Vision and Studio Vision Pro

Version 4.1

Manual Supplement

Opcode Systems, Inc.
365 East Middlefield Road
Mountain View, CA 94043
Internet: http://www.opcode.com/

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Programing
Dave Oppenheim
Dan Timis
Ray Spears
Doug Wyatt
Aron Nelson
Daniel Steinberg
David Willenbrink
Larry Gerndt
Dave Scoggin
Andy Wolpert

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Quality Assurance
Mike Rogers
James Livingston
Nathan Yeakel

Documentation
Greg Thomas
Gregory A. Simpson

Manual Design
Gregory A. Simpson

Technical Editing
Dave Oppenheim
Dan Timis

Product Management
Jonnie Gillham

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Introduction

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CHAPTER 1: Introduction

This *4.1 Manual Supplement* provides additional information not found in your MIDI and Audio Reference Manuals.

Following is a short summary of the material in this manual:

- *Part 1: Introduction* is what you are reading right now and provides a general overview of how you should proceed with your documentation.
- *Part 2: Summary of 4.1 Enhancements* summarizes the feature changes in version 4.1 of Vision and Studio Vision Pro.
- *Part 3: The Acadia Audio System* discusses how to use the new Acadia audio system, which provides advanced digital audio capabilities for Vision. These chapters cover hardware configuration, recording, playback, audio processing, and optimization for digital audio.

WHAT SHOULD I READ FIRST?

After reading this introductory chapter, read the **MIDI Reference Manual**. It is the starting point for learning Vision basics and contains tutorial and reference material for all of Vision's MIDI features.

Next, read Chapter 2 in this **4.1 Supplement**. In addition to summarizing the feature changes since the printing of the MIDI and Audio Reference Manuals, it contains a review of the audio systems supported in Vision and Studio Vision Pro.

Next, read Chapters 1 and 2 in your **Audio Reference Manual**. These chapters introduce some basic digital audio concepts and terms.

Next, read the chapters related to the audio system you will use with Vision or Studio Vision Pro.

- If you will use the Acadia audio system, read *Part 3: The Acadia Audio System* in this **4.1 Supplement**.
- Or, if you intend to use one of the other audio systems, read either Part 2 (Sound Manager), Part 3 (Yamaha CBX), or Part 4 (DAE) in the **Audio Reference Manual**.

Finally, read Parts 5, 6, and 7 in your **Audio Reference** manual. These chapters discuss, in detail, all elements of digital audio sequencing and editing.

Summary of 4.1 Enhancements

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2
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The Acadia Audio System

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CHAPTER 3: Acadia: Hardware Setup

This chapter discusses how to configure your audio hardware for use with the Acadia audio system. For other related information on taking advantage of your hardware, see *Chapter 11: Acadia: Optimizing for Digital Audio.*

THE ACADIA AUDIO SYSTEM

When using the Acadia audio system, Vision uses the ASIO driver specification (developed originally by Steinberg Soft- und Hardware GmbH) for inputting and outputting digital audio.

Included with Vision are Opcode ASIO drivers for Sound Manager (taking advantage of the built-in sound capabilities of your PowerMac), and Digidesign's DirectIO (supporting the Audiomedia III and other Digidesign PCI audio cards).

There are ASIO drivers available for a number of Macintosh audio cards such as the Korg 1212 I/O and the Sonorus STUDI/O. For the availability of these and other ASIO drivers, contact the manufacturer.

NOTE: Vision looks for ASIO drivers in a folder called "ASIO Drivers." This folder must reside in the same folder as the Vision application.

SYSTEM REQUIREMENTS

To run Vision with the Acadia audio system, you must meet the following computer requirements:

- A PowerMac (603 or faster recommended) with Level 2 cache. ASIO-compatible digital audio card recommended but not required.

  Consult the *QuickStart* card included with your package for information on RAM and System software requirements.
- A "fast" and defragmented hard disk.

  The faster your hard disk, the more simultaneous voices Vision can play. For optimum performance, Opcode recommends using a SCSI hard disk driver that supports asynchronous disk I/O.

  You will achieve improved audio performance if you frequently defragment your hard disk. Opcode strongly encourages you to use defragmentation software before recording audio.

For the very latest system requirements and recommendations, check the Opcode Web site:

http://www.opcode.com

SET VISION TO THE ACADIA AUDIO SYSTEM

To use Vision with your ASIO-compatible hardware, select **Audio>Audio System>Acadia** to place a check mark next to the option.

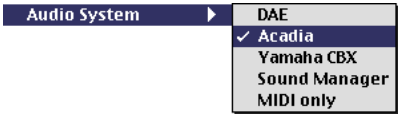


Figure 3.1: Selecting the Acadia audio system

HARDWARE SETUP

Before you can record and play digital audio, you must tell Vision which ASIO driver you're using.

When selecting the Acadia audio system for the first time, the default ASIO driver is Opcode's "Sound Manager" driver.

To specify a different ASIO driver:

a **Choose Audio>Hardware Setup.**

The Hardware Setup dialog opens.

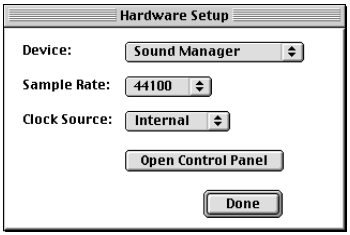
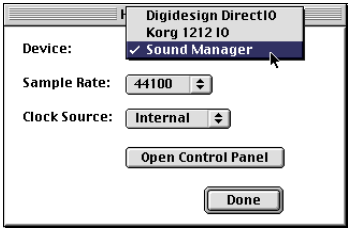


Figure 3.2: Hardware Setup dialog for the Acadia audio system

b **From the Device pop-up, select the appropriate ASIO driver for your audio hardware.**



If you're using your PowerMac's built-in sound capabilities, choose the **Sound Manager** driver.

If using compatible Digidesign hardware, choose **Digidesign DirectIO**.

If your ASIO driver is not listed in the Device pop-up, make sure the driver is in the "ASIO Drivers" folder, which must reside in the same folder as the Vision application.

About the Hardware Setup Dialog Box

As shown in Figure 3.2, the Hardware Setup dialog box contains numerous elements for configuring your audio hardware. Using this dialog, you can choose your ASIO driver, set the hardware sample rate, and specify a digital clock source. In addition, you can click the Open Control Panel button to configure additional hardware-specific settings.

Sample Rate

From this pop-up menu, choose the desired *hardware sample rate*, which determines the rate at which audio is recorded and played.

See the manufacturer's documentation for which rates your hardware supports.

NOTE: The sample rate in the Hardware Setup dialog can also be specified in the Sample Rate/Size dialog (as discussed on page 19). Changing it in either location updates it in the other.

Clock Source

In most cases, as when recording from an analog input, you will leave the Clock Source pop-up set to "Internal."

If, however, you are recording from a digital source (like a DAT machine or digital multitrack), you'll want to switch this pop-up to the appropriate digital setting. For details, consult the manufacturer's documentation for your hardware.

Sound Manager

If using the Sound Manager driver, click the **Open Control Panel** button in the Hardware Setup dialog to access additional sound input options, see Figure 3.3.

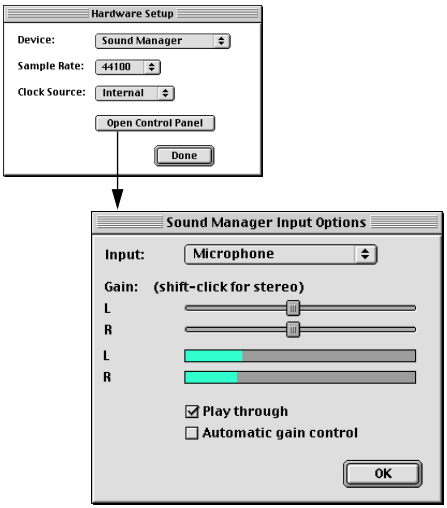


Figure 3.3: Sound Manager Input Options

In the Sound Manager Input Options dialog, configure the following:

- The **Input** pop-up determines the input source (microphone, internal CD, etc.) for recorded material.
- The **Gain** faders (left and right) boost the input signal. Hold down the Shift or Option key to adjust both faders at the same time.

  Use the accompanying L and R input LEDs to monitor for an optimum input signal.

- Check **Play through** to echo the input source to your computer's output.

  You'll usually want this is option disabled when using Vision, which has it's own "Thru" option in the Record Monitor.
- Check **Automatic gain control** for input levels to be adjusted automatically when recording (recommended when using Apple's PlainTalk microphone).

Digidesign Audio Cards

If using the Digidesign DirectIO driver, click the **Open Control Panel** button to access the Digidesign Hardware Setup dialog, as seen in Figure 3.4.

