

Version **3.0**

© 1997 Emagic GmbH



**emagic**

- Table of Contents
- How to use this Guidebook
- 'How to' Index
- Movie Index

**Logic**  
A | U | D | I | O

**GUIDEBOOK**

## Quicktime Tutorials



- Recording a Sequence



- Recording with Cycle mode



- MIDI Step recording



- Copying Sequences



- Adjusting Sequence boundaries



- Importing audio files



- Naming Regions and audio files



- Matching tempo to audio loops

**Logic**  
AUDIO

GUIDEBOOK

# Table of Contents

## ***How to use this Guidebook***

|                       |    |
|-----------------------|----|
| Basic Structure       | 9  |
| Other Conventions     | 10 |
| Special PDF Functions | 11 |

## ***Quick Start***

### **Basic MIDI connections and Settings** 18

|                           |    |
|---------------------------|----|
| Set Interface Preferences | 18 |
| Check MIDI Thru           | 22 |

### **Program Change Response Check** 29

### **Record your first MIDI track** 31

### **Volume and Pan Check** 32

### **Audio System Check** 34

## ***MIDI Setup and Configuration***

### **Preliminary Steps** 40

|                      |    |
|----------------------|----|
| Logic's Default Song | 40 |
| Saving your Song     | 40 |

### **Environment Basics** 41

|   |    |
|---|----|
| Beginning Setup   | 41 |
| Controlling the various view options in the Environment | 41 |
| The Environment Layers                                  | 42 |
| Instrument Objects                                      | 43 |
| Creating Instrument Objects                             | 43 |
| Cleaning up the Instrument Menu                         | 44 |

### **Configuring Multi-Instruments** 46

|  |    |
|--|----|
| Program Names and Bank Select messages | 49 |
|--|----|

### **Configuring Mapped Instruments** 53

|  |    |
|--|----|
| Selecting Notes  | 54 |
| Naming notes   | 55 |
| Re-mapping note pitches                                    | 55 |
| Setting a velocity offset                                  | 56 |
| Setting a different channel and output cable for each note | 56 |

# Table of Contents

## **MIDI Input Handling** 58

Avoiding doubled notes 58

MIDI feedback loops 59

## **Talking to Internal Devices** 61

## **Working with OMS (Open Music System)** 63

Using OMS Equivalents 64

Creating new Instruments under OMS 64

Using the OMS Output Map 64

## **MIDI Mixing** 66

Creating a Virtual Mixer 66

Connecting your Mixer to the Instrument Parameter Box 68

Setting Up Mixers for all of your instruments 70

## ***What makes Logic Special***

## **Working with Logic's Windows** 72

Arrange and Transport Windows 74

Normal vs Floating Windows 74

## **Using Screensets** 78

## **Understanding the Link Modes** 80

## **Working with Key Commands** 82

## ***Recording***

## **Getting Setup for Recording** 86

Setting up the Metronome 86

Setting Logic's Tempo & Time Signature 90

Setting the tempo 93

Preparing the Arrange Window for Recording 94

## **Basic Recording** 95

Creating a new Track 95

Rehearsing over a repeated section (Cycle Mode) 96

## **Punch-in Recording** 99

# Table of Contents

|   |     |
|---|-----|
| Manual Punch-in/out with Replace          | 99  |
| Automatic Punch-in/out with Replace       | 100 |
| Punch in/out and add data without Replace | 101 |

## **MIDI Step Time Recording** 102

|  |     |
|--|-----|
| Step-time Record notes into the Sequence | 104 |
| Special MIDI Step key Commands           | 105 |

## ***Editing***

### **Working in the Arrange Window** 108

|   |     |
|---|-----|
| Sequence Parameters   | 108 |
| Converting Sequence Parameter settings to destructive edits | 112 |
| Moving a Sequence to a different position or track          | 113 |
| Changing Sequence Boundaries                                | 114 |
| Making Aliases, Copies & Loops                              | 115 |
| Stopping a loop   | 117 |
| Changing Aliases & Loops into Real Copies                   | 118 |
| Merging Sequences   | 118 |
| Cutting Sequences   | 122 |

### **Working with Folders** 125

### **Working in the Event List** 128

|                                 |     |
|---------------------------------|-----|
| Other Event list objects        | 131 |
| Filtering the display of Events | 132 |
| Adding Events                   | 133 |
| Copying Events                  | 133 |
| Other Buttons/Menus             | 136 |

### **Working in the Matrix Editor** 137

|                           |     |
|---------------------------|-----|
| Quantizing selected notes | 139 |
| De-Quantizing Notes       | 141 |

### **Working in the Score Editor** 142

|                          |     |
|--------------------------|-----|
| Controlling note display | 146 |
| Inserting Event          | 147 |
| Copying/Moving Events    | 148 |
| Changing the Clef type   | 150 |
| Time and Key Signatures  | 150 |

### **Mix Automation** 152

# Table of Contents

HyperDraw—Another Mixing Tool 153

## **Other Useful Editing Tools 155**

Markers 155

The Event Float 157

Global Editing 158

Demixing 159

Using the Computer Keyboard to "nudge" values 160

Reclock 161

Using Lock to SMPTE Position as a method of reclocking 165

## **Working with Audio**

### **Audio Hardware Selection 170**

### **Setting the Record Path 172**

*what's an "Audio object"* 174

### **Recording Audio 175**

Selecting an audio track 175

Selecting the Input 175

Setting the Sample Rate 177

Record enabling the track 177

Starting Record 177

*Differences between Audio and MIDI recording options* 178

### **Editing Regions 180**

Making copies of Regions 180

Adjusting Region boundaries 181

Fixing Regions which have been unintentionally moved 186

### **Useful Audio File features 187**

Adding audio files 187

Matching song and audio file tempos 187

Strip Silence 189

Search for Zero Cross Points 191

### **Destructive Audio Processing 192**

Basic editing of audio files 192

Creating new Regions in the Sample Editor 193

Creating a new audio files from sections of existing ones 194

# Table of Contents

## **Real-time DSP** 196

- EQ only systems (all DAE hardware except for Pro Tools w/TDM) 196
- User configured DSP systems 196
- Inserting an effect 196
- Inserting multiple effects 197
- Mono and Stereo effects 197
- Bussing audio signals 198

## **Audio File Utilities** 201

- Copy, Moving and Deleting files 201
- To Delete a file from a Song 201
- To Delete files from your hard drive 201
- Copy or Moving files on your hard drive 202
- Importing/Exporting files 202
- Optimizing files 203

## ***Synchronisation***

### **Syncing to an external source** 208

- Set the SMPTE Offset (not applicable for MIDI clock) 209
- SMPTE View Offset 210

### **Logic as the Sync source** 212

### **Setting Logic to transmit MMC** 214

## ***MIDI Studio Inventory Worksheet***

# Table of Contents



# Introduction

*Well, you've gone and done it.*

*In a moment of weakness, during the wee hours of a Saturday morning, you called the 800 number on the screen and nervously recited the 16 digits of your VISA card number. Now, the day of reckoning has arrived because the object of your techno-lust has just been delivered:*

***The SEE - Magik Housemaster 2000  
All-In-One, Do-It-Yourself,  
2000 Piece Home Builders Toolkit***

*After carefully releasing the kit from its package and checking that all 2000 pieces safely made the journey, you sit down to scan the instruction manual.*

*It all seems to be there. The function of each piece is meticulously described, right down to the drill key and the carpenters square. In addition, there's over 100 bonus pages reviewing the history and philosophy of carpentry. Sure, there's a lot to learn, but now that you have the right tools and information on what each tool is used for, how can you go wrong? This is going to be a breeze.*

*There's only one question left in your mind — Where do I begin?*

While it is certainly a stretch to compare this scenario to your purchase of LOGIC Audio, there are enough similarities to make it a workable analogy. Perhaps it would be more accurate to describe buying the **SEE - Magik Window Master, Concrete Master, and Lumber Master** kits as well. At least that would more closely convey the multi-faceted nature of LOGIC Audio.

In either case, the concluding question - *Where do I begin* - is exactly the question this manual endeavors to answer. Instead of just describing a particular features function — as the User manual does — this guidebook endeavors to provide answers to questions about when, where and in what order you might use these tools.

So, though you will still some are glossary-like definitions such as:

- ***The Multi-Instrument***

The Multi-Instrument is a special object in the Environment window that allows you to address multiple channels of one of your MIDI devices,

# Introduction

You'll also find step-by-step instructions on setting up this object under a heading like:

## ***How to decide what Environment object to use for each of your MIDI devices***

This approach is especially useful when the answer to a question cannot easily be found in one place in the user's manual. For example, the question of how to record an audio track involves: settings in the **Audio Extensions Preference** window; setting the **Record Path**, selecting the proper input on the **Audio Object**, assigning an **Audio Object** to a **Track** in the **Arrange Window**, record enabling the **Audio Object**, and using the **Transport Controls**. The an Audio object, might be the question of how to record digital audio when synchronized to tape and using MIDI Machine Control. The information about these tools is spread across two or three separate chapters of the users manual. Here, the basic information you need to perform this task is presented in one series of step-by-step instructions.

The scope of this manual is limited.

To answer every possible "how to" question relating to the use of LOGIC or LOGIC Audio would take volumes, and is not the goal of this document. Instead, it attempts to address the most prevalent question that the majority of users will face during the initial 30 days of owning the program.

So , don't throw away your user's manual — it is still the primary resource for information about Logic Audio. If you take the time to read it, it will clarify and enhance the basic knowledge provided in this guidebook. This will increase your potential for getting the most out of your investment in this program, and eventually, make Logic the most powerful creative tool in your musical arsenal. (other than your heart and brain of course! )

# How to use this Guidebook

As suggested in the Introduction, this guidebook is primarily "application driven". In other words, it is more interested in answering questions about *how to* do something in LOGIC rather than those about what it *can do*. Each chapter will therefore be dominated by step-by-step instructions leading through specific procedures.

This does not mean the document is completely devoid of simple feature descriptions. Enough reference material is included so that the manual can "stand on its own".

In this chapter we address a very important "How to", namely — "How to use this Guidebook". Taking the time to read it will make it easier for you to find the information you need, because you will understand how it has been organized, and what tools are available for accessing it.

## Basic Structure

This handbook is organized into 5 major sections:

### Quick Start

A quick test and setup section designed to get you up and running as quick as possible.

### MIDI Setup and Configuration

All about tailoring Logic to match your MIDI system

### What Makes Logic Special

Examines unique and indispensable tools found in Logic Audio

### Recording

Discusses primary recording procedures and settings. (Although it focuses on MIDI use, much of this chapter is equally applicable to audio applications )

### Editing

Discusses primary editing tools and features

*( Although it focuses on MIDI use, much of this chapter is equally applicable to audio applications )*

### Working with Audio

Examines those aspects of Logic Audio that are unique to the audio portion of the program

# How to use this Guidebook

In addition to these sections you will find a Table of Contents, a special "How To" Index and an Index for the on-line Quicktime tutorial files.

## Other Conventions

There are a few other little conventions used in each chapter which should help you find and digest the information you need more quickly.

## Menus

In the interest of keeping this guide shorter than the Manhattan Telephone Directory, we'll abbreviate menu selections by listing the menus and choices in the format shown below. The first item in the instruction will be the name of the window that the menu belongs to. Everything that follows will be a menu or sub-menu name until the last item, which is the selection to be made. If there is no window name at the beginning of the string, it means the menu is one of the "global" menus always at the top of the screen. For example, if we were instructing you to select the "Delete Unused" track command, it would look like this:

***Arrange -> Structure -> Track -> Delete Unused***

If there are multiple choices at the end of the menu, they will be separated by the '|' symbol.

One further convention regarding menus: In some cases, if the sub-menu may be a "pop-up" menu rather than a menu on a menu bar, the word "menu" will be included in the instruction. This is just a code to alert you not to look for a menu by this name on one of the menu bars — obviously, we'll tell you where to find a pop-up menu before we ask you to use it. In Windows systems, the sub-menu sometimes comes in the form of the common Windows "tab". If that is the case, the word "tab" will be appended to the sub-menu name.



MacOS vs



Windows systems

This handbook covers both the Windows and MacOS versions of Logic Audio. Whenever there is a key command or other procedural discrepancy, the convention for each system will be clearly indicated, sometimes identified by the associated symbol as above. The screenshots used are taken equally from the Mac and Windows versions. When there are significant differences between what you see in each program, screenshots for both are included.

## Abbreviated step-by-step instruction headings

Each step in a set of step-by-step instructions begins with an abbreviated description in bold, followed by the more detailed instructional text. If you are a more experi-

# How to use this Guidebook

enced user reviewing a procedure you can therefore get through the instructions more efficiently by just reading these bolded headings.

## "What you will Learn" summary

There is a summary at the beginning of each chapter which clearly outlines what material will be covered in that chapter. This information will assure that you are in the right place, and prepares you mentally to digest the material to be covered.



### TIPS

Tips describe keyboard shortcuts, useful mouse modifiers, or other procedural hints that will help you become a more effective user. They are easily identified by the icon like the one at the left.



### NOTES

Notes contain supplemental information or procedural reminders regarding the topic being discussed. They are easily identified by the icon like the one at the left.



### WARNINGS

Warnings are indicated by the icon like the one to the left of this text. They contain important reminders and should be read carefully.

## Information Sidebars

Occasionally, you will find a section of text set off from the rest by a darker tan background. These "sidebars" contain additional information about the procedures being described on the surrounding pages. They are separated from the rest of the text only because they do not have to be read in order to complete the tasks at hand. It is of course still in your best interest not to skip over these special sections.

## Special PDF Functions

When you installed Acrobat Reader 3.0 on your machine, it installed a Readme file describing all of the nifty features that it has to offer. You will do yourself a great disservice if you neglect to read it, as Acrobat Reader has a lot of nice features which enable you to get around this document more readily. The three features that we took special advantage of when creating this document are described below:

## Bookmarked Chapters and Sections

You may have already discovered that the chapters and sections of this manual are

# How to use this Guidebook

listed in the column along the left of this text. (If this column is not visible, click on the (PIC) icon in the toolbar at the top of this window).

## Hyperlinked Text

PDF documents allow you to hyperlink text within a document. This means that you can click on any hyperlinked word and it will take you to the section it is linked to. In this handbook, all purple words are hyperlinked. Clicking on the word will leap-frog you to that section. Clicking on the title of that section will return you to your starting point.

## Quicktime Movies



One of the most exciting features of PDF documents is the ability to link to Quicktime movies. This document contains eight quicktime movies which give you a first hand look at the procedures being discussed in the handbook. Whenever you see the icon like the one at the left, click on it and the movie will immediately open and play. You can use the standard Quicktime transport controls to rewind, fast forward or locate within a movie.

# How to use this Guidebook

# How to use this Guidebook



# How to use this Guidebook

# How to use this Guidebook

# Quick Start

## What You Will Learn

This section's purpose is to get you up and running as fast as possible. In the process, we'll be able to make sure that the main components in your MIDI and Audio system are "on-line" and talking to one another as they should. The steps followed will also provide you with a standard test procedure to use in the future, in the event that you run into any trouble.

The information is organized into the following sections:



Basic MIDI connections and Settings



Program Change Response Check



Record your first MIDI track



Volume and Pan Check



Audio System Check

## 1.1 Basic MIDI connections and Settings

### Set Interface Preferences

The first task is to make sure that the LOGIC's MIDI settings are set correctly for your particular hardware and connections. Before you can do this, you must know a few facts about your system.

#### ***You must know the type of interface you are using***

There are two basic types of MIDI interfaces:

- 'Standard' single port interfaces which provide for a maximum of 16 MIDI channels for each port they are connected to (This includes an interface like the Studio 3, which is basically just two interfaces in one, each of which gets connected to a separate serial port on your MacOS)
- A 'multiport' interface which provides multiple discrete (sometimes called "virtual") ports for the serial port it is connected to.

#### ***You must know which outputs of the interface each of your devices is connected to***

If you have a multiport interface, you must know which MIDI outputs go to which MIDI inputs of your MIDI devices

We are also assuming that you have made all the proper MIDI and serial port connections as per the instructions that came with your interface.



#### ***MacOS***

#### ***You must know which MacOS serial port the interface is connected to***

If you are using a multi-port interface such as a Unitor 8, Studio 5, Studio 4, MIDI Time Piece, MIDI Express, Studio 64, you should know what speed you've set the interface to perform at. This is generally referred to as Normal or Fast speed within the interfaces documentation. It is often set simply with a switch on the front panel of the interface but in some cases, i.e. the Studio 5, this setting is switched in software. In still other cases, i.e. the Studio 4, the setting has to be made in both software AND the front panel.

#### **how to:**

- set Preferences that match your MIDI interface
- select and define outputs from Arrange view using Instrument Parameter Box
- check that MIDI thru is working
- check that LOGIC's MIDI settings are set correctly for your MIDI system
- create a new instrument from the Arrange window

# Quick Start



## Windows

***You must make sure the proper drivers are installed for your MIDI interface***

If you are running a Windows system then you simply need to have installed the correct drivers for your MIDI interface. It is also generally a good idea to make sure that you have the latest drivers since improvements and bugfixes are made to these drivers all the time. Once you have the answers to these questions, proceed through the following steps:

***Windows users can skip over the next section and proceed to the following section on page 22 , "Check MIDI Thru".***

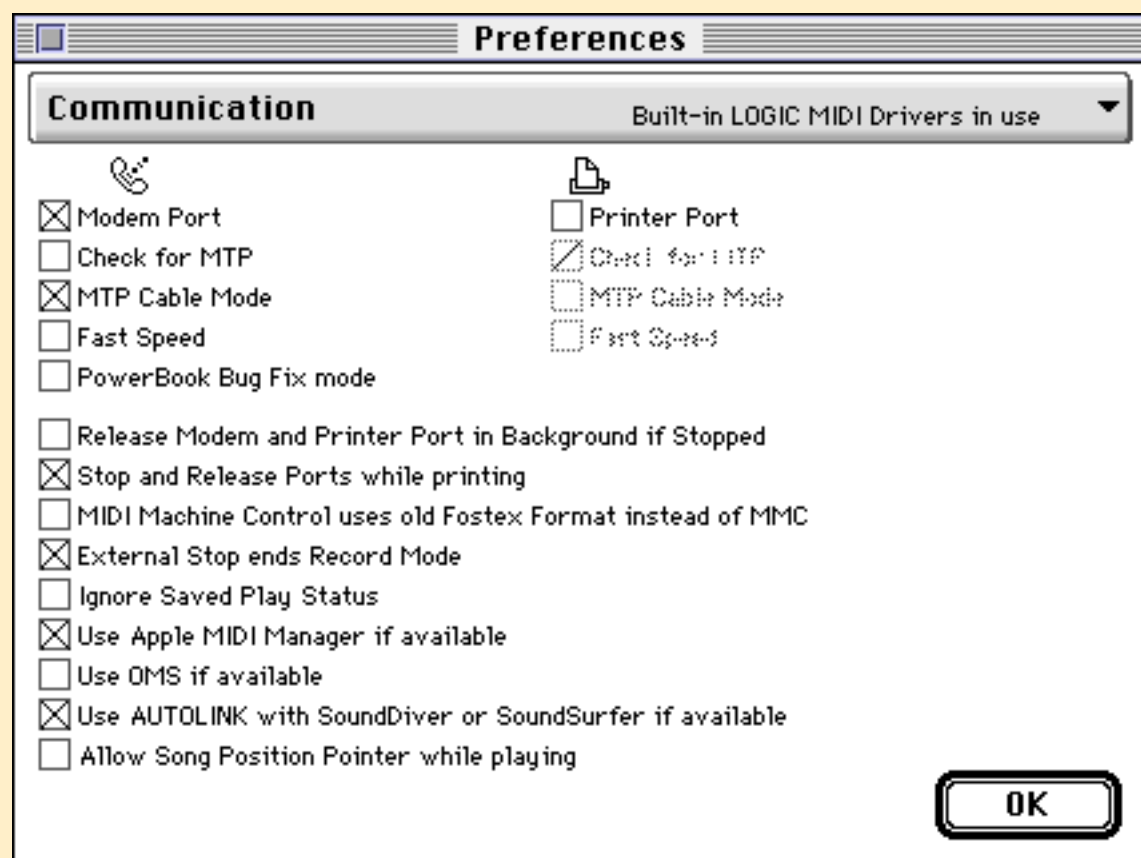


## MacOS

### 1. Open File -> Preferences

Select Preferences from LOGIC's main File menu. The window you now see should look like this:

# Quick Start



1

# Quick Start

## 2. Activate the Port(s) corresponding to the port your interface is connected to

If your interface is connected to the Modem port then check the box to the left of **Modem Port**. If your interface is connected to the Printer Port check the box to the left of **Printer Port**.



**NOTE** If you are using OMS you can simply activate that option and skip steps 3 and 4



**NOTE** When the **Check for MTP** option is checked, the options set in the next 2 steps will be set automatically - at least if all the following criteria is met:

- **The interface is connected and turned on,**
- **The interface has been configured properly,**
- **The interface is a Midi Time Piece or MTP compatible interface. (Essentially, this covers all multi-port interfaces)**
- **The interface is NOT a Studio 5. Although the Studio 5 is a MTP compatible interface, it does not respond as one over the serial cable like all other MTP compatible interfaces.**

If the **Check for MTP** option is enabled, you will be unable to perform steps 3 and 4 manually. If you wish to bypass this feature for some reason (for example, setting it up to use with a Studio 5 that is functioning as an MTP compatible interface) and make your settings manually, you must first de-select the **Check for MTP** option

1

## 3. Activate the **MTP Cable Mode** option if appropriate

If you are using a MIDI Time Piece or MIDI Time Piece compatible interface then make sure **MTP Cable Mode** is enabled for the Port(s) you activated in step 2. As just described, this option may already be on as a result of the **Check for MTP** option being enabled.

## 4. If you have enabled **Fast Speed** on your interface, make sure that option is enabled here as well

Once again, if the **Check for MTP** option is on, this feature should already be set correctly - as long as the above criteria was met.

# Quick Start



**TIP** You can use the **Check for MTP** option as a way to check that your MTP compatible interface is properly connected and "being seen" by Logic. Under the port to which your interface is connected:

- **Disable "Check for MTP"**
- **Disable "MTP Cable Mode"**
- **Disable "Fast Speed"**
- **Enable "Check for MTP"**
- **Disable, then Enable the Port ( Modem or Printer )**

When you enabled the Port, **MTP Cable Mode** should come on automatically as should **Fast Speed**, if that is how it is set on your interface.

## 5. Close the Preferences Window

That's It! LOGIC should now be setup to properly "talk" to your MIDI interface. Let's run through the following tests to see if things are now working as they should be.

## Check MIDI Thru

### 1. Open Arrange and Transport Windows

This is the state that LOGIC opens too, but if for some reason you're not sure that these are the two windows that are open, close all windows, then choose

**Windows -> Arrange | Transport**

### 2. Select the MIDI Thru channel and Port

The term "MIDI Thru" refers to where incoming MIDI data is going to be directed after it *passes thru* the sequencer. In Logic, this path is determined by the *Instrument* that is assigned to the currently selected *Track*.

When Logic boots, it creates a default set of these *Instruments* and automatically assigns some of them to a few of the default tracks. If you're using a standard interface, you may be able to simply select one of these default tracks to test MIDI thru. Otherwise, you will have to assign an appropriate *Instrument* to the selected track.

(Don't fret if this doesn't make sense to you right now. Remember — this is just a Quick Start chapter. This bit of theory was just thrown in to give you some idea of what we're doing in this step)



# Quick Start



## MacOS

If your interface is connected to the Modem port, select the Track that says **1 Piano 1**. If your interface is connected to the Printer Port, click-hold your mouse on any track and choose **GM Device Printer 1 Piano 1** from the **Instrument List menu** that pops up.



If you chose to use OMS when asked the first time you booted Logic AND you are still using OMS, then select a track that contains an Instrument corresponding to one of your OMS Instruments

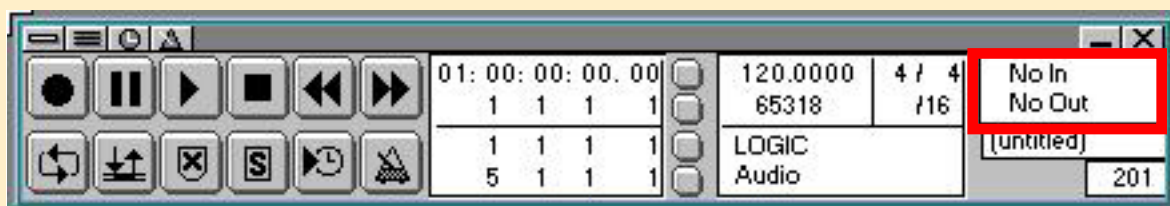


## Windows

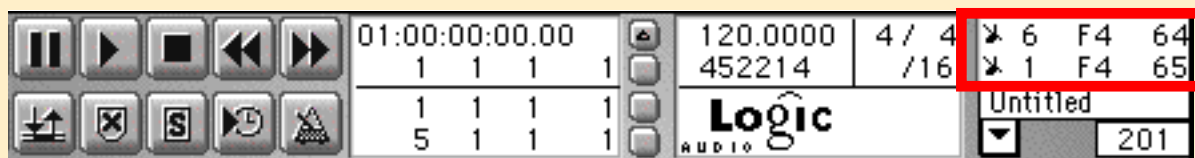
Select the track that says **1 Grand Piano 1**

### 3. Check for MIDI Activity

Logic's Transport window contains a handy MIDI activity meter that makes it easy to see if MIDI data is coming in and/or leaving the program. It is located in the upper right hand corner of the window and looks like this when there is **no data present**:



When there is incoming and outgoing MIDI data it looks like this:



# Quick Start

Your MIDI interface also probably has LED indicators which will help us to determine if data is travelling the route it's supposed to.

When you strike a note on your controller device i.e., the MIDI keyboard or other device from which you are entering MIDI data, the following events should occur:

- ***The MIDI Activity meter should register data going in and out***
- ***Both the In and Output lights of your MIDI interface should light up***

If you are using a generic "single port" MIDI interface, then you may skip to the next section concerning checking that Pan and Volume changes are working properly. If you are using Logic Audio Windows and are not getting output, or the output is going only to your internal sound card, then **DO NOT** skip the following section.

## 4. Set LOGIC's Multi-Instrument to address a specific output of your Multi-Port interface



### MacOS

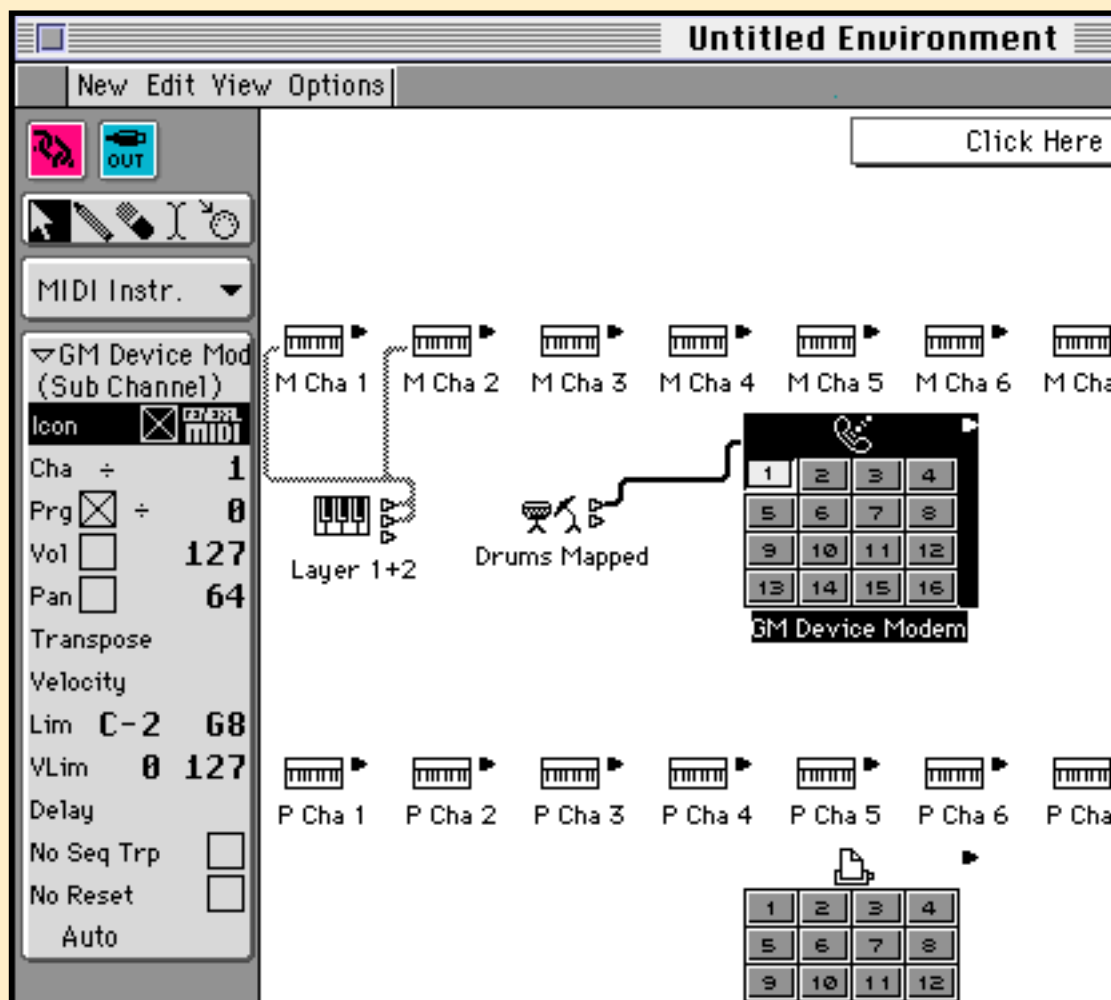
If you are using a multi-port interface, and you've proceeded to this step successfully, then you may now be wondering why all of the output lights are lighting on your MIDI interface, and perhaps as a result, why all or many of your devices are responding with a cacophony of sound. This is happening because the default *Instrument* " that we have selected is setup by default for a standard, single port interface. When this is used with a multi-port interface, data is sent to All outputs.

To change this so that the *Instrument* is only addressing a single port:

# Quick Start

- Double Click on the Instrument's name in the track window, i.e. on the word **Piano**

This will open up the Environment Window and look something like this:



If you are using the Printer port, The **GM Device Printer** object will be selected alternatively.

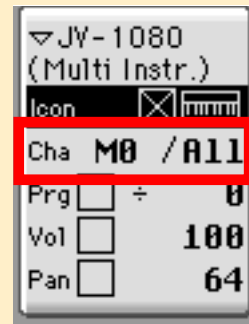
The object with 16 buttons on it is called a **Multi-Instrument**.

- Click once with the mouse on the little telephone "modem port" icon (if you're using Modem Port) or the little "printer port" icon (if you're using the Printer Port)

The result of this should be that none of the 16 little "buttons" on this object are selected.

# Quick Start

Now turn your attention to the box in the left hand column which contains multiple settings and parameters. The box, called the **Instrument Parameter Box**, will have the name **GM Device Modem** or **GM Device Printer** at its top (the one in the picture has been renamed to "JV-1080") and the word **Multi-Inst** written in parentheses below that. The line that starts out with the letters **Cha** is where the Port and Channel settings are made for the selected instrument.



- Click-hold your mouse directly on the '0' character in the 'M0' or 'P0' entry and change it's value by dragging your mouse up or down.

The number you choose determines which output of your MIDI interface this LOGIC instrument will address. Set it to match to the output to which the MIDI instrument you want to address is attached.



**WARNING** Be careful not to change the "M" to a "P" or vice versa. These letters, you may have already deduced, refer to "Modem" and "Printer" and must be set to match the physical port your MIDI interface is set to. If you accidentally change the value, be sure to change them back to their correct setting.

1

You should also be careful NOT to change the value after the "/" symbol which should now read **All**.



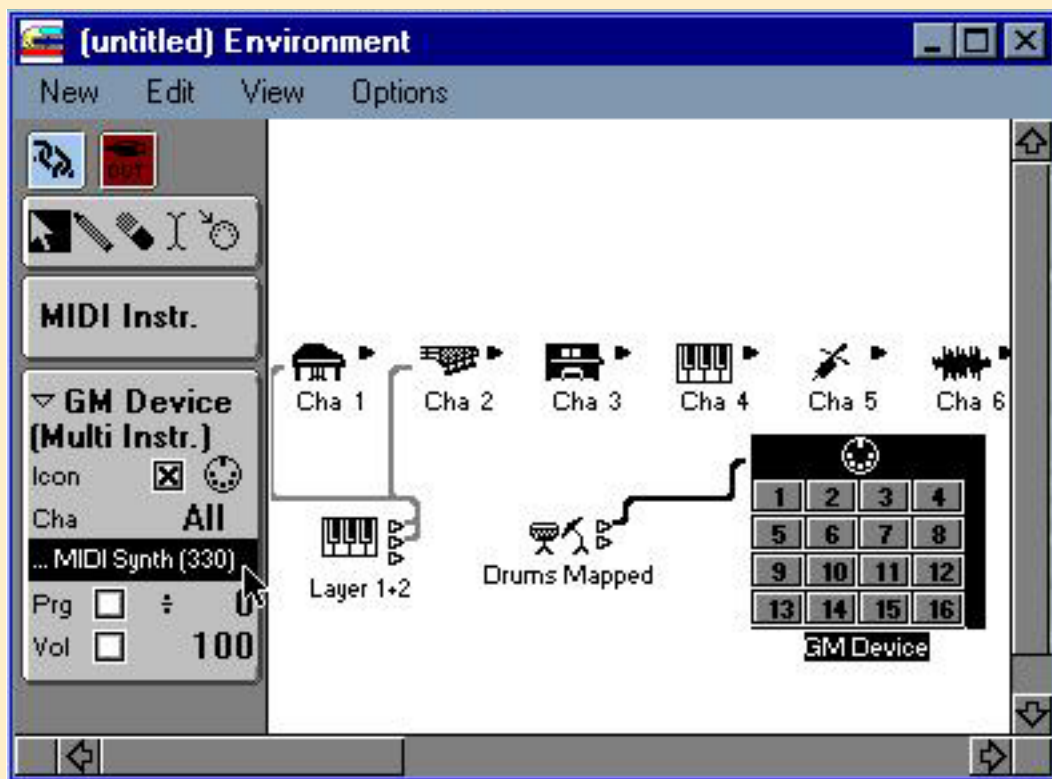
## Windows

If you have an internal sound card and you are not getting MIDI output, it is likely that the default instrument is currently set to address the on-board sounds of the card instead of the MIDI output driver. To change the output driver of the default *Instrument*:

# Quick Start

- Double Click on the Instrument's name in the track window, i.e. on the word **Piano**

This will open up the Environment Window and look something like this:



The object with 16 buttons on it is called a *Multi-Instrument*.

- Click once with the mouse on the little MIDI port icon in the top border of the **Multi-Instrument**.

The result of this should be that none of the 16 little "buttons" on this object are selected as follows:

Now turn your attention to the box in the left hand column which contains multiple settings and parameters. The box, called the **Instrument Parameter Box**, will have the name **GM Device** or at its top. The text **Multi-Instr** written in parentheses below that. As you move down a few lines you will see on the line where the output driver for this Multi-instrument is selected. It is the line just below the line that starts out with the letters **Cha**. The actual text varies based on the drivers in your system, but it may contain the text "MIDI Synth" or "MIDI Out".

## Quick Start

If you click-hold directly on this text, a flip-menu should pop up which lists all MIDI output drivers currently installed in your system. Select the driver which identifies the MIDI output you wish to address. (you may need to consult your MIDI interface's documentation documentation if the name of the driver does not clearly identify the device output.. )

Ok, that's it. When you now perform the check as per Step 3, you should see the proper output light on your MIDI interface light up, and you should hear the corresponding MIDI instrument play. Close the Environment Window and move on to the next section.

1

## 1.2 Program Change Response Check

Now that Logic is communicating with your MIDI interface correctly, we'll check to see that the MIDI device at the receiving end is responding normally to Program Change messages.



**NOTE** *Program Change messages are a special class of MIDI message which allow you to remotely call up different patches on a MIDI device. Only the oldest of MIDI devices do not respond to this message but many devices allow you to disable/enable the reception of this message. You must make sure that the device being tested is set up properly to receive these messages before proceeding.*

### how to:

- test that Program change messages are being sent and received properly
- select patches from the Arrange window

### 1. Find the Instrument Parameter Box



The Instrument Parameter box is displayed in the column that runs along the left side of the Arrange Window. The column contains three separate boxes. The Instrument Parameter box is the one below the box that contains a series of tool icons.

If the column is not visible, select **Arrange Window -> Options -> Parameters**.

If the column is visible, but you don't see all the Parameters in the box such as in the graphic below, then click once on the small triangle in the upper left corner of the box.

If you can't see all of the Parameter box because it is extending outside of the view of the window try either enlarging the window or clicking the on the triangle in the first parameter box. This will minimize that box and make more vertical space available for the Instrument Parameter box.

# Quick Start

## 2. Enable the Program Change box

Towards the middle of the box you should see a line that starts with the letters "Prg" which is an abbreviation for "Program". Click in the box to the right of those letters. This will enable the transmission of program changes for that *Instrument*.



## 3. Change the Program Change value

The number to the far right of "Prg" is the current program change value. You can change by:

- **click dragging it up and down**
- **double clicking it to open a text entry box, typing in a value, then hitting "Return" or "Enter"**

As you change the value, the sound you hear when you play your controller keyboard should change. You should also be able to see the patch changing on the receiving MIDI device. If this is not functioning, watch your interface as you are changing the Program value. The corresponding output light should come on everytime you change the number. If it doesn't, then double check that you have checked the box to the right of "Prg" as previously described. If the output does light, then the problem is with the receiving MIDI device. Review the instructions for that device to make sure it is set up properly to respond to these messages.



## 1.3 Record your first MIDI track

---

Now let's check to see that Logic can record and playback MIDI properly.

### how to:

- test that Program change messages are being sent and received properly
- select patches from the Arrange window

### 1. Select the track

In the Arrange window, make sure you still have the track selected that we selected in the previous section

### 2. Go to Bar 1

Make sure you are at Bar 1 by clicking once on the **Stop** button on the Transport. It looks like this:

### 3. Start Recording

Click the Record button on the Transport and proceed to play anything you wish.

### 4. Click the "Stop" button again when you are through.

There should now be a rectangular object in the main, grey area of the Arrange window, just to the right of the selected track.

### 5. Play back the results

Go back to bar 1 and click the play button on the Transport window. You should now hear your performance played back to you.

## 1.4 Volume and Pan Check

As a final check of your MIDI system, let's test that MIDI Volume and Pan messages are doing what they're supposed to do.

To make this easy, we'll start by turning on Logic's **Cycle Mode**. This will cause Logic to continuously repeat the section you just recorded.

### To enable Cycle Mode:

1. Click the button on the Transport with circular icon
2. Set the Start and End points to Cycle



Adjust the boundaries by click dragging the lower left and right hand corners of the highlighted portion of the Bar ruler that runs along the top of the Arrange window.

### To Adjust Volume and Pan from the Instrument Parameter box:

1. Find the Volume and Pan settings in the Instrument Parameter box

The Volume and Pan settings are located just below the Program Change setting in the Instrument Parameter box. They are denoted as **Vol** and **Pan** respectively.

2. Enable Volume and Pan

Click the check box to the right of **Vol** and **Pan**

3. Start the sequence playing

4. Adjust the values for **Vol** and **Pan**

You adjust the values just as you did for the **Program Change** setting earlier. If everything is working properly, you should hear the effect of your changes immediately.

#### how to:

- test that Pan and Volume messages are being sent and received properly
- adjust volume/pan from Instrument Parameter Box in Arrange Window
- make the Transport play a select section repeatedly (Cycle Mode)

If this is not functioning, watch your interface as you change the values. The corresponding output light should come on everytime you change the number. If it doesn't, then double check that you have checked the boxes to the right of **Vol** and **Pan** as previously described. If the output does light, then the problem is with the receiving MIDI device. Review the instructions for that device to make sure it is set

# Quick Start

up properly to respond to these messages.

## 1.5 Audio System Check

Now let's run through a quick check of your Audio system. In the process you'll learn where to tell Logic Audio what hardware you're using, how to select the desired audio input, and how to record audio.

### 1. Open the **Audio Extensions** window

Logic Audio supports various types of audio hardware so the first task is to tell Logic Audio what system you're using. This is done in the Audio Extensions window. To open this window, choose: **File -> Preferences -> Audio Extensions menu / tab**



**NOTE** *The Preferences and Song Settings windows each have a flip menu bar at the top of the window. Click hold on this bar to access the various categories of options. In Windows, this flip menu is replaced by the common "tabs" used in many Windows95 applications.*

### 2. Select the hardware option that corresponds to the system you're using

Under normal circumstances, Logic Audio automatically recognizes the hardware installed in your system and makes the necessary settings in this window. If for some reason that automatic system has failed, select the box to the left of the hardware that you own. Deselect any boxes that are checked next to hardware you don't own or don't wish to use currently.

In the MacOS example below, Logic Audio is setup to use a TDM capable DAE system (such as Pro Tools III), and an AudioWerk8 card. There are other settings here that will be covered later when necessary.



#### **Windows Only**

If you're using an MME compatible sound card, then select the option marked **PC AV**. You must then select both the input and output driver that corresponds to your card in the flip menu selection boxes provided. For now, ignore the **Force Half Duplex**, **Use Old 2.5 Driver Model** and the **Delay** settings boxes.

#### **how to:**

- set Logic Audio's Preferences so they match your audio hardware
- select and enable an audio track
- record enable an audio track
- select the desired Audio input for recording (Cycle Mode)

# Quick Start



If you had to change the system that Logic Audio will use in this window, you will have to restart the program before continuing.

## 3. Select an audio track

An “audio track” is any track in the Arrange window which has an Audio object assigned to it. When you first load Logic Audio, the first 4 - 8 tracks (depending on your system), will already be set up in this way. Select the audio track assigned to **Audio 1** and proceed to the next step.



## 4. Select the correct Input



Before record enabling the track, you should check that the input source for the Audio object matches the input to which you are feeding signal. On systems that allow for this, the input is selected in the second box above the fader knob on the Audio object under the figure “I/O”. To see the Audio Object: double-click on the track, right where it says **Audio 1**.

This should open up what is called the Environment window. The Audio Object is the the object that looks like a fader strip.

If you don’t have this option, it simply means that you have only two inputs, or that your inputs are “hardwired”, i.e., input 1 always goes to 1, input 2 to 2, etc.

If you have only two inputs, then input 1 feeds all the odd numbered tracks and input 2 feeds all the even numbered tracks.

## 5. Record Enable the Track

To record enable the audio track either:

- Click the Audio object Rec button or,






- **Click the record enable button on the track**

When you Record enable a track for the first time, a file selector box like the one below will open automatically:

This window is essentially asking "where do you want the audio file you are about to create stored on your hard drive and what do you want it named?" This procedure is generally referred to as "setting the Record Path". You only have to do this once. The program will then continue to use this record path until you decide to set a new one.


Once the audio object is record enabled, the level meters on the audio object should respond to incoming signal. If they don't, check then double check that all of the hardware connections are correct and intact.

## 6. Start Recording


Once you're ready to perform, hit the **Record**  button on the Transport, just as we did previously for MIDI recording. When Logic Audio begins recording you should see the following window pop up .

The progress bar and time counter keep you informed of the remaining recording time. The time is determined either by the Maximum Recording Time value you have pre-defined or, ( if you have disabled that option) the available drive space.

## 7. Stop Recording

When you've finished recording, hit the **Stop**  button on the transport or your computer's **Enter** key. If everything is working properly, a progress bar window will show up in the upper left hand corner of your screen which says **Creating Overview**. When it is finished, you should see a rectangular object with a waveform display in the main part of the Arrange window.

## 8. Playback the recording

Click the **Stop** button (or **Enter** key) again. This should return you to bar 1 of the song. Now hit the **Play**  button on the Transport (or your computer's numerical "0" key. You should now hear the material you just recorded. If you don't, try disabling the Record Enable button and trying again. If you still don't hear anything, run through these steps again very carefully to try and trace the source of the trouble.

