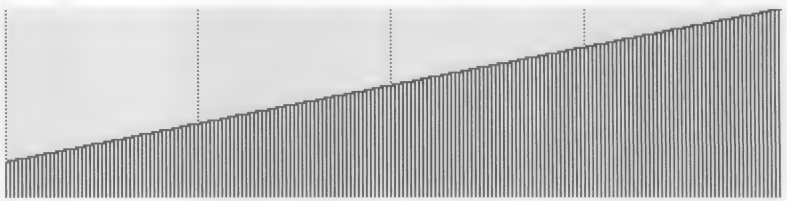
example, if you are inserting a constant tempo of 120 bpm *without randomization*, the result is a single tempo event at the beginning of the region as shown below:

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:

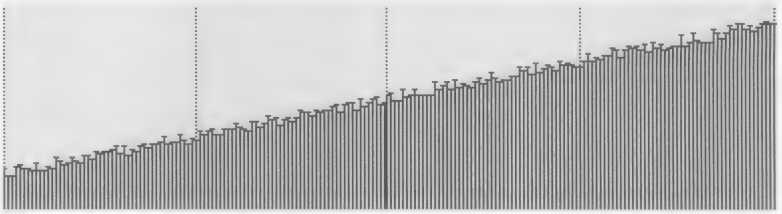


Randomization can be used in conjunction with any curve

Randomization option is a check box option, which means that it can be used in conjunction with any of the tempo curves:



A linear tempo curve with no randomization.



The same curve with randomization set to ±10 bpm.

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 such as are used in film and video work, you will probably not need to use the Options button.

The Compute Button

The Compute button calculates and displays computed parameters (those which you cannot enter yourself) based upon the parameters you enter. Traditionally, these calculations are done by the composer or arranger either with arithmetic or by using a reference book. Performer gives you a quick means to make these calculations with the Compute button. Since computed parameters are not updated automatically, you must use the Compute button to see their current values. The Compute button doesn't make any internal alterations to the tempo data; it is just a utility to let you see all the parameters.

The OK and Cancel Buttons

Pressing the OK button computes the tempo changes and enters them in the Conductor track. The computation may take a while. If you want to terminate the computation, press the Command and period keys together. Pressing the OK button automatically makes all the calculations for all the parameters.

Pressing the Cancel button terminates the Change Tempo command without entering any of the changes you made.

Viewing and Editing Tempo Changes

Tempo change data is stored in the Conductor track for the Chunk. Tempo changes look like continuous MIDI data (such as pitch bend or controller information) in the Conductor track Event Editing

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 either the Tracks window or the Event Editing windows for the Conductor track. You can apply all the commands on the Edit menu to tempo changes. Make sure that tempo changes are selected in the Edit Filter, available from the Edit menu.

Note that smooth tempo changes require a large number of discrete tempo changes very close together. Also note that Performer's internal resolution of tempo events is much higher than that displayed in the Event Editing windows. So, tempo events that seem identical actually represent different tempos with higher resolutions than can be shown.

To edit tempo changes using the Tracks window, set the Edit Bar times and select the Conductor track. To edit tempo changes in one of the Event Editing windows for the Conductor track, just highlight one or more tempo change events as you normally would in any other track's editing window. Make sure that tempo changes are selected in the View Filter. You can also insert single tempo changes by using the Insert button in the title bar. See the chapter *The Conductor Track* for more information.

Tempo Editing Resolution

Tempos can be manually edited to a resolution of a hundredth of a beat per minute. When you use the Compute button in the Change Tempo dialog box, tempos are calculated to a much higher degree of accuracy.

Chapter 35 The Conductor Track

The Conductor track is a special track containing markers, meter, tempo and key change information. Every sequence and song 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 has two available Event Editing windows: the Event List window and the Graphic Editing window. The examples in this chapter refer to the Conductor track's Event List window; see the chapter *The Graphic Editing Window* to learn about editing the Conductor track graphically.

Basics

The Conductor track automatically appears in the Tracks window for each sequence. The Conductor track cannot be deleted or renamed; it can be moved and given comments like a standard track. The Conductor track has a record-enable button for use with Tap tempo synchronization, described in the *Receive Sync* chapter. The Conductor track cannot be looped.

A song's Conductor track can be opened by choosing *Edit Conductor Track* from the Song window mini-menu.

The Conductor track contains four types of events: Tempo changes, Meter changes, Key changes, and Markers. These events are not MIDI data; instead, they control or conduct your music's performance during playback. The tempo, meter, and key events can be edited like standard MIDI events, either with the commands on the edit menu or directly in the Conductor track Event List or Graphic Editing window. Unlocked markers may be edited in the Conductor Track; locked markers may only be edited in the Markers window.

The following sections describe each type of event in some detail; for more information on the Change Key, Change Meter, and Change Tempo commands, or the Markers window, see the appropriate chapters.

Key Changes

1|1|000 C Major

Key change events display the name of the key. User-defined key signatures are displayed as 'Custom'. See the *Change Key* chapter for a full description of key signatures in Performer.

Also note that this section discusses the editing of key changes in the Conductor track Event List window. See the chapter *The Graphic Editing Window* for information on editing the Conductor track graphically.

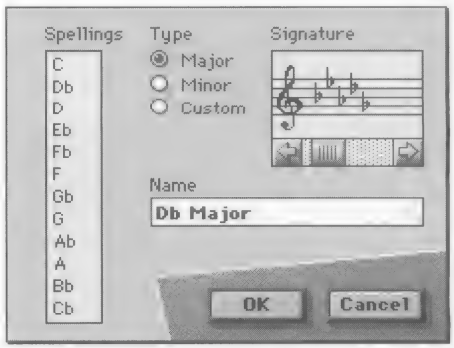
To insert a Key change event in the Conductor track Event List window:

1. **Press the Insert button in the Event List window title bar.**
2. **Select Key Change from the menu.**

   A new Key change event appears, with the location field highlighted for editing.

3. **Type in the measure, beat, and tick location and key for the event.**

   Use the Tab key to move from field to field. When you highlight the key field, the Change Key dialog box will appear. See the *Change Key* chapter for information on this dialog box. Click OK to confirm the key; the key you specify will be in effect until the next key change.



4. **Press the Return key to confirm your choice.**

   You can cancel the insertion by clicking anywhere else on the screen.

To edit a Key change event in the Conductor track Event List window:

1. **Option-click or double-click on the Key change event.**

   A pop-edit box will appear.

2. **Change the location or key information.**

   Use the Tab key to move from field to field. When you highlight the key field, the Change Key dialog box will appear. See the *Change Key* chapter for information on this dialog box. Click the OK button to confirm the key change; the key you specify will be in effect until the next key change.

3. **Press the Return key to confirm your edit.**

   You can cancel the edit by clicking anywhere else on the screen.

Meter Changes

4/4 click ♩

Meter change events display the time signature (the number of beats per bar, over the duration value which gets the beat) and the click value, (the duration value between metronome clicks). See the *Change Meter* chapter for more information about these values. Moving meter change events, or inserting them using the Insert button, can cause unexpected results: please read the section later in this chapter on *Meter Changes and Partial Measures* before attempting to move or insert a meter change.

This section discusses the editing of meter changes in the Conductor track Event List window. See the chapter *The Graphic Editing Window* for information on editing the Conductor track graphically.

To insert a Meter change event in the Conductor track Event List window:

1. **Press the Insert button in the Event List window title bar.**

2. **Select Meter Change from the menu.**

   A new Meter change event will appear, with the location field highlighted for editing.

3. **Type in the measure, beat, and tick location, meter, and metronome click value for the event.**

   Use the Tab key to move from field to field, and type in the correct values. Use the mouse to select your choice of click value.

4. **Press the Return key to confirm your choice.**

   You can cancel the edit by clicking anywhere else on the screen. Note that if you typed in a tick location other than 000, the meter change will show 000 after you press return. This is because a meter change always starts a new measure. See the section on Meter changes and partial measures later in this chapter.

To edit a Meter change event in the Conductor track Event List window:

1. **Option-click or double-click on the Meter change event.**

   The event will be highlighted.

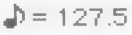
2. **Change the location or meter information.**

   Use the Tab key to move from field to field, and type in the correct values. Use the mouse to choose the click value from the pop up box.

3. **Press the Return key to confirm your edit.**

   You can cancel the insertion by clicking anywhere else on the screen. Note that if you typed in a tick location other than 000, the meter change will show 000 after you press return. This is because a meter change always starts a new measure. See the section on Meter changes and partial measures later in this chapter.

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 singly, 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 or pitchbend information. For more information on tempo events, see the *Change Tempo* chapter.

There are two ways to insert Tempo change invents in the Conductor Track: by directly inserting them, and by recording them while slaved to Tap tempo synchronization. The following procedures cover direct insertion and editing in the Conductor Track.

For information on recording a tempo map in real time, refer to the Tap tempo section in the chapter *Receive Sync*. Recording in Tap tempo creates normal tempo events which can be edited as described below.

Also see the chapter *The Graphic Editing Window* for information on editing tempo changes graphically.

To insert a Tempo change event in the Conductor track Event List window:

1. **Press the Insert button in the Event List window title bar.**
2. **Select Tempo Change from the menu.**

   A new Tempo change event will appear, with the location field highlighted for editing.

3. **Type in the measure, beat, and tick location and tempo for the event.**

   Use the Tab key to move from field to field, and type in the correct values. Use the mouse to select your choice of beat value.

4. **Press the Return key to confirm your choice.**

   You can cancel the insertion by clicking anywhere else on the screen.

To edit a Tempo change event in the Conductor track Event List window:

1. **Option-click or double-click on the Tempo change event.**

   The event will be highlighted.

2. **Change the location or tempo information.**

   Use the Tab key to move from field to field, and type in the correct values. Use the mouse to choose the beat value from the pop up box.

3. **Press the Return key to confirm your edit.**

   You can cancel the edit by clicking anywhere else on the screen.

Markers

Bridge

Markers are visible in all Event Editing windows, but they may only be edited in the Conductor track editing windows. Markers cannot be created directly in the Conductor track editing windows; use the Markers window to insert or record new markers. In addition, locked markers cannot be edited in the Conductor track. Unlocked markers can be edited in the Conductor track with the Edit Menu commands. For more information on pop-editing markers see *The Markers Window* chapter.

Editing in the Conductor Track

The Edit commands Cut, Copy, Paste, Erase, Repeat, Merge, Snip, Splice, and Shift 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.

To use the Edit commands on the Conductor track of a sequence:

1. **Highlight the Conductor track name in the Tracks window and set the Start and End times in the Edit bar for the correct region,**

   OR

2. **Open an Event Editing window (Event List or Graphic Editing) for the Conductor track and highlight the correct events.**

3. **Select the desired command from the Edit menu.**

To use the Edit commands on the Conductor track of a song:

1. **Open the Song window.**

   Do so by double-clicking the Song name in the Chunks window.

2. **Choose *Edit Conductor track* from the Song window mini-menu.**

   The Event Editing window for the song's Conductor track will appear.

3. **Highlight the events you wish to edit.**

4. **Select the desired command from the Edit window.**

The Edit menu commands affect events in the Conductor track in the same way as normal MIDI data. See the chapter *Edit Commands* 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 or song. 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 unexpected results. Read the section on *Meter Changes and Partial Measures* below before editing Meter change events.

Using the Edit and View Filters with the Conductor Track

To effectively edit events in the Conductor track it is important to understand how the Edit and View Filters affect the commands on the Edit menu. Please review the section *Setting the Edit Filter* in the chapter *Edit Commands* and the section *The View Filter* in the chapter *The Event List Window* before working extensively with the Conductor track. Both filters affect the Conductor track the same way as they do for regular tracks.

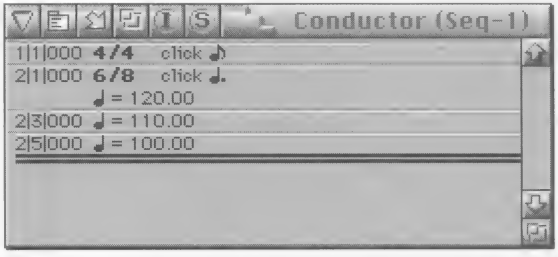
Here are some guidelines to remember when using the Edit and View Filters:

- The Edit Filter selects which types of events are edited from the Tracks window.
- The View Filter selects which types of events are viewed and edited in each Event Editing window.

- The Edit Filter does not affect editing in the event editing windows; all visible, highlighted events in an editing window are affected by the editing commands.

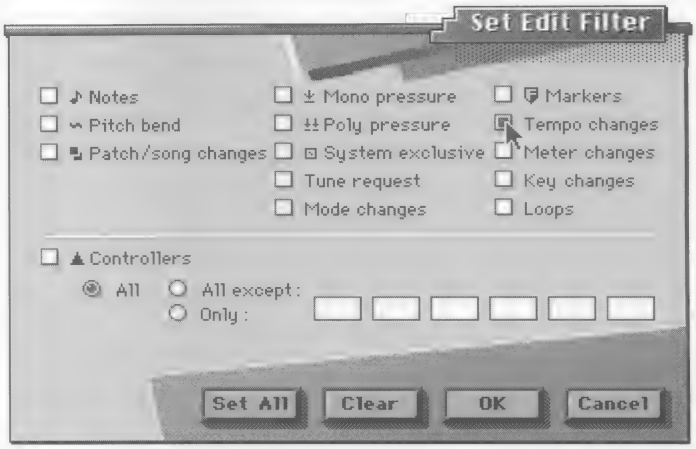
Both filters will affect all Edit commands used in the filters' respective windows. For example, pasting over existing events will erase only those types of events selected in the filters; other events are retained and merged with the pasted data.

The Edit and View Filters are important when editing the Conductor track because it is common to want to edit just one element, e.g. tempo changes, without affecting the other events in the track. For example, the tempo changes in measure two of this sequence can be moved to measure one using the Edit Filter and Tracks window.



1. **Select the Edit Filter from the Edit menu, or press command-F.**

   The Edit Filter dialog box appears.



2. **Option-click the check box for Tempo.**

   This is a easy way of deselecting everything but Tempo change events.

3. **Highlight the Conductor track in the Tracks window.**

4. **Set the Edit bar for the correct region.**

   In this case, the region starts at 2/1/000 and ends at 3/1/000.

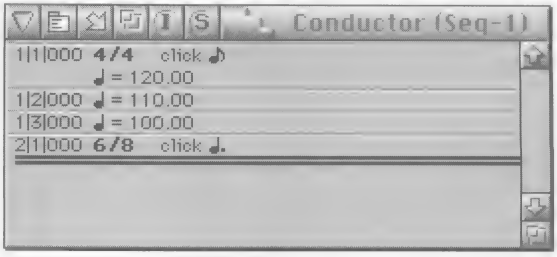
5. **Select Cut from the Edit menu.**

   The Tempo changes are removed; the Meter change is unaffected.

6. **Change the Edit bar start time to 1/1/000.**

7. **Select Paste from the Edit Menu.**

   The Tempo changes appear in the first measure; the Meter changes are unaffected.



8. Set the Edit Filter back to normal.

Select it from the Edit menu (or press command-F) and use the Set All button to check all the boxes.

If the Edit Filter had not been set during this example, the Meter change in the second measure would have been cut along with the Tempo changes, and the Meter change in the first measure would have been erased during the Paste command.

Meter Changes and Partial Measures

Performer lets you to place a Meter change event anywhere in a sequence or song. 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 the Insert button in the Event List title bar is used to place a meter at 3|1|240, when you press the Return key to confirm the insertion, 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 the Insert button is used to place 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.

While such partial measures are not always useful, 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.

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 or song becomes complex or confusing during editing, simply erase the meter changes and re-enter them from the start of the region.

Another way to avoid partial measures is to use the Change Meter command found in the Change menu. The Change Meter dialog box will never create partial measures.

Looping and the Conductor Track

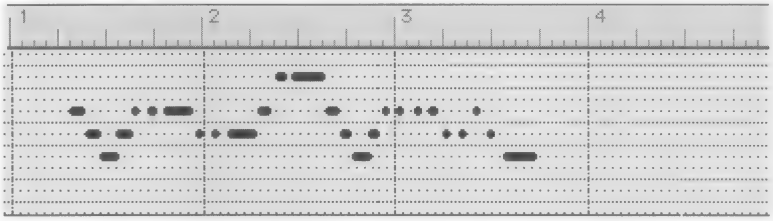
The Conductor track cannot be looped. If you need to repeat tempo or meter changes in a looped region, use the Repeat command from the Edit menu to make consecutive copies of the Conductor track over that region.

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 Metronome panel to the Metronome slider. Doing so temporarily disables tempo changes so that they don't complicate recording.

Chapter 36 *The Record Beats Command*

The Record Beats command, found in the Change menu, allows you to record music without listening to a metronome click and then afterwards realign Performer's internal beats and barlines with the music you recorded.

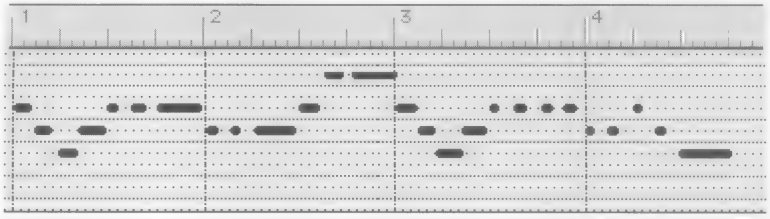
Here's a simple example. The Graphic Editing window below is the tune *Mary Had a Little Lamb* recorded without Performer's metronome click:



Mary Had a Little Lamb recorded in the Graphic Editing window without using the metronome click. Notice that the first note is not on beat 1 and that none of the downbeats in the music match the downbeats in the measure ruler above.

Notice that the music does not line up with the beats and barlines in the measure | beat | tick ruler. This prevents many useful editing tasks, such as quantizing and easy region selection.

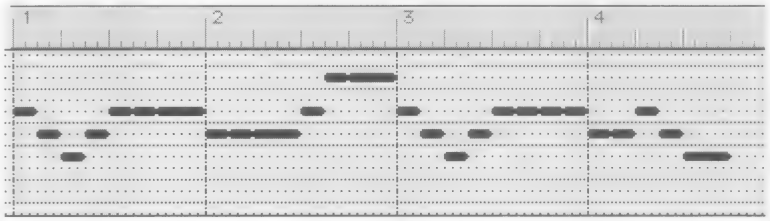
After using the Record Beats command, Performer's beats and barlines have been realigned to match the beats in Mary Had a Little Lamb:



Mary Had a Little Lamb after using the Record Beats command. Notice that the beats and barlines in the time ruler now match the downbeats in the music. Also note that the music plays back exactly the same way as the original recording (as long as the Tempo Control in the Metronome is set to the Conductor track).

It is important to note that Performer's beats have been realigned to the music, not the other way around. The music plays back in the same fashion as the original recording. When using Record Beats, you are in no jeopardy of losing the original feel of your performance. Performer accomplishes this by creating a tempo map at the same time as realigning the beats. Thus, Performer's beats speed up and slow down to match the original performance.

Once beats and barlines have been realigned, many useful editing commands can be employed that were not possible beforehand. For example, the above tune can now be successfully quantized for rhythmic accuracy and transcription:



After using Record Beats, music can be quantized, groove quantized, and edited.

Using Record Beats

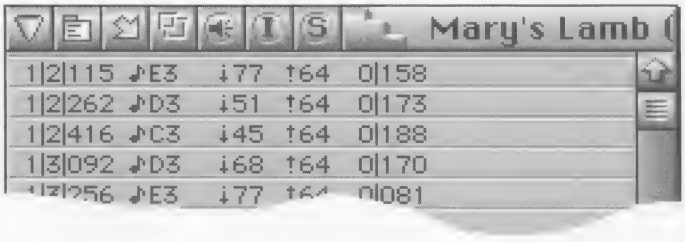
To use Record Beats:

1. **Record music into a track.**

   You can play as freely as you like. Pay no attention to Performer's Counter window. You can even turn off the Metronome click.

2. **Open the Event List window and make note of the time of the first event.**

   In the Mary Had a Little Lamb example above, the first note occurred at 1|2|115:

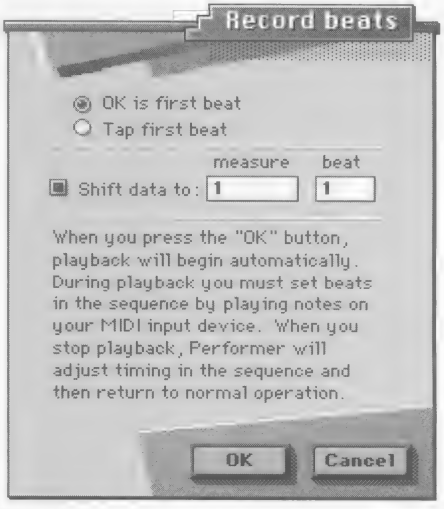


3. **Set the Main Counter to the same time as the first event.**

   In this example, we enter 1|2|115 into the main Counter.

4. **Choose Record Beats from the Change menu.**

   The Record Beats dialog box will appear.



5. **Use the OK is first beat option.**

   This option means that Performer will place the first downbeat right at the current counter location, which is 1|2|115, the location of the first note in this example.

6. **Check the Shift data to option and type in the measure and beat at which you want to place the first downbeat.**

   For example, if the first note of music should be at measure 1, beat 4, as a pickup note, type in measure 1, beat 4. Be sure that the location you choose here is NOT before the sequence start.

7. **Get ready to tap any note on your MIDI controller.**

   Get ready to tap along with the music you played.

8. **When you are ready, click OK and *begin tapping on the second beat.***

   With the *OK is first beat* option, Performer begins playback and taps the first beat for you at the starting location of the Counter. In this example, Performer places the first tap at 1|2|115. You should then begin tapping on the second beat. If you miss the second beat, stop, Undo, and try again.

9. **Keep tapping along with the beats in your music as accurately as you can.**

10. **When you reach the end of the piece, click Stop.**

    Performer may take moment to realign the beats and enter the newly generated tempo data in the Conductor track.

After Performer calculates the changes, the downbeat of your music will now be at the measure and beat that you indicated with the Shift data to option. In addition, the Counter will beat in 4/4 time on the downbeats that you tapped. To change the meter, refer to the section later in this chapter called *Handling Odd Meters*.

Listening to What You Have Done

To listen to the result of your tapping:

1. **Choose *Conductor track* from the tempo control pop-up menu in the Metronome panel.**

   Performer will now play back according to the new tempo map in the Conductor track.

2. **Press the Play button.**

   The music will sound the same, and the metronome and Counter windows will line up with the music as accurately as you tapped while Recording Beats.

Using a Countoff and the Tap First Beat Option

The Tap first beat option in the Record Beats dialog box allows you to tap the first beat when you recorded a countoff at the beginning of your original performance, or a visual cue on film or video at which to start tapping.

In this case, you have an aural or visual cue before the first tap that allows you can prepare to hit the first tap accurately.

To use the Tap first beat option:

1. **Set the counter to a position several seconds before the first tap.**

   This will give you enough time to prepare for the first tap. You can have as much preroll time as you like to get ready for the first beat.

2. **Choose Record Beats and select the Tap first beat option.**

3. **Click OK to begin Recording Beats.**

   Performer will begin playing back. Listen carefully to the countoff or music and get ready for your first tap. Performer will not begin recording beats until your first tap.

4. **Begin tapping on the downbeat where you would like to begin realigning beats.**

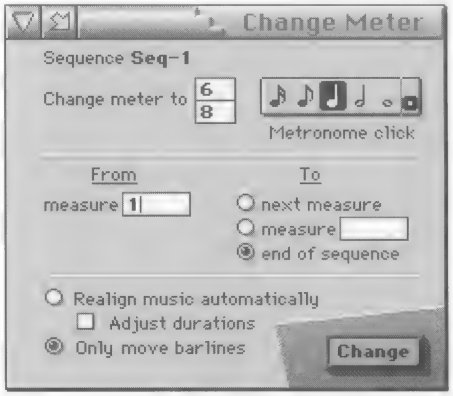
5. **If you are punching out, click Stop immediately after your last tap.**

   This prevents music after the punch-out time from being realigned inadvertently. Performer may take a moment to realign the beats.

Handling Odd Meters

The Record Beats command realigns your original Performer into a default meter of 4/4 time. However, if you would like the music to be expressed in an odd meter or in changing meters, you can do so by using the Change Meter command *after* using Record Beats.

For example, let's say that you would like to bar your music in 6/8 time. After using Record Beats, it will be in 4/4 time. To convert it to 6/8, open the Change Meter dialog box, type in 6/8 as the meter, set the beat value to a dotted quarter note, choose the measure range you wish to convert to 6/8, select the Only move barlines option, and click OK. This will re-bar the music in 6/8 time without changing the playback of the music. For more information, please refer to the *Change Meter* chapter.



Handling Pick Up Beats with the Shift Data To Option

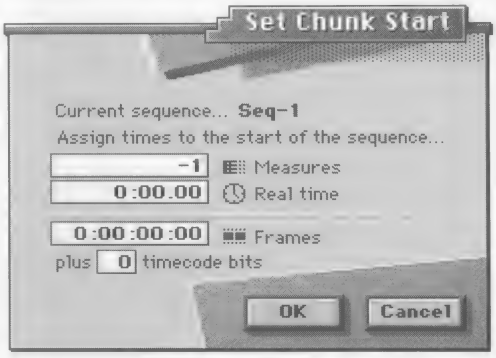
The *Shift data to* option allows you to determine the placement of the first downbeat of the re-recorded beats. *The most important thing to remember is this: do not choose a beat that occurs before the Chunk Start Time.* For example, let's say that your music has two pickup beats and that you would like the following downbeat to occur at 1|1|000. Before you use Record Beats, create a pickup measure from 0|1|000 to 1|1|000 to accommodate the two pickup beats at 0|3|000 and 0|4|000.

To create a pickup measure:

1. **Click the Start Time button in the main counter to open the Set Chunk Start dialog box.**

2. **Set the Measure Start Time to 0.**

   If you need two measures of pickup, set the Measure start time to -1.



3. **Click OK.**

Now, when you press Rewind back to the beginning of the sequence, the Counter window will read 0|1|000.

Once you have set up measure 0, you can set the Shift data to option in the Record Beats dialog box to measure 0, beat 3 to accommodate the two pickup beats in your music, and the first downbeat will occur at 1|1|000.

Recording Beats While Slaved To Tape

Record Beats may also be used while Performer is slaved SMPTE time code via Direct Time Lock or MIDI Time Code. This allows you to freely record music while slaving Performer to film or video without being concerned with Performer's metronome. After recording, you can then line up the beats and barlines afterwards with Record Beats.

Here are a several important preparations you will need to make to Record Beats while slaved to tape:

- *Establish lockup to tape using Direct Time Lock or MIDI Time Code* and a SMPTE-to-MIDI converter such as Mark of the Unicorn's MIDI Time Piece™ or Video Time Piece™. For more information, consult the chapters called *Receive Sync, Performer and MIDI Time Piece*, and *Performer and Video Time Piece*.

- *Either before or after you record your music, make sure the first downbeat of the music occurs at the very beginning of the sequence and set the SMPTE Chunk Start Time at so the music starts at the desired SMPTE frame*. You can either record the music this way, or shift the music after recording. This makes it easy to play the first beat accurately when you Record Beats.

- *Set up a countoff before the sequence start using Performer's click so that you can easily record the first downbeat*. To do so, enable Performer's click and select *Only during Countoff* in the Click & Countoff Options dialog box. To set the number of measures for the countoff, double-click the Countoff button in the Consolidated Controls panel.

Once you have made the above preparations, you are ready to record beats while slaved to tape:

1. **Set Performer in Slave to external sync mode.**

2. **Rewind the tape to several seconds before the Chunk start time.**

3. **Choose Record Beats from the Change menu.**

   The Record Beats dialog box will appear.

4. **Select the Tap first beat option, but don't click OK yet.**

   This option means that you will tap the first downbeat (in addition to all subsequent beats).

5. **While the Record Beats dialog box is still open, get ready to tap any note on your MIDI controller.**

6. **When you are ready, roll tape and immediately click OK.**

   Right after the Record Beats dialog box disappears, Performer's play button should turn black, indicating that it is slaved to tape. The Counter will be counting down negative measures before the sequence start time.

7. **Listen for Performer's countoff and *begin tapping on the first downbeat of the sequence.***

8. **Keep tapping along with the beats in your music as accurately as you can.**

9. **When you reach the end of the piece, click Performer's Stop button.**

   Performer may take moment to realign the beats and enter the newly generated tempo data in the Conductor track.

Before you listen to the results, be sure that Tempo control in the Metronome is set to the Conductor track so that the sequence will play back with the tempo changes generated by the Record Beats command.

Chapter 37 *Receive Sync*

The Receive Sync dialog box, found in the Basics menu, allows you to 'slave' Performer to a wide variety of 'master' timing sources. Performer 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 an FSK or SMPTE to MIDI converter such as Mark of the Unicorn's MIDI Time Piece (MTP), Performer can synchronize (or '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. For more information about synchronizing Performer with the MTP, see the chapter called *Performer and the MIDI Time Piece*. Performer also has a unique Tap tempo feature for synchronizing to prerecorded music, conducting a sequence as it plays back, or simply recording a tempo map in real time. For a technical description of Performer's sync formats, see *Appendix A: Synchronization Specifications*.

Basics

Performer supports all standard modes of synchronization: standard MIDI beat clocks, Indirect Time Lock, Direct time lock/MIDI Time Code for SMPTE time code sync, and Tap tempo. These modes are selected in the Receive Sync dialog box. When Standard beat clocks, Indirect time lock, or Tap tempo is selected, other parameters appear in the Receive Sync dialog box and must be set correctly; the Direct time lock/MIDI Time code mode has no other parameters. The mode you use depends on the equipment to which you are synchronizing; the following section describes the common forms of synchronization and the corresponding modes in Performer.

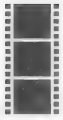
Basic Types of Sync

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. To sync Performer to devices using these MIDI messages, use the Standard Beat clock mode in the Receive Sync dialog box.

FSK is an audio signal which can be recorded on audio tape. Like MIDI clock signals, it provides metrical timing information based upon a certain frequency of oscillations per beat. FSK does not include any positioning information; when using it, playback must always begin from the beginning of the signal. If you are using Performer with an FSK converter, you must rewind the sequence and the tape each time to sync correctly. Performer does not read FSK directly, a special device is needed to read the code and convert it to MIDI clock signals. To sync Performer to FSK converters, use the standard beat clocks mode in the Receive Sync dialog box.



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 tempi. Performer'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 Standard beat clock, Indirect time lock, or Direct time lock/MIDI Time Code modes. Direct Time Lock/MIDI Time Code is the easiest and most accurate mode. Indirect Time Lock, Direct Time Lock, and MIDI Time Code allow the use of Performer's tempo maps, and are far superior to the Standard beat clocks mode.

Tap Tempo is Performer's real-time tempo control facility. This form of synchronization slaves Performer to a 'tap' entered from your MIDI controller. Performer 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 is slaved to

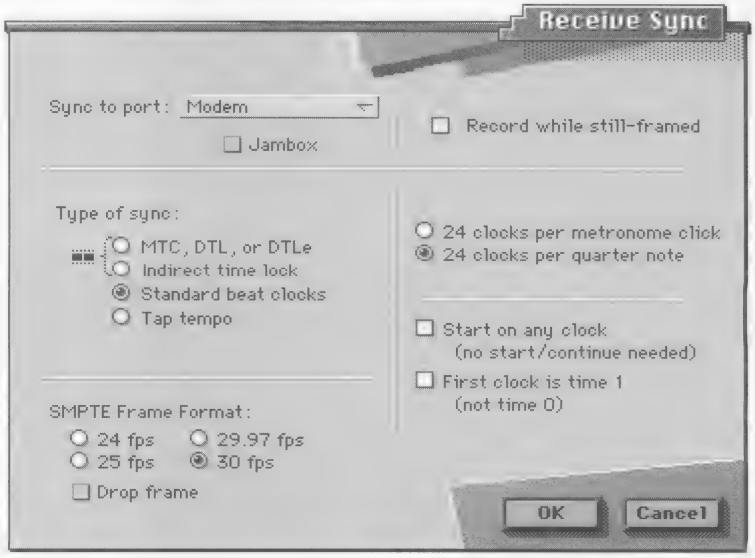
Tap tempo. Tap tempo supports both recording and playback, so your tap can conduct or be recorded into any sequence, empty or finished. When you record in Tap tempo, each tap becomes a tempo event in the Conductor Track. Even if you have a minimum MIDI setup, you have everything you need to use Tap tempo synchronization.

The following sections describe Performer's sync modes.

Standard Beat Clocks

This is the standard form of synchronization between two MIDI devices. When the Standard beat clocks option is selected, Performer can sync to a master device that is generating MIDI clock signals. If you want to slave Performer using a drum machine, external sequencer, FSK converter, 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 Standard beat clocks mode, Performer's tempo will match that of the master device; Performer's tempo features are disabled.

When you select the Standard beat clocks option, the Receive Sync dialog box looks like this:



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 provides several options for maximum synchronization compatibility with your master device:

24 clocks per metronome click/24 clocks per quarter note: Some manufacturers have begun to 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 new 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 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 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 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 seems slightly behind the master device, try checking this option.