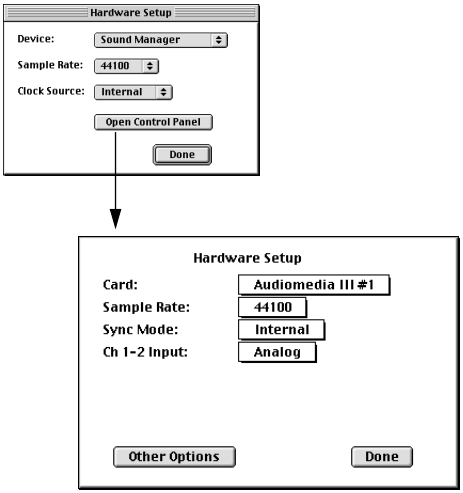


Figure 3.4: Digidesign Hardware Setup for Audiomedia III

Click the **Other Options** button to configure various input and output options specific to your Digidesign audio card.

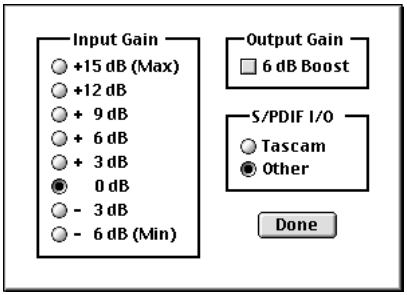


Figure 3.5: Other Options for Audiomedia III

If using an Audiomedia III, for instance, the "other options" include settings for Input and Output Gains, and the type of S/PDIF I/O you will use.

For details on configuring your audio card, consult the Digidesign documentation.

NOTE: In order to use the Digidesign Direct IO driver, you must have version 3.4 or later of the DigiSystem INIT installed.

Other ASIO Hardware

Other ASIO-compatible hardware, such as the Korg 1212 I/O, may provide the bulk of its configuration controls in a separate application or control panel (not directly accessed from Vision). For details, consult the manufacturer's documentation.

NOTE: In order to use your ASIO-compatible audio card, its driver must be in the "ASIO Drivers" folder, and this folder must reside in the same folder as the Vision application.

THE SESSION SAMPLE RATE

The *session sample rate* is the sample rate that Vision uses to record and play back audio.

The term "sample rate" refers to the number of audio samples that comprise 1 second worth of audio. Higher sample rates produce better audio fidelity, but use more disk space (because there are more sample points per second). You can save disk space by using lower sample rates, but this degrades the audio fidelity.

The session sample rate is the sample rate that is common to all audio files referenced by the sequences in a Vision file. If you attempt to import an audio file whose rate does not match the session sample rate, you will be prompted to convert the file.

When using the Acadia audio system, the session sample rate should always be the same as the hardware sample rate (as specified in the Hardware Setup dialog). Changing the Sample Rate pop-up in the Hardware Setup dialog automatically changes Vision's session sample rate.

When using the Acadia audio system, the session sample rate must always match the rate used by your audio files. If you therefore switch the session sample rate, you will be prompted to convert any existing audio files to the new rate—otherwise they will not play back at the correct pitch and tempo.

To set Vision's session sample rate:

a **Choose Audio>Sample Rate/Size.**

Vision opens the Sample Rate/Size dialog.

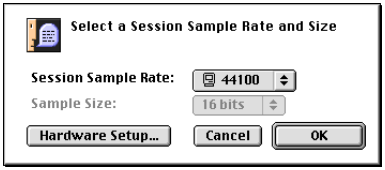


Figure 3.6: Set Session Sample Rate/Size dialog box

b **From the Session Sample Rate pop-up menu, select the desired session sample rate.**

This pop-up menu lists the sample rates supported by your audio hardware and its associated ASIO driver.

c **Click the OK button.**

The session sample rate is changed (along with the rate specified in the Hardware Setup dialog). If necessary, you are prompted to convert existing audio files to the new rate.

NOTE: Attempting to play audio files with sample rates that differ from the session sample rate results in their original pitch and tempo being altered.

ACTIVE IN BACKGROUND

If you want Vision's playback of MIDI and audio to continue uninterrupted when it is not the current application, make sure that "Run MIDI in the Background" is checked in the **OMS MIDI Setup** dialog.

When Vision is stopped, and no longer the current application, audio processing of inputs will continue as long as **Audio>Active in Background** is checked.

CHAPTER 4: Acadia: Record Monitor Window

Use the Record Monitor Window to control such recording operations as:

- record-enabling an input
- record level monitoring
- file and option selection
- Audio Instrument selection

Read this chapter to learn what's in the Record Monitor Window. You'll apply this knowledge when you learn how to actually record audio in *Chapter 5: Acadia: Recording Audio*.

OPENING THE RECORD MONITOR WINDOW

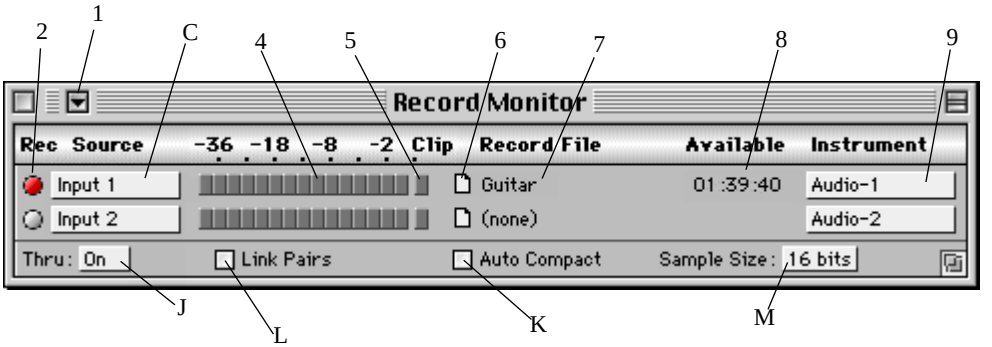
To open the Record Monitor Window:

a **Choose Windows>Record Monitor.**

Vision opens a Record Monitor Window similar to the one shown on page 22.

TIP: You can also open the Record Monitor Window directly from the Control Bar by clicking the Record Indicator button ( ).

NOTE: The appearance of the Record Monitor Window changes slightly depending on the type of hardware specified in the Hardware Setup dialog. Please see Chapter 3: Acadia: Hardware Setup for details on configuring your audio hardware.



Typical Record Monitor Window with two input lines

ANATOMY OF THE RECORD MONITOR WINDOW

The following items discuss each element in the Record Monitor Window shown on page 22.

A **Record Monitor** menu**:** Contains the pop-up menu item for Audio Record Preferences. See *Chapter 21: Advanced Recording Techniques* in your Audio Reference Manual for details.

B **Record Enable Indicators**: Click a Record Enable Indicator to enable recording from the specified record source. The Record Enable Indicator has three states:

—Solid Red: When an input line is record-enabled, this indicator is solid red.

—Flashing Red: The indicator flashes red if Vision is in play mode and has the possibility of recording (such as with punch-in)—it then turns solid red when Vision begins to actually record.

—No Color: The input line is not enabled and will not record audio.

C **Record Source**: Choose from this pop-up menu the record source from which you will record. Record sources include hardware inputs and outputs, busses, and Audio Instruments.

When “Link Pairs” is checked, input and output pairs are available from this pop-up—otherwise, hardware inputs and outputs are listed as mono sources.

D **Record Levels**: Use these LEDs to monitor the audio level from the specified record source.

E **Clipping Indicators**: This indicator lights when an audio level reaches 0 dB and stays lit until you reset it by clicking anywhere within the Record Level indicator for the offending channel.

F **Record File** pop-up: Press and hold this icon to open a pop-up menu of record file options. These options let you enable a new record file, append new audio to an existing file, or close an existing record file.

G **Record File**: This column displays the name of the files to which audio data is recorded.

H **Available Recording Time**: This column displays the amount of recording time available (based on the amount of free disk space and other recording parameters).

I **Audio Instruments**: Use this pop-up menu to assign an Audio Instrument for each record source (or linked pair). Use Audio Instruments to group related audio events, to associate controller data with specific events, and to associate audio events with particular outputs.

J **Thru**: Use this pop-up menu to select one of three audio thru options:

On: Select On if the signal you're recording is patched directly into your computer without first going through a mixing console. When the On option is selected, Vision sends the audio signal arriving at the input directly to the output of an audio channel so that you can hear the signal you're recording.

Off: Select Off if you're using a mixing console to route audio signals to and from your audio interface. When the Off option is selected, Vision does *not* send the audio input signal directly thru to the output.

Auto: Select this option if you want Vision to make "intelligent" thruing decisions based on recording/playback modes. Specifically:

- Vision turns Thru On during idle times.
- Vision turns Thru Off during playback.
- Vision turns Thru On *only* for the input lines that are record-enabled while recording, which allows you to hear what you are recording as you record it.

NOTE: Some ASIO drivers may exhibit a noticeable latency in thruing audio. If at all possible, disable Thru and monitor record sources externally.