## Conclusion

If you've made it successfully to this point , then the basic components of your system are and running, and you're ready to begin peeling back more of the layers that separate you from the proficient Logic Audio user we hope you'll be by the time you finish this guidebook. If you ever get stuck along the way, or your system seems to be failing, running through the relevant steps in this chapter again may help you to isolate where the trouble is.

# Quick Start

**1**



# MIDI Setup and Configuration

## What You Will Learn

In this section you will learn how to configure Logic to match your MIDI studio. You will see how to get Logic to "listen" to your MIDI controllers and to "talk" to your MIDI sound devices, effects processors and other MIDI "listeners". You will also learn how to get Logic to: display program names - select the correct program bank - work with mapped MIDI devices like drum synths - communicate with internal devices like SampleCell, WaveMaker, QuickTime and Morningstar. Then you will learn about Logic's on-screen MIDI mixing console. Finally, you will learn how to create a Song template called "Autoload" so that whenever you start Logic it will be optimally configured to your MIDI studio and working style.

The information is organized into the following sections:



Preliminary Steps



Environment Basics



Configuring Multi-Instruments



Configuring Mapped Instruments



MIDI Input Handling



Talking to Internal Devices



Working with OMS



MIDI Mixing



Mix Automation

## 2.1 Preliminary Steps

### Logic's Default Song

For what follows, it will be most convenient to work with the blank "default" Song that Logic presents you with when you start Logic for the first time. To make sure you've got this song open, hold the:



**Mac** — Option key



**Windows** — no key needed

#### how to:

- open Logic's default Song
- save your song

while choosing "New" from Logic's "File" menu. (If you get a dialog that asks you to close currently open songs, choose "Close") You should also take the time to fill out the MIDI Studio Inventory sheet you'll find in an Appendix at the end of this guidebook. Having that filled out and on hand will make the following exercises easier to complete.

### Saving your Song

It's always a good idea to save a Song when you first create it then to save any changes at regular intervals during your progress.

To save the default Song select: **File -> Save as**

When the standard dialog box opens, type in the file name, choose a location and press the **Return** key. (Choose a name that will make it easy to recall what it is for such as "JumpStart" or "JS". Later in the manual, will discuss how you can make this "template song" load automatically when you boot the program.)

2



**NOTE** The reason we used **Save as** in the above procedure is that Logic's **Save** command is disabled when you've first created a song or after you've just saved it—i.e. there must be "new" information for Logic to save. Also, after you've saved a Song once, you will not have to give it a name and location each time you save it—just choosing **Save** from the File menu or using the **Save** key command will automatically do the job.



**Mac** Command + S



**Windows** - Control + S

## 2.2 Environment Basics

The Environment is one of Logic's most powerful features. It can also be confusing—entire books have been written about it—but the basics you will need to configure Logic to your MIDI studio are quite simple and easy to understand. A little attention spent on the details of matching Logic to your MIDI studio is well worth the effort.

The first thing to understand about the Environment is that all MIDI data starts and ends there—all messages pass through the Environment on their way into and out of Logic. From the Environment they get sent to Logic's Arrange window for recording and from the Arrange window they get sent back to the Environment for routing to the desired MIDI device. You can find out more about the Environment and its powerful features in your Logic manual and the Environment guide that comes along with it, but in this chapter we're primarily concerned with getting MIDI messages in and out of Logic.

### Beginning Setup

When you open Logic's default Song, what you see is Logic's Arrange window and a floating Transport window. We'll discuss the Arrange and Transport windows in more detail in the sections to follow, but right now let's get on with the business of customizing Logic's Environment.

To start the process of matching the Environment to your MIDI studio, open the Environment window by selecting :

- **Windows -> Open Environment**

When the Environment window opens, move and resize it as necessary to fit your screen.

### Controlling the various view options in the Environment

Before we explore the Environment, let's make sure we have the same view. The Environment window's "View" menu contains a number of items, each of which may or may not have a dot (**Mac**) or checkmark (**Windows**) to its left. The marking indicates that the item is active (turned on).

#### how to:

- create an Instrument object in the Environment
- find the Instrument Parameter Box
- protect the Environment from accidental alterations
- hide or show the parameter sections to the left of most windows
- decide what Environment object to use for each of your MIDI devices.

# MIDI Setup and Configuration

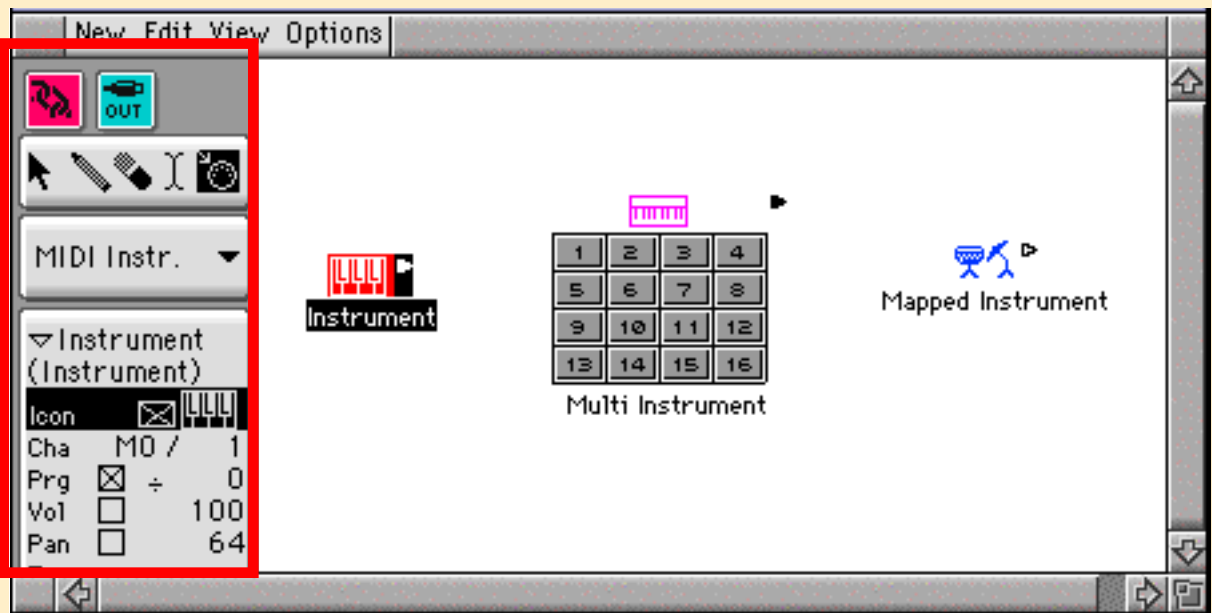
To set up our view:

1. Be sure that **Protect Cabling/Positions** is inactive

We need to deactivate this option in order to make changes and additions to the Environment. Once your Environment is configured, it's a good idea to protect it by reactivating this option.

2. Be sure that **Parameters** is active

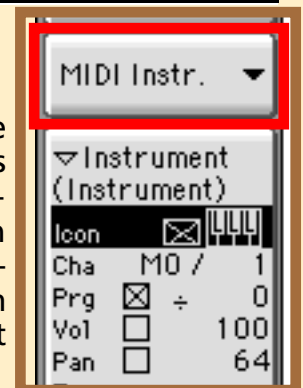
This makes the Parameters section at the left side of the Environment window visible. We will use the little boxes and menus in this section to make many settings but after your Environment is set up, you may want to de-activate this option to save screen space.



2

## The Environment Layers

Logic divides the Environment into layers—you can think of these as sub-windows of the Environment window. The box towards the top of the left column with the name **MIDI Instr.** in it is a flip-up menu called the **Layers** menu. This is where you select which layer to view. Don't get confused — there is always just one Environment. The purpose of the layers is simply to keep things from getting too cluttered. Also, the layer an object is on has no affect on its function.



# MIDI Setup and Configuration

There's a special layer called the "Global Objects" layer which we're going to use in setting up our Environment.

To select this layer choose: **Environment -> Layers menu -> Global Objects**

The Global Objects layer has a special property: any objects in this layer will show up in all other layers.

## Instrument Objects

The first step in matching the Environment to your MIDI studio will be to create objects which will talk to and represent each of your listening MIDI devices—a separate object for each device. These objects are the centerpiece of your Environment and having them available on all layers will be very handy in the future.

The Environment objects we'll use for the MIDI devices in your studio are generally referred to as "Instrument" objects. There are three different types:

- **the Single Instrument**
- **the Multi-Instrument**
- **the Mapped Instrument**

In most cases, you will use the Multi-Instrument for your regular MIDI synth devices. This is for two basic reasons: A Multi-instrument can address multiple channels of a multi-timbral device and; it can store multiple banks of patch names, allowing you to access your patches by name instead of just by number. One exception would be the choice for drum-type synths which "map" a different sound (rather than pitch) to each MIDI note. The Mapped Instrument is ideally suited for that type of MIDI device.

## Creating Instrument Objects

You must now decide which MIDI devices you need Environment objects for. That means it's time to consult your MIDI Studio Inventory. The important column is the "Listen Chans" column. *You will want an Environment object for each item (i.e. row) where there is an entry in the "Listen Chans" column.* These are the MIDI devices in your studio that receive data (i.e. the "listeners" in your studio).

Creating an instrument object in the Environment is simple:

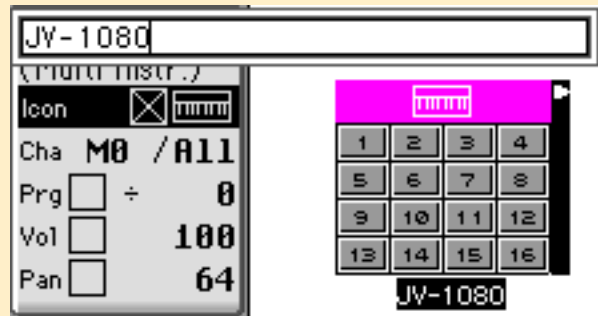
1. Choose **Environment ->New -> Instrument | Multi Instrument | Mapped Instrument**

(remember, the slashes, "|", indicate alternatives to choose from)

# MIDI Setup and Configuration

## 2. Name the Instrument via the Parameter Box

Rename the object by clicking on its name at the top of its Parameter Box and typing in a name that will help you remember the listening MIDI device.

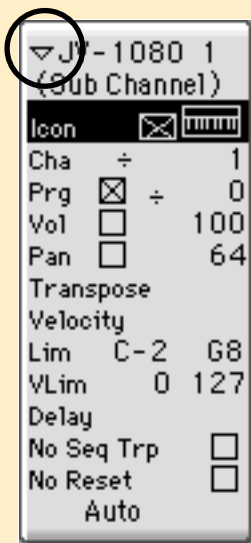


**NOTE** An Environment object's Instrument Parameter Box is displayed in the Environment window's parameter settings column whenever that Environment object is selected. The one thing that is always visible is the object's name. The rest of its parameters will be hidden if the Parameter Box has been "minimized".

To the left of the object's name is a triangle pointing either to the right or downward—when it is pointing right, the box is minimized.



When it is pointing down, all parameters are visible. Click the triangle to switch between these two views (minimized and expanded).



After you've created an instrument object for one of the listening devices in your studio, follow the instructions in the following sections for that particular instrument type (i.e. Multi-Instrument or Mapped Instrument).

## Cleaning up the Instrument Menu

Logic's default song contains a basic set of Environment objects which you really don't need once you've configured the Environment to match your MIDI system. To keep these objects from causing any confusion and needlessly cluttering the Instrument menu, let's delete them now before moving on.

Here's how it's done:

1. Go to the Environment layer named **MIDI Instr.**

# MIDI Setup and Configuration

2. Select **Environment** ->**Edit** ->**Select All**
3. Select **Environment** ->**Edit** ->**Clear**
4. Repeat this process for the Layer named **MIDI Faders**

This removes unneeded objects from your Environment since you have already created Instruments and mixers matching your Studio.

## 2.3 Configuring Multi-Instruments

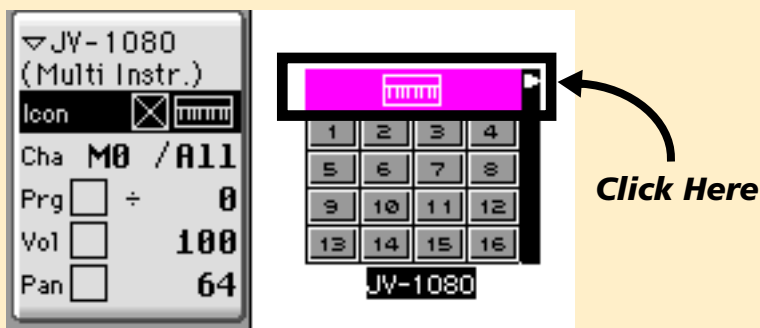
The Multi-Instrument is really 16 instruments rolled into one—one instrument for each MIDI channel. The little squares with numbers (1-16) in them correspond to these 16 "sub-channels". Clicking one of these sub-channels activates its corresponding **Instrument Parameter Box**

### how to:

- access all channels of a multi-timbral instrument
- connect a Multi-Instrument to the right MIDI port
- select icons for the Multi-Instrument and its sub-channels
- choose programs by name rather than by number
- enter and edit program names
- get Logic to send the correct bank select messages

### 1. Select the whole Multi-Instrument

If you click on the Multi-Instrument outside of the numbered squares, i.e., in the top border or on its name, you will select the Multi-Instrument as a whole and its corresponding Parameter Box. This is where you will globally set the output Port for the Multi-Instrument which in turn governs the output port for all of the sub-channels.



2

### 2. Select the correct Output Port



Windows



The port setting is changed by click-holding in the space just below the the word **Cha** in the Parameter Box. If you click-hold in the correct spot, a flip menu pops up with the currently available MIDI drivers.



# MIDI Setup and Configuration

Choose the one that corresponds to the MIDI output to which the Instrument you are creating a Multi for is connected.



## Mac

The current port setting ("M0" for a newly created Multi-Instrument) is indicated next to the word **Cha** in the Parameter Box. In this case the "M" stands for "Modem Port" and the "0" stands for "output 0" which is an established way of saying "All Outputs". If M0 is not the correct port for this Multi-Instrument, click and hold on the Port Indicator and scroll it until the correct port comes up.

## 1. Select the correct output Channel



## Mac

The number after the slash indicates the MIDI channel output.



## Windows

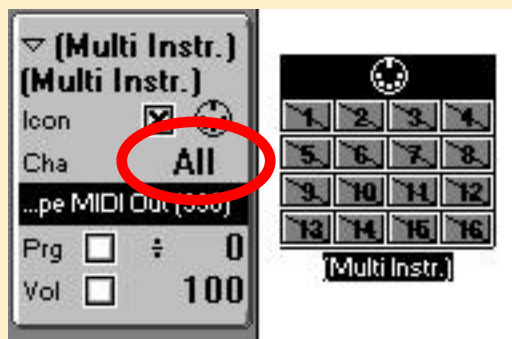
The number after the abbreviation **Cha** is where you select the output channel for the object.



## All Systems



For "normal" single channel type Instruments, you would set this to the desired value. In the case of a Multi-Instrument however, DO NOT change the channel setting. Instead, leave it set to "ALL". The reason, is that in this special case, the channel output is determined by which of sub-channels is selected in the Arrange window. If you were to change this to a specific value, all the sub-channels would be forced onto that channel ("re-channelized" if you will), thus defeating the purpose of the Multi-Instrument.



2

# MIDI Setup and Configuration

## 2. Hide the global Multi-Instrument icon from the Instrument menu

Generally, there is no need for the *global* Multi-instrument to be accessible from the Arrange Window's Instrument menu, so, for the sake of saving space, we'll "hide" it from that menu. (Typically, you will be assigning the sub-channels of the Multi-Instrument to Arrange window tracks and it is unlikely that you will want to assign the whole Multi-Instrument to a track.) To hide an Instrument, simply uncheck the box next to the word "Icon" in the Multi-Instrument's Parameter Box.



## 3. Enable the desired number of sub-channels



You must "enable" a sub-channel before it will appear in the Instrument Menu in the Arrange window. You do this by simply clicking the numbered square that corresponds to the channel you wish to enable. Set up sub-channels for each of the MIDI channels on which the associated MIDI device is listening. DO NOT attempt to choose a port or channel for the sub-channel. The port is set by the whole Multi-Instrument and the channel is the same as the sub-channel number. This cannot be changed.

## 4. Choose an icon for the sub-channel

You choose an icon for the Multi-Instrument or any sub-channel by clicking on the icon to the right of the Instrument menu checkbox. The main purpose for the icons is to make the object easier to recognize on the Arrange window's track list and Instrument menu so choose an icon (s) that best represents the listening MIDI device. Logic also has a preference for ordering the Instrument menu by icon—a option we recommend you enable.

## 5. Set the other parameters

Below the channel settings are parameters for controlling the program, volume, pan, transpose, velocity adjustment, pitch & velocity input filter and playback MIDI delay. If you know that you want particular settings, go ahead and fill them in. Otherwise, leave them alone—you can always change them later (even from the Arrange window) if the need arises.

# MIDI Setup and Configuration

## 6. Enabling program selection.

The one parameter you DO want to set is the "Prg" checkbox. This will allow you to select programs by name and see their names in the Arrange window's track list. To enable it, ensure the checkbox is X'd.



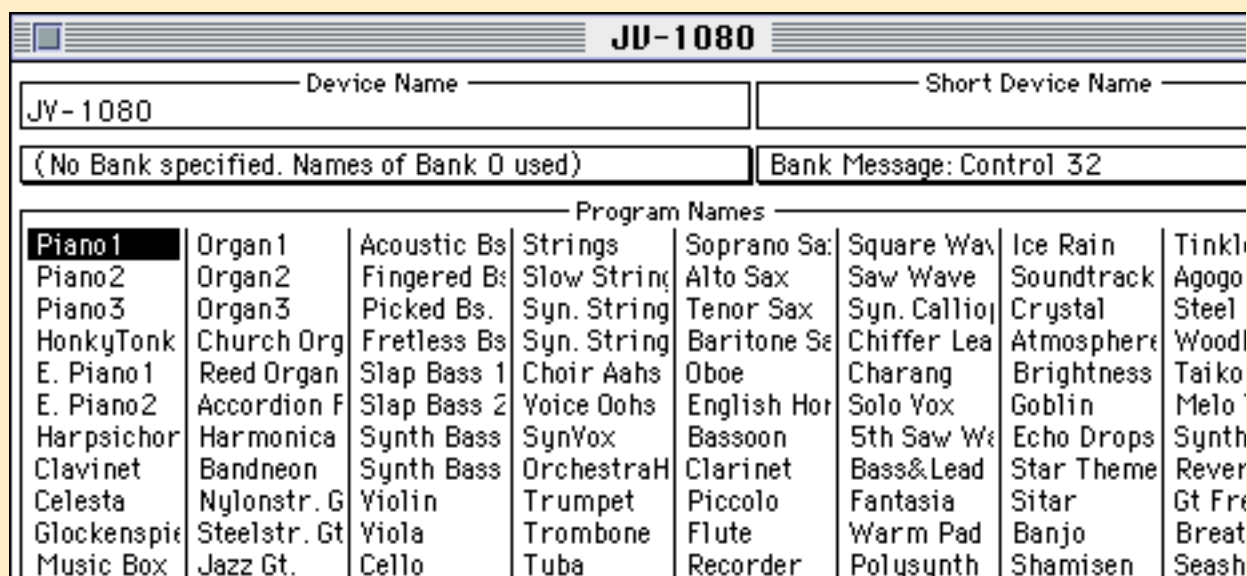
**NOTE** *Setting sub-channels has no effect on their intended MIDI device listeners—these devices still need to be enabled and set up to respond to the standard MIDI messages.*

## Program Names and Bank Select messages

Once you have set up the Multi-Instrument and its sub-channels, you're ready to deal with program names and banks. This is one of the main advantages of using Multi-Instruments—they can store up to 15 banks of program names (128 per bank) to match the programs in your MIDI device. Once these are set up, the names of selected programs will appear in the Arrange window's track list (if the sub-channel's "Prg" checkbox is checked) and you will be able to select programs by name in several convenient ways.

### Entering program names

You enter program names in the window which opens up when you double click the Multi-Instrument.



# MIDI Setup and Configuration

Initially, this window contains one bank of names which are set by default to the GM standard program names. You can change a program name by double-clicking on it and typing in a new name, but this can become tedious for inputting long lists of names. Fortunately, there are several alternatives presented in the Names menu which pops-open when you click the downward pointing triangle at the upper far-right of the window.

## Shortcuts for entering program names

There are two convenient ways to work with program names—in any convenient text editor and in Emagic's Sound Surfer/Diver. The "Cut, Copy & Paste" choices are for moving name banks (all 128 names at a time) between Logic and any text editor or Sound Surfer/Diver. The "Update using AutoLink" is for automatically drawing names from the Sound Surfer/Diver instrument with the same MIDI port and channel assignment—check your Sound Surfer/Diver manual for details.

## Using bank select messages

The pop-up menu to the left of the Names menu is for choosing the type of bank select message that the Multi-Instrument will send (when a program bank is indicated). If you don't see the name of your particular MIDI device here, try the first few choices (in top-down order) to see if they work. If not, you will need to delve further into custom bank select messages—a topic well covered elsewhere in your Logic documentation.

## Initializing and using program name banks

The flip-up menu to the left of the Bank Message menu is the Bank menu. This is where you set up separate banks of program names. When you create a Multi-Instrument, there is only one bank of names. If your MIDI device has more than one bank, use this menu to create additional name banks.

2



**TIP** Do not create additional name banks unnecessarily. They use up memory and may cause confusion.



**TIP** Logic's support files contains a special song file whose Environment is stuffed with pre-configured Multi-Instruments for many of the most popular synths. If you open this Song file, you can then easily Copy/Paste the Multi's you need from there into the template song you are constructing.

# MIDI Setup and Configuration

## Accessing Patch Names

Once your Multi-Instrument program names are in place, there are a few different ways to access them. This is always done from the Arrange window because that's where MIDI gets routed from your MIDI controller, through the Multi-Instrument then on to the listening MIDI device.

So, return to the Arrange window and select the first track—the one whose instrument is currently set to "No Output".

To use a sub-channel and select presets by name:

### 1. Choose the Instrument and desired channel from the Instrument menu

Choose **Arrange -> Instrument menu -> sub-channel** (for the Device you wish to "talk to"). The number just after the Instrument name indicates the channel.

Check the box to the right of **Prg** in the Instrument Parameter Box.

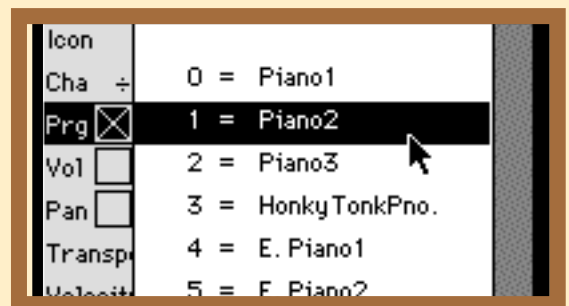
### 2. Choose the desired bank



Select the desired program bank using the numerical adjacent to the **Prg** checkbox. If there is no bank currently selected this position will have a little division symbol as a place marker. If there is only one bank, leave this numerical set to "÷".

### 3. Select the desired Program/Patch

Click & hold on the program number to the right of the bank indicator. A menu will pop-up from which you can select a program by name, OR;



Click on the name of the Multi-Instrument at the top of the Parameter Box. This will open up the Multi-Instrument's window and any program name that you click will be sent to the sub-channel for auditioning. The corresponding program number will also be set in the Instrument Parameter Box.

# MIDI Setup and Configuration



**TIP** If you hold the **Mac** — Control + Option; **Windows** — Control + Alt keys down and double-click the icon in the Track list, it will open the Multi-Instrument window



**TIP** Once the instrument window is open, you can use the arrow keys on your computer keyboard (up, down, right & left all work) to scroll through the programs in the current bank. You can even do this while Logic is using the Instrument during playback.

## 2.4 Configuring Mapped Instruments

The Mapped Instrument is designed for use with MIDI drum synthesizers, but it's equally appropriate for any MIDI sound device that maps each note to a different sound—different sound effects in a sample bank you've set up, for example. The primary advantage of the Mapped Instrument is that you can name each note so that when you're working in one of Logic's editors, the note is identified by that name instead of by its pitch.

Mapped Instruments also make it possible to individually assign a note its own channel and cable output, which allows you to spread notes among several MIDI devices or Environment processes.

The first thing that happens when you create a Mapped Instrument is that a new window called the "Mapped Instrument" window opens up and becomes the active window. This is where you set up the individual note parameters. Before we use this window however, let's look at the Mapped Instrument's parameters.

### how to:

- open & close the Mapped Instrument window
- set the Mapped Instruments parameters
- re-map MIDI notes using a Mapped Instrument
- name individual notes to match your drum synth
- set a velocity offset for each note
- control the destination of individual notes
- control how notes appear in a drum score style

### 1. Close the Mapped Instrument window

Close the Mapped Instrument window by clicking the close box in its upper left hand corner

### 2. Select the Mapped Instrument

Select the Mapped Instrument by clicking on it.

### 3. Set its port and channel

You set the port and channel for the Mapped Instrument just as for a Multi-Instrument (see steps 1 thru 4 under [Configuring Multi-Instruments](#))

### 4. Select its icon just as for a Multi-Instrument

See step 6 under [Configuring Multi-Instruments](#).

### 5. Open the Mapped Instrument window

Double-click the Mapped Instrument object in the Environment window to

# MIDI Setup and Configuration

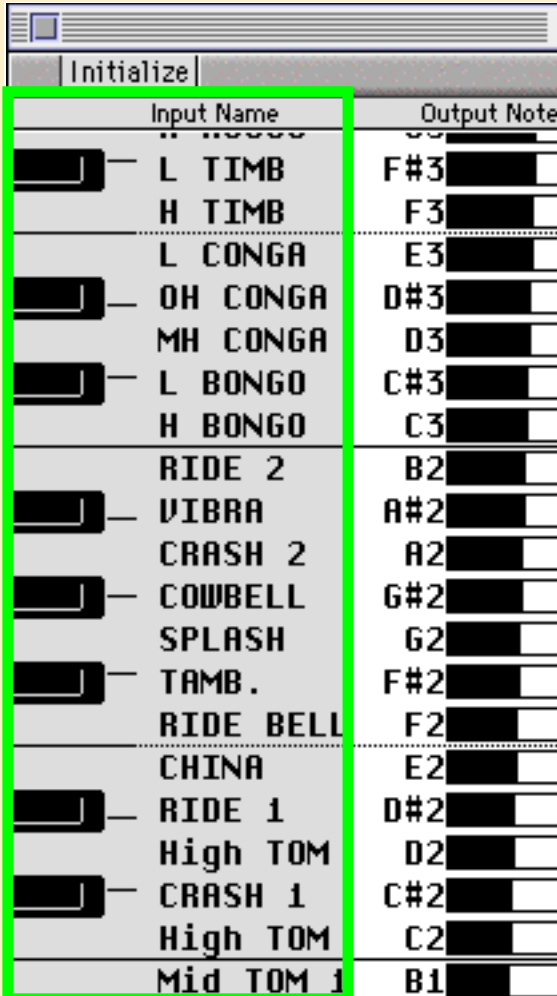
open it.

The Mapped Instrument window has a keyboard along its left edge. This is where you select a note or group of notes for working on. When a note is selected, its name to the right of the associated key will be reversed (gray letters on a black background).

## Selecting Notes

One or more notes can be selected at the same time in the Mapped Instrument window. Whenever you make a selection, you will hear the selected note (assuming there is a MIDI device listening at the other end). Here are several ways to select notes:

- Click on the Mapped Instrument window's keyboard to select a single note.
- Shift-click on the Mapped Instrument window's keyboard to add another note to the selection.
- **(Mac Only)** Click & drag along the Mapped Instrument window's keyboard to "rubberband" select groups of consecutive notes.
- Play the note you wish to select on your MIDI controller keyboard (it doesn't make any difference what track is selected in the Arrange window)



| Input Name | Output Note |
|------------|-------------|
| L TIMB     | F#3         |
| H TIMB     | F3          |
| L CONGA    | E3          |
| OH CONGA   | D#3         |
| MH CONGA   | D3          |
| L BONGO    | C#3         |
| H BONGO    | C3          |
| RIDE 2     | B2          |
| VIBRA      | A#2         |
| CRASH 2    | A2          |
| COWBELL    | G#2         |
| SPLASH     | G2          |
| TAMB.      | F#2         |
| RIDE BELL  | F2          |
| CHINA      | E2          |
| RIDE 1     | D#2         |
| High TOM   | D2          |
| CRASH 1    | C#2         |
| High TOM   | C2          |
| Mid TOM 1  | B1          |

Once you have selected a note or notes, use the mouse to make changes to their parameter settings in the other columns of the Mapped Instrument window.



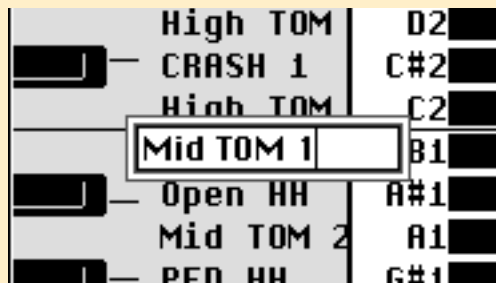
**NOTE** Any changes you make to a selected note will also apply to all other selected notes but they will not appear in the Mapped Instrument window until the note selection is changes.



# MIDI Setup and Configuration

## Naming notes

You can name an individual note by double-clicking on its name to the right of its key. (When you do this, the note becomes the only selected note—you can not name multiple notes at the same time.)



When a Mapped Instrument is created, the notes corresponding to keys D#0 through D#5 have the standard GM note names. The notes corresponding to the remaining keys have the ordinary "pitch" names. At the top of the keyboard is a menu named "Initialize" (the only menu for the Mapped Instrument window) where you can reset the names for all selected notes. There are only two choices (for names) here: the standard note names and the GM drum names. Any other names must be entered manually.

## Re-mapping note pitches

Re-mapping a note means setting the pitch that is output to something different than the pitch that is input. The note will be re-mapped whenever it "passes through" the Mapped Instrument, i.e. when the Mapped Instrument is the current thru instrument or, when it is on a track assigned to the Mapped-Instrument. The output note is set in the Mapped Instrument window's **Output Note** column. This column contains both a pitch name and a horizontal bar. This

| Input Name | Output Note | Velocity | Cha  | Cable | Head | Rel.Pos |
|------------|-------------|----------|------|-------|------|---------|
| L TIMB     | G4          | 0        | Base | 1     | •    |         |
| H TIMB     | F3          | 0        | Base | 1     | •    |         |
| L CONGA    | E3          | 0        | Base | 1     | •    |         |
| OH CONGA   | D#3         | 0        | Base | 1     | •    | ↓1      |

You can use either to select the output note—the horizontal bar scrolls right and left while the note name scrolls up and down. You can also double-click the note name to type in a new value.

# MIDI Setup and Configuration

## Setting a velocity offset

A Mapped Instrument allows you to add or subtract a set amount of velocity for each note individually. The velocity offset for each note in the map is set in the Mapped Instrument window's **Velocity** column.

| Input Name | Output Note | Velocity | Cha  | Cable | Head | Rel.Pos |
|------------|-------------|----------|------|-------|------|---------|
| L TIMB     | G4          | 83       | Base | 1     | ●    |         |
| H TIMB     | F3          | 0        | Base | 1     | ●    |         |
| L CONGA    | E3          | 0        | Base | 1     | ●    |         |
| OH CONGA   | D#3         | 0        | Base | 1     | ●    | ↓1      |

The value set here (which is 0 by default) is added to the incoming note's velocity. The range of possible values is -127 to 127. As with the output note, there is a numerical display as well as a horizontal bar and changes can be made with the mouse or by typing.

## Setting a different channel and output cable for each note

The Mapped Instrument allows you to select both the channel and the output cable on a note-by-note basis. This means that you can divide the notes among:

- Several channels of a multi-timbral MIDI device
- Several MIDI interface output ports connected by cables from the Mapped Instrument
- Several Environment processes connected by cables from the Mapped Instrument

2

A note's output channel is set in the Mapped Instrument window's **Cha** column by scrolling or double-clicking with the mouse. A setting of **Base** means the channel set in the Mapped Instrument Parameter Box will be used.

A note's cable is set in the **Cable** column. Mapped Instrument output cables are numbered counting from the top down and choosing a number higher than the number of cables results in the note's not coming out anywhere.

The last three columns in the Mapped Instrument window determine how individual notes are notated in the Score window when a drum-type Score style is used. The **Head** column controls what the note head will look like. The **Rel.Pos** column measures how many lines (whole numbers) and spaces (halves) the note head will be above or below the top staff line. The **Group** column sets which polyphonic voice the note will be assigned to. (For more details on score styles consult the users Logic manuals.)

# MIDI Setup and Configuration



**NOTE** *All the settings in the Mapped Instrument window apply to the input note.*

## 2.5 MIDI Input Handling

The "Talk Chans" column of your MIDI Studio Inventory indicates which devices in your setup are MIDI talkers, i.e., those that send MIDI data into your MIDI interface. This includes all your MIDI controllers—keyboards, hardware fader surfaces, drum pads, breath controllers, etc. It might also include MIDI devices that can send SysEx information about their internal setup—patch dumps, panel settings, etc.

### how to:

- avoid doubled notes
- avoid MIDI feedback loops

Logic's default Environment setup—the one we're working with here—listens to all MIDI talkers at the same time and sends the incoming MIDI data to the one selected track in the Arrange window. From there it is sent to the Environment object assigned to that track, and if that object is assigned or is connected to an output port, the MIDI data is sent back to your MIDI interface. If Logic is recording, the data gets recorded.

In most cases, this means everything will work smoothly without your doing anything. If there are any problems, they typically fall into two categories: doubled notes or MIDI feedback loops.

### Avoiding doubled notes

Doubled notes typically result from MIDI devices that are both controllers and sound devices such as workstations and controller keyboards with built in sounds. If these devices are connected to Logic as both talkers and listeners while at the same time "talking to themselves" (Local Control Mode) the result is doubled notes. (In these situations, doubled notes will only occur when an Arrange window track is selected whose Instrument is set to the port and channel of the MIDI device.)

The best way to solve a doubled notes problem is to make the MIDI device stop talking to itself. This is called local control. There is usually a device setting called "Local" which can be set to "On" or "Off". You always want it set to "Off".



**TIP** A quick way to check this is to assign Logic's "No Output" Instrument to the currently selected track. If playing MIDI keyboard still produces a sound then local is "On".

### If you don't have Local Off control

Some older MIDI devices don't allow you to turn local control off. If you have only one such device and have created an Instrument for it in the Environment, then Logic

# MIDI Setup and Configuration

provides a way to block MIDI "thru" to this Instrument:

1. Choose **Arrange -> Options -> MIDI Options**
2. **Re-define the "no MIDI thru" instrument**

Select the Instrument you have set up for this MIDI device from the pop-up menu labeled "Instrument without MIDI Thru function".



**NOTE** *If the MIDI device is multi-timbral and you have set up a Multi-Instrument for it in the Environment, you can only block MIDI thru for one sub-channel. This is an unlikely scenario however as most offending MIDI devices are older and not multi-timbral.*

If you can't solve your doubled notes problems this way, check the Environment guide that came with Logic for a more complete set of options.

## MIDI feedback loops

MIDI feedback is what happens when a listening MIDI device re-sends the data it receives. If the Instrument assigned to the currently selected track can send and receive anything played on the track, will be returned and resent ... and returned ... and resent ... and returned. This is called a MIDI feedback loop.

If you have a MIDI feedback problem on a particular port, you will quickly find out—the first time you select a track using this port and play a note, you will hear the note repeating very rapidly. You will also see constant input & output in the MIDI output section of Logic's Transport window.

The "quick fix" solutions include:

- **Select another Arrange window track.**  
This should be a track assigned to a different Instrument or to "No Output". This may leave notes "hanging" but it will at least, break the feedback loop. Of course, what you really want to do is prevent MIDI feedback from happening. There are several alternatives:
- **Stop your MIDI device from resending the data.**  
Most modern MIDI devices have a setting for this—two common names for these settings are "MIDI Thru" and "MIDI Echo"
- **Set the Environment object for this device as the "Instrument without MIDI Thru function"**  
See previous section.

# MIDI Setup and Configuration

- **Disconnect the MIDI device from your MIDI interface's input port.**  
This removes the device as a talker in your setup but that's better than MIDI feedback.

If you can't solve your MIDI feedback problems in any of these ways, check the Environment guide that came with Logic for a more complete set of options.

## 2.6 Talking to Internal Devices

From the viewpoint of Logic, an "internal device" is any hardware or software MIDI device inside of the same computer that is running Logic.

Mac examples include: Digidesign's SampleCell card; Kurzweil's Wavemaker card; or Apple's Quicktime Musical Instruments software. On a Windows system, this could be the synth sounds on your Soundblaster or compatible sound card, or the a sample card like the Terratec E64.

Dealing with these systems on a Windows system requires no further knowledge, since their Windows drivers will be accessible in the same way as the drivers for your MIDI interface. On the Mac however, Emagic has had to include special Environment ports to accommodate these systems. ***The rest of this section therefor applies only to Mac based systems***

### how to:

- get Logic to communicate with an internal card or software
- set up Logic to use Apple's Quicktime Musical Instruments
- set up Logic to access a SampleCell card



**NOTE** *If the card or hardware supports it, another way to access these internal systems is via OMS. However, if Logic has an internal port for the object, it is better to use that port. If you need to use OMS, see the instructions on OMS in the following section, "Working with OMS (Open Music System)"*

To set up Instruments and Mixers that access these special internal ports:

1. Select **Environment -> New -> Internal -> Digidesign's SampleCell | Apple Quicktime | Morningstar Wavemaker | Autolink**



**NOTE** *The Autolink port is used to send Sysex data back to SoundDiver. The main purpose for that is if you wanted Diver's edit knobs to update according to Sysex data recorded in Logic.*

2. Create a Multi-Instrument and enable the sub-channels as needed
3. Cable the Multi-Instrument to the new port object
4. Choose to "Remove" cables and ports from the resulting dialog box
5. Create a GM Mixer

See in the following section, "Creating a Virtual Mixer"

# MIDI Setup and Configuration

6. Cable the Mixer to the port object

7. Choose to "Remove" cables and ports from the resulting dialog box

You can now access the Instrument just as you would a "normal" MIDI instrument.



**TIP** A good place to put these internal objects is on the Environment's "Clicks & Ports" layer since all the real MIDI ports are represented there.

## SPECIAL NOTE FOR SAMPLECELL USERS

---

If you are using Logic Audio Mac with a Sample Cell card, please make sure the follow settings are made:

### ***In Logic***

1. Open **File -> Preferences -> Communications Menu**

2. Uncheck "Release Modem and Printer Port in Background when stopped"

This ensures that Logic retains hold of the port when switching over the the Sample Cell applications

3. Check "Release Audio port in background when stopped"

This ensures that Logic allows Sample Cell to use the audio port when switching over to the Sample Cell software

### ***In Sample Cell***

- **Disable all MIDI in/out options in Sample Cell Preferences**

Since Logic is talking to Sample Cell directly, SampleCell does not need to communicate via MIDI. Having these options on can also lead to problems if Sample Cell tries to access the Port while Logic is using it.



## 2.7 Working with OMS (Open Music System)

*This section applies only to Mac based systems*

When you boot Logic or Logic Audio for the first time, it checks to see if OMS is installed. If it detects its presence, it will ask whether you want to use it as your MIDI driver. Unless you really need to use it (see below) it is probably best to click "Don't Use" as Logic's own drivers can talk to any existing MIDI interface on the market. Furthermore, Logic's own drivers will communicate more efficiently as there will be one less "layer" between the program and your interface.

***There are only three basic situations that require you to run OMS:***

- You need to send data between two OMS compatible applications running on the same computer. For example, if you were trying to internally sync Logic and Pro Tools using MIDI Time Code.
- You want run two OMS compatible applications simultaneously, such as Logic and Opcode's Galaxy.
- You are running multiple Studio 5 MIDI interfaces connected to a single port

### **how to:**

- decide when to use OMS
- enable Logic to use OMS
- set Logic up to switch automatically between OMS and non-OMS operation
- set up Logic's OMS "map" to match your Environment setup

If you meet one of these three criteria, (or simply have a strong personal compulsion to use OMS), then either select **Use** when Logic prompts you at startup, or; if you have already opened the program and chosen **Don't Use** initially, enable the **Use OMS if available** option found in the **File -> Preferences -> Communications** window.



**NOTE** *All of the following instruction assumes that you have already read the documentation that came with your OMS software — generally included with your MIDI interface — and have properly configured and "made current" and OMS Studio Setup. If you have not done this yet, you will need to before proceeding.*

Once Logic is enabled to use OMS there are two basic ways to go about accessing your OMS Instruments. The first method is to use specially created Environment objects which Logic can create for you automatically. These are referred to as "OMS Equivalents". While this is the most convenient option, the second option is more

# MIDI Setup and Configuration

flexible. It uses a global output map to remap instruments based on their "MTP Style" Environment cable settings. Though you could use a mix of both methods, they are essentially mutually exclusive, i.e., only one is required. Here are the two methods described in more detail:

## Using OMS Equivalents

When OMS is enabled, anytime you create a default song (by choosing File -> New, or, if you have an Autoload, by holding the Option key while selecting File -> New) Logic creates a set of "OMS equivalent" Environment objects and places them in a special layer of the Environment named "OMS Objects". The objects will be either multi-instruments or "regular" instruments, depending on how they were defined in your OMS Studio Setup. These instruments will show up in the Arrange window's Instrument menu just as any Environment object does. This make it by far the quickest way to get up and running immediately with access to everything in your studio. There are however a few limitations.

You still have to get the patch names into the Multi-instruments in some fashion.

You still have to define the proper MIDI bank select message for that MIDI device

All of the sub-channels of the Multi-instruments are generally enabled (if that's the way that they were defined in your OMS Studio Setup) which, if you have a fair number of instruments, can lead to an inordinately long and somewhat clumsy Instrument Menu in the Arrange window. (You can of course go back and "disable" some of these channels by hiding the icons as described earlier)

## Creating new Instruments under OMS

You can create new Instruments in a similar fashion to the way described earlier. The only difference is in the method used to set the output port. You can directly assign the outputs of Instruments and Multi-Instruments by click-holding in the space in the Instrument Parameter Box just below the line containing the Icon. The line defaults to saying "(OMS Map Used)". A flip-menu will pop up that displays all your OMS Instruments, as defined in your OMS Studio Setup. Simply select the appropriate Instrument.



**NOTE** Unless you use the OMS Output Map option (described next), you must cable all other object types, i.e., the Mapped Instrument, GM Mixer, the Metronome, faders, etc, to an Instrument or Multi-Instrument assigned to an OMS output to enable them to communicate with OMS. In this case, you are essentially using the Instrument or Multi-Instrument as a port object.

## Using the OMS Output Map

As mentioned briefly in the beginning of this section, this option allows you to set

# MIDI Setup and Configuration

up a global map which routes all output to OMS Instruments based on their Environment "cable" setting. In other words, you can tell Logic to take the output of a device defined to, say, Modem Port 3 (M3) and re-map it to a particular OMS Instrument. This approach has some distinct advantages:

- It allows you to easily adapt an Environment that was created w/o OMS to work with OMS
- It allows you to switch between using OMS and not using OMS with relative ease.
- It allows you to globally reconfigure Logic to work with a new OMS Studio Setup — for example, if you were to bring your song files to another studio. Without using this option, you must reconfigure songs on a song to song basis rather than globally.
- It means that all of the functionality of the Environment window are available to you with the same flexibility as when not using OMS.

Configuring the Output Map is relatively painless.

## 1. Open *File -> Preferences -> OMS Output Map Modem | OMS Output Map Printer*

Choose the Printer or Modem option which corresponds to the serial port to which your interface is connected.