Default 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 Standard Beat Clocks Mode

To put Performer into Standard beat clocks mode:

1. **Select Receive Sync from the Basics menu.**
2. **Choose the port receiving the sync information.**

   Choose the port from the pop-up menu provided.
3. **Click on the Standard Beat clocks button.**
4. **Choose between 24 clocks per metronome click or per quarter note.**
5. **Select the timing options you want by checking their check boxes.**

   Selecting the *Start on any clock* will cause Performer to automatically start upon receipt of any clock signals. Selecting the *First clock is time 1* option will interpret the Start signal as the first timing clock.
6. **Press OK to confirm your choice or Cancel to cancel it.**

To slave Performer to an external source transmitting MIDI beat clocks:

1. **select Slave to External Sync from the Basics menu.**

   This puts Performer 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 is waiting for sync information to start.
3. **To start Performer, start the external device.**

   When Performer is locked and playing, the Play button will turn to solid black. Once locked, Performer 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 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 Basics menu.

Indirect Time Lock

Indirect time lock allows Performer to lock to time code (such as SMPTE) using standard MIDI clock signals. This requires a specific method of setting your SMPTE to MIDI converter. Indirect time lock works as follows: First, a steady tempo (60 BPM) and a starting SMPTE frame are set in the SMPTE to MIDI converter. The converter reads the time code and generates MIDI clock signals at the specified tempo. Performer reads these clock signals and computes SMPTE frame locations based upon the constant MIDI beat clocks it receives: the original SMPTE frame times are regenerated by Performer.

To use Indirect time lock, you must set the converter to a constant tempo of 60 beats per minute and pick a starting frame that is before the point at which you want playback to start. The starting frame for the converter should be at least 10 seconds before the start of the sequence and no more than 45 minutes before the end of the sequence, the exact time is not important.

The starting frame time must be entered into Performer. It is important to set exactly the same frame time in Performer and your converter, as all subsequent frame times are computed from this starting time. For best results, use a round number to start from such as 1:28:00:00. This will reduce the chances of rounding errors in the converter. Once locked up, Performer follows the tempo map you've programmed for the sequence. Also upon lockup, if Click is enabled, Performer will click in the meter specified at 1|1|000 or will default to 4/4.

Due to the limitations of the MIDI song position message, Performer can only locate over a 45 minute range in this mode. If you try to work on a longer piece, Performer will not be able to lock to it after 45 minutes.

To put Performer into Indirect time lock:

1. **Set the starting frame number on your converter.**

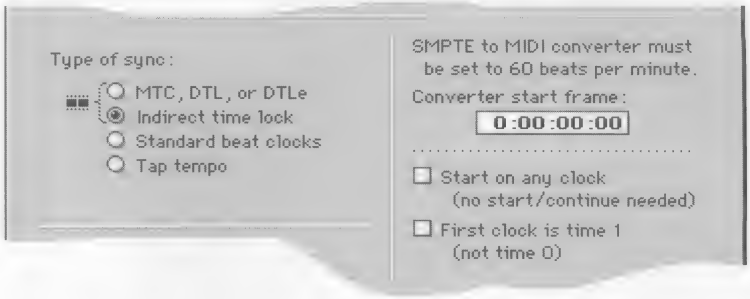
   Make sure that this time is at least 10 seconds before the start of the sequence and not more than 45 minutes before the end of the sequence.

2. **Choose Receive Sync from the Basics menu.**

   A dialog box appears.

3. **Choose the port receiving the sync information.**

4. **Click on the button next to "Indirect time lock".**



5. **Set the converter start frame time.**

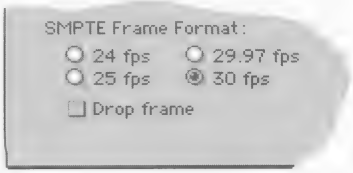
   This must match the frame number you set in the converter.

6. **Set the timing options if necessary by checking their check boxes.**

   If your converter outputs non-standard timing information, you may need to check the *Start on any clock* and/or *First clock is time 1* options. See the *Standard beat clocks* section above for an explanation of these.

7. **Press OK to confirm your choices or Cancel to cancel them.**

8. **Set the SMPTE frame format.**



   All standard SMPTE frame rates are provided, including 29.97 Drop and 29.97 non-drop. The Drop frame check box is available only when the 29.97 frame rate option is selected.

9. Set the start time for the counter, if necessary.

Click the Start Time button in the counter and enter the start time in the dialog box provided.

The counter start time is different from the starting frame number you entered in the converter and the Receive sync dialog box: it is the time that Performer will display as the starting time when the sequence begins. The time you enter should be later than the one you set on your conversion unit or external device (a few seconds, at least): Performer will take this amount of time to "chase" the correct frame number to lock with it.

10. Select External Sync from the Basics menu.

This puts Performer into slave mode, waiting for sync information from an external device.

11. Click on the Play or Record button in the main transport controls.

The Play button will turn grey, meaning that Performer is waiting for sync information to start.

12. To start Performer, start the external device.

When Performer is locked and playing, the Play button will turn to solid black. Once locked, Performer will follow, start, stop and rewind under control of the master. Also upon lockup, if Click is enabled, Performer will click in the meter specified at 1|1|000 or will default to 4/4.

13. To terminate the lock up with the master, click on the Stop button.

Clicking on the Stop button will both stop Performer 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 Basics menu.

Don't confuse the counter's start time with the converter starting time. The converter starting time is an arbitrary number that is necessary for Performer to calculate frame numbers from the MIDI clock signals it receives. The sequence starting time, set with the Start Time button in the Counter, is the time at which the sequence will actually begin playing.

Slaving to SMPTE with MTC, DTL, or DTLe

Use this mode when you are slaving Performer to SMPTE time code via a converter that supports one of these formats. The SMPTE time code is fed from a master source such as a audio tape recorder, video tape recorder, or SMPTE generator into a SMPTE-to-MIDI converter such as a MIDI Time Piece II, which translates the SMPTE into MIDI timing information. This MIDI timing information can be produced in one three popular formats: Direct time lock (DTL), Direct time lock enhanced (DTLe), and MIDI time code (MTC). There are only slight differences between these three MIDI timing formats. For the most part, they produce identical results. The differences are discussed later in this chapter.

MTC/DTL/DTLe sync mode is the simplest and most direct way to slave Performer to an external source generating SMPTE time code. Performer is able to lock to the frame times of the master, insuring precise synchronization between devices. To use this mode, you must have a SMPTE to MIDI converter that supports at least one of these three sync formats, such as a MIDI Time Piece or MIDI Express SMPTE/MIDI interfaces from Mark of the Unicorn.

There are no special options to select in the Receive Sync dialog box: when in MTC/DTL/DTLe mode, Performer simply responds to timing data directly.

Once Performer is locked to the master, there is no need to use Performer's main transport controls unless you wish to record. Performer will start, stop and locate under control of the master. Also upon lockup, if Click is enabled, Performer will click in the meter specified at 1|1|000 or will default to 4/4.

You can put Performer into play or record either before or after you start rolling tape. In either case, Performer will lock up quickly.

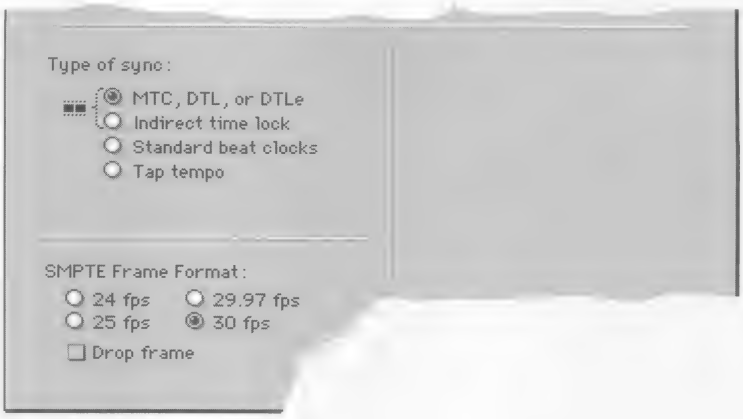
To put Performer into MTC/DTL/DTLe lock up:

1. **Choose Receive Sync from the Basics menu.**

   A dialog box will appear.

2. **Specify the port to receive sync information.**

3. **Choose the MTC/DTL/DTLe option as the "Type of sync" by clicking its button.**



4. **Set the SMPTE frame format.**

   All standard SMPTE frame rates are provided, including 29.97 Drop and 29.97 non-drop. The Drop frame check box is available only when the 29.97 frame rate option is selected.

5. **Click OK to confirm the Receive Sync settings.**

6. **Set the sequence starting frame.**

   Click the Start Time button in the Main Counter.

7. **Select Slave to External Sync from the Basics menu.**

   This puts Performer into slave mode, waiting for sync information from an external device.

8. **Click on the Play or Record button in the main transport controls.**

   The Play button will begin to blink, meaning that Performer is waiting for sync information to start.

9. **To start Performer, start the external device.**

   When Performer is locked and playing, the Play button will turn to solid black. Once locked, Performer will follow, start, stop and rewind under control of the master. Also upon lockup, if Click is enabled, Performer will click in the meter specified at 1|1|000 or will default to 4/4.

10. To terminate the lock up with the master, click on the Stop button.

Clicking on the Stop button will both stop Performer 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 Basics menu.

Comparing MTC and DTLe

Like Direct Time Lock enhanced, MIDI Time Code is a simple and direct way to slave Performer to an external source reading SMPTE time code. In fact, the only difference between MIDI Time Code and Direct Time Lock enhanced is that *MIDI Time Code uses two bytes for each quarter-frame message, where DTLe uses only one.* Performer supports MIDI Time Code because it was added to the MIDI specification. However, Performer, along with most SMPTE-to-MIDI converters, provides Direct Time Lock as a more efficient alternative.

Which mode should you use? We recommend Direct Time Lock enhanced because of its higher efficiency. If your converter does not support Direct Time Lock enhanced, then you will need to use MIDI Time Code.

The procedure for using MIDI Time Code is exactly the same as the procedure for Direct Time Lock enhanced. See the previous section in this chapter for detailed information.

Comparing DTL and DTLe

Direct time lock (DTL), when it was first introduced, had only one frame-advance message per SMPTE frame. A year or so later, Direct time lock enhanced (DTLe) was developed. It consists of four quarter-frame advance messages per frame, as well as a full-frame message once per second; these enhancements produce the highest degree of SMPTE sync accuracy currently available with MIDI.

MTC and DTLe both have a higher timing resolution than DTL. If your converter supports DTL instead of DTLe, you may want to use MTC instead in order to take advantage of its timing higher resolution.

Tap Tempo

Tap tempo is Performer's real-time tempo control feature. Tap tempo lets you slave Performer 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 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, and three more Performer 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.

Using Tap Tempo Mode

The following are general points to consider when preparing to use Tap tempo sync.

Establish a meter. When slaving to Tap tempo, Performer 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(s) using the Change Meter command in the Change menu.

Establish a metronome click value. Your taps correspond to the current metronome click value, specified using the Change Meter command from the Change menu. 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. However, tempo events in very small increments will fill up your Conductor Track — and your supply of RAM — fairly quickly. Choose a click value that will give your tempo map high enough resolution but not generate too much data to be recorded at one time.

Choose a tap source. You can use any standard MIDI event as your tap source. Performer 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 Modem 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 Modem 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, 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 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.

To use Tap tempo:

1. **Ensure that you've established the correct meter(s) and metronome click value(s) for the sequence.**

   Use the Change Meter command in the Change menu. See the chapter *Change Meter* for more information on establishing meters.

2. **Choose Receive Sync from the Basics menu.**

   The Receive Sync dialog box appears.

3. **Select the port that will receive the tap.**

4. **Click on the radio button next to "Tap tempo".**

   The right side of the box displays the Tap tempo parameters *MIDI beat input data* and *Sync countoff beats.*

5. **Choose the MIDI device you will be tapping from in the pop-up menu provided.**

6. **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.

7. **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 Macintosh will beep (or the menu bar will flash) 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.

8. **Click OK to confirm your choices or Cancel to cancel them.**

9. **Choose Slave to External Sync from the Basics menu.**

   This puts Performer in slave mode; it is now waiting for sync information from an external source.

10. **If you wish to record the tap into your sequence, record-enable the Conductor Track.**

    Activate the Tracks window by clicking once on it, then click on the Conductor Track's Record-Enable button. 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.

11. **If you wish to record music into your sequence, record-enable the desired track(s).**

    If you wish to record the tapped tempo and music simultaneously, or record music onto more than one track, choose Multi-Record from the Tracks window mini-menu. Specify the record device for each track that is record-enabled. The Conductor Track will record from the device specified in the Receive Sync dialog box.

12. **Press the Play or Record button in the main transport controls.**

    The Play button will flash, meaning that Performer 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.

13. **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 dialog box.

14. **Begin 'tapping' the MIDI event that you designated in the Receive Sync dialog box.**

    Performer will listen for the specified number of countoff beats to predetermine the tempo for the beginning of playback or recording. When Performer has received the countoff, playback or recording will begin.

15. **Tap the desired tempo and tempo changes.**

    Make your tap as expressive and dynamic as you wish; Performer will follow. The Counter display will update as you tap.

16. **To end recording or playback, press the Stop button in the main transport controls.**

    Don't be alarmed if the Macintosh wristwatch icon remains onscreen for an extended period of time after you stop recording. Performer is calculating precise tempo changes from the taps you just recorded.

17. **Take Performer out of slave mode by choosing Slave to External Sync from the Basics menu.**

18. **If 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(s) 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 Event Editing windows.

Tapping to Prerecorded Music on Tape

You can use Tap Tempo to record a tempo map while Performer 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 the chapter called *Tap Tempo While Slaved to Tape.*

Hints for Using 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 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 dialog box 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 the temporal details of a sequence. When you tap, you simply send a MIDI event and Performer does the rest. This means you can use any MIDI sequencer to load its own tempo map into Performer — just program the sequencer to play a song's worth of quarter notes while Performer is slaved to Tap tempo sync.

Yet another way of sending Performer 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 miced rim shot, etc.) can be fed into such a device and converted into MIDI events from which Performer can generate a tempo map.

Punching In a tempo. Auto-Record 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 Consolidated Controls 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 to Tap tempo disables the sequence's existing tempo map. So when you start playback in Auto-Record mode, even though Performer 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.

Record While Still-framed

The Receive Sync dialog box has an option called *Record while still-framed*. Without this option checked, Performer drops out of record as soon as you stop the tape after a record pass while slaved to tape; Performer will not record again until you press the Record button. This prevents unintentional recording while cueing and accidental loss of Undo Record. When this option is checked, Performer 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 using VITC and the Video Time Piece, which provides accurate frame-advancing. Unless you are recording while frame-advancing, we recommend that you leave this option unchecked.

Multi-track Audio Recording

Let's look at an example which illustrates a number of techniques you may find useful in the recording studio.

You are recording a five minute song in the studio. You've preproduced the drum and synthesizer track with Performer. Now you want to record guitar and vocal tracks using live players. You plan to use a synchronization code conversion box (a converter) to translate audio synchronization code recorded on tape into MIDI timing data. Let's start by assuming you are using a SMPTE/MIDI converter, then discuss what you will have to do differently if you are using an FSK conversion box.

Synchronizing with SMPTE

The first thing you should do when you get to the studio is to "stripe" (i.e. record) one track of your multi-track tape with an audio sync signal. For this example, let's assume you are using SMPTE time code. Start striping the tape at time 0:59:00:00. *We recommend that you use 30 frames per second, non-drop-frame code*, unless you have a specific reason to use one of the other frame rates. Continue for at least 7 minutes; you should always have at least a minute of time code on the tape prior to the start of your song, and you should record plenty of extra time code at the end in case you decide to lengthen the song at some point. Many people stripe the whole reel straight out of the box with one continuous time code track. Striping may take some time; get it started first thing upon arriving at the studio, so that it will be finished by the time you get everything else set up for recording.

Now, set up Performer to play in sync with the multi-track. Feed the time code from the tape into your SMPTE to MIDI converter. Connect the converter to the Macintosh; some converters connect directly, others have a MIDI Out which must go to the MIDI In of an interface connected to the Macintosh. If you have a MIDI Time Piece (II) or MIDI Express, no additional connections are necessary beyond the normal one to the modem (or printer) port.

If your converter supports Direct time lock, Direct time lock enhanced, or MIDI Time Code, set the appropriate mode on the converter (to lock to SMPTE). Select *Receive Sync...* from the Basics menu. Choose the correct port (*Sync to port:*) and *MTC, DTL, or DTLe* (*Type of sync:*). OK the dialog box.

Otherwise, you should use Indirect time lock. Set the converter to generate a constant tempo of 60 beats per minute, and have it start at 0:59:00:00. Select *Receive Sync...* from the Basics menu. Choose the correct port (*Sync to port:*) and *Indirect time lock* (*Type of sync:*). For *Converter start frame:* enter 0:59:00:00 (the same time that you set the converter to). You won't need to check either of the other options unless your converter is non-standard. See the *Synchronization* section for more information on these options.

Let's start the song at time 1:00:00:00 on the tape (this is a minute after the start of the time code). Click the Start Time button in the Counter. Enter 1:00:00:00 + 0 time code bits for the frame time. Set the other values as you wish. OK the dialog box.

Set the frame rate correctly in Performer in the Receive Sync dialog box. Choose the correct frame rate; use 30 frames per second unless you have a specific reason to use another format.

Check the *Slave to External Sync* entry in the Basics menu. Press the play button in the motion controls; it will turn grey. At this point, Performer should be slaved to the tape. Display frame time in the counter window, and roll the tape from before the time code. Make sure Performer starts, stops, and follows the tape when you wind through the tape.

For overdubbing, you need to provide your players with a reference mix of the song. You can have Performer sync live to the tape and send the players a cue mix. Or, you might find it easier to just place a scratch mix on one or two of the tracks of the multi-track. That way,

you won't have to worry about Performer while recording. If your session is spread out over several dates, putting a scratch mix on the tape will save you having to set up your computer and synthesizers every time.

When you get to the final mix, you have two choices. You can mix from Performer playing slaved to the tape. This provides the ultimate in sound quality, as the synthesizers are first recorded on the master tape. On the other hand, you may wish to record each synthesizer part on a separate track of the multi-track. This has several benefits. Since the tracks are recorded one at a time, each track can use all of your synths to create a sound. Blending several synthesizers together often creates a more full-bodied sound than you could otherwise achieve. Also, if you have limited outboard effects gear, you can record each track with effects, allowing you to reuse what equipment you have.

When recording a single part to tape, we recommend you *turn off the play-enable buttons* in the tracks window for all tracks except the one you are recording. When you do this, Performer completely ignores the other tracks, letting it concentrate all of the computer's processing power on playing one part. *If you use the Solo button instead,* Performer will scan the other parts while playing. If you have dense, complicated music, or lots of continuous data, this may cause the Macintosh to become bogged down during playback.

When recording each part separately, you can slide individual parts slightly ahead or behind to compensate for delays in your synthesizers, or the specific sounds. For example, string parts often need to be attacked ahead of the beat in order to sound on the beat.

With sampling synthesizers, you may find that some sounds have as much as 100 milliseconds of "dead air" at the beginning of the sample, which results in that much delay between turning the note on and hearing any sound.

To slide a part, just adjust the start time relative to the start time the other parts were recorded with. For example, if you did have a sample with 100 milliseconds of dead air at the start, you could set the start time to 0:59:59:27 + 0 time code bits. That's 3 frames ahead

of the other parts, and at 30 frames per second, 3 frames is 1/10th of a second, or 100 milliseconds. Your sample's audible attack times will now be aligned with those of the other parts.

It's best to slide parts by ear — just keep trying different start times until the part seems most lined up.

Synchronizing with FSK

If you are using an FSK converter in the above example, you can proceed in a very similar fashion.

When striping the tape, you must usually feed the converter with MIDI beat clock information. This information is recorded more or less directly onto the tape. When the tape is played back through the converter, you should receive exactly the same MIDI beat clock information.

When synchronizing to an FSK converter, Performer follows the tempo recorded onto the tape; Performer's internal tempo map is disabled.

The FSK converter usually sends out a carrier tone when it is not receiving MIDI beat clock information. You should record a minute or so of this carrier tone prior to starting Performer.

When synchronizing to tape, you must use the *Standard beat clocks* mode to receive synchronization. Remember that the tempo is already recorded on the tape.

When using FSK, you must always begin playing the tape from the beginning; FSK code does not encode any position information on the tape.

Hints

When locking to external SMPTE synchronization, you can shift parts forward and backward in time to compensate for the numerous time delays in a complex system (each device used in a MIDI path introduces at least 2 milliseconds of delay) or to adjust for envelope delays in certain synthesizer patches (such as strings or any other slow-attack patch).

When recording in external sync, 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. To record in external sync, start the master device, wait for Performer to lock up, and then press the record button.

Many new digital effects devices, like reverbs, delays, equalizers, and even mixers, allow MIDI control. By using Performer with a time code converter to sync to your multi-track tape recorder, you can automate effects changes and other aspects of mixing accurately and flexibly. Read cue points from Performer's counter, or use the Record Hits feature in the Markers window to find locations to insert patch changes and controller information to control your MIDI devices. Alternatively, use the sliders, switches and pedals of your controller keyboard or MIDI mixer to record your mix in real time, then use Performer's editing features to correct any problems.

Setting a Countoff Before Sequence Start While Slaved to Tape

If you are working in a studio situation where you need a countoff before the beginning of the sequence while slaved to tape, here is how you can set up the Performer's countoff feature:

1. **Choose a Click Option in the Click & Countoff Options dialog box that will enable the click during Performer's countoff.**

   For example, choose the Always Click option or the Only during countoff option.

2. **Set the number of measures you would like for the Countoff.**

   Do so by double-clicking the Countoff button and typing in the number of measures.

3. **Make sure that the Click is enabled.**

   The Click item on the Basics menu must be checked.

If you now rewind well before the sequence start time and roll the tape, Performer, as it counts down, will begin the countoff at the appropriate number of measures before the downbeat of the first measure.

Syncing to SMPTE with the Studio 5™

In general, we recommend using Direct Time Lock Enhanced (DTLe) to lock Performer to SMPTE time code. If you are using an Opcode Studio 5, however, use MIDI Time Code (MTC) instead. Just set up

the Studio 5 to generate MTC instead of DTLe. In Performer, no change is needed because Performer uses the same settings for either type of time code. For other hardware interfaces, including the Opcode Studio 4, we recommend using Direct Time Lock Enhanced.

Chapter 38 *Transmit Sync*

Basics

The Transmit Sync dialog box, available from the Basics menu, allows you to configure Performer as a master time source. When being used as a master, Performer sends synchronization signals to which other MIDI devices can slave. Performer generates standard MIDI beat clocks; devices which do not recognize MIDI beat clocks require a converter to the appropriate type of synchronization information. For more information on synchronization, see the *Receive Sync* chapter and *Appendix A: Synchronization Specifications*.

You may use Performer as a master of some devices while Performer itself is slaved to another device. This is especially useful when slaving Performer to SMPTE time code; Performer (slaved to the tape) can generate tempos for other sequencers slaved to Performer.

When Transmit Sync is selected for one or both of the serial ports, Performer becomes a master time source: any compatible MIDI devices connected to Performer will follow Performer'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 when the Counter location is changed or the Rewind button and Position bar are used.

Performer can transmit sync information in two ways: it can simply pass on (or echo) any sync messages it receives, or it can generate new sync information based upon its own tempo map and controls. These options are described below:

Echo received sync: This option echoes synchronization information which is received. No processing is performed. The reception port must be selected in the Receive Sync dialog box, and Performer must be in External Sync mode for sync to be echoed. Sync is echoed to the ports selected in the Transmit Sync dialog box. 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 and another device to a master which generates MIDI beat clocks. However, for best results, you should use a MIDI thru box and connect both Performer and the other slave directly to the master. Echoing sync through Performer results in a small delay.

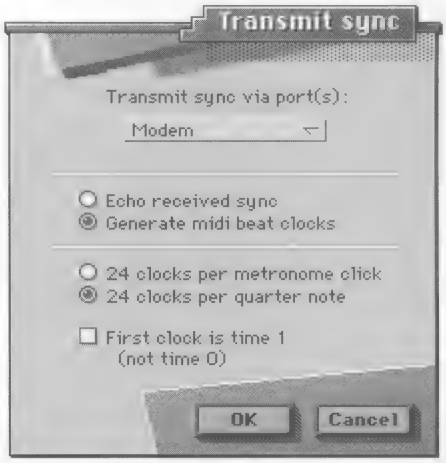
Generate MIDI beat clocks: Performer generates MIDI beat clocks in tandem with the other MIDI information being played back. Use this mode when Performer is the master. You may also find this mode useful when slaving Performer to SMPTE using one of the time lock modes. Performer will generate MIDI beat clocks according to its tempo map in sync with the SMPTE code, so you can slave a sequencer or device that doesn't support SMPTE through Performer.

Using Transmit Sync

To set Performer to transmit sync information:

1. **Choose *Transmit Sync* from the Basics menu.**

   A dialog box appears.



2. **Select the Macintosh ports that you wish Performer to send sync information over.**

   If neither port is selected, Performer will not generate or echo sync information. If you are not slaving external devices to Performer, setting the ports option to none improves performance.

3. **Choose between echoing and generating sync information.**

   Click on the corresponding radio button.

4. **Set any necessary options.**

   If you are using *Generate MIDI beat clocks*, set the options *24 clocks per metronome click / 24 clocks per quarter note* and *First clock is time 1* as necessary. These options have no effect when echoing received sync.

Performer is now set to transmit sync information. If your slave devices are set up correctly, they will start, stop, rewind, and play in time with Performer.

Generally, you must put the slave device in an external sync mode before it will respond to Performer's transmissions. Consult the owner's manual for the device to determine the exact procedure. The mode may be called *external clock*, *MIDI sync*, *MIDI clock*, etc.

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 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.

Chapter 39 *Using MIDI Machine Control*

MIDI Machine Control (MMC) is a recent and significant addition to the original MIDI specification. MMC consists of an extensive set of system exclusive commands that allow multiple recording devices to be remotely controlled from a single source. MMC expands Performer's ability to serve as "a recording studio at your fingertips" by allowing you to control the transport and recording functions of your recording hardware entirely from within Performer.

This chapter explains how to use Performer with hardware devices that support the MIDI Machine Control (MMC) specification, such as:

- The Alesis ADAT™ digital multitrack recorder (with the BRC or other MMC interface)
- The Akai DR4d™ digital hard disk recording system (with the additional card necessary for MMC)

Performer serves as a computer-based front end for MMC devices, causing them to play, stop, rewind, and otherwise follow Performer's transport control functions. In addition, you can record-enable tracks on a MMC device remotely from within Performer (for MMC devices that support this capability).

☛ As you begin working with Performer and your MMC gear, keep the following in mind. Performer provides features that are supported by most MMC devices. However, not all MMC devices support every feature explained here. In addition, there can be slight variations in the way each device handles MMC that cause it to behave differently than described. Try to familiarize yourself as much as possible with the features your device supports via MMC. Also, check for "Read Me" files in your Performer folder and update note booklets that accompany your Performer manual; they may include further information about specific devices.

Setting up MMC hardware

MIDI Machine Control requires two-way MIDI communication between Performer and the MMC device. Performer sends control commands (in the form of system exclusive messages) to the MMC hardware, and the MMC hardware sends SMPTE time code back to Performer.

Some MMC devices can generate SMPTE time code in the form of MIDI Time Code (MTC). (Some MMC devices support other forms of MIDI timing information as well, including standard MIDI beat clocks, Direct Time Lock, and Direct Time Lock Enhanced.) Other devices generate SMPTE time code in the form of longitudinal time code (LTC), an audio signal that must be converted to MIDI Time Code by way of a SMPTE-to-MIDI converter such as the MIDI Time Piece II. These two hardware setups are shown below.

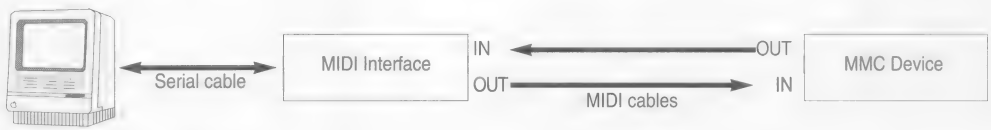


Figure 39-1: If the MMC device can generate MIDI Time Code (MTC), the MIDI connections shown here are all that are necessary. Be sure the MIDI interface internally routes the MTC to the Macintosh.

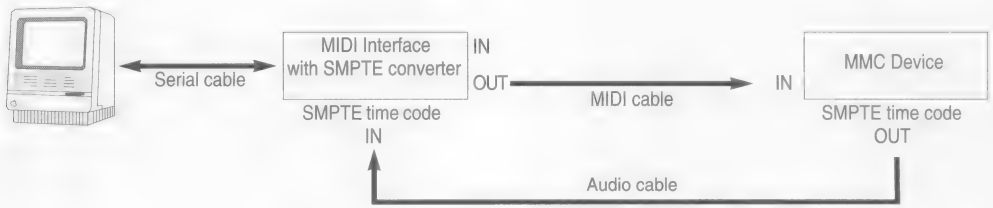
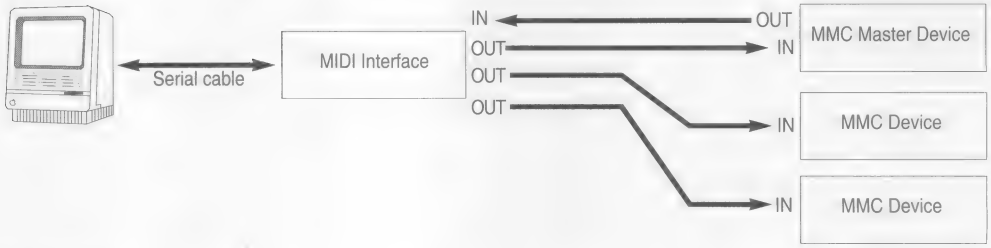


Figure 39-2: If the MMC device generates SMPTE Time Code, connect its time code output to a SMPTE-to-MIDI converter like the MIDI Time Piece II as shown here, which converts it to MTC. Route the resulting MTC to the computer.

Connecting multiple MMC devices

If you have more than one piece of MMC gear, decide which one will be the time code master. Hook up the master device as shown in either Figure 39-1 or Figure 39-2 (whichever is required by the device), and then feed the time code from the master device to the other MMC devices in your setup. Doing so establishes one time code source, which keeps all devices (and Performer) in sync with one another. Connect the remaining devices to your MIDI interface as shown below.



Open-loop versus closed-loop systems

The hardware setups shown in Figure 39-1 and Figure 39-2 support open-loop MMC configurations. Performer does not currently support closed-loop MMC communication. Closed-loop communication is not necessary for accurate synchronization between Performer and MMC hardware.

Setting up Performer

Setting up Performer for MMC is simple. All you need to do is create a MMC device in your FreeMIDI setup.

1. **Open the FreeMIDI Setup Application.**

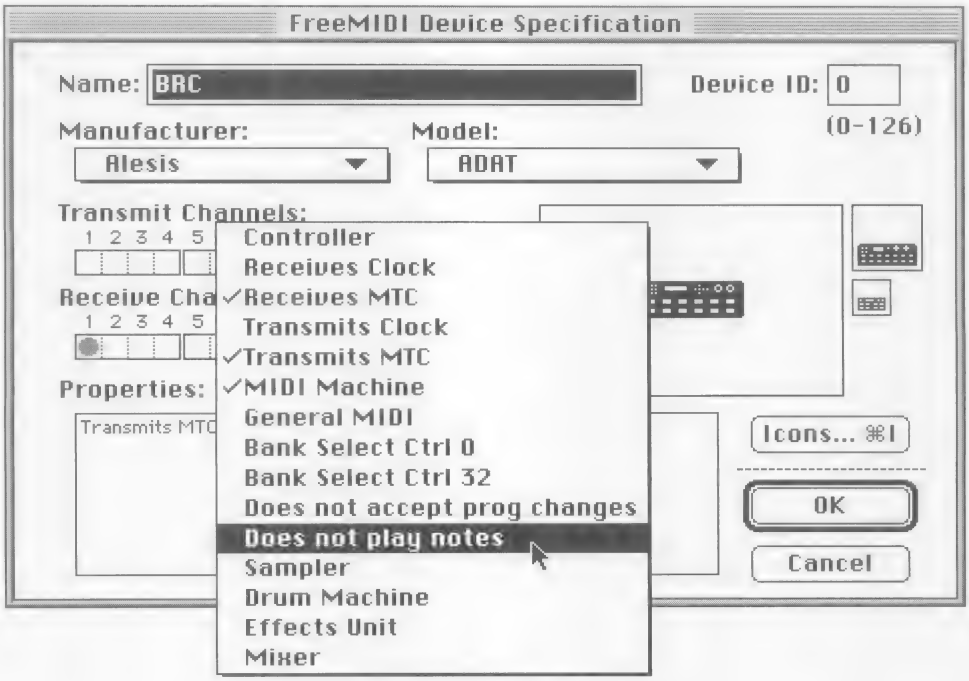
   If you are currently running Performer, click the FreeMIDI button in the Control Panel, or choose Edit FreeMIDI Configuration from the Basics menu. Otherwise, double-click the FreeMIDI Setup icon in the Macintosh Finder. The FreeMIDI Setup application launches and your current studio configuration appears.

2. **If the MMC device already exists in your FreeMIDI configuration, double-click it. If not, add it using the Create Device command in the Configuration menu.**

   The FreeMIDI Device Specification window appears.

3. **In the Device Specification window, make sure that "MIDI Machine" Device Property is checked in the Device Properties pop-up menu as shown below, as well as the "Receives MTC" and "Transmits MTC" properties.**

   If any of these items are not checked, select them to check them.



4. **Make sure that the Device ID setting correctly matches the setting in the device itself.**

   ☛ If you used FreeMIDI's Auto Config feature to automatically detect the MMC device, the ID setting is already correct. The device ID setting is important because if it is not correct, the MMC device will not respond to Performer.