K **Auto Compact**: Choose this option to automatically compact audio during recording. Compacting frees disk space by throwing out audio data that is not referenced by the current Vision file (such as data from discarded "takes").

L **Link Pairs**: Choose this option to link two input lines together to create a single stereo audio event. In addition, the input pair is assigned to a single Audio Instrument.

M **Sample Size**: Use this pop-up menu to specify the sample bit depth for the record file. Choices for the Acadia audio system include 16 or 24 bits. See *Using 24 Bits (pg. 24)* for details.

Variations in the Record Monitor Window

The number of input lines that appear in the Record Monitor Window depends on your particular audio hardware. If you are using a Korg 1212, for instance, you will see 12 input lines, as shown in Figure 4.1.

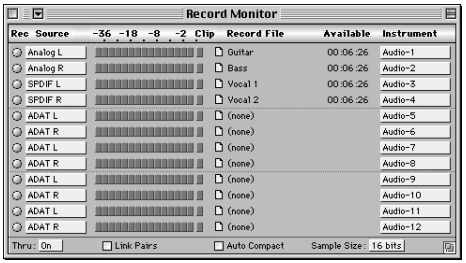


Figure 4.1: Record Monitor Window for Korg 1212

Generally, the number of input lines appearing in the Record Monitor Window corresponds to the number of hardware inputs your audio interface has.

USING 24 BITS

If your digital audio hardware supports 20 or 24 bits, set the Sample Size pop-up in the Record Monitor to **24 bits**. This will let you take full advantage of your hardware's capabilities.

The Acadia audio system can import and play 8, 16 or 24 bit audio files—these formats can even be used at the same time.

If you have a 20 bit sound card and record 24 bit files, the resolution is maintained (though the extra 4 bits are ignored) and will be present during playback. 24 bit audio files are no larger than 20 bit files and therefore don't take any more disk space.

NOTE: Even if your audio hardware supports 20 or 24 bits on input, the extra resolution is only communicated to Vision if it is supported in the ASIO driver.

Contact the manufacturer for information on the supported sample sizes for your audio hardware and its associated ASIO driver.

CHAPTER 5: Acadia: Recording Audio

This chapter discusses how to record digital audio using the Acadia Audio System.

For more details on recording, please see *Chapter 21: Advanced Recording Techniques* in your Audio Reference Manual.

For details on importing audio, please see *Chapter 20: Import/Export Cornucopia* in your Audio Reference Manual.

RECORDING: POWER USER OVERVIEW

Following are the basic steps required to record a mono audio file from a hardware input:

a **Choose Windows>Record Monitor.**

Vision opens the Record Monitor Window.

With the Record Monitor Window active:

a **For the desired input line, specify a mono hardware input from the Record Source pop-up.**

b **Record-enable the input line by clicking its Record Enable Indicator.**

Vision produces a standard Save As dialog box.

c **For the record file, enter a name, folder destination, and file type (AIFF or Sound Designer II).**

d **Send an audio signal to your digital audio interface (or to the sound input jack of your Macintosh) and watch the on-screen LEDs to set an optimal input level.**

e **Enable any other desired options.**

Options include audio thruing, auto compacting, and designating the sample size in bits.

f **Assign a mono Audio Instrument to the audio you're about to record.**

g **Leave the Record Monitor Window open, then go to the Tracks Window.**

The Record Monitor Window must be open in order to record audio.

With the Tracks Window active:

a **Record-enable a track.**

b **In the Control Bar, select the desired record mode.**

If you are about to record an audio event, the Record Mode display contains a small digital audio icon.

c **In the Control Bar, either set a Countoff or select Wait for Note.**

d **Click the Record button in Vision's Control Bar.**

If you chose **Wait for Note**, either play a MIDI note, click the **Play** button, or press the Spacebar to start recording.

e **Begin playing or singing the material you wish to record.**

f **When finished, click the Stop button to stop recording.**

The remainder of this chapter discusses the previous steps in detail.

RECORDING: STEP-BY-STEP

The following sections discuss in detail how to set up and record a single, mono audio track in Vision.

Designate a Record File

To record audio, you must first designate where to store it on your hard disk. This is called the *record file*.

To designate a record file for a monophonic input:

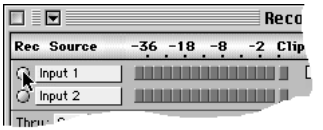
a **Choose Windows>Record Monitor.**

Vision opens the Record Monitor Window.

Figure 5.1: Typical Record Monitor Window

b **For the desired input line, specify a mono hardware input from the Record Source pop-up.**

c **Record-enable the input by clicking its Record Enable Indicator.**

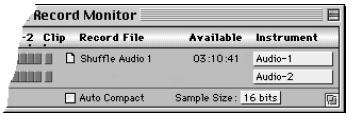


Vision opens a Save As dialog.

d **For the record file, enter a name, folder destination, and file type (AIFF or Sound Designer II).**

e **Click the Save button.**

The name of your record file is displayed in the "Record File" column, the Record Enable Indicator is lit (indicating recording on that input is enabled), and the amount of available recording time is displayed in the "Available" column (as determined by the amount of free space on your hard disk).



Use the Audio Recording Preference dialog to automate the naming of record files, set their default folder location, and specify whether individual "takes" are recorded into the same or separate audio files. See *Chapter 21: Advanced Recording Techniques* in your Audio Reference Manual for details.

Disabling a Record File

You can disable audio recording by clicking the Record Enable Indicator again to turn it off. This lets you record MIDI tracks without recording audio at the same time.

Once you've assigned a record file to an input line, you can toggle its Record Enable on and off as desired—you won't be prompted by the Save As dialog box. That dialog box appears only if you haven't assigned a record file to the input line.

Set Record Levels

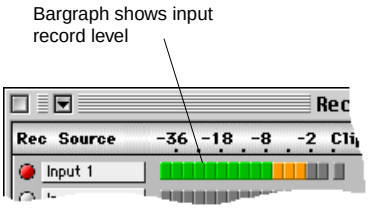
This section discusses how to set recording levels.

The bargraph in the Record Monitor Window functions like an LED display. Whenever the Record Monitor Window is open, its bargraph displays the amplitude for incoming signals.

To set your input levels:

a **Play or sing into a microphone that's connected to the specified audio input.**

b **Look at the bargraph for the input whose volume you wish to set.**



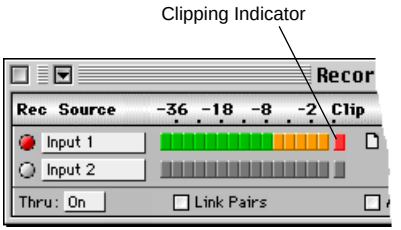
c **Adjust the level of the signal you're sending to Vision.**

To obtain the best signal-to-noise ratio, adjust the signal so that its peak amplitude is as high as possible, but below 0 dB. In digital recording, you cannot record above 0 dB without clipping the audio.

Avoiding Clipping

If the amplitude of the audio signal exceeds 0 dB, the waveform becomes chopped off and flat (like a square wave), and the audio will sound buzzy and distorted. This is called "clipping," which you will most always want to avoid. If you're accustomed to analog recording, you'll soon notice that digital clipping is harsher and much less tolerable than analog clipping.

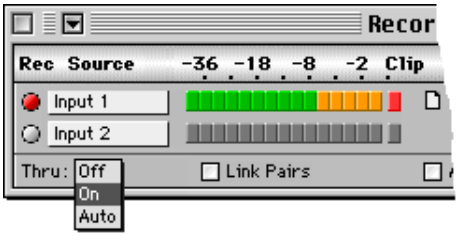
If you clip the input level so the amplitude exceeds 0 dB, the Record Monitor's Clipping Indicator lights at that moment. After the level recedes, the clipping indicator remains lit to remind you that you clipped the input level and you should go back and adjust it.



When you're ready to try a different input level, you can clear the clip light by clicking anywhere in the record level bargraph for that input line.

Monitoring the Input

If you're recording directly into your computer without running the signal through a mixing console, you will need to turn on the **Thru** option in order to hear the signal you're recording.



When you turn on **Thru**, Vision sends the audio input signal directly to the selected Audio Instrument so you can monitor it.

If you're using an external mixing console, use *it* to route the audio signals and turn the **Thru** option off. For more information, see *Anatomy of the Record Monitor Window (pg. 22)*.

NOTE: Some ASIO drivers may exhibit a noticeable latency in thruing audio. In these instances, if at all possible, disable Thru and monitor record sources externally.

Assign an Audio Instrument

Vision initially assigns each record file to one of your Audio Instruments. Audio Instruments are discussed in *Chapter 6: Acadia: Audio Instruments & Routings Window*. For now, you need only know that Vision uses Audio Instruments to determine audio output assignments.