## 2. Assign Cable outputs to OMS Instruments

In either window you will see three columns of numbered pop-up menus. The numbers correspond to the modem port numbers. For example, the "0" pop-up menu is for the "M0" port, (shorthand for "All Ports"), the "1" pop-up menu is for the "M1" port, etc. For each of these ports that your MIDI interface uses, select a corresponding OMS Instrument

That's it!

And don't forget, since this is a Preference, the map affects ALL of your songs, not just the one currently open. That means you are free to open or create a song file and, when you are using OMS, all output will be re-directed based on its settings.

## 2.8 MIDI Mixing

One of the things you'll want to start doing as soon as you begin making multi-track music with Logic is controlling the mix. In the MIDI world, this means sending pan and volume MIDI messages to your various MIDI sound devices. While you can set basic Pan and Volume levels from the Instrument Parameter Box in the Arrange window, the Environment window provides various on-screen fader and knob objects which provide a more graphic way to perform this function. This section focuses on using one of those objects — the GM Mixer.

### Creating a Virtual Mixer

Here are the steps for creating an on-screen mixer for one of your Multi-Instruments. Since on-screen mixers get fairly large, you probably won't want to put several of them on the Global Objects layer, so create an empty layer by selecting:

***Environment ->Layers menu -> "\*\*\*Create!\*\*\*".***

This creates a new layer named "(Unnamed)" which you can rename by double-clicking on the name. This new layer will at first look exactly the same as the Global Objects layer, but when we start adding things to it, they won't appear on the Global Objects layer or any other layer than their own.

#### how to:

- create an on-screen mixer for each port
- set up the on-screen mixer
- connect the mixer to your Instrument objects
- use the on-screen mixer and record the results
- move Environment objects between layers

### Create a GM Mixer

Create Logic's on-screen, 16-channel mixer by selecting:

***Environment ->New ->GM Mixer***

A large mixer object will appear. (You may need to scroll or resize your Environment window to see the whole GM Mixer.)

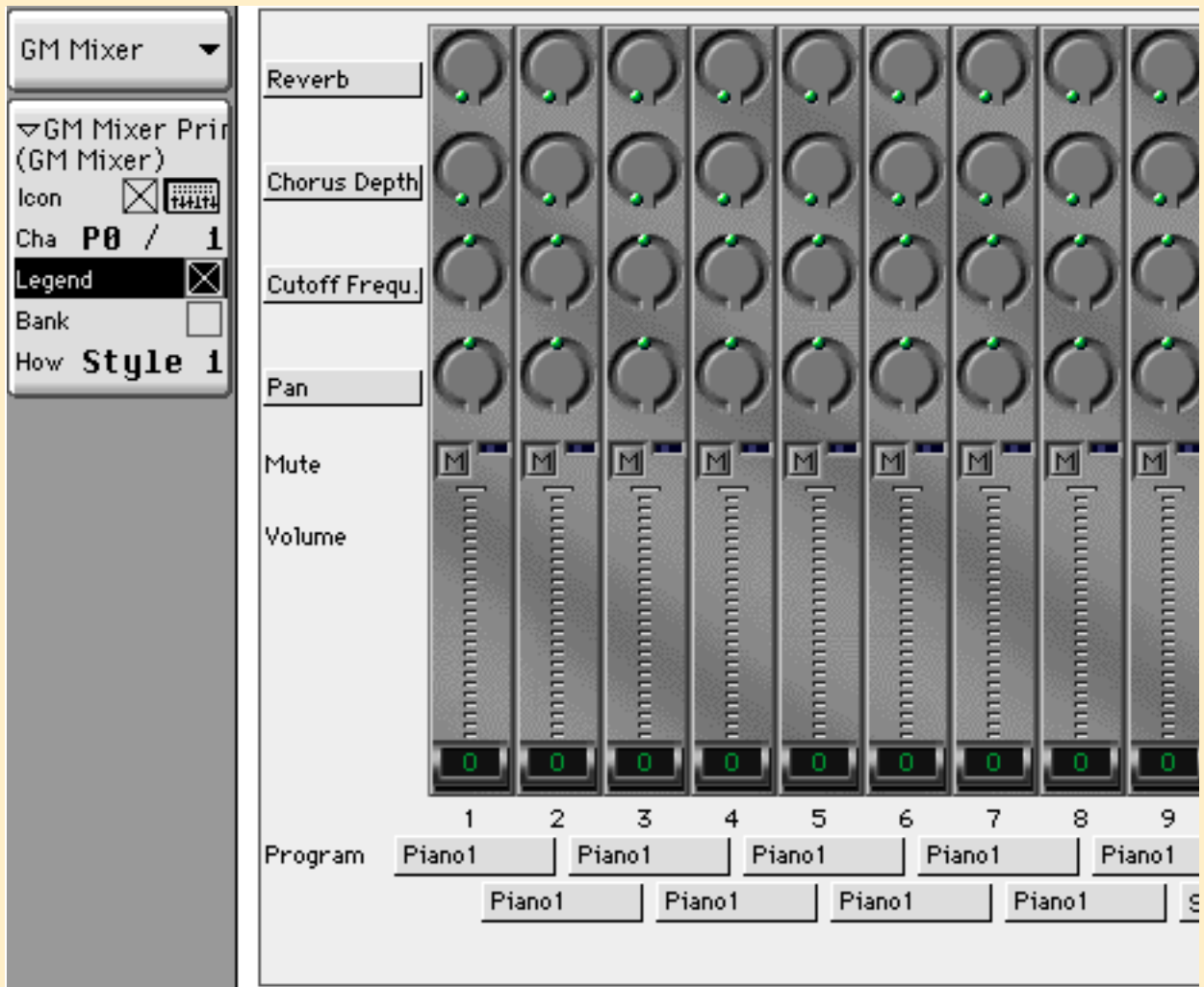
Logic's on-screen GM Mixer has 16 columns—one for each MIDI channel. Each column has a vertical slider, a mute button, and a stack of four knobs. Below this array of controls are two rows of numerical controls and two rows of boxes with MIDI GM preset names in them. To the left of the mixer columns is a "legend" column containing labels for the controls.



**NOTE** *The names for the four knobs are actually pop-up menus that allow you to define what the knobs actually send.*

# MIDI Setup and Configuration

The GM Mixer has only a few parameters to set. Here's how to set them:



## 1. Assign the Port

Select a port exactly as you do for any of the Environment's Instrument objects. The port should be the same as the port you chose for the associated Multi-Instrument.

## 2. Select a "base channel" for the mixer.

The "base channel" is the lowest mixer channel and is set in the same way a channel for any of the Environment's Instrument's channels is set. Typically you will keep the default setting of "1" but if you select a higher number, the columns for the lower numbers will disappear making the mixer smaller. (The "All" setting is the same as "1".)

## 3. Choose an icon for the mixer

# MIDI Setup and Configuration

Select an icon for the mixer as you do for a "normal" instrument. There's actually a little mixer icon you can use if you wish, but any icon is OK. Leave the icon checkbox checked so that the mixer can be selected in the Instrument menu. You will need to do this in the future when you start exploring automated mixing.

## 4. Disable/Enable the mixer's legend

Choose whether to have the mixer's legend (described above) visible. Making it invisible makes the mixer that much smaller but for now, leave it visible as it helps in setting & remembering what the top four knobs do.

## 5. (Mac Only) Choose a *Style* for the mixer.

The default style, "Style 1" is the most "modern looking" but it is also the slowest to refresh. On slower computers, you may prefer one of the other two styles. (They're also smaller).

You're done! Your on-screen mixer is set up and ready to use.

To try it out, go to the Arrange window and select or create a track for one of the sub-channels of the Multi-Instrument corresponding to the mixer. Select a program and play your MIDI keyboard. Assuming you hear something, return to the Environment and change the volume and pan settings for the corresponding channel on the mixer. You should hear the volume and pan changes when you play your MIDI keyboard again. (If you can do this while still playing your MIDI keyboard, all the better. If not, just switch back and forth.) You can also try the other controller knobs. They may or may not have any affect—it depends on the settings and capabilities of the MIDI device receiving the MIDI data.

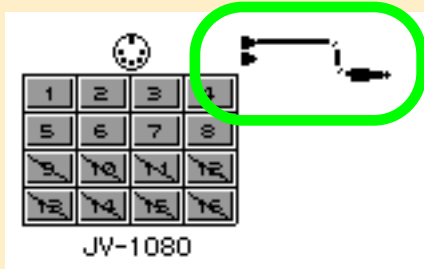
## Connecting your Mixer to the Instrument Parameter Box

There is one enhancement we'll make to this mixer setup and that is to put the mixer in the MIDI "signal path" between its associated Multi-Instrument and the output port. This is the first (and only) cabling we'll be doing and it is *completely optional*. The advantage of doing this is that any mixer-type data recorded on tracks using the **Prg**, **Vol** or **Pan** settings in the Instrument Parameter Box for a Multi-Instrument's sub-channels will be displayed by the mixer. The mixer will therefore, always reflect the current state of the listening MIDI device (at least to the extent that this was set by Logic in the first place).

# MIDI Setup and Configuration

*To re-route this signal path*

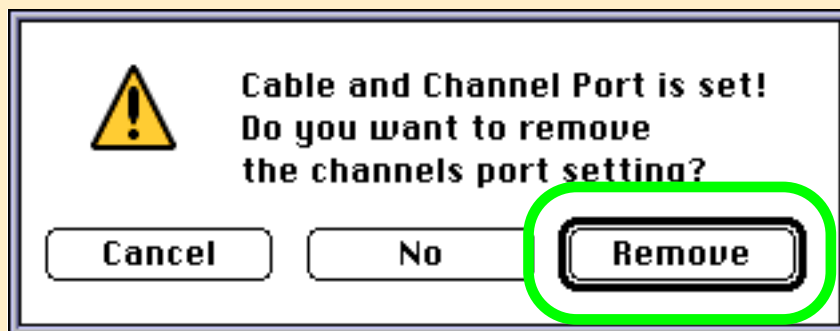
1. Click-hold the Multi-Instruments's "outlet"



Click and hold the mouse on the top outlet of the Multi-Instrument. The "outlets" are the right-pointing triangles along the right edge of the Multi-Instrument object.

2. Cable Multi-Instrument to GM Mixer

Drag the cable that appears into the body of the GM Mixer and release the mouse button. When you release the mouse button, the cable will remain "attached" to the GM Mixer and a dialog box will pop-up with three buttons labeled "Cancel", "No" and "Remove". Click the "Remove" button.



This breaks the automatic port connection of the Multi-Instrument. It is no longer needed because the Multi-Instrument is now connected to its port through the GM Mixer. In other words, the GM Mixer is now also functioning as an output port. Leaving both connections would result in doubled notes!

To see the fruits of this labor, select one of the sub-channels of the Multi-Instrument, enable its **Prg**, **Vol**, and **Pan** parameters by checking their checkboxes, then mouse in different settings. You should see these changes reflected on the GM Mixer panel.



**NOTE** Unfortunately, this is a one-way connection. Changing the mixer settings does not result in a change to the corresponding Instrument Parameter Box setting



# MIDI Setup and Configuration



**TIP** When you change programs on the Multi-Instrument you will probably notice that the Multi-Instrument names do not match the GM Mixer's names. The GM Mixer **ONLY** uses the standard General MIDI preset names. This is unfortunately just a limitation of the GM Mixer right now. Just disregard the GM Mixer's program display in this case. **Mac only** - If it is too distracting, just resize the Mixer (using the box in the lower right hand corner ) so that the program names are not visible.

## Setting Up Mixers for all of your instruments

The simplest approach for a mixer setup is to create a GM Mixer for each of your MIDI ports that have listeners on them. You have already created Instrument objects for each listener on each of these ports. The only further step necessary is to repeat the above steps for each of the ports and Instrument objects.

If you have more than one Instrument object for a certain port, cable ALL of the Instrument objects for the port into the same GM Mixer. I.e. even though you may have more than one Multi-Instrument or Mapped Instrument for a port, you only need one GM Mixer per port.

Because of the size of the GM Mixer, you will probably want to put each GM Mixer on its own layer. (There's no need to do this, it's a matter of whether you prefer scrolling the Environment window or changing Environment layers.) You may also prefer not to keep all of your Instruments on the Global Objects layer so that they are visible (and perhaps in the way) on all other layers. One place to move them is to the same layer as the mixer you create for them.



**TIP** To move Environment objects between layers simply select the object(s) to be moved, then hold down the **Windows** — Control; **Mac** — Option ; key on your computer keyboard while selecting the destination layer from the Layers menu.

2

Logic's Environment provides all the tools for building completely customized mixers and control panels one object at a time. You'll find a simple example on the Environment layer named **MIDI Faders**.

With the advent of the GM Mixer (new in Logic 3.0), straight forward mixer panels like the one on the MIDI Faders layer are kind of pointless, but when it comes to customization, the possibilities are limitless. To learn more about building your own Environments, consult your Logic manual and the Environment guide that comes with it. There is also a third party manual available which is dedicated to plumbing the depths of the Environment. It is called *E.g., a Complete Guide to Logic's Environment*. You can find information about the book by visiting the companies website. The address is [www.swiftkick.com](http://www.swiftkick.com)



# What makes Logic Special

## What You Will Learn

In this section you will learn about the special features that allow you to customize LOGIC to your working preferences. In particular, you will learn how to use "Screen Sets", "Link Modes", and "Key Commands" to tailor Logic's use of your computer's monitor and keyboard.

The information is organized into the following sections:



Working with Logic's Windows



Using Screensets



Understanding the Link Modes



Working with Key Commands

## 3.1 Working with Logic's Windows

Windows are an important part of Logic—they have a lot to do with Logic's "look & feel". In this section we'll be dealing mostly with windows like the Arrange and Environment windows which we'll call "working" windows to distinguish them from windows like the Preferences and Song Settings windows which we only open briefly to change settings. All of the working windows are listed under the main Windows menu.

***Here are some things that all working windows have in common:***

- There is a "Title Bar" across the top with the name of the Song in it.

Information about your current selection is also appended to the Song name under certain circumstances. If this bar

**Mac** — has gray, horizontal lines running through it,

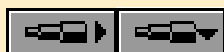
**Windows** — is highlighted;

it is the "active" or "topped" window. If the bar is all white except for the Song name then some other Logic window is active. We'll deal more with this very important concept as we go on.

- Just below this bar there is a menu bar.

The menus and their contents vary from window to window. When you do something within the window, the menus temporarily disappear and information pertinent to your actions appears here. For example, if you alter a note in the Matrix (piano roll) window, this area will display the type of event (Note), it's position, velocity, and current length. This line of information is referred to as the Control Line.

- There are two "zoom controls" to the right of the menus in the menu bar.



These look like telescopes—the first one zooms the display vertically (indicated by the downward pointing triangle) and the second one zooms the display horizontally.

Clicking on the big end makes things bigger and shows less territory and clicking on the little end makes things smaller and shows more territory.

- Multiple windows of a given type can be open simultaneously

This is a very helpful feature which is unique to Logic. It means you can, for example, have two different Matrix windows open simultaneously, each viewing different sequences.

### how to:

- open & close windows
- change active windows
- open & use floating windows
- work with Logic's Transport
- use the Catch button
- make your window display stay current with the current song position

# What makes Logic Special



**TIP (Mac Only)** Holding down the Control key and pressing the arrow keys also controls zooming if you haven't changed Logic's default key commands.

- There are "scroll bars" along the bottom and right edges of the window.

The bottom left corner acts like a double scroll bar—just click-hold your mouse on the square and the window will follow your mouse's up/down and left/right movements as you move in the main body of the window.

**Structure Edit Functions View Options**

**Top Toolbar:** Walkman icon, Link icon, Stop icon, Play icon, Solo icon, Mute icon, Previous icon, Next icon, Time display: 00:00:32:17.34, 13 3 3 1.

**Left Column (Parameter Settings):**

- MIDI THRU**
  - Qua off (3840)
  - Loop
  - Transpose
  - Velocity + 1
  - Dynamics
  - Gate Time
  - Delay
- PA: Pop 1 (Mapped Instr.)**
  - Icon [X] [Speaker icon]
  - Cha ÷ 10
  - Prg [X] 1 8
  - Vol [X] 127
  - Pan [X] 64
  - Delay
  - No Seq Trp [X]
  - No Reset [ ]
  - Auto Style

**Top Right (Timeline/Bar Ruler):** Shows a timeline with markers at 1 and 5.

**Annotations:**

- Blue Box:** In the upper left hand corner there may be two buttons—one with a little man in it and the other with a chain link. These are called the "Catch Man" and the "Link Button" and we'll describe them in detail below. Next to the Catch Man and Link Button there may be an array of Transport buttons together with two boxes of numerical displays. Whether these components are visible depends on a View menu option as well as whether there is enough space. To create more room, grab the corner where the Track list and the Bar Ruler meet and drag it down and to the right. If the Transport buttons still don't appear, select **Arrange -> View -> Hide/Show Transport**.
- Green Box:** Along the top there may be a time line. This is referred to as the Bar Ruler. The Arrange, Matrix, Score and Hyper Edit windows all have a time line, referred to as the Bar Ruler, which runs horizontally along the top of the window. The Event and Environment windows do not display this Bar Ruler; the Event window because it's time axis runs vertically, and the Environment window because it doesn't deal with time. Where there is a Bar Ruler, the View menu allows you to view or hide SMPTE time display.
- Red Box:** Along the left side of the window there is a parameter settings column. The window's View menu allows you to hide or show this column.

# What makes Logic Special

In this guide we will not spend a lot of time on the details of how each of these displays works—you can find that information in chapter 4 of your Logic manual. Our object here will be to become familiar with how Logic's windows work.

## Arrange and Transport Windows

If you haven't done so yet, close the Environment window. There are two ways to close a window:

- **Click the Close Box at the left end of the Title Bar.**
- **Press the definable key command for closing the window.**

The defaults are; **Mac** — Command-T **Windows** — No default

Be careful to make sure that the window you wish to close is active. This is indicated by;



**Mac** — horizontal lines in its Title Bar



**Windows** — a highlighted Title Bar.

If it is not the active window you will need to make it active by clicking anywhere in the window.

Now the Arrange window should be the only remaining window.

## Normal vs Floating Windows

Logic has two kinds of windows—normal and floating. The Arrange window is an example of a normal window. Logic's standard Transport window is an example of a floating window.

To open a Transport window choose: **Windows -> Open Transport**

3

### **Two things distinguish floating windows:**

- Floating windows are never the active window.
- Floating windows are always visible over normal windows.

The only window that can cover a floating window is another floating window.

The Transport window is just one example of a floating window. We'll see others as we go along.

# What makes Logic Special



**TIP (Mac Only)** Any of the working windows can be opened as a float simply by holding the Option key down while opening it from the main Windows menu (alternatively, hold Option while using the key command to open the window)







Take a look at the Transport window. The left half looks a lot like the Transport display in the upper left corner of the Arrange window. Both contain the same buttons and information.

Here are some guidelines to understanding what each of those buttons do:

- The top row of buttons control Logic's "transport" functions:

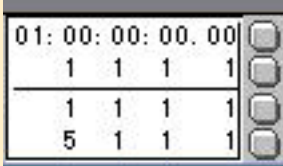
Record  Pause  Play  Stop  Rewind  Forward 





- The bottom row of buttons control Logic's record & playback options:

Cycle  Autodrop  Replace   
Solo  Sync  Metronome 

- Next to the buttons is the position and locators display.

The top line is Song Position in SMPTE, the 2nd line is the Song Position in bars-beats-divisions-ticks, the 3rd line is the left locator and the 4th line is the right locator.



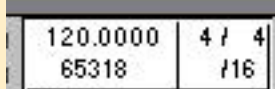
|                    |   |
|--------------------|---|
| 01: 00: 00: 00. 00 |  |
| 1 1 1 1            |  |
| 1 1 1 1            |  |
| 5 1 1 1            |  |

- The tiny buttons move the current Song Position

The Song Position is indicated, when visible, by a vertical line running through the Arrange window. This line is often referred to as the Song Position Line or "SPL" for short. When a song is playing, these tiny buttons will set the locators according to the current SPL.

- Next to the tiny buttons is an info box

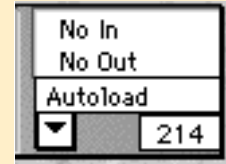
This box displays the tempo, memory remaining, time signature and the Display Format value.



|          |       |
|----------|-------|
| 120.0000 | 4 / 4 |
| 65318    | /16   |

# What makes Logic Special

- At the right end is the MIDI activity indicator; the Song name; a small pop-up menu called the "Display" menu — for altering the Transport window's appearance; and a Song length indicator (in measures).



You will find a detailed explanation of the function of each button and display in chapter 5 of your Logic manual. For now, let's make a couple of changes to the Transport window, then move on to other things:

## 1. Select **Transport -> Display menu -> Legend**

The Legend labels each portion of the Transport making it easier when you're first learning Logic to remember what each button does. You probably won't want it permanently displayed as it makes the transport bigger .

## 2. Select **Transport -> Display menu -> Position Slider**

The Position Slider allows you to move the Song Position (see above) around quickly either by clicking or click-dragging.

The Transport's Position Slider is very handy for making large position moves in any of Logic's time-oriented windows. The following little exercise demonstrates how it works and in the process, show the purpose for Logic's Catch button.

## 3. Click & hold at the left end of the Position Slider and drag back and forth.

You will see Logic's Song Position change in the Transport's Position display; the gray section of the Position Slider will expand and contract and the Arrange window's vertical Song Position Line will move in and out of view.



**TIP** If you have a hard time seeing the Arrange window's Song Position Line ("SPL"), check the "Wide Song Position Line" checkbox in: **File -> Preferences -> Display**.

3

## 4. Click on the Catch button



The button is located in the top left-hand corner of the Arrange window. If the SPL is out of view the Arrange window's horizontal view will immediately change to show where the SPL is.

## 5. Repeat step 3

Notice that the SPL now always stays in view. This is the whole point of the Catch button —it ensures that you're always viewing Logic's current position in the song.

# What makes Logic Special



**TIP** *The important thing about the Catch button is that it is independent for each of the currently open windows so that you can keep some windows at the SPL position and others fixed where you've set them.*

Now that you are familiar with the various types of windows in Logic, you should know about two important tools that are available to help you organize them, and control how they interact. These two tools are known as Screensets and Link Modes. We'll start with Screensets.

*Before going on, please record or otherwise create two sequences in the Arrange window and name them "Seq1" and "Seq2". (If you do not know how to do this, please consult the Quick Start section of this guide.)*

## 3.2 Using Screensets

Screensets provide a very simple and convenient way for you to manage Logic's various windows. They allow you to call up a pre-configured set of windows with just a keystroke. Using them is essential to realizing Logic's full potential. Not using them would be like never using your car's 4th gear.

The Event List provides a list view of your song's data. The list can be of the objects in a Sequence (e.g. notes and other MIDI data) or of the Sequences in the Arrange window or in a Folder (more later). Select the sequence named "Seq1" and open the Event List by: **Windows -> Open Event List**.

The window can also be opened using the:



**Mac** — Command + 2 key command;



**Windows** — definable key command

An important thing to note about the Event List is that time is represented vertically.

- ***The events in the list are in chronological (time) order.***
- ***Each column displays different information about of each entry.***

At the moment, your screen should contain an Arrange window, a Transport window and an Event List window. Move and size these to fit your screen and personal taste.

**3**

Congratulations! You have just created a Screenset.

In fact, whatever is currently on your screen is a Screenset. Logic will remember up to 90 of them—numbered from 1 to 99 except that no numbers with "0" in them are allowed.

Here are the most important facts about screensets:

- The screenset number is displayed next to the word **Windows** on the global menu bar.
- Screensets can be "locked".

When a screenset is locked, you can still make any changes you like. The only

### how to:

- open and close editor windows
- view a sequence in several windows at once
- create and move between screenset-salleviate screen clutter
- lock/unlock Screensets
- copy Screen Sets



# What makes Logic Special

difference between locked and unlocked screensets is that changes to locked screensets are lost as soon as you change screensets. A locked screen set is indicated by a:



**Mac** — black dot;



**Windows** — "#" symbol;

to the left of the screenset number.



**NOTE** You can only lock and unlock screensets by using the definable key command. The default Logic key command on a **Mac** system is "Command+L". The **Windows** version of Logic does not have a default key for this — you must define it before using it.



**NOTE Windows Only** You cannot lock the screenset if Logic's main title bar is the one highlighted. You must make sure one of Logic's "normal" windows is the active window before locking a screenset.



**TIP** If you unintentionally change a screenset you like, you can "revert" to the state it was in when you selected it but you must assign a Logic key command to do this (it is not assigned by default). You can also assign key commands to step forward and backward (by number) through screensets.

You change screensets by typing any number on your computer keyboard. On Windows system, you must use the QWERTY keyboard numbers, i.e., not the numbered keyboard. Either will work on Mac systems.

**To select screens higher than "9", hold the:**



**Mac** - Control key;



**Windows** —Shift key;

while typing in the number.

**To copy Screen sets hold the:**



**Mac** — Shift key;



**Windows** — Control key;

while selecting the new number.

## 3.3 Understanding the Link Modes

The Link Modes control whether selections in one window affect the view in another window. When windows are linked, making a selection in one will cause that selection to be viewed in the other window. For example, you can choose whether or not an Event List window should update its view when you select a new Sequence in an Arrange Window.



**NOTE** *Linking works between all windows—even windows in different Screensets. Putting a window in Link Mode means that it will always display the current selection and there will always be only one selection.*

Your screen should now have an Arrange window and a Event List window in it. (The Transport's there too, but it doesn't concern us at the moment—close it if you like.) The Event List should be showing the notes and other MIDI data in the Sequence "Seq1". In the upper-left corner of each window is a button with a chain-link icon on it. This is the Link Mode button. For the following exercise, the button should be gray in both windows—if it's not then click it until it is.

### how to:

- link windows & keep the song position in view
- force an edit window to follow the selections made in another edit windows
- keep the view of an edit window fixed on a particular sequence

There are two different link modes: **Link** and **Show Contents** modes. The easiest way to help you understand how they work is to demonstrate.

1. Go to the Arrange window
2. Select the Sequence named "Seq2" (by clicking on it once).  
Observe that the Event List still shows the MIDI contents of "Seq1"
3. Select the Sequence named "Seq1".
4. Click the Link button in the Event List window.

With a:



**Mac** — it will turn red.



**Windows system** — it will turn light blue



# What makes Logic Special

## 5. Select "Seq2" again.

Observe that the Event List now lists what's in the Arrange window—namely, Seq1 and Seq2 and that Seq2 is selected. (*Remember there is always only one selection.*)

## 6. Double-click the Link button in the Event List window.



**Mac** — it will become blue with a black square in the middle



**Windows** — it will turn dark blue



## 7. Select Seq2 again.

Observe that the Event List now changes to list *the contents* of Seq2. This is why it is called "Show Contents" mode—the linked window will always change to show the contents of the current selection.



**TIP** *The Link and Catch buttons can work together to keep the contents of what's playing always in view. To enable this feature choose:*

**File -> Preferences -> Global -> Allow Content Catch by Position if Catch and Link enabled.**

This is just one simple example of how Logic's windows can work together to make your life easier—we'll see a few more in the *Editing* chapter. If Logic is managing what your windows display, you don't have to. As you work, keep the Link and Catch buttons in mind. You'll find it saves a lot of clicking.

## 3.4 Working with Key Commands

One of Logic's most beneficial features is the ability to set up key command equivalents for the vast majority of Logic's operations. This includes most menu functions as well as many tasks that only available as key commands. In this section we'll explore Logic's Key Command window.

To open the window select:

**Windows -> Key Commands**

Like the Event editor, the Key Commands window contains a list and only a vertical zoom tool which changes the print size. There is the usual parameters column at the top of which is a collapsible window showing the details of the currently selected key command row. Below this are several buttons. The first four buttons are used when assigning key commands and the last three are used when trying to find key commands. (You'll quickly discover that with so many possibilities, these last three buttons are extremely helpful.)

### Key command window's views

Here are some ways to change what is viewed in the Key Commands list:

#### how to:

- find out to what task a key is assigned
- find out which key is assigned to a task
- assign your own keys to tasks
- trigger key commands from your MIDI keyboard
- print a list of your key commands

#### 1. Click the **Hide Unused** button

Now only the tasks that have been assigned key commands appear in the list. Typically, this makes the list considerably shorter.

Hide Unused

#### 2. Click the **Hide Used** button

Now you should only see a single item in the list—the item that's currently selected.

Hide Used

#### 3. Click the **Hide Unused** button again

Now you will see all the possible Key Commands that are not assigned to anything (plus the currently selected line because that's always visible).

#### 4. Click in the box next to the word **Find:** and type **Open**

Then click the **Find** button. This will show you a list of all unused Key Commands with the word **Open** in their description. Notice that **Open Key Commands...** is one of the items on the list.

Find:

# What makes Logic Special



**TIP** These buttons—**Find**, **Hide Used**, and **Hide Unused**, are the first things to check when you can't find something in the Key Commands window.

## Assigning a key command to an operation

In this exercise, we'll assign the "k" key to the operation **Open Key Commands**

1. Find and Select the **Open Key Commands...** option
2. Click the **Learn Key** button

Now Logic is ready to assign the next key you type to this command. Type "k" to make the "k" key open the Key Commands window.



3. Click the **Learn Key** button again

This is necessary for your keyboard to become usable again—otherwise, Logic will just keep changing the key for this command as you type new keys.



**TIP Windows Only** — Key commands won't function if the main menu window bar is active. Use the F9 to activate one of the other windows (or click on one) if a key command doesn't seem to be working. (F10 re-activates the main menu window bar.

## Finding the function a particular key is already assigned to

1. Make sure the Learn Key button is NOT selected
2. Press the key or keys whose function you're searching for

In this case, press the Space Bar on your keyboard. You will see the line for "•Record Toggle" selected. (Note also that the "Hide Used" button automatically gets turned off.)



**NOTE** The "•" next to the command "•Record Toggle" indicates that this process can ONLY be done using a key command. To see a list of the things that can only be done this way, use the "Find" function for "•". (You type "•" on your keyboard by holding the Option key and typing "8".)

For your convenience, at the end of this guide there are lists of all the default key commands, all the remaining unused key commands and all the "•" key commands.




# What makes Logic Special



**TIP** You may have noticed that the Key Commands list is divided into categories: "Global Commands", "Various Windows", "Arrange Window", etc. You can use the same key in different categories so that what it does will change from window to window. This can be a useful option, but if you use it, use it sparingly. It can be difficult to remember and easy to thwart some global key command that you really want to use. For example, if you assign "k" to some "local" process in the Arrange window, you won't be able to use it to open the Key Commands window from the Arrange window.

Logic has a few fixed key commands that aren't listed in this window (or elsewhere). In particular, the characters: Q; W; E; R; A; S; D; B; N; M; are used for MIDI Step-Input. If you assign these to other tasks, they will no longer function their fixed task so be sure you aren't going to need those key commands before reassigning them.

Here are a few other useful things to remember about key commands:

-  **Mac Only** Keys that appear twice on your keyboard can be assigned separately. Do this by using the "Learn Sep. Key" button instead of the "Learn Key" button. ("=" and "-" are examples of such keys.)
-  **Mac** — Any of the "modifier" keys;
-  **Windows** — the Shift and Control keys;

can be used to assign alternate processes to a key. For example, you could have Shift+"k" or Control+"k" open the Key Commands window instead of just plain "k". You can also use multiple modifiers such as Control + Shift + k for example.

- Any MIDI message can also be assigned to a key command  
This is assigned similarly to computer key commands.  
Just use the **Learn MIDI** button (instead of **Learn Key**) to assign the next incoming MIDI event to a command.

Learn MIDI



**TIP** For MIDI commands to work, **MIDI Remote** must be on. Rather than leaving this on permanently and subjecting yourself to unwanted MIDI commands, assign the **Toggle MIDI Remote** and **Disable MIDI Remote** commands to MIDI events. (A note-on and the same note-off make good choices for these commands.) Then you can turn MIDI remote on and off from either your computer keyboard or your MIDI controller.

## What You Will Learn

In this chapter you will learn the various ways to get MIDI data into Logic. Recording is the most common of these, but there are other, non-real-time methods, which also have their uses. Many of the procedures are applicable for recording audio as well, so even if you are primarily interested in using the audio side of the program, don't skip this section.

The information is organized into the following sections:



Getting Setup for Recording



Basic Recording



Punch-in Recording



MIDI Step Time Recording

## 4.1 Getting Setup for Recording

In the *Quick Start* section, we made a simple recording by selecting a track in the Arrange window and pressing the record button on Logic's transport. As the focus was on testing, we didn't necessarily pay attention to Logic's tempo and meter settings. In this section, we'll treat the process more seriously by setting up, and following, Logic's metronome. This will ensure that what we end up with is synchronized to Logic's tempo & meter.

(The section " " explores various ways to take a freely recorded sequence — i.e., not following the metronome — and synchronize them after the fact.)

It's a good idea to have something in mind to record as we go through this set up procedure. Choose something fairly short — say 32 bars or so — and plan to record several different parts (e.g. piano, bass & drums).

Here are a few things to decide before setting up:

- **The song's time signature**  
Keep it simple, like 4/4 without meter changes.
- **A rough tempo for the song.**  
Choose a comfortable playing tempo.
- **Which Environment Instruments you'll use.**  
Make sure the required Instruments and Multi-Instrument sub-channels appear on the Track list's Instrument menu.

### how to:

- set up the Metronome
- make the Metronome click for recording, playback or both
- turn off the Speaker Click
- set the count-in
- make the Metronome click only during count-in
- set & change Logic's time signature
- set & change Logic's tempo
- choose a Track and Instrument for recording
- make a single-pass recording
- re-do a single-pass recording

## 4

### Setting up the Metronome

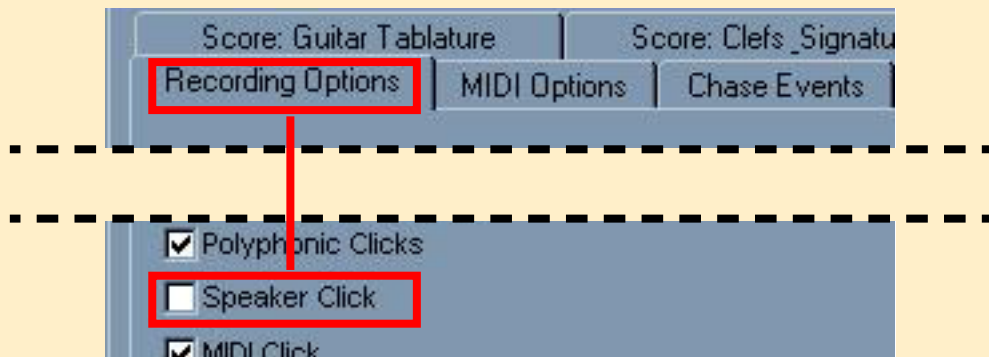
Logic provides two ways for you to hear a metronome click; either through your computer's speaker or via MIDI. We will focus on using the MIDI click since it is the most accurate option and provides functionality not possible with the speaker click. Therefore, we'll start by turning the Speaker click off.



# Recording

## To Turn the Speaker click off:

1. Open **Arrange Window -> Options -> Recording Options**



2. Disable **Speaker Click** option

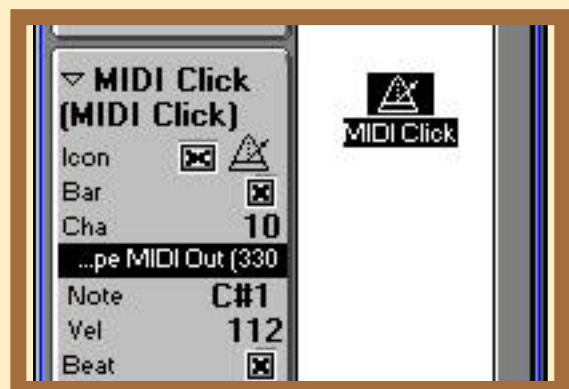
## Finding/Selecting the Metronome Object

Logic's MIDI Metronome can be set to sound at bars, beats and/or the current Display Format setting. The Metronome is an Environment object, so its settings are selected in an Object Parameter Box, just as you have learned to do previously for Logic's other Environment objects. Once its settings are defined, you can turn it on and off from Logic's Transport display. You can also control aspects of the metronome's activity in the **Arrange Window -> Recording Options** window .

The MIDI metronome normally resides in the **Clicks and Ports** layer of the Environment, so you can access it by opening the Environment window and going to that layer. There are however, two simpler alternatives for accessing its parameters:

- **Alternative 1**

From the Transport Window, click-hold on the Transport button and choose **Locate MIDI Metronome** from the flip menu. The result of this action will be that the Environment window will open to the proper layer and the MIDI metronome will be selected.



# Recording

- **Alternative 2**

You can select the Metronome from the Arrange Window just as you do a "regular" instrument, — by click-holding in a track and selecting it from the Instrument flip Menu.

Regardless of which method you use, once you have selected the Metronome object, you are ready to alter its settings.

## **Altering the Metronome's Parameters**

### **1. Set the Metronome's parameters in its Parameter Box**

The metronome's settings allow you to assign different sounds to the bar, beat or sub-division clicks. You could, for example, have a bell sound at the top of every bar and a rim shot sound on all other beats.

### **2. Set the output port and channel settings.**

Like Logic's Instrument objects, the Metronome output can be set directly in its **Parameter box**. ( via "Direct Port assignment" ) In other words, it is not necessary to cable it to some other Environment object such as a MIDI port object or other Instrument.

(The Figure at the right shows the settings on a **Windows** system. Output definition for **MacOS** is handled the same way it is for "regular" instrument objects. See the relevant section in the **MIDI Setup and Configuration** chapter.)

There is a separate channel setting for each of the possible clicks (bar, beat and division), but the port setting is set globally with the bar-click setting. The checkbox to the left of each of the possible click options enables/disables that option from clicking.



**NOTE** The most common setting is probably for the Bar and Beat to be enabled but the Division disabled.

### **3. Set the click pitches & velocities**

The bar, beat and division clicks can each have their own pitch (i.e. their own sound if you're sending the Metronome to a drum-style MIDI device) and velocity. As long as an option is enabled, the Metronome emits a test click whenever you make changes, making it easy to find the sound you wish to use.

# Recording

## To configure when the Metronome should sound

1. Open Logic's Song settings by choosing:  
**Arrange Window -> Recording Options**

2. Enable/Disable **Click while recording**

This checkbox, near the middle of the Recording Options window, determines whether the Metronome will click while Logic is recording.

3. Enable/Disable **Click while playing**.

This checkbox determines whether the Metronome will click while Logic is playing back.

4. Enable/Disable **Polyphonic Clicks**.

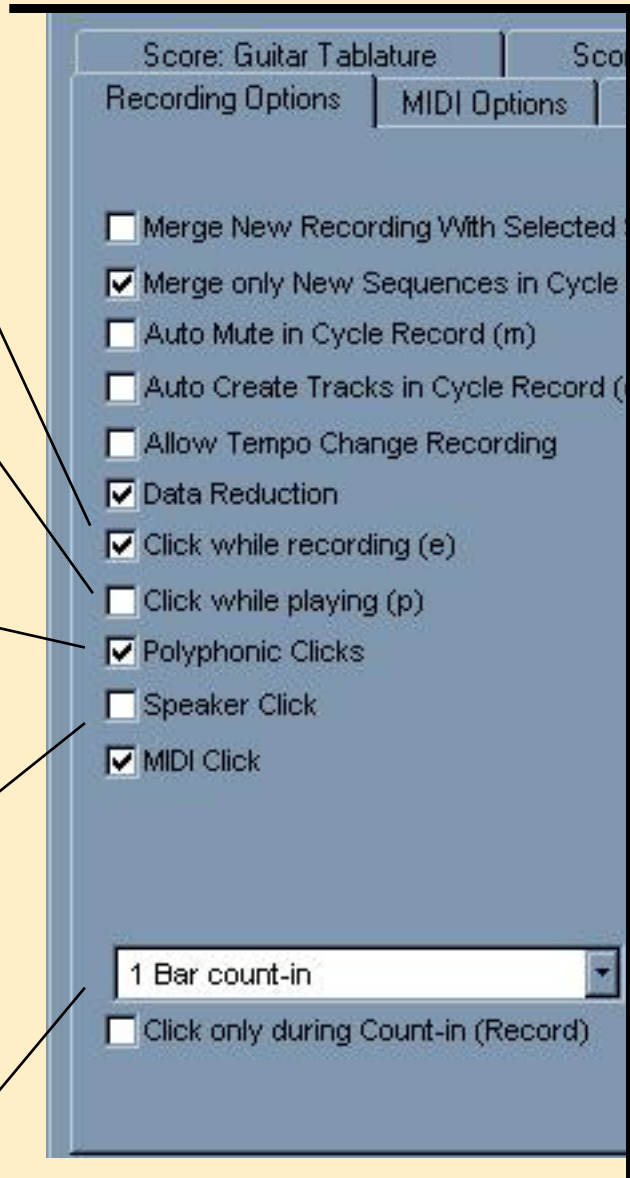
When this box is checked, the beat click will sound on the bars and the division clicks will sound on the beats and bars. When it is unchecked, only one click sounds at a time.

5. Enable/Disable **Speaker Click**.

Check this box to have your computer speaker sound the Metronome's clicks.

6. Set the count-in.

The "count-in" is the number of bars or beats that Logic will play before the record start-point. (There are several ways to set the record start-point which we'll deal with below.) You can set the Metronome to only click during the count-in by checking the box just below the count-in menu. NOTE: This option is only available when **Click while recording** is enabled.



# Recording



**TIP** Don't overlook the "Wait for note" count-in setting. Using this with "Click while recording" enabled causes Logic to start clicking but not start recording until you play your first note. (i.e. you don't have to make it across the studio to your keyboard by the end of the count-in.)

## Setting Logic's Tempo & Time Signature

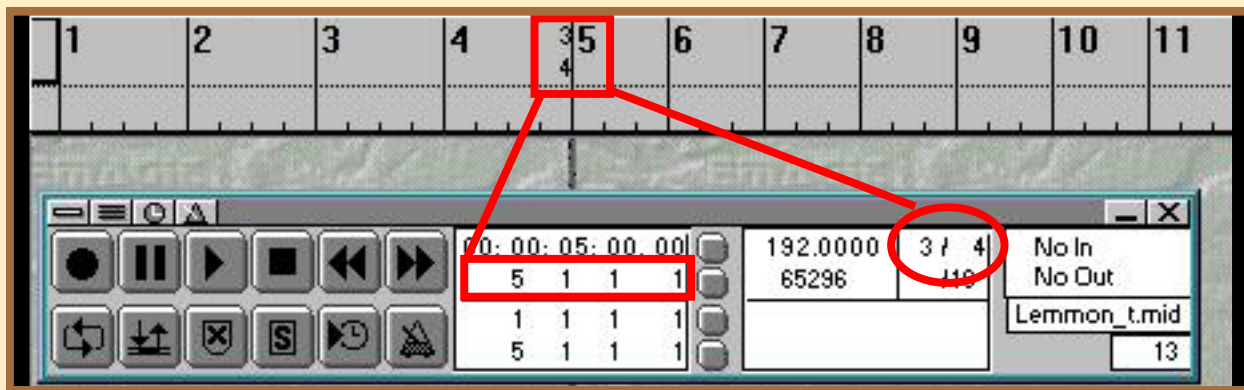
Logic's time signature (the number and type of beats per bar) can be set in the Tempo/Signature Display of the Transport window. It can also be set directly on the staff in the Score editor. The Transport window shows the time signature as a fraction "# / #".

Whenever you make a change to either the "numerator" (left # setting for the number of beats per bar) or the "denominator" (right # - setting for the type of note that is a beat), the new time signature takes effect at the closest barline to the left of the Song Position. This will be indicated by a small time signature on the Bar Ruler of any window that has a Bar Ruler such as the Arrange window, the Matrix editor, etc. (The initial time signature — at beat 1 of bar 1 — is not shown on the Bar Ruler.)