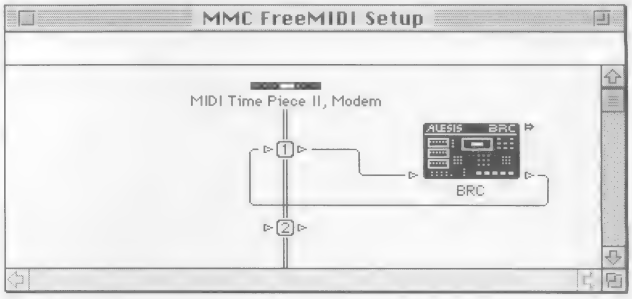
5. **If you are creating the FreeMIDI device for the first time, set the rest of the device information as needed.**

6. **Click OK.**

7. **Make sure that both the MIDI IN and MIDI OUT ports of the MMC device are connected to the MIDI interface.**

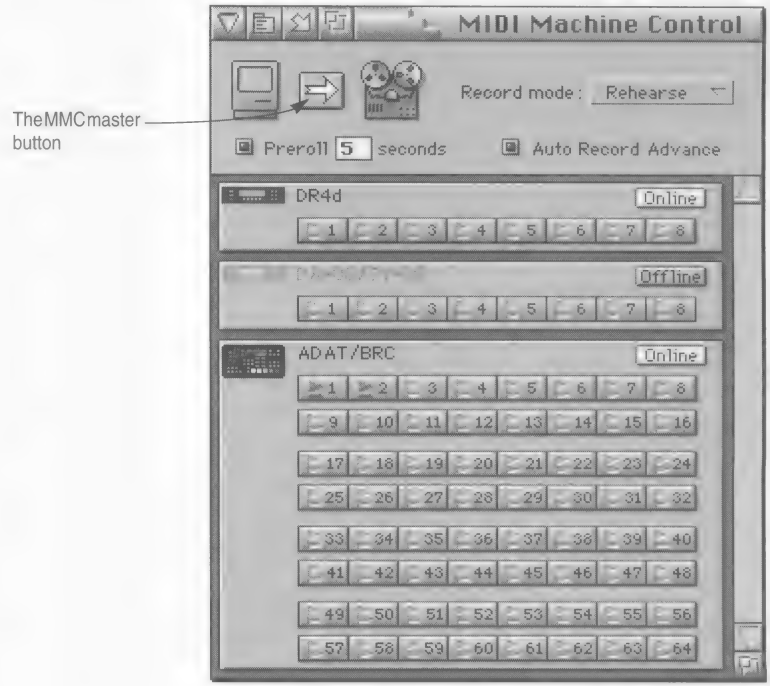
   If not, connect them by dragging a patch cord from the MIDI interface port to the device icon. For more information, see "Connecting Devices to Interfaces" on page 696.

The presence of a MMC device in the MIDI configuration activates the MMC features in Performer.



Activating MMC in Performer

Each MMC device that you have defined in your FreeMIDI setup appears in Performer's MIDI Machine Control window, which can be opened from the Windows menu.



The MMC master button

The MIDI Machine Control window

The area at the top of the window contains several important buttons MMC-related controls.

The MMC master button

The MMC master button activates all of Performer's MMC features. To activate these MMC features, click the arrow button between the computer and tape deck icon at the top of the window. When this button is on, MMC is activated. In addition, Performer is placed in *Slave to External Sync* mode. For more information about external sync mode, see "Setting Performer's Receive Sync options" on page 638.

The Record mode pop-up menu

The Record mode pop-up menu has three modes: Safe, rehearse, and record.

- **Safe:** no recording can occur in any MMC device
- **Rehearse:** this mode depends on the MMC device. Usually, it causes the device to act as if it is recording, punching in, punching out, etc. but no recording actually occurs.

  ☛ Make sure that your deck supports rehearse mode before attempting to use this record feature. If it doesn't, rehearse mode may actually record.

- **Record:** allows recording on the currently record-enabled track(s) for any MMC device. To actually record, press the record button in Performer's main transport controls.

Preroll

When this option is checked, MIDI Machine Control devices get cued to 5 seconds before the location you specify with Performer's transport functions. Click the preroll value in the box to change it (1-99 seconds).

Preroll saves you the trouble of figuring out preroll time in your head. Preroll lets you cue Performer to musically intuitive locations or hit points while giving the hardware and Performer enough time to fully synchronize by the time they reach the cue location you chose.

Auto Record Advance

When the Auto Record Advance button is checked, Performer will automatically record-enable the next higher track (or set of tracks for stereo recording) during Memory-cycle recording. As Performer loops the same section over and over, each pass is recorded on a new track (or set of tracks), preserving all previous takes. For example, when you begin cycle-recording, you could record a section on track 1. The second time around the loop, Performer releases track 1 and record-enables track 2, and the second pass gets recorded on track 2. The third time around, Performer record-enables track 3, and the third pass gets recorded there. Performer will continue to record-enable the next track until it records on the highest available track.

☛ Make absolutely sure that the consecutive tracks in line for recording do not have material on them that you wish to keep.

When this check box is unchecked, the same track (or tracks) remain record-enabled until you change them manually by clicking the record-enable buttons in the MIDI Machine Control window.

The Auto Record Advance option requires the following preparations in Performer:

1. Memory-cycle must be enabled.
2. Auto-Record must be enabled.
3. The Record mode popup in the MIDI Machine Control window must be set to *Record* mode. (It does not advance in *Safe* or *Rehearse* mode.)
4. Performer must punch-in at some point before cycling back to the beginning of the Memory-cycle loop.

Setting up each MMC device

The MIDI Machine Control window provides a list of MMC devices in your FreeMIDI Setup. Any connected device that has the *MIDI Machine* device property assigned to it appears in this window. Several settings are provided for each device.

Device name and icon

The name and icon of the device comes from its name in your FreeMIDI studio configuration. You can change the name using the FreeMIDI Setup application. To change the icon, see "Editing FreeMIDI Icons" on page 759.

Bringing a MMC device on line

When the *On line* button is selected, the device is on line, which means that it will respond to Performer's transport control commands. When a device is off line, it will not respond to Performer.

Specifying the number of tracks

The *Set number of tracks...* mini-menu command sets the number of tracks that the MMC device has. Keep in mind that in some situations, a single device in Performer's MIDI Machine Control window actually

represents several physical devices. For example, an Alesis BRC may be connected to several ADAT's, each with 8 tracks. In this example, you'd want to include the tracks for all of the ADAT's. Be sure to set the number of tracks accordingly.

Setting a timecode track

The timecode track option in the *Set number of tracks* command lets you specify one of the tracks as a timecode track. The timecode track becomes record-protected, and it cannot be record-enabled by the arrow keys (discussed below) or Auto Record Advance. You can record-enable the timecode track manually by clicking it, but a warning appears to confirm that you would like to do so.

Changing the order of the devices in the window

To change the order of the devices in the window, drag the panels up or down.

Ejecting a tape

Th Eject mini-menu command ejects the tape from the currently selected MIDI Machine Control device in the list. To select a device, click its name. The device must be on line and the master MIDI Machine Control button must be active for this to work.

Keyboard shortcuts for record-enabling tracks

Option-click a track to record-enable it and at the same time turn off all other record-enabled tracks. Command-click a track to turn it off and record-enable all others.

User the up and down arrow keys to record-enable the next or previous track. This works with adjacent pairs as well.

Selecting a MMC device in the MMC window

To select a device, click its name.

Setting Performer's Receive Sync options

While controlling external MMC devices, Performer actually slaves to time code generated by the MMC hardware to remain synchronized with the hardware during playback and recording, as explained in the diagram below.

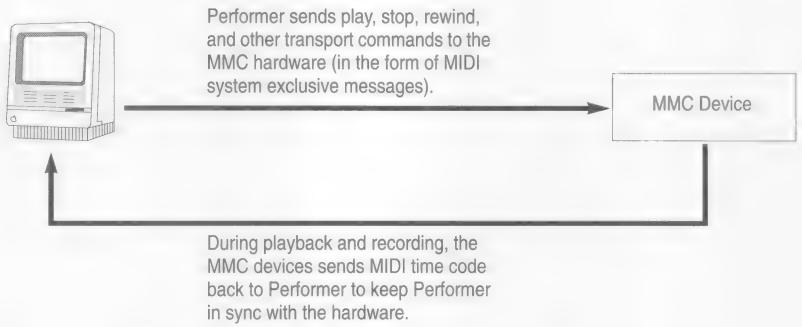


Figure 39-3: When Performer controls the transport functions of MMC hardware, Performer simultaneously slaves to time code from the MMC hardware.

Performer governs the transport control functions, and the MMC device serves as the master timing source to keep them synchronized.

As a result, when you activate MMC control in Performer, Performer is automatically placed in *Slave to external sync* mode, in which Performer slaves to external time code. To successfully slave Performer to the time code, make sure that the settings in Performer's Receive Sync command in the Basics menu match the time code being generated by the MMC master device. For complete information on the Receive Sync dialog settings, see "Slaving to SMPTE with MTC, DTL, or DTLe" on page 609.

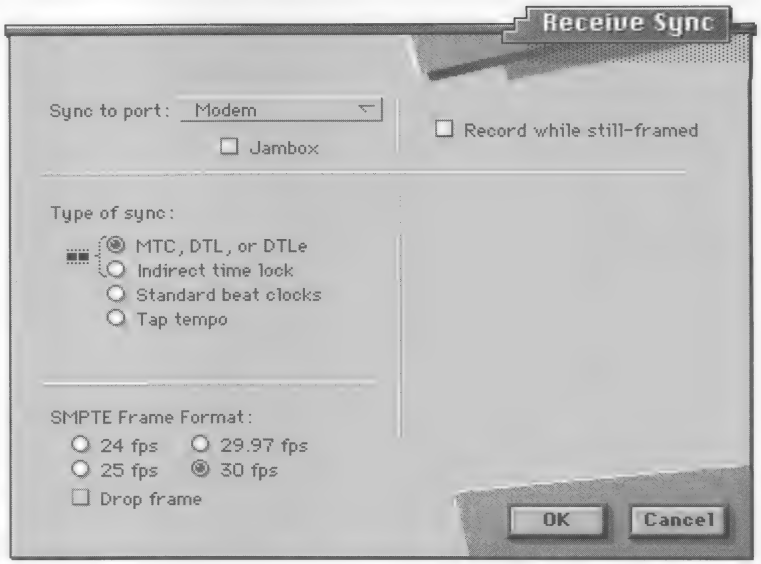


Figure 39-4: Make sure that Performer's Receive Sync dialog box settings (Basics menu) match the time code generated by the master MMC device.

Setting Performer's SMPTE start time (offset)

Because MMC control involves SMPTE synchronization, be sure to set Performer's SMPTE start time (SMPTE *offset*) to a value that is appropriate for the time code being generated by the MMC device. To set the start time, click the start time button in the main counter, or select Set Chunk Start from the Chunks window mini-menu. For more information, see "Setting the start time" on page 90.

Using Performer's transports to control MMC devices

Once you activate MMC and set up each device as described in the previous sections, Performer will shuttle the transport controls on each on-line MMC device in sync with Performer's own transport controls. For example, when you press play, stop, and rewind in Performer's main transport control panel, each MMC device will do the same.

All of Performer's transport control functions are supported. For example, if you use Memory-cycle to loop over a region, the MMC device will follow. Keep in mind, however, that Performer's transport functions are virtually instantaneous, whereas MMC hardware devices are mechanical devices that take time to cue. As a result, Performer

will stop and wait at times when the MMC device is cueing to a new location. The longer the cue time, the longer the wait will be. Once the MMC device has finished cueing, Performer will resume at the same time as the MMC device.

Transport features that are supported include:

- Play
- Stop
- Rewind
- Pause
- Record
- Auto-punch in/out

Cueing functions include the following:

- Typing a time into the Main Counter
- Using Fast-forward and rewind cueing buttons below the main transports
- Clicking a marker in the Markers window
- Double-clicking in any time ruler
- Memory bar features such as Auto-stop, Auto-rewind, Memory-cycle
- Dragging the scrolling wiper

All of these functions behave normally, except for the waiting period mentioned above.

Recording into Performer while using MMC

Once you have set up MMC in Performer as described in this chapter, you can record MIDI data into Performer in the usual fashion (as described in chapter 9, "Recording"). Record-enable a MIDI track in Performer's track list, press record, and play your controller. All of Performer's MIDI recording features work normally, including Multi-record, Auto punch-in, etc. Since Performer is slaved to the external MMC device, there may be an occasional wait during cueing.

Using Performer to record a track on a MMC device

To record to a track on a MMC device:

1. **Make sure that the device you wish to record on is on line in the MIDI Machine Control window.**

   If not, click the Off Line button to bring it on line.

2. **Choose either *Record* or *Rehearse* from the pop-up menu in the MIDI Machine Control window.**

   For details about Rehearse mode, see "The Record mode pop-up menu" on page 635.

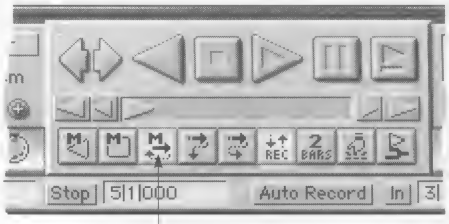
3. **Record-enable one or more tracks on the device by clicking the appropriate track button(s) in the MIDI Machine Control window.**

   ☛ Note: some devices do not support remote record-enabling. If so, record-enable the track directly on the device.

   Until you actually begin recording, the record-enable button flashes. When you begin recording, it becomes solid.

4. **If you would like to loop a section to record several passes, click the Memory-cycle button in the Main Control Panel and set the Start and End points in the Track Overview.**

   For information about using Memory-cycle, see "The Memory-cycle button" on page 71.

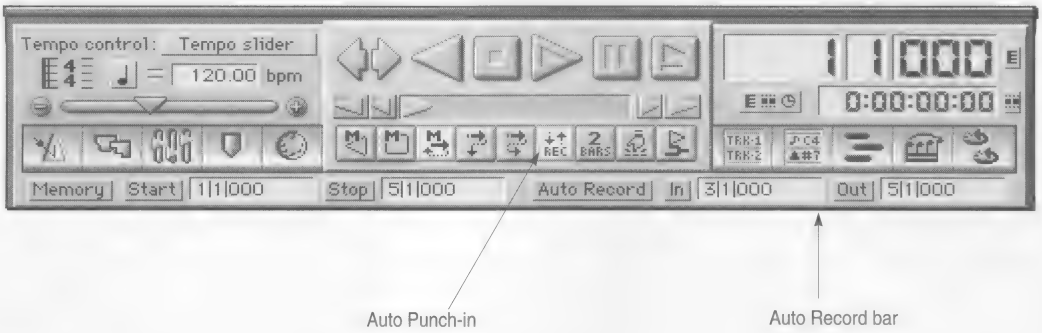


5. **If you are going to loop a section with Memory-cycle as described in the previous step, and you would like to record each pass on a new track to preserve each take, check the Auto Record Advance box in the MIDI Machine Controls window.**

   For details, see "Auto Record Advance" on page 635. Make sure that Auto-record and Memory-cycle are enabled. Also, make sure that the record mode pop-up menu in the MIDI Machine Control window is set to Record mode. Auto Record Advances doesn't work in Rehearse or Safe mode.

6. **If you would like to set punch-in and punch-out points, click Performer's Auto Punch-in button below the main transports, and set the punch-in and out times in the Memory bar**

   You can even set punch locations while looping a section with Memory-cycle. In Performer the punch location can be set independently from the loop points. If you want, you can set the in and out times on the fly by clicking the In and Out buttons in the Memory bar during playback. For more information, see "The Auto-Record button" on page 76.



7. **To begin recording, cue Performer's main counter to a point that is at least 5 seconds before the punch-in point, or set the pre-roll time in the MIDI Machine Control window to at least 5 seconds.**

   The amount of pre-roll depends on the device; some may require longer.

8. **Press Performer's record button.**

9. **Record at the punch in location.**

10. **Press stop to end recording.**

Chapter 40 Using Performer with the MIDI Time Piece™

About this chapter

This chapter discusses how Performer and the MIDI Time Piece (MTP) and MIDI Time Piece II (MTP II) work together. This chapter also applies to the MIDI Express and multi-port interfaces from other manufacturers, such as Opcode's Studio 5.

Performer relies on FreeMIDI to identify what type of interface is connected to the Macintosh. FreeMIDI automatically figures out what is connected. If a MIDI Time Piece, MIDI Time Piece II, MIDI Express, Studio 5, or other similar interface is present, several important features are automatically enabled in Performer. The sections below refer to features that are fully documented in other chapters of this manual, such as the MIDI Monitor window. You may want to review these chapters as you read this one; this will help you understand how Performer works with the MIDI Time Piece.

The MIDI Time Piece, MIDI Time piece II, and MIDI Express can each be thought of as four MIDI devices wrapped into a single rack-space unit. Each one is:

- an 8 IN/8 OUT MIDI interface (4 IN/6 OUT in the MIDI Express)
- a MIDI patch bay with routing, channelizing, and muting
- a SMPTE-to-MIDI synchronizer
- a SMPTE time code (LTC) generator

Performer has three features that support them:

- high data transfer rate with FAST mode (not available with the MIDI Express)
- 128 MIDI channels through data cablization (96 channels with the MIDI Express)
- Improved SMPTE synchronization with Enhanced Direct Time Lock™

High data transfer rate with FAST mode

When Performer and the MIDI Time Piece are set to FAST mode, they communicate two to four times faster than a regular interface running at 1 Megahertz. As a result, they sustain greater data throughput to all 8 MIDI OUT cables on the MTP. Fast mode also alleviates irregular timing problems that occur when too much data is being transmitted, commonly referred to as "MIDI logjam."

128 MIDI channels via 8 independent cables

The MIDI Time Piece is unique because it offers *eight independent* MIDI INs and MIDI OUTs. *Independent* means that each cable handles its own, separate set of 16 MIDI channels. Eight cables, multiplied by 16 MIDI channels each, equals 128 separate MIDI channels. Performer provides access to all 8 cables and all 128 channels. In addition, up to four MTPs can be networked together for a total of 512 MIDI channels.

The MIDI Express provides 96 MIDI channels (6 outputs times 16 channels each).

In either case, the primary benefit is that you'll never have to worry about overlapping MIDI channels—MIDI channels that are being used by more than one MIDI device at a time. Each device has its own channels, so you'll never have a conflict.

Another benefit is that both the MIDI IN and MIDI OUT of each device can be connected at all times, allowing easy access to and from the instrument. This is especially useful when using a editor/librarian software such as Mark of the Unicorn's Unisyn™.

Improved SMPTE sync with Enhanced Direct Time Lock™

Enhanced Direct Time Lock (DTLe) is an improved form of the DTL supported in earlier versions of Performer. Instead of one frame advance message per SMPTE frame, DTLe consists of *four* frame advances per frame. In addition, DTL's tape position (full frame) message has been expanded to include the frame rate of the SMPTE and an identification of which device in an MTP network is sending the DTLe.

To fully support DTLe, the MIDI Time Piece sends a tape position message approximately once every second. This prevents even the slightest amount of drift due to small dropouts or other inconsistencies in the SMPTE time code.

When used with Performer, the MIDI Time Piece provides the most reliable SMPTE-to-MIDI lockup available. In addition, DTLe allows Performer to establish lockup without stopping the tape transport. While the film or video tape is rolling, you can press Performer's Play button and the program will jump right into sync with the tape.

Synchronizing to SMPTE with DTLe

Enhanced Direct Time Lock™ (DTLe) is an improved form of DTL supported by earlier versions of Performer. The following sections provide a brief overview of how to sync Performer to SMPTE time code via DTLe and the MIDI Time Piece. If you are not already familiar with the synchronizing process, please refer to the chapter in the MIDI Time Piece user's manual called Working with SMPTE.

The principal benefits of DTLe are: 1) you are less likely to have problems such as dropouts, drifting, etc. and 2) lockup can be achieved *while the tape continues rolling*. You no longer have to stop the tape to reestablish lockup.

Performer still supports old DTL if you are using an original DTL converter. The procedure for using original DTL is the same as for DTLe.

Locking the MTP to SMPTE

To lock the MTP to SMPTE, connect an audio out from the tape deck to the AUDIO IN jack on the rear panel of the MTP. In the MTP Desk Accessory (MTP DA) MIDI Sync window, choose the DTLe option, and make sure that DTLe is being routed to the Macintosh.

To verify lockup, open the SMPTE Reader window from the MTP software and roll the tape. The SMPTE Reader should begin to roll. Lockup is indicated on the MTP by the LTC/LOCK light (LED) on the front panel, which glows steadily as long as the MTP is locked. In addition, the POWER/TACH (tachometer) LED flashes regularly once per second. If the LEDs flicker erratically, the MIDI Time Piece is not locking up consistently. Try boosting or attenuating the SMPTE output from the tape deck.

Using the MIDI Monitor to check incoming DTLe

To verify that Performer is receiving the incoming DTLe properly, use the MIDI Monitor window. When DTLe is being received, the RT light turns dark (due to the four F8 bytes being received each frame):

The real-time data light ("Rt") lights up when Performer is successfully receiving DTLe.

Locking Performer to the MTP

Once the MTP has been successfully locked to tape, and you have verified that it is sending DTLe to Performer, lockup is easy. Choose MTC/DTL/DTLe in the Receive Sync dialog box, set a start time in the counter with the Start Time button, choose Slave to External Sync, press Play (or Record), and roll the tape. You can press stop at any time and reestablish lockup by pressing Play again, even while the tape is rolling.

Troubleshooting

If you have trouble establishing lockup, refer to the MIDI Time Piece manual SMPTE chapter for detailed, step-by-step instructions. Also refer to "Slaving to SMPTE with MTC, DTL, or DTLe" on page 609.

If you continue to have problems, check out the troubleshooting chapter at the end of the MTP manual. It discusses solutions to common synchronization problems.

Chapter 41 Performer & the Video Time Piece

The Video Time Piece is Mark of the Unicorn's affordable SMPTE/VITC/MIDI time code converter and character generator. VITC (*Vertical Interval Time Code*) is SMPTE time code that is recorded directly in the video signal, freeing up both audio tracks and allowing lockup to be maintained while freeze-framing or frame-advancing the video.

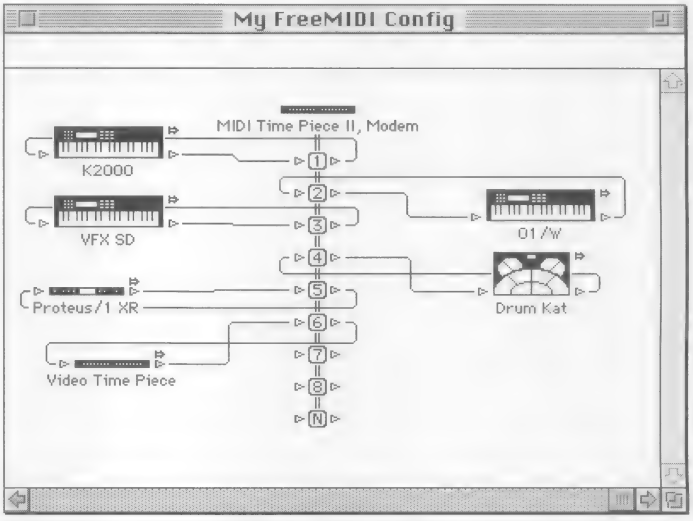
Performer supports many of the Video Time Piece's unique features. With the Performer/Video Time Piece combination you can:

- Lock Performer to VITC and remain in sync while frame advancing
- Download Markers as streamers to the video display
- Display a Conductor Crawl Line that displays the hit point of each downbeat in the sequence
- Convert an audio click track into a Performer tempo map in the Conductor track
- Prevent dropouts during tape sync with adjustable freewheeling

Setting Up Performer

To set up Performer for the Video Time Piece, you need to add the Video Time Piece to your FreeMIDI configuration using the FreeMIDI setup application. If Performer is currently running, you can launch

FreeMIDI setup by choosing Edit FreeMIDI Configuration from the Basics menu. Choose Create Device from the Configuration menu and set up the options as needed.



When you have a Video Time Piece in your FreeMIDI configuration as shown above, special features for the Video Time Piece are automatically enabled in Performer; they are discussed in this chapter.

Locking Performer to VITC

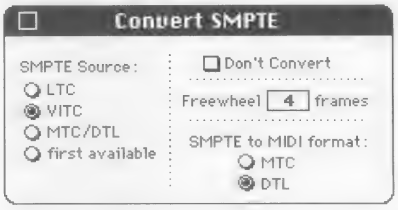
Once you have installed the Video Time Piece, you can lock Performer to video that has been recorded with VITC or LTC.

Before attempting lockup to VITC, it is a good idea to make sure that the Video Time Piece is successfully converting the VITC into MIDI sync and transmitting the sync data to Performer and the Macintosh.

Verifying Incoming Time Code with the MIDI Monitor

To verify incoming time code from the Video Time Piece:

1. **Open the Video Time Piece desk accessory and open the Convert SMPTE window.**



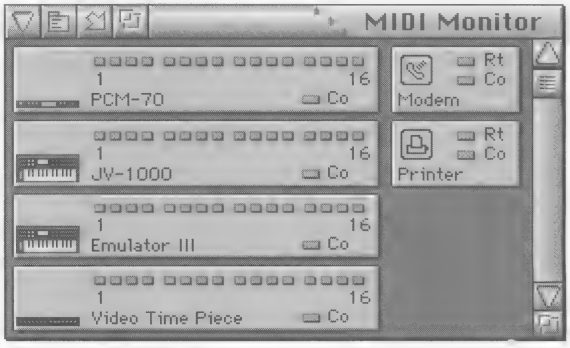
2. **Choose the VITC option and the DTL (Direct Time Lock) option.**

   Alternately, you can use MTC (MIDI Time Code) option.

3. **Roll the Video tape.**

   When the VITC LOCK light on the Video Time Piece indicates that lockup has been achieved, the COMPUTER OUT LED should begin to glow, indicating that the Video Time Piece is sending DTL (or MTC) to the Macintosh and Performer.

4. **Open Performer's MIDI Monitor window.**



   If you are using Direct Time Lock enhanced, the "Rt" light on the port to which the VTP is connected will turn black. In addition, the Co light on the Video Time Piece panel will blink regularly if DTLe is being successfully received by Performer.

   The Co light will turn black if you are using MTC.

Locking Up Performer

You can now lock up Performer, even while the video tape is still rolling:

1. **Choose the MTC/DTL/DTLe timecode option in Performer's Receive Sync dialog box.**

   Be sure to match the same type of sync that the Video Time Piece is sending.

2. **Enable the Record while still-framed option in the Receive Sync dialog box.**

   This causes Performer to remain in record when you are frame-advancing.

3. **Choose Slave to external sync from the Basics menu.**

   This puts Performer into slave mode.

4. **Press the Play or Record buttons.**

   You can do so even while the tape is rolling. Performer will immediately lock to the tape. If necessary, you may have to stop and adjust the start time in the Counter. (Click the Start Time button to do so.)

Recording Hits While Frame Advancing

To record hits while frame-advancing:

1. **Freeze the video image.**

   Performer will also stop at the frozen video SMPTE frame.

2. **Choose Add from the Markers window mini-menu or play a MIDI event into the currently record-enabled track.**

   The new marker will be added to the list at the current tape location. If the Markers window isn't already open, press stop, open it, and press play again.

3. **Advance to the next hit using your VCR's frame-advance button.**

   Performer will follow along.

4. **Repeat the above two steps as many times as necessary.**

   When you are through, you can rename each marker and lock it to its SMPTE time.

Performer remains in sync during freeze-frame because the VCR tape heads keep spinning—even when the tape is stopped. Thus, they continually scan the video image (and the VITC). The Video Time Piece, in turn, remains locked to the frozen image as it is being continually scanned and sends periodic tape position messages to Performer to let Performer know where the current tape location is. You can see these periodic tape position messages as brief flashes on the COMPUTER OUT LED on the Video Time Piece. To record notes, you must have the Record while still-framed option checked in the Receive Sync dialog box.

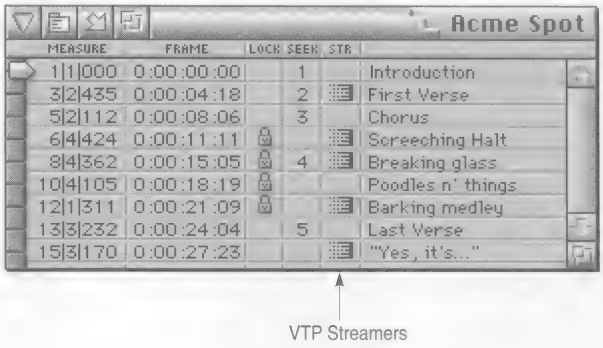
Using Streamers

The Markers window has an additional capability designed for the Video Time Piece's character generator. The Video Time Piece can superimpose graphic images on a video picture, including *streamers*. A streamer is a solid white bar that travels across a video screen from left to right to reach the right-hand side of the screen at an exact hit point. Streamers help studio musicians and sound effects engineers to anticipate hit points during video post-production.

Performer's markers have the ability to serve as triggers for streamers generated by the Video Time Piece. Here is how it works: while Performer is slaved to the video via SMPTE time code and the Video Time Piece, it sends a message to the Video Time Piece several seconds before playback reaches the marker location. This message tells the Video Time Piece the name of the marker and its exact location. To warn the viewer of the approaching hit point, the Video Time Piece immediately displays the name of the marker on screen for several seconds before the streamer. The Video Time Piece then displays a moving streamer for the marker such that the streamer hits the right side of the screen at the exact SMPTE frame location of the marker.

Enabling Streamers

To enable streamers in Performer, check the "Generate VTP Streamers" mini-menu command. Then you will see the Streamers column next to the marker names in the Markers window:



To enable a streamer for a marker, click in the Streamer column next to the marker name and the streamer icon will appear. The marker will then appear as a streamer on the Video Time Piece's video picture. If you option-click, the marker will be assigned a streamer and all others will not. Conversely, if you command-click, all markers except the one you click will be assigned a streamer.

Streamer Hints

Remember that marker names are displayed onscreen for approximately 3 seconds before the streamer. If your markers are closer than 3 seconds to one another, they may overlap onscreen; that is, the name of the second marker may be displayed before the first marker's streamer.

When the Video Time Piece displays the name of the marker, it displays up to 20 characters. Names longer than 20 characters will be cut off. So, you may want to keep your marker names as short as possible.

Displaying the Conductor Crawl Line

Together, Performer and the Video Time Piece have the ability to display a crawl line on the video screen. A crawl line is a series of white "blips" that travel across the video screen from right to left, striking the left-hand side of the screen in time with each beat of music in the Performer sequence. The Conductor Crawl Line is useful for lining up downbeats in your Performer sequence with hit points on the video.

Performer triggers each beat in the Conductor Crawl line when the Click feature in the Basics menu is enabled. To set up the click feature:

1. **Choose Click & Countoff Options from the Basics menu.**

   If you do not want to hear the click, uncheck both the Internal speaker and MIDI options.

2. **If you do want to hear the click, check the option you would like and, if necessary, enter the data for the MIDI click.**

   Choose the Always click option.

3. **Click OK to confirm your choices.**

4. **Select Click from the Basics menu to enable the click.**

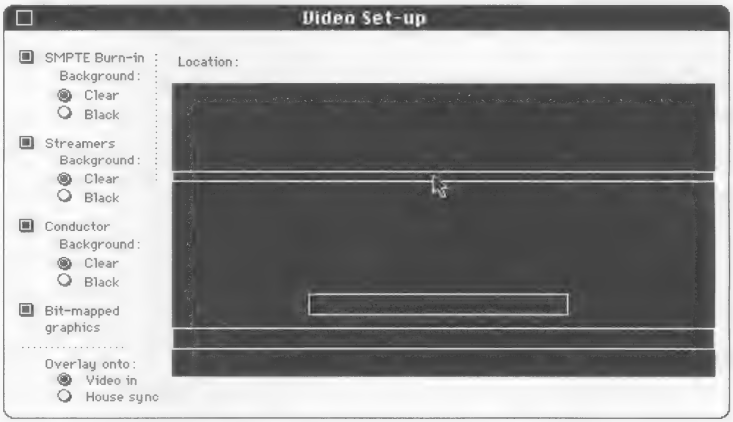
   The Click menu item will become checked.

To display the Conductor Crawl line:

1. **Choose Video Time Piece from the Apple menu to open the VTP DA.**

2. **Choose Video Setup from the VTP menu.**

   The Video Setup window will appear.



3. **Check the Conductor option.**

   You can choose a clear or black background for it, and you can adjust its position on the video screen by dragging the crawl line display up or down in the Video Setup window.

4. **To turn off the Conductor Crawl Line, simply uncheck the option or turn off Performer's click.**

Converting a Click Track into a Tempo Map

With the Video Time Piece, you can convert an audio click track into a MIDI event. This allows you to convert the click track into a tempo map in a Performer sequence's Conductor track. You can even record the tempo map while Performer's time base is referenced to SMPTE time code, allowing you to accurately synchronize a Performer sequence to prerecorded music.

Before attempting to convert the click track into a tempo map, make sure that the Video Time Piece is successfully converting the audio click into MIDI data and transmitting the data to Performer and the Macintosh.