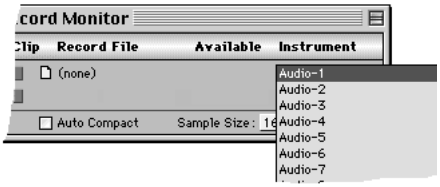
For this reason, it's convenient to select an Audio Instrument when you first record a file. This lets you:

- Audition files after you record them.
- Monitor a recording as you make it (if you use the Record Monitor Window's **Thru** option).

To assign a record file to a specific Audio Instrument:

a **Press and hold the mouse in the Instruments column for the desired input line.**

Vision opens a pop-up menu of Audio Instruments.



b **While still holding the mouse button, drag the cursor over the desired Audio Instrument to select it (highlighting it).**

Since we are not recording from a stereo record source (Link Pairs is not checked), make sure you specify a mono Audio Instrument.

c **Release the mouse button.**

Vision will assign the recorded audio to the selected Audio Instrument.

You can change Audio Instrument assignments any time in the future.

To learn how to assign outputs to an Audio Instrument, see *Output Assignments (pg. 42)*.

Record a Track

Now that you've set a record level and designated a record file into which you will record the audio, you're ready to record a track.

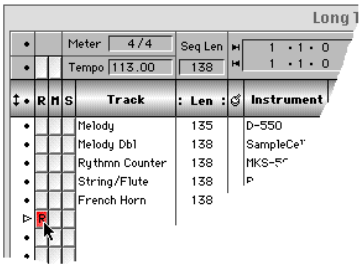
TEMPO TIP: If you have any MIDI data recorded, make sure you're happy with the sequence's tempo. Although you can change the audio's playback tempo with the **DSP>Adjust Audio Tempo™** *command, it's always easier to "do it right the first time" rather than "fixing it in the mix."*

To record an audio track:

a **Leave the Record Monitor Window open.**

The Record Monitor Window must be open in order to record audio.

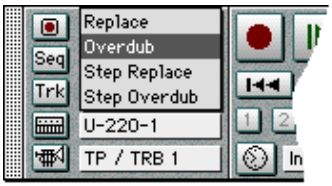
b **In the Tracks Window, click the "R" column to record-enable a track (just as you do when you record MIDI).**



c **If desired, enter a new track name.**

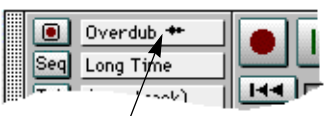
d **Select the desired record mode from the Record Mode pop-up menu in the Control Bar.**

Record modes are discussed in your MIDI Reference Manual.



Record-enabled tracks can *always* record MIDI data, but to record audio the Record Monitor Window must be open and one or more input lines must be record-enabled.

If Vision is properly configured to record audio, then the Record Mode display contains a small digital audio icon.



Digital audio icon indicates that you will be recording audio events

e **In the Control Bar, either set a Countoff or select Wait for Note.**

f **Click the Record button in Vision's Control Bar.**

If you chose **Wait for Note**, either play a MIDI note, click the **Play** button, or press the Spacebar to start recording.

g **Begin playing or singing the material you wish to record.**

Vision records the audio along with any MIDI you perform.

h **When finished, click the Stop button to stop recording.**

The recorded audio is stored in the current record file (or files) listed in the Record Monitor Window. Remember, if you want to record into another file, you need to first designate *it* as the record file.

If you have the Graphic Window open you'll see a graphic representation of your waveform appear below the Piano Roll.

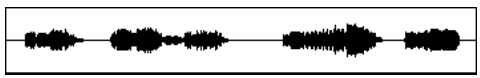


Figure 5.2: Waveform Displayed

The appearance of the waveform is determined by the **Audio>Waveform Display** submenu. Specifically:

- **Off**: This display option completely disables the waveform display. When you select this option, Vision displays waveforms as a straight line and wastes no time calculating their appearance.
- **Fast**: This display option allows Vision to redraw waveform displays quickly because it draws them at a low resolution. This may be desirable when you're recording or playing back audio, but the lower resolution is not as good for detailed audio editing.

- **High Resolution**: This display option allows Vision to display the actual texture of waveforms. This is desirable when you're editing and need to clearly see all peaks and valleys, but it takes the longest amount of time to recalculate and draw.

For more information, see *Chapter 30: The Audio Menu* in your Audio Reference Manual.

NOTE: Remember, if you want to turn audio recording off so Vision records only MIDI, disable the Record Enable Indicator in the Record Monitor Window, or simply close the window. You can see if audio recording is enabled by looking for the little digital audio waveform in the Record Mode pop-up.

ADVANCED RECORDING TECHNIQUES

The following sections discuss other audio recording techniques for Vision.

Stereo Recording

This section discusses how to set up Vision to record stereo audio events using the Acadia audio system.

To record a stereo track:

a **In the Record Monitor Window, click the Link Pairs option to check it.**

Vision automatically switches the mono hardware inputs to a stereo input pair (see Figure 5.3).

Figure 5.3: Link Pairs enabled

b **In the Record Source pop-up, make sure you have the desired input pair selected.**

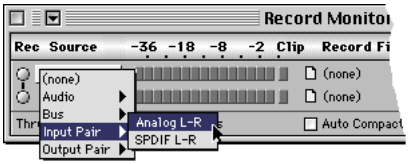
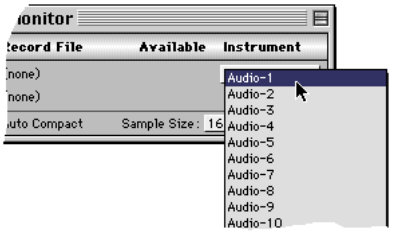


Figure 5.4: Choosing a hardware input pair

c **In the Instrument pop-up, make sure you have a stereo Audio Instrument selected.**



To make an Audio Instrument "stereo," place a checkmark in the Stereo column of the Audio Instruments & Routings Window, see Figure 5.5.

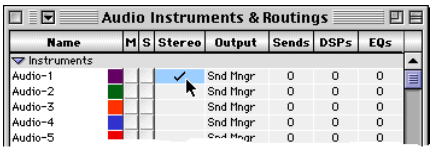
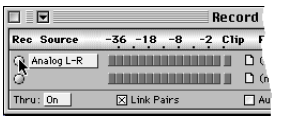


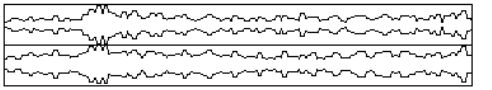
Figure 5.5: Making an Audio Instrument "stereo"

d **Record-enable the linked input pair by clicking one of the Record Enable Indicators.**



When prompted, enter names for the record files for both the left and right channels.

When you record in stereo, both channels appear in the Graphic Window as a single audio event, but with unique left (on top) and right (on bottom) waveforms.



Recording Multiple Takes

It's common to record a particular performance numerous times. Each performance is called a *take*. By recording numerous takes, you can later choose the best performance or, perhaps, assemble a new performance from the various takes.

There are two different techniques for storing multiple takes:

- You can record all audio takes into a single record file.

  This method keeps all audio information together in one place, making it easy to find and back up audio performances.
- You can record each audio take into a separate record file.

  This method keeps different takes in different files so, if you lose or damage a file, you lose only one take and not all of them.

The method you choose affects only how audio is stored on your hard disk—it does not affect playback. Each method can be automated using the **Audio Recording Preferences** dialog. See

Chapter 21: Advanced Recording Techniques in your Audio Reference Manual for more details on recording multiple takes.

You can save disk space by using **Undo** after an unsatisfactory take—when you do so, Vision erases the previously recorded take.

Recording Audio While Monitoring Existing Audio Events

You can record new audio files while monitoring existing ones. For example, you might want to record a backup vocal while listening to your lead vocal.

To do so, simply record into a new track, assigned to a different Audio Instrument while the other audio tracks play.

When using the Acadia audio system, each Audio Instrument can play one audio event at a time. This means that the number of Audio Instruments you've specified determines the theoretical number of tracks (audio events) that can concurrently play. See *Setting the Number of Audio Instruments (pg. 36)* for details.

CHAPTER 6: Acadia: Audio Instruments & Routings Window

This chapter discusses the items contained in the Audio Instruments & Routings Window. To open this window, choose **Windows>Audio Instruments**.

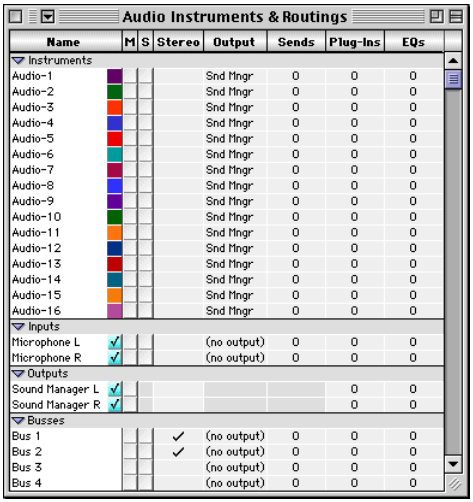


Figure 6.1: Audio Instruments & Routings WIndow

TIP: If a track contains only audio data, you can open the Audio Instruments & Routings Window directly from either the List or Graphic Window by clicking the Instruments button ( ).