### To insert a new Time Signature

#### Using the Transport Window...

1. Set the Song Position to the position at which the Time Signature is to begin.  
If there is to be only one Time Signature throughout the song, then go to the first bar.
2. Adjust the time signature setting on the Transport panel  
Click-drag on the numerator (top) and denominator (bottom) of the Time Signature on the Transport panel to change the value



# Recording



**WARNING** *It is important to know where you are in the song before changing the value, otherwise you might accidentally insert a Time Signature change where you didn't intend to. If your song has the same Time Signature throughout, then simply make sure you are at Bar 1 before changing the Time Signature.*

## From the Score Window...

### 1. Make the Time Signature palette come to the top of the Part Box

In the palette box below the Tool box, click on the box with the "4/4" icon. This will bring the Time Signature palette group to the top of the Symbol Palette.



### 2. Insert a "standard" Time Signature

If you're inserting a 2/4, 3/4, 4/4, 6/8, "common time", or "cut time" Time signature, click-drag that selection onto your staff at the desired measure. If you need to insert something other than those selections skip to step 3.  
( Otherwise, skip step 3 )

### 3. Insert a "non-standard" Time Signature

If you're inserting a time signature other than 2/4, 3/4, 4/4, 6/8, "common time", or "cut time" ; click-drag the "A/B" option to the desired measure.

Change the values for the Nominator and Denominator in the resulting settings window by either:

- **Click-dragging on the existing values or;**
- **Double-clicking on the values, then typing in the desired number**



**NOTE** *You may also insert a Time Signature in the Score Window using the Pencil Tool by selecting the desired symbol, then clicking once at the beginning of the measure in which you want the new signature to appear.*

# Recording

## To modify an existing Time Signature

### *Using the Transport Window:*

1. Set the Song Position to the same bar position as the Time Signature you wish to alter.
2. Adjust the time signature setting on the Transport panel  
Click-drag on the numerator (top) and denominator (bottom) of the Time Signature on the Transport panel to change the value

### *From the Score Window:*

1. Double-click directly on the Time Signature on the staff
2. Change the values for the Nominator and Denominator

Change the values by either click-dragging on the existing values or; double-clicking on the values, then typing in the desired values.



**TIP** You can control the default beam and tie grouping of notes displayed in the Score by inputting a simple equation in the "Beat Grouping" box. The simple addition equation must simply add up to the value of the Nominator. For example, if you are in 6/8 time, and you wish to have notes default to being grouped in pairs, then you'd input the equation; 2+2+2. If, alternatively, you wanted notes grouped in 3's, you'd type "3+3". If your equation doesn't properly "add up", then Logic Audio will automatically change the Nominator value to reflect the new sum. So, in the above example, if you had accidentally typed 2+2+3, the Nominator would have changed to a 7 — rendering the Time Signature as 7/4.

4

## To delete a time signature

### *From the Transport Window...*

1. Set the Song Position to the position of the time signature you wish to delete
2. Change the time signature in the Transport Panel to match the preceding



# Recording

time signature.

## ***From the Score Window...***

1. **Go to the measure containing the Time Signature you wish to delete.**

Remember, there must be at least one sequence in the song in order to view a staff in the Score window

2. **Click once on the Time Signature being deleted to select it**

It will flash off and on when it is selected

3. **Press the Delete key on your computer keyboard**

You may also delete a Time Signature by clicking on it with the Eraser tool.

## **Setting the tempo**

Logic stores tempo information as a series of Tempo events. These events can be viewed and edited in the Tempo List editor window. The format of the window is essentially the same as the Event List Window. The current tempo is what is displayed in the Transport window.

If your song has only one tempo throughout, then simply input the tempo in the Transport window's Tempo/Signature display. If you need to input multiple tempos, you will have to open one of Logic's tempo editing windows. The most common is the Tempo List Editor. It can be opened from two different locations

- ***Arrange -> Options -> Tempo & Synchronization -> Tempo List Editor***
- ***Transport -> Sync Button -> Tempo List***



Once it is open, the current tempo setting will be listed as an event at time position "1 1 1 1".

To input tempo change here:

# Recording

## 1. Select the Pencil Tool

## 2. Click once on the existing event, right on the word Tempo

This creates a new Tempo event with a text entry box for the 'Position' automatically open.

## 3. Type in the desired position for the new Tempo event

Use either a Space or '.' in between the bar, beat, division, and tick values.



**NOTE** Logic will insert '1' for any missing positions to the right of the values typed so typing "5.3" for example, will render "5 3 1 1".

## Other Tempo Event edit Windows

There are two other edit windows that can be used to insert or alter Tempo Events: the **Tempo Graphic Editor** and **Tempo Operations** windows. These are covered in detail in your Logic manual — here we'll only be using the Tempo List editor.



**TIP** Logic 3.0 now allows for 10 different and completely independent tempo lists. These are called **Tempo Alternatives** and are selected from the Tempo List editor's Options menu. There is also a definable key command that opens a small window for selecting the current Tempo Alternative.

## Preparing the Arrange Window for Recording

Now that you have set up Logic's Metronome, time signature and tempo settings, all that remains is to select a Track and Instrument for recording. This is done in the Arrange window exactly as it was in the *Quick Start* section. Here is a quick review of the steps:

## 1. Set up a recording Track and Instrument

Top the Arrange window and select a Track. For simplicity in following this example, delete any Sequences and Folders already in the Arrange window and delete all but the top track. To do the latter step, simply choose:

**Arrange -> Structure -> Tracks -> Delete Unused**

## 2. Select an Instrument from the Track List's Instrument menu

Once you've selected the instrument, check that it is responding to your MIDI controller.

## 3. Set the Song Position to the beginning of the Song.

The easiest way to do this is to hit the "Stop" command key twice



## 4.2 Basic Recording



You're ready to start recording. You can **start** Logic recording in several ways —

- *using a key command on your computer keyboard,*
- *using a MIDI remote key command (handy if your keyboard is not close by)*
- *using the Transport window's Record button.*

You **stop** Logic recording the same way you stop playback — with the Transport window's stop button or a key command (the **Enter** key by default).



**TIP** *If you click and hold on the Transport's record button, a menu will pop-up with several recording related choices. Please Note that the "Punch on the fly" option is only relevant when recording audio.*

Chances are you made a perfect recording the first time, but just in case you didn't, a handy way to re-do the recording is by using the **Record Repeat** option. This option is enabled by selecting:

**Transport -> Record Button menu -> Record Repeat**

This will delete the previous recording, return the Song Position to the start point and begin recording again. You can repeat this process until you are satisfied with the take.



**NOTE** *Unless you're a "one take Charlie", you'd probably be well advised to assign a key command and/or MIDI key command to this very useful option.*

Let's now record a second part on a new Track with a different Instrument.

### Creating a new Track

- Double-click on any empty spot on the Track list or;

#### how to:

- prepare to record a second part
- create a new track
- practice with the first part in Cycle Mode
- record multiple takes in Cycle Mode without stopping

# Recording

- Choose **Arrange -> Structure -> Track -> Create**



**TIP** If you double-click an empty part of the Track list with the:

**Mac** Option key held down; **Windows** Control key held down;

Logic will create a new track and assign the next Instrument from the Instrument menu to it.

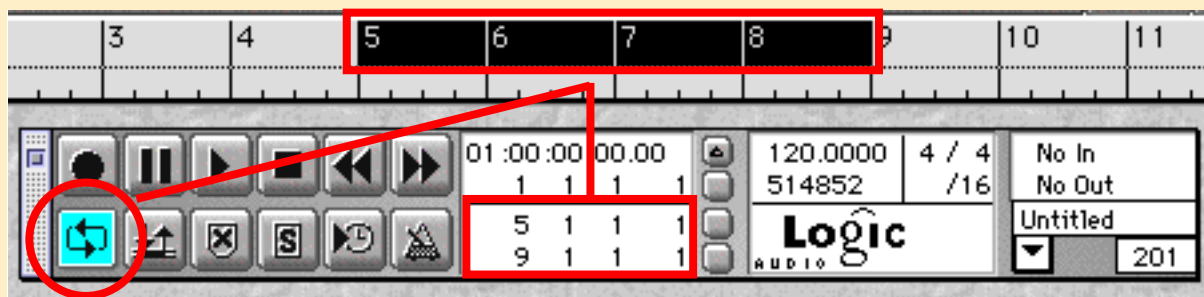


## Rehearsing over a repeated section (Cycle Mode)

Before recording you may want to practice playing against the part you just recorded. The easiest way to do this is to:

### 1. Set the cycle locators and playback in Cycle Mode.

Turn **Cycle Mode** on by clicking the **Cycle** button at the left end of the bottom row of buttons on the Transport. Alternatively, you can just click in the upper part of the Arrange window's Bar Ruler.



### 2. Set the cycle start and end points to the Sequence borders.

To do this, select the Sequence you just recorded and choose:

**Arrange -> Functions -> Set Locators by Objects**

### 3. Select the new recording Track.

### 4. Start Logic playing

Click the Transport's **Play** button or use a key command ("0" by default).

4



**TIP** If you think you missed a great take while practicing, there is a key command called "Capture Last Take as Recording" (Shift+Return by default) which can recapture it for you. As long as you hit this key command **BEFORE STOPPING**, Logic creates a new sequence containing everything you played from the point at which you last started the sequence.

You can record the second part one pass at a time just as you did the first part, but

# Recording

if you think you'd like to record multiple takes, there's an easier way. Logic can automatically create tracks and record multiple takes without stopping and restarting each time. Here's how:

1. Open **Arrange Window -> Options -> Recording Options**

This opens the Recording Options window, the same window you used for setting the Metronome click and count-in options.

2. Check **Auto Create Tracks in Cycle Record**

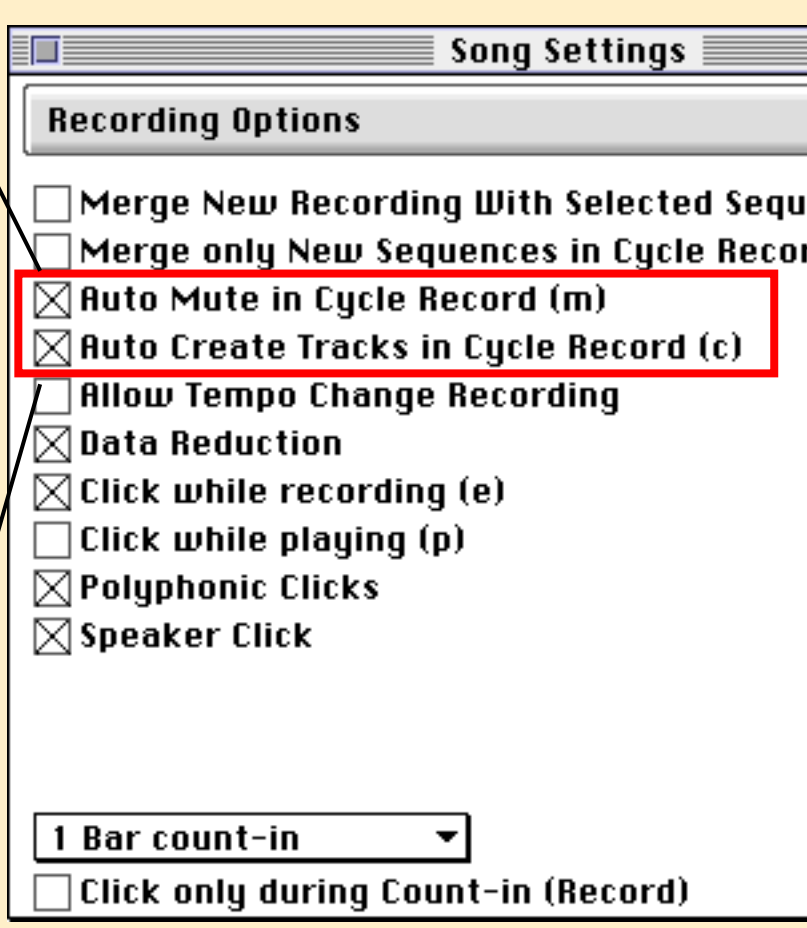
This causes Logic to create a new track for each repeat of the Cycle rather than recording all takes into the same track. This makes it much easier to see and select from your takes once you're done.

3. Check **Auto Mute in Cycle Record**

This ensures previous takes do not play while you're recording new ones.

4. Start recording

Use the Transport button, key command or MIDI key command to start recording. Play as many takes as it takes — when you have one you like, stop recording.



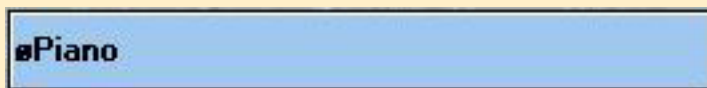
You should now have multiple tracks, each with a different take. The "Auto Create Tracks" option pushes the older takes down, so the latest take will be on top. Logic also automatically numbers the takes so you can see which is the latest. All but the most recently recorded sequence will also be muted as a result of having the "Auto Mute in Cycle Record" option enabled. You can now go back and unmute/mute the various takes to determine which was the best of the lot.

# Recording



**NOTE** A black dot (**MacOS**), or “null” symbol (**Windows**), next to the name of a Sequence indicates that the Sequence has been muted. You can mute or unmute Sequences with the Arrange window's Mute tool (square icon with an "M" in the middle) or with the **Mute Track** key command (no default assignment).

## ***Muted Sequence in Windows:***



## ***Muted Sequence in Mac:***



## 4.3 Punch-in Recording

Even if you were able to find that "magic" take from all those that you recorded, for the sake of this exercise, let's suppose there are a couple of bars in the middle of the best take that you're not quite happy with. A common remedy in this situation is to "punch in and out" of the offending area and replace it with a new performance.

### how to:

- punch in a correction to a part
- punch-in automatically
- Use Punch mode with or w/o Replace Mode on

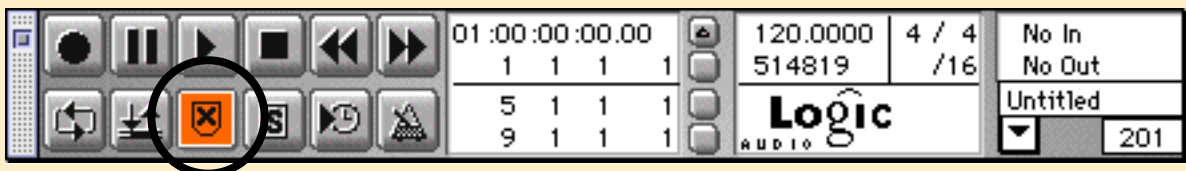
### Manual Punch-in/out with Replace

1. Position the song either at bar 1, or anywhere prior to the area to be punched in on.
2. Select the track you are punching in on
3. Enable Replace Mode

Replace mode determines whether previous events will be erased while you are recording. To enable it either: Click once on the Replace Mode button on the Transport; or use the definable key command.

**Windows** default is: Control + R

**Mac** default : not defined



4. Start the sequencer
5. Punch in to record

You Punch in to record either by clicking on the Transport's record button or hitting the **Record Toggle** key command.

**Mac** and **Windows** default key is: **Space Bar**

6. Punch out of record

You punch out of record either by clicking the **Play** button on the transport, or hitting the **Record Toggle** key command again, or simply stop the sequencer.

# Recording

If you are working alone, then it would probably be easier to perform the previous task if you let Logic punch in and out of record automatically for you. Logic refers to this function as **Autodrop**

## Automatic Punch-in/out with Replace

### 1. Turn **Cycle Mode** off

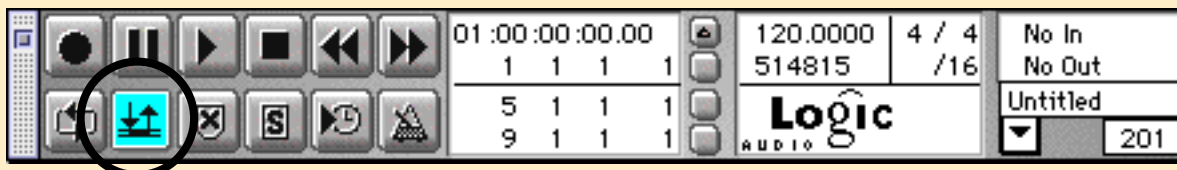
Use the Transport's **Cycle** Mode button or a key command



**NOTE** The reason we turn Cycle Mode off is that Logic will only replace the first pass when Autodrop and Replace Mode are on. You can Autodrop through many cycles but you can only replace the first time.

### 2. Turn Autodrop on

Use the Transport's **Autodrop** button (to the right of the Cycle Mode button) or a key command.



### 3. Turn Replace Mode on

Use the Transport's **Replace** Mode button. ( The button with the "X" on it )

### 4. Set the Song Position to any place before the start of the Autodrop region

### 5. Start Logic recording.

Logic will playback up to the start of the Autodrop region then start recording automatically. Because Replace Mode is on, Logic will delete any existing Sequence material on the record Track.

4



**TIP** There is a set of definable key commands labeled "Set Drop Point by Song Position" which allow you to set the left and right drop points based on the current Song Position. This allows you to set in/out points on the fly — a useful option for those "tight" punches.

# Recording

## Punch in/out and add data without Replace

If you wish to add material to your performance using Punch in/out recording, follow the previous procedures but without enabling the Replace mode option.

How Logic handles the new material is determined by the following setting:

**File -> Song Settings -> Recording Options -> Merge New Recordings with Selected Sequences**

When **Merge New Recordings with Selected Sequences** is enabled, Logic will merge the new data in with the old and no new sequences will be created. Generally, this is the more desirable option.

If **Merge New Recordings with Selected Sequences** is disabled, Logic will create a new sequence containing the new material and place it on top of the old sequence.



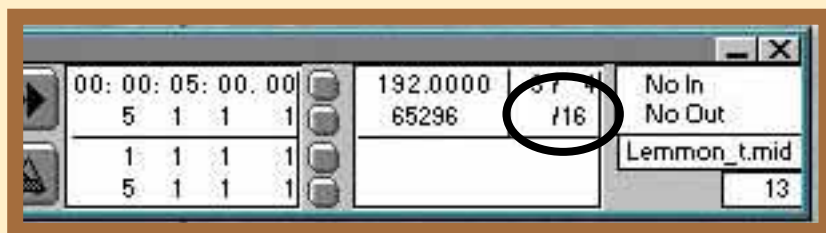
**TIP** You can automatically move these "overlapped" Sequences to their own tracks using: **Arrange -> Structure -> Track -> Create for Overlapped Objects**.

## 4.4 MIDI Step Time Recording

Now let's create a third part using Logic's **MIDI Step-time Recording mode**. MIDI Step recording allows you to input Notes with your MIDI keyboard while the sequence is stopped. The position and lengths of notes are pre-determined by selections you make before striking each note. This is often a good solution for busy melody or percussion parts that are difficult to play in real time. It's also handy for entering notes from a complicated written score.

With Step-time Recording, you "record" by setting the Song Position to the desired start point, then playing notes one-step-at-a-time from your MIDI keyboard. Each time you release ALL notes, the Song Position jumps ahead by the step amount.

The step amount is determined by Logic's **Display Format** value. This value is set in the Transport Window, just below the Time Signature. It is displayed in the format "/#"



### how to:

- create an empty sequence for Step-time Recording
- start & stop Step-time Recording
- control the size of the steps while entering notes
- use Logic's special shortcut keys for Step-time Recording



**WARNING** The Display format value dictates two other important functions in Logic.

- It defines what the division value is wherever an Event's bar/beat/division/tick position or length information is displayed algebra-numerically -- such as in the Event List, Tempo List or Event Float windows. For example, a note displayed at 1 1 1 241 with the Display Format set to "/8", will be displayed at 1 1 2 1 when it is set at "/16" (240 ticks = 1/16th note)
- It determines the display quantize setting in the Score window when a sequence's Score Parameter Box "Qua" setting is set to "Default"

Since changing the Display Format value can radically alter the way things look in these windows, it is generally a good idea to leave the Display Format alone except for MIDI step editing purposes. It is also wise to make sure that you return it to its



# Recording

original value when you're through using MIDI step input.

You can add notes to any Sequence using Step-time Recording but if you starting from scratch, you must create a new Sequence before you begin.

Here are the steps:

1. Create a new (empty) sequence:
2. Create a new Track
3. Select the Instrument for this part.
4. Select the Arrange window's Pencil tool.

To select the Pencil tool, click on it in the Toolbox in the parameters section of the window.

5. Create the Sequence

Click in main part of the Arrange window, to the right of the new Track, at the desired start time for the Sequence. The should create a new sequence object inthe Arrange window.

6. Select the Pointer tool.

It's a good habit to always reselect the Pointer tool after using another tool. This keeps you from making changes you didn't intend to make. A quick way to do this is to simply hit the **Esc** key twice.



**TIP** You can bring up a "floating" Tools palette at the cursor position by typing the **Show Tools** key command (**Esc** by default). Then you can choose a tool by clicking on it or by typing the tool number. (The Pointer tool is #1, the Pencil tool is #2, etc. counting clockwise around the palette.)



**TIP (Mac Only)** You can have two tools easily available at one time by assigning an "alternate" tool which will be active whenever you hold down the Command key. To assign an alternate tool, just hold down the Command key and select the desired tool.

7. Lengthen the new Sequence

Newly created sequences default to being only one bar long so you'll usually want to lengthen them after they are created. You can do this with the Pointer tool by clicking on the lower-right edge of the Sequence and dragging. You will know you're ready to drag when the cursor turns into a:

**Mac** pointing finger

**Windows** Left and Right arrow symbol

In this case, make your new sequence about the same length as the Sequences you've just recorded.

To enter notes using Step-time recording, you need to be in one of Logic's three main editor windows: Matrix, Score or Event. For this example we'll use the Matrix Editor.

Open the Matrix editor window for the Sequence by selecting the Sequence and choosing: **Windows -> Open Matrix Edit.**

## Step-time Record notes into the Sequence

1. **Set the Song Position to the beginning of the Sequence.**

2. **Turn on Step-time Recording**

Click the MIDI In button — the button labeled "IN" just below the Catch button. This enables Step-time Recording.

3. **Set the Display Format value to the smallest note you'll need.**

If you're only entering quarter-notes, use division 1/4. If you'll be entering quarter-notes and 8th notes, use division 1/8. You can change the division any time you want (even while holding down notes), so you needn't be too fussy about the choice.

4. **Play notes on your MIDI keyboard.**

The notes will appear in the Matrix editor as you enter them.

5. **When you are finished turn Step-time Recording off.**

This is another good habit to get into. If you leave it on, anything you play on your MIDI keyboard while in this Matrix editor window will be recorded.

## To Create Chords

Logic doesn't "step" until all notes are released. Until that time, Logic records any new notes at the current Song Position, i.e., creates a chord.

## To Lengthen a note as its being input

4

If you step on the MIDI sustain pedal (MIDI controller #64) or hit the **TAB** key while holding a note, the note is lengthened by one **Display Format** value. For example, if the **Display Format** setting is "1/8" for 8th notes and you want to enter a quarter note, step on (and release) the pedal once before releasing the note.

## To input rests

If you step on the MIDI sustain pedal (MIDI controller #64) or Hit the TAB key without holding a note, the Song Position will advance by one Format value, leaving a rest equal to that value.

## Special MIDI Step key Commands

In most cases, Logic gives you the option of defining your own key commands, but in the case of MIDI Step input, there is a set of fixed key commands which cannot be altered. Furthermore, if you assign these keys to other functions in the Key Command Window, it defeats their special Step-time function.



**NOTE** *There is one special exception to this rule. There are definable key commands in the Score Window which select different note values from the Partbox. While these key commands were designed for speeding up mouse entry of notes in the Score window, they can also be used for MIDI step entry since they alter the Display Format value. The restriction is that they will only function from within the Score Window.*

The following special keys on your computer keyboard affect Step-time settings:

| <b>Key</b> | <b>Selects the division</b>                |
|------------|--|
| A          | Quarter note                               |
| S          | 8th note                                   |
| D          | 16th note                                  |
| Q          | 32nd note                                  |
| W          | 64th note                                  |
| <b>Key</b> | <b>Changes the division</b>                |
| E          | Next higher division (e.g. from /8 to /12) |
| R          | Next lower division (e.g. from /12 to /8)  |
| <b>Key</b> | <b>Moves the Song Position</b>             |
| N          | Next beat                                  |
| M          | Next bar                                   |
| B          | Back one division and delete what's there  |

Also remember that the standard **Forward** and **Rewind** key commands can be used during Step-time Recording.



**NOTE** *All normal activities like moving notes, using the tools, setting the division manually, quantizing, etc. are still available during Step-time Recording.*

# Recording



**TIP** You can change the pitch or velocity of an existing note, using your MIDI controller.

1) Double-click the **MIDI IN** button in the Event, Score, or Matrix Windows;

On a **Mac**, the button will then look like this:



In **Windows**, like this:



2) Select the note you wish to alter and play the correct pitch with the desired velocity on your controller keyboard. The selected note will take on the pitch and velocity of the note you struck. Be careful not to forget to de-select the MIDI IN button when you're through.

## What You Will Learn

In this section you will learn the various ways you can edit the MIDI data you've recorded. We will see how to organize and move Sequences around in the Arrange window. Then we'll work with Logic's main editor windows and examine the unique features of each. In the process we'll take brief looks at Logic's quantization and reclocking features.

The information is organized into the following sections:



Working in the Arrange Window



Working with Folders



Working in the Event List



Working in the Matrix Editor



Working in the Score Editor



Mix Automation



Other Useful Editing Tools

## 5.1 Working in the Arrange Window

At this point you should have the short three-part piece that you recorded in the *MIDI Recording* section. Set the left and right Locators to the beginning and end of the piece and turn Cycle Mode on. This will allow you to cycle the piece and hear the changes you make as you make them. There are a number of things you can do with Sequences and groups of Sequences in the Arrange window so that's where we'll start.

### Sequence Parameters

Each Logic Sequence has its own, individual set of parameters which affect the way its MIDI data is played back. You can alter many aspects of the notes including their overall loudness (Velocity); rhythmic accuracy (Quantization); or average duration (Gate Time).

The basic set of parameters are shown in the **Sequence Parameter Box** at the top of the Arrange window's parameter settings column. It is important to understand that these are *playback* parameters only, i.e., their effect is non-destructive. This means that the actual MIDI data is not changed, only the way it is played back.

#### how to:

- use Sequence parameters to affect playback
- lock in the Sequence parameters
- quantize while recording
- quantize multiple tracks/sequences at once
- quantize non-destructively

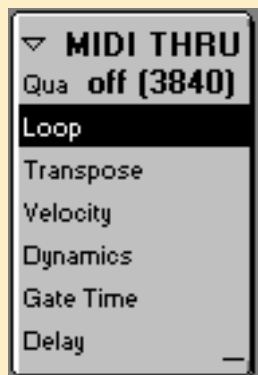


**NOTE** If you don't see the complete Sequence Parameter Box, recall that Logic's various parameter boxes can be "minimized" or "expanded" by clicking on the triangle in their top-left corner.

5

When a Sequence is selected, the parameters in the Sequence Parameter Box update to reflect the settings for that sequence. The name at the top of Sequence Parameter Box changes to reflect which sequence or sequences are selected.

***Here is what will be displayed and how the data will be affected for each of the possible states of selection***

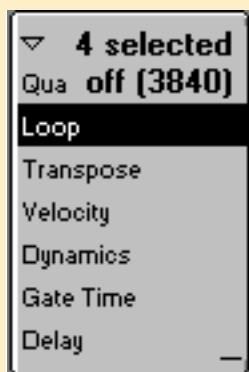
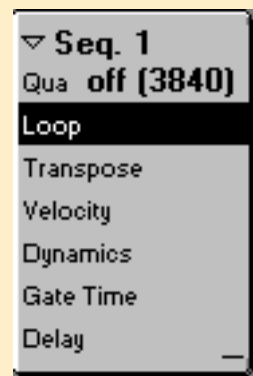


- **When no Sequences are selected**

The words "MIDI THRU" are displayed and all incoming MIDI data is effected by the settings. This is the way to define a set of default settings for the Sequence Parameter Box. It is how you would, for example, "quantize on-the-fly". When you record, the resulting Sequence take on these parameter settings. Don't forget however that since these settings are non-destructive, you can still alter the values later or return them to "blank" to hear the original MIDI data as it was performed.

- **When one Sequence is selected**

The name of the Sequence is displayed and all settings apply only to that Sequence. (If a setting is "blank", it means it is off or set to a value of "0")



- **When multiple Sequences are selected**

"# Selected" is displayed and all selected Sequences are effected by the parameter settings. If the Sequences already have some parameter settings and they are not all the same, a "\*" will appear next to that parameter. Changing a '\*'d setting causes relative changes in all the selected Sequences.

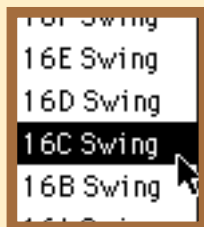
The meaning of many of the Sequence parameters should be self-evident to most, others may require a little experimenting to reveal their effect. (For a detailed discussion of all the Sequence parameters consult your Logic user's manual.) The best way to experiment is while Logic is playing so that you can hear the results as they happen.

Let's try it:

## 1. Start Logic playing

Click the Transport's play button or use a key command ("0" by default) to start Logic playing. If you turned Cycle Mode on as suggested, your short piece will playback over and over.

## 2. Select one of the Sequences that should be "in time" like a drum, bass or rhythm guitar part and change its **Qua** parameter setting.



When you click to the right of the word **Qua** in the Sequence Parameter Box, a menu pops-up with various choices. These are time divisions and quantizing "snaps" all notes to the closest division of the selected type, i.e., if you choose **1/8-Note**, every note in the Sequence will play at an 8th-note time division. This means it is important to choose a quantize setting that properly corresponds to what was played. If you choose 1/8th-Note but you played notes of a shorter duration like 8th-note triplets or 16th notes, many of the notes would end up "clumped" on top of one another in an undesirable fashion..

Logic offers very powerful and complex quantizing choices - including the ability to quantize one sequence to another. These are beyond the scope which are beyond this "getting started" guide so for now, just experiment with the basic settings. Consult your users manual once you are ready to explore the other options available for quantizing.

## 3. Experiment with the other parameters

Spend some time experimenting with some of the other parameters except "Loop" , which will have no audible effect. (We'll discuss looping a little later.)



The users manual contains a complete description of what each of the Parameters do. Here is a basic description for a few of the parameters that you are likely to use most often:

- **Transpose**

The name says it all. This parameter allows you to transpose notes up or down, one half-step at a time. The range is +/- 96 half-steps

- **Velocity**

Adds or subtracts a set velocity to/from all notes

- **Dynamics**

Expands (louder notes get louder, softer notes get softer) or Compresses (all notes approach the middle of the range) the overall range of note velocities. Can be a very useful tool, especially when used in conjunction with the Velocity parameter.

- **Gate Time**

Shortens or lengthens all notes by a given percentage. The range is from 25% to 400%. At one end of the range you also have the option to "FIX" all note lengths to the same length and at the other to make all the notes play "Legato", i.e., to continue to sustain right up until the next note.

- **Delay**

Shifts the positions of all events within the sequence by the selected value. The values are represented in ticks by default. If you wish to adjust the value using the milliseconds, select Arrange -> View -> Delay in ms



**NOTE** *The Quantize settings are the only Sequence Parameters which will have an effect on the display of events in the various event windows.*



**TIP** *If you click-hold just to the left of where the value is input for the Transpose and Delay settings, a flip-menu opens with an abbreviated selection of the most "musically useful" options for that parameter. For Transpose, the menu contains only perfect octaves — for Delay, only perfect note values, i.e., 1/32, 1/24, 1/16, 1/12, 1/8, etc.*

## Converting Sequence Parameter settings to destructive edits

At some point you may decide you want to you like and want to "lock" in your Sequence parameter settings, i.e., turn them into hard edits to your data. This is necessary in fact when your are preparing a song to be exported as a MIDI file.

The way to do this is to:

1. Select the Sequence or Sequences to be affected.
2. Choose **Arrange -> Functions -> Sequence -> Instrument Parameter -> Normalize Sequence Parameters**

The actual Sequence data will be changed according to the parameters and the settings in the Parameter Box will be returned to their zero setting. Remember though, you can only undo this type of edit once — just after performing it. After that, the edit cannot be reversed.



**WARNING** *Selecting this option will also change the internal MIDI event channel to match that of the current Instrument. This can be a problem if you are using a polyphonic score style in the score window, since in that case, the event channel is being used to differentiate between voices. To avoid this potential problem, select the optional menu selection: **Arrange -> Functions -> Sequence -> Instrument Parameter -> Normalize w/o channel***

There is one other option as well — **Normalize w/o channel and delay**. This option, as the name implies, will also ignore the current Delay setting when Normalizing. Normalizing does not apply to the Quantize setting . Quantize values can be "locked-in" using a separate option: **Arrange -> Functions -> Sequence -> Instrument Parameter -> Fix Quantize**



**TIP** *If you double-click on any of the parameter names on the left side of the Sequence Parameter Box, a floating window version of the Sequence Parameter Box opens which includes an extended set of parameters. Amongst other things, these extended parameters give control over the Range and Strength of the Quantize settings. They also give you the ability to quantize the velocity and lengths of notes.*

## Moving Sequences and changing their Boundaries

5

Sequences can be conveniently manipulated within the Arrange window. With simple and intuitive mouse movements you can move, copy, or change the duration of a musical phrase.



## Moving a Sequence to a different position or track

1. Click hold on directly on the sequence you wish to move until the cursor turns into a;

**Mac** — grabbing hand

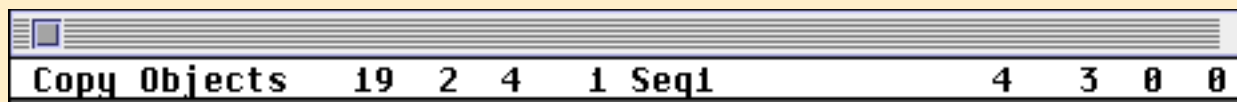


**Windows** — cross-hair tool



2. Drag the mouse to a new location or track

As you move the Sequence, notice that the area where the window's menus normally reside changes and now display current information about the size and position of the Sequence you are moving.



This display is referred to as the "Control Line".



**NOTE** A Control Line also appears in the Hyper, Matrix and Score windows to indicate similar information about MIDI events as you edit them there.



**TIP** Logic normally snaps your movements to the nearest beat. To temporarily defeat this grid and move by the sub-division of the beat:

**Mac** — hold the Control key down AFTER click holding the mouse button

**Windows** — hold the Alt key down AFTER click holding the mouse button

To temporarily defeat this grid and move by the ticks:

**Mac** — hold the Control + Shift keys down AFTER click holding the mouse button

**Windows** — hold the Alt + Shift keys down AFTER click holding the mouse button



**TIP** Logic by default allows you to freely move objects both horizontally and vertically. Some users prefer to work with a little less freedom of motion in order to reduce the risk of making unintentional changes. If this idea appeals to you, select **File -> Preferences -> Global menu / tab -> Limit dragging to one direction in Arrange**.

Notice there is a similar option for limiting your movements in the Matrix and Score Windows. In either case, when this option is enabled, Logic will automatically sense which direction you first travel in, and then restrict your movements to that direction.



## Changing Sequence Boundaries

Another useful option you may perform in the Arrange Window is to change the left and right boundaries of a Sequence. If you think of the Sequence as a box of data, this amounts to making the box bigger and smaller. You can move either end to the left or right but you can't move the beginning to the right past the first note. Shortening a Sequence doesn't destroy any data—it simply keeps it from playing back. If you expand the Sequence again, the data is still there and will play.

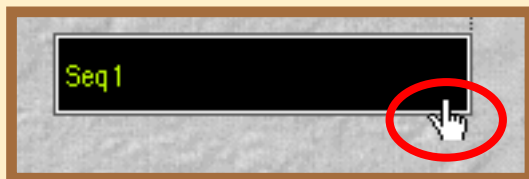
Let's give it a try:

### 1. Click-drag the lower right hand corner of the Sequence

Select one of the Sequences in your piece and click the pointer on the lower half of its right edge. When the pointer;



**Mac** — changes to a hand with one pointed finger,



**Windows** — changes to a left and right pointing arrow;



drag to the left until the sequence is roughly half of its original length.



**TIP** *The same Control Line mentioned previously will display updated length information as you make this edit. This allows you to know precisely what you're doing.*

## 2. Check the effect of the edit

Start the song and take notice that nothing plays after the newly edited right hand boundary of the Sequence.



**TIP** *If you hold the; **Windows** — Control key **Mac** — Option key ; while changing a Sequence's length, the position and length of the notes changes in proportion. In other words, if you shorten the Sequence to half of its original length, it will play twice as fast and all notes will be half as long. Remember to use the Control Line to ensure that your length edit is precise.*

We'll see next that changing Sequence boundaries is a very handy feature when used in conjunction with Loops, Aliases and Folders.

## Making Aliases, Copies & Loops

In Logic, there are three basic types of "copies" of a Sequence. Each type has its advantages and uses. Here is a brief description of each:

- **Standard Copy**

A completely independent copy of the original. Once a copy is made there is no relationship between the copy and the original. You can create this type of copy in three different ways:

- **using standard Copy/Paste functions**
- **Mac — Option drag sequence; Windows — Control drag Sequence**
- **using the Arrange -> Edit -> Copy MIDI Events window(see User's manual for details on this feature)**

- **Alias**

A freely movable place holder that tells Logic to play the original Sequence at a new location. Any change in the original also applies to all its Aliases, but Aliases have their own Sequence parameters and can be moved around the Arrange window freely.

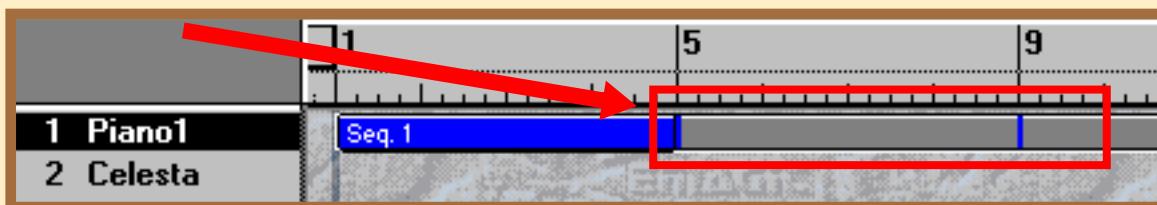
- **Loop**

A place holder that tells Logic to continuously repeat the original sequence until it "runs into" another object on that Track.

Let's look at an example of how these three kinds of copies might be used in your three-part piece:

## 1. Loop one Sequence:

Select one of the Sequences, say the bass part, and click to the far right of the word "Loop" in the Sequence Parameter Box. You will see a strip of gray "ghosts" of the Sequence extend continuously to the right. The horizontal dividing lines indicate the points at which the sequence is reiterated.



## 2. Alias one Sequence:

Select another Sequence, for example, the melody part, and choose:

**Arrange -> Structure -> Alias -> Make**

Drag the Alias so that it starts at the same position as the beginning of the third Loop of the first sequence (i.e. until there is a "one Loop" gap between the original and the Alias.)



**TIP** You can also make an alias of a Sequence by simply holding the **Windows** — Control + Shift keys; **Mac** — Option + Shift keys ; while you drag it to a new location.

## 3. Copy the remaining Sequence

Select the Sequence and choose: **Arrange -> Edit -> Copy**

Position the SPL at the end of the original and paste the copy there by choosing: **Arrange -> Edit -> Paste**



**TIP** You can also make a copy of a Sequence by simply holding the ; **Mac** — Option key ; **Windows** — Control key ; while you drag it to a new location.

**5**

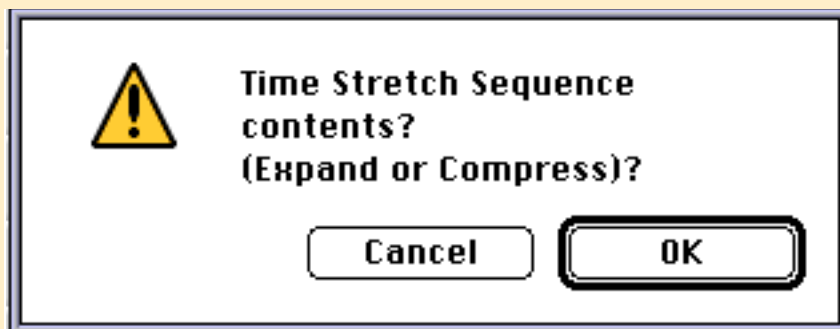
Before we hit play to hear the results, let's try our hand at the previous tip which described a way to Time Stretch or Expand the contents of a sequence. With the recently Pasted Sequence selected:

### 1. Hold down the;

**Mac** — Option key ; **Windows** — Control key;

and stretch the copy to (exactly) twice its length. The following warning box

will show up:



2. Click 'OK'



**NOTE** "Time Stretching" doesn't work with Aliases—that's why we used a real copy.

3. Playback the Song

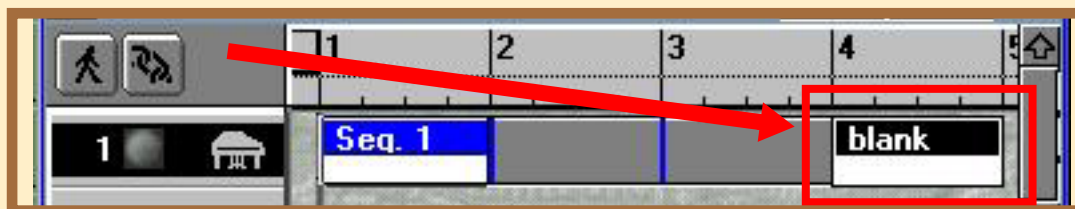
If all went according to plan you will now have a song that is three times as long as the original—let's call this three choruses. The looped Sequence (presumably bass) plays for all three choruses. The aliased Sequence plays for the 1st and 3rd choruses only and the copied & stretched Sequence (presumably drums) plays for all three choruses but plays at half-speed for the last two choruses.

## Stopping a loop

As stated earlier, a Looped Sequence continues until the end of the song, or until it "runs into" an object on the same track. There is in fact two other ways to stop a Looped Sequence from continuing to play. Here they are:

- **Block the Loop with an empty sequence**

Create an empty Sequence with the Pencil tool at the exact place you want the looping to stop. Alternatively, you could also place a Copy or Alias at the same location where you want the last Loop to play.



- **Pack the Looped Sequence into a Folder**

If a looped Sequence is inside a Folder it will not play beyond the limits of the Folder. To learn about creating folders, read in the following section, **"Working with Folders"**

## Changing Aliases & Loops into Real Copies

After you've used Loops and Aliases to repeat and restructure your Sequences, you may want to turn some or all of them into "real" copies for further editing. This would, for example, allow you to edit the MIDI events in the Sequence, something you can't do with a Loop or Alias. (at least not without effecting the "original")

Fortunately, Logic allows you to easily change both Loops and Aliases into real sequences. Open the Folder with your three choruses in it by double-clicking on it (if you're not inside it already). Then follow these steps:

1. Select the Alias and choose:

**Arrange -> Structure -> Alias -> Turn to Real Copy**

2. Select the looped Sequence and choose:

**Arrange -> Functions -> Sequence/Instrument Parameter -> Turn Loops into Real Copies**



**TIP** You can also choose to turn Loops into Aliases. This allows you to freely reposition and edit the Sequence parameters of the Loops (once they are Aliases) but without add extra MIDI data to your Song.

Since we no longer need the Folder to "contain" the three Loops, move out of the Folder and for simplicity, unpack it (by selecting it and choosing: **Arrange -> Structure -> Unpack Folder**).

## Merging and Cutting Sequences

---

### Merging Sequences

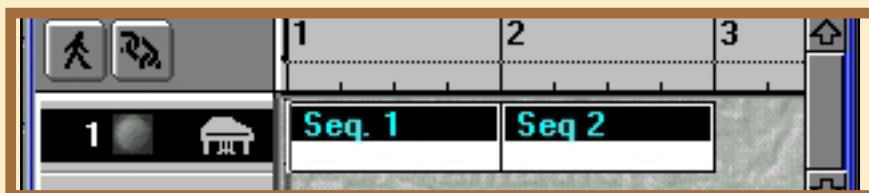
A common function you will likely need to perform at some point is to "glue" two or more sequences together. Logic generally refers to this as "merging" sequences. There are few different ways to perform a merge operation, all of which are quite simple to do.