Verifying Incoming MIDI Clicks with the MIDI Monitor

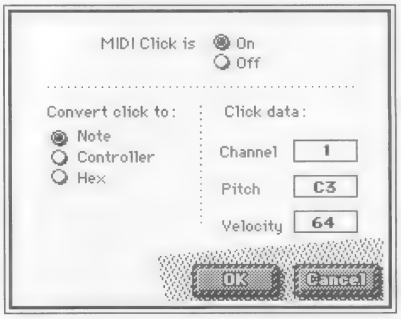
To verify incoming MIDI clicks from the Video Time Piece:

1. **Make sure that an audio cable is plugged into the CLICK IN phone jack on the rear panel of the Video Time Piece.**

2. **Choose Video Time Piece from the Apple menu to open the VTP DA.**

3. **Choose Set Click to MIDI from the VTP menu.**

   The Click to MIDI dialog box will appear.



4. **Choose the MIDI data type and parameters for the MIDI click.**

   Most of the time, any event will do, such as a note like C3.

5. **Click OK to Confirm your choice.**

6. **Roll the tape.**

   When the CLICK light on the Video Time Piece indicates that the click is being received, the COMPUTER OUT LED should begin to blink, indicating that the Video Time Piece is sending the MIDI click event to the Macintosh and Performer.

7. **Open Performer's MIDI Monitor window.**

8. **A channel light (and cable light with the MTP) will flash if the MIDI click is being successfully received by Performer.**

   If none of the channel lights flash, check your connections and try again.

Setting Up Tap Tempo

The next step is to set up the Tap Tempo options in the Receive Sync dialog box.

1. **Choose Receive Sync from the Basics menu and select the Tap Tempo option.**

2. **Choose Video Time Piece from the device pop-up menu.**

3. **Press the tab key to move to the Event parameter and play in the MIDI click event by simply rolling the tape.**

   Since you have already successfully set up the MIDI click in the previous section, as soon as you roll the tape, Performer will receive the MIDI click event from the Video Time Piece and enter the proper value in the Event box.

4. **Type in the number of countoff beats.**

   Be sure to type in the same number of countoff beats as there are on the click track on tape.

5. **If you do not need to synchronize the sequence containing the resulting tempo map to the tape with the audio click track, choose the Internal clock option.**

6. **If, later on, you will be synchronizing the sequencing containing the resulting tempo map to the tape with the audio click track, choose the External time code option and check the Capture start time box.**

   These options tell Performer to reference your clicks to time code while it is recording the tempo map. By doing so, Performer will then be able to accurately synchronize the resulting tempo map with the tape.

7. **Click OK to confirm your choices.**

Checking Tap Tempo

Before recording anything, check to make sure Performer will follow the MIDI clicks sent by the Video Time Piece.

1. **Choose Slave to external sync from the Basics menu.**
2. **Press the Play button.**
3. **Roll the tape.**

   After a few bars or so of countoff click, the sequence will begin to play back, following the clicks on tape. If not, check the MIDI Monitor window to make sure Performer is receiving the MIDI click. Also check the Tap Tempo options in the Receive Sync dialog.

4. **Stop the tape and rewind it to the beginning of the cue.**

You are now ready to record the tempo map.

Recording the Tempo Map

If you will be synchronizing the sequence containing the new tempo map to the click track using SMPTE time code, make sure that you:

- already have SMPTE time code recorded on one track and the click recorded on another
- already have Performer and the Video Time Piece set up for SMPTE synchronization *such that when you roll the tape, Performer is receiving both the MIDI click and Direct Time Lock (or MIDI Time Code) at the same time*
- have selected the *External time code* and *Capture start time* options in the Receive Sync dialog box

☛ Please note: if you want to be able to synchronize the sequence to the click track via SMPTE, it is absolutely necessary that Performer is receiving both the MIDI click and either DTL or MTC when you record the tempo map.

To record the tempo map:

1. **Record-enable the Conductor track in the Tracks window.**
2. **Press the Record button in the main transport controls.**
3. **Roll the tape.**

   If you chose the Capture start time option and are referenced to time code, Performer will remember the exact SMPTE frame of the tap that is the first downbeat and automatically remember to start the sequence at that SMPTE frame when you lock the sequence to SMPTE afterwards.

4. **When you are finished recording, stop the tape.**

   Performer may take a few moments to process the new tempo data.

You now have a new tempo map the matches the click track on tape.

Locking the Recorded Tempo Map to Tape

If you recorded the tempo map referenced to time code, you can now lock the sequence to tape. Just choose the Direct Time Lock (or MIDI Time Code) option in the Receive Sync dialog box, make sure the Metronome is under Conductor track tempo control, and roll the tape. The Capture start time option automatically sets the Chunk SMPTE start time, so the first downbeat of the sequence should occur at exactly the first click downbeat (not including countoff beats, of course).

Preventing Dropouts While Slaved to SMPTE

The Video Time Piece has an adjustable freewheeling feature. When a SMPTE reader such as the Video Time Piece encounters a drop-out —a series of missing or unreadable frames—in the SMPTE time code, it "freewheels" past them, pretending that they were not missing and briefly generating its own code to make up for the missing frames.

Most converters will freewheel for only up to 3 or 4 frames. The Video Time Piece can freewheel from 0 frames up to 127 frames (over 4 seconds). This allows it to maintain lockup with Performer over even the most pernicious SMPTE drop outs.

If you encounter a time code drop out while slaving Performer to tape with the Video Time Piece, try increasing the freewheel amount in the Convert SMPTE window. The default value is 4 frames. Try adding a few frames at a time when adjusting the amount.

Chapter 42 *Tap Tempo While Slaved To Tape*

Tapping to Prerecorded Music on Tape

You can use Tap Tempo to record a tempo map while Performer 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 Mark of the Unicorn's Video Time Piece™. For more information, please refer to the chapter called *Performer and the Video Time Piece.*

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 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, simply sync Performer to the tape in the fashion that you normally do with Direct Time Lock (DTL), Direct Time Lock Enhanced (DTLe) or MIDI Time Code (MTC). If you have never synchronized Performer to SMPTE, now is a good time review the *Receive Sync* chapter. (Please note that you must synchronize to tape via MIDI Time Code or *Enhanced* Direct Time Lock.)

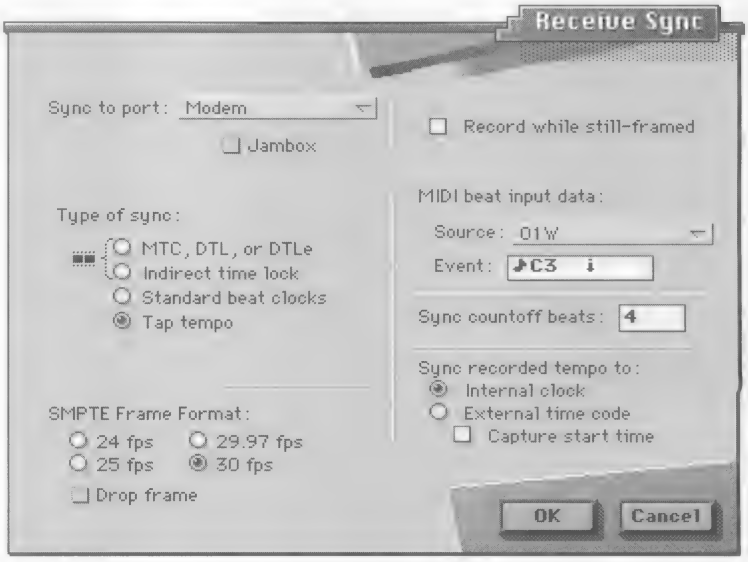
Once you have set up SMPTE sync, set up Tap Tempo. To do so, simply follow the directions in the *Receive Sync* chapter called *Setting Up Tap Tempo.* Test it to be sure that when you tap, Performer does indeed follow your taps. This will ensure that you have the proper channel and event for Tap Tempo 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.

Tapping Tempo While Referenced to Tape

Once you have made these preparations, you are ready to begin. To Tap Tempo to prerecorded music on tape:

1. **Open the Receive Sync dialog box from the Basics menu.**



2. **Set the Sync to port option to the port that will be receiving the SMPTE sync data from tape.**

   For example, if your SMPTE-to-MIDI converter is sending Enhanced Direct Time Lock to the modem port, select the modem port. (If the converter does not send Direct Time Lock or Direct Time Lock enhanced, use MIDI Time Code instead.)

3. **Select the Tap Tempo option.**

   The tap event can be received from any controller device on either serial port.

4. **Type in a number of countoff beats.**

   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 bar of countoff, tap along for the second bar, 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. **Enter the beat input data.**

6. **Select the External time code option.**

   Performer will now reference your taps to incoming DTL, DTLe, or MTC.

7. **Select the Capture start time option.**

   This option makes Performer remember the exact SMPTE frame of your first tap (excluding the countoff beats) so the sequence will start at the correct SMPTE time.

8. **Click OK to confirm your choices and close the dialog box.**

9. **Record-enable the Conductor Track.**

10. **Choose Slave to External Sync from the Basics menu.**

11. **Press the Record button in the main transport controls.**

12. **Get ready to tap, and roll the tape.**

13. **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 automatically remembers the exact SMPTE time of your tap on the first downbeat of the sequence and saves it as the Chunk start time. When you later slave the sequence to tape, Performer will automatically start the sequence at the correct SMPTE time.

14. Tap along with the music as accurately as you can.

Remember that synchronization later on will only be as accurate as the accuracy with which you tap in this procedure.

15. To end recording, press the Stop button in the main transport controls.

Don't be alarmed if the Macintosh wristwatch icon remains onscreen for an extended period of time after you stop recording. Performer 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 to the tape using your usual method of synchronization, such as Direct Time Lock or MIDI Time Code, in the Receive Sync dialog box. 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 sequence will exactly reproduce your tapping performance with respect to the music on tape. If you tapped accurately, Performer will play along accurately. If you goofed, so will Performer. You can always try again.

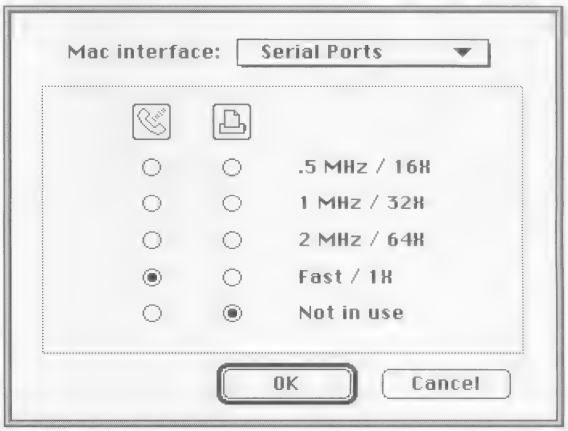
Chapter 43 *Printing*

This chapter explains how to:

- Print out the contents of a Performer list window, such as the Event List, Tracks, Markers, Chunks, and Remote Controls windows.
- Print one or more tracks as music notation and display the results on the computer screen or print them on a printer
- Customize the page layout for notation printing
- Get best-looking results when printing notation

Checking your serial ports before you print

Before you print anything—either a list window or notation, consider which Macintosh serial port you will be using for printing. To check the status of the serial ports, choose Interface Settings from the Basics menu. These settings reflect your current FreeMIDI studio configuration.



In the example above, the printer port is "Not in Use", which means that it is OK to print if your printer is connected to it. If your printer is connected to modem port in this example, you'd need to change the way the serial ports are set up for MIDI.

Using MIDI on one port and printing on the other

If you plan to do a lot of printing from Performer, your best bet is to use one serial port for MIDI and the other for printing as shown above. Affordable multi-port MIDI interfaces such as Mark of the Unicorn's MIDI Express and MIDI Time Piece II provide a convenient connection for all of your MIDI gear through one Macintosh serial port.

Printing when you use MIDI on both serial ports

Depending on your MIDI setup, you may require MIDI on both serial ports. For example, you may have a large MIDI rig that requires multi-port interfaces connected both serial ports, or you may have an old MIDI interface that calls for using both ports. In either case, you probably have your printer connected to a "thru" port on the interface. When you want to print something, you press a "thru" switch to temporarily suspend MIDI and allow printing.

In this scenario, MIDI activity must be temporarily suspended on the serial port being used for MIDI. Use the Interface Settings command in the Basics menu to temporarily set the port to *No Interface* while printing.

Printing the Contents of a List Window

To print the contents of a track's Event List window, the Tracks Window, the Markers Window, the Chunks list window, or the Remote Controls window:

1. **Bring the window you want to print to the front to make it the active window.**

   To do so, click its title bar or choose its name from the Windows menu.

2. **Open the Chooser from the Apple menu and select the desired printer and serial port.**

   See "Checking your serial ports before you print" on page 665.

3. **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%.

4. **Choose Print from the File menu.**

   The standard print setup dialog box appears for your printer.

5. **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 is easy, as you'll see in the following sections. Performer 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. **Open the Chooser from the Apple menu and select the desired printer and serial port.**

   See "Checking your serial ports before you print" on page 665.

2. **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%.

3. **Select the data or the region of data that you would like to print using any method of selection that you prefer.**

   Performer is extremely flexible because you can use any one of Performer's many ways to select data—from a single note to the entire piece. You can select any portion of a track, or any portion of multiple tracks. See "Choosing what tracks to display" on page 347 for more information.

4. **Click the QuickScribe notation editing window button in the Consolidated Controls window.**

   A window appears containing staves for the 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 23, "QuickScribe Notation".

5. **Use the QuickScribe window mini-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 23, "QuickScribe Notation".

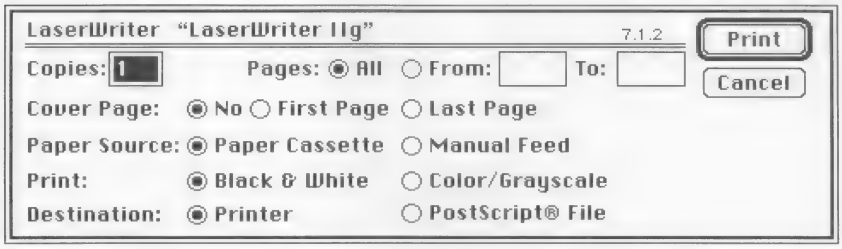
Formatting command:	Brief description:
Score Options (Mini-menu)	Provides control for title page, staff names, measure numbering and spacing, and staff spacing.
Page Margins (Mini-menu)	Lets you adjust top, bottom, left, and right page margins.

6. **Add text as desired with the text tools in the Tools palette.**

   See "Working with text" on page 367 for more information.

7. **Choose Print from the File menu.**

   The standard print setup dialog box appears for your printer. For example, if you are printing with an Apple LaserWriter in System 7, you'll see the window below:



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

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

Chapter 44 Using Performer With Unisyn

What is Unisyn?

Unisyn is Mark of the Unicorn's state-of-the-art editor librarian software. Unisyn provides you with a complete MIDI sound management environment, coupled with powerful tools for creating and editing sounds.

How Are Unisyn and Performer Integrated?

Unisyn and Performer are both FreeMIDI compatible applications. As a result, they are integrated with one another through FreeMIDI in the following ways:

- FreeMIDI allows Performer to play back a sequence in the background when you switch into Unisyn under System 7 (or MultiFinder in System 6) to audition patches, edit a patch, or perform any other task in Unisyn.
- While you are working in Unisyn, you can start, stop, and play a Performer sequence without ever leaving Unisyn.
- Unisyn keeps all of the FreeMIDI patch lists completely up to date. In turn, FreeMIDI shares the patch lists with Performer and all other FreeMIDI compatible applications. These patch lists show up through Performer, most notably in the Tracks window default patch and current patch columns.

Integration Happens Automatically

With FreeMIDI installed in your system, all of the integration features above happen automatically as you use Performer and Unisyn. No additional effort is required on your part.

Selecting Sounds

With Performer and Unisyn working together, you have many choices for how to select sounds in your sequences. In general, they fall into two general approaches:

1. Using patch change events in Performer
2. Using Unisyn for general sound management

Using Patch Change Events in Performer

These approaches are discussed in the following sections. Which approach you will use depends on how you work. These considerations are also discussed.

One way to select sounds is to choose them by name from Performer's patch list pop-up menus. For example, you can select a default patch for each track in the Performer's Tracks window. When you play the sequence from the beginning, the default patch gets transmitted to the synth to recall the patch before music begins playing. You can also insert (or record) patch change events in the sequence's tracks to change sounds during playback.

The critical concept with this approach is that you are dealing with MIDI patch change events, which are MIDI events numbered from zero to 127. Unisyn provides names so that you can conveniently refer to them by name, rather than by number.

When managing sounds in this fashion in Performer, Unisyn serves two purposes:

1. To provide Performer with accurate names in the patch lists—that is, names of patches that are currently in the synth. For example, if you send a bank to a synth from Unisyn, the patch names from that bank will be displayed in Performer's patch lists. If you then send a different bank to the synth, Unisyn updates Performer's patch lists to the patches in the new bank.

2. To save the current bank in each synth in a performance so that this same bank can be restored when you work on the sequence at a later time.

If you don't save the current banks as a performance in Unisyn, you have no easy way to restore the banks if you need to work on the sequence at a later date. If you don't restore the patch banks, the patch lists in Performer may not be the ones you originally used, and your default patch selections, as well as patch changes you've inserted in tracks, won't recall the correct sounds.

Advantages

As you can see, the integrity of this approach depends on having the correct banks of sounds loaded in the synth. If you don't change banks in your synths, handling sounds in this manner works very well, and the only role Unisyn plays is to provide accurate factory

preset patch lists. This is the easiest way to handle sound selection because everything is done in Performer alone. Once Unisyn has provided the patch lists, you don't even need to run it when using Performer.

If you do change banks in your synths, this approach still works fine. But be absolutely sure to save the banks to disk in Unisyn and include them in the performance that you create for the sequence. This technique is described further in "Using Unisyn for General Sound Management" on page 674.

Of course, if you know you'll never be working on the project again, and you will never need to recall the sound setup, you certainly don't need to save a Unisyn performance.

Disadvantages

When you select a patch from Performer's patch list pop-up menu, sometimes what you selected won't be what you hear. This is because many synths have more than one "mode", e.g. "multi" and "voice" mode, which have a dramatic effect on what happens when you send a patch change to the synth from Performer. If the synth is not in the right mode, you won't get the patch you expect. You must learn enough about your synths to choose the necessary mode, either from its front panel controls or by selecting the appropriate module in Unisyn's Modules window (depending on the synth). Refer to the synth's documentation for clues.

Another drawback to this method is that you are limited to the zero through 127 range of patch changes allowed by MIDI, which, for most synths, only select RAM sounds. New synths support a new MIDI command called *bank select*, which provides direct access to many more ROM sounds; however, if a synth is more than about a year old, it won't support bank select. As a result, you are forced to go through considerable gymnastics in the synth to have access to all your patches via MIDI patch change events.

In general, if a synth has many ROM sounds, you will have an easier time selecting sounds for it with Unisyn rather than with patch lists in Performer.

Patch Maps

Some synths, such as the E-mu Proteus, address the 128-patch limitation by providing a "patch map" which lets you choose from a larger set of sounds. However, Unisyn doesn't take patch mapping

into consideration when providing patch lists to Performer, so once again you are left with a situation where the patch you select in Performer won't be the one you hear from the synth.

Unisyn sets up Performer's patch list so that the first patch in the list always selects the first patch in Unisyn's bank window, the second selects the second patch, etc. If your synth has a programmable patch map, it should be permanently set to correspond in this fashion. If you need to access patches that are not available via the program change table, use Unisyn to copy them into RAM locations that are available via the program change table. If you employ this technique, the patch list in Performer should show the correct name.

> ☛ The E-mu Proteus 1,2, or 3 are exceptions. Patch 0 in Performer's patch list selects ROM preset 000. Patch 64 in Performer's patch list selection RAM preset 064, patch 65 selects RAM present 065, etc. (This exception does not apply to the Proteus XR.)

Updating Unisyn

In general, Unisyn keeps Performer completely updated as far as what patches are available in your synths. Performer's patch menus should always reflect the sounds currently available via patch changes sent from Performer.

On the other hand, Performer doesn't have the same powerful features as Unisyn, so it cannot automatically inform Unisyn if you select a different patch from its patch list. If you make patch selections in Performer and you want Unisyn to know about them (such as to save them in a Unisyn performance), use the Get Group/All Patches command in Unisyn after you make the changes to update Unisyn. If you select patches entirely in Performer, however, there's no need to update Unisyn in this fashion, unless you need to edit a patch.

Using Unisyn for General Sound Management

Beyond its integration with Performer, Unisyn has many features of its own that serve as a powerful compliment to Performer. By following the general guidelines below, you can select all your sounds and banks via Unisyn and then save them as a Unisyn performance, which captures the entire state of your MIDI setup for the Performer sequence you are working on. You can easily recall

this setup before you begin work on the sequence at a later date. Using this approach, you can rely on Unisyn to handle most, if not all, of your sound selection needs.

☛ The tasks below are basic Unisyn procedures that you will become very familiar with as you learn Unisyn. They are explained in detail in the Unisyn manual.

Creating a Performer/ Unisyn Project

Use Performer to create your sequence, and use Unisyn to select the desired banks and patches for the sequence.

After you have set up your synths with the correct banks, and you have selected all of the appropriate sounds for the tracks in your sequence, go into Unisyn and create a performance to save them for the sequence. To keep things clear, you might want to give the performance the same name as the sequence, such as "On the Road Again/Sounds&Banks".

If you are using patch change events in the tracks of your sequence to change patches during playback, or if you used Performer's "Default Patch" feature, be sure to save the necessary banks with the performance. This ensures that the synth will have the correct bank of sounds the next time you work on the sequence.

Recalling the Project

To recall the project, load it's corresponding Unisyn Performance before you begin playing the sequence. By doing so, you load all of the correct patch banks and sounds for each module so that the sequence plays back with the correct sounds.

Advantages

Using Unisyn gives you many powerful capabilities, such as patch editing, sound libraries, and more. In terms of sound selection, you get the best of both worlds: you can select sounds using both Performer's patch changes and Unisyn's sound management features. However, you need to decide how you are going to choose default patches for each track: either by using Performer's default patch feature (in the Tracks window) or by saving patches for Unisyn's modules in a Unisyn performance file. You may find that the decision differs for each synth and depends on how you use the synth.

By using Unisyn's libraries and powerful searching features, you potentially have thousands of sounds at your fingertips, as opposed to the restricted 0-127 range imposed by MIDI patch changes.

Another great advantage is that you can easily incorporate Unisyn's patch editing capabilities into your sequencing. Does that bass patch need more snap in the attack? Just open Unisyn's Patch Edit window and tweak away. You can even do so while the sequence is playing.

Disadvantages

The only (small) price you pay for using Unisyn to its fullest potential with Performer is that there is a bit of extra housekeeping required on your part. You need to organize your files on the hard disk in a way that makes it easy for you to determine which Unisyn performance file goes with which Performer sequence file. Here's a suggestion: create a folder for the project and place the Performer sequence file and the Unisyn performance file together in the folder.

Troubleshooting

Here are a few common problems you might encounter.

You get a "Not enough memory" message when you try to run both Performer and Unisyn at the same time.

Cause: There isn't enough free RAM (random access memory) in your computer to support the memory requirements of both applications at the same. Solution: Make sure there no other applications running. Try restarting the computer and launching them again. If you still don't have enough memory, you may need to get a memory upgrade. Contact Mark of the Unicorn technical support.

You select a patch in Performer's patch list, but you don't hear the correct sound on the synth.

Cause: There could be many causes for this. One possibility is that the synth is in a mode that causes it to respond to your patch change differently than by calling up a sound. In this case, try switching into Unisyn and selecting a different module for the synth. Also, check the

MIDI channel of the device for the patch list. Is the device perhaps transmitting on a channel that the synth isn't set to receive patch changes on? Also, have you changed the patch map in the synth? If so, read "Patch Maps" on page 673.

You hear a pause during Performer's playback.

If Performer is playing back when you switch between Unisyn and Performer, you will hear a brief pause in Performer's playback. Also, if you send a bank or other data intensive operation in Unisyn while Performer is playing in the background, this can also stop playback momentarily.

You make a change to a patch in a bank in Unisyn, but the change is not reflected in Performer's patch list.

Under some circumstances, changes you make to an individual patch in the synth's current bank in Unisyn will not be immediately reflected in Performer's patch list. This includes things like changing a patch name, moving it to a different location in the bank, adding a new patch to the bank, etc. To bring Performer's patch list up to date, use the Send Bank command in Unisyn's MIDI menu, which will update Performer's patch list.

Chapter 45 MIDI Utilities

Interface Settings

The *Interface Settings* command in the Basics menu allows you to set the communication speed between Performer (actually FreeMIDI) and other MIDI hardware and software. Use the Interface Settings command to open the Interface Settings dialog box. This dialog box allows you to enable and disable the two serial ports for MIDI. If, for instance, you have a printer attached to the Thru port of your MTP II and the MTP II is connected to the Printer serial port, you will need to disable MIDI on the printer port in order to do any printing.

Edit FreeMIDI Configuration

The Edit FreeMIDI Configuration command in the Basics menu opens the FreeMIDI Setup program. Doing so lets you add, remove, and modify devices in your FreeMIDI setup. Use this command when you would like to make changes to the device list pop-up menus that appear throughout Performer.

FreeMIDI Sync

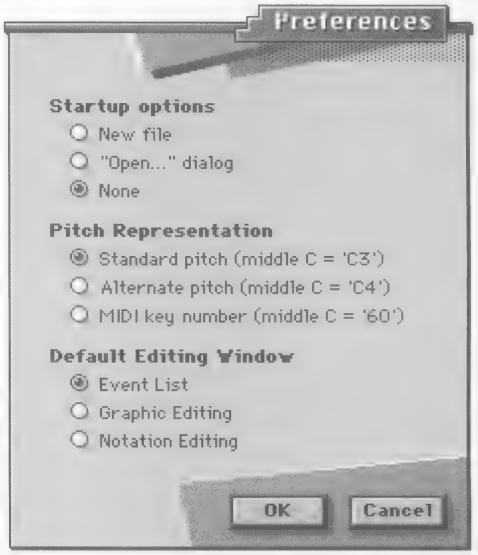
Free MIDI Sync command in the Basics menu, when checked, causes all FreeMIDI programs that are currently running to play, stop, rewind, and locate together. When you enable it in Performer, it automatically gets enabled in all other FreeMIDI programs, too. Conversely, if you enable it in any other FreeMIDI program, it gets enabled in Performer automatically. When it is checked, it is enabled; when it is unchecked, it is disabled. For complete information about this command, refer to "The Transport Controls" on page 710.

Panic

The Panic command in the Basics menu sends an *All Notes Off* MIDI message and then a *note off* MIDI message for every MIDI note on every possible MIDI channel on every MIDI output cable on both serial ports. It also resets MIDI buffers in FreeMIDI software. This command can take quite a while. If you wish to stop the operation, type command-period on your Mac keyboard.

Preferences

The Preferences command in the File menu gives you several choices for various features in Performer.



Startup options

Choose how you would like Performer to open when you first launch the application. Performer can do one of three things:

- Open a new file.
- Present you with the Open file dialog box.
- Neither of the above. In this case, no window or dialog box appears. Instead, Performer's menu bar appears at the top of the screen, and the only menu available is the File menu, from which you can choose New or Open.

Pitch Representation

Lets you choose how note octaves are numbered.

Default Editing Window

This setting determines what you get when you double-click a track. The other two windows can be opened by command-double-click and option-command-double-click.

Settings in the Preferences window are stored in the Performer Preferences file, which is automatically created in the Preferences Folder in the System Folder. They are global settings and affect all files.

Chapter 46 Using FreeMIDI Setup

This chapter explains all the major functions of the FreeMIDI Setup application.

FreeMIDI Setup is the application that you use to edit your FreeMIDI configuration or FreeMIDI System Preferences. It is the application that is launched or switched to when the *Edit FreeMIDI Configuration* command is chosen in FreeMIDI-compatible applications such as Performer, Mosaic, or Unisyn. In FreeMIDI Setup, you can edit the properties and connections of devices as well as the various settings in the FreeMIDI System, such as Inter-application MIDI and Monitor Patch Changes. You can view the current patch list for a device in a pop-up menu. You can control the Transport functions of a FreeMIDI sequencer, such as Performer. You can also use FreeMIDI Setup to test your studio connections.

The Current FreeMIDI Configuration

There is no need to make a FreeMIDI configuration "current". The configuration that is visible in the FreeMIDI Configuration window is the current configuration that all FreeMIDI applications will use. Whenever you launch FreeMIDI Setup to view or edit your FreeMIDI configuration, the configuration document with which you were last working is opened automatically. If you do not launch FreeMIDI Setup, other FreeMIDI applications will be using the FreeMIDI configuration that was last opened in FreeMIDI setup.

If you open a new or existing configuration, it will immediately become the current configuration that all FreeMIDI applications will use.

See "Working with FreeMIDI Configurations" on page 703 for information on working with multiple FreeMIDI configurations.

FreeMIDI Preferences

The FreeMIDI Preferences dialog box is where you tell FreeMIDI which serial ports you will be using for MIDI, whether you want to use Inter-application MIDI, whether FreeMIDI should monitor patch changes and whether FreeMIDI should allow non-FreeMIDI

applications to use the serial ports for MIDI. See "Launching FreeMIDI Setup" on page 46 of the *Getting Started* booklet for more information on FreeMIDI Preferences.

Quick Setup

Use the *Quick Setup* command to add and delete devices from your FreeMIDI configuration. This command is especially good to use when you need to add or delete more than one device from your configuration. Quick Setup can also shorten the process of connecting devices to interfaces, since the connections can be specified before the devices appear in the FreeMIDI Configuration window and then automatically appear when the setup is completed.

Auto Config

The Quick Setup dialog box contains an *Auto Config* push button which opens the Auto Config dialog box. Auto Config can automatically find many of the MIDI devices in your MIDI studio. See "Configuring Your studio automatically" on page 51 of the *Getting Started* booklet for information on using Auto Config to configure FreeMIDI for your studio.

Using Quick Setup to Add FreeMIDI Devices

To use Quick Setup to add devices:

1. **Choose *Quick Setup* from the Configuration menu.**

   The Quick Setup dialog box appears.

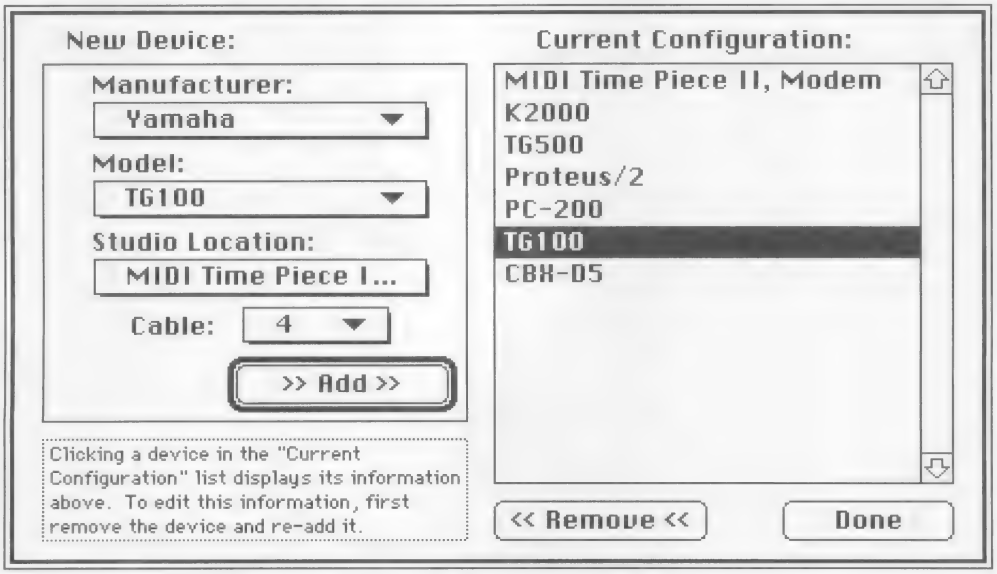


Figure 46-1: Quick Setup Dialog Box

This dialog box contains a list of all the MIDI devices that are contained in your current FreeMIDI configuration on the right side under the label *Current Configuration*.

2. **Select the correct manufacturer, model, studio location and cable (if applicable) from the pop-up menus on the left and then click *Add*.**

   If the pop-up menus do not contain a description of a particular device, choose *Other* and click *Add*. We will see how you can re-name and re-define these devices later in this manual. For now they will be called by the default name *Device-1* for the first such device, *Device-2* for the next and so on. If you accidentally add a

device to the list that you do not want to appear in your studio configuration, select its name from the list on the left and click *Remove*.

3. **When you have added all the devices to the list that you wish to add to your studio configuration, click *Done*.**

   The FreeMIDI Configuration window will appear containing all of the MIDI devices defined in the Quick Setup dialog box and their connections.