As can be seen in Figure 6.1, the Audio Instruments & Routings Window contains sections for the following items:

- **Audio Instruments** are assigned to audio events (residing in tracks), and determine how the events are outputted.
- **Inputs** correspond to the physical inputs of your audio hardware. Inputs appear as input sources in the Console Window and record sources in the Record Monitor.
- **Outputs** correspond to the physical outputs of your audio hardware. Outputs are assigned as destinations for Audio Instruments, Audio Sends, busses, and even hardware inputs. Outputs can also be used as input sources in the Console Window or record sources in the Record Monitor.

  The Acadia audio system supports a maximum of 24 hardware outputs.
- **Busses** (up to 16) act as mono or stereo destinations for groups of console channels (via sends), they can also be assigned as outputs. Busses are useful for creating auxiliary sends to shared plug-ins, submixes, and master faders.

Any of these items (which we will often refer to as audio channels) can act as input sources in the Console Window or Record Monitor.

Each of the four sections in the Audio Instruments & Routings Window can be closed or opened by clicking the appropriate open/close triangle, see Figure 6.2.

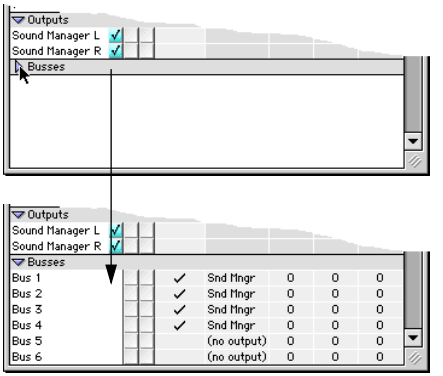


Figure 6.2: Busses section, opened and closed

Vision offers a great amount of flexibility in routing and processing audio. While the following sections in this chapter explain the various controls in the Audio Instruments & Routings Window, *Chapter 7: Acadia: Audio Channels in Consoles* explains how to assign plug-ins, sends, and EQs. In addition, *Chapter 10: Acadia: Bussing, Routing, & Bouncing to Disk* explores some real-world examples for bussing, routing, and recording audio channels.

NOTE: When using either the CBX or Sound Manager audio systems, the Audio Instruments Window does not display Inputs, Outputs, and Busses. This capability is only available for Acadia, and DAE with TDM hardware.

SETTING THE NUMBER OF AUDIO INSTRUMENTS

NOTE: This section applies to all Vision and Studio Vision users but is most applicable to TDM and Acadia users.

Vision can use as many Audio Instruments as your memory and CPU resources allow, up to a maximum of 128.

Vision initially defaults to 16 Audio Instruments, but you can request a greater number if you like. Vision stores the requested number of Audio Instruments in both its Setup file and in each Vision file.

When using the Acadia audio system, the number of Audio Instruments you specify determines the number of possible audio events that can sound at any one time, and the amount of RAM used for audio buffers.

IMPORTANT: The number of Audio Instruments you specify determines only the theoretical number of possible audio events that can play back simultaneously.

There are many other factors that affect the actual number of simultaneous audio tracks you can expect Vision to play. These include: the speed of your CPU; the speed of your hard disk (and the speed of its IDE/SCSI connection); the number of EQ bands in use; and the number and type of VST plug-ins employed. For more information, see "Chapter 11: Acadia: Optimizing for Digital Audio."

To select the desired number of Audio Instruments:

a **Press and hold the mouse on the menu in the Audio Instruments & Routings Window.**

b **Move the cursor over the Number of Instruments item.**

Vision produces a pop-up menu from which you can select the desired number of Audio Instruments.

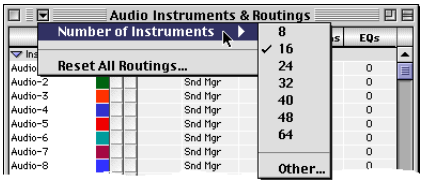


Figure 6.3: Selecting the number of Audio Instruments

c **Highlight the desired number of Audio Instruments, then release the mouse button.**

To specify a number of Audio Instruments not listed in the submenu, choose the **Other** option. From the dialog that appears, you can specify any number of Audio Instruments (up to 128).

VOICE ALLOCATION AND AUDIO PLAYBACK

When using the Acadia audio system, Vision uses “fixed” voice allocation for digital audio playback. This means that each Audio Instrument can play just one audio event at a time.

For instance, if Audio-1 is playing an audio event and a second audio event is encountered (also assigned to Audio-1, either in the same track or in another), the second event will interrupt the first event.

Therefore, if you want overlapping audio events to be played concurrently, they must be assigned to different Audio Instruments—which can reside in the same or separate tracks.

COLUMNS IN THE AUDIO INSTRUMENTS & ROUTINGS WINDOW

The following sections discuss each column in the Audio Instruments & Routings Window. Please note that not all columns apply to all four sections (Audio Instruments, inputs, outputs, and busses).

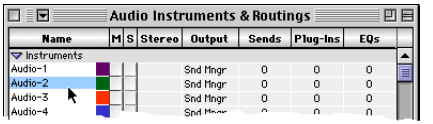
The configuration of the Audio Instruments & Routings Window is saved with each Vision file, and can be saved with the Vision Setup file.

Name

This column displays the name for each Audio Instrument, input, output, and bus. Custom names can be typed in for each item—for instance, “vocals” for an Audio Instrument or “Master L-R” for a bus.

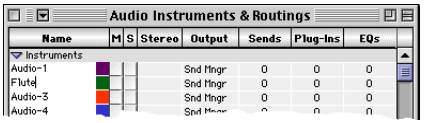
To rename an Audio Instrument, input, output, or bus:

a **Click in the Name column for the desired audio channel.**



The name becomes highlighted.

b **Type in the new name and then type Return.**



Changes to the names are automatically updated in other windows, dialogs, and pop-up menus.

To return a name to its default, highlight the desired name and type the Delete key.

Color

Like MIDI Instruments, each Audio Instrument can have its own color, which is used for displaying track data. To change an Audio Instrument’s assigned color:

a **Choose Windows>Audio Instruments.**

Vision opens the Audio Instruments & Routings Window.

b **Press and hold the mouse in the Color column (located immediately to the right of the Audio Instrument’s name).**

Vision opens a color selection pop-up menu.

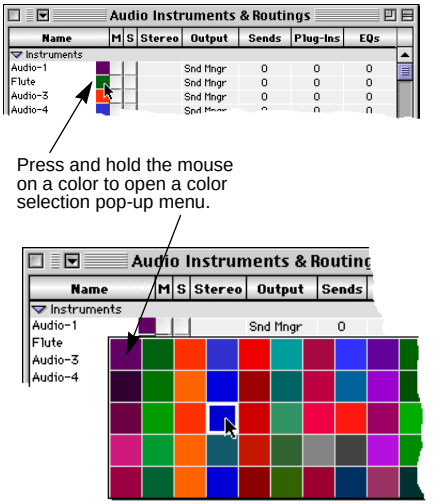


Figure 6.4: Setting an Audio Instrument’s color

c **Highlight the desired color from the pop-up menu and release the mouse button.**

You can change the colors available in the color selection pop-up menu. To do so:

a **Choose Setups>Colors.**

Vision opens a dialog box containing all defined colors.

b **Click the color you wish to change.**

Vision opens a standard Macintosh color picker dialog box.

c **Pick a new color and click the OK button.**

d **Change other colors as desired, then click the OK button to close the Colors dialog box.**

You can reset any modified colors to Opcode's default colors. To do so:

a **Choose Windows>Instruments.**

Vision opens the MIDI Instruments Window.

b **Choose Initialize Colors from the Instruments Window menu.**

Vision resets its colors to their default values.

Enabling Inputs and Outputs

Inputs and outputs are unique in that they have an option for being enabled and disabled from the Audio Instruments & Routings Window. To enable an input or output place a checkmark next to it in the Name column.

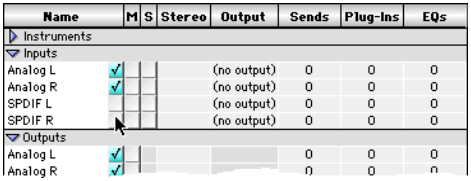


Figure 6.5: Enabling/disabling inputs

By default, only the first two of your hardware inputs and outputs are enabled. To enable more, simply place a checkmark next to the desired items.

To disable an input or output, click on a checkmark to remove it. Disabled items are unavailable (grayed out) in the pop-ups in the Record Monitor and Console Windows.