## ***To Merge selected sequences together***

### **1. Select the sequences you wish to merge**

You can do this either by shift-clicking or lassoing them. Selecting a track will select all the sequences in the track, unless Cycle is on, in which case it will only select those sequences within the boundaries of the Cycle.



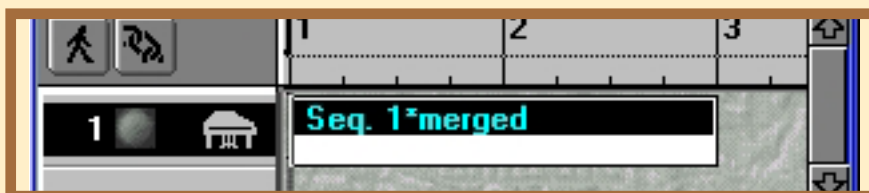
### **2. Click on any one of the sequences using the Glue Tool**

OR, select

***Arrange -> Structure -> Merge -> Objects/Digital Mixdown***

OR,

use the definable key command called ***Merge Objects***  
( ***Mac default*** — Shift + M ***Windows*** — no default )



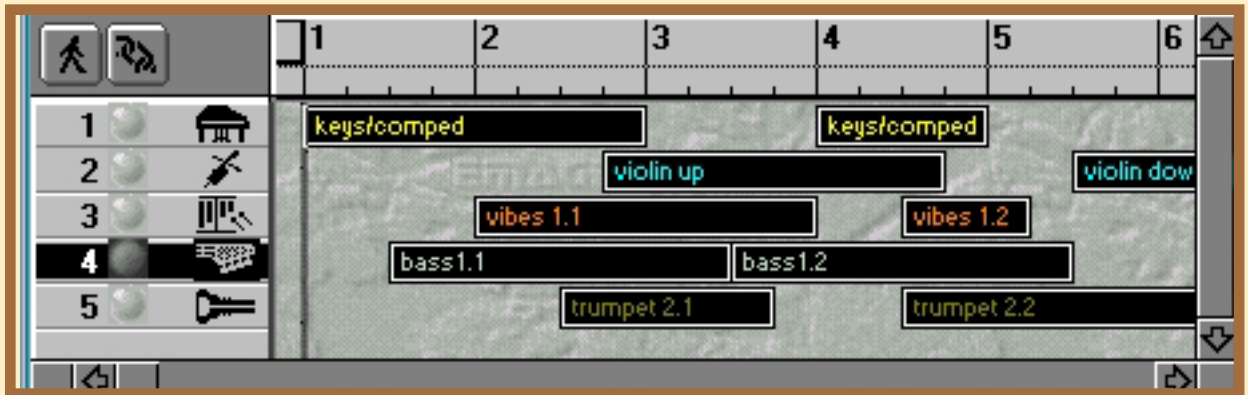
## ***To merge all sequences on a per track basis***

It is sometimes more convenient to have all sequences in a track merged into one. This is generally a good idea for example, when preparing the score for printout. Fortunately, there is a dedicated feature for performing this task on all selected sequences.

# Editing

To perform this operation on your whole song:

1. Select all the Sequences in the Arrange window



2. Select **Arrange -> Structure -> Merge -> Objects per Tracks**



If you only want to merge the Sequences on a selection of Tracks, select only those Sequences before performing this operation.

## 5 Using the Merge function to add controller or other data to an existing sequence

While it may be more common to use the merge operations *horizontally*, i.e., to append sequences to one another, there are times when you may wish to merge Sequences that are playing at the same time and by the same instrument. A good example is when you have added controller or other data to a track and the new recordings are in new sequences, perhaps even on separate tracks.

Imagine that when you recorded the parts or your piece, you were concerned with the notes and didn't bother with the other MIDI controllers (foot pedal, modulation wheel, pitch bend, etc.) It's often easier to add this information after the fact, especially for Sequences that were step-time recorded. Let's add some controller data and pitch bend to one of the Sequences.

## 1. Select the Track of the part to add controllers to and choose:

***Arrange -> Structure -> Track -> Create***

This creates a new Track just below the selected one. Another way to create a new track is to simply double-click in the space at the bottom of the Track list, just below the last initialized track.

## 2. Record some modulation wheel movements into the new track

Use the procedures described in the Recording chapter to record modulation wheel changes into the new track.

## 3. Record pitchbend changes into another new track

Create another new Track as in step 1 and record some pitchbend changes into it.

## ***Merge all the sequences together***

### 1. Use the procedure described under **To Merge selected sequences together** to merge the new sequences together

### 2. Delete the now unused tracks

Logic provides a nice menu option/key command that makes it easy to delete any tracks that no longer have sequences in them.

Select any track that *does* contain sequences, then select:

***Arrange -> Structure -> Track -> Delete unused***

(Logic will not delete the currently selected track, even if it is empty. That is why we instructed you to select a used track before selecting this operation)



**NOTE** You could also have used the **Merge New Recordings with Selected Sequences** option described in the Basic Recording chapter. With that option enabled, your new recordings are automatically merged as you record. However, an advantage to recording without that option enabled is that you are able to take multiple takes, then audition each to find the one you like before merging it into the original sequence.

## Cutting Sequences

Now that we've looked at putting sequences together, let's explore the features available for taking them apart. You will use these features whenever you wish to remove a portion of a Sequence, or when you want to take a portion of a Sequence and move or paste it to another track or location in the composition. All of these features can also be used on a group of Sequences as well. All you have to do is select them before starting the operation.

### *Using the Scissors Tool*

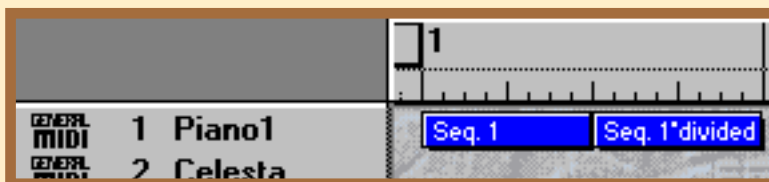
Perhaps the easiest and most intuitive method for cutting sequences is to simply use the Scissors Tool

1. Select the Sequence or Sequences you wish to cut
2. Select the Scissors Tool from the Tool box
3. Cut the Sequence at the desired location

Click-drag directly over the top of the Sequence, in the general location where you wish to cut the Sequence.



The Control Line discussed previously will become visible, allowing you to see where you are about to cut. . You will also notice that the MIDI data "under" your current position is transmitted as you move, creating a "MIDI scrub" effect. This let's you use your ears to find the location for your cut.

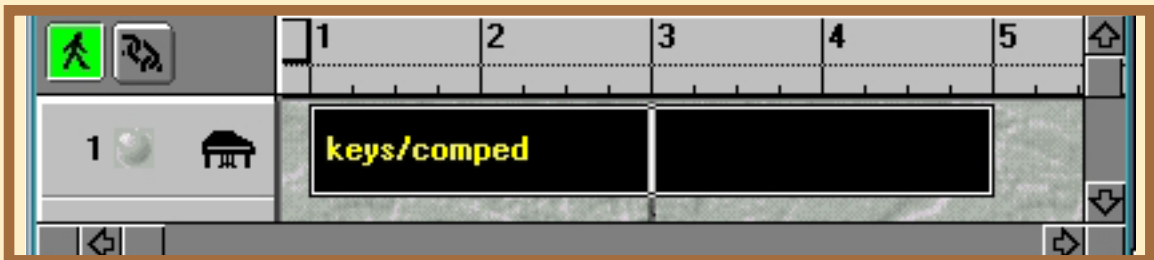


As with moving Sequences, movement is initially snapped to a beat grid. You can defeat this grid using the modifier key options described under the previous section, **"Moving a Sequence to a different position or track"**

## Using the Song Position

1. Select the sequence or sequences to be split
2. Locate the Song Position to the spot at which you wish to cut

Probably the fastest, most efficient way to do this is to use the **Goto Position...** definable key command although you can alternatively: click and drag the song position values in the Transport window, or click and drag the Song Position Line to the desired location.



3. Select **Arrange -> Functions -> Split/Demix -> Split Object by Song Position.**



You can alternatively use the key command equivalent for this function.

## Using Locator values

This option allows you to make two cuts with one operation.

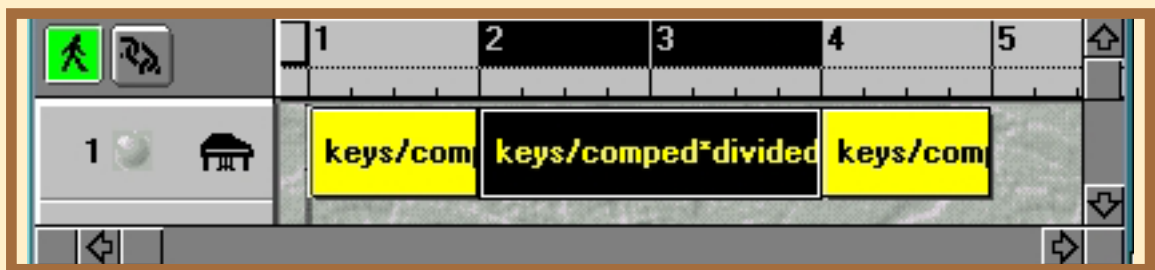
1. Select the sequence or sequences to be split
2. Set the Left and Right Locators to the beginning and ending points of the area you want to split off.

The most direct and intuitive way to this is to click-drag your mouse in the upper portion of the Bar Ruler, the same way you do to define the boundaries for Cycle mode. (Yes, this will also enable Cycle mode, but it's easy enough to disable it once the operation is finished) You can alternatively "dial in" the desired locator values directly on the Transport Panel



### 3. Select **Arrange -> Functions -> Split/Demix -> Split Object by Locators**

You can also use the definable keyboard equivalent.



**TIP** If you use the key command for **Split Object by Locators** in conjunction with the key commands for **Set Left Locator by Song Position** and **Set Right Locator by Song Position**, you can very quickly and easily split off portions of Sequences "on the fly".



**TIP Mac Only** If you hold down the Command Key while click-dragging in the Bar Ruler to define Cycle boundaries, all selected objects will be split by those locator settings when you release the mouse button.

You should now have a pretty good idea of how to get around the Arrange window. Before we move on to looking at the other edit windows, we'll examine a useful organizational tool called **Folders**.

## 5.2 Working with Folders

If you get to a point where your composition contains a large number of Sequences, you may begin to wish for an efficient way to organize them all. This is the function of Logic's Folders. By "packing" your Sequences into these Folders, it's easy to organize them vertically into instrumental groups, and/or horizontally, into musical sections.

**NOTE** *Don't feel that you have to use Folders. While they are an excellent organizational tool, be aware that they introduce an extra level of hierarchical complexity to your song. Before you begin using them, be absolutely sure that you have a firm grasp of Logic's hierarchical nature and the various Link Modes which were covered in the "What Makes Logic Special" chapter.*

### how to:

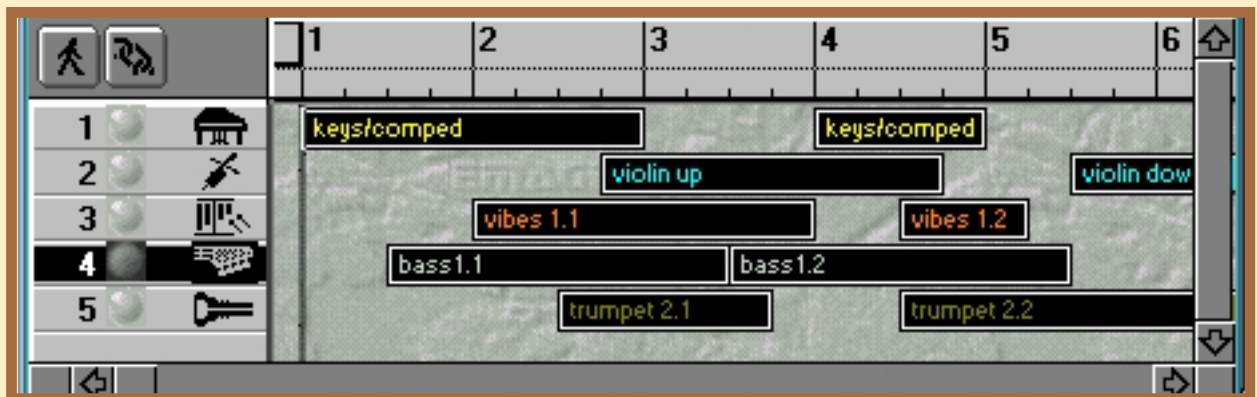
- combine Sequences in Folders
- move in and out of Folders
- use Folders to repeat song structures

Let's create a Folder for the three choruses of your Song:

### 1. Select everything in the Arrange window.

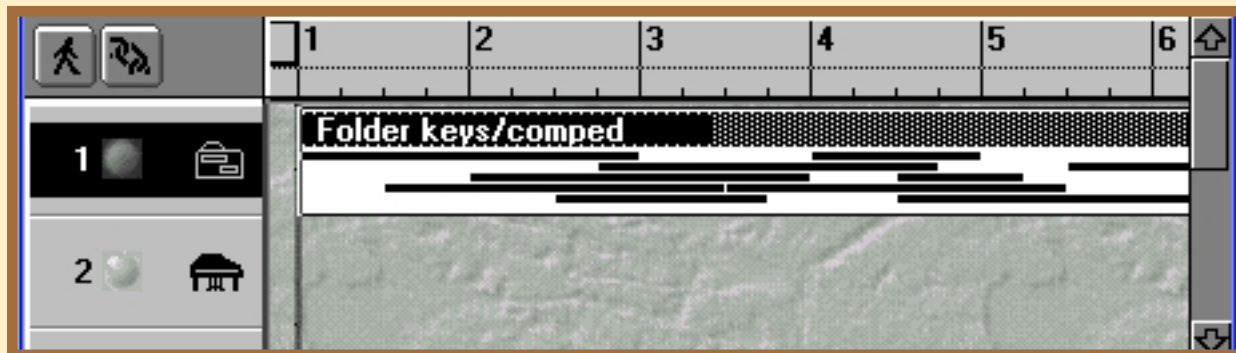
You can do this in several ways:

- **Shift-Click each object (except the Loops).**
- **"Rubber-band" select all the objects.**
- **Choose Arrange -> Edit -> Select All (or use a key command for this).**



## 2. "Pack" everything into a Folder by choosing:

***Arrange Window -> Structure -> Pack Folder***



A Folder is a container just like a Sequence except that Folders can only contain Sequences or other Folders. In other words, Folders cannot contain actual MIDI events.

When you "pack" a Folder, Logic puts it on a Track whose Instrument is "Folder". This is NOT an Environment object — it is one of two things on Logic's Instrument menu that is built into Logic. ( the other is the "No Output" object — a special Instrument generally used to disable MIDI Thru ). If there is no Folder Track in your Arrange window, Logic creates one when you pack a Folder.

### ***Some important points to remember about Folders:***

- **You can unpack Folders any time you want.**

To see this, select the Folder you just created in step 2 above and choose: ***Arrange -> Structure -> Unpack***. Your Song should return to its original structure. Now pack the Folder again and we'll explore Folders some more.

- **You get "inside" of a Folder by double-clicking on it.**

This is called *changing levels* because it doesn't open a new Arrange window—it just moves "down a level" to the inside of the Folder. When you move inside the Folder, it appears that you're back to your original view—the way things were before you packed the Folder.

If you look in the Arrange window's Title Bar, you'll see the name of your Song followed by a colon (":") followed by the name of the Folder you're inside of.





**NOTE** *You can always tell where you are in any of Logic's windows by looking at the Title Bar. Each level is indicated by a colon—no colons for the top level, one colon for the 2nd level, etc.*

- **You get outside of a Folder by double-clicking on any empty space in the window's workspace.**

You can also click the level button at the left end of the Menu Bar. (This button looks like a black square within a gray square.) Finally, there are key commands available for going between levels. (These key commands have no default assignment.)

- **Folders have their own parameters.**

The Sequence Parameter Box becomes the Folder Parameter Box when a Folder is selected. This means you can transpose, loop, quantize, etc. everything in a Folder at the same time.

- **You can Loop Folders and make Aliases or copies of them.**

For example, you might wish to loop the three-chorus structure you created above, then record "melody" Sequences spanning several Loops.

As you spend more time with Logic, you will find many powerful uses for Folders but for now, we'll simply perform a few edits while inside our folder then unpack it. That way, we can continue to explore Logic's editing features without worrying what "level" we're on.

## 5.3 Working in the Event List

The Event List window displays events in an alpha-numeric list. It is the oldest type of edit window used in a sequencer, and is still perhaps the most efficient. It is also the only edit window in Logic where you can effectively view and edit any level of your composition, i.e., not just MIDI events, but Sequences and Folders as well.

Select the Sequence you just added mod-wheel and pitchbend to and open the Event List by choosing:

**Windows -> Open Event List**

The Event List window will open up and you will see a list of all the MIDI events in the Sequence.

**Here are two important points to remember about the Event List window:**

- **Time is represented vertically.**  
The events in the list are in chronological (time) order. The various event information is organized into columns
- **The left column shows the position of each event in the list.**  
The four numbers indicate bars, beats, sub-division and ticks. The sub-division value is variable and is defined by the **Display Format** value which was discussed in the Recording chapter. Keep in mind that changing this value does not change the actual position, only the way the it is represented.

### how to:

- open the Event List editor window
- edit event parameters in the Event List
- add events to the Event List
- select events in the Event List
- change the format of the Event List's position display
- quantize selected events in the Event List
- Select events of just one type



**NOTE** Normally, an event's position is measured from the beginning of the Song. If you wish to have the positions measured from the beginning of the Sequence, select Event List -> View -> Local Position.

You can edit the values in this column either by scrolling any of the four digits or double-clicking and typing in a new position. In the latter case, use a Space or "." to delineate between the bar, beat, division, and tick values. Remember that Logic will insert '1' for any missing positions to the right of

the numbers typed in. Typing "5.3" for example, will render "5 3 1 1".

| Edit Functions View |   |   |     |         |     |                            |     |             |        |
|---------------------|---|---|-----|---------|-----|----------------------------|-----|-------------|--------|
| POSITION            |   |   |     | STATUS  | CHA | NUM                        | VAL | LENGTH/INFO |        |
| 1                   | 1 | 2 | 1   | PitchBd | 1   | 0                          | 48  | =           | - 2048 |
| 1                   | 1 | 3 | 2   | Note    | 6   | A2                         | 47  | -           | 1 12   |
| 1                   | 1 | 3 | 169 | Note    | 6   | G2                         | 47  | -           | 212    |
| 1                   | 1 | 4 | 221 | Note    | 6   | A2                         | 56  | -           | 1 124  |
| 1                   | 2 | 1 | 1   | P-Press | 1   | E3                         | 0   |             |        |
| 1                   | 2 | 2 | 1   | Program | 1   | <input type="checkbox"/> ÷ | 38  | ROOMY-ORGAN |        |

- The **Status** column shows the type of MIDI event.

| Edit Functions View |   |   |     |         |     |                            |     |             |        |
|---------------------|---|---|-----|---------|-----|----------------------------|-----|-------------|--------|
| POSITION            |   |   |     | STATUS  | CHA | NUM                        | VAL | LENGTH/INFO |        |
| 1                   | 1 | 2 | 1   | PitchBd | 1   | 0                          | 48  | =           | - 2048 |
| 1                   | 1 | 3 | 2   | Note    | 6   | A2                         | 47  | -           | 1 12   |
| 1                   | 1 | 3 | 169 | Note    | 6   | G2                         | 47  | -           | 212    |
| 1                   | 1 | 4 | 221 | Note    | 6   | A2                         | 56  | -           | 1 124  |
| 1                   | 2 | 1 | 1   | P-Press | 1   | E3                         | 0   |             |        |
| 1                   | 2 | 2 | 1   | Program | 1   | <input type="checkbox"/> ÷ | 38  | ROOMY-ORGAN |        |

The Status is only for display. You can't transform one type of MIDI event into another — at least not here.

- The **Cha**, **Num** and **Val** columns show the event parameters.

All three of these parameters can be edited by scrolling or double-clicking and typing in new values.

| Edit Functions View |   |   |     |         |     |                            |     |             |        |
|---------------------|---|---|-----|---------|-----|----------------------------|-----|-------------|--------|
| POSITION            |   |   |     | STATUS  | CHA | NUM                        | VAL | LENGTH/INFO |        |
| 1                   | 1 | 2 | 1   | PitchBd | 1   | 0                          | 48  | =           | - 2048 |
| 1                   | 1 | 3 | 2   | Note    | 6   | A2                         | 47  | -           | 1 12   |
| 1                   | 1 | 3 | 169 | Note    | 6   | G2                         | 47  | -           | 212    |
| 1                   | 1 | 4 | 221 | Note    | 6   | A2                         | 56  | -           | 1 124  |
| 1                   | 2 | 1 | 1   | P-Press | 1   | E3                         | 0   |             |        |
| 1                   | 2 | 2 | 1   | Program | 1   | <input type="checkbox"/> ÷ | 38  | ROOMY-ORGAN |        |

**Cha** is the MIDI channel. This is the channel that was the event "came in on". In other words, it was the channel your controller was transmitting on when you initially recorded the data. Normally, this value will not effect the channel the data is being played back on because it is overridden by the

channel of the Instrument currently assigned to the Track.



**NOTE** The only time you will probably ever be concerned with this value is when handling polyphonic (multi-voiced) parts in the Score window because Logic uses this "event channel" to differentiate between polyphonic voices.

**Num** displays something different depending on the type of event. For notes it displays the pitch, for controllers, the controller number and for pitchbend, the data LSB (don't be concerned if you don't understand what that means).

**Val** also depends on the type of event. For notes, it's velocity, for controllers, it's the controller amount and for pitchbend it's the data MSB (again, don't be concerned if you don't understand what that means).

- The "Length/Info" column shows the length or duration of notes and gives pertinent information about all other types of events.

| Edit Functions View |   |   |        |         |     |                          |     |             |             |
|---------------------|---|---|--------|---------|-----|--------------------------|-----|-------------|-------------|
| POSITION            |   |   | STATUS |         | CHA | NUM                      | VAL | LENGTH/INFO |             |
| 1                   | 1 | 2 | 1      | PitchBd | 1   | 0                        | 48  | =           | - 2048      |
| 1                   | 1 | 3 | 2      | Note    | 6   | A2                       | 47  | -           | 1 12        |
| 1                   | 1 | 3 | 169    | Note    | 6   | G2                       | 47  | -           | 212         |
| 1                   | 1 | 4 | 221    | Note    | 6   | A2                       | 56  | -           | 1 124       |
| 1                   | 2 | 1 | 1      | P-Press | 1   | E3                       | 0   |             |             |
| 1                   | 2 | 2 | 1      | Program | 1   | <input type="checkbox"/> | ÷   | 38          | ROOMY-ORGAN |

For registered Continuous Controllers it displays the actual controller name, i.e., for mod-wheel (cc#3) it displays Modulation and Pan (cc#10) it displays Pan. For Pitchbend events, it shows the amount as a single value (between -8192 and +8192).

- You can select events in all the usual ways (clicking, shift-clicking, rubber banding, etc.).

Always make selections in the **Status** column area or else you may accidentally change the data. The Edit menu also provides many useful selection options.



**TIP** To view the event positions and lengths in SMPTE units, select **Event Window -> View -> Position & Length in SMPTE Units**. The same menu also has another useful option — **Length as Absolute Position**. When this is enabled, the value in the **Length** column represents the end position of the event rather than actual length value. This is an especially useful mode

*when editing Folders, Sequences, or Audio Regions.*

## Other Event list objects

The left side of the Event List window contains two columns of buttons. The top two in the left column are the familiar **Catch** and **Link Mode** buttons. Beside them are scroll buttons for moving the displayed events up and down in the window. The black wedge in the middle of the left border of where the events are displayed is the **Position Arrow**. If **Catch Mode** is on, this will correspond to the Song Position. The two buttons labeled **In** and **Out** toggle Step-time recording and MIDI output, respectively. When MIDI output is on;

**Mac** — blue button



**Windows** — Red button

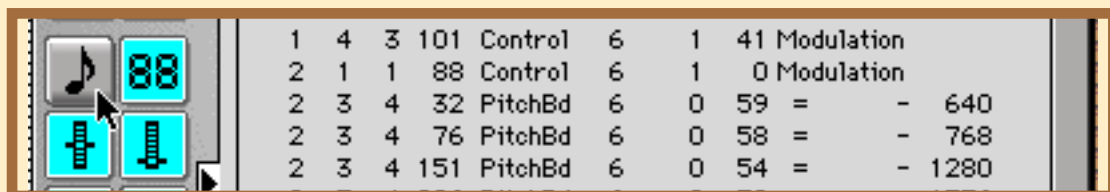


selecting an event in the Event List will cause it to be played.

## Filtering the display of Events

Below the **In** and **Out** buttons you'll find two columns of "Event Type Buttons". These buttons serve two purposes. The first is to determine what event types will appear on the list.

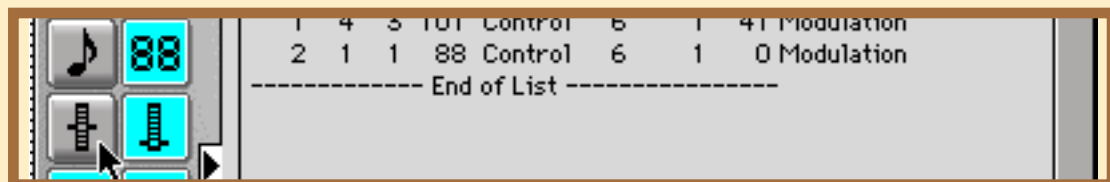
1. Click the button with the note icon so that it is gray.



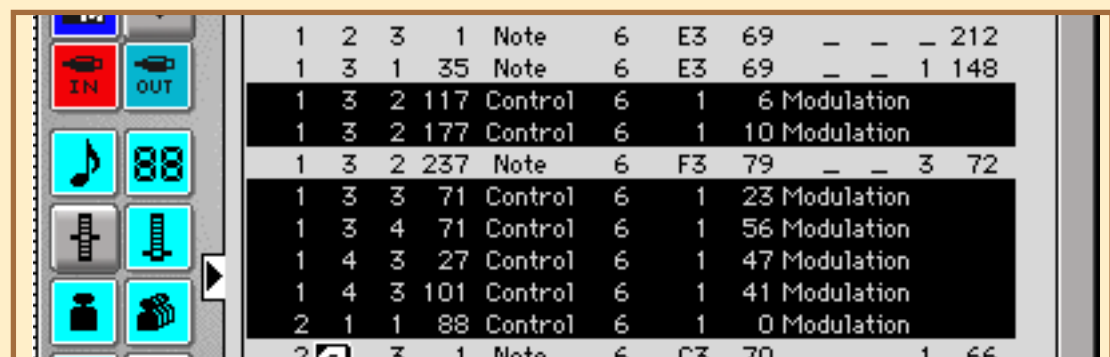
When a button is gray the corresponding events are suppressed from the list. They are not erased, they simply aren't displayed. You should now only see two types of events: mod-wheel (controller #1) and pitchbend ("PitchBd").

2. Click the button just below the note button.

The icon is a slider with its position mark in the middle and this represents a pitchbend wheel. You should now see only mod-wheel events.



3. Select all events using the Edit menu or a keyboard command.  
All visible events should now be selected (i.e. all the mod-wheel events).
4. Click the note button again.



You should now see all the notes and mod-wheel events with only the mod-wheel events selected and all the notes not selected. This is a handy way to select events of just one type in the Event List.

5. De-select everything in the Event List by clicking in the thin border between the list and the Event List window's Parameters Column.

Another way to do this is to use the "Select All" then "Toggle Selection" key commands.

6. Select the first mod-wheel event in the list.

You may want to hide the notes again to make this easier to find. If its value is not 0, change it to 0.

7. Choose: **Event List → Edit → Select Equal Objects.**

You should see at least two mod-wheel events selected, the first one and the last one. (Otherwise, the mod-wheel on your synth is not returning to 0 correctly.) "Select Equal Objects" means the same type of event and with the same value.

8. Choose: **Event List → Edit → Select Similar Objects.**

You should see all the mod-wheel events selected. "Select Similar Objects" means the same type of event with any value.

## Adding Events

The Event Type buttons can also be used to add events in the Event List. You can do this clicking the button with Logic's Pencil Tool, or by:



**Mac** — holding the Command key while clicking



**Windows** — Right clicking

the appropriate Event Type Button.

In either case, *the event will be add to the list at the current Song Position.* Unless Catch Mode is on, this will probably not be the position indicated by the Event List's Position Arrow.

## Copying Events

You can copy events in the Event list using at least three different methods:

**5**

***Using the standard Copy/Paste operations;***

1. Select the events to be copied
2. Select **Event List → Edit → Copy** or use the common key command
3. Select **Event List → Edit → Paste** or use the common key command

Type in the start position at which you'd like the events to be pasted. Once you hit paste, all of the events in the clipboard are pasted and a text entry box is automatically opened. Type in the starting position at which you'd like the events to be inserted then hit Return or Enter.

## Using the Copy MIDI Events window

### 1. Open Event List -> Edit -> Copy MIDI Events



### 2. Input the Left and Right boundaries of the area you wish to copy

Input the Left and Right boundaries of the area you wish to copy in the boxes labeled Left Locator and Right Locator respectively.

### 3. Input the location where the events are to be pasted in the box labeled Destination

Input the location where the events are to be pasted in the box labeled Destination

### 4. If you wish to paste multiple copies, input the number of copies you wish

### 5. If you want the copied data to be put into a completely new

Sequence, click once the right of "Create New Sequence" so that it says "ON".

If this option is not enabled, the events will be pasted into the originating sequence.

### 6. Select the "Mode" you wish to use for the operation.

The mode dictates various aspects of what happens when you paste the data, for example whether it will merge the events into any events that might already exist at the destination, or whether it will replace those events with the new. Please consult the user's manual for a detailed description of each mode. For now, we'll use the mode, **Copy Merge**.



**TIP** The Left and Right locator settings are initially set to match the global Left and Right locators, so a convenient way to define them is to set Cycle boundaries by click dragging in a bar ruler BEFORE opening the Copy MIDI Events window. (of course, this requires that a window be open that contains a Bar Ruler)



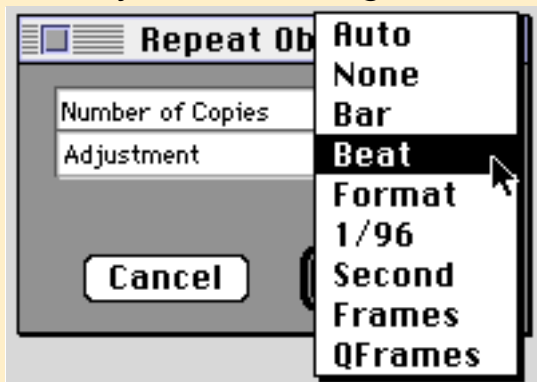
## Using the Repeat Objects function

If you want to repeat a phrase or progression then this may be the best option to use, especially if you want to repeat it more than one time

1. Select the events to be copied
2. Select **Event List -> Edit -> Repeat Objects**



3. Input the number of times you want the events repeated
4. Select the appropriate "Adjustment" setting



This setting controls the exact position at which the events or objects will be repeatedly pasted. If "None" is selected, the events or objects are pasted exactly end to end. All of the other options will "round off" the paste position to the nearest value selected. The "Auto" selection selects the most logical selection based on the position and length of the material being repeated. A little experimentation with this setting will make it clear how each option effects the outcome.



**NOTE** *Both of the previous two copy options are available in all edit windows. In windows in which you can view more than one Sequence at a time — the Arrange, Event List and Score Windows — the operation will be carried out on all selected objects.*

## Other Buttons/Menus

Below the Event Type Buttons, you'll find the standard Toolbox, a Quantization menu and a little display for changing Logic's Display Format value. As mentioned previously, changing the Display Format value changes the way in which event positions and lengths (for notes) are displayed because it defines the value of the subdivision column. It also dictates the step value when using MIDI Step Input. The Quantization menu allows you to quantize only the selected events—we'll talk more about quantization later in this section.

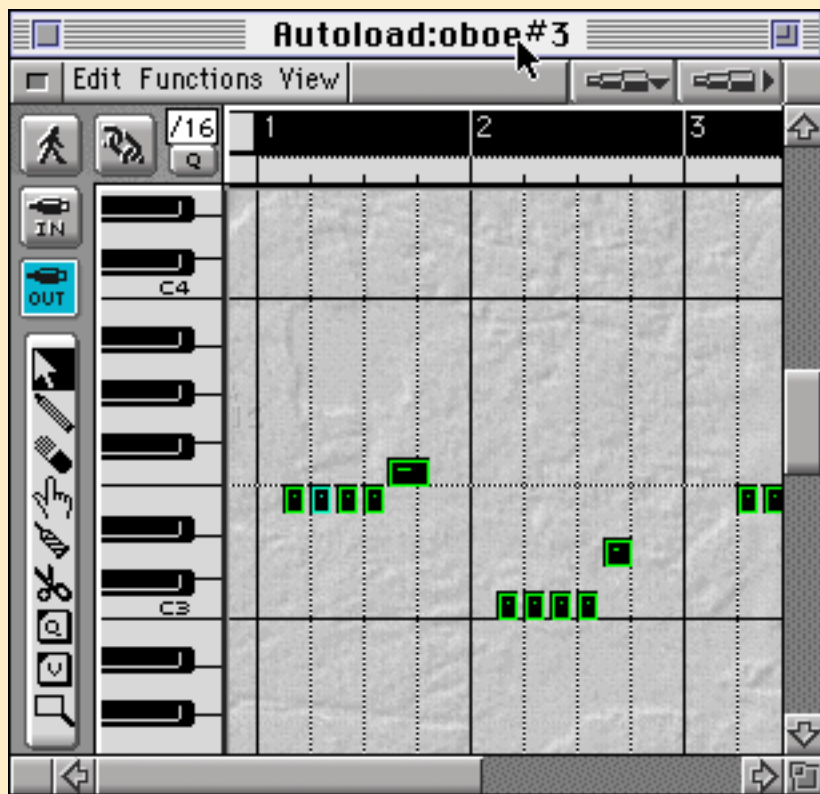
While the Event list is very useful because it allows you to see a lot of data in a relatively small amount of space, sometimes a more graphic view of the events is more conducive to certain types of editing. The next section examines one of the more graphic oriented editors — The Matrix window.

## 5.4 Working in the Matrix Editor

The Matrix editor provides a piano-roll view of MIDI note events. ( It is called "piano-roll" because it's a similar view to the paper rolls that used to be used in the old player pianos )The Matrix Window is an especially useful window for adjusting Note pitch, duration and position.

Select the same Sequence you were viewing in the Event Editor (the one with some mod-wheel and pitchbend in it) and choose:

**Windows -> Open Matrix Edit**



### how to:

- open the Matrix editor window
- view and edit note velocities in the Matrix editor
- change the Matrix editor's display grid lines
- select the top or bottom voice of a multi-voice Sequence
- select notes by other criteria in the Matrix editor
- quantize selected notes in the Matrix editor

**5**

**Here are some important things to remember about the Matrix editor:**

- **Notes are the primary MIDI event type shown in the Matrix editor.**  
We say "primary" because you can also see other event types by using the Hyperdraw feature now accessible from within the Matrix Editor. You can open and close this from the View menu—consult your Logic manual for details.

# Editing

- **Notes are represented by horizontal bars.**

Their time position can be measured by the Bar Ruler and the vertical gridlines that extend down from the Bar Ruler. (see below)

Their pitch is indicated by the keyboard graphic.

Their duration is represented by the length of the bar.

Their velocity is denoted by the color of their bar and also by a thin line within their bar. (The length of this thin line relative to the length of the whole bar is what indicates the velocity.)

- **There is a Bar Ruler across the top (just like the Arrange window) which indicates the time position.**



- **There is a keyboard graphic down the left side which represents note pitches.**

- **There are vertical "gridlines" through the editing part of the window.**

- ***Solid lines indicate bars.***
- ***Fine dotted lines indicate beats.***
- ***Coarse dotted lines indicate "divisions".***



- **There is a Display Format setting and Quantize menu to the left of the time line.**

These serve the same function as in the Event List discussed previously.



**TIP** If you want to know how many "divisions" there are per quarter note, divide by 4. (For example, "/12" = 12 divisions per whole note = 3 divisions per quarter note = 8th note triplets.)

- The "In" and "Out" buttons serve the same purpose as in the Event List.



**TIP** You can use the computer's left and right arrow keys to move the selection back and forth within the Matrix editor. If you hold down the Shift key, notes will be added to the selection. If the "Out" button is on (**Mac**— blue **Windows** — gray) you will hear each note as it is selected. (If you keep holding an arrow key, the whole Sequence will play back on a note-by-note basis—forwards or backwards!).

- You can move selections around within the Matrix editor window  
Moving the objects around changes their pitch and/or position.
- You can change the length of all selected objects by clicking at the right edge of any of the selected objects and dragging.

**Mac** —The pointing-finger cursor indicates length change. The full hand cursor indicates position change.

**Windows** — The left/right arrow indicates length change. The cross-hair indicates position change)

## Quantizing selected notes

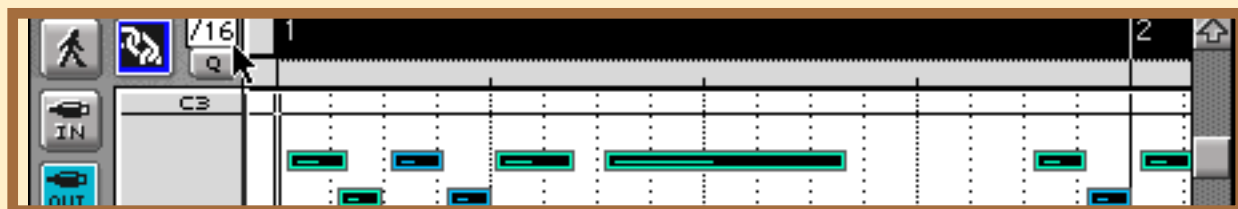
At some point you may wish to quantize only a selection of notes rather than all the notes within a sequence — which of course is what happens when you quantize from the Sequence Parameter Box. There is a Quantize menu which allows you to do this within each of the edit windows including; the Event List, Matrix, Hyper and Score windows.

Let's take a look at how to use this feature within the Matrix. In the process we'll check out a few other special selection options, including one which allows you to select specific lines in a multi-voice part.

We'll need to be looking at one of the Sequences you recorded earlier in this section, or, if you're just jumping in at this point, any Sequence contain notes you performed along with the metronome.

1. Choose a Display Format value which puts grid lines close to the beginning of all notes in the Sequence.

5



# Editing

Since you recorded in time with the metronome, this should not be too difficult. Start by increasing the zoom then change the value until you get the desired result. (Unless you're Chick Corea, /8, /12 or /16 will probably do it.)

2. Turn Cycle Mode on and set its boundaries to match the beginning and end of your piece's three choruses.

3. Choose the lowest voice by choosing:

**Matrix -> Functions -> Note Events -> Select Bottom Line.**

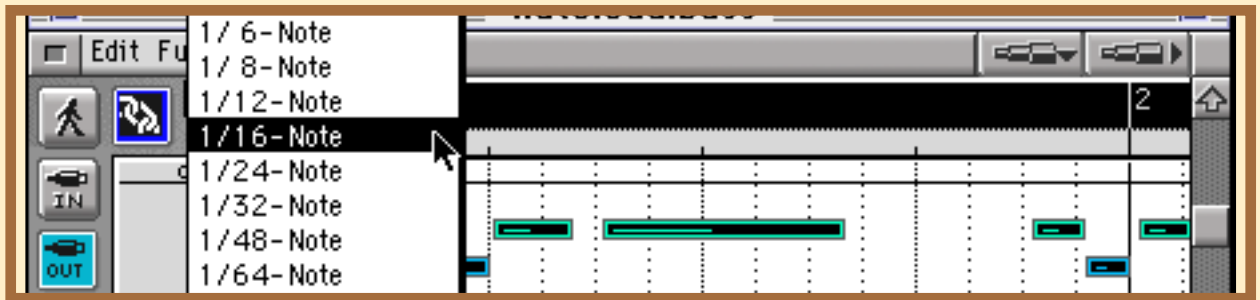
If you did not record a multi-voice part, this step will just select everything.

4. Limit the selection to the first chorus by choosing:

**Matrix -> Edit -> De-select Outside Locators**

5. Quantize to the same value as the Display Format setting.

- Click on the "Q" button to pop-open the Quantize menu.
- Select the same setting as is displayed in the Division box above



You should now see the notes in the bottom voice, within the Cycle Locators, adjust slightly to line up exactly with the grid lines.

6. Playback this chorus of your song.

How this sounds will depend on the kind of material in the Sequence and how close your playing was to the metronome in the first place. The important points to have learned are: you can quantize a selection of notes; the Matrix editor makes it easy to see the results; and there are various useful selection techniques. The more you use Logic, the more you will appreciate these extra little features.



**TIP** You can use the Matrix editor's "Q" tool to selectively quantize notes or selections of notes. You can also assign key commands to quantize and "quantize again".

5

## De-Quantizing Notes

You can perform the opposite of the above described feature, i.e., you can defeat the Sequence Parameter Quantize for the selection of notes. Logic refers to this as **De-quantize**. The procedure for applying this option is easy.

1. Select the notes you wish to **De-Quantize**
2. Select **Matrix -> Edit -> De-Quantize**.

The selected notes will no longer be effected by the Quantize value selected in the Sequence Parameter Box.

## 5.5 Working in the Score Editor

Logic's Score editor provides the most traditional view of your music—standard musical notation. While the subject of Score Layout and Printing is too extensive to cover here, we can examine the basics of getting around this window for the purposes of editing note events.

We will also look briefly at the settings which govern how Logic interprets your MIDI performance and turns it into a readable score.

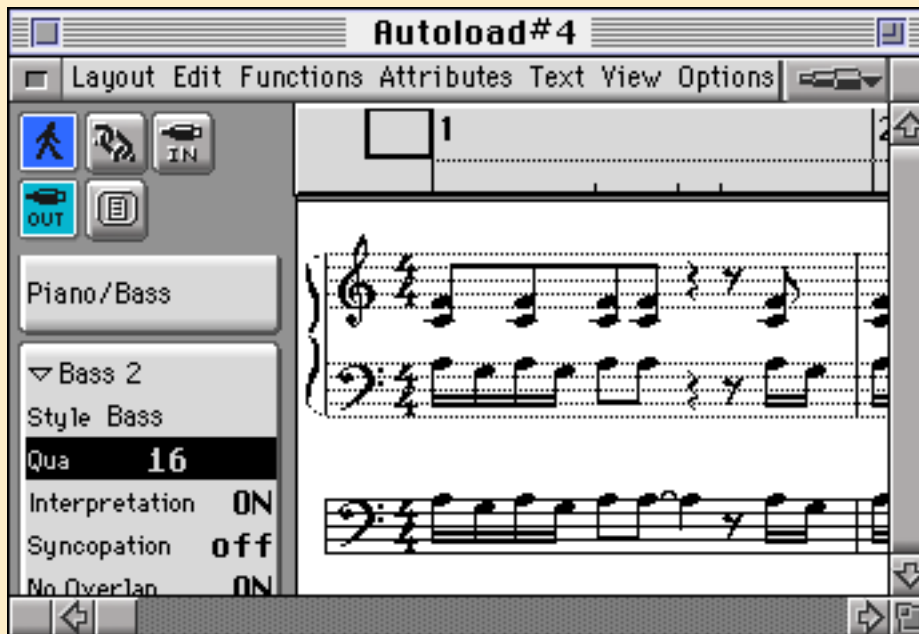
Close the Matrix editor and select two Sequences on separate Tracks in the Arrange window (avoid a drum part if possible). Then open the Score editor by choosing:

**Windows -> Open Score**

The Score editor will open up displaying separate staves for each selected part.