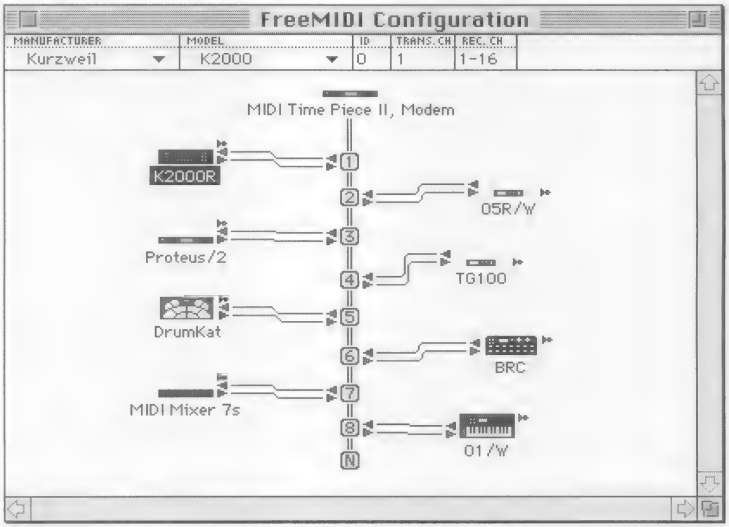


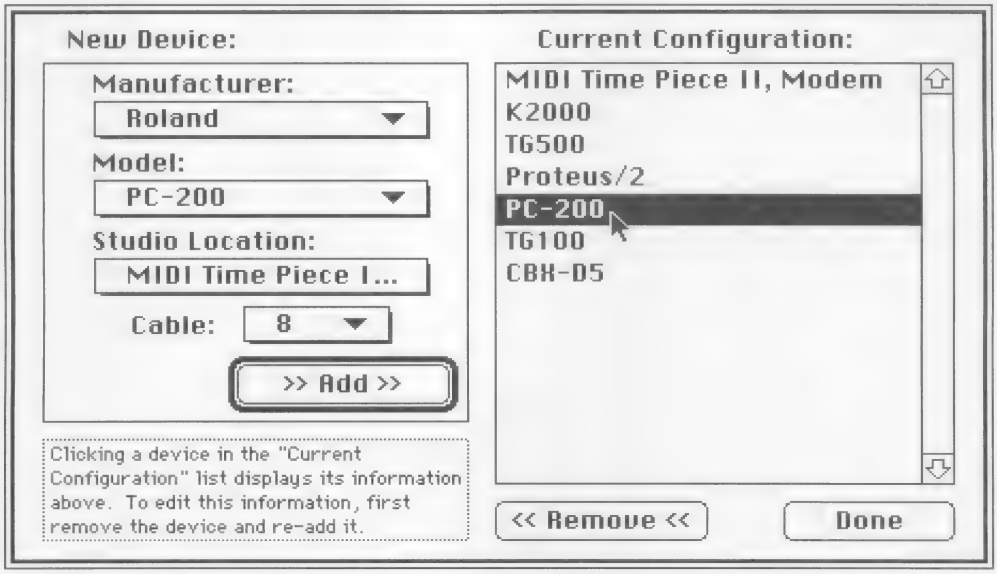
Figure 46-2: FreeMIDI Configuration Window

Using Quick Setup to Remove FreeMIDI Devices

To use Quick Setup to remove devices:

1. **Choose *Quick Setup* from the Configuration menu.**

   The Quick Setup dialog box appears.



2. **Select the device or devices you wish to remove from the *Current Configuration* list and click *Remove*.**

   The selected devices will disappear from the list.

3. **When you have finished removing devices, click *Done* to close the Quick Setup dialog box.**

   The FreeMIDI Configuration window will appear containing all of the MIDI devices defined in the Quick Setup dialog box and their connections, minus the devices which were removed.

The FreeMIDI Configuration Window

This window is where you edit your FreeMIDI Configuration. It is the window that will appear when you choose the *Edit FreeMIDI Configuration* command in other FreeMIDI applications such as Performer, Mosaic, and Unisyn.

This window contains a graphical representation of your MIDI studio. It contains MIDI interfaces, FreeMIDI devices, interface-to-device connections and an Info Bar.

Use the title bar of the window to move it as with any standard Macintosh window. Use the horizontal and vertical scroll bars to view portions of the window not currently visible as with any standard Mac window. Use the Zoom button to toggle the window between full size and its current state. Use the grow handle to change the size or shape of the window.

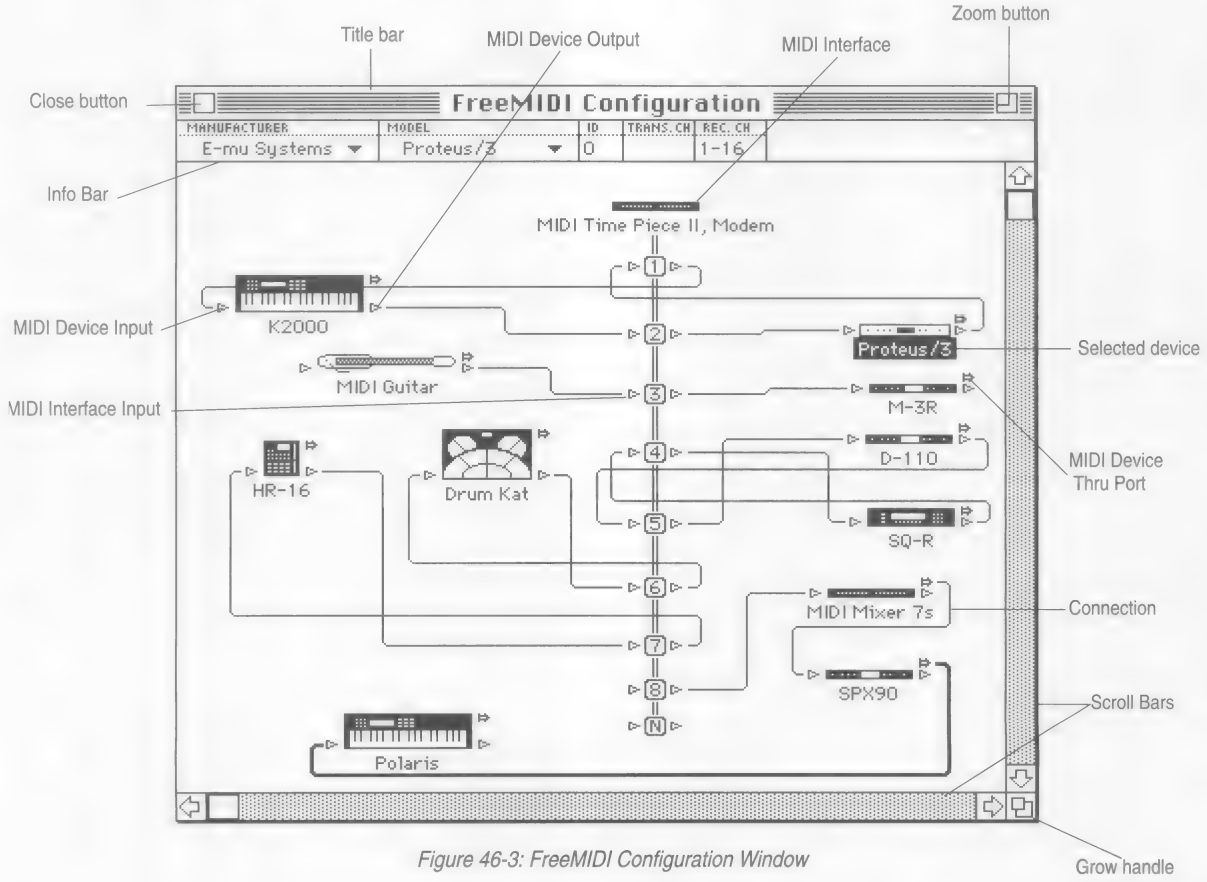


Figure 46-3: FreeMIDI Configuration Window

In the FreeMIDI Configuration window, you can view, edit, and rearrange your FreeMIDI configuration in most any way that you like.

The FreeMIDI Configuration window shows your current configuration. You can make any other previously saved configuration the current configuration simply by opening it.

Use the Quick Setup command along with the Auto Config command to quickly set up a configuration that matches your MIDI studio. For more information, see "Configuring Your studio automatically" on page 51 of the *Getting Started* booklet.

Editing Device Info in the FreeMIDI Configuration Window

You can edit some of the properties of devices that appear in your FreeMIDI configuration directly in the FreeMIDI Configuration window. The properties that you can change are the manufacturer name, model name, device ID, device name, and MIDI transmit and receive channels. See "Editing FreeMIDI Devices" on page 693 in this chapter for information on editing *all* the properties of FreeMIDI devices.

To quickly change the manufacturer, model, device ID or MIDI channel for a device:

1. **Select the device you wish to edit by clicking its icon.**

   It's device info appears in the info bar near the top of the window.

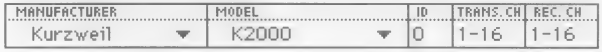


Figure 46-4: FreeMIDI Configuration window Info Bar

2. **Select a new manufacturer or model name from the appropriate pop-up menus.**

   Unless you want to leave the model name blank, you will need to change the model name for a device if you change its manufacturer.

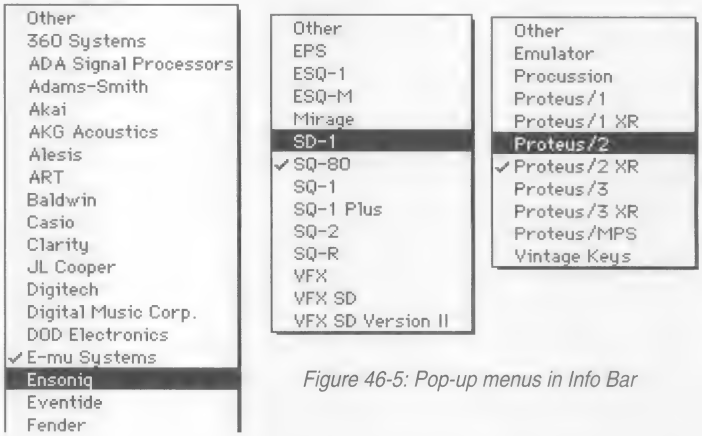


Figure 46-5: Pop-up menus in Info Bar

3. **Enter new device ID or MIDI transmit and receive channels numbers in the appropriate text entry box(es).**

   If you would like to enter consecutive MIDI channel numbers, enter the numbers like this: 1-8. If you would like to enter non-consecutive numbers, enter the numbers like this: 1,3,5,7,10.

Editing FreeMIDI Configurations

You can add, delete, edit, rename, duplicate, connect, disconnect, and rearrange FreeMIDI devices in the FreeMIDI Configuration window. Use the techniques below to add and remove devices from your FreeMIDI configuration if you only need to add or remove one device at a time. Otherwise, it is usually easier to use the Quick Setup command to add or remove multiple devices. See "Using Quick Setup to Add FreeMIDI Devices" on page 685 in this chapter for more information on using the Quick Setup command.

See "Working with FreeMIDI Configurations" on page 703 in this chapter for information on working with multiple FreeMIDI configurations.

Adding FreeMIDI Devices

To add a single FreeMIDI device to your configuration:

1. **Choose *Create Device* from the Configuration menu or type command-K on your Mac keyboard.**

   The FreeMIDI Device Specification dialog box appears. If you do not wish to add a device at this time, click *Cancel* and the FreeMIDI Configuration window reappears.

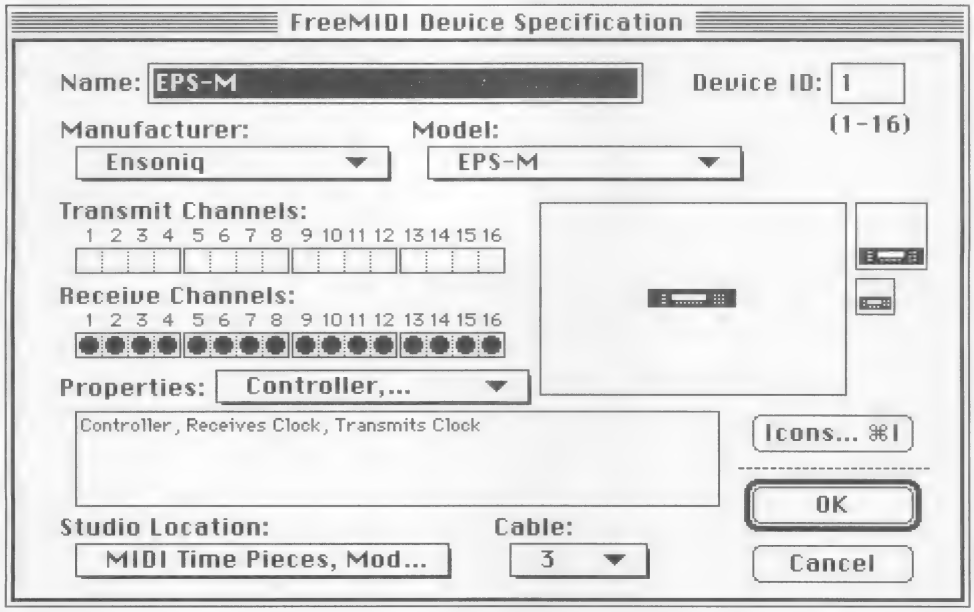


Figure 46-6: FreeMIDI Device Specification Dialog Box

2. **Select a manufacturer and model from the pop-up menus.**

   Steps 2-7 below are optional. FreeMIDI ships with default settings for each device in it's model list. These default settings appear when you select a specific model from the model pop-up menu. If you would like to change any of the settings such as the device name, ID, properties, MIDI channels or icon, proceed to steps 2-7 below. Otherwise, click OK and the new device will appear at the top of FreeMIDI Configuration window.

3. **Enter a name for the device by typing the name into the name text box.**

4. **Set a device ID number by entering a new number in the Device ID text box.**

5. **Select up to eight different Properties for the device by selecting properties from the Properties pop-up menu.**

   For more information, see "Device Properties" on page 716.

6. **Set transmit and receive channels for the device, by clicking the appropriate box(es) below the MIDI channel numbers that are displayed.**

   It is very important to set the MIDI channel information correctly, since this controls the amount of channels that appear for the device in other FreeMIDI applications such as Performer.

7. **Select an icon to represent the device in the FreeMIDI Configuration window.**

   Click *Icons* and scroll until the icon that you wish to use is displayed in the middle, bordered field and click OK. For information on entering your own icons into FreeMIDI, see chapter 49, "Editing FreeMIDI Device Files".

8. **Indicate the studio location of the device by selecting the appropriate MIDI interface and cable number from the pop-up menus provided.**

   If you don't have a multi-port MIDI interface like the MIDI Time Piece II or MIDI Express, the cable pop-up menu will not be available.

Removing FreeMIDI Devices

To remove FreeMIDI devices from your configuration:

1. **Select the device you wish to remove by clicking its icon. Shift-click device icons to select more than one device.**

2. **Type backspace or delete on your Mac keyboard or choose *Cut* or *Clear* from the Edit menu or type command-X or command-B on your Mac keyboard.**

   Any of these commands removes the selected devices.

3. **If you remove the wrong devices, choose *Undo* from the Edit menu and try again.**

Editing FreeMIDI Devices

Once FreeMIDI devices are defined and appear in your FreeMIDI configuration, you can change any of their properties with the FreeMIDI Device Specification dialog box.

To edit a FreeMIDI device:

1. **Double-click the device you wish to edit. Alternately, select the device and choose *Edit Device* from the Configuration menu or type command-E on your Mac keyboard.**

   The FreeMIDI Device Specification dialog box appears. If you select more than one device in the FreeMIDI Configuration window, the *Edit Device* menu item becomes grayed-out (disabled) since you can only edit the properties of one FreeMIDI device at a time.

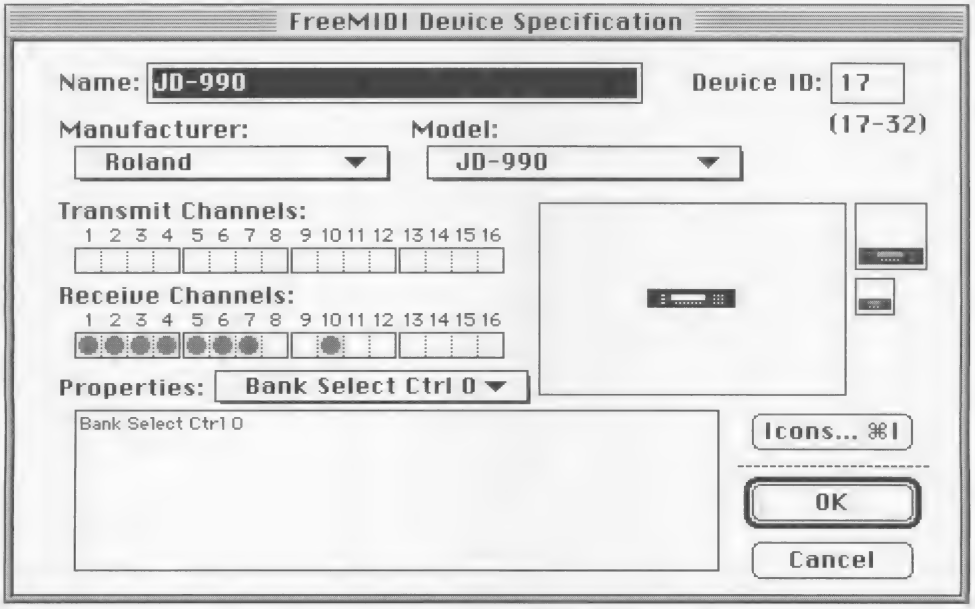


Figure 46-7: FreeMIDI Device Specification Dialog Box

2. **Make the changes you desire and click *OK* or click *Cancel* to cancel the edit operation.**

   See "Adding FreeMIDI Devices" on page 691 in this chapter for information on the various properties you can edit in this dialog box.

Naming FreeMIDI Devices

When devices are added to your FreeMIDI configuration using Quick Setup and Auto Config, they are given default names that correspond to their model names. You can easily rename these devices if you wish. See "Editing FreeMIDI Devices" on page 693 in this chapter for information on one method of changing the name of any existing FreeMIDI device with the FreeMIDI Device Specification dialog box.

An even easier way to change a FreeMIDI device name follows:

1. **Select the device by clicking its icon.**

   You can skip step 2 below by clicking the device's name directly. The mouse cursor will change to the text insertion I-beam to indicate that it is in text entry mode.

2. **Type the *Return* or *Enter* key on your Mac keyboard.**

3. **Enter a new name for the device.**

4. **Type the *Return* or *Enter* key on your Mac keyboard to confirm your choice. Alternately, you can click any where in a blank part of the FreeMIDI Configuration window to confirm the new name.**

5. **If you enter the wrong name, choose *Undo Rename* from the Edit menu and try again.**

   ☛ For users familiar with System 7, FreeMIDI's naming convention is identical to naming icons in the Finder.

Selecting FreeMIDI Devices

To select a FreeMIDI device in the FreeMIDI Configuration window, click its icon. To select more than one FreeMIDI device, shift-click each icon. To deselect a previously selected FreeMIDI device, shift-click its icon. To deselect all selected FreeMIDI devices, click in a blank area of the FreeMIDI Configuration window.

Duplicating FreeMIDI Devices

You can make copies of FreeMIDI devices in two ways. Using the *Copy* or *Cut* command along with the *Paste* command, you can make copies of devices to paste into other FreeMIDI configurations. Using the *Duplicate* command, you can make copies of devices in the current FreeMIDI configuration with one command.

To copy or cut and then paste devices:

1. **Select the device you wish to copy or cut by clicking its icon. Shift-click device icons to select more than one device.**

2. **Choose *Copy* or *Cut* from the Edit menu. Alternately, you can type command-C for Copy and command-X for Cut on your Mac keyboard.**

   Copy makes a copy of the selected items and places it on the clipboard for pasting. *Cut* makes a copy of the selected items and places it on the clipboard for pasting and removes the original selection.

3. **(Optional) If you wish to paste the devices into a different FreeMIDI configuration, close the current configuration and open a new or existing configuration.**

   For info on opening new and existing configurations see "Opening Existing FreeMIDI Configurations" on page 705 and "Creating a New FreeMIDI Configuration" on page 703 in this chapter.

4. **Choose *Paste* from the Edit menu. Alternately, you can type command-V on your Mac keyboard.**

   The pasted devices will appear in some blank portion of the FreeMIDI Configuration window.

To duplicate devices:

1. **Select the device you wish to duplicate by clicking its icon. Shift-click device icons to select more than one device.**

2. **Choose *Duplicate* from the Edit menu. Alternately, you can type command-D on your Mac keyboard.**

   The duplicated devices will appear in some blank portion of the FreeMIDI Configuration window.

Connecting Devices to Interfaces

Once you have added a FreeMIDI device to your FreeMIDI configuration, you need to connect its inputs and outputs to an interface in your configuration. FreeMIDI is unable to send or receive MIDI to or from the device unless it is connected to an interface. FreeMIDI does not require that the input and output cable of a device be the same number, but, in most cases, setting up your studio this way may be more organized and simpler to understand.

☛ Outputs are represented by small triangles that are located on the right side of devices and interface ports. Inputs are represented by small triangles that are located on the left side of devices and interface ports.

To connect a device output to an interface:

1. **Drag a "patch cord" from the output of a device to an input on an interface.**

   When you release the mouse, the connection will appear. If you have a multi-cable interface such as the MTP II or MIDI Express, be sure to connect the device output to the input to which the device is physically connected. If you are using both the modem and printer serial ports, be sure to connect the device output to the input on the interface on the serial port to which the device is physically connected.

2. **Alternately, you can drag the "patch cord" from the input of an interface to an output on the device.**

3. **If you connect the wrong ports for a device, choose *Undo Drag* from the Edit menu and try again.**

To connect a device input to an interface:

1. **Drag a "patch cord" from the input of a device to an output on an interface.**

   When you release the mouse the connection will appear. If you have a multi-cable interface such as the MTP II or MIDI Express, be sure to connect the device output to the input to which the device is physically connected. If you are using both the modem and printer serial ports, be sure to connect the device output to the input on the interface on the serial port to which the device is physically connected.

2. **Alternately, you can drag the "patch cord" from the output of an interface to an input on the device.**

3. **If you connect the wrong ports for a device, choose *Undo Drag* from the Edit menu and try again.**

Making MIDI Thru Connections

When more than one MIDI device shares a single output port from a MIDI interface, you need to connect the MIDI Thru port of the device to the input of the other device. This mirrors the physical connection that you should have between the devices.

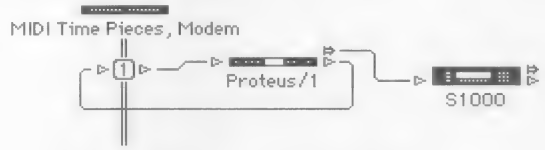


Figure 46-8:MIDI Thru Connection

Making Multiple MIDI Input Connections

FreeMIDI Setup allows you to connect more than one MIDI output from a device to a single MIDI input on an interface. When you make such a connection, you are telling FreeMIDI that both devices' MIDI outputs are connected to a single MIDI input on an interface. Without some type of MIDI merger, this type of connection is not possible.

Connecting Devices to other Devices

FreeMIDI Setup allows one connection per port (input output, or thru) on each device. You cannot connect devices to each other except from MIDI Thru to MIDI In of a separate device. If you would like to make such connections, use the Cable Routing (on MIDI Time Piece and MIDI Express interfaces) or similar features in your MIDI interface or MIDI patch bay/merger gear.

Removing Device Connections

Once you have made connections between devices and interfaces, you can remove the connections to make different connections if you physically change the connections in your MIDI studio.

To remove FreeMIDI device connections:

1. **Click at the intersection of the Device port and the patch cord and drag the connection away from the device and then release the mouse.**

   The connection is broken.

Figure 46-9: Breaking a Connection

An alternate way to remove FreeMIDI device connections follows:

1. **Select a connection by clicking it. Shift-click connections to make multiple selections simultaneously.**

   When a connection is selected, it appears as a thicker, heavier line. To deselect a connection, click somewhere in a blank area of the FreeMIDI Configuration window.

Figure 46-10: Selecting a Connec-

2. **Type backspace or delete on your Mac keyboard or choose *Cut* or *Copy* from the Edit menu or type command-X or command-B on your Mac keyboard.**

   Any of these commands will remove the selected connections.

3. **If you remove the wrong connections, choose *Undo* from the Edit menu and try again.**

Arranging the FreeMIDI Configuration window

You can arrange the FreeMIDI Configuration window any way you like. We suggest that you drag device icons so that they appear as they do in your studio. For instance, you can arrange all the modules, which are in a rack to the left of your Mac, to the left side of the window and all the modules, which are in a rack to the right of your Mac, to the right side of the window. You can drag the patch cords, which connect the devices to the interfaces, up or down so that you can view the connections clearly. You can drag MIDI ports in a multi-

cable interface, such as the MTP, MTP II or MIDI Express, up or down to create more or less space between them. You can delete input or output cables, which are not part of your studio setup, by clicking the patch cord to select it and typing the backspace or delete key on your Mac keyboard. You can also make and break connections by just dragging the ends of the patch cords. You can use the different options in the Views menu to change the size of the icons and to view input and outputs separately or together.

The Clean Up Window Command

You can use the Clean Up Window command in the Views menu to quickly arrange all the devices in the window into uniform columns.

Updating Interfaces

Interfaces are an important part of the FreeMIDI Configuration. They appear automatically when FreeMIDI scans the serial ports for MIDI interfaces. This happens the first time you set the FreeMIDI System Preferences to access one or both serial ports for MIDI. You can use the Update Interfaces command in the Configuration menu to have FreeMIDI check for MIDI interfaces that you may have installed or powered on after originally setting the Preferences file.

To do so:

1. **Choose Update Interfaces from the Configuration menu**

   The Update Interfaces dialog box appears.

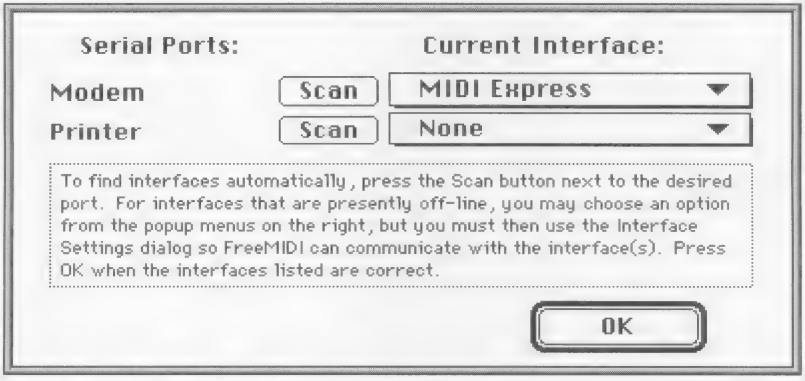


Figure 46-12: Update Interfaces dialog box

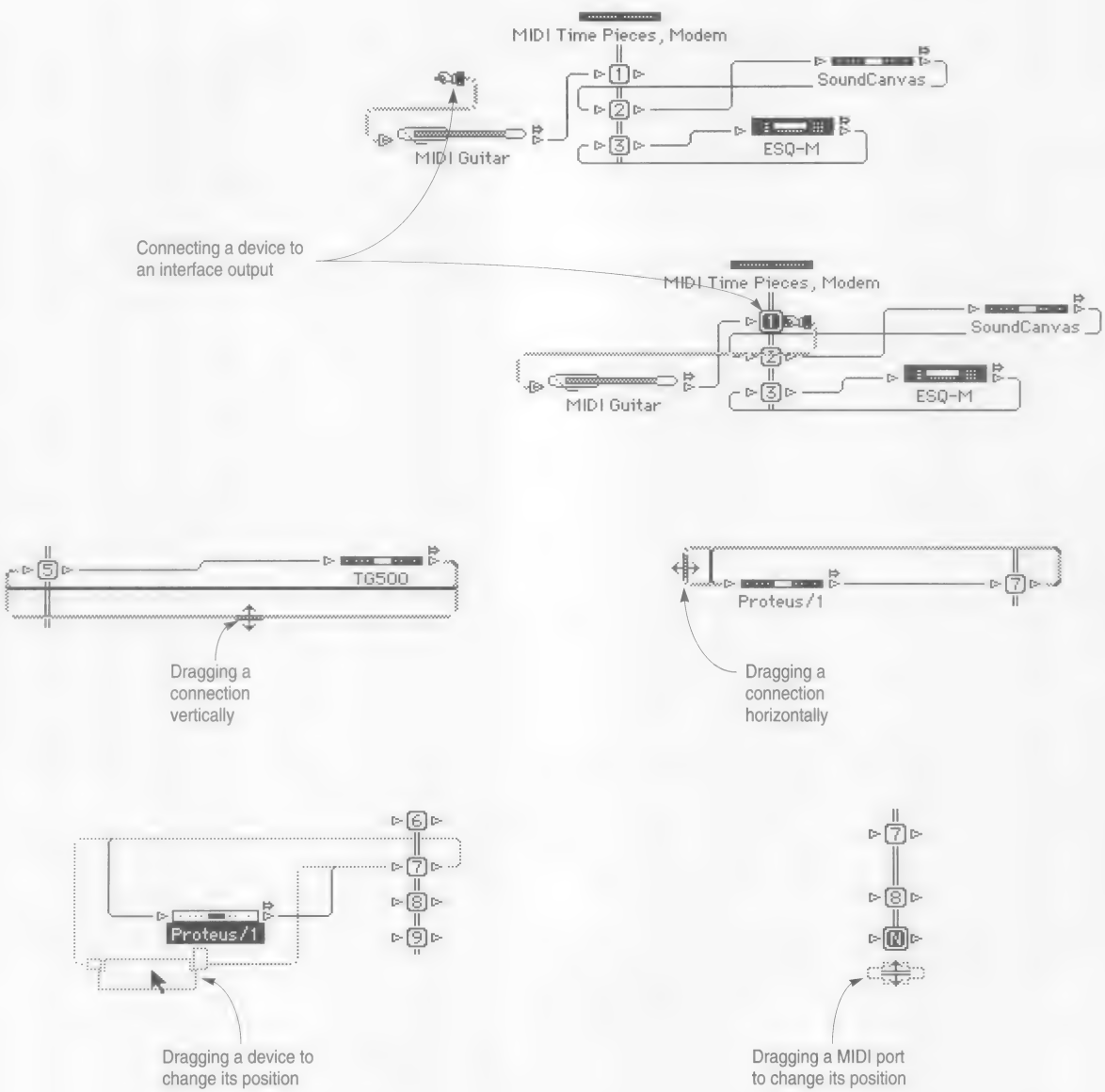


Figure 46-11: Arranging FreeMIDI devices and connections

2. **Click the Scan button for the Serial port(s) you wish FreeMIDI to search for interfaces and click OK.**

   Interfaces that FreeMIDI finds appear in the FreeMIDI Configuration window.

Adding Interfaces

You can use the Update Interfaces command in the Configuration menu to add MIDI interfaces that may currently be off-line (powered off or disconnected) to the current FreeMIDI configuration.

To do so:

1. **Choose Update Interfaces from the Configuration menu.**

   The Update Interfaces dialog box appears. See Figure 46-2 above.

2. **Sselect the interface you require from the pop-up menus and click OK.**

   The interfaces are added to your FreeMIDI configuration.

3. **Choose Interface Settings from the MIDI menu.**

   This step is essential to ensure that FreeMIDI can communicate with the newly-added interface(s). The Interface Settings dialog box appears.

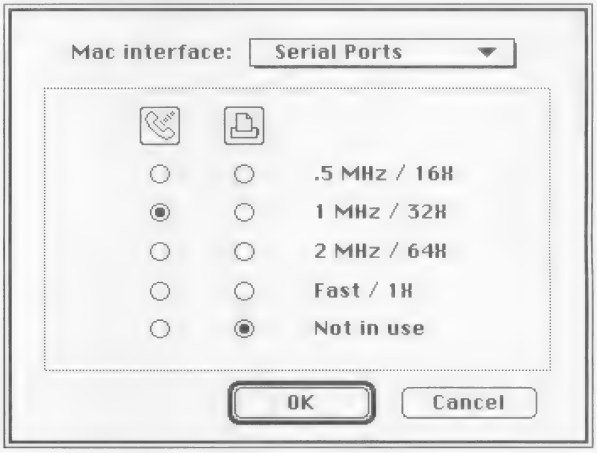


Figure 46-13:Interface Settings dialog box

4. **Select the appropriate settings for the interface(s) you have added and click OK.**

Moving FreeMIDI Interfaces

To move a FreeMIDI interface, drag its icon to the desired position. Choose *Undo Drag* command from the Edit menu to return the device icon to its original position.

You can drag the input/output ports of a MIDI interface up and down to make more room between each port by dragging the port number icon that you wish to move. Choose *Undo Drag* command from the Edit menu to return the port number icon to its original position.

Figure 46-14: Moving interface ports vertically

Editing FreeMIDI Interface Names

After a FreeMIDI interface appears in the FreeMIDI Configuration window, you can change its name. To do so:

1. **Select the FreeMIDI interface you wish to edit by clicking its icon.**

   It's info appears in the info bar. If you clicked the interface icon's name, the mouse cursor changes to a text insertion I-beam and you can enter a new name by just typing. If you did not click the icon name, you can still edit the name by typing the *Return* key on your Mac keyboard and the name will pop-up for editing and the mouse cursor changes to a text insertion I-beam when it is over the icon name. If you are familiar with System 7, this naming convention works identically to the Finder in System 7.

Working with FreeMIDI Configurations

We call the documents created by the FreeMIDI Setup application "FreeMIDI configurations". When FreeMIDI Setup is open, the FreeMIDI Setup document that is currently open and whose FreeMIDI configuration is visible in the FreeMIDI Configuration window is the current configuration that all FreeMIDI applications use. Whenever you launch FreeMIDI Setup to view or edit your FreeMIDI configuration, the configuration document with which you were last working is opened automatically. If you do not launch FreeMIDI Setup, other FreeMIDI applications use the FreeMIDI configuration that was last opened in FreeMIDI Setup.

If you open a new or existing configuration, it will immediately become the current configuration that all FreeMIDI applications use.

Creating a New FreeMIDI Configuration

Although only one FreeMIDI configuration can be current or active at a time, you can create as many FreeMIDI configurations as you like. Once you have created a FreeMIDI configuration for your own MIDI studio, you might want to create a FreeMIDI configuration for another studio that you might be working at in the future or you might want to create several variations of your home studio for different situations.