Inputs and outputs are always enabled or disabled in pairs. For instance, placing a checkmark next to "Input 1" also automatically places a checkmark next to "Input 2."

NOTE: Enabled inputs and outputs consume valuable CPU resources. Therefore, to preserve CPU resources, disable any inputs and outputs not in use.

IMPORTANT: Enabling a digital input may change the Clock Source in the Hardware Setup dialog from "Analog" to "Digital." If you wish to record from only your analog inputs, make sure all digital inputs are disabled.

Mutes and Solos

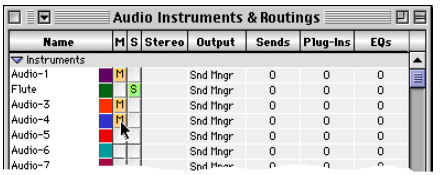
These columns let you mute and solo the items in the Audio Instruments & Routings Window. Muting and soloing occurs across MIDI and Audio Instruments, hardware inputs and outputs, and busses. If you therefore solo a hardware input, playback of MIDI and Audio Instruments will be muted, along with busses.

NOTE: Hardware outputs cannot be soloed and therefore do not have a Solo column.

To mute or solo an Audio Instrument, input, output, or bus:

a **Click the Mute or Solo column next to the desired audio channel.**

This places an “M” or “S” in the column to indicate whether the audio channel is muted or soloed.



Soloing occurs across MIDI and Audio Instruments, inputs, and busses. Soloing an audio channel mutes all unsoloed Audio and MIDI Instruments (and inputs and busses).

b **Click again to disable an audio channel’s mute or solo.**

Buttons for mute and solo also appear for audio channels in the Console Window, and for Audio Instruments in the Graphic Window. Clicking a Mute or Solo button in any location echoes it to the others.

When anything is soloed, the Global Solo Indicator button appears in the Control Bar, which is helpful if you’ve forgotten about a clicked Solo button and suddenly realize that nothing is playing back.

Click Global Solo Indicator
to find soloed Instruments and channels.

Click the Global Solo Indicator button to automatically open the window with the soloed Instrument or audio channel.

Soloing Busses

Soloing a bus may not yield the results you’re expecting. For instance, if you have Audio-1 routed to a bus via an Audio Send and you solo that bus, you will not hear Audio-1.

Therefore, when soloing a bus you must also solo the desired audio channels routed to that bus.

Stereo

The Stereo column determines whether an Audio Instrument, hardware input or output, or bus is stereo or mono. To make an audio channel "stereo," place a check mark in the column for that channel.

In order to play back stereo audio events, they must be assigned to a stereo Audio Instrument.

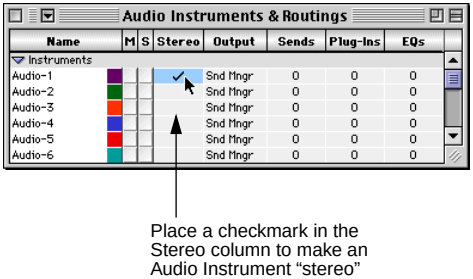
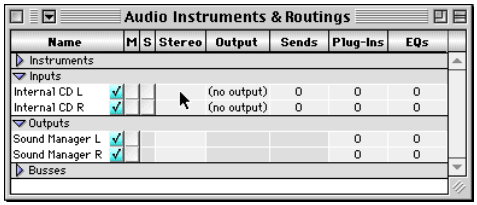


Figure 6.6: Stereo Audio Instrument

Whether a channel is mono or stereo also determines how it can be used as an input source in a console channel, or as a record source in the Record Monitor. For instance, stereo Audio Instruments can only stereo plug-ins, and should be assigned to stereo outputs; also, if you're routing stereo audio channels to a bus, make sure it is a stereo bus; and, if you're attempting to record with Link Pairs checked, you'll need to record from a stereo source (Audio Instrument, input or output, or bus) to a stereo Audio Instrument.

Clicking in the Stereo column works a little differently for inputs and outputs (as opposed to Audio Instruments and busses).



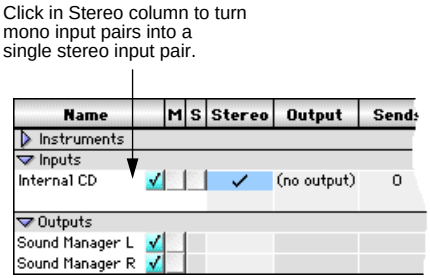


Figure 6.7: Stereo input pair

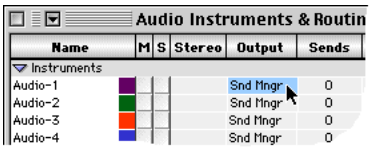
Hardware inputs and outputs can appear in the Audio Instruments & Routings Window as either mono or stereo pairs. For instance, if your audio interface has just two outputs (1-2), they can act as individual mono outputs, or they can act as an output pair—not both. Therefore, placing a checkmark in the stereo column for Output 1 or Output 2 turns them into an output pair ("Output 1-2"), and, in the process, makes them unavailable as mono outputs.

Output Assignments

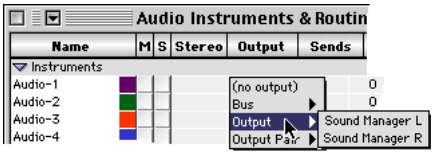
Use the Output column to assign an output for Audio Instruments, hardware inputs, and busses. This lets you easily monitor any of these audio channels without using the Console Window or Record Monitor.

To assign an output for an audio channel:

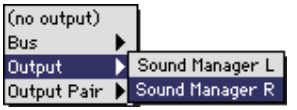
a **Click in the Output column for the desired audio channel.**



A pop-up menu of Outputs appears.



b **Highlight the appropriate output type (Bus, single Output, or Output Pair), then select from the submenu the desired destination.**



The items appearing in the Output pop-up correspond directly to your hardware outputs and busses. If you have renamed any of these items, it is reflected in the Output pop-up.

Interestingly enough, busses can be assigned to either outputs, or to other busses (you can send submixes to a master mix, for instance). You cannot, however, route an individual bus to itself, or assign a bus if the routing will result in a loop. Clicking in the Output column for Bus 1, for instance, reveals that “Bus 1” is unavailable.

The Output column’s pop-up menu is duplicated in the Console Window for each audio channel. Changing an output assignment in the Audio Instruments & Routings Window automatically updates it in the Console Window, and vice versa.

NOTE: The Input and Output sections in the Audio Instruments & Routings Window only displays items as either mono or stereo—not both. And, only these displayed items show up as sources in the Instrument Selector pop-up for console channels in the Console Window.

However, all outputs, mono and stereo pairs, are available in the Output column pop-up (and in the Output Selector pop-up for console channels).

IMPORTANT: Bus outputs must be assigned to an actual hardware output before any of the audio channels routed to them will be heard.

Sends, Plug-Ins, and EQs

These columns let you monitor the number of assigned sends, plug-ins, and EQ bands for Audio Instruments, inputs, outputs, and busses. The individual fields for each column are for display purposes only, you cannot click in them to make changes—they indicate the processing and routing resources assigned in all of four Console Windows.

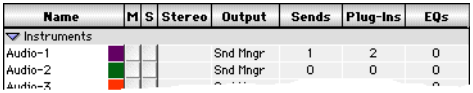


Figure 6.8: Viewing Sends, Plug-Ins, and EQs

In Figure 6.8, for instance, Audio-1 is routed to one send, is assigned to two plug-ins, and has no of EQ bands enabled.

Since it is possible for audio channels to be removed from a Console Window without clearing their sends, plug-ins, and EQ settings, these columns can be used to monitor these assignments—regardless of the state of the Console Windows.

And, if the Performance Window (see page 81 for a description) indicates you are low on CPU resources, you can use the Audio Instruments & Routings Window for a global overview of where those resources are being used.

NOTE: Since Audio Sends are not available for outputs in the Console Window, the Sends column is grayed out for outputs in the Audio Instruments & Routings Window.

Clearing Routings

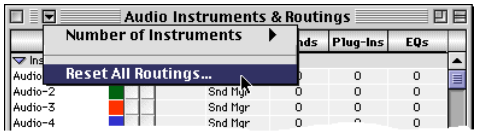


Figure 6.9: Reset All Routings command

From the menu in the Audio Instruments & Routings Window, choose **Reset All Routings** to:

- Clear all plug-in and send assignments;
- Reset and disable all EQ settings;
- Reset all output assignments for Audio Instruments to their default first two outputs.
- Set all output assignments for inputs and busses to “none”;

You can, of course, manually remove plug-in and send assignments and disable EQs in the Console Window. In addition, you can choose **Clear Console** from the menu in the Console Window to clear everything in *that* console, including plug-ins, sends, and EQ settings.