### how to:

- open the Score editor
- control what Sequences are displayed in the score
- view the score a line or page at a time
- move between multi-staff and single staff views
- quantize the score display without affecting the notes in the Sequence
- Insert or Edit Time and Key Signatures
- change the Clef Type





**Here are some important points to remember about the Score editor window:**

- The Score editor can display more than one Sequence at a time.

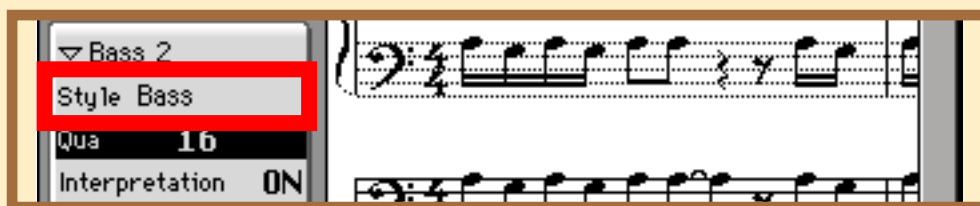
To view one Sequence, double-click directly on its staff lines. To view all Sequences, double-click in the white background of the Score display. You can limit what tracks are displayed by using Instrument Sets . (see below)



**TIP** If you select sequences from several Tracks before opening the Score editor, Logic automatically creates an Instrument Set containing just the Instruments for those Tracks.

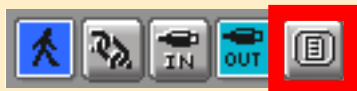
- Each Sequence has its own staff system.

This may contain one or more staves depending on the **Score Style** assigned to the part.



A **Score Style** is simply a collection of settings that control such elements of the display as: clef type; staff size and style (standard, percussion, or guitar tablature); # of staves, # of polyphonic voices, and display transposition. The separate systems are in the same vertical order as their Tracks in the Arrange window — unless an **Instrument Set** is being used that changes that order.

- There is a "View Button" to the left of the Bar Ruler



This button provides a quick way to toggle "Page View" on and off. In Page View, the score "wraps around", as it would when printing. If it is off, the score runs continuously from left to right, just as it does in the Arrange Window.

- **The Instrument Set** selection menu controls the order and selection of Instruments being viewed

Below the buttons is the **Instrument Set selection menu**. This is where you tell Logic what Instrument set you want displayed in the Score. An Instrument Set filters the display based on the Instruments used in the song.



**TIP** If you hold the: **Mac** — Option key; **Windows** — Control key; while opening this menu, you will see a list of the Instruments that are currently used in the song. Selecting one of these will cause the Score to temporarily only display tracks using that particular Instrument.

- The **Display Parameter box** settings control how notation is displayed

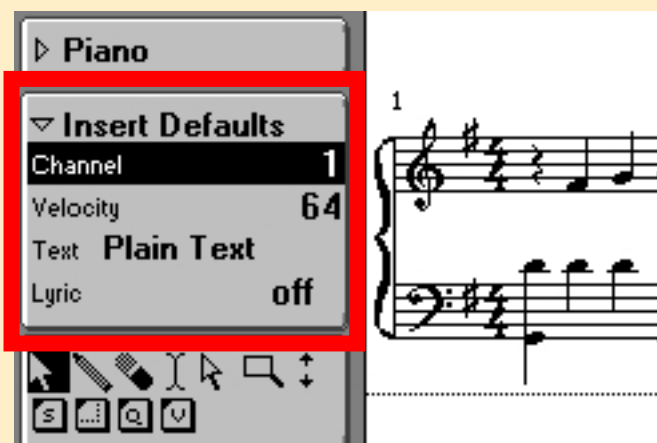
The Display Parameter box is just below the Instrument Set pop-up menu. It contains some very important settings which effect how notes in a Sequence are displayed. This is where you select the Score Style and Display Quantization values for example.



- The **Event Parameter box** displays current values for selected events

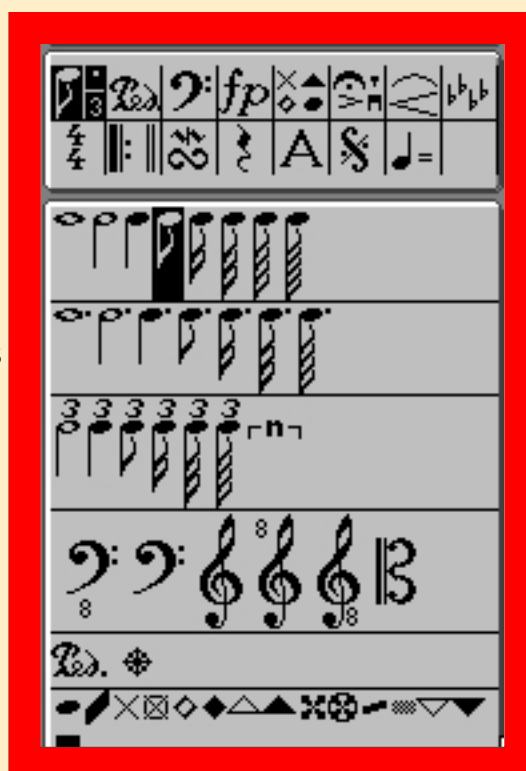
## Editing

The **Event parameter box** is just below the Display Parameter Box and contains values for the currently selected event or events. The type and number of parameters will change to reflect the type of event selected.



- The **Parts boxes** contain notes, symbols, etc. that can be dragged onto the score

The Parts boxes are just below the Toolbox. They are used for selecting notes and other score symbols for insertion in the score.

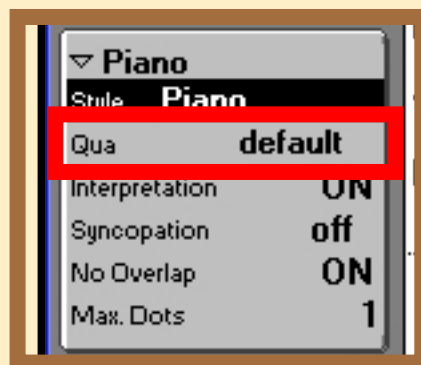


## Controlling note display

If Logic represented your MIDI performances on the staff with perfect accuracy, the resulting score would probably be unreadable. That is because standard notation is actually a somewhat crude system which conveys only the most basic information about the music it represents. Even with the various symbols and standardized descriptive text options, much of the musical nuance is left to the performer's interpretation. Here is a brief summary of how each of these settings effect how Logic renders MIDI events as notes on a staff.

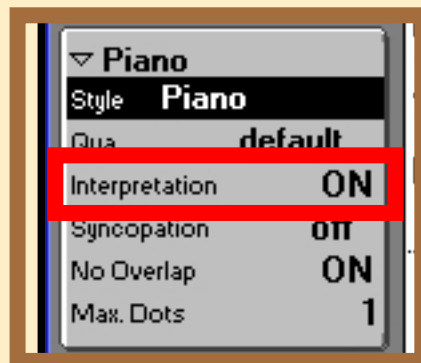
- **Display Quantization ( Qua )**

This is probably the most important of all the settings in this box. Just like normal quantization, display quantization snaps the position of notes to a definable grid. The difference is that this setting is for display purposes only (as the name implies), i.e., it has no effect on how the music is played back. The range of options are exactly the same as the other Quantize menus available throughout the program. A setting of "Default" means the value is determined by the Display Format Value.



- **Interpretation ( Int )**

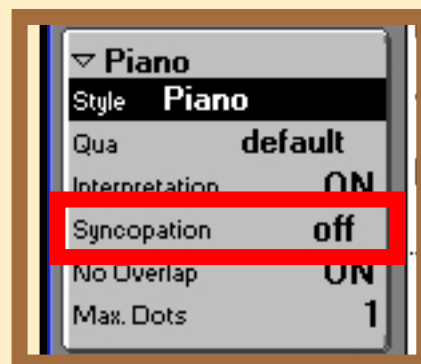
This setting functions somewhat like a display-only *length* quantize. Depending on the notes surrounding a note, its displayed length is changed to make it more readable. For example, imagine that you played a series of very staccato 8th notes. Without Interpretation, these would likely be displayed as very small note values, say 1/64th notes, surrounded by a clutter of small rests.



**TIP** It is generally best to leave *Interpretation* and *Display Quantization* OFF for sequences that have been step entered. That is because, in that case, the note values are the perfect length and at exact positions so there is no need for Logic to "interpret" the notes for score display. In fact, these features may actually cause the score display to look like something other than what was intended.

- **Syncopation ( Sync )**

This setting controls how syncopated rhythms are displayed. An example would be a figure involving an eighth note on the down beat, followed by a quarter note on the "and" of the same beat. If Syncopation is off, the first eighth note would be beamed to an eighth note tied which is to an eighth note on the next downbeat. If it is on, the starting eighth note would not be beamed and the quarter note would be notated as a quarter note and not tied to anything.



- **No Overlap**

This option examines the lengths of notes and suppresses ties when notes overlap. This is especially useful for legato passages where notes might overlap one another just for a few ticks.



- **Maximum Dots ( Max. Dots )**

This setting limits the amount of dots allowed when notating dotted note values. If you don't like triple dotted notes gracing your staff, this option is for you.



## Inserting Event

5

Inserting notes onto a staff in the Score window is easy.

1. **Select the Sequence into which you wish to insert the notes**

To select a Sequence in the Score window, click once on the staff lines of the Sequence. Staves that are selected have solid black staff lines, those that aren't have grayed-out ones.

**NOTE** *There must be at least one Sequence in the Song before you can enter anything in the Score window. If there isn't, the score will simply display the text — Nothing to Display . You can create a blank Sequence in the Arrange window by clicking once with the Pencil tool in the main, gray-background area of the Arrange Window.*

## 2. Select the note value

Select the note value, i.e. eighth, quarter, etc., that you wish to insert from the Part box in the left hand column

## 3. Insert the note

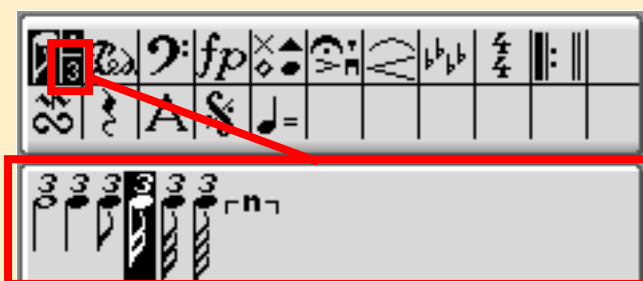
Drag the note from the part box over to the staff onto which you are inserting the note OR, select the Pencil tool and click on the staff where you wish to insert the note. In either case, use the Control Line described in the Arrange window section



**TIP** *There are a series of definable key commands for selecting note values*



**TIP** *The smaller part box at the top can be used to bring a specific category of note values or symbols to the top of the main part box below it. In the case of note values, the box actually has three hot spots , one for each of the note value types available. Click on the note symbol to bring up all dupe note values, the "3" , to bring up triplet note values, and the "." (dot), to bring up dotted note values.*



You can use the procedures described for MIDI Step Input to insert notes in the Score window.

## Copying/Moving Events

You can copy or move notes in the Score window using the same facilities already described for other windows including: standard Copy/Paste functions, Copy MIDI

Events, and Repeat Objects.



**WARNING** When you are using standard Copy/Paste procedures in the Score window it is important to understand that rests (accept for User Rests — see your User's Manual) are not actual events and so cannot be pasted. Therefore, you must be careful Paste events at the correct starting position. For example, imagine you are Copy/Pasting a 4/4 measure that starts with a rest. Even if you highlight the whole measure before copying, the only events copied will be those starting at beat 2. When you Paste the events you must therefore start at beat 2 of a particular measure. (i.e., X 2 1 1)

Logic also has two special paste options yet to be discussed that may be of special interest when working in the Score window.

## **Paste at Original Position**

This option is tailor made for copying phrases from one part to another because you can do so without paying attention to the Song Position.

### **1. Copy the Notes you wish to paste**

Highlight the notes to copy, then choose Copy from the Edit menu ( or use the familiar key command).

### **2. Select the destination Sequence**

Select the Sequence to which you wish to paste the events by clicking once on the staff lines of that part

### **3. Select Score -> Edit -> Paste at Original Position (or use the definable key command for this function)**

## **Paste Multiple**

This options allows you to paste events into multiple Sequences with one command.

### **1. Copy the Notes you wish to paste**

Highlight the notes to copy, then choose Copy from the Edit menu or use the familiar key command

### **2. Move the song position to the location at which the notes are to be pasted.**

The **Goto Position...** key command is ideal for this purpose

### **3. Select the staves to which the events are to be pasted**

### **4. Select multiple staves by holding down the Shift key while clicking on the staff lines of each of the staves to be selected**

### **5. Select Score -> Edit -> Paste Multiple**



**TIP** This option can be used effectively to Copy/Paste dynamic markings and symbols that need to reside on multiple parts.

## Changing the Clef type

As mentioned earlier, the clef type is part of a group of score display parameters that are saved collectively as a Score Style. Logic's default song contains a basic collection of Score Styles which cover the majority of circumstances. Many of these basic Styles are named based on their clef type, so selection for this purpose is easy.

To select a Score Style:

1. Make sure the Sequence (Staff) you want to apply the Style to is selected
2. Click-hold your mouse to the right of the word **Style** in the **Display Parameter Box**
3. Choose an appropriate Style from the flip-up menu



**NOTE** You can also change the clef type by double-clicking on the clef itself, then selecting from the resulting selection box, BUT, this necessarily changes the clef used for the currently assigned Style which creates two potential problems: a Style called "Treble" might end up with a Tenor clef, and; other Sequences using that Style will be changed unintentionally.



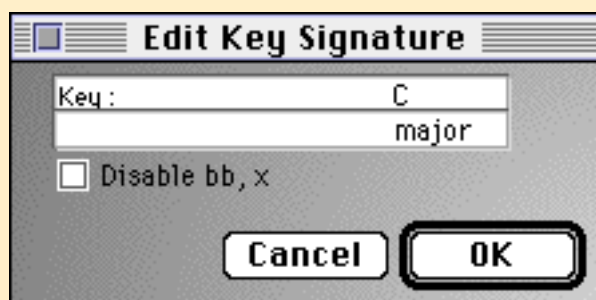
## Time and Key Signatures

Changing or inserting Time Signatures was already covered in the **Recording** chapter. Changing or inserting Key signatures is handled in very much the same way.

### To change an existing key signature

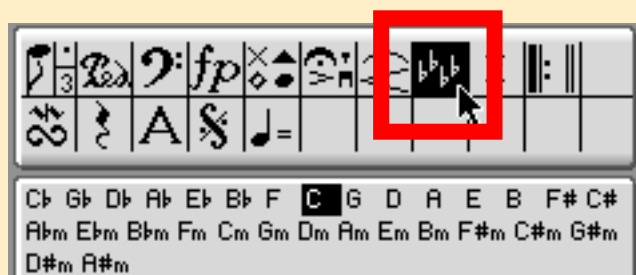
1. Double-click on the Key Signature
2. Select the desired key and mode (major or minor) in the resulting window





## To insert a key signature

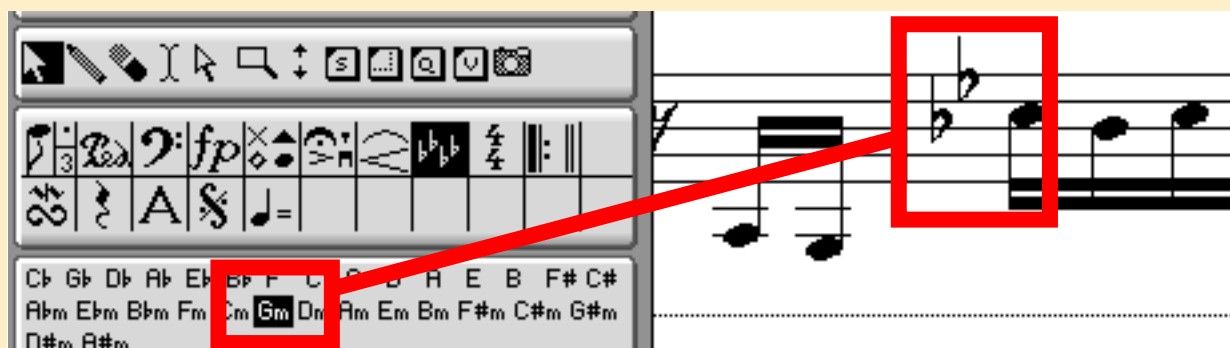
- 1. Click on the key signature symbol in the top part box**



This brings the palette of key signature options to the top of the main part box

- ## 2. Drag the Key Signature to the staff

Click-drag the key signature from the part box to the desired destination on any staff.



**NOTE** Since `time` and `key` signatures are global objects it doesn't matter what staff you perform the edit on



## 5.6 Mix Automation

Automated mixing is relatively easy in Logic. The process is much the same as for recording and playing back all other types of MIDI data. This is because the on-screen faders and knobs generate and respond to MIDI data much like your “real” MIDI devices. The essential step is to make sure the MIDI data is recorded and played back on a track assigned to an appropriate instrument. There are essentially three “appropriate” instruments to use:

### how to:

- record and playback the results of a mix
- have your mixer respond to an auto-mated mix

- **The MIDI Instrument that is being automated**

This could be any type of Instrument (Multi, Mapped, etc.). While this will cause the instrument’s Volume or Pan settings to change, the drawback is that the fader itself will not update in response to the automation.

The other limitation of this option is that you cannot record multiple channels of automation of one track. That is because MIDI data in a sequence is always “re-channelized” by the channel of the Instrument assigned to the track on which it is playing. So, for example, if you recorded fader movements for channel 1 and 2 on a track assigned to an Instrument set to channel 1, the channel 1 fader would respond to both channels of data, and fader 2 would not respond at all.

- **The fader or GM Mixer that generated the data**

This is generally a better method than the first because it causes the on-screen faders to move in response to the automated changes. If you’re using the GM Mixer, then you can record multiple channels of automation on a single track. The mix data will be sent to the channel it is intended, for because each event is distributed according to its “event channel”.

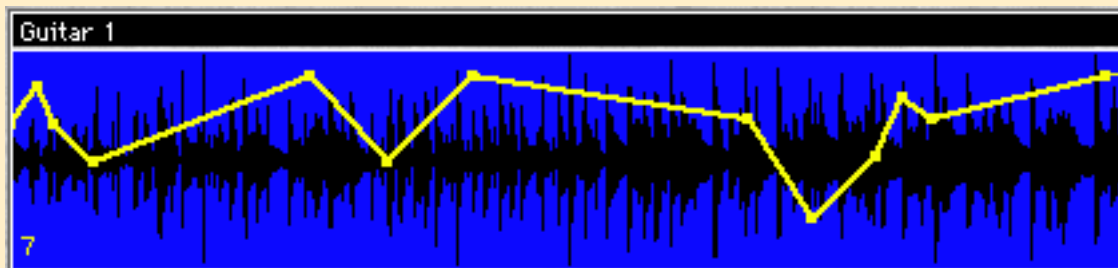
- **A Cable Splitter that is cabled to the faders or Audio objects generating the data**

This method uses an Environment **Cable Splitter** object as a pipeline to distribute the data to the faders being automated. A good example of this is the **A-Playback** object that Logic Audio creates in its default song. This object is a Channel Splitter cabled to all of the Audio Objects. If you’re using single fader objects or the Audio Objects, this is generally the best option.



**NOTE** *Logic has three useful mixer automation modes: "Merge", "Replace" and "Update". For complete details on how to use these automation modes, consult your Logic manual.*

## HyperDraw—Another Mixing Tool



On-screen mixing consoles are great for real-time mixing, and displaying or modifying mixes created with with external hardware controller surfaces. However, Logic offers another approach to entering, editing and recording MIDI mixing information that you should also explore — it's called HyperDraw. (A Logic Editor called the Hyper Edit Windows is also available for manipulating this data—consult your Logic manual for details.)

HyperDraw provides a graph-like interface for inputting and modifying controller data. It allows you to draw controller data patterns directly into Logic Sequences in the Arrange window. It is also available in all Logic Editor windows.

The types of information HyperDraw will allow you to create and edit include all controller information, pitch bend, note velocities, channel pressure (a.k.a. after-touch) and program changes. You select exactly which information you wish to work on (one at a time, please) when you enable the HyperDraw view for a sequence or Audio region.

Here are the steps to create or edit MIDI volume information for a Sequence (or Audio Region) in the Arrange window using HyperDraw:

### 1. Select a Sequence (or Audio Region)

You use HyperDraw on one Sequence at a time. It also necessary to be at a relatively high zoom level to view and edit comfortably. So, the first step is to select a Sequence (or Audio Region) in the Arrange window into which you wish to enter (or edit) volume information using HyperDraw. Use the Arrange window's Zoom Tools (or the Toolbox's Magnifier Tool) to Zoom the sequence to a large size in both the horizontal and vertical directions.

## 2. Activate HyperDraw for Volume

Activate HyperDraw for the selected Sequence by choosing:

**Arrange > Options > HyperDraw > Volume**

Logic will activate HyperDraw for MIDI controller #7 (volume) on the same channel as the Track's Instrument uses.



**NOTE** Two other choices from this menu, **Autodefine** and **Channel** allow you to specify HyperDraw choices—**Autodefine** tries to match other controller data in the same Sequence and **Channel** selects a specific channel number.

If you wish to manually select a controller number and channel, choose:

**Arrange > Options > HyperDraw > Other**

## 3. Draw in the Controller Information

You enter controller data in HyperDraw by clicking (and dragging) with the mouse. A click enters a single data point. Clicking on an existing data point deletes it. A click and drag enters a straight line of data points between the mouse-down and mouse-up locations.



**TIP** Dragging with the;

**Windows** — Alt

**Mac** — Control

key held down restricts dragging to the vertical—very handy for changing a single data point's value. Dragging with the;

**Windows** — Control

**Mac** — Option

key held down causes the selected data point and all later data points to follow the dragging. (i.e., you can move a whole data curve up and down this way.)

## 4. Deactivate HyperDraw

When you're finished, deactivate HyperDraw by choosing:

**Arrange > Options > HyperDraw > Disable**

This is a good habit to get into. Otherwise, you may accidentally change controller data in a Sequence when you only intend to select or move the Sequence around in the Arrange window.

## 5.7 Other Useful Editing Tools

The following features can be very handy when you are in the process of editing.

### Markers

When working on a Song, it's often convenient to be able to "mark off" sections for future reference. For example, you might mark the three choruses of your song to provide visual cues and/or as a way to locate to their beginning quickly and easily. Logic's Markers are designed specifically for this purpose. These markers also can function as a sort of "timed notepad" because you are able to type in up to 20,000 characters of text into each Marker.

**NOTE** While markers are not an editing feature per se, it certainly facilitates the process of editing. That is why it is included in this chapter.

Let's create markers for the three choruses of your Song:

#### 1. Create a marker for the first chorus

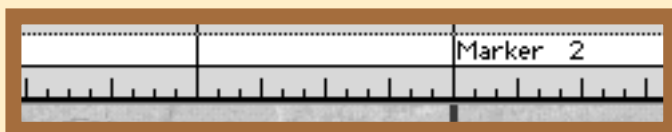
Move the SPL to the beginning of the first chorus then choose: **Arrange -> Options -> Marker -> Create**



This inserts a marker at the current Song Positions. It will be visible in the Arrange window's Bar Ruler as a white box with the label "Marker 1" in it. Note that the box extends the full length of the Song.

#### 2. Create a marker for the second chorus

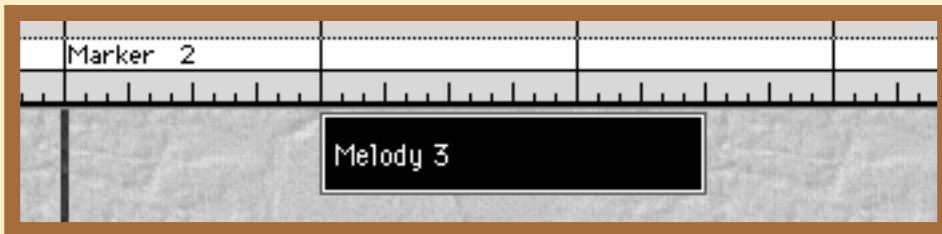
Move the SPL to the beginning of the second chorus and create another marker. This Marker will be labeled "Marker 2". It will terminate "Marker 1" and extend to the end of the Song.



#### how to:

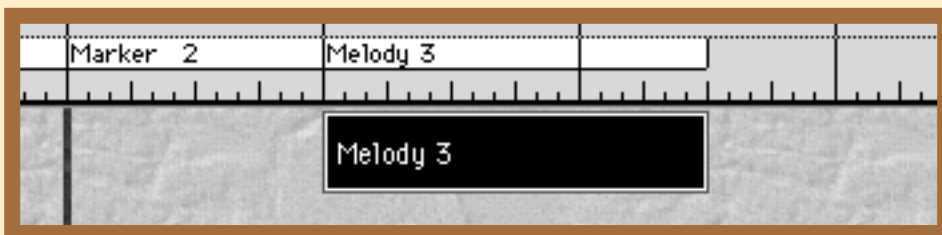
- create markers
- create separate tracks after recording from external sequencer
- de-mix a sequence based on pitch
- nudge Sequence or MIDI events
- keep written notes with song
- cut/copy/paste Key and Time Signatures
- time lock some or all notes in a Sequence
- conform Logic's tempos to match a "legato" performance. (Reclock)

3. Create a marker for the third chorus using "Create by Objects" method  
Select the Sequence that plays only in the third chorus of your Song.



This time, create the Marker by choosing:

**Arrange -> Options -> Marker -> Create by Objects**



Notice that this time, the Marker is the same length as the selected Sequence it was created from and that it is named after this Sequence.



**TIP** If you click on a Marker, then drag upward until the pointer turns into a finger pointing up, releasing the mouse will set Logic's Cycle to the marker and turn Cycle Mode on. If you drag downward until the pointer turns into a down-pointing thumb, releasing the mouse will delete the marker.

Logic keeps a list of your Markers in a special Marker list window. To see and use this list, choose: **Arrange -> Options -> Marker -> Open List**



Three useful things to remember about the Marker list :

- Clicking on an item in the list moves the SPL to the beginning of that Marker
- You can edit the Markers position and length in the list.

If you change the length to anything but "- - - 1" you will set an "absolute" length for the Marker. "- - - 1" indicates the Marker extends to the next Marker.

- Double-clicking on an item in the list opens the Marker's text window.

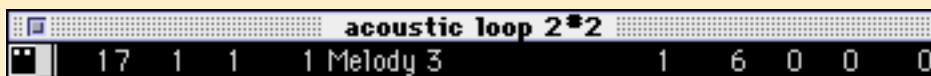
Here you can type in any text you wish. The top line of text is what appears in the marker on the Bar Ruler. You get back to the list by clicking the book icon at the left.

## The Event Float

One very useful feature in Logic is a special little device called the Event Float. The Event float can be opened from any of the edit windows and functions like a single line of the Event list. The event (or object) displayed is always the last one selected in any of the open edit windows. You can edit its parameters by scrolling them with the mouse, or by double-clicking and typing in the a value. It thereby provides the same facility as the Event list editor but without taking up nearly as much screen real estate.

Open the Event Float from the Matrix editor by choosing:

**Matrix -> View -> Event Float ...**





**TIP** If you scroll a parameter for a note event you will hear the note sound over and over—once for each step in the parameter. To turn this off, hold the **Mac Only**—Command key and click the little "film" icon at the left edge of the Event Float. (Clicking here without using a modifier changes the time display between SMPTE and the usual format.)

As an example, let's use the Event Float to increase the velocities of the notes that make up the melody in the Sequence we are viewing in the Matrix editor.

1. Select the top line of the Sequence in the Matrix editor by choosing:

**Matrix -> Functions -> Note Events -> Select Top Line**

2. Click on the velocity of the displayed note in the Event Float and scroll the value up and down.
3. Observe the colors of the selected (top line) notes change as you scroll.

This indicates that the velocities of all selected notes are increasing (hotter colors) and decreasing (cooler colors).



**NOTE** Changes you make with the Event Float apply to ALL selected events—not just the single event displayed in the Event Float.



**TIP** Using the Event Float in the Arrange window is a great way to numerically change the position and/or length of Sequences and Folders.

## Global Editing

Most of the editing discussed up to this point effects only a song's MIDI events and not the global events which are an important part of a song's structure. Global events include the Time and Key Signatures, the Tempo events as well as any other Score elements which automatically appear on all staves when inserted on one. While these events can be edited directly, Logic has a few special features for editing MIDI and global events simultaneously.

All of these features are accessed from the Arrange Window

### **To Insert blank measures in the middle of a Song (Insert)**

1. Set the Left locator at the position at which the new blank section is to begin.
2. Set the Right locator to the position at which the new blank section is to end.





**TIP** A convenient way to perform these first two steps is to highlight the area in the Bar Ruler, the same way you do when defining the start and end points of a Cycle.

### 3. Select all objects in the Arrange window.

(If you wish to edit only the Global events, then don't select any objects in the Arrange window. )

### 4. Select **Arrange -> Structure -> Cut/Insert time -> Insert Time and Move by Locators**

## **To Remove measures in the middle of the Song (Snip)**

Perform the same three steps as the previous procedure then,

### 1. Select **Arrange -> Structure -> Cut/Insert time -> Snip: Cut time and move by locators**

## **To Remove measures and Insert them elsewhere (Splice)**

Perform all the steps as the previous exercise then,

### 1. Move the song position to the place where you wish to insert the measures

### 2. Select **Arrange -> Structure -> Cut/Insert time -> Splice: Insert Snipped part at Song Position**



**TIP** You can use the previous operation to copy a section and move it elsewhere. Just select **Edit -> Undo** (or use the keyboard equivalent) after Step 4. This reverses the Snip process, but, since the material is still in the clipboard, you are still able to Splice it.

## **Demixing**

Logic has two useful features which allow you to split up the events in a sequence into separate sequences based on either on Note pitch or by event MIDI channel. The most common use for the first option is to convert a composite percussion track into separate tracks for each instrument, i.e., one for Kick, one for Snare, etc. The second option is often used after recording a track from an external sequencer which has transmitted separate parts on different MIDI channels.

5



**NOTE** Logic does not currently have a "multi-track" MIDI recording option so multiple tracks must first be recorded on one track then de-mixed. This applies when recording from an external sequencer (as just mentioned) or when recording the output of multiple MIDI controllers/players. In the latter case, you simply need to make sure each controller is transmitting on a sepa-

rate channel.

## **De-Mixing by Event Channel**

1. From the Arrange window, select the Sequence to be De-Mixed
2. Select **Arrange -> Structure -> Split/Demix -> Demix by Event Channel**

Logic attempts to place the de-mixed sequences on tracks assigned to Instruments whose MIDI channels are equal to the de-mixed event's event channel.

Whew!

In other words, events that were originally on Channel 1, will be placed on the next available track that has an Instrument assigned to channel 1, etc.. If Logic cannot find such a track, it will create new track to accomodate the new sequences.

## **De-Mixing by Pitch**

1. From the Arrange window, select the Sequence to be De-Mixed
2. Select **Arrange -> Structure -> Split/Demix -> Demix by Pitch**

LOGIC pastes the new Sequences consecutively into newly created tracks

## **Using the Computer Keyboard to "nudge" values**

In the Event List we changed MIDI event parameters by either scrolling the numerical display or double-clicking and typing in values. In the graphic editors (Matrix and Score) we also grabbed notes and dragged them to different locations or pitches. You can also do many of these things from your computer keyboard. There are two ways:

- **Assign and use the "Nudge" key commands.**

These key commands which all appear in the "Arrange and Various Sequence Editors" section of the Key Commands window allow you to "nudge" the selected notes' position, length, pitch and channel. For position and length there are separate commands for bar, beat, division (called "Format") and tick.

- **Use the "+" and "-" keys on the numeric keypad after first making an adjustment with the mouse.**

For example, after you've changed a note's pitch in the Event List using the mouse, using the "+" or "-" key will again change the pitch by one increment. (This only works with numerical displays, however.)

## Reclock

When you enter data using Step-time Recording, or by playing along with Logic's metronome, your performance will fall suitably within the bars and beats structure of the song. This insures that quantization will have appropriate musical results and that the score window can properly notate the events. But what happens when you record freely, without a metronome, or import a Sequence with unknown tempo changes? If the music is of a particularly rubato character (i.e., has a lot of varying tempi), any quantizing will likely lead to disaster, and the score could end up virtually unreadable. To illustrate this, walk through the following steps.

1. **Select all the Sequences in your current Song and mute them.**

You may find it easiest to first pack them into a Folder and then mute the Folder.

2. **Select an empty Track and assign it a relatively percussive Instrument**

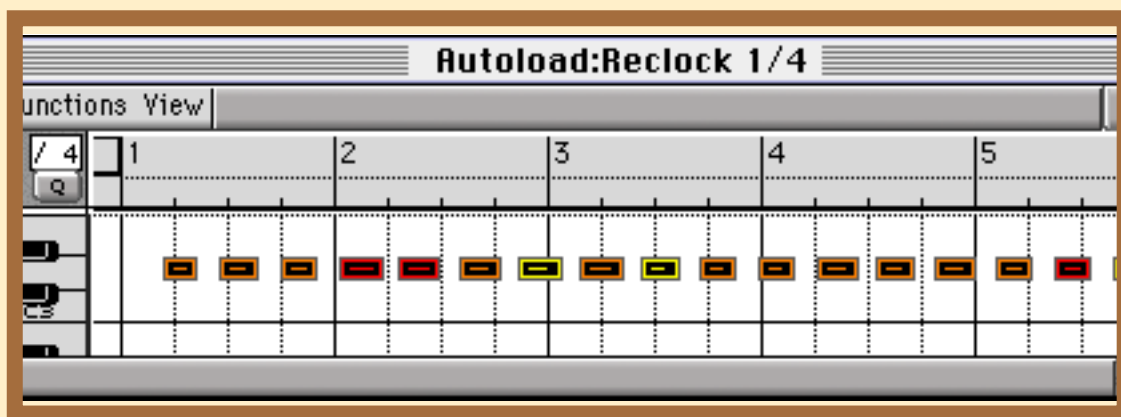
Drums, bass or even piano is good—a string pad is not the best choice.

3. **Record quarter notes without metronome**

With the metronome off, record a series of quarter-notes as regularly as you can.

4. **Turn the metronome on and play the Sequence back.**

5. **Look at the Sequence in a Matrix editor.**



Chances are the notes are nowhere near the quarter-note gridlines. (If they are, do it over again trying harder to get it wrong.)

Fortunately, Logic provides a some useful tools for dealing with this scenario. The primary one is called Reclock.

The function of Reclock is to adjust the position of the bars and beats so that they conform with the intrinsic bar and beat positions of an existing music passage. It

does this in the only way possible, by inserting a series of tempo events in between those bars and beats where necessary.

There are two basic ways to use the Reclock function — with or without using a Guide Sequence. The more tedious and 'manual' approach is to use it without using a Guide Sequence. With that method, you select a note or range of notes, manually input their intended bar and beat position, then let Reclock calculate the correct tempo value which forces them to those positions.

The Guide Sequence method automates much of the process by providing a grid which Reclock can use to ascertain the intended bar and beat positions. This is the option that we will use here. Please consult your user's manual for details on using Reclock without the use of a Guide Sequence.

1. **Select the Sequence in the Arrange window and choose: *Arrange -> Functions -> Reclock Song***

This opens the Reclock Song window which can which is where all the pertinent settings for this feature are selected.

2. **Make the following settings in the Reclock Song window:**

**Reclock Song**

☒ Use Guide Sequence  
☒ Create Tempo Changes to preserve timing  
☐ Use only Selected Events as Source  
☒ Reclock only within Left and Right Source

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

Left Destination: **1 1 1 1**      Step increment: **/ 4**      Source Tempo: **93.0000**  
 Destination Tempo: **81.3114**

Cancel      **Reclock**

- **Enable "Use Guide Sequence"**

This means that the selected Sequence will be used to decide the tempo changes.

- **Enable "Create Tempo Changes to preserve timing"**

This means that tempo events will be inserted between the notes in the guide Sequence, so that they will line up with perfect bar and beat positions.

- **De-select "Use only Selected Events as Source"**

When this option is selected, only the selected notes in the Sequence are considered during the process. This is useful when using an actual musical passage for your guide, because you are able to carefully select only those notes that are supposed to be at the Step Increment (see below) positions. In our case, all notes are to be considered, so the option should be disabled.

- **Enable "Reclock only within Left and Right Source"**

- **Set the Left Destination to "1 1 1 1"**

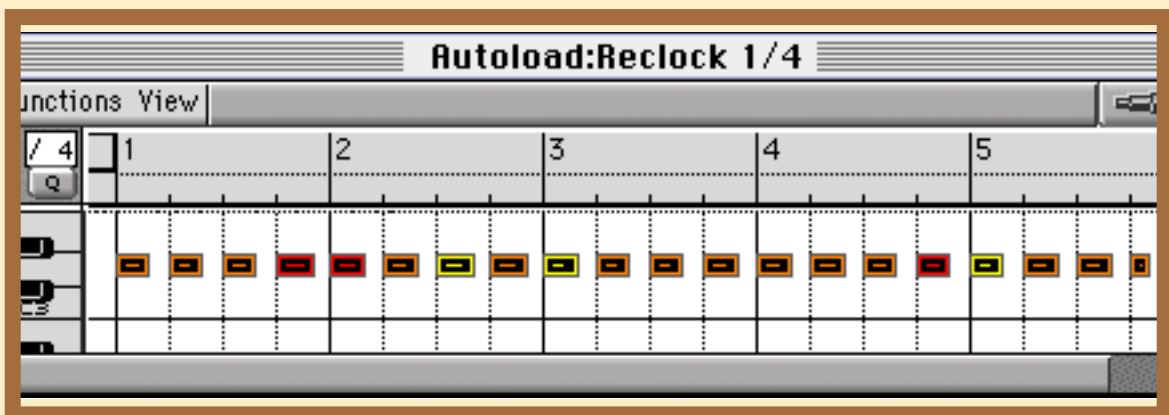
This is where the reclocking begins and where we wish the first quarter note in the Guide Sequence to be at the end of the procedure.

- **Set Step Increment" to "1/4"**

Since the notes in our Guide Sequence are intended to be quarter-notes, we set this value to "1/4". If the Guide Sequence notes were whole notes, you'd select, "1/1"; half notes, "1/2", etc.

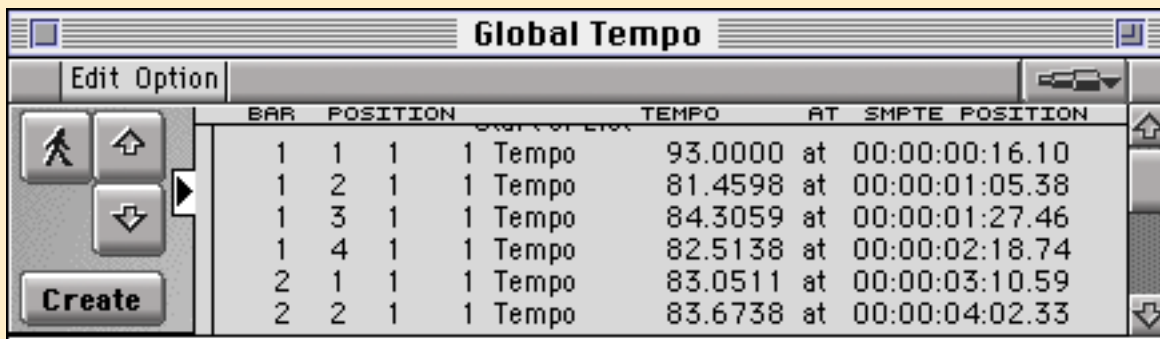
### 3. Click the "Reclock" button.

If you look in the Matrix Editor now, you will see that each note is exactly on a quarter-note gridline.



# Editing

If you look at the Tempo List, you will see tempo changes at each quarter-note position.



The screenshot shows a software window titled "Global Tempo". It has a menu bar with "Edit Option" and a toolbar with navigation icons. Below the toolbar is a table with columns: BAR, POSITION, Start of Event, TEMPO, AT, and SMPTE POSITION. The table contains six rows of tempo change data.

| BAR | POSITION | Start of Event | TEMPO | AT      | SMPTE POSITION    |
|-----|----------|----------------|-------|---------|-------------------|
| 1   | 1        | 1              | Tempo | 93.0000 | at 00:00:00:16.10 |
| 1   | 2        | 1              | Tempo | 81.4598 | at 00:00:01:05.38 |
| 1   | 3        | 1              | Tempo | 84.3059 | at 00:00:01:27.46 |
| 1   | 4        | 1              | Tempo | 82.5138 | at 00:00:02:18.74 |
| 2   | 1        | 1              | Tempo | 83.0511 | at 00:00:03:10.59 |
| 2   | 2        | 1              | Tempo | 83.6738 | at 00:00:04:02.33 |



**WARNING** *If after performing a Reclock function, the results are not what you expected or desire, then immediately Undo the operation before trying again. DO NOT simply delete the Tempo events that were created. This will cause you to irretrievably lose the original timing of the performance.*



**TIP** *When necessary, Reclock can be used effectively to create a tempo map based on an imported audio file. Start by recording a track of even whole, half, or quarter notes which follow the tempo contour of the audio file. Next, use that track as your Guide Sequence when performing the Reclock function. Depending on the material, you can also experiment with creating your Guide Sequence using the Digital Factory's "Audio to Groove" or "Audio to Score" options.*

## Using Lock to SMPTE Position as a method of reclocking

If you're having a hard time grasping exactly what Reclock is doing, running through the following exercise might help you to understand. It uses a feature we haven't covered in this guidebook — **Lock to SMPTE Position** — to help illustrate Reclock's function. Lock to SMPTE Position locks events or objects to SMPTE positions so that tempo changes will not change their SMPTE position. This is an indispensable tool for film composers and foley artists. Here, we'll show how the feature can be used to move the bar and beat grid "underneath" the notes, without changing the actual time distance between them. (their rhythm)

Before beginning this exercise, you will need to have a Sequence containing freely played quarter notes such as the one that was created at the beginning of the reclock section.

### 1. Create a screenset with the following configuration:

- **An open Arrange window**
- **An Open Matrix editor with Show Contents turned ON**

It should also be set to view the quarter-note Sequence you just recorded. Also, turn on the Ruler Bar's SMPTE view by choosing: **Matrix -> View -> Hide/Show SMPTE Time Ruler**

- **An open Event List showing the contents of the quarter-note Sequence**

Make sure the Event List is NOT showing the position in SMPTE. ( If it is, use the View menu to change it.)