To create a new FreeMIDI configuration:

1. **If you have not done so already, open FreeMIDI Setup by double-clicking its icon in the Finder. Alternately, you can open FreeMIDI setup by choosing the *Edit FreeMIDI Configuration* command in any other FreeMIDI application.**

   The FreeMIDI Configuration window opens and displays the current FreeMIDI configuration.

2. **Choose *New* from the File menu or type command-N on your Mac keyboard.**

   If you have made changes to the current configuration and have not yet saved them, FreeMIDI Setup will ask if you would like to save these changes before the new configuration opens.

3. **The Update Interfaces dialog box appears.**

   This dialog is shown in Figure 46-12 on page 699.

4. **If you have an interface connected, click Scan on the port it is connected to.**

5. **If you don't have an interface connected at the moment, choose an interface from the pop-up menu and click OK.**

   You now see a new, window with the interface you just found (or chose by hand).

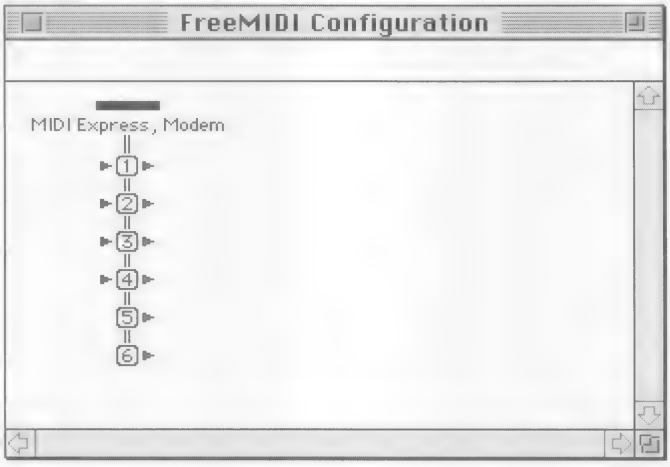


Figure 46-15: New FreeMIDI Configuration

6. **Use Quick Setup or Auto Config to add and connect devices to the interface in this new FreeMIDI configuration. Alternately, you can add devices to the configuration individually by choosing *Create Device* from the Configuration menu.**

   For more information on adding and connecting devices in this new FreeMIDI configuration, see "Quick Setup" on page 684, "Auto Config" on page 684, and "Editing FreeMIDI Configurations" on page 690 in this chapter.

You now have a FreeMIDI configuration that can be used in the studio for which it was designed. See "Saving FreeMIDI Configurations" on page 705 for information on how to save this configuration to disk so that you can open it when you start work in the studio for which it was designed.

Opening Existing FreeMIDI Configurations

Once you have saved more than one FreeMIDI configuration to disk, you can open any existing configuration for use in a situation such as starting a project in another MIDI studio.

To open an existing configuration:

1. **If you have not done so already, open FreeMIDI Setup by double-clicking its icon in the Finder. Alternately, you can open FreeMIDI setup by choosing the *Edit FreeMIDI Configuration* command in any other FreeMIDI application.**

   The FreeMIDI Configuration window opens and displays the current FreeMIDI configuration.

2. **Choose *Open* from the File menu. Alternately, you can type command-O on your Mac keyboard.**

   If you have made changes to the current configuration and have not yet saved them, FreeMIDI asks if you would like to save these changes before another configuration opens. Otherwise, a standard Macintosh File Open dialog box opens.

3. **Select the FreeMIDI configuration that you would like to open and click *Open* or click *Cancel* to leave the current FreeMIDI configuration open.**

   The selected configuration opens and you can proceed to use this configuration in your other FreeMIDI applications. Use the directory pop-up menu to navigate to a disk and folder in which the configuration you wish to open is located. See your Macintosh owner's manual for more information on saving files and navigating to disk and folders.

Saving FreeMIDI Configurations

You can save each FreeMIDI configuration that you create to disk so that you can recall them at a later date.

To save a FreeMIDI configuration:

1. **Choose Save from the File menu. Alternately, you can type command-S on your Mac keyboard.**

   If the configuration has been saved before, it replaces the current version of the configuration. If there are no changes since the last time the configuration was saved, the Save menu item is disabled (grayed-out) in the File menu. If the configuration has never been saved before, a standard Macintosh File Save dialog box opens.

2. **Use the suggested name "FreeMIDI Configuration" or enter another name for your configuration if you like, and click *Save* or click *Cancel* to cancel the operation.**

   Use the directory pop-up menu to navigate to a disk and folder in which you wish to save this configuration. If you like, you can use the New Folder button to create a new folder in which to save this configuration and others that you might create in the future. See your Macintosh owner's manual for more information on saving files and navigating to disk and folders.

The configuration is now safely saved and you can recall it at a later date.

Popup Patch Lists

Librarian applications, such as Unisyn or PatchList Manager, which support FreeMIDI's patch lists, can be used to define patch lists for your FreeMIDI devices. You can view the patch lists assigned to FreeMIDI devices and send patch changes to their default channels directly in the FreeMIDI Setup application. For more information on how to define patch lists for a FreeMIDI device, consult your Librarian software's users manual. If you use the PatchList Manager, this information is in chapter 48, "Using PatchList Manager".

To view and send patch changes in the FreeMIDI Setup application:

1. **Check to be sure that the Popup Patchlists menu item in the MIDI menu is enabled.**

   The Popup Patchlists command should have a check next to its name. If it does not, choose it to select it.

2. **Press the mouse on a device in the FreeMIDI Configuration window and its current patch list appears in pop-up menu.**

   Figure 46-2 below shows a portion of an Ensoniq ESQ-M popup patch list.

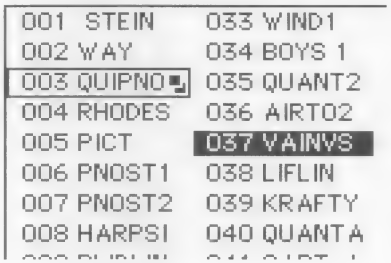


Figure 46-16: Popup Patchlist

3. **(Optional) If you want to send a patch change command to the device whose patch list you are viewing, choose the patch you want to send and release the mouse.**

   The patch change will be sent to the device on its default channel.

Patch Thru

The PatchThru command lets you send MIDI data from one FreeMIDI device to any selected FreeMIDI device while FreeMIDI Setup is the current application.

Audition Channels

Before using PatchThru, be sure to set the Audition Channels the way you need them.

To do so:

1. **Choose *Audition Channels* from the MIDI menu.**

   The Audition Channels dialog box appears.

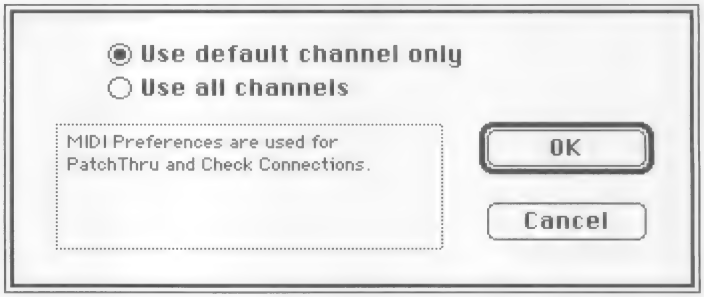


Figure 46-17: Audition Channels Dialog Box

2. **Select one of the two options available.**

   The *Use default channel only* option is the default setting. With this setting PatchThru sends all incoming MIDI data to the selected device on the first available MIDI receive channel for that device. The *Use all channels* option will cause PatchThru to send all incoming MIDI data to the selected device on all of the selected device's MIDI receive channels at once. This option is mostly useful for detecting to which channels a device is currently responding.

3. **Click *OK* to confirm your choice or *Cancel* to leave the Audition Channels settings unchanged.**

Using PatchThru

PatchThru is a checkable menu item. This means that its state (on or off) is toggled each time you choose it from the menu. When there is a check next to the PatchThru menu item in the MIDI menu, PatchThru is enabled.

To use PatchThru:

1. **Check to be sure that the PatchThru menu item in the MIDI menu is enabled.**

   The PatchThru command should have a check next to its name. If it does not, choose it to select it. You can also use the Mac keyboard shortcut to toggle the state of PatchThru by typing command-T.

2. **Select a device and play notes on your MIDI controller keyboard.**

   You should hear the notes being played coming from the device that is selected.

   ☛ You can only patch thru to one device at a time. To Patch Thru to more than one device, use Multi-record mode in Performer or cable routing in the MTP, MTP II or MIDI Express.

MidiLocate

MidiLocate is a unique feature designed to make adding devices to your FreeMIDI configuration easier. In this mode, FreeMIDI automatically determines the proper input cable to which a device is physically attached and then displays this connection in the FreeMIDI Configuration window.

MidiLocate is a checkable menu item. This means that its state (on or off) is toggled each time you choose it from the menu. When there is a check next to the MidiLocate menu item in the MIDI menu, MidiLocate is enabled.

To use MidiLocate:

1. **Select a FreeMIDI device in the FreeMIDI Configuration window.**

2. **Check to be sure that MidiLocate menu item in the MIDI menu is enabled.**

   The MidiLocate command should have a check next to its name. If it does not, choose it to select it. You can also use the Mac keyboard shortcut to toggle the state of MidiLocate by typing command-L.

3. **Play some MIDI data from the MIDI device.**

   FreeMIDI will determine from where the MIDI data is coming and redraw the FreeMIDI Configuration window to indicate the appropriate connection.

Here is an example of MidiLocate in action. Let's say you have a Kurzweil K2000 that is connected to some MIDI input on your MTP II, but you are not sure which input:

1. **Add a K2000 FreeMIDI device your configuration using *Quick Setup* or *Create Device*.**
2. **Enable MidiLocate.**
3. **Select the K2000 device.**
4. **Play some notes on its keyboard or send some other MIDI data from it and the K2000 device automatically is connected to the correct MIDI input port on your MTP II in the FreeMIDI Configuration window.**

The Transport Controls

The Transport Controls window contains buttons that can control the transport functions (Play, Stop, Rewind, Locate) of other FreeMIDI applications from within FreeMIDI Setup. For instance, you might want to start a sequence playing in Performer while you are working on some aspect of your FreeMIDI setup. You do so by opening the Transport Controls window, enabling FreeMIDI Sync, and clicking Play. With this feature, there is no need to switch to Performer.

> ☛ Playing MIDI in the background using the transport controls only functions when FreeMIDI Preference's Software Compatibility is set to allow *FreeMIDI applications only*. For more information, see "Launching FreeMIDI Setup" on page 46.

Once FreeMIDI Sync is enabled you can also stop Performer, rewind the sequence, or locate to up to 8 predefined positions within the sequence directly from FreeMIDI Setup.

FreeMIDI Sync can be enabled from any FreeMIDI application that is currently open and that supports this feature of FreeMIDI. In Performer, this command is in the Basics menu. When you enable FreeMIDI Sync in any open FreeMIDI application, it is enabled for all FreeMIDI applications on that Macintosh.

☛ The state of FreeMIDI Sync (ON or OFF) cannot be changed while a FreeMIDI application such as Performer is playing.

To use the Transport Controls:

1. **Choose *Transport Controls* from the MIDI Menu or type command- = on your Mac keyboard.**

   The Transport Controls window appears.

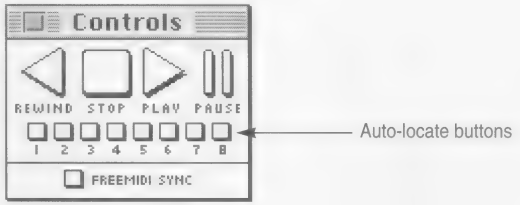


Figure 46-18: Transport Controls Window

2. **Click *FreeMIDI Sync* to enable FreeMIDI Sync.**

   You can skip this step if FreeMIDI Sync has already been enabled by some other FreeMIDI application. If it is already enabled, the FreeMIDI sync check box appears checked.

3. **Click the Transport Control function that you want to use.**

   Click Rewind, Play, Stop, or Pause to send those commands to the FreeMIDI application that you are controlling. The FreeMIDI application should respond to these commands as if you were using its own controls.

4. **If the FreeMIDI application that you are controlling supports their use, you can use any of the 8 auto-locate buttons to auto-locate to some pre-defined location in the sequence or song that is currently playing.**

   In Performer, you can define these auto-locate points in the Markers window. Assign a number from 1-8 for a marker in the Seek column and that marker's location in the sequence will be defined as one of the 8 FreeMIDI auto-locate points. Click the corresponding button in the Transport Controls window and Performer will locate to that point. You can auto-locate at any time, even during playback.

The Panic Command

The Panic command found in the MIDI menu sends an *All Notes Off* MIDI message and then a *note off* MIDI message for every MIDI note on every possible MIDI channel on every MIDI output cable on both serial ports. It also resets MIDI software buffers in FreeMIDI software.

This command can take quite a while. If you wish to stop the operation, type command-period on your Mac keyboard.

Check Connections

The Check Connections command is a utility that FreeMIDI Setup provides for troubleshooting and testing the connections of your MIDI studio.

Check Connections is a checkable menu item. This means that its state (on or off) is toggled each time you choose it from the menu. When there is a check next to the Check Connections menu item in the MIDI menu, Check Connections mode is enabled.

Checking MIDI Output

To use Check Connections mode to check MIDI output connections:

1. **Check to be sure that the Check Connections menu item in the MIDI menu is enabled.**

   The Check Connections command should have a check next its name. If it does not, choose it to select it. When the menu item is checked, Check Connections mode is enabled and the mouse

cursor will change to the Check Connections cursor when it is within the FreeMIDI Configuration window as shown in Figure 46-2 below.

Figure 46-19: Check Connections mouse cursor

2. **Press a device icon and hold the mouse button down.**

   While you hold the mouse button down, FreeMIDI sends a C major chord on all MIDI channels to the MIDI output port to which the selected device is connected. If you have an MTP, MTP II, MIDI Express or other interface which can show MIDI output activity, the LED should light up on the selected output port. Additionally, the device to which you are playing MIDI should play the C major chord. If you do not see MIDI activity or do not hear the C major chord, check the connections, cables and power switches of all your MIDI gear.

3. **Press other device icons to test the rest of your studio.**

4. **Uncheck the Check Connections menu item in the MIDI menu by selecting it.**

Checking MIDI Input

To use Check Connections mode to check MIDI input connections:

1. **Check to be sure that Check Connections menu item in the MIDI menu is enabled.**

   The Check Connections command should have a check next its name. If it does not, choose it to select it. When the menu item is checked, Check Connections mode is enabled and the mouse cursor will change to the Check Connections cursor when it is within the FreeMIDI Configuration window as shown in Figure 46-2 above.

2. **Send MIDI data from one of your MIDI devices.**

   If the device has a keyboard, play notes on it. If it is a rack-mount unit, you will need to find a way to send some type of MIDI data from it. Try changing patches or initiating a system exclusive dump from its front panel.

3. **The MIDI port to which the device is connected should flash the eighth note icon as shown below inFigure 46-2.**

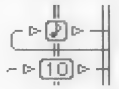


Figure 46-20: Incoming MIDI Data indicator

If no ports flash, this means that FreeMIDI is not receiving the MIDI data. Check the connections, cables and power switches of all your MIDI gear. If a port flashes, but it is not the port you expected, you will need to re-connect the MIDI device to the correct port or better yet, change the connection in your FreeMIDI configuration to match the physical connection. See "MidiLocate" on page 709. for a quick and easy way to re-connect a device in your FreeMIDI configuration.

The View Menu

The View menu allows you to change the way the FreeMIDI Configuration window displays. The Clean Up Window command automatically aligns devices in straight columns. For more information, see "The Clean Up Window Command" on page 699.

There are three size options, which control the display of FreeMIDI device icons and four input/output options, which control the display of the "patch cords" that connect devices and interfaces, as illustrated in Figure 46-2 below.

The two upper sections in this menu each have mutually exclusive options. Choosing one of the icon size options disables the other two icon size options. Similarly, choosing one of the input/output view options disables the other three input/output view options.

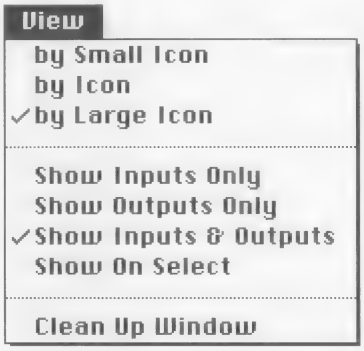


Figure 46-21: The View Menu

To use the View menu to change the display of your FreeMIDI configuration:

1. **Choose an icon size option from the View menu and the FreeMIDI Configuration window will redraw (if necessary) to display your choice.**

   The choices are Small Icon, Icon, and Large Icon. These three choices represent the three icon sizes possible for each FreeMIDI device. See "Editing FreeMIDI Devices" on page 693, for information on changing the icons of your FreeMIDI devices. These options are useful for displaying more or less of your FreeMIDI Configuration, depending on what you are doing at the time.

2. **Choose an input/output view option from the View menu and the FreeMIDI Configuration window will redraw (if necessary) to display your choice.**

   These choices are useful for making the FreeMIDI configuration window display easier to read.

Changing Interface Settings

Normally, FreeMIDI finds out what your interface settings are automatically. In this case, you should never need to change the interface settings.

There are, however, a few situations in which you might need to make the interface settings manually, such as the following cases:

- You have an interface that FreeMIDI does not automatically recognize
- You have just changed the communication speed on your interface (for example, you've changed it from FAST/1X speed to 1 MHz).

There are other possible situations as well. In these cases, you can set the interface speed manually using the Interface Settings command in the MIDI menu.

To changing the interface settings:

1. **Choose Interface Settings from the MIDI menu.**

   The Interface settings dialog box appears. See Figure 46-2 above.

2. **Select the appropriate options and click OK.**

Device Properties

Device properties are descriptive words that can be assigned to any FreeMIDI device. FreeMIDI applications can use these device properties in any way that they require. Here are two examples of the use of device properties:

- A FreeMIDI application which knows about the General MIDI specification could check FreeMIDI devices for the General MIDI device property. If the application found this property assigned to a certain device, it could then adjust itself to display and send the General MIDI patch changes only to this device, without having to know anything else about the device (such as the device model name or patch list).

- A FreeMIDI application that needs to synchronize its timing to a certain device could check for the Transmits Sync device property. If the property existed, the application would know that it could successfully sync to the device.

You can assign device properties to a device when the device is first added to your FreeMIDI configuration or at a later time. The FreeMIDI Device Specification dialog box is where this assignment is made. See "Editing FreeMIDI Devices" on page 693 and "Adding FreeMIDI Devices" on page 691, for information on assigning device properties to devices.

Chapter 47 Quick Reference for FreeMIDI Setup

This chapter contains brief descriptions of all the commands and dialog boxes contained in the FreeMIDI Setup application. Use this chapter as a reference guide for finding out how a certain feature is used. Read the chapters that are cross-referenced for more detailed information on these features.

The Apple Menu

The Apple menu contains Desk Accessories under system 6 and what ever is in the Apple Menu Items folder under system 7. The first command in the Apple Menu is About FreeMIDI Setup.

About FreeMIDI Setup

Choose *About FreeMIDI Setup* to display the FreeMIDI Setup startup screen and version number. Click the mouse anywhere to make this display go away and return to the FreeMIDI Configuration window.

The File Menu

The File menu contains all the commands that allow you to open, close, and save FreeMIDI configuration files.

New

Use the New command to close the current configuration and open a new empty configuration. You will be asked if you are sure that you want to close the current configuration, since this will affect all FreeMIDI applications that are currently being used. Before the new configuration is created, the Update Interfaces dialog appears so that FreeMIDI can establish what type of MIDI interface you have.

Open

Use the Open to close the current configuration and open a previously defined configuration.

Close

Use the Close command to Quit FreeMIDI Setup.

Save

Use the Save command to save changes you have made to the current configuration file on disk.

Save As

Use the Save As command to save the current configuration file with a new name.

To save the current configuration file with new name:

To save the current configuration file with new name:

1. **Choose *Save As from* the File menu.**

   The Save As dialog box appears.

2. **Enter a new name for the configuration file.**

   You can't use a colon (:) in the name; however all other characters are permitted, including spaces. Navigate to the disk and folder to which you wish to save the configuration file using the directory menu at the top of the window. If you enter a name that is already in use, a dialog box asks you to confirm your choice.

3. **Click Save.**

   Your configuration file is saved on the disk in its current state under the new name.

Revert

Use the Revert command to discard any changes you have made to the current configuration file and restore it to the state it was in when you last saved it.

Page Setup

Use the Page Setup command to control the way your configuration is printed when using the Print command. See your Macintosh user's manual for more information on Page Setup.

Print

Use the Print command to print a picture of your FreeMIDI configuration. See your Macintosh and printer user's manual for more information on printing.

FreeMIDI Preferences

Use the FreeMIDI Preferences command to open the FreeMIDI Preferences dialog box. This dialog is where you control some of the global settings of FreeMIDI such as which serial ports FreeMIDI will use, whether Inter-application MIDI is enabled, whether non-FreeMIDI applications will have access to the serial ports and whether patch change monitoring is enabled.

Quit

Use the Quit command to exit the FreeMIDI Setup application.

The Edit Menu

The Edit menu contains commands for copying and pasting FreeMIDI devices in the FreeMIDI Configuration window. These commands also work in the standard Mac way anywhere in FreeMIDI Setup where you edit text.

Undo

Use the Undo command to undo the last edit or change that you made to your FreeMIDI Configuration. Generally, this command displays the command that it will Undo, such as Undo Drag or Undo MidiLocate. As a shortcut, type command-Z on your Mac keyboard to invoke this command.

Cut

Use the Cut command to place a copy of the current selection on the Clipboard and then remove the current selection. As a shortcut, type command-X on your Mac keyboard to invoke this command.

Copy

Use the Copy command to place a copy of the current selection on the Clipboard. As a shortcut, type command-C on your Mac keyboard to invoke this command.

Paste

Use the Paste command to insert whatever data is currently on the Clipboard. As a shortcut, type command-V on your Mac keyboard to invoke this command.

Clear

Use the Clear command to remove the current selection. No copies are placed on the Clipboard. As a shortcut, type command-B on your Mac keyboard to invoke this command.

Duplicate

Use the Duplicate command to make copies of the currently selected FreeMIDI devices. This command only works on selected FreeMIDI devices, so it is grayed-out(disabled) unless at least one FreeMIDI device is selected. As a shortcut, type command-D on your Mac keyboard to invoke this command.

Select All

Use the Select All command to quickly select all of the current type of data. For instance, if there is no selection in the FreeMIDI Configuration window, Select All selects all the FreeMIDI devices, interfaces, and connections in the window. If a text entry box is active, such as the name field for a FreeMIDI device, Select All will select all the text in the name field. As a shortcut, type command-A on your Mac keyboard to invoke this command.

The Configuration Menu

The Configuration menu provides access to various commands for setting up and changing your FreeMIDI configuration.

Quick Setup

Use *Quick Setup* to open the Quick Setup dialog box, which allows you to quickly add and remove devices to and from your current FreeMIDI configuration. For more information, see "Quick Setup" on page 684.

Update Interfaces

Use *Update Interfaces...* to inform FreeMIDI of changes you have made to the MIDI interface(s) that you have connected to the serial port(s) on the Macintosh. For more information, see "Updating Interfaces" on page 699.

Create Device

Use *Create Device* to open the FreeMIDI Device Specification dialog box and add a new FreeMIDI device to your current FreeMIDI configuration. For more information, see "Adding FreeMIDI Devices" on page 691.

Edit Device

Use *Edit Device* to open the FreeMIDI Device Specification dialog box and edit an existing FreeMIDI device in your current FreeMIDI configuration. You must select a device before this command becomes enabled. With no devices selected, it remains grayed-out (disabled). For more information, see "Editing FreeMIDI Devices" on page 693.

The MIDI Menu

The MIDI Menu contains commands which provide control over FreeMIDI Setup's various MIDI settings.

Interface Settings

Use the Interface Settings command to open the Interface Settings dialog box. This dialog box allows you to enable and disable the two serial ports for MIDI. If, for instance, you have a printer attached to the Thru port of your MTP II and the MTP II is connected to the Printer serial port, you will need to disable MIDI on the printer port in order to do any printing.

Return

Use the Return command to return to the FreeMIDI application that was last active before switching to FreeMIDI Setup. This command will only have an effect if you switch to FreeMIDI Setup with the Edit

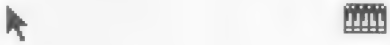
FreeMIDI Configuration command from any other FreeMIDI application. As a shortcut, type command-R on your Mac keyboard to invoke this command.

Transport Controls

Use the *Transport Controls* command to open the Transport Controls window. The Transport Controls window contains buttons that can control the transport functions (Play, Stop, Rewind, Locate) of other FreeMIDI applications from within FreeMIDI Setup. For more information, see "The Transport Controls" on page 710.

Check Connections

This command, when checked, causes the arrow cursor to change to a small keyboard cursor.



When you click a device in the FreeMIDI configuration window with the keyboard cursor, FreeMIDI sends a C-major chord to the device via MIDI. If all is well, the device plays the chord. If there is a communication problem between FreeMIDI and the device (such as a lose cable or something), the device does not play the chord.

Conversely, when this command is checked, and you send MIDI from one of your MIDI devices to FreeMIDI, the port to which the device is connected flashes a note symbol to indicate that FreeMIDI is successfully receiving data from the device.

This command serves as a diagnostic tool for you to determine if MIDI communication is OK.

MidiLocate

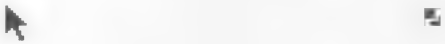
Use the MidiLocate command to toggle the state of MidiLocate. When the menu item is checked, MidiLocate is enabled. When it is unchecked, MidiLocate is disabled. For more information, see "MidiLocate" on page 709.

PatchThru

Use the PatchThru command to toggle the state of PatchThru. When the menu item is checked, PatchThru is enabled. When it is unchecked, PatchThru is disabled. For more information, see "Patch Thru" on page 707.

Popup Patchlists

This command, when checked, causes the arrow cursor to change to a MIDI patch change icon cursor.



When you then press on a device in the MIDI configuration window with the patch change cursor, a popup patch list appears containing a list of the patches for the device. For more information, see "Popup Patch Lists" on page 706.

Audition Channels

The *Audition Channels* command allows you to choose how PatchThru and Check Connections will function. For more information, see "Audition Channels" on page 707.

Panic

Use the *Panic* command to send an "All Notes Off" MIDI message and then a "note off" MIDI message for every MIDI note on every possible MIDI channel on every MIDI output cable on both serial ports. This command will also reset all MIDI buffers in all FreeMIDI software. This command can take quite a while. If you wish to stop the operation, type command-period, on your Mac keyboard. For more information, see "The Panic Command" on page 712.

The View Menu

The View menu controls the display of the FreeMIDI Configuration window. The three options at the top of the menu, *by Small Icon, by Icon* and *by Large Icon*, are mutually exclusive. Choosing one option disables the other two. When an option is chosen from the menu, it gets a check mark next to its menu item.

The next four options, *Show Inputs only, Show Outputs only, Show Inputs and Outputs,* and *Show On Select*, are also mutually exclusive. For more information, see "The View Menu" on page 714.

Use the *Clean Up Window* command to quickly arrange all the FreeMIDI devices in the window in a neat column. For more information, see "The Clean Up Window Command" on page 699.

Chapter 48 *Using PatchList Manager*

What is PatchList Manager?

This chapter explains how to use PatchList Manager, a FreeMIDI-compatible application included with Performer. You can find it in the FreeMIDI Applications folder on the top level of your hard disk (unless you have moved it since installation).

PatchList Manager helps you create and maintain accurate patch lists for your MIDI instruments, so that the sound names in Performer match the sounds in the instrument. In fact, the word *patch* refers to a specific sound in your MIDI instrument.

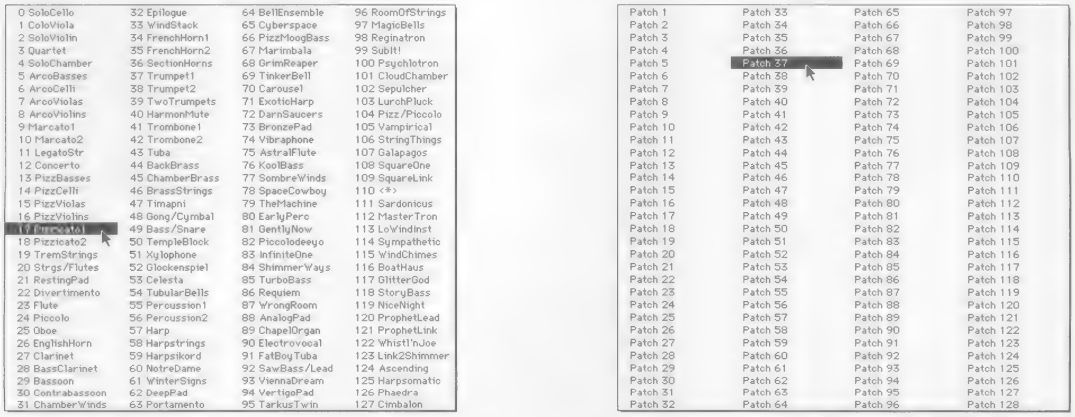


Figure 48-1: For many popular MIDI devices, Performer automatically displays sound names in its pop-up patch lists. If not, you'll see generic names as shown on the right. PatchList Manager lets you replace generic names with the actual names in the synth. In addition, it provides a host of capabilities that allow you to maintain accurate patch Lists for all of your MIDI devices.

Do you need to use PatchList Manager?

FreeMIDI automatically provides factory default patch lists for over 70 popular synthesizers and sound modules. If your device is one of them, the patch lists you see in Performer's *Patch* and *Default Patch* pop-up menus will be accurate and complete, and you probably won't need to use PatchList Manager. To check the accuracy of a device's patch List in Performer, choose a sound from a track's *Default Patch* pop-up menu in the Tracks window and then see if the track plays with the sound you chose. If so, you are all set.

Situations that call for PatchList Manager

Here are the most common situations in which you would need to use PatchList Manager:

- Performer is displaying generic sound names for one of your devices as shown in Figure 48-1 on page 725 (i.e. "Patch 1, Patch 2, Patch 3" etc.) and you want to see actual sound names instead.
- The current sound names in Performer don't match the sounds you hear in the instrument.
- You want to make minor changes to a patch List, such as changing the order of the sounds in the list.
- You have loaded a new bank of sounds into the instrument (or have otherwise changed the internal state of the instrument) and you want to access them by name in Performer.
- You want to set up, reorganize, add, or remove multiple patch Lists for an instrument that has multiple banks of sounds.

A brief overview of PatchList Manager

PatchList Manager has the three main windows shown in Figure 48-2. The FreeMIDI Devices window shows the MIDI device or devices that you want to work with. The Patch List window shows all of the patch lists that can be assigned to the devices. The Programs window displays the list of sounds contained in a particular patch list.

The information shown in these three windows is saved in your FreeMIDI Setup document, as well as a separate PatchList Manager document, which you'll save to disk when you have finished working with PatchList Manager.

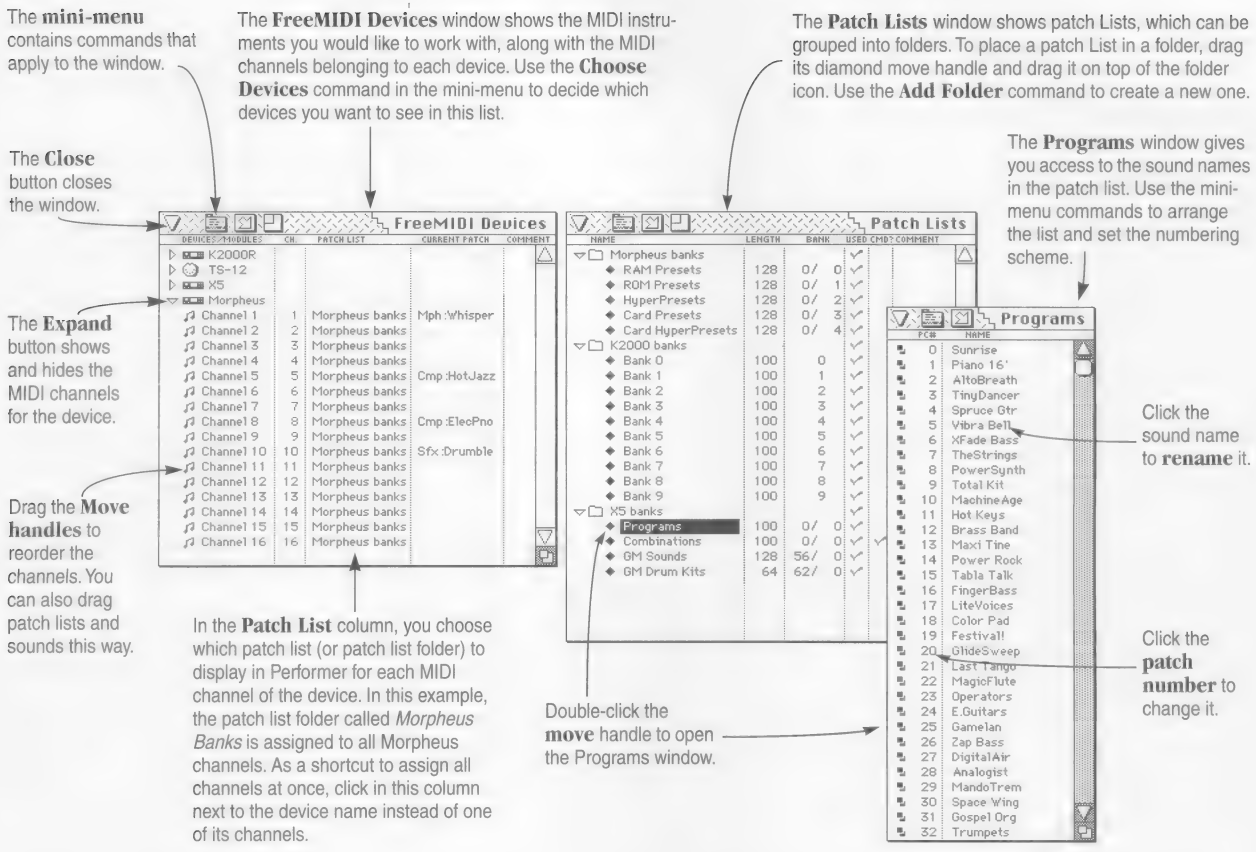


Figure 48-2: PatchList Manager's main windows

Opening PatchList Manager

To open PatchList Manager, double-click the PatchList Manager icon on your hard disk. It is located in the FreeMIDI Applications folder on the top level of your hard disk (unless you have moved it since installation). What you'll see at first is the Choose Devices dialog box as shown in Figure 48-3 on page 728.