SAVING INSTRUMENT SETUPS

The configuration of the Audio Instruments & Routings Window is saved with each Vision file, along with MIDI Instruments.

You may also save this information in the Vision Setup file by using the **File>Save as Setup** command. See your MIDI Reference Manual for more information about the Vision Setup file.

CHAPTER 7: Acadia: Audio Channels in Consoles

AUDIO IN CONSOLES

Before reading this chapter, you should be familiar with Visions's Console Windows. If you haven't done so, please read *Chapter 38: The Console Windows* in your MIDI Reference Manual.

In addition to controls for volume, pan, mute, and solo, Console Windows provide additional processing and routing capabilities for audio channels. These include:

- **4 Plug-In** inserts assignable to VST-compatible plug-ins;
- **EQ** with up to 4 independent bands, along with Phase control;
- **4 Sends** routeable to either hardware outputs, or to any of 16 busses;
- **16 Busses** for creating submixes and master faders, and for routing to shared plug-ins.
- **Outputs** assignable to hardware outputs or any of 16 busses.

Figure 7.1 illustrates a console channel with most of its processing and routing capabilities displayed. These individual components (sends, plug-ins, EQs, and outputs) will each be discussed in detail later in this chapter. For now, it's important to grasp the basic signal flow for an audio channel within a console.

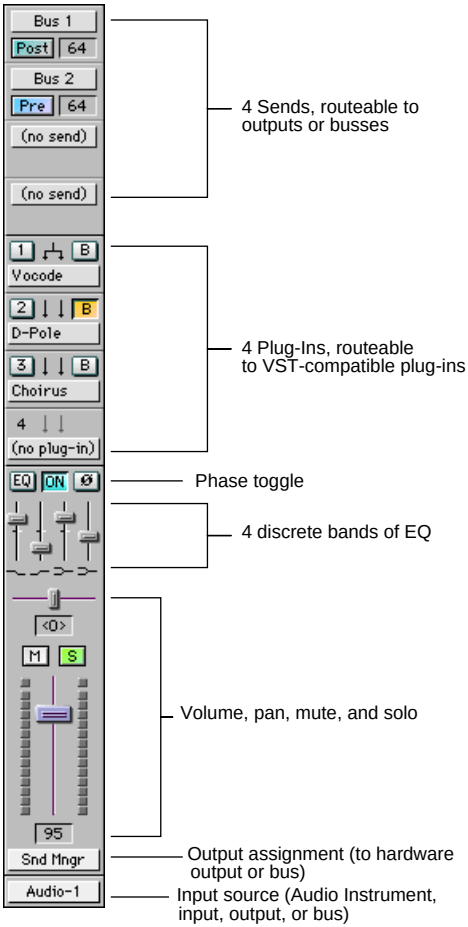


Figure 7.1: Console channel for audio

While Figure 7.1 illustrates an actual console channel as it might appear in Vision, Figure 7.2 illustrates the theoretical signal flow for an audio console channel. Notice that the signal flow begins with an input source (which can be an Audio Instrument, input, output, or bus) and ends with an output assignment (which can be a hardware output or a bus).

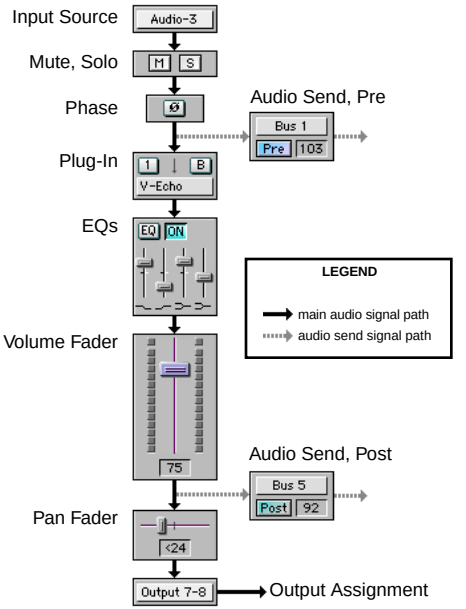


Figure 7.2: Audio signal flow in a console channel

In between the source and the output, the signal can be processed by plug-ins and EQ, and the signal can be routed to busses via sends.

Pay particular attention to the order of the components in Figure 7.2. While mute, solo, and volume affect signals sent to busses via sends (pre and post), pan only affects what is sent to the output.

While EQs affect the signal after being processed by the plug-ins, a channel's Phase mode (enabled in the EQ Area) occurs before sends.

Sends to busses can be *pre* or *post*, taking advantage of, or ignoring the plug-in modules, EQ settings, and volume fader.

Mono vs. Stereo Signals

The various components in an audio channel interact differently depending on whether the signal is mono or stereo.

Audio Instruments, inputs, outputs, and busses can be either mono or stereo as specified in the Audio Instruments & Routings Window.

However, routing a mono source to a stereo destination, and vice versa, has important ramifications for what happens to the audio signal. When relevant, these points will be discussed in the remaining sections of this chapter.

ASSIGNING PLUG-INS

The Acadia audio system supports VST-compatible plug-ins. These plug-ins offer real-time processing of audio in Vision. Vision ships with a large number of useful plug-ins developed by Opcode. These plug-ins are installed into a folder called "VSTPlugins," which must reside in the same folder as the Vision application.

If you have other VST plug-ins you'd like to use with Vision, just drag a copy of them (or an alias) into the *VSTPlugins* folder.

Up to four plug-ins can be used for each audio channel—the output of each plug-in connecting to the next (in series).

NOTE: Although you can assign up to four plug-ins for each console channel, you probably shouldn't do this for every channel. This can take up a lot of CPU resources and limit the number of tracks you can successfully play in Vision. For more details, see "Chapter 11: Acadia: Optimizing for Digital Audio."

Following is an example of how to assign plug-ins in the Console Window. For details on using the Plug-In Edit Window to edit, store, and recall plug-in programs, please see *Chapter 8: Acadia: Plug-In Edit Window*.

To assign a plug-in to an audio console channel:

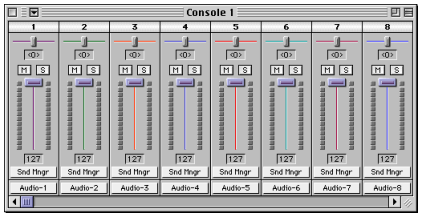
a **Choose Windows>Consoles> Console 1.**

The Console Window opens.

TIP: For easy access to any of the four Console Windows, use the Commands Window to assign a key equivalent to open them.

b **From the Console Window menu, choose Build Console From>Audio Instruments.**

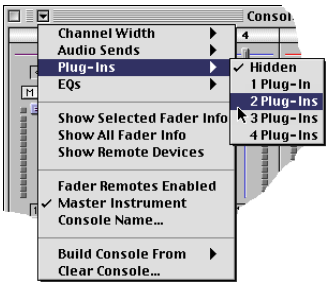
Each of your Audio Instruments is automatically assigned to a console channel.



NOTE: You could manually assign individual channels to only those Audio Instruments used in your sequence, but this method provides a quick way to create a single console that controls all of your Audio Instruments.

c **From the Console Window menu, press and hold the mouse on the Plug-Ins item.**

Vision produces a submenu of plug-in choices.



d **From the submenu, highlight the desired number of plug-ins and release the mouse.**

Vision adds a Plug-In area to each audio channel in the console.

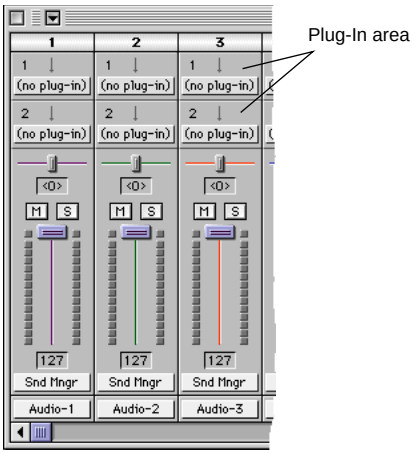
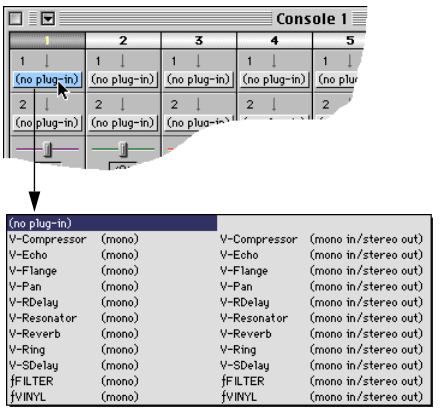


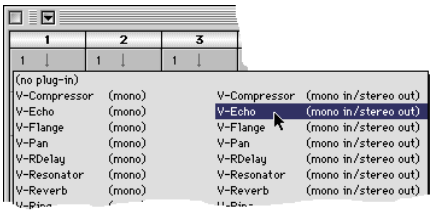
Figure 7.3: Console Window, 2 plug-ins displayed

e **For the desired console channel, click on the Plug-In Selector pop-up.**

A list of installed plug-ins is displayed.