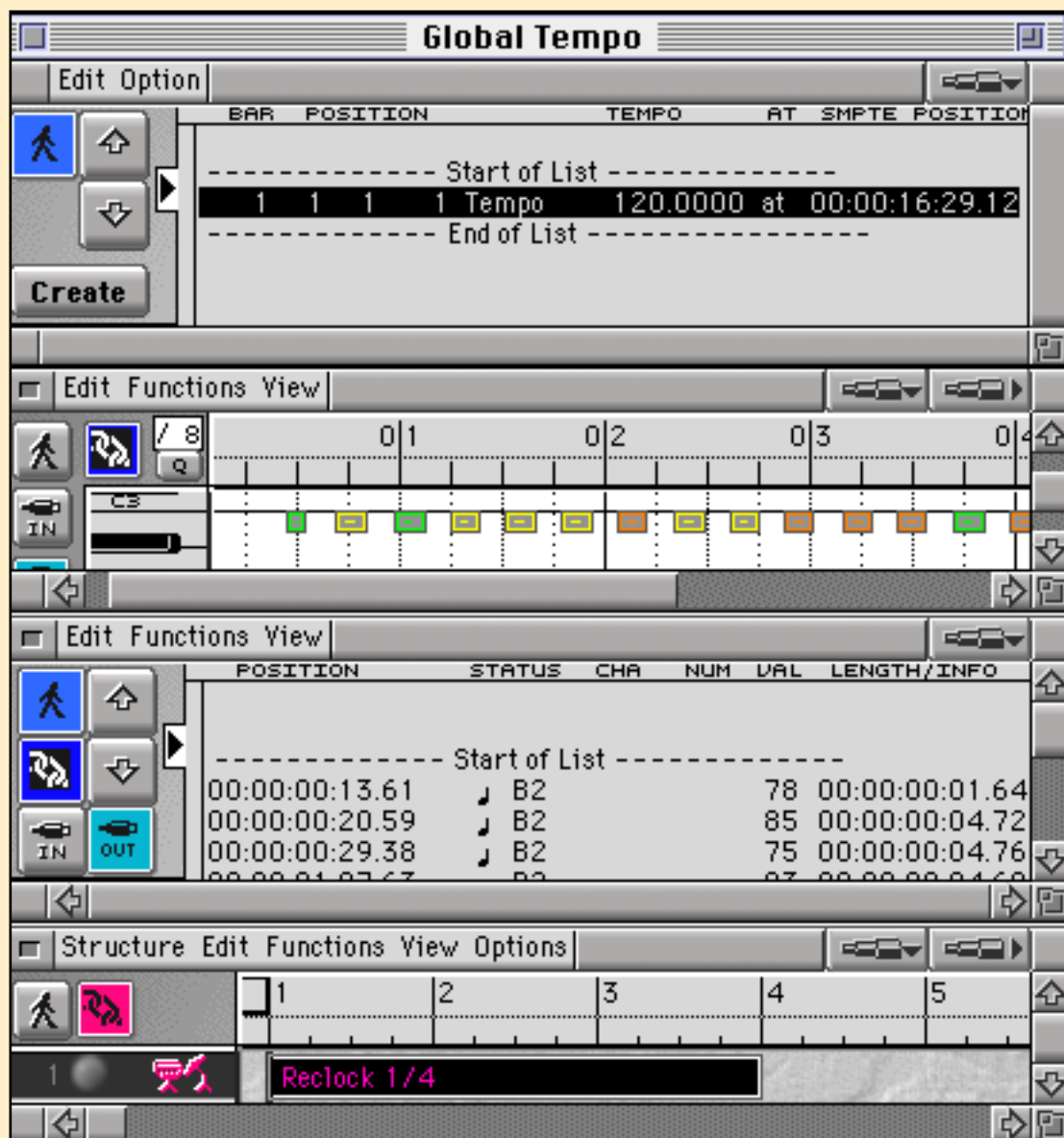
- **An open Tempo List**

Open this by choosing: **Arrange -> Options -> Tempo & Synchronization -> Tempo List Editor**. Make sure that there is only one tempo event in the list at position "1 1 1 1", with a tempo setting of 120.

### 2. Move the Sequence to bar 1 1 1 1

Move the Sequence in the Arrange window until its left edge is at the beginning of the Song (position 1 1 1 1).

When you're through, it should something like this:



### 3. Change the position of the first note to 1 1 1 1

Select all notes in the Event List and change the the first note's position to "1 1 1 1". (All other note positions will be shifted the same amount so that the sound doesn't change.)

### 4. Take note of 2nd bar's SMPTE Position

Top the Matrix window and notice that the second bar starts at the 2 second SMPTE mark. (120 quarter-notes per minute = 2 quarter-notes per second so that one measure takes 2 seconds.)



## 5. Notice how tempo changes effect SMPTE and Bar/Beat values

Change the tempo in the Tempo List and notice that only the SMPTE markings move. The notes maintain their relationship to the barlines but changing the tempo changes the time-length of a bar. After you've experimented with this, return the tempo to 120.

## 6. Lock the SMPTE Position of notes

Select all notes then choose: **Matrix (or Event) -> Functions -> Lock SMPTE Position**

## 7. Adjust the Tempo

Now change the tempo again as in step 5 and notice that the notes move along with the SMPTE markings. The notes are locked to their position in time and the Sequence will sound the same no matter what tempo changes you make in Logic. (If you look at the Sequence in the Event List, you will see a little lock icon next to each note.)

## 8. Adjust first tempo event until fifth quarter is at 2 1 1 1

Change the tempo at position "1 1 1 1" so that the fifth quarter-note is exactly at position "2 1 1 1". The easiest way to do this is to change one digit in the Tempo List then use the "+" and "-" keys to nudge that digit until the note is as close to "2 1 1 1" as possible. Then change the next digit to the right and nudge again, etc.

## 9. Input new tempo event at 2 1 1 1

Set Logic's Song Position to "2 1 1 1" and create a tempo event in the Tempo List at this position. Do this by clicking the "Create" button in the Tempo List window.

## 10. Adjust second tempo event until ninth quarter is at 3 1 1 1

Change the tempo event at position "2 1 1 1" until the 9th quarter-note's position is "3 1 1 1".

## 11. Input new tempo event at 3 1 1 1 and adjust tempo

Insert a tempo event at position "3 1 1 1" and change its value until the 13th quarter-note's position is "4 1 1 1".

## 12. Unlock all notes

## 13. Select all the notes and unlock them by choosing:

**Matrix (or Event) -> Functions -> Unlock SMPTE Position**

Your Sequence of 16 quarter-notes will now be pretty much in line with Logic's barlines. Most likely the notes not on downbeats will be a little off, reflecting the "groove" or your playing.

## What You Have Learned in This Section

In this section you have seen how to select and move Sequences around in Logic's Arrange window. You have learned how to pack Sequences into Folders and to use Folders to create and repeat structures within Songs. You have seen how to make three kinds of copies—real copies, Aliases and Loops—and how to use each of them for specific tasks. You have learned how to add controller data to the notes in Sequences and how to combine several Sequences on the same Track and or different Tracks. You have explored Logic's three primary editors, the Event List, the Matrix editor and the Score editor, and saw how to use the Event Float in conjunction with any of these Editors. Finally, you learned how to make Logic's bars & beats grid conform to freely recorded Sequences without changing the sound of the Sequences.

## What You Will Learn

This chapter covers the basics of using Logic Audio for hard disk recording. You will learn everything from how to specify what audio hardware you're using, to how to properly manage your audio files. We will also spend some time examining the available real-time and destructive DSP options.

The information is organized into the following sections:



Audio Hardware Selection



Setting the Record Path



Recording Audio



Editing Regions



Useful Audio File features



Destructive Audio Processing



Real-time DSP





Audio File Utilities

## 6.1 Audio Hardware Selection

LOGIC Audio is able to address various types of audio hardware. It can even record and playback through multiple systems simultaneously. The first task is therefore to tell Logic Audio what type of system(s) you own.

Before proceeding, check that your audio system is listed in the following compatibility table.

|  MacOS                   |  Windows95 |
|---|---|
| AudioWerk 8   | AudioWerk 8   |
| All DAE supported Digidesign systems including ProTools III, Pro Tools Project, Session 8, AMII and AMIII | Digidesign's AMIII  |
| Apple's Sound Manager 3.2   | MME compatible sound card   |
| Yamaha CBX-D3 or D5   | Soundscape SSHDR  |
| Korg 1212 I/O   | Korg 1212 I/O   |

If your hardware is listed in the table then you are ready to begin.

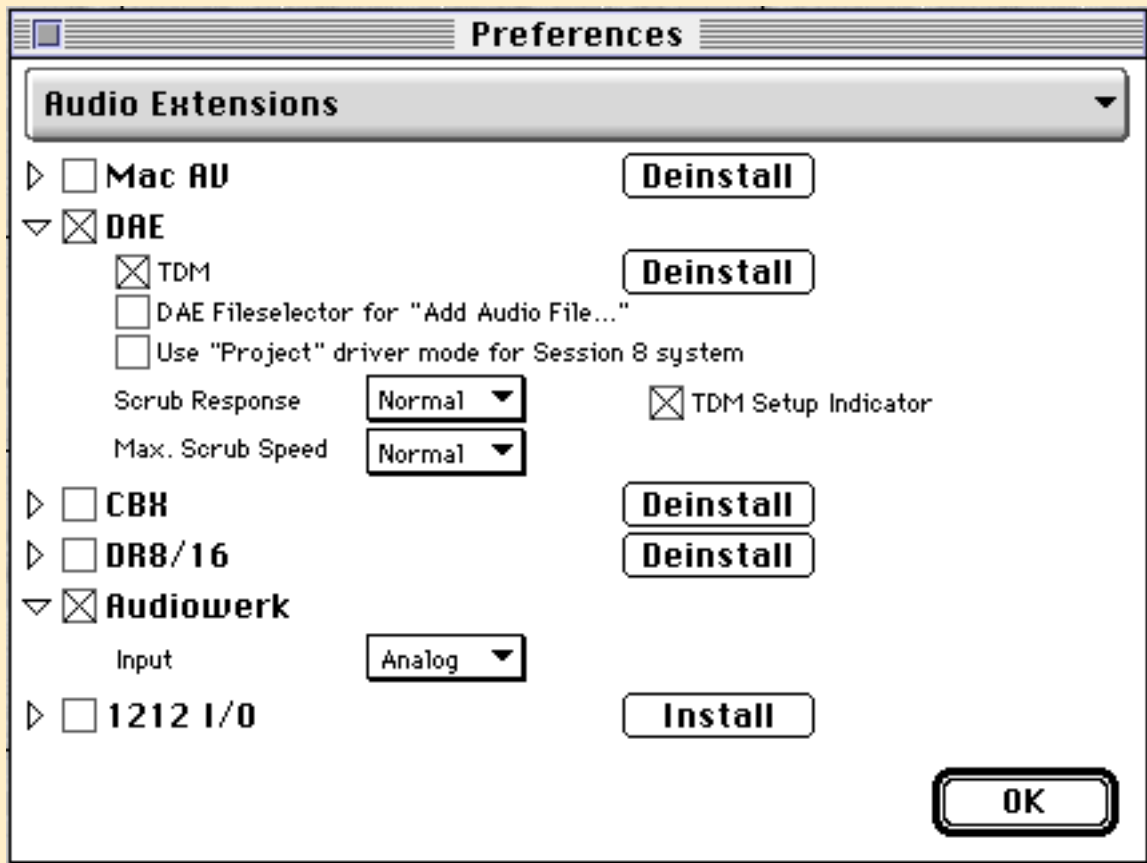
### 1. Open **File -> Preferences -> Audio Extensions**

This opens the Audio Extensions Preference window which is where you enable Logic Audio to communicate with the audio hardware you are using.

### 2. Select the options that correspond to your hardware

Under normal circumstances, Logic automatically recognizes the hardware installed in your system and makes the necessary settings in this window. If for some reason that automatic system has failed, select the box to the left of the hardware that you own. Deselect any boxes that are checked next to hardware you don't own or don't wish to use currently.

In the MacOS example below, Logic Audio is setup to use a TDM capable DAE system (such as Pro Tools III), and an AudioWerk8 card. There are other settings here that will be covered later where necessary.



## Windows Only

If you are using an MME compatible sound card, then select the option marked "PC". You must also then select both the input and output driver that corresponds to your card in the flip menu selection boxes provided. For now, you can ignore the "Force Half Duplex", "Use Old 2.5 Driver Model" and the "Delay" settings boxes.

## 6.2 Setting the Record Path

Before recording audio, you must specify where the resulting audio files are to be stored and what they will be named. This process is commonly referred to as the setting the "Record Path".

Version 3.0 now allows you to define a Record Path on a global or per song basis. Furthermore, files can be named according to a pre-defined default name, or the name of the Audio Object assigned to the track you are recording on. All of these options are set in the Record Path window.

### how to:

- control the directory to which your audio files are recorded
- set a record path that is global for all songs
- set a record path that is different for each song
- control how audio files are named
- use folders on your hard drive to organize your audio files

### 1. Select **Windows-> Audio Window-> File-> Set Record Path**

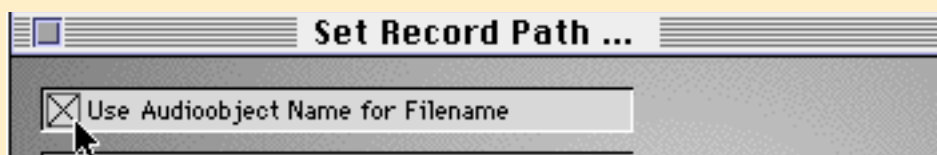


### 2. Select the "Global" or "Song" Record Path option

Click hold in the area that now says either **Global Recording Path** or **Song Recording Path** and select the option that best suits you. The most common choice is probably **Song Recording Path**, as this option allows you to easily organize your audio files on a per song basis.

### 3. Choose whether you want to **Use Audio Object Name for File name**

If this option is selected, new audio files will be named based on the name of the Audio object assigned to the track you are recording on. Otherwise, they are named according to the default name defined in step 4.



## 4. Set the Record Path for each Audio system

There is now a **Set** button for each of the audio systems available and activated. Clicking this button opens a typical File Selector window. Choose the directory to which your recorded audio files are to be stored and type in a default audio file name. This is the name that will be given to each new audio file, *unless you have chosen to have your audio files named by the Audio object name* in step number 3. The number in the far right of the box indicates the available drive space.



**NOTE** In either case, “.n+1” is appended to each new audio file to distinguish between new recordings. For example, if you choose the name “new audio”, the first recording will be called “new audio”; the second, “newaudio.1”; the third, “new audio.2”; etc.



## ***what's an "Audio object"***

All audio input and output is controlled via a special Environment object called the "Audio object". These "objects" show up as fader strips in the Environment window and can be assigned to tracks in the Arrange window just like other Environment objects. (instruments, MIDI faders, etc.)

Depending on the audio system you are using, Audio objects can be defined as "Track", "Bus", "Auxiliary", "Input" or "Output" objects; each type having it's own special function. The type that all systems have in common is the "Track" Audio object. This is the type that you will most often interact with, as it is the type that you assign to a track for recording and playback of your audio.

A very special attribute of an Audio object is it's ability to automatically reconfigure itself to conform to the capabilities of the particular audio system currently in use. The beauty of this design is that it is very easy to load and play your song files on different computers with various audio system configurations.

If you don't grasp all of this right now, don't worry. It's not too important that you understand this in the beginning, because all the objects that your system supports are automatically created for you when you first start Logic Audio. Once you've used the program for a while and wish to know more about these different types of audio objects, consult the relevant portions of the Logic Audio manual for details.



## 6.3 Recording Audio

Once you've defined the Record path, you are ready to record.

### Selecting an audio track

An "audio track" is any track in the Arrange window which has an Audio object assigned to it. When you first load Logic Audio, the first 4 - 8 tracks (depending on your system), will already be set up in this way.

Select one of those tracks or assign an Audio object to a separate track by:

- **Click-holding in the track**
- **Selecting an audio object from the flip-up menu**

In a default song, these audio objects are named "Audio 1", "Audio 2", etc.

#### how to:

- prepare a track for recording
- record enable a track
- set the input source for recording
- record from digital source
- set Sample Rate



**NOTE** If you are recording a stereo audio file, click on the button with the circle icon in the lower left hand corner of the Audio object. The recorded audio files will then be 'linked', meaning that editing one side of the stereo pair will always affect the opposite side as well.

### Selecting the Input



Before record enabling the track, you must check that the input source for the Audio object matches the input to which you are feeding signal. On systems that allow for this, the input is selected in the second box above the fader knob on the Audio object under the figure "I/O".

If you don't have this option, it simply means that your inputs are "hardwired", i.e., input 1 always goes to 1, input 2 to 2, etc. If you have only two inputs, then input 1 feeds all the odd numbered tracks and input two feeds all the even numbered tracks.

If you are recording digitally, then you must use inputs 1 and 2. (Unless you have a Digidesign Pro Tools hardware with an 888 i/o interface. In this case, please consult the user's manual for details concerning your system's inputs)

# Working with Audio

## Recording from digital input

If you are going to record via the digital inputs on your hardware, you must set your digital sync and input options accordingly. This may be accessed in a few different places, depending on your audio hardware.

### If you are using an AudioWerk8 card

1. Open **File -> Preferences -> Audio Extensions**

2. Under **Audiowerk**, click-hold on the flip-menu to the right of **Input** and choose **Digital**



3. Close the Preference Window

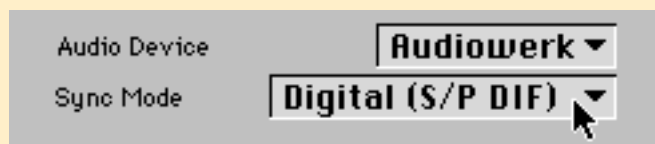
4. Click-hold on the Synchronization button on the Transport Panel and choose **Synchronization**



5. Click on the **Audio** tab



6. Select **Digital-In (S/PDIF)** to the right of **Sync Mode**



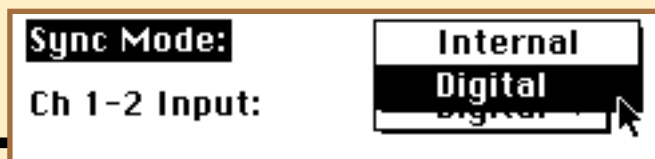
### If you are using a DAE based system

1. Select **Audio Window -> Digidesign Hardware Setup**

2. Choose **Digital** to the right of **Ch 1-2 Input**



3. Choose **Digital** to the right of **Sync Mode**



# Working with Audio

If you own a system other than the two described here, please consult the user manual for the procedural details on.

## Setting the Sample Rate

Logic defaults to recording and playing back audio files at a sample rate of 44.1khz. If you wish to change this to 48khz, select **Audio Window -> Options -> 48000**. If you have imported audio, be sure that this setting matches the inherent sample rate of the files you are playing back, otherwise they will play back at the wrong speed. Also, if you are recording digitally, check that this setting matches the setting on the machine that is your digital source.

## Record enabling the track

To record enable the audio track either:



- Click the Audio object **Rec** button or,

- Click the record enable button on the track



**NOTE** Once the audio object is Record enabled, the level meters on the audio object should respond to incoming signal. If they don't, double check that all of your hardware connections are correct and intact.

## Starting Record

Once you're ready to perform, just hit Record -- via transport or key command -- and play away. Most record functions behave exactly as they do for MIDI, so if you've read through the previous chapter on MIDI recording, you should already know your way around the Arrange and Transport windows. (if you didn't, then perhaps you should review that section now)

When Logic Audio begins recording you should see the following window pop up.



The progress bar and time counter display the remaining recording time. The time is determined either by the **Maximum Recording Time** value you have pre-defined or, (if you have disabled that option) the available drive space.

## ***Differences between Audio and MIDI recording options***

While most of Logic Audio's record options are functionally identically for MIDI and audio recording, there are a few important differences.

### **The *Merge New Recordings with Selected Objects* option does not work for audio recording**

Logic Audio always creates a new audio file every time you record, so it is not possible to "destructively replace" material in an existing audio file.

### **The Replace Mode option is non-destructive for audio**

Functionally, Replace mode is the same for audio as it is for MIDI. The difference is that it is non-destructive, i.e, the original audio file being recorded over is left intact. The only thing "replaced" is the original audio Region. (Remember, with MIDI recording, Replace mode permanently erases the old data.)



**NOTE** *This is not how it may appear in the Arrange window -- when you drop in and out of record on an existing track, the area recorded over looks as though it has been erased. What in fact has happened, is that two new audio regions have been created -- one before and one after the newly recorded material. Always remember - edits performed in the Arrange window are always non-destructive, because it is the audio regions which are edited, not the audio files themselves.*

## Cycle Record option differences

The recording option **Auto create tracks in Cycle Record** is now available for audio in version 3.0. The only difference from using it with MIDI recording is that Logic will always mute the previous audio regions, even if the **Auto Mute in Cycle Recording** option is disabled. This is because only one audio region can play at a time out the same Audio Object.



**TIP** Use the Replace mode when doing Punch-in and out recording of audio. That way, when you finish, you'll have only the last "punched in" region, rather than multiple takes stacked one on the other.

## Punch Mode

Logic Audio now has a special mode for Punch-in recording of audio. The option is enabled/disabled by click-holding on the Record button on the Transport Panel. When this mode is enabled your punch-in and out points will be seamless, and the playback of audio up to and after your punch points should be smooth and continuous.



**NOTE** When **Punch-in mode** is enabled, Logic temporarily "borrows" one additional audio channel for every one being recorded. This means you can only use this feature with up to half the number of available tracks. For example, if Logic Audio is used with a single Pro Tools III system supporting 16 tracks, you can punch-in up to 8 tracks simultaneously when Punch-In mode is enabled.

## 6.4 Editing Regions

Regions can be manipulated in the Arrange window in the same manner as MIDI sequences. Furthermore, almost all of the Arrange window tools that function for MIDI perform the equivalent function for audio. This includes the Selector, Eraser, Text, Scissors, Glue, Solo, Mute and Zoom Tools. The only one not available is the Pencil tool.

Most of the Playback Parameter box options are unavailable for audio, as the majority of them pertain to MIDI specific functions. Those that are available -- the Name, Loop and Delay options -- function just as they do for MIDI sequences.



**TIP** You can use the **Parameter Box's Delay** parameter to 'push' or 'pull' all the audio files in a track. To view the values in milliseconds select **Arrange Window -> View -> Delay in ms**

### Making copies of Regions

You can use most of the same methods available for copying MIDI events for copying Regions as well. These include using standard Copy / Paste functions, the **Repeat Objects** window and **Splice**. You can also use the customary

**Mac — Option - drag**

**Windows — Control-drag**

methods, but there are two variations for using this operation on Audio.

#### Variation 1

To make a copy of a region that is independent, i.e., can be manipulated without affecting the original:

- **Select the region to be copied**
- **Hold the Option key (Mac) down and drag it to a new location**

This is useful when you wish to manipulate the copy without affecting the original or vice versa.

#### how to:

- adjust regions in the Arrange Window
- make copies of Regions
- change the size of Regions
- adjust a Region's Anchor Point
- re-position regions that have been moved unintentionally

# Working with Audio



**TIP** Logic defaults to 'snapping' your movements to the nearest beat. (at extremely low zoom levels, the grid becomes the bar.) To force the grid to the subdivision of the beat — hold the **Control** key down after click-holding the mouse. To force it to the tick — hold the **Control** and the **Shift** key

## Variation 2

To create a copy of a Region which is just a new instance of the same Region, i.e., any alterations affect both the original and 'copied' regions.

- **Select the region to be copied**
- **Hold Shift + Option (Mac) down and drag the Region to a new location**



**TIP** If you wish to do any Sample based editing (i.e. Gain Change, Pitch Shifting, etc.) on a file without altering the original create an independent copy using the Option-drag method just described then select **Arrange Window-> Functions-> Convert Regions to Individual audio file**. You can now work with the new file without affecting the original.



## Regions vs. Audio Files

It won't be long before you'll want to get down to the business of editing your recordings, but before doing so, it is important that you understand the difference between **Regions** and **Audio Files**.

The term Audio File refers to the actual file that resides on your hard drive. Any editing that effects an audio file is destructive, i.e., the file itself is altered.

The term Region refers to a portion of an audio file. Whenever you manipulate audio in the Arrange window, you are working with regions. All edits to regions are non-destructive, i.e., they do not modify the actual audio file on your hard drive. Essentially, a region is nothing more than a set of instructions which tell Logic what portion of an audio file to play.

The Audio window functions as a complete catalog of the audio files, and their associated Regions, which have been created or added within a song.

## Adjusting Region boundaries



**WARNING** The Arrange window is the only window in which you can manipulate a Region's boundaries without the possibility of moving the relative position of the audio in the song. In all other edit windows, be very careful not to unintentionally move a region's Anchor point while moving it's Start and End points, because if you do, it will change the relative position of the audio in the song.

# Working with Audio

## In the Arrange window...

- Click-drag the lower left or right hand corners of the region

The mouse turns to a pointing finger (as opposed to a grabbing hand) when you've clicked the correct "hot spot".



**NOTE** Logic's zoom tool is an indispensable utility during this process. It allows you to temporarily zoom in and see the region's waveform while you're editing.

Here's how it works:

While holding the **Control** key, click-drag a box around a small portion of the region. (Be careful that you start your 'lasso' in the grey area of the Arrange Window.) When you let go of the mouse, the area you selected will fill the whole of the Arranger view. Once you've made your edit, you can return to the previous zoom level by simply holding the **Control** key and clicking once in the gray background of the window.

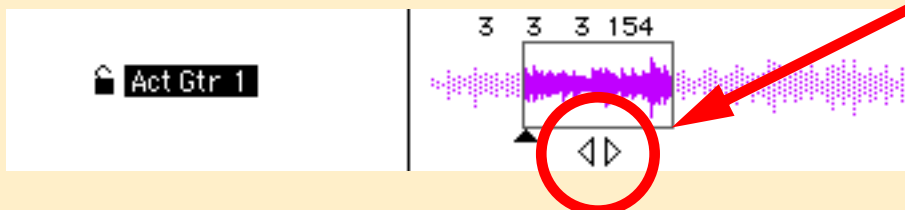
## In the Audio Window...

- Click-drag the lower left and right hand corners of the region

The mouse turns to a pointing finger (as opposed to a grabbing hand) when you've clicked the correct "hot spot".



You can also move both the Start and End points *simultaneously* by click-dragging in the lower half of the region's overview. The mouse turns into a pair of left-right pointing triangles when you've clicked the correct hot spot.





# Working with Audio



**TIP** Click-hold on the Region's overview turns the mouse to a speaker icon and begins playing audio from that point.



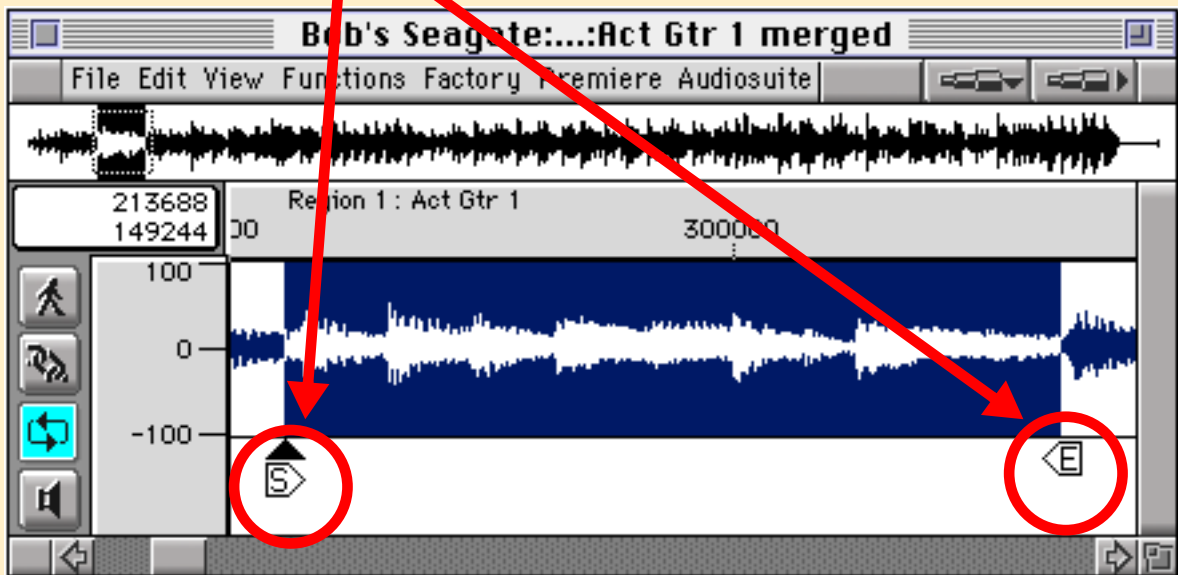
**TIP** To play the region repeatedly while you edit it: click the button in the left column that looks like the Cycle button on the Transport; then click the Speaker icon

## In the Sample Edit window...

Fine adjustments to a Region's boundaries are best performed in the Sample Edit Window. To open the Sample Edit window:

- **Window -> Sample Edit** or;
- **Double click on an Audio region**

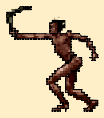
Once you're in the Sample Edit Window, look for the two flag shaped handles labeled "S" and "E".




These mark the Start and End points of the selected audio region. You can click drag these handles to edit the size of the Region or, alternatively;

- **Make a new selection by click-dragging over the waveform**
- **Select Sample Edit -> Functions -> Set Region by Selection**

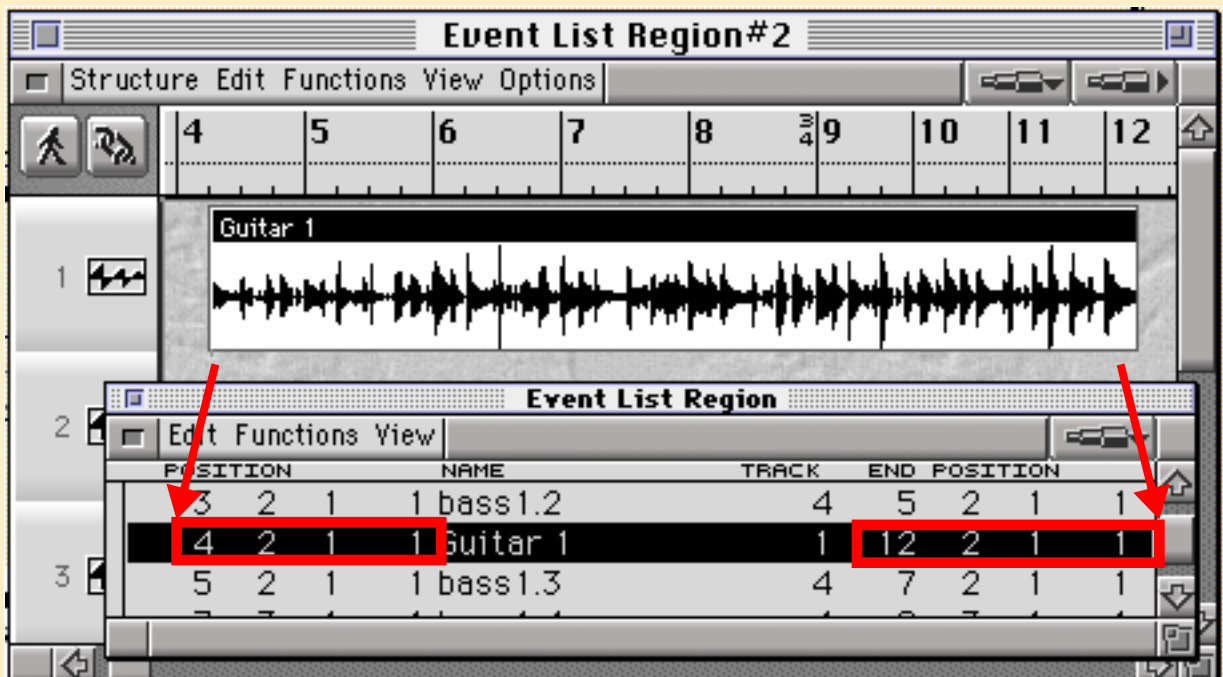
# Working with Audio



**TIP** If Link Mode is enabled  in a Sample Editor, the audio file its display will change as you select different regions in the Audio, Arrange or Event Edit Windows.

## In the Event Window...

Audio regions can also be edited in the Event Edit window. It simply needs to set to a hierarchical level at which it is viewing the objects in the Arrange window, as opposed to the data those objects contain. (Please review the section discussing the Link modes and levels if that doesn't make sense to you) The start of the Regions can easily be manipulated via the numbers in the left hand column. Changing the values in the right hand column (under 'Length') changes the region's length by changing it's end point.



The screenshot shows the 'Event List Region#2' window. It has a menu bar with 'Structure Edit Functions View Options'. Below is a timeline with markers 4 through 12. A waveform for 'Guitar 1' is displayed. Below the waveform is a table titled 'Event List Region'.

| POSITION | NAME     | TRACK | END POSITION |
|----------|----------|-------|--------------|
| 3 2 1 1  | bass1.2  | 4     | 5 2 1 1      |
| 4 2 1 1  | Guitar 1 | 1     | 12 2 1 1     |
| 5 2 1 1  | bass1.3  | 4     | 7 2 1 1      |

Red arrows point to the 'POSITION' and 'END POSITION' columns. Red boxes highlight the values for the 'Guitar 1' region: '4 2 1 1' for position and '12 2 1 1' for end position.



**TIP** To view the ending position of the region (as opposed to its Length) select **Event Window -> View -> Length as absolute position**. (This is how it is set in the figure above)

6



**TIP** To view all values as SMPTE values select **Event Window -> View -> Position & Length in SMPTE Units**

# Working with Audio

## In the Event Float Window...

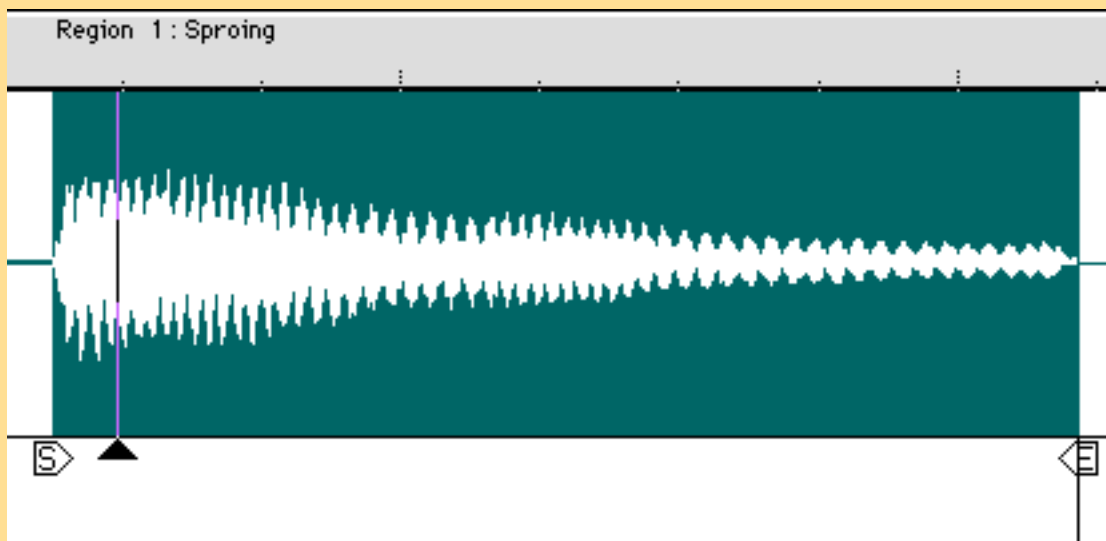
The Event float can be very handy for quickly 'touching up' a region's boundaries. To open it in the Arrange window select **Options -> Event Float**. Click the small "film-strip" icon at the left edge of the window to view the Position and length values in SMPTE units.



**TIP** You can drag and drop audio files from the Audio window directly into the Event list. When you do so, the entry box for the region's position automatically opens, allowing you to quickly "spot" cues to the desired location.

## what's the "Anchor Point"?

The point at which a Region is tied to its position in the song is called the **Anchor Point**. Newly recorded files always have their anchor point at the beginning of the region, but it can in fact be at any position. You can move the Anchor point from within the Sample Edit window but BE CAREFUL -- *moving this point moves the region's relative position in the song*. That is because the Anchor point's position in the song is stationary --anchored--, so moving it causes the Region to move a relative amount.



## Fixing Regions which have been unintentionally moved

If you inadvertently move a region's relative position in the song, you can usually correct the mistake simply by:

- **Selecting the region (or regions) in question.**
- **Choosing Arrange Window -> Functions -> Regions to original Record Position**

Be aware that this feature will only work on regions that were originally recorded within that song.



**TIP** If you've got audio files that start at some odd numbered tick before a beat, you might want to move the anchor point to a nice even beat position to make it easier to keep track of a region's position. Here's a way to do this without disturbing the Regions relative position in the song.

- 1 Click-drag the lower left hand corner of the Region to the right until it lines up with the nearest beat. (you'll have to hold the **Control** + **Shift** keys down after clicking initially with the mouse so you can move in tick increments)
- 2 Open the Sample Edit window by double clicking the region.
- 3 Click-drag the Start position of the audio file to the left while holding down the **Option** key to "uncover" the portion of the audio file that was covered up when you shortened the Region from the left.

*Holding the Option key allows you to move the beginning of the region w/o moving the Anchor point which otherwise always snaps to the Region Start point.*

## 6.5 Useful Audio File features



### Adding audio files

Adding audio files is done via the Audio Window

1. Select **Window -> Audio Window -> Add Audio File**
2. Select the audio file from the resulting File Selector window

The file, is then added to the list of files and regions in the Audio Window. If you wish for it to be placed in the song:

3. Click-hold on the Region name and drag it into Arrange window.

The Region will be placed at the position of your cursor when you release the mouse button, so watch the 'Control Line' as you drag it in to see where you're placing it.



**NOTE** Remember that if you're using a Digidesign system with it's own SCSI chain, you must add audio files from a drive that's on that chain.

### Audio Window basics

The Audio window serves as a running catalog of all of the audio files that have been created or added in a song. The Audio files are listed in bold type with their associated Regions listed just below in normal type. Clicking the small triangle to the left of each file 'opens' and 'closes' this Region view for that particular audio file. Command clicking the triangle performs the same function for all Audio files in the Audio Window.

The primary functions performed in this window include: Importing, exporting and moving audio files, accessing audio hardware settings, auditioning audio regions, checking the drive path, file size, and sample rate specifications for audio files, launching the Sample editor, and launching the **Strip Silence** feature.



### Matching song and audio file tempos

A lot of dance music involves importing drum loops or musical samples which have their own inherent tempo. This necessitates matching the tempo of the audio file with the tempo of the song. This can be achieved

# Working with Audio

in one of two ways: changing the tempo of the sequence to match the audio file's tempo or; changing the tempo of the audio file to match the tempo of the song.

## ***Changing the tempo of the song to match the audio file's tempo***

Setting the song's tempo to match the audio file is the easiest option because it does not involve any processing of the audio file. Logic has very simple method for determining the tempo of the audio file.

### **1. Select the region for the audio file you wish to determine the tempo of**

If you haven't done so already, import the audio file you wish to work and drag it into the Arrange window to the desired start location, as per the instructions the previous section, **"Adding audio files"**.



**NOTE** *For this example we are assuming that the audio file in question is already trimmed so that it loops perfectly after an even number of beats. Furthermore, you should know how many beats long the audio loop is. If the audio file is not in this state, follow the instructions under "Setting loop points" before proceeding with this exercise.*

### **2. Set Cycle to the desired number of beats**

Starting at the beginning of the audio region, define a Cycle region that has the same number of beats as the audio file does inherently. For example, if you placed an 8 bar loop at bar 5, click-drag in the upper portion of the Bar Ruler to create a Cycle that starts at bar 5 and ends at bar 13. (It's not important that Cycle be on, we're only using this as an easy method for setting the left and right locators)

### **3. Arrange Window -> Functions -> Adjust Tempo using object length and Locators**

Make sure that the Region in question is still selected then choose the option

### **4. Choose to insert the tempo change globally or locally**

- **Choose Global if you want the whole song to be set to the new tempo**
- **Choose Create if you want to insert a new tempo event at the beginning of the Region**

## ***Changing the tempo of the audio file to match the sequence tempo***

Changing the tempo of the audio file means destructively modifying the sample using the Digital Factory's Time Machine. The Digital Factory and other Sample Edit operations are covered in greater detail in the following section, **"Destructive Audio Processing"**. Please read through that section if you have any trouble working through this exercise.

# Working with Audio

## 1. Select the region/audio file you wish to adjust the tempo of

If you haven't done so already, import the audio file you wish to work with and drag it into the Arrange window to the desired start location as per the instructions in the previous section, "**Adding audio files**".

## 2. Open the Sample Edit Window

Double-click the Region to bring up the Sample Edit window (Better yet, go to or create a Screenset set up optimally for this task)

## 3. Select **Sample Edit Window -> Digital Factory -> Time Machine**

## 4. Set the bar/beat value you wish the audio file to be

Under the "Destination column", and to the right of where it says "Bars/Beats", input the correct length of the audio file (in bars and beats). LOGIC will automatically calculate how much it must speed up or slow down the audio file in order for it to be "x" number of beats at the songs current tempo

## 5. Click **Process**

## 6. Choose whether or not you wish to create a backup file

It is advisable to select "Make Backup" when prompted. If you do, then Logic Audio will create a backup to which you can "revert" at any time in the future.



**NOTE** *The Time Machine attempts to streamline the process of altering the tempo of files by automatically setting the Source Tempo based on the tempo of the song at the current song position. This means that if there are multiple tempos in the song, it is necessary to make sure that the SPL is located within an area that has the desired Source tempo.*

## Strip Silence

**Strip Silence** is a simple but incredibly useful feature which cuts away the silent portions of an Audio region. To perform Strip Silence on an audio region:

1. Select the Audio region you wish to process from within the Audio window.
2. Open **Audio Window -> Functions -> Strip to Silence**

### 3. Adjust the Parameters until the graphic displays the desired results

The parameters in the Strip Silence window are quite similar to those in a standard Noise gate or Limiter processor and should be familiar to anyone with experience with those types of devices. The primary difference is the addition of two “non-real-time” parameters: Minimal time to accept as Silence; and Pre-attack time. Logic Audio takes much of the guess work out of setting these parameters by displaying a graphic preview based on the current settings. For a detailed description for each of the parameters, refer to the appropriate sections in your owners manual.

### 4. Click “Process”

If the Audio region is being used somewhere in the Arrange Window, Logic will prompt you at the end of the process, asking whether you wish to replace the original region with the new, segmented equivalents. Normally, that is the intention, so answer “Yes” (replace?)

#### ***why should I use “Strip Silence”?***

There are three primary reasons for using this feature:

- **To “Clean up” your mix**

Removing the “silent” portions of an audio track means removing any hum or other unwanted low-level noise that usually exists in those sections. In the “old days” a similar result was sometimes achieved by “riding the mutes”, i.e., muting a track in the silent portions during mix-down.

- **To Reduce the amount of drive space used for a song**

Silent portions in an audio file take up just as much drive space as those portions that aren't. While Strip to Silence alone does not remove these “unused” portions from your hard drive, it is the first in a series of steps that will. See the relevant section under “Audio File Utilities”

- **To improve the timing between audio and MIDI playback**

With Logic Audio's unique “trigger-sync” system, multiple smaller audio regions generally stay locked tighter to the MIDI playback than single long ones; simply put: because they have less time to potentially “drift”. There is no need to go to the extreme with this concept -- we're not recommending that you slice up your regions into 1 beat increments to keep things tight! Under normal conditions, noticeable drift should not occur in Logic Audio, especially with regions that are anything less than a minute long.



## Search for Zero Cross Points

If the beginning or end of a region occurs where the audio file is not at absolute zero amplitude, it is likely that you will hear tiny pops or clicks at those points. This is a natural occurrence which can only be avoided by adjusting a region's boundaries so that they are exactly at "zero cross points". Fortunately, Logic Audio can do this automatically in three places that you often work with Regions; the Arrange, Sample Edit, and Strip to Silence windows.

### *In the Arrange window...*

- Select **Options->Search for Zero Cross Points**

Logic will always move the region's boundaries to the nearest zero cross point when you either divide a region (using the Scissors tool or other method) or adjust a regions start or end point by click dragging in the lower left or right hand corners respectively.

### *In the Sample Edit window...*

- Select **Edit->Search for Zero Cross Points**

Logic will always snap to the nearest zero cross point when you make any changes to the region boundaries or current selection.

### *In the Strip Silence window...*

- Check the box in the lower right hand corner

Logic will snap the boundaries of all newly created regions to the nearest zero cross point.

## 6.6 Destructive Audio Processing

---

Any edit which alters an audio file on your hard drive is referred to as a “destructive” edit. Almost all destructive edit processes in Logic Audio are carried out from within the Sample Edit Window. (The only exceptions are the file utilities such as **Delete** and Optimizing files, which are accessed from the Audio window).

### ***To open the Sample Editor:***

- ***Windows ->Open Sample Edit or,***
- ***Double- click Region in Arrange window or,***
- ***Double-click Region in Audio window or,***
- ***Double-click Region in Edit window***



**NOTE** *If you open the Sample Editor from the Arrange or Event Edit windows, the first position on the time ruler is equal to the regions start point in the song. If you open it from the Audio window, the time ruler begins at zero.*

There are two different menus in the Sample edit window which access file editing functions. The first -- **Edit** -- contains a list of standard Sample edit features such as Normalize, Gain Change, Reverse, etc. The second, -- **Digital Factory** -- accesses the more advanced features such as the Time and Pitch Machine II, the Groove Machine, Audio to Score, Audio Energizer, etc.