Choosing the devices you want to work with

The first thing you need to do is choose the device or devices you need to work with. Only choose the devices whose patchlists you need to edit. Remember, if their patch lists are already fine, you don't need to do anything with them in PatchList Manager.

1. **Select each device you would like to work with by highlighting its name; deselect devices you don't need to work with.**

2. **If Performer's pop-up menus already display sound names for the device, and you would like to work with this default list of names in PatchList Manager, choose the list by its manufacturer and device name in the "PatchList template" pop-up menu to the right of the device.**

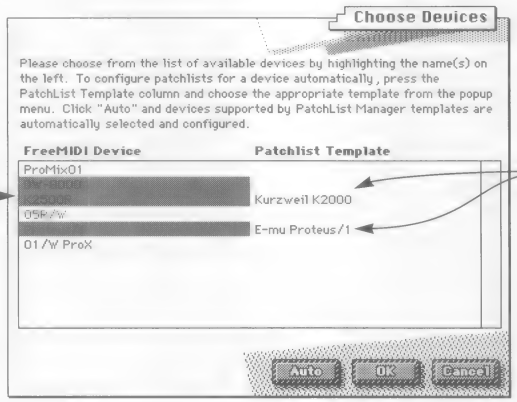


Figure 48-3: Choosing the devices you want to work with

Click the devices shown here to select or deselect them. If a device's lists are showing up in Performer and selecting the correct sounds, there is no need to select it here.

If you want to work with FreeMIDI's default patch List(s) for a device in PatchList Manager, choose the list by name here. Note that some devices aren't supported and therefore will not have a default list, as shown in this example by the Korg DW-8000.

Under the hood: what happens when you choose a sound by name?

The sounds in a patch list are the sounds that are evoked when a MIDI program change message (sometimes called a patch change) is sent to the device. MIDI patch change events are numbered from 0 to 127 (or 1 to 128), so patch Lists will commonly have 128 sounds in them, although you'll frequently encounter other sizes.

Some MIDI devices have more than 128 sounds. In this case, the instrument either organizes them into multiple banks of sounds (usually ranging in size from 50 to 128 each), or it allows you to "map" sounds higher than 128 to a program change number below 128, replacing the original sound that used that number.

If an instrument has multiple banks, a separate patch list is set up for each bank. In this case, the term *patch list* is pretty much synonymous with the word *bank*.

If a device has multiple banks, it often requires an additional message, called a *bank select* message. To call up a sound from the bank in this case, Performer sends several MIDI messages: a bank select message (usually controller #0 and/or controller #32) followed by a patch change message. Some devices use a different type of MIDI message for bank select, such as a short system exclusive message. FreeMIDI can handle any type of bank select message. To learn more, see "Using multiple patch lists & bank select messages" on page 747.

3. **The devices appear in the FreeMIDI Devices window with their MIDI channels shown below them.**

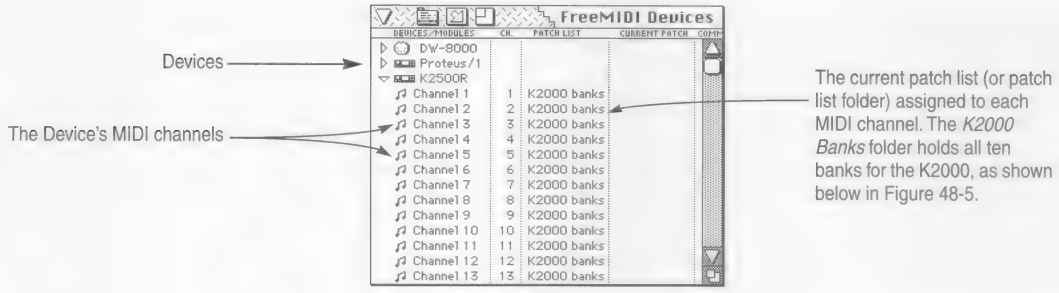


Figure 48-4: A device in the FreeMIDI Devices window

4. **If you imported FreeMIDI's default patch lists along with the devices, they appear in the Patch Lists window.**

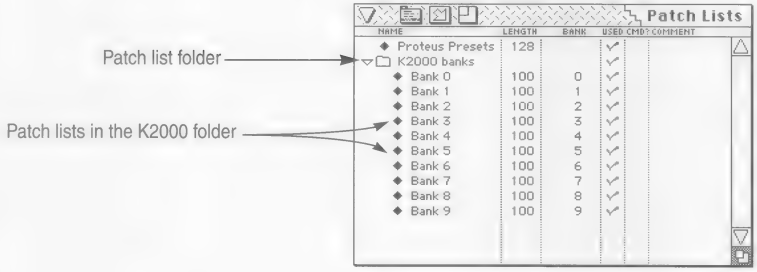


Figure 48-5: Imported FreeMIDI patch lists appear in the Patch Lists window.

Deciding what to do next

What you do next depends on what the situation is with each MIDI device. Here is a summary:

Situation	What to do
Performer is displaying generic sound names for one of your devices as shown in Figure 48-1 on page 725 (i.e. "Patch 1, Patch 2, Patch 3" etc.) and you want to see actual sound names instead.	See "Creating a new patch list" on page 731.
Most or all of the current sound names in Performer don't match the sounds you hear in the instrument.	See "Creating a new patch list" on page 731.
You have loaded a new bank of sounds into the instrument (or have otherwise changed the internal state of the instrument) and you want to access them by name in Performer.	See "Creating a new patch list" on page 731.
You want to set up, reorganize, add, or remove multiple patch lists for an instrument that has multiple banks of sounds.	"Using multiple patch lists & bank select messages" on page 747.
You want to make minor changes to a patch list, such as changing the order of the sounds in the list or renaming a few sounds.	See "Making changes to a patch list" on page 741

Creating a new patch list

If your MIDI instrument doesn't have a patch list yet, or if the current patch list is inaccurate for some reason (i.e. more than just a few sound names are incorrect), your next step is to create a new *patch* list for the device. There are several ways to do so. They are summarized below in the order in which you should try them.

Ways to create a patch list	Explanation	Where to go
Load the Device's patch list (or lists) from old Performer or Digital Performer files	If you already have patch lists for the device in a Performer 4.2 (or earlier) or Digital Performer 1.4 (or earlier) file, you can import the list(s) into PatchList Manager. Regular Performer files *and* configuration files can be read by PatchList Manager.	"Importing patch lists" on page 732
If PatchList Manager supports the device, it can get a "patch dump" from the device to automatically extract accurate patch lists from it	PatchList Manager gets a system exclusive bulk dump from the device, extracts the patch names, & generates a patch list for each bank.	"Using PatchList Manager to load patch names" on page 733
If PatchList Manager doesn't support the device, you can use Unisyn, Mark of the Unicorn's universal editor/librarian software, to extract an accurate patch list for each bank in the device	Get banks using Unisyn and then import the Unisyn-generated patch list for the bank into PatchList Manager.	"Getting patch lists with Unisyn" on page 736
If none of the above methods apply, you can type in the patch names by hand	You add a new, generic patch list and type the names in by hand.	"Creating a patch list by hand" on page 738

What is a "system exclusive bulk dump"?

The phrase *system exclusive* refers to a certain kind of MIDI message. Without getting too technical, system exclusive messages are used to communicate information that is unique to a specific MIDI instrument or device. System exclusive messages have a special format that allows them to hold a varying amount of information. They can be so small that they are transmitted in a fraction of a second; they can be so large that they take minutes to transmit.

The term *bulk dump* is used to refer to system exclusive messages containing large amounts of information. Often, a bulk dump represents the complete internal state of a MIDI device. In other words, the bulk dump serves as a "snapshot" of the current state of the instrument. PatchList Manager usually deals with bulk dumps that consist of one bank of sounds. For some devices, it gets the entire internal state. Either way, you'll probably wait *at least a few seconds* for the transmission to be completed.

Importing patch lists

You can import patch lists from Performer 4.2 (or earlier) or Digital Performer 1.4 (or earlier) files. You can import the patch lists from either complete sequence files *or* configuration files. You can also import them from other PatchList Manager files you may have saved on disk.

To import patch lists from a Performer or Digital Performer file:

1. **Choose Import Patch Lists from the File menu.**

   A standard Mac open file dialog appears.

2. **Select the Performer or Digital Performer file that contains the patch list you wish to import and click Open.**

   Use the directory menu as needed to navigate on your hard disk in order to find the file. You can select either configuration or complete sequence files.

3. **If the Patch Lists window isn't already open, choose it from the Windows menu to view the imported list(s).**

4. **(Optional) If several of the imported lists belong to the same MIDI device, create a folder in the Patch Lists window and place them in the folder.**

   See "Grouping patch lists in a folder" on page 744. If the MIDI device supports some form of bank select, you will want to set up the bank select message for each list so that you can effortlessly choose sounds from any bank. See "Using multiple patch lists & bank select messages" on page 747.

5. **To make the imported lists appear in Performer, assign them to their appropriate device in the PatchList Manager Devices window.**

   See "Getting patch lists to appear in Performer" on page 740.

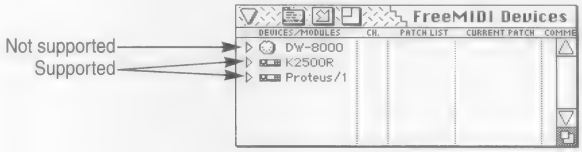
Using PatchList Manager to load patch names

For some MIDI devices, PatchList Manager can get a *system exclusive bulk dump* — also called a *patch dump* — from the instrument to extract an accurate patch list (or lists). (See the side-bar on page 731 for an explanation of this term.) The most common situation in which you would want to do this is when you have changed the sounds or banks in the instrument (so that it is no longer in its factory default state), and you would like the patch lists in Performer to reflect those changes.

For example, if you have an E-mu Proteus, and you have changed the patch map in order to access sounds above 128, you can use PatchList Manager to get a new patch list with names that match the current patch map. As another example, you may have loaded a new bank of sounds into your Korg M1 and you would like the new bank to appear as a patch list in Performer instead of the factory bank.

Determining if PatchList Manager supports your device

PatchList Manager can only get patch dumps from devices that it specifically supports. To see if your device is supported, look at its icon in the Devices window as shown below:



If your device is not supported, chances are good that you can use Unisyn, Mark of the Unicorn's universal editor/librarian software, instead. Unisyn currently supports 212 MIDI devices (with more on the way). See "Getting patch lists with Unisyn" on page 736. If you don't have Unisyn (yet), your only recourse at this point is to type in the patch names by hand. See "Creating a patch list by hand" on page 738.

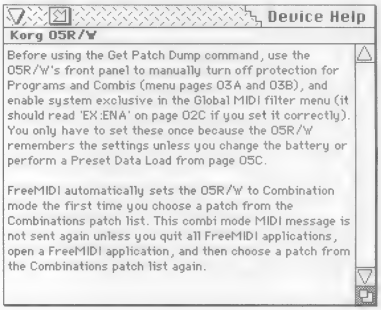
Getting device help

If your device is supported by PatchList Manager, check its Device Help window for important information about how to use PatchList Manager with the device. This window often contains information about settings that you need to enable/disable in the MIDI device to successfully get a patch dump from it. It may also contain other important and relevant information about the device.

To check Device Help:

1. **Click the device in the FreeMIDI Devices window to select it.**
2. **Choose *Device Help* from the Devices menu.**

   The Device Help window appears. This is the Device Help window for the Ensoniq ESQ-M:



Make sure the device has both its MIDI IN and MIDI OUT connected

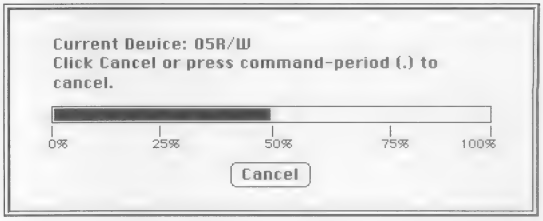
Before you go further, make sure that the device has both its MIDI IN and MIDI OUT connected to your MIDI interface. Otherwise, PatchList Manager won't be able to get the patch dump successfully. If you add a connection at this time, use the Edit FreeMIDI Configuration command in the MIDI menu to make sure both connections are present in your FreeMIDI configuration.

Getting a patch dump from a device

Once you have checked device help and MIDI cable connections, you are ready to get a patch dump from the device. By doing so, PatchList Manager will automatically extract a patch list for each bank in the device. To get a patch dump:

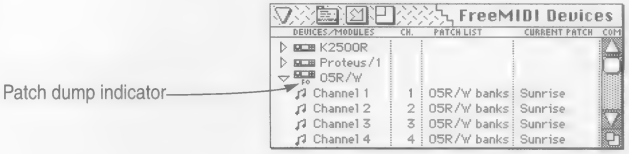
1. **Click the device in the FreeMIDI Devices window to select it.**
2. **Choose *Get Patch Dump* from the Devices menu.**
3. **The Patch Dump progress dialog appears while PatchList Manager receives the patch dump.**

   ☛ Depending on the format of the MIDI device's sysex data dump, this progress bar may fill up slowly or all at once when the dump is complete.



Two things happen when the patch dump is complete:

- The factory default patch list is updated, and the updated lists will automatically appear in Performer.
- The device's move handle icon changes slightly to indicate that it contains a sysex data dump.



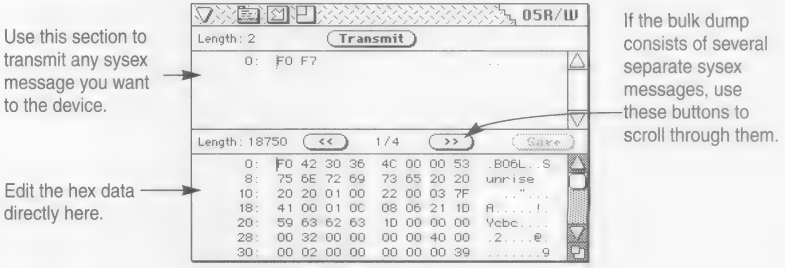
Sending the dump back after editing it

For most instruments, PatchList Manager will allow you to edit the patch lists (change names of sounds, etc.) and then send the bulk dump back to the instrument to update the device itself. See "Sending a patch list back to a configured device after editing it" on page 743.

Editing the bulk dump in its raw hex form

If you enjoy doing such things, PatchList Manager lets you view and edit bulk dump in its raw hexadecimal form. To do so:

1. **Click the device in the FreeMIDI Devices window to select it.**
2. **Choose *Edit patch dump* from the Devices menu.**



Getting patch lists with Unisyn

If you have a synthesizer or sound module that is not supported by PatchList Manager, Unisyn can save you the trouble of typing in the patch lists by hand. Unisyn is Mark of the Unicorn's Universal Editor/Librarian software. Unisyn supports 212 MIDI devices (more are on the way) with complete library and editing functions. If PatchList Manager doesn't support one of your MIDI devices, chances are that Unisyn does. Contact Mark of the Unicorn to see if your device is supported.

Unisyn specializes in getting banks from synths. When it gets a bank, it automatically publishes the patch list for the bank to all FreeMIDI-compatible programs. If you want to work further with it in PatchList Manager, you can load this Unisyn-generated patch list into PatchList Manager as follows:

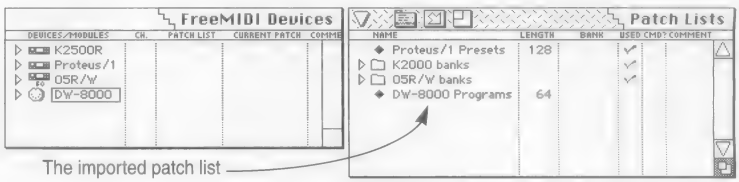
1. **Get the bank from the device using Unisyn's Get Bank command.**

   Consult the Unisyn manual if you need help with this step. As soon as Unisyn gets (or sends) a bank, it "publishes" a patch list for the current bank to all FreeMIDI programs. In some cases, you may need to transfer the bank into RAM before getting it. Consult Unisyn's profile help for the device.

2. **Back in PatchList Manager, select the device by clicking its name in the FreeMIDI Devices window.**

3. **Choose Load FreeMIDI Patch Lists from the Devices menu.**

   The Unisyn-generated patch list is added to the bottom of the list in the Patch Lists window. Some devices produce several lists.



4. **(Optional) Rename the newly loaded patch list(s) by clicking its name in the Patch Lists window.**

   This step is especially recommended if you are loading multiple lists for a single device because it helps you better identify each bank.

5. **(Optional) If Unisyn produced several separate patch lists for the device (one for each bank), create a folder in the Patch Lists window and place them in the folder.**

   See "Grouping patch lists in a folder" on page 744. If the MIDI device supports some form of bank select, you will want to set up the bank select message for each list so that you can effortlessly choose sounds from any bank. See "Using multiple patch lists & bank select messages" on page 747.

6. **To make the imported list (or newly created folder) appear in Performer, assign it to the appropriate device in the PatchList Manager Devices window.**

   See "Getting patch lists to appear in Performer" on page 740.

7. **If the device has other banks that you want to import, repeat this procedure for each bank.**

   For example, Unisyn may be able to import data card banks for the device. In this case, you can import a patch list for each data card. In fact, you can import as many banks as you want into PatchList Manager and then place them together in a folder so that you have all the names at your fingertips in Performer. If you do, however, you'll need to keep track of which banks are actually loaded into the instrument at any given moment.

Creating a patch list by hand

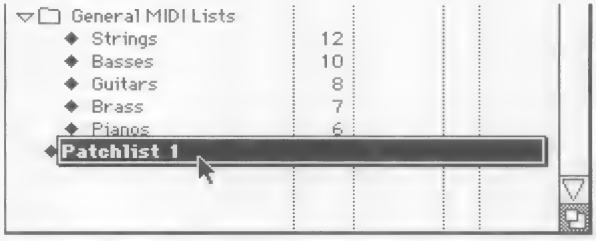
If none of the methods discussed in the previous sections for creating a patch list apply to you, you can create a new patch list manually and type in the patch names by hand.

To create a new patch list:

1. **Choose Add Patch List from the Patch Lists menu.**

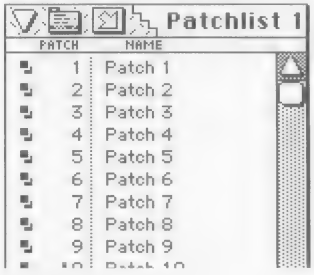
   A new patch list appears at the bottom of the list. It is named "PatchList 1".

2. **Click its name and enter an appropriately descriptive name for the patch list.**



3. **Double-click the new patch list's move handle icon to open its patch list window.**

   The sound names window appears. Alternately, you can choose the patch list's name from the Windows menu to open its window.



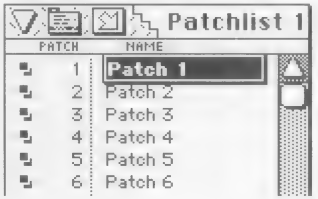
4. **Choose *Set Numbering Format* from the patch list window mini-menu to set the numbering of the patch list.**

   See "Setting the numbering format for a patch list" on page 743 for more information.

5. **Click the first patch name in the list, "Patch 1" and type in a new name.**

6. **Press the Return key on your Mac keyboard to confirm the edit, or press the Enter key to move to the next name in the list.**

   Similarly, you can move up and down between patch names with the up and down arrow keys.



7. **If you'd like to list the names alphabetically, choose Sort by name from the mini-menu.**

8. **(Optional) If you are creating several separate patch lists for the device (one for each bank), create a folder in the Patch Lists window and place them in the folder.**

   See "Grouping patch lists in a folder" on page 744. If the MIDI device supports some form of bank select, you will want to set up the bank select message for each list so that you can effortlessly choose sounds from any bank. See "Using multiple patch lists & bank select messages" on page 747.

9. **To make the new list (or folder) appear in Performer, assign it to the appropriate device in the PatchList Manager Devices window.**

   See "Getting patch lists to appear in Performer" on page 740.

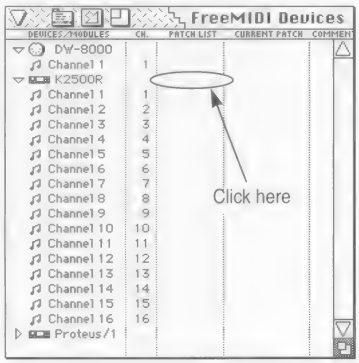
Getting patch lists to appear in Performer

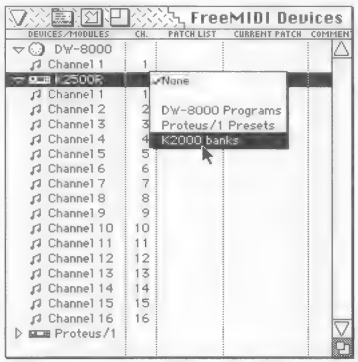
To make a patch list or patch list folder show up in Performer's pop-up menus, you need to assign it to the device in PatchList Manager's Devices window. You can assign the patch list to all of the device's MIDI channels, or you can assign it to individual channels. You can even assign different lists to different channels. For example, you might assign a drum kit list to channel 10 and a list of all other sounds to channels 1-9 and 11-16.

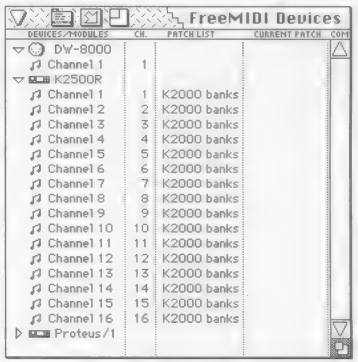
To assign a patch list or patch list folder to all of a device's MIDI channels at once:

1. **In the FreeMIDI Devices window, press in the Patch List column to the right of the device name.**

   A pop-up menu of patch lists appears.







2. **Choose the desired patch list.**

To assign a patch list to an individual MID channel:

1. **If the MIDI channels for a device are hidden, click the Expand button to display them.**

2. **Press in the Patch List column next to the MIDI channel and choose the desired list from the pop-up menu.**

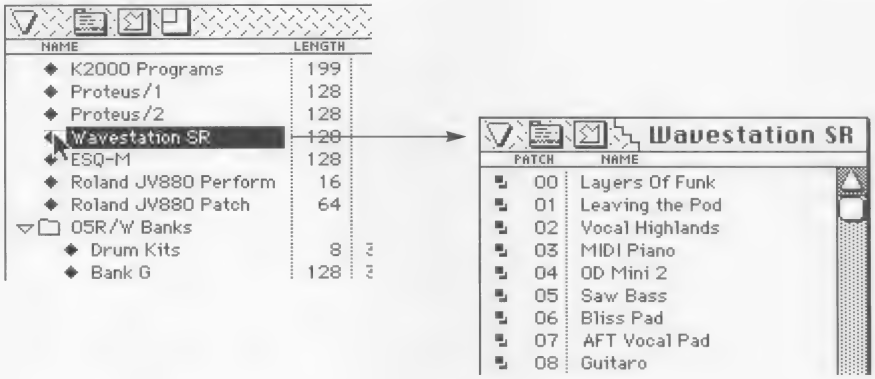
Making changes to a patch list

In a patch list, you can:

- Edit the names of the sounds
- Change their order in the list by dragging them up and down
- Sort them by numerically or alphabetically
- Change the numbering scheme
- Change the patch change number for any sound

Opening up a patch list

To open a patch list, double-click the patch list's name or move handle icon to open its patch list window.



The sound names window appears. Alternately, you can choose the patch list's name from the Windows menu to open its window.

Editing a patch list

Here is a summary of what you can do in the patch list:

To do this	Do this
Change the name of a sound	Click the patch name in the list that you wish to edit, enter a new name and press the Return key on your Mac keyboard to confirm the edit. The new name appears. If you press the Enter key instead of Return, the edit is confirmed and the next patch name is ready for editing. Similarly, you can move up and down between patch names with the up and down arrow keys. 
To move a sound up or down in the list	Drag its handle
To sort the sounds alphabetically	Choose Sort by name from the mini-menu
To sort the sounds numerically	Choose Sort by number from the mini-menu
To change the numbering scheme	Choose *Set Numbering format* from the mini-menu. For more information, see "Setting the numbering format for a patch list" on page 743.
To create a custom numbering scheme	Choose *Show ASCII String* from the mini-menu. For more information, see "Creating a custom numbering format" on page 743.
To change the overall number of sounds	Same as above
To make the numbering start at 0 instead of 1 or vice versa	Same as above
To set up a bank select message for the list	See "Using multiple patch lists & bank select messages" on page 747
To change a sound's patch number	Click its current patch number

Setting the numbering format for a patch list

Most MIDI devices number the sounds in a bank using one of several common conventions. For your convenience, PatchList Manager lets you choose the numbering scheme that most closely matches the instrument. To set the numbering format, choose Set Numbering format from the sound names window mini-menu or click in the *Length* column. Choose the appropriate options and click OK.

> ☛ You can always change the format, but you can't change the number of patches in the list after it has been assigned to a device MIDI channel. If you need to do so, you have to temporarily de-assigned it, make the change, and then reassign it.

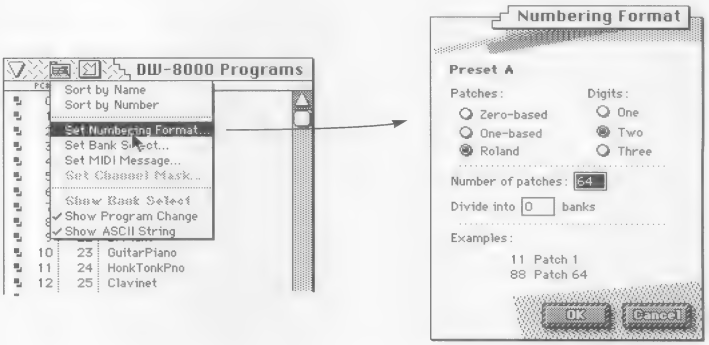


Figure 48-6: Setting the numbering format

Creating a custom numbering format

If your device has a specialized numbering scheme, use the *Show ASCII String* command in the mini-menu instead. This displays a column in the patch list in which you can type any number or text string next to each patch. This gives you complete flexibility in setting up the patch numbers. Use the *Show Program Change* and *Show ASCII String* commands to hide the program change column and display the ASCII numbers.

Sending a patch list back to a configured device after editing it

If the patch list you are editing is one that you loaded from a configured device using the Get Patch Dump command, making changes in the patch list may also change the patch dump, depending on the device. Check the device's Device Help (see "Getting device help" on page 733) to see what the patch dump actually contains (it varies by instrument). If the patch dump only contains the patch

names , then you can only change the names of the sounds when you send it back to the instrument. If the patch dump is a complete bulk dump of the whole instrument, you may be able to control other aspects of the bank. Device Help will give you specific advice for your instrument.

Duplicating a patch list

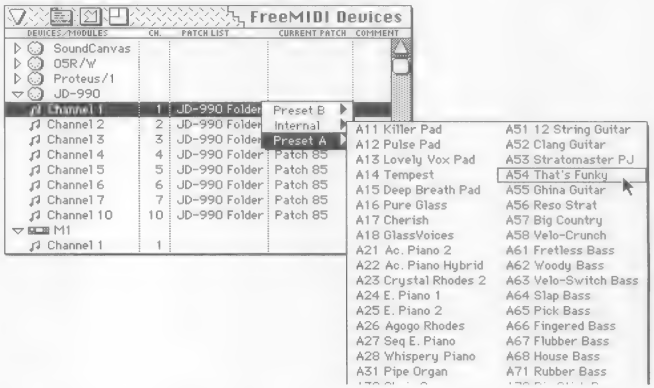
At times, you may need to duplicate a patch list to make a separate copy of it. For example, you may want to place the list in more than one folder. To duplicate a patch list:

1. **Click the patch list move handle to select it.**

2. **Choose Duplicate from the Patch Lists menu.**

Grouping patch lists in a folder

A patch list folder allows you to group several patch lists together. You can then assign the folder to a MIDI channel, which makes all of the lists available to it. The resulting pop-up patch list for the MIDI channel is hierarchical and shows each patch list as shown below.



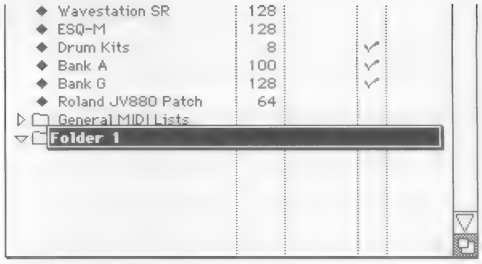
Folders are ideal for handling devices that have multiple banks, and therefore multiple patch lists. For more information about multiple banks, see "Using multiple patch lists & bank select messages" on page 747.

To group patch lists in a folder:

1. **Choose Add Folder from the Patch Lists window mini-menu.**

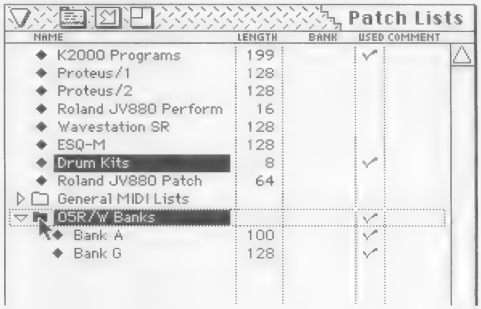
   The folder appears at the bottom of the list.

2. **Click its name to rename it.**



3. **Drag each list on top of the new folder by dragging the diamond list icon.**

   Once inside the folder, the lists are indented to the right to indicate that they are inside the folder, just like the System 7 Finder. Use the show triangle to show or hide the patch lists in the folder. You can put as many patch lists as you like in the folder. You can use this feature to help organize patches.



4. **Assign the folder to the device it is intended for.**

   See "Getting patch lists to appear in Performer" on page 740 for information about how to do this.

5. **(Optional) If you want a particular bank in the folder to appear on only certain MIDI channels for the device, use the Set Channel Mask command in the patch list's mini-menu.**

   See the next section for more information.

Making a patch list appear on only certain MIDI channels

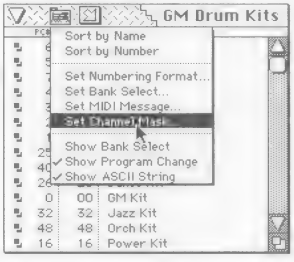
When you place multiple patch lists in a folder and then assign the folder to the entire device as described in "Getting patch lists to appear in Performer" on page 740, all of the patch lists in the folder will appear on all the device's MIDI channels. In some cases, however, you may want to limit the channels on which a particular patch list appears. For example, if your MIDI instrument only plays drum kits on channel 10, you'd want the drum kit patch list to appear on channel 10 only, and you'd want all of the other patch lists to appear on channels 1-9 and 11-16. To do so, you can set the *channel mask* for each patch list in a folder. The channel mask lets you choose which channels the patch list will appear on. This can only be done on patch lists that currently reside inside a folder.

To set the channel mask for a patch list:

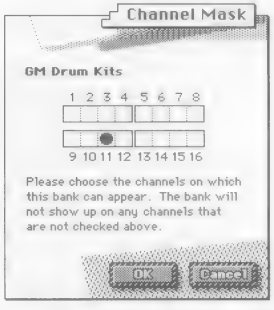
1. **Open the patch list by double-clicking its diamond move handle in the Patch Lists window.**

2. **Choose Set Channel Mask from the mini-menu.**

   If this command is grayed out, the patch list is not in a folder yet.



3. **Click the channels as necessary so that the channels on which you want the list to appear have a black dot.**



Using multiple patch lists & bank select messages

For devices that support MIDI bank select messages, set up a folder containing one patch list for each bank. (See the earlier sections of this chapter to learn how to do this.)

Once you've arranged all the banks into a folder and assigned the folder to the MIDI channels for the device, all that is left to do is assign the appropriate bank select number to each patch list.

Determining your device's bank select implementation

Once you've set up a device in FreeMIDI for bank select, you need to find out is how your MIDI device handles bank selection. This can get a little tricky. All MIDI devices that support bank select do so a little differently. And often you'll have to wade through the MIDI implementation charts in the back of the manual.

The following sections tell you what you should find out about your synth.

Which banks can be accessed via bank select?

The most important thing to know about a bank is: can it be called up with a bank select message and can items within the bank be called up with a MIDI program change event?

Try to get a feel for what the banks are. Some banks are not actually sounds. Instead, they consist of internal configurations for the synth, such as multi-timbral setups (like Yamaha and Korg *multis*) or multiple layers of sounds (such as *combis*). Some banks represent a card slot and are therefore only available when a card is present. Banks can be designated as General MIDI, which means that they contain a standard set of sounds or drum kits. Some banks are drum kits only and may only be available on certain MIDI channels (usually channel 10).

Does the device use one controller or two for the bank select message?

Some devices use a single MIDI controller, either #0 or #32. Others use both.