Instead of duplicating material already covered in your owners manual, this section simply runs through a series of short exercises demonstrating how these features are generally accessed.

### **Basic editing of audio files**

You follow the same basic steps to apply any of the edit operations listed under **Sample Edit->Edit**. In this example we'll “Normalize” an audio file, a basic process which increases the output level of a file until it's peak is at 100%.

### ***To normalize an audio file:***

**6**

#### **1. Select the portion of the audio file you wish to process**

When you first open the Sample Edit window, the portion selected is equal to the Region's boundaries. To process a different selection, click-drag your mouse over the waveform in a manner similar to the way you highlight text

# Working with Audio

in a word processor. You may use the Shift key to increase the size of your selection without moving the start position as follows:

- **click once in the waveform area towards the beginning of the file**
- **use the windows scroll bar to move your view to the end of the file**
- **hold the shift key and click once in the waveform**

The result should be that the whole of the area between your two 'click points' becomes selected.



**TIP** Hold the Shift + Option keys to reset the Right locator when you are in an area to the left of the mid-way point of the selection. (Using Shift alone in this instance would reset the Left locator, not the Right) This process works in the opposite direction as well, i.e., resetting the Left locator when you are to the right of the mid-point of the selection.

## 2. Select **Edit -> Normalize**

## 3. Choose whether you wish to make a backup file

When the process is over, a dialog asks whether you wish to make a backup of the audio file you have edited. If you choose yes, then you will be able to take advantage of the **Audio window->File->Revert to Backup** option and retrieve this original, unaltered version of the file at any time.

## Creating new Regions in the Sample Editor

You can easily re-define the boundaries of an existing region or create a completely new one without ever leaving the Sample Editor.

### **To re-define an existing region:**

1. Double-click a region to open Sample Edit Window
2. Click-drag over waveform to make new selection
3. Select **Edit->Selection to Region**



**NOTE** The menu option **Region to Selection** does just the opposite, i.e., it transfers the currently selected region's boundaries to the selection in the Sample Editor

### **To create a new region:**

1. Double-click an region to open Sample Edit Window
2. Click-drag over waveform to make new selection

## 3. Select *Edit-> Create New Region*

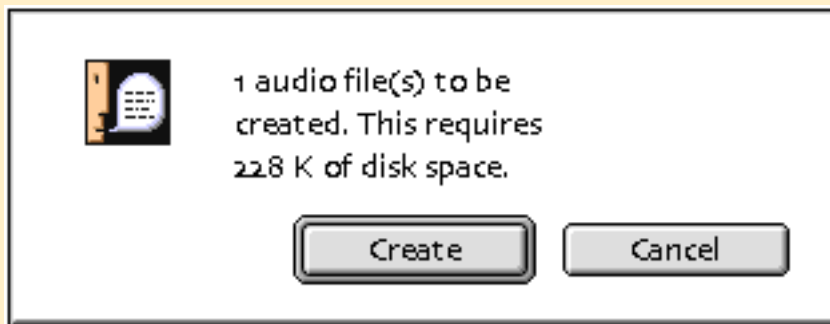
### Creating a new audio files from sections of existing ones

At some point, you may wish to create a new audio file out of a portion of an existing one. You can perform this function from either the Arrange or Sample Edit windows.

#### *From the Arrange window....*

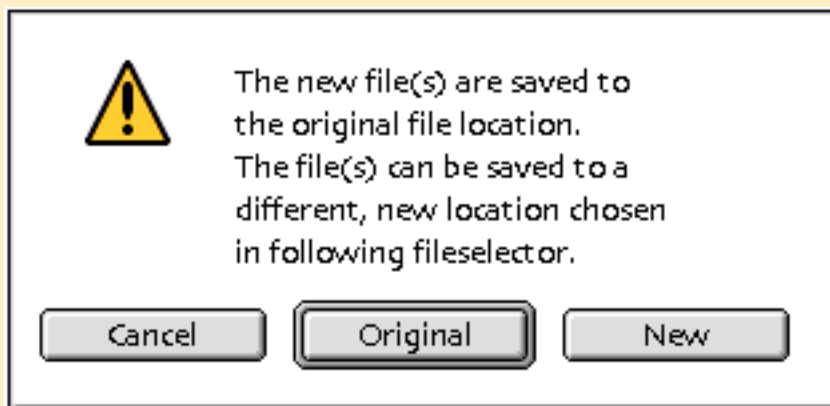
1. Select a region or regions which you wish to "convert" to new audio file
2. Select *Functions->Convert Regions to Individual Audio files*

The following dialog will tell you how much disk space is required and prompt you to confirm your action. Click Create to follow to begin the process or Cancel to abort it.



## 3. Choose where the new file will be stored

In the following dialog, choose Original if you wish to place the file in the same directory as the file you're creating the new file from or choose New to place it in a new directory

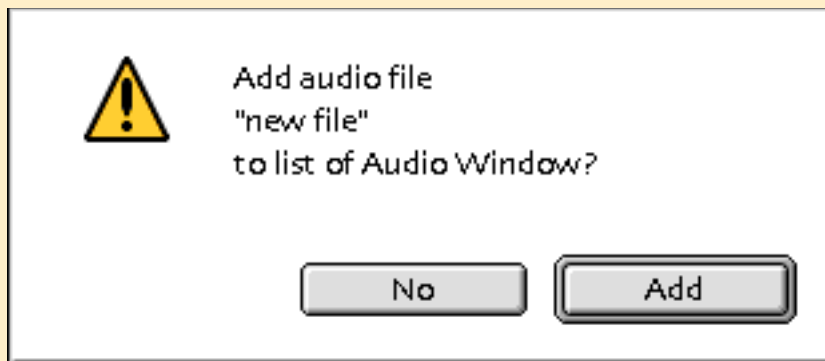


# Working with Audio

## *From the Sample Edit Window...*

1. Click-drag over waveform to select portion of sample that you wish to make new audio file out of
2. Select **File->Save Selection As....**
3. Name the new file and select the directory in which it is to reside
4. Choose whether or not you want the new audio file to be added to the available files in the song.

Once you choose the directory and name and click OK, you will be prompted by the following dialog to choose whether or not to add the audio file to the files in the Audio window



## 6.7 Real-time DSP

---

This section describes the standard procedures for accessing Logic Audio's real-time DSP functions. The type and amount of real-time DSP available to you depends on your particular hardware setup and can vary from a single parametric EQ per channel to a fully expandable system built around a plug-in architecture.

### EQ only systems (all DAE hardware except for Pro Tools w/TDM)

---



When Logic Audio “talks to” any Digidesign hardware, it does so via Digidesign’s own driver software, commonly known as **DAE** (Digital Audio Engine). This means that the only real-time DSP possible for those systems, is the DSP provided via DAE. In all cases, accept for a Pro Tools II or III based system with TDM, that DSP is limited to one or two parametric EQ’s per channel.

Using that EQ in Logic is quite easy and straightforward. The standard parameters (Frequency, Gain, and Q) show up on the Audio object and can be altered by simply click-hold-dragging your mouse up or down. Alternatively, you can double-click on the value and input a number directly from your computer’s numeric keypad.

### User configured DSP systems

---

The term “user-configured” is used loosely here to describe those systems where you can control the bussing of the audio signal and insert multiple effects into an Audio object. Essentially, this covers all systems besides the “EQ only” ones just described; this includes Logic Audio’s own host-based DSP, the Yamaha CBX’s on-board effects, and Digidesign’s elaborate TDM plug-in system.

While each system has its own specific set of limitations and capabilities, the basic methods for inserting an effect or bussing an audio signal are essentially the same for all setups.



### 6 Inserting an effect

If it is possible to insert an effect into the output path of an Audio object there will be at least one blank rectangular box at the top under the word **Inserts**. It should look something like this the figure to the right.

To insert an effect:

- **Click-hold your mouse in this box**
- **Make your choice from the resulting drop down menu**
- **Double-click the effect name to open the effect parameter box**



**NOTE** The Link button in the effect parameter box works similarly to the way it does for other windows. If it is selected then double-clicking on an inserted effect will cause it to update to reflect the new selection. Otherwise, the window will not update and double-clicking an effect will cause a new parameter box window to open instead.

## Inserting multiple effects

In most cases (the CBX-D5 being the exception) it is possible to insert multiple effects into a single Audio object. The actual number is dependent on the system you are using and is indicated by the number of rectangular boxes that appear at the top of the Audio object. However, take note that the number of boxes is “dynamic”. This means that more boxes will open up as you insert more effects. For example, you may insert up to 8 effects using Logic’s own DSP but initially, only two boxes are visible.

Inserting a new effect is done just as with one:

- **Click-hold your mouse in an available box**
- **Select from the drop down menu**
- **Double-click the effect name to open the effect parameter box**

When you insert multiple effects, the audio passes through them in series starting at the top. So, for example, if you wish to EQ the signal before it goes through a delay, insert the EQ first, then the Delay.

## Mono and Stereo effects

If you insert an effect on a mono Audio object you may find that there are two group of effects available in the selection menu. These groups are delineated by a dividing line in the menu with the first group having the letters “m/m” after the effect name, and the second group have the letters “m/s”. These letters stand for “mono/mono” and “mono/stereo” respectively, indicating whether the effect is mono or stereo.

# Working with Audio

If you choose a stereo effect, the output of the object will be stereo and the Audio object will change to a stereo object to reflect this. (as indicated by the two concentric circles on the button in the lower left of the object as well as the dual set of LED's)

## Bussing audio signals

If you have any experience using even a basic mixer you are probably already familiar with the concept of "bussing". The term simply refers to the ability to route an audio signal from one place to another.

Perhaps the most common use for this function is to send some or all of an audio channels signal to a **Bus** or **Auxiliary** output which in turn is sending its signal through an effect such as a Reverb. This type of setup, in contrast to inserting the effect on a single output, allows you to use the same effect on more than one signal. Here's is how you would perform this task in Logic Audio.

***Using Audiowerk8, Sound Manager, a standard MME soundcard, or any other system where you're using Logic's host-based DSP:***

### 1. Select the bus to use for the Send

Click-hold in the box under the word **Sends** on the Track object that is the source of the signal you which to bus. Select a Bus from the flip menu. In the figure to the right, Bus 1 is being used.

### 2. Insert the desired effect on the corresponding Bus object

Find the number bus object that corresponds to the bus you selected in step 1. (If you don't find one, you may need to create one. Please refer to the relevant section in your user's manual). Insert the desired effect on the Bus object as described in the previous section, "**Inserting an effect**". In the figure to the right, a DaD Valve effect has been inserted into the Bus 1 object.

### 3. Set the Bus object to the desired pair of outputs

Click hold in the second box below the letters "I/O" to select the desired output for the bus object. In the figure to the right, **Bus 1** is set to **Output 1-2**

### 4. Adjust the Send level on Track object

Use the Send knob that is to the right of the place you selected the bus on the original Track object to set the amount of signal you wish to "send" to the





# Working with Audio

Bus object for processing. In the figure, the Track 1 object's send is set to the 1 o'clock position.

## Using TDM:

### 1. Select the bus to use for the Send

Click-hold in the box under the word **Sends** on the Track object that is the source of the signal you wish to bus. Select a Bus from the flip menu

### 2. Set an Auxiliary to receive signal from the corresponding Bus

Find or create an Auxiliary object and set its input to the same Bus selection you made in step two. The input is selected in the first box under the characters **I/O** (If you need to create an Auxiliary object but don't know how to, please refer to the relevant portions of your user's manual)

### 3. Insert the desired effect on the Auxiliary object

Insert the desired effect on the Bus object as described in the previous section, **"Inserting an effect"**

### 4. Set the Auxiliary object to the desired pair of outputs

Click-hold in the second box below the letters **I/O** to select the desired output for the Auxiliary object

### 5. Adjust the Send level on Track object

Use the Send knob that is to the right of the place you selected the bus on the original Track object to set the amount of signal you wish to "send" to the Bus object for processing.



**TIP** A TDM based system allows you to set the input of a Track object to be a bus allowing you to re-record the outputs of one or more tracks - a useful option for mixing down multiple tracks while printing their effects and automation.

## Using Yamaha CBX-D5:

### 1. Select the bus to use for the Send

Click-hold in the box under the word **Sends** on the Track object that is the source of the signal you wish to bus. Select a Bus from the flip menu

### 2. Select the desired effect on the corresponding Return object

Find the number bus object that corresponds to the bus you selected in step 1. (If you don't find one, you may need to create one. Please refer to the relevant section in your user's manual). Select the desired effect on the Return object.

### 3. Adjust the Send level on Track object

## Working with A u d i o

Use the Send knob that is to the right of the place you selected the bus on the original Track object to set the amount of signal you wish to “send” to the Bus object for processing.

## 6.8 Audio File Utilities

---

An inevitable task involved with hard disk recording is managing all of the audio files which so quickly fill even the largest of hard drives. Eventually, you will need to copy, delete, move, or otherwise manipulate these files, either to make more space on a drive, or to export them for use in other programs. Fortunately, Logic Audio has some very useful utility features which help you accomplish these goals with the minimum of strain.

### Copy, Moving and Deleting files

Logic has dedicated options for copy, moving and deleting files. While these functions can be performed from within your computers OS, performing the functions within Logic Audio has its advantages:

- The song file is kept up to date regarding the locations of the files in use
- Logic's performs these functions much faster than your computers OS
- It is more convenient to perform these functions from within the program

### To Delete a file from a Song

From the Audio window,

#### 1. Select the Audio file or files you wish to delete

Remember, the audio file is listed in bold with a triangle to its left and the Regions are listed below that. If you only select the Region, you'll delete the region only and not the whole audio file. (If there is one region, deleting it will in fact delete the audio file from that song as well; every audio file must have at least one region associated with it)

#### 2. Hit the Delete key

This deletes the file from the song but leaves the file on our hard drive.

### To Delete files from your hard drive

1. From the Audio window, select the Audio file or files you wish to delete
2. Select **Audio Window->File->Delete file**

# Working with Audio



**NOTE** You can also delete files from the Arrange window if the region you delete is the only one associated with that audio file. In that case, when you select the region and hit the delete key, you will be prompted with a dialog which asks whether you wish to delete the file from the hard disk or only from the song.

## Copy or Moving files on your hard drive

1. From the Audio window, select the Audio file or files you wish to copy or move
2. Select **Audio Window->File->Copy file or Move file**
3. Select the new location  
to which you wish to copy/move the file in the resulting File Selector window
4. Choose whether you want the current song to look for the audio file in the new location

When the process finishes, a dialog asks whether or not to update the directory information for the file in the current song. Select "Yes" if you want the song to look for the file in its new location the next time you load it.

## Importing/Exporting files



### Mac

While Logic records and plays back only monophonic Sound Designer II files it can also import and export SDII Stereo, AIFF, and WAV files



### Windows

While Logic records and plays back only monophonic WAV files it can also import and export SDII and AIFF.

### *To import a an audio file:*

1. Select **Audio Window->File->Import File**
2. Select the type of file you wish to import from the hierarchical flip menu
3. Select the file from the resulting File Selector window

# Working with Audio

## 4. Click **OK**

Once you've selected the file you wish to import, Logic will copy and convert the file on your hard disk, leaving the original intact. In the case of a SDII Stereo file, Logic will create two new monophonic files which are "linked" when used by Logic.

### ***To export an audio file***

1. Select **Audio Window->File->Export File->AIFF/Wav/SDII Stereo**
2. Select the type of file you wish to export from the hierarchical flip menu
3. Type in an appropriate name for the new file in the resulting File Selector window
4. Click **OK**

### ***To export Sound Designer II regions:***

Sound Designer II files can store region data but Logic does not do this by default. (That information is normally stored only in the song file) This is a useful feature when you want to load the files into programs such as Pro Tools ©, Sound Designer © or Bias's Peak © sample editor, which can recognize Sound Designer II files and their associated regions.

1. From the Audio window, select the audio file or files whose regions you wish to export
2. Select **Audio Window->File->Export SDII regions**

## **Optimizing files**

A good way to free up space on your drive is to use Logic's Optimization function. This option deletes those portions of an audio file that aren't being used in the song.

For example, imagine that you recorded a one minute long audio file but then ended up using only the first half of that recording in the arrangement. Or, perhaps a guitar solo you recorded contains multiple silent sections that you stripped away using the Strip to Silence option. In either case, there are unused portions of the audio file which are taking up valuable hard disk space. Optimization cleanly deletes those unused portions.

# Working with Audio

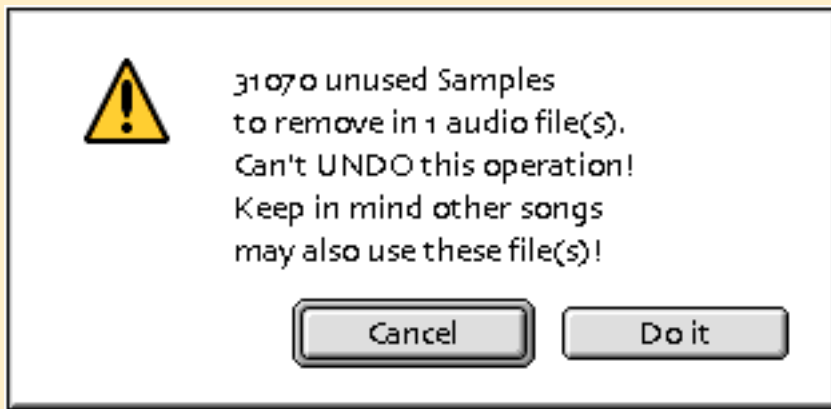


**W A R N I N G** *This is a destructive edit process, so any other song files which access the affected files will no longer playback the audio correctly. Therefore, only optimize the audio files which are NOT being used by other song files you wish to keep intact.*

## **To Optimize a file or files:**

1. From the Audio window, select the audio file or files you wish to Optimize
2. Select **File->Optimize File(s)**

The following dialog will tell you how many samples are going to be deleted and warn you to be careful with the operation. Click Do It when you are sure you want to proceed.









# Synchronisation

## What You Will Learn

This brief chapter will describe the basic steps necessary to enable Logic to Sync to external sources, as well as how to use MIDI Machine Control (MMC). It will also explain how to transmit sync in cases where you wish to use Logic as the master.

The information is organized into the following sections:



Syncing to an external source



Logic as the Sync source



Setting Logic to transmit MMC

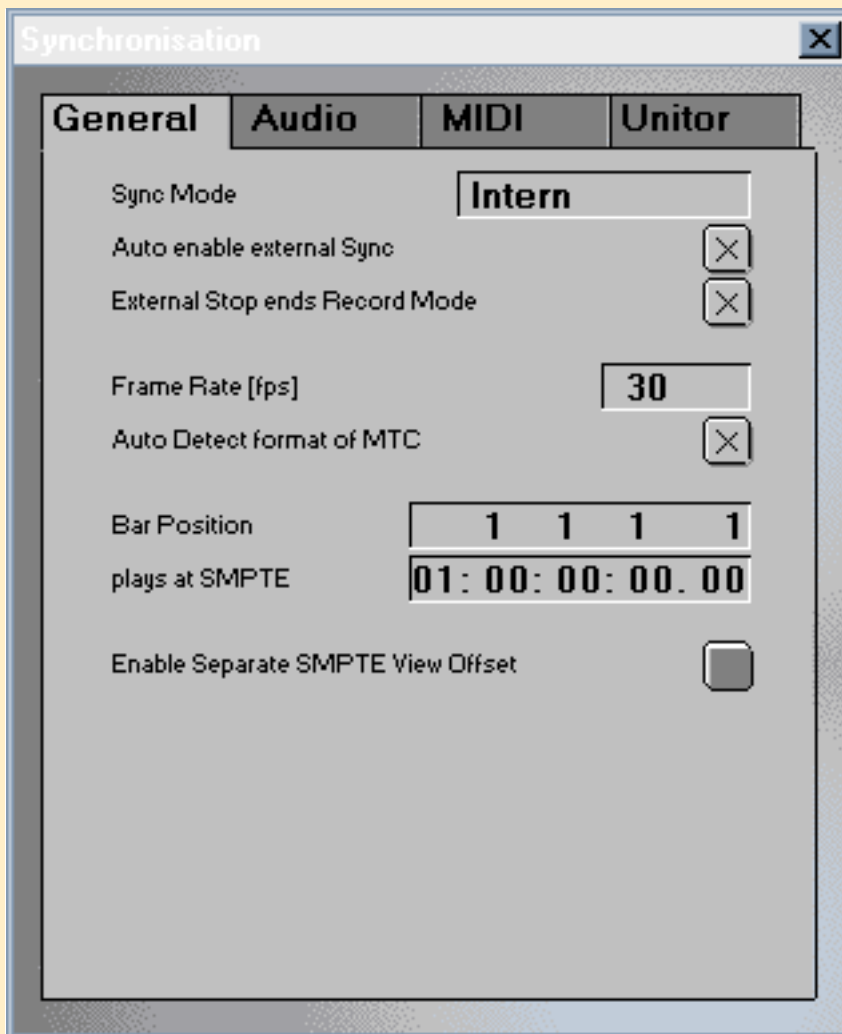
## 4.1 Syncing to an external source

To set Logic to sync to either MIDI Clock or MTC:

1. Open the **Synchronisation** window  
**Transport -> Sync Button -> Synchronisation**
2. Go to General settings window  
Click on the tab at the top of the window labeled **General**.

### how to:

- set Logic to sync to an external source.
- select the type of synchronisation Logic will use
- select a SMPTE frame rate.
- set the SMPTE offset.
- set Logic to send sync to an external device



# Synchronisation

## 3. Select the type of sync you wish to use

You may set Logic to sync to MIDI Clock, MTC (SMPTE) or the internal clock from the Sync Mode window.

### **MIDI Clock Sync**

If you select MIDI Clock Sync, then Logic will follow incoming MIDI clock from external devices such as drum machines or other sequencers.

### **MTC**

To set Logic to follow MTC (SMPTE), select “MTC” from the Sync Mode window.

## 4. Auto enable external Sync

Engaging the **Auto enable external Sync** button allows Logic to sense incoming MTC or MIDI Clock, and to automatically switch to it.

## 5. Setting the SMPTE Frame Rate

If you are using MTC, you'll need to set the correct frame rate. To set the SMPTE frame rate, select the appropriate rate from the **Frame Rate (fps)** menu.



### **NOTE Auto Detect format of MTC**

Logic has a unique feature that allows you to automatically detect the format and rate of the incoming SMPTE timecode. This can be very useful if for some reason you are unsure of the SMPTE frame rate you're trying to sync to. (For example, if you are working with a tape which has been previously striped at an unknown rate.) If you are sure of the incoming SMPTE rate, it is generally best to leave this off and set the value manually.

## Set the SMPTE Offset (not applicable for MIDI clock)

If your song starts at a SMPTE position other than the default of 01:00:00:00.00, then you will need to adjust Logic's offset to match.

### 1. Check Bar position

You will see a window labeled **Bar Position**, and below it another labeled **Plays at SMPTE position**. You will almost always leave the Bar Position set to “1 1 1 1”.

### 2. Set the SMPTE Offset value

Set the **Plays at SMPTE** window to the SMPTE time that you would like your

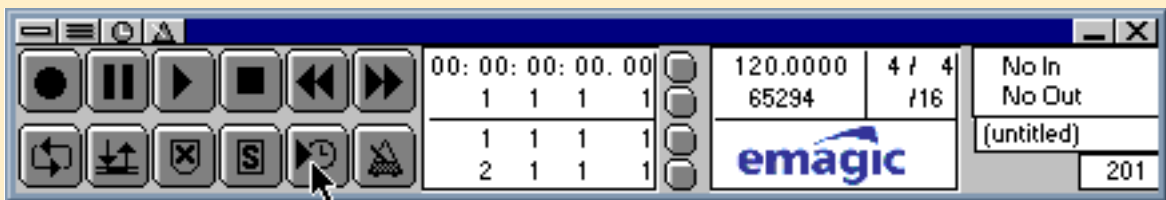
# Synchronisation

song to start at.

## SMPTE View Offset

In some cases you might wish to set Logic's SMPTE display to start from a time other than the SMPTE offset value. For example, when you want the SMPTE displays to show time measured from "zero" rather than from an odd numbered offset value. This is the purpose of the **SMPTE View Offset** feature. To enable this option:

1. Open the **Synchronisation** window  
**Transport -> Sync Button -> Synchronisation**

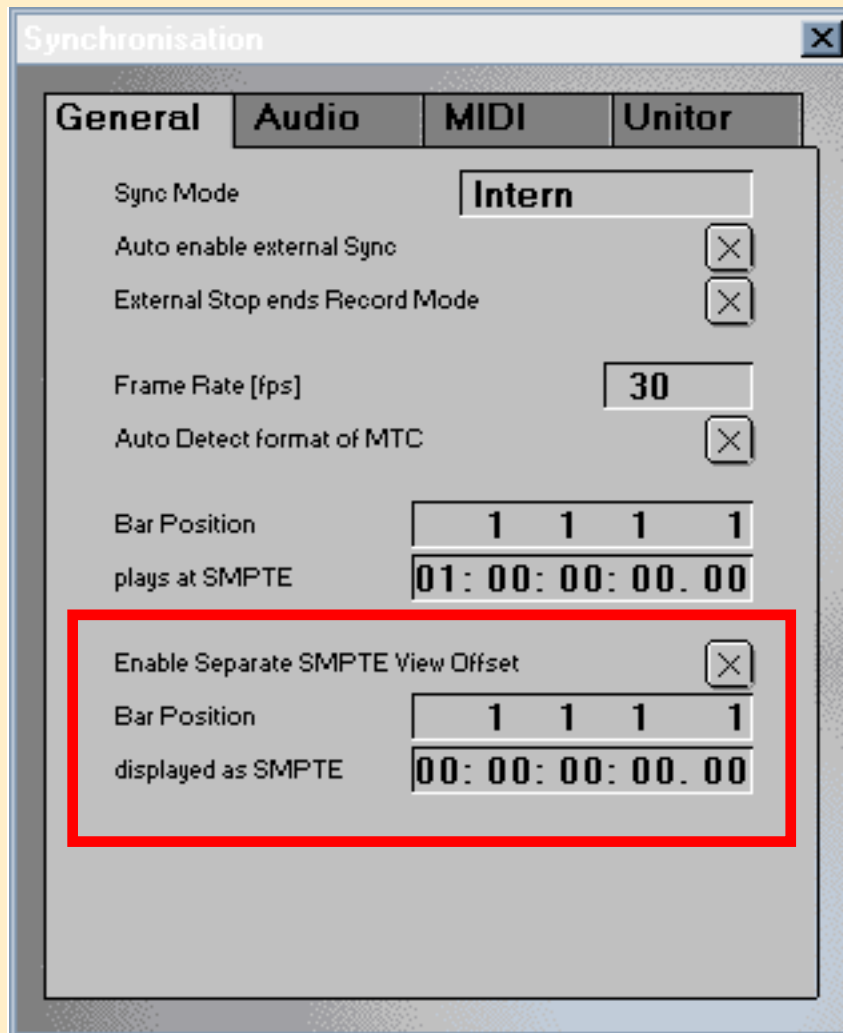


2. Enable the **Enable Separate SMPTE View Offset** button.

# Synchronisation

## 3. Set the SMPTE view offset value

Input the Bar and SMPTE values in the Bar Position and displayed as SMPTE boxes provided.



## 4.2 Logic as the Sync source

To set Logic to transmit MTC or MIDI clock to other devices

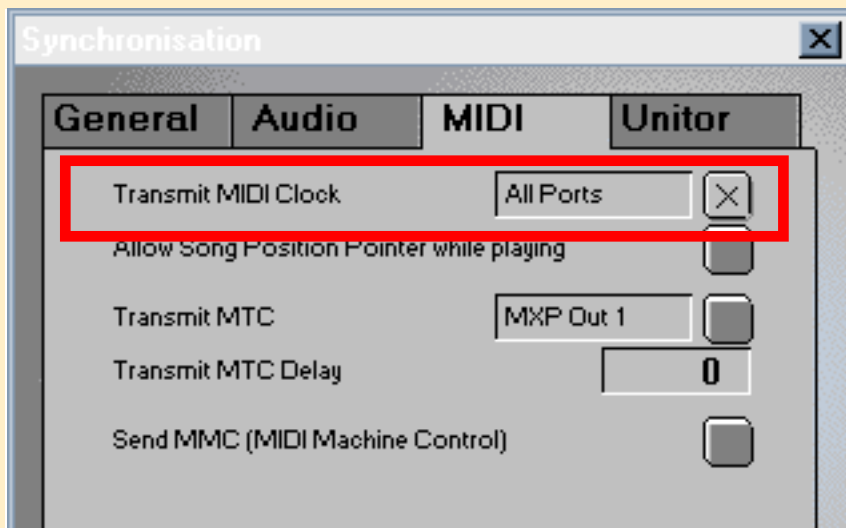
1. Open the **Synchronisation** window

**Transport -> Sync Button -> Synchronisation**

2. Click on the **MIDI** tab at the top of the **Synchronisation** window

**To send MIDI Clock:**

1. Enable the **Transmit MIDI Clock** button



2. Set the output port for MIDI Clock

You may specify the output on your system that clock will be sent on in the port select window to the right of **Transmit MIDI Clock**. You may specify any single port, or all ports.

3. Enable Allow Song Position Pointer while playing

To set Logic to send SPP while playing, engage the **Allow Song Position Pointer while playing** button. Logic will send position cues along with the clock data, so that the target device will follow position as well as tempo information.

## ***To send MTC***

1. Enable the ***Transmit MTC*** button.

2. Set the output port for MTC

You may specify the output port on your system that MTC will sent on in the port select window to the right of ***Transmit MTC***. You may specify any single port, or all ports.

## 4.3 Setting Logic to transmit MMC

There is some confusion on the subject of MIDI Machine Control (MMC). Some people get confused and think of this as a form of sync. In fact MMC is simply the MIDI version of a remote control. MMC provides a standard series of transport commands to remotely control an external device. There is no actual synchronisation involved. Therefore, the general practice is to set Logic as the MMC master, but in turn as the slave to incoming MTC (or potentially, MIDI Clock). Logic acts as a "remote control", sending transport commands to a tape deck, or other external device, and then syncs to the MTC coming from that device when it starts.

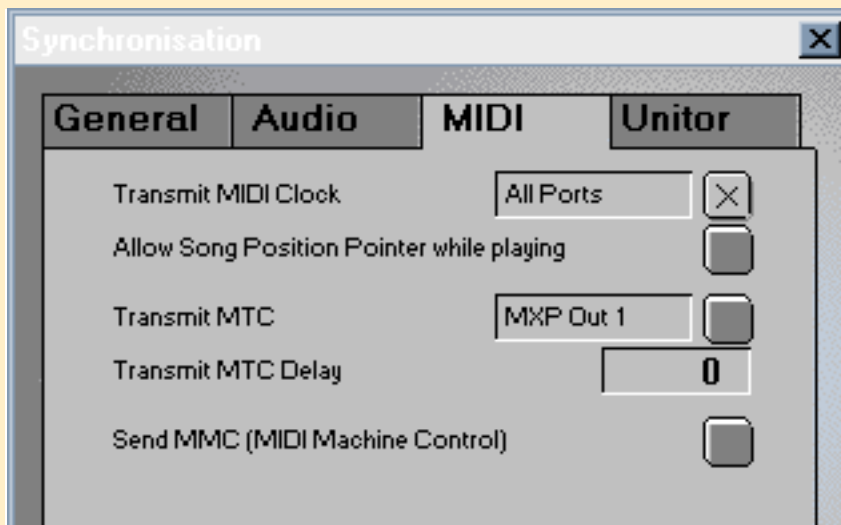
### ***To enable MMC:***

1. Open the ***Synchronisation*** window

***Transport -> Sync Button -> Synchronisation***

2. Go to the MIDI settings window

Click on the ***MIDI*** tab at the top of the window.



3. Engage the button labeled ***Send MMC (MIDI Machine Control)***











# MIDI Studio Inventory Worksheet

The Table on the next page is provided as a tool to help you keep track of your MIDI studio. It's advisable to fill it out before proceeding through the procedures outlined in the MIDI Setup and Configuration chapter.

## MIDI Studio Inventory Worksheet

[illegible]

# MIDI Studio Inventory Worksheet

*Here is a brief example of a completed table for a MIDI studio with 7 devices sharing 4 interface "virtual" ports.*

| Device        | Port | Listen Ch (1-16) | Talk Ch (1-16) | Local /Thru | Map-ped | GM XG GS | Cont. Control-lers | SysEx |
|---------------|------|------------------|----------------|-------------|---------|----------|--------------------|-------|
| XP-50         | M1   | 1-16             | 1              |             |         | √        | √                  | √     |
| D5            | M2   | 10               |                |             | √       |          |                    |       |
| DX-7          | M2   | 1                |                | local       |         |          |                    |       |
| PC-1600       | M2   |                  | 1-16           |             |         |          |                    |       |
| Ultra Proteus | M3   | 1-16             |                |             |         |          |                    | √     |
| MPX-1         | M4   |                  |                |             |         |          |                    | √     |
| PC200         | M4   | 2                |                |             |         |          |                    |       |

## Description of Columns

- **Device**

Use one row for each MIDI device in your studio—name the device in this column.

- **Port**

Indicate which port of your MIDI interface the device is connected to. Typically a MIDI device will be connected to the input and/or output of a single interface port. If for some reason you use different input and output ports for the same device, list the device in two separate rows—one for its input function and the other for its output function.

- **Listen Chans**

Indicate the MIDI channels on which you will want the device to receive MIDI data. This is a function of the devices capabilities and settings. For example,

# MIDI Studio Inventory Worksheet

if two multi-timbral devices share the same port, you will most likely enable some channels on one device and other (different) channels on the other device. Fill out this column accordingly.

- **Talk Chans**

Indicate the MIDI channel(s) on which the device sends MIDI data. Stand-alone MIDI sound modules typically do not send MIDI data. (Such devices often will send SysEx preset information, however - see the "SysEx" column.) Generally, you will use this column to indicate what channel your MIDI controller(s) are set to. A MIDI controller might be the keyboard of a workstation like the XP-50, a stand-alone keyboard like the PC 200 or a fader/button controller like the PC 1600, for example. The channel numbers you fill in here should be the channels you intend to use the controller on, not all the ones it may be capable of.

- **Mapped**

Indicate whether the MIDI device is intended to play a different sound for each MIDI note—drum synths are a typical example. Logic has special tools for managing these devices.

- **Local/Thru**

**Local** If the device is both a MIDI controller and a MIDI sound device AND if you have MIDI cables running both to and from the device then determine whether the device offers a way to turn local (internal) control off. The point is that you will not want the device both "talking to itself" and sending information back to itself through Logic. The typical solution is to turn local control off, but if this is not possible, Logic can prevent MIDI data that comes from the device from being sent back to it. Enter "Local" in this column if there the device DOES NOT allow you to turn local control off.

**Thru** If the device is both a listener and a talker (i.e. if you have MIDI cables running both to and from the device) then determine whether the device "echos" incoming MIDI data back thru its output. If it does, determine whether there is a way to turn this off. The point is that you do not want to create a MIDI loop by having data that Logic sends to the device returned to Logic to be sent again to be returned again to be sent again ... Enter "Thru" in this column if there the device DOES NOT allow you to turn MIDI Thru off.

- **GM/GS/XG**

GM is a format for numbering MIDI sound device presets. The sound devices that feature it are typically multi-timbral synths. There are also other MIDI enhancements like "GS" and "XG" which can be indicated in this column. Logic has special "tools" that take advantage of these features when they are



# MIDI Studio Inventory Worksheet

available.

- **Continuous Controllers**

These are also extended MIDI modes available on some MIDI devices. When available they offer greatly expanded control of the device's internal settings. You can use Logic to manipulate these parameters on devices that feature RPN and NRPN.

- **SysEx**

SysEx is the most flexible method of getting at a MIDI device's unique features. Not all MIDI devices implement SysEx. For those that do, some will both send and receive this information and others will only receive it. Use this column to indicate both the device's capabilities and your intention to use them. (I.e. if you have no plans to use SysEx, you can ignore this column.)

# MIDI Studio Inventory Worksheet

# MIDI Studio Inventory Worksheet

# MIDI Studio Inventory Worksheet

## Quick Start

|  |    |
|--|----|
| set Preferences that match your MIDI interface                             | 18 |
| select and define outputs from Arrange view using Instrument Parameter Box | 18 |
| check that MIDI thru is working  | 18 |
| check that LOGIC's MIDI settings are set correctly for your MIDI system    | 18 |
| create a new instrument from the Arrange window                            | 18 |
| test that Program change messages are being sent and received properly     | 29 |
| select patches from the Arrange window                                     | 29 |
| test that Program change messages are being sent and received properly     | 31 |
| select patches from the Arrange window                                     | 31 |
| test that Pan and Volume messages are being sent and received properly     | 32 |
| adjust volume/pan from Instrument Parameter Box in Arrange Window          | 32 |
| make the Transport play a select section repeatedly (Cycle Mode)           | 32 |
| set Logic Audio's Preferences so they match your audio hardware            | 34 |
| select an Audio track  | 34 |
| record enable an audio track   | 34 |
| select the desired Audio input for recording(Cycle Mode)                   | 34 |

## MIDI Setup and Configuration

|  |    |
|--|----|
| save your song   | 40 |
| create an Instrument object in the Environment                       | 41 |
| find the Instrument Parameter Box                                    | 41 |
| protect the Environment from accidental alterations                  | 41 |
| hide or show the parameter sections to the left of most windows      | 41 |
| decide what Environment object to use for each of your MIDI devices. | 41 |
| access all channels of a multi-timbral instrument                    | 46 |
| connect a Multi-Instrument to the right MIDI port                    | 46 |
| select icons for the Multi-Instrument and its sub-channels           | 46 |
| choose programs by name rather than by number                        | 46 |
| enter and edit program names   | 46 |
| get Logic to send the correct bank select messages                   | 46 |
| open & close the Mapped Instrument window                            | 53 |
| set the Mapped Instruments parameters                                | 53 |
| re-map MIDI notes using a Mapped Instrument                          | 53 |
| name individual notes to match your drum synth                       | 53 |
| set a velocity offset for each note                                  | 53 |
| control the destination of individual notes                          | 53 |
| control how notes appear in a drum score style                       | 53 |
| avoid doubled notes  | 58 |
| avoid MIDI feedback loops  | 58 |
| get Logic to communicate with an internal card or software           | 61 |

## How to...

|  |    |
|--|----|
| set up Logic to use Apple's Quicktime Musical Instruments              | 61 |
| Set up Logic to access a SampleCell card                               | 61 |
| decide when to use OMS   | 63 |
| enable Logic to use OMS  | 63 |
| set Logic up to switch automatically between OMS and non-OMS operation | 63 |
| set up Logic's OMS "map" to match your Environment setup               | 63 |
| create an on-screen mixer for each port                                | 66 |
| set up the on-screen mixer   | 66 |
| connect the mixer to your Instrument objects                           | 66 |
| use the on-screen mixer and record the results                         | 66 |
| move Environment objects between layers                                | 66 |

## ***What makes Logic Special***

|  |    |
|--|----|
| open & close windows   | 72 |
| change active windows  | 72 |
| open & use floating windows  | 72 |
| work with Logic's Transport  | 72 |
| use the Catch button   | 72 |
| make your window display stay current with the current song position       | 72 |
| open and close editor windows  | 78 |
| view a sequence in several windows at once                                 | 78 |
| create and move between screensetsalleviate screen clutter                 | 78 |
| lock/unlock Screensets   | 78 |
| copy Screen Sets   | 78 |
| link windows & keep the song position in view                              | 80 |
| force an edit window to follow the selections made in another edit windows | 80 |
| keep the view of an edit window fixed on a particular sequence             | 80 |
| find out to what task a key is assigned                                    | 82 |
| find out which key is assigned to a task                                   | 82 |
| assign your on keys to tasks   | 82 |
| trigger key commands from your MIDI keyboard                               | 82 |
| print a list of your key commands  | 82 |

## ***Recording***

|  |    |
|--|----|
| set up the Metronome                                     | 86 |
| make the Metronome click for recording, playback or both | 86 |
| set the count-in   | 86 |
| make the Metronome click only during count-in            | 86 |
| set & change Logic's time signature                      | 86 |
| set & change Logic's tempo                               | 86 |
| choose a Track and Instrument for recording              | 86 |

## How to...

|   |     |
|---|-----|
| make a single-pass recording                              | 86  |
| re-do a single-pass recording                             | 86  |
| prepare to record a second part                           | 95  |
| Create a new track  | 95  |
| practice with the first part in Cycle Mode                | 95  |
| record multiple takes in Cycle Mode without stopping      | 95  |
| punch in a correction to a part                           | 99  |
| punch-in automatically                                    | 99  |
| use Punch mode with or w/o Replace Mode on                | 99  |
| create an empty sequence for Step-time Recording          | 102 |
| start & stop Step-time Recording                          | 102 |
| control the size of the steps while entering notes        | 102 |
| use Logic's special shortcut keys for Step-time Recording | 102 |

## Editing

|  |     |
|--|-----|
| use Sequence parameters to affect playback                             | 108 |
| lock in the Sequence parameters  | 108 |
| quantize while recording   | 108 |
| quantize multiple tracks/sequences at once                             | 108 |
| quantize non-destructively   | 108 |
| combine Sequences in Folders   | 125 |
| move in and out of Folders   | 125 |
| use Folders to repeat song structures                                  | 125 |
| open the Event List editor window                                      | 128 |
| edit event parameters in the Event List                                | 128 |
| add events to the Event List   | 128 |
| select events in the Event List  | 128 |
| change the format of the Event List's position display                 | 128 |
| quantize selected events in the Event List                             | 128 |
| select events of just one type   | 128 |
| open the Matrix editor window  | 137 |
| view and edit note velocities in the Matrix editor                     | 137 |
| change the Matrix editor's display grid lines                          | 137 |
| select the top or bottom voice of a multi-voice Sequence               | 137 |
| select notes by other criteria in the Matrix editor                    | 137 |
| quantize selected notes in the Matrix editor                           | 137 |
| open the Score editor  | 142 |
| control what Sequences are displayed in the score                      | 142 |
| view the score a line or page at a time                                | 142 |
| move between multi-staff and single staff views                        | 142 |
| quantize the score display without affecting the notes in the Sequence | 142 |
| Insert or Edit Time and Key Signatures                                 | 142 |

## How to...

|   |     |
|---|-----|
| Change the Clef Type  | 142 |
| record and playback the results of a mix                          | 152 |
| have your mixer respond to an automated mix                       | 152 |
| create markers  | 155 |
| create separate tracks after recording from external sequencer    | 155 |
| de-mix a sequence based on pitch                                  | 155 |
| nudge Sequence or MIDI events                                     | 155 |
| keep written notes with song                                      | 155 |
| cut/copy/paste Key and Time Signatures                            | 155 |
| time lock some or all notes in a Sequence                         | 155 |
| conform Logic's tempos to match a "legato" performance. (Reclock) | 155 |

## ***Working with Audio***

|  |     |
|--|-----|
| control the directory to which your audio files are recorded | 172 |
| set a record path that is global for all songs               | 172 |
| set a record path that is different for each song            | 172 |
| control how audio files are named                            | 172 |
| use folders on your hard drive to organize your audio files  | 172 |
| prepare a track for recording                                | 175 |
| record enable a track  | 175 |
| set the input source for recording                           | 175 |
| record from digital source                                   | 175 |
| set Sample Rate  | 175 |
| adjust regions in the Arrange Window                         | 180 |
| make copies of Regions                                       | 180 |
| change the size of Regions                                   | 180 |
| adjust a Region's Anchor Point                               | 180 |
| re-position Regions that have been moved unintentionally     | 180 |

## ***Synchronisation***

|   |     |
|---|-----|
| set Logic to sync to an external source.          | 208 |
| select the type of synchronisation Logic will use | 208 |
| select a SMPTE frame rate.                        | 208 |
| set the SMPTE offset.                             | 208 |
| set Logic to send sync to an external device      | 208 |