What is the controller value for each bank?

MIDI controllers have a number that identifies them (such as #32), but they also have a *value* between 0 and 127. The controller *number* identifies the controller as a bank select message, and its *value* calls up a specific bank. Here's an example:

Bank:	Controller used to call it up:
Bank A	Controller #32, value 0
Bank B	Controller #32, value 1
Bank C	Controller #32, value 2

If your device uses both controller #0 and #32, be sure to obtain the value for both for each bank.

The fun part about this is that often the device's manual gives you this information in *hexadecimal* form. Don't worry. PatchList Manager lets you use the hexadecimal numbers without even knowing what they are.

Once you are armed with the information above, you are ready to proceed.

Setting up bank select devices in FreeMIDI

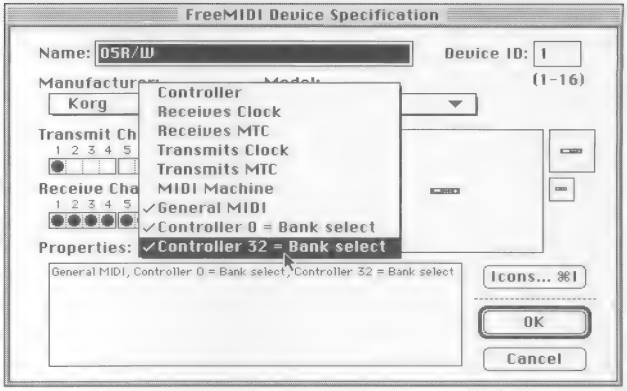
To use bank select messages with a MIDI device, you first need to tell FreeMIDI which MIDI controller the device uses for bank select:

1. **Open FreeMIDI Setup.**

   If you are running Performer or PatchList Manager, choose Edit FreeMIDI Configuration from the Basics menu or MIDI menu, respectively. If are running neither, double-click the FreeMIDI Setup program in the FreeMIDI applications folder on your hard disk.

2. **Double-click the icon for a MIDI device that supports bank select.**

   The Device Specification window appears.



3. **Choose the appropriate bank select device properties from the Properties pop-up menu.**

   If the synth uses both controllers for bank select, choose both bank select properties. See "Determining your device's bank select implementation" on page 747 if you need help with this step.

4. **Click OK to confirm your choice.**

5. **Repeat this procedure for each device in your FreeMIDI setup that uses bank select.**

Assigning a bank select number to a patch list

Now you are ready to assign the bank select controllers to each patch list:

1. **Places all of the patch lists together in a folder.**

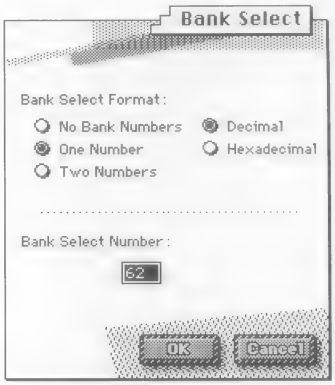
   See "Grouping patch lists in a folder" on page 744.

2. **Click in the Bank column to the right of the Patch List name.**

   The Bank Select dialog box appears.

3. **Choose the necessary number format, and type in the correct bank select number or numbers.**

   If the bank number information you got from the device's manual is in hexadecimal format, you'll need to choose the Hexadecimal option. Otherwise, use decimal format.



4. **Click OK when you are done.**
5. **Repeat this procedure for each bank.**
6. **Assign the folder to the MIDI channels for the device.**

See "Getting patch lists to appear in Performer" on page 740.

What to do if bank select doesn't work

Once bank select messages are assigned as described in the previous section, you can choose any patch from the pop-up patch lists in Performer, PatchList Manager, and FreeMIDI setup, and doing so should call up the correct sound from the correct bank.

If it doesn't, check to make sure that the device has been given the proper Bank Select device property in your FreeMIDI setup. To do so, choose Edit *FreeMIDI Configuration* from the MIDI menu.

Next, check the synth. Sometimes they have a mode that makes them ignore bank select or program changes. Still no response? Then the controller information you have is probably incorrect, or perhaps the instrument still isn't in the correct mode. Or the actual MIDI connections between FreeMIDI and the synth are somehow not working correctly.

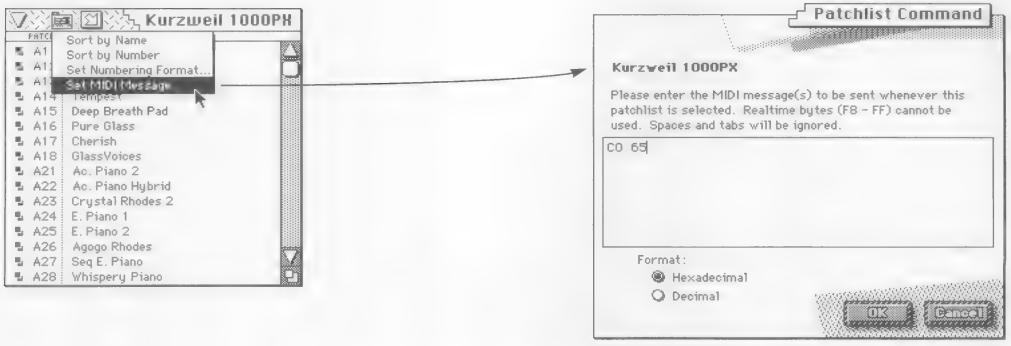
Assigning additional MIDI messages to a bank

Some devices don't use controller #0 or #32 for bank select and use another type of MIDI message instead. For these devices, you can type in any MIDI message the device calls for. This includes system exclusive data, a MIDI program change event with certain value, or any other type of event.

To assign a MIDI message to a patch list:

1. **Open the patch list by double-clicking its icon in the Patch Lists window.**

2. **Choose Set MIDI Message from the mini-menu, or click in the "CM?" column in the Patch Lists window next to the patch list.**



3. **Choose the desired number format (either decimal or hexadecimal) and type in the MIDI message.**

4. **Click OK when you are done.**

Now, the MIDI message you entered will be automatically sent whenever necessary to call up the bank (such as at the beginning of a session or when you change banks).

Saving your patch lists

When you are done setting up your patch lists, you need to save your work:

1. **Choose Save from the File menu.**

2. **Type in a name for the patch list file.**

3. **Click Save.**

PatchList Manager then saves the entire contents of the FreeMIDI Devices and Patch Lists windows in a file on your hard disk. In addition, PatchList Manager tries its best to stay in sync with the FreeMIDI devices in your current FreeMIDI Configuration. Each PatchList Manager document is associated with a specific FreeMIDI

Configuration. If you change FreeMIDI Configurations, PatchList Manager will close the current file and open the file associated with the new, current FreeMIDI Configuration. If you change back to a FreeMIDI Configuration, PatchList Manager will automatically use the corresponding PatchList Manager file.

Hot tips

Splitting up a patch list into instrument categories

Here are some things you can do with PatchList Manager.

PatchList Manager allows you to organize the sounds in an device into instrument categories as shown below in Figure 48-8. To do so, you will make one copy of the patch list for each category. In the list, you'll move the patches that you want to appear in the category to the top of the list, and then hide the rest. Finally, you'll group the lists into a folder and give them an appropriate name for each category.

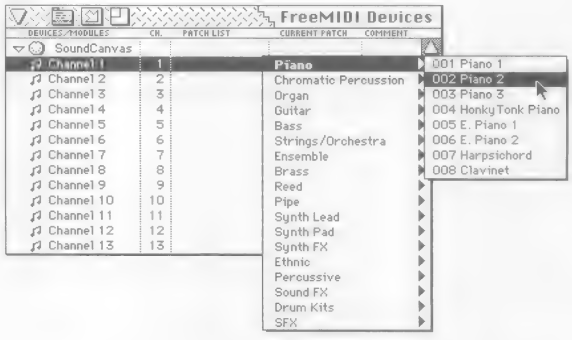


Figure 48-7: Patch lists that have been organized into instrument categories

To split up a patch list into instrument categories:

1. **Duplicate the original patch list.**

   For information on duplicating a patch list, see "Duplicating a patch list" on page 744.

2. **Rename the duplicate list with the category name, such as *Pianos* or *Basses*.**

   Click the name of the patch list in the Patch Lists window to pop-edit the name.

3. **Double-click the move handle of the list to open it.**

4. **Drag the sounds that belong to that category to the top of the list.**

   A short cut for this is to type in a space at the beginning of the name of each sound and then choose Sort by name from the mini-menu. When you are done, you can remove the spaces.

5. **Count the number of patches that are now at the top of the list that you want to include in the category.**

6. **Choose Set Numbering Format from the patch list mini-menu and type in the number of patches you just counted.**

   The list now displays only the patches you chose for the category.

7. **Repeat this procedure, starting at step 1, for each category you would like to create.**

8. **After you have created a separate patch list for each category as described in this procedure, place them together in a folder.**

   See "Grouping patch lists in a folder" on page 744.

Getting back the factory default patch Lists provided by FreeMIDI

There may be times when, after assigning your own patch list (or folder) to a device, you want to return to the factory default patch lists that were originally provided for the device by FreeMIDI. To restore the factory default patch lists, choose None from the Patch List column next to the device name in the Devices window as shown below.

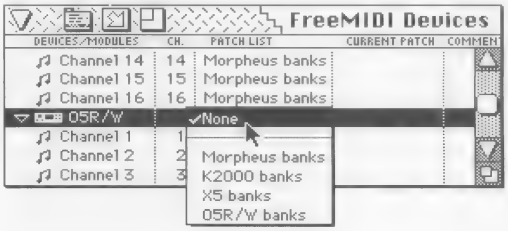


Figure 48-8: Restoring FreeMIDI's original factory default patch lists for a device

Duplicating MIDI channels in a device

In PatchList Manager, the MIDI channels listed below a device are called *modules*. Modules are added to Devices automatically by PatchList Manager. The number of modules added and their MIDI channel assignments are based on the number of MIDI receive channels specified for the device in FreeMIDI Setup.

There is rarely a need to do so, but you can add, edit, and delete modules for a device.

To add modules:

1. **In the FreeMIDI Devices window, select a device to which you wish to add a module.**
2. **Choose *Create Module* from the mini-menu.**

   The new module appears at the bottom of the selected devices module list.
3. **[Optional] Assign a MIDI channel for the module by selecting it from the pop-up menu in the CH column.**
4. **[Optional] Enter a name for the module by clicking its name and then typing.**

To delete a single module:

1. **In the FreeMIDI Devices window, select the module you wish to delete.**

   Shift-click modules to select more than one.
2. **Choose Delete Module from the mini-menu.**

To delete all modules for a device:

1. **Select the device itself (not one of its modules).**
2. **Choose Delete Module from the mini-menu.**

Chapter 49 Editing FreeMIDI Device Files

This chapter explains how to:

- Edit the icons that FreeMIDI uses to display devices in the FreeMIDI Configuration window.
- Add devices to the FreeMIDI Devices file so that MIDI devices that are in your studio but not already defined in the current version of FreeMIDI will appear in the manufacturer and model name pop-up menus in places such as the Quick Setup dialog box and the FreeMIDI Device Specification dialog box.

Working with FreeMIDI Icons

Adding or Replacing Icons to FreeMIDI

You can add, delete, and edit icons that ship with FreeMIDI so that you can customize the look of your FreeMIDI configurations.

To add icons to FreeMIDI's icon list:

1. **Copy the icon you wish to add from your icon editor to the Clipboard, so that it will be ready to paste.**

   When you create an icon, note that there are actually three sizes for the display in FreeMIDI: small, medium, and large. If you make an icon for each size, you'll need to paste in the three icons one at a time using this procedure.

2. **If you have not done so already, open FreeMIDI Setup by double-clicking its icon in the Finder. Alternately, you can open FreeMIDI Setup by choosing the *Edit FreeMIDI Configuration* command in any other FreeMIDI application.**

   The FreeMIDI Configuration window will open displaying the current FreeMIDI configuration.

3. **Choose *Create Device* from the Configuration menu or type command-K on your Mac keyboard.**

   The FreeMIDI Device Specification dialog box appears.

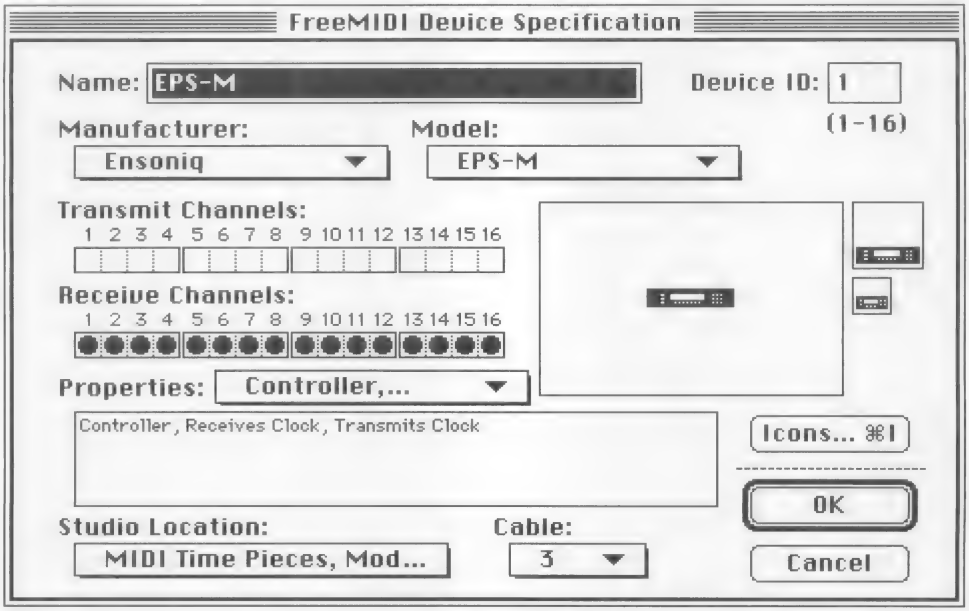


Figure 49-1: FreeMIDI Device Specification Dialog Box

4. **Click *Icons* or type command-I on your Mac keyboard.**

   The Device Icons dialog box appears.

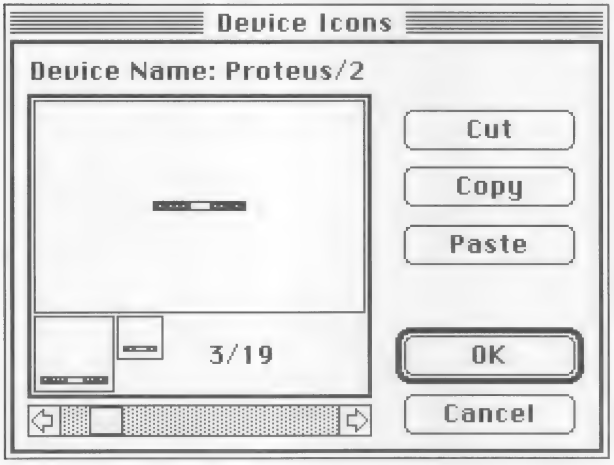


Figure 49-2: Icons Dialog Box

5. **If you want to replace an existing icon, scroll to it now.**

6. **Click one of the three boxes shown to select the size of the icon that you are pasting.**

   FreeMIDI has three possible sizes at which it can display the device icon. Each size is shown in the boxes. Click the box into which you want to paste.

7. **Click Paste to paste the icon from the Clipboard into FreeMIDI's icon set.**

   If there is an icon currently selected, you are asked whether you want to replace the current icon or create a new icon.

8. **If you want to add a new icon, choose the create option and the new icon options.**

   The icon is added to FreeMIDI's icon set and you can assign it to any FreeMIDI device.

9. **If you want to replace the existing icon, choose the replace option.**

   The icon replaces the currently selected icon. For more information, see "Editing FreeMIDI Devices" on page 693.

10. **Click OK to close the Icons dialog box.**

    The FreeMIDI Device Specification dialog box reappears.

11. **Click Cancel to close the FreeMIDI Device Specification dialog box.**

    If you do not cancel the FreeMIDI Device Specification dialog box, you are adding a FreeMIDI device to your FreeMIDI configuration.

Deleting FreeMIDI Icons

To delete icons from FreeMIDI's icon set:

1. **If you have not done so already, open FreeMIDI Setup by double-clicking its icon in the Finder. Alternately, you can open FreeMIDI setup by choosing the Edit FreeMIDI Configuration command in any other FreeMIDI application.**

   The FreeMIDI Configuration Window opens displaying the current FreeMIDI configuration.

2. **Choose Create Device from the Configuration menu or type command-K on your Mac keyboard.**

   The FreeMIDI Device Specification dialog box appears as shown in Figure 49-1 on page 756.

3. **Click Icons or type command-I on your Mac keyboard.**

   The Icons dialog box appears as shown in Figure 49-1 on page 756.

4. **Use the horizontal scroll bar and arrows to scroll the FreeMIDI icon list until you see the icon you wish to delete in the center panel.**

   Alternately, you can click icons to the left or right of the center panel and they will be scrolled to the center panel.

5. **Click Cut.**

   Since this operation cannot be undone, you are asked to confirm this deletion.

6. **Click OK to close the Icons dialog box.**

   The FreeMIDI Device Specification dialog box reappears.

7. **Click Cancel to close the FreeMIDI Device Specification dialog box.**

   If you do not cancel the FreeMIDI Device Specification dialog box, you are adding a FreeMIDI Device to your FreeMIDI Configuration.

Editing FreeMIDI Icons

To edit icons in FreeMIDI's icon set:

1. **If you have not done so already, open FreeMIDI Setup by double-clicking its icon in the Finder. Alternately, you can open FreeMIDI setup by choosing the *Edit FreeMIDI Configuration* command in any other FreeMIDI application.**

   The FreeMIDI Configuration window opens displaying the current FreeMIDI configuration.

2. **Choose *Create Device* from the Configuration menu or type command-K on your Mac keyboard.**

   The FreeMIDI Device Specification dialog box appears as shown in Figure 49-1 on page 756.

3. **Click Icons or type command-I on your Mac keyboard.**

   The Icons dialog box appears as shown in Figure 49-1 on page 756.

4. **Use the horizontal scroll bar and arrows to scroll the FreeMIDI icon list until you see the icon you wish to edit in the center panel.**

   Alternately, you can click icons to the left or right of the center panel and they will be scrolled to the center panel.

5. **Click Copy to copy the icon to the Clipboard.**

6. **Click OK to close the Icons dialog box.**

7. **Click Cancel to close the FreeMIDI Device Specification dialog box.**

8. **Launch your icon editing program and paste the icon into your editing program.**

9. **Make the icon look the way that you want and then copy it back to the Clipboard.**

10. **Choose *Create Device* from the Configuration menu or type command-K on your Mac keyboard.**

    The FreeMIDI Device Specification dialog box appears.

11. **Click *Icons* or type command-I on your Mac keyboard.**

    The Icons dialog box appears.

12. **Click Paste to paste the icon from the Clipboard into FreeMIDI's icon set.**

    You are asked whether you want to replace the current icon or create a new icon. The new icon is added to FreeMIDI's icon set and you can assign it to any FreeMIDI device. For more information, see "Editing FreeMIDI Devices" on page 693.

13. **Click OK to close the Icons dialog box.**

    The FreeMIDI Device Specification dialog box reappears.

14. **Click Cancel to close the FreeMIDI Device Specification dialog box.**

    If you do not cancel the FreeMIDI Device Specification dialog box, you are adding a FreeMIDI device to your FreeMIDI configuration.

Preserving Your Custom Icons

Icons are stored in a file called FreeMIDI Icons, which is located in the FreeMIDI Folder in the System Folder. If you create your own icons and paste them into FreeMIDI as described in this chapter, make a copy of the FreeMIDI Icons file as a backup copy so you don't lose your work.

Editing Text File

Edit the text within the FreeMIDI Devices text file so that FreeMIDI can have more information about various MIDI devices than the information that was shipped with your version.

To edit the text in the FreeMIDI Devices file:

1. **Open your text editor application.**

   You can use any text editor which can save files in a "text only" format. Even the TeachText application from Apple will work.

2. **Open the FreeMIDI Devices file.**

   This file is found within the FreeMIDI Folder that is located inside your System Folder.

3. **Enter the information that you wish to add.**

   The file contains a description of the data format that is required by FreeMIDI. Enter the information about devices following this format. If you do not understand this format by reading these descriptions, we suggest that you have someone else do this type of editing for you.

4. **Save the file in the "text only" format.**

   TeachText does this automatically.

5. **The next time you open FreeMIDI Setup your changes appear in the various pop-up menus.**

Appendix A Synchronization Specifications

This appendix describes the synchronization formats supported by Performer.

MIDI Beat Clocks

MIDI beat clocks (also called MIDI clock) are a standard form of synchronization which may be transmitted between two MIDI devices. Using MIDI beat clocks requires no synchronization code conversion box; the signals are simply carried on a MIDI cable along with other MIDI information. To synchronize MIDI beat clocks to other forms of sync code, such as FSK or SMPTE time code, you must use a converter which translates from the audio code to MIDI beat clocks.

Technical Specification

MIDI beat clock synchronization consists of five different MIDI messages: *start, timing clock, stop, continue,* and *song position*. These messages are transmitted from the MIDI Out of the master to the MIDI In of the slave.

Start signals the slave to prepare to begin playback from the beginning of the sequence. Playback does not actually begin until a timing clock is received.

Timing clocks are sent 24 times per quarter note. These keep the slave locked to the master. Because the signals are based on the quarter note, the master controls tempos.

Stop signals the slave to stop playback.

Continue resumes playback. If the last signal was a stop, the first timing clock following the continue message is the one which follows the last timing clock sent before the stop. Thus, it is as if the stop and continue messages never happened, and the timing clocks had just kept on going. However, if the last message was a song position, the first timing clock following the continue message is the timing clock specified by the song position message.

Song position signals the slave to rewind to a specified position, and prepare to resume playback. The position is specified in multiples of 6 timing clocks (sixteenth notes). The position value is only 14 bits long. In 4/4 time, this limits the range to 1024 measures.

Variations in MIDI Implementation

Some MIDI equipment only implements part of the MIDI clock synchronization specification. This can cause confusion when used with Performer, which implements the full specification.

Timing clocks only. Some equipment only sends and receives timing clocks. When slaving such a device to Performer, you must rewind the device manually. Since there is no positioning control, Performer will begin at the current Counter location, and the device will begin playing wherever it is located. You must make sure the two positions match manually.

When slaving Performer to this type of device, you must set the *Start on any clock* option in the Receive Sync dialog box. As above, you must make sure that both the device and Performer are positioned to the same location before starting the device.

Start/stop (and timing clocks) only**.** The device can only begin playback from the beginning of its sequence. Performer will slave to such a device without problems. If you slave the device to Performer, it will only start playing if you start at the beginning of the Performer sequence. Note that some devices do not send a continue command via MIDI, even if they have an internal continue feature.

Start/stop/continue (and timing clocks) only (no song position). Performer slaves properly to such a device. When slaving the device to Performer, you must be careful when rewinding Performer:

If you stop Performer and then start again without rewinding, the master and the slave will remain in sync.

If you stop Performer, cue in either direction, and start again, Performer will begin at the location you moved to but the slave device will begin where it had last stopped. No song position command is passed, and the two will no longer be in sync.

If you rewind to the beginning of the sequence and start Performer again, Performer will send a start command. The slave will respond to this and start correctly at the beginning of the sequence, and master and slave will remain in proper synchronization.

Direct Time Lock (Enhanced)

Enhanced Direct Time Lock (DTLe) is a synchronization standard which allows Performer to easily lock to SMPTE or other time code through a converter supporting this standard, such as Mark of the Unicorn's MIDI Time Piece™. What follows is a detailed technical specification of the standard and its implementation in Performer. This specification is a revision of the original Direct Time Lock specification released in June, 1987.

Technical Specification

There are two messages associated with direct time lock: *full frame* and *frame advance*. The *full frame message* should be sent when the time code source (such as a tape machine) is started and the converter first achieves lock, followed by a full frame message once per second while the converter maintains lock. The message is implemented as a system exclusive message. The data specifies the full frame in hours, minutes, seconds, frames.

<full frame> :==

<F0H>	<00H>	<33H>	(Manufacturer's ID)
		<7FH>	(Universal real time message)
		<0CH>	(DTL full frame message ID)
		<0nH>	(MTP network specifier) n = 0 specifies Box 1-8 n = 8 specifies Box 9-16
		<0ffhhhhhB>	(ff specifies SMPTE time-code frame rate, and hhhhh specifies the hour from 0 to 23.) ff = 00 specifies 24 fps ff = 01 specifies 25 fps ff = 10 specifies 30 drop ff =11 specifies 30 non-drop
		<mmH>	(Specifies minutes from 0 to 59
		<ssH>	((Specifies seconds from 0 to 59
		<ffH>	(Specifies frames from 0 to 29
		<F7H>	(End of message)

The full frame message is a starting reference for the frame advance messages; it need not be sent in synchronization with anything. A converter may wish to send the message a few frames before the specified frame is reached.

The frame advance message is sent four times each frame. The first frame advance sent after a full frame message corresponds to the beginning of the frame specified in the full frame message. Successive frame advances correspond to successive frames.

<frame advance> :== <F8H>

The frame advance message is the same as the standard MIDI clock message used in normal MIDI sync. This message is a real time message as defined by MIDI, and may be inserted in the middle of a normal MIDI message for minimum timing delay.

While the tape is running, the converter should send a tape position message once per second. These messages should be sent between frame advances. As with the initial full frame message, the frame advance following the full frame message corresponds to the beginning of the frame specified in the full frame message.

Sending periodic full frame messages allows slave devices to come on line at any time and sync up to the master. Periodic full frame messages also ensure that any slippage due to data loss over the MIDI line is corrected.

Performer's Direct Time Lock Implementation

If Direct lock mode and Slave to External Sync are selected and the Play button is grey, Performer waits for a full frame message. When one is received, the sequence is rewound to that point and playback is readied. When frame advances are received, Performer advances in sync with the frame messages, playing the sequence. This continues until one of two things happens.

If more than 8 frames of time pass without a frame advance message, Performer assumes playback has been stopped. The sequence is stopped (notes are turned off), and Performer begins looking for a full frame message again.

When another full frame message is received, Performer compares the position in the message to the current playback position. If they are the same, Performer does nothing. Otherwise, Performer makes whatever adjustment is needed. If the full frame message is not close to the current location, Performer immediately stops playback and rewinds to the new location. Playback is then readied at the new location, and frame advances are looked for.

If you are designing a converter, you should be aware of the automatic time out. If your converter has the capability to sync to slow tape motions (tape rocking), it should send full frame messages only without frame advances when doing so. It is also not recommended that you send frame advances at high speed when the

tape is cueing rapidly. It's better to stop sending frame advances, and then send a new full frame command when the tape returns to normal playback speed.

If the tape is being rewound, the converter should stop sending messages and wait until the tape is moved forward again. At that point the first full frame message should be sent.

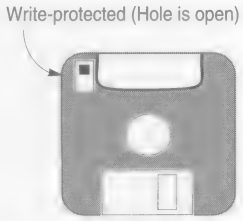
Appendix B Troubleshooting and Customer Support

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 File and Disk Hints* in the chapter *Working With Files* for detailed suggestions about file management.

Keep plenty of free space (20K or more) on any disk containing sequences which you are actually working on. This will prevent the Macintosh from attempting to save your file onto a disk that doesn't have enough space for the whole file. Running out of disk space while saving can result in an unreadable and irretrievable sequence.

Keep track of your RAM (Random Access Memory) usage with the Memory Window, and save often. Recording and editing both use a great deal of RAM. Also watch the Message Center — it will sometimes warn you that a recording pass or a requested edit operation requires more memory than is available. In this situation, try recording or editing the region in smaller sections; for example, transpose a 20-track, 200-measure sequence 5 tracks at a time.



Keep your Mark of the Unicorn master disks locked (write-protected) at all times by sliding the tab on the back of the disk open so that light can be seen through the rectangular aperture. We recommend that you use the master disks only as resources from which you can make working copies, and as key disks with which to start the program when you begin a session. Should your copies become damaged, you will always be able to go back to the master disk for fresh working copies.

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 applying 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 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: starting the program from a different disk drive, restarting the Macintosh with a system folder containing different versions of the System File and the Finder, working with a new sequence instead of an existing one, 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. At this point you will want to experiment with changes in your hardware configuration (where possible) to attempt to isolate the source of the problem.

The most important tools for tracking down problems are the MIDI Monitor window and the Event List windows. The MIDI Monitor window indicates the type and channel assignments of all MIDI data being sent to Performer. If there is a hardware problem, or if your channel assignments are wrong, the problem should be apparent in the MIDI Monitor window.

On the other hand, the Event List windows show all the MIDI data being sent **from** Performer. If you're hearing something unusual in your sequence, the first thing to do is to bring up the Event List windows for the tracks in question. Go to the points in the track at which you are hearing the discrepancy and look for events that may correspond to what you are hearing. Use the View Filter if necessary to clearly isolate the events you are interested in. If the problem is visible in the event list, you can erase or edit the events in question.

If an audible problem does not correspond to anything in the event list, its cause is likely to be something external to Performer: the Macintosh, interface, cables, instruments, or other equipment.

If the Counter, Click, or Flash move irregularly, or if playback is erratic or seems to stall and skip: the problem may be a "MIDI logjam", in which the Macintosh is asked to process too much MIDI information too quickly. This is not a serious problem if the actual playback timing is not affected; Performer gives priority to sending and receiving MIDI data over most screen redisplay. However, with enough of an overload you may hear delays or erratic timing in your music.

Usually the overload is caused by vast reams of aftertouch (mono or poly key pressure), controller, or pitch bend events in one or more synthesizer tracks. Open Event List windows for the tracks in question and look for large amounts of data of this type.

To solve the problem, you must reduce the amount of MIDI information being passed through the modem and/or printer port in the following ways:

- Slow down the tempo of the sequence during the problem passages.
- Delete a track or tracks from the sequence.
- Turn off the play-enable buttons for one or more tracks. When you do this, Performer completely ignores these tracks, letting it concentrate all of the computer's processing power on playing one part. Do not use the Solo button instead; if you do, Performer will scan the other parts while playing and the problem will remain.
- Use the Edit Filter and the Cut or Erase commands to remove some data from one or more of the tracks. See the *Edit Commands* chapter for help with this. Remember to set the Edit Filter back to its default setting before going on with your work.
- Use the Thin Continuous Data command to reduce the amount of continuous data in one or more tracks. This command preserves the original contour and basic effect of the controllers you are editing, while thinning out unnecessary information.

- Reassign some of the tracks to be output through the other serial port. There is a limit on the amount of information which can be passed through each port individually; balancing your output through both ports can eliminate the overload.

If Performer starts correctly, but you are unable to record (or play) anything: double-check your cable connections and synthesizer settings. Check the MIDI interface dialog box, and be sure you have chosen to receive data at the correct frequency through the correct serial port (modem and/or printer) on the back of the Macintosh. 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 synthesizer for input/output. The easiest way to test if MIDI data is actually getting to Performer is to open the MIDI Monitor window. Make sure that any recording channel assignments in the Tracks window and Input Filter correspond to the MIDI channels set in the controlling keyboard or device.

If you cannot open a particular file: first try opening other existing files, or a new file, to be sure Performer is working at all. Refer also to the list of disk and file errors in the chapter *Working with Files*. 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 on another disk.

If Performer will not start up at all, or always brings up an irregular or damaged file when the Performer icon is opened from the Finder, your working copy may be damaged. Make a fresh working copy from one of your master disks. To be thorough, make this new working copy by dragging the Performer program icon from another master disk (i.e. not from the key disk from which the original working copy was made). Restart the Macintosh and try opening another (new or existing) file with your new working copy to see if you have the same problem. Check also to see if other applications (Professional Composer, MacWrite, MacPaint, etc.) are working properly.

If one of your key disks becomes damaged and fails to work as a key, our Customer Support Department will be glad to replace it. See the *Customer Support* section below for more information.

If you're having problems synchronizing Performer with other equipment: refer carefully to the chapter called *Receive Sync* and the section called *Variations in MIDI Implementation* in Appendix A. Remember that Performer inputs and outputs only MIDI, and that the MIDI beat clock specification consists of only five different types of messages. Try to deduce exactly which signal(s) are not being sent or are being misinterpreted by which piece(s) of equipment. The MIDI Monitor window is helpful in determining if timing information is being sent: the RT (real time) indicator will highlight for the port(s) receiving beat clocks or other timing data.

Disk Repairs

We are glad to replace damaged disks belonging to registered users. Please contact Mark of the Unicorn Technical support by phone, fax, or letter if your disk needs to be repaired or replaced. Our Technical support phone number is: (617) 576-3066. Fax: (617) 576-3609.

Customer Support

We are happy to provide customer support to our registered users. If you haven't already done so, please take a moment to complete the registration card in the front of the manual and send it in to us. When we receive your card, you'll be placed on our mailing list and sent a free backup key disk.

Registered users who are unable, with their dealer's help, to solve problems they are encountering with Performer may call our technical support line. The number is (617) 576-3066, and is staffed Monday through Friday 9 AM to 8 PM, Eastern Time. If you decide to call, please have your Performer 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 manual) which holds the registration card. 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 you are working with.** This is displayed briefly in the start-up screen when Performer is started; it is also available through the *About Performer* command on the Apple menu from within Performer.

- **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 or creation date of the system software you are using to run the Macintosh.** See the Installation Guide for help in finding version numbers for 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. If you have features or ideas you would like to see implemented in our music software, we'd like to hear from you. Please write to the Performer Development Team, Mark of the Unicorn 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 from the address indicated on your registration card, please send us a note with your change of address so that we can keep you informed of future upgrades and releases.

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