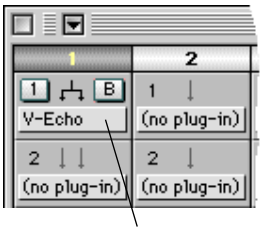


f **While still holding the mouse button, move the cursor over the desired plug-in to highlight it.**



g **Release the mouse button.**

Vision assigns the selected plug-in to the Audio Instrument displayed in that console channel.



The Audio Instrument in this channel uses the “V-Echo” plug-in.

Anatomy of the Plug-In Area

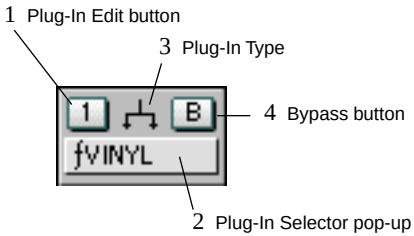


Figure 7.4: Plug-In area

The Plug-In area, once enabled, consists of the following items:

A **Plug-In Edit** button: Click this button to open the Plug-In Edit Window, where you can edit, store, and recall plug-in programs.

Figure 7.5: Plug-In Edit Window

The Plug-In Edit button also displays the console channel's plug-in number (1-4).

For a complete explanation of the components in the Plug-In Edit Window, please see *Chapter 8: Acadia: Plug-In Edit Window*.

B **Plug-In Selector** pop-up: Choose a plug-in from this pop-up menu to assign it to the console channel, or choose "no plug-in" to remove the current one.

Only those plug-ins that will work for the selected audio channel and slot are displayed in the Plug-In Selector pop-up.

C **Plug-In Type**: Indicates whether the plug-in's input and output are mono or stereo—which, in turn, determines the type of plug-in that can be used (see *Mono and Stereo Plug-Ins (pg. 50)*).

mono in/mono out

mono in/stereo out

stereo in/stereo out

When there is no plug-in assigned, the indicator is grayed out.

D **Bypass** button: Click this button to bypass the associated plug-in. Any of the four plug-ins for a console channel can be independently "bypassed" by clicking its Bypass button.

The Bypass button is duplicated in the Plug-In Edit Window. Changing it in either location updates the other.

Mono and Stereo Plug-Ins

There are basically three types of plug-ins:

- **mono in/mono out**

  These plug-ins can only be assigned to a mono Audio Instrument (or mono input, output, or bus), and their output can only be connected to another “mono in” plug-in.
- **mono in/stereo out**

  These plug-ins can only be assigned to a mono Audio Instrument (or mono input, output, or bus), and their output is generally connected to a “stereo in” plug-in.

  Vision can, however, use this plug-in type as a mono in/mono out plug-in by only outputting its left channel. When viewing mono in/stereo out plug-ins in the Plug-In Selector pop-up, a duplicate of each plug-in (labeled as “mono”) is displayed in the left column of the menu.
- **stereo in/stereo out**

  These plug-ins can only be assigned to a stereo Audio Instrument (or stereo input, output, or bus), and their output can only be connected to another “stereo in” plug-in.

Some VST plug-ins can be used in just one mode. Still others can be used in two modes—mono in/stereo out or stereo in/stereo out.

Some manufactures, on the other hand, provide two different versions of their plug-ins for connecting to either mono or stereo. Usually, these plug-ins are named accordingly (for instance, “DeNoiserM” and “DeNoiserS”).

Vision represents plug-in routings graphically in the Console Window, as shown in Figure 7.6.

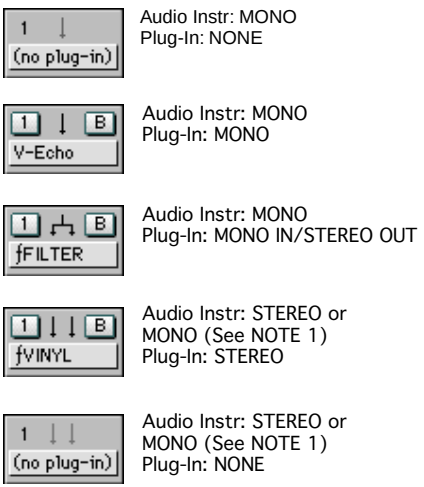


Figure 7.6: Graphic indication of stereo status

NOTE: A mono Audio Instrument can have stereo plug-in inputs if the plug-in above it contains a mono in/stereo out plug-in. For more information, see “Using Mono Plug-Ins (pg. 51).”

Using Stereo Plug-Ins

When assigning plug-ins to a stereo Audio Instrument, only stereo plug-ins appear in the Plug-In Selector pop-up.

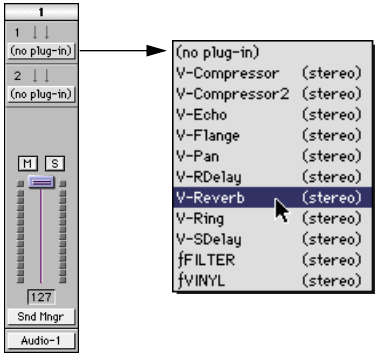


Figure 7.7: Stereo plug-ins

Using Mono Plug-Ins

When assigning plug-ins to a mono Audio Instrument, mono in/mono out and mono in/stereo out plug-ins are available in separate columns from the Plug-In Selector pop-up.

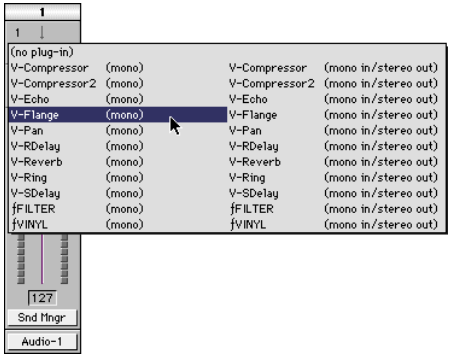


Figure 7.8: Two types of “mono in” plug-ins

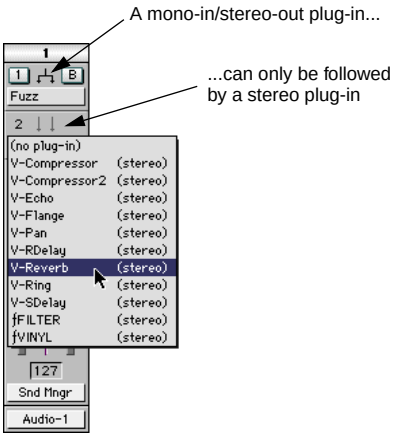
If you select a **mono in/mono out** plug-in, it processes the mono input signal and outputs a mono signal.

NOTE: Vision lets you use mono in/stereo out plug-ins as mono in/mono out plug-ins—thereby preserving a mono signal. These plug-ins are displayed in the left side of the Plug-In Selector pop-up and are labeled “mono,” see Figure 7.8.

Keep in mind that these are not true “mono out” plug-ins and only the left channel is routed.

If you select a **mono in/stereo out** plug-in, it processes the mono input signal and outputs a stereo signal, which means that:

- Since the plug-in’s output is stereo, any plug-in placed after it in the chain can only be a stereo plug-in.
- In order to hear the stereo signal, you must send that signal to an output pair.



ASSIGNING EQ

The Acadia audio system lets you assign up to 4 bands of EQ for each audio channel. The four bands (connected in series) can each be independently set to EQ types of Low Cut, Low Shelf, Parametric, High Shelf, or High Cut.

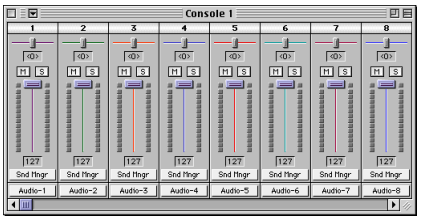
To enable display of the EQ area for your audio channels in the Console Window:

a **Choose Windows>Consoles> Console 1.**

The Console Window opens.

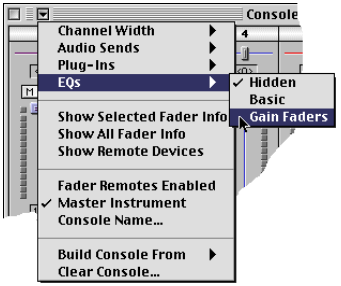
b **From the Console Window menu, choose Build Console From>Audio Instruments.**

Each of your Audio Instruments is automatically assigned to a console channel.



NOTE: You could manually assign individual channels to only those Audio Instruments used in your sequence, but this method provides a quick way to create a single console that controls all of your Audio Instruments.

c **From the Console Window menu, choose EQs>Gain Faders.**



Vision adds an EQ area with Gain faders to each audio channel in the console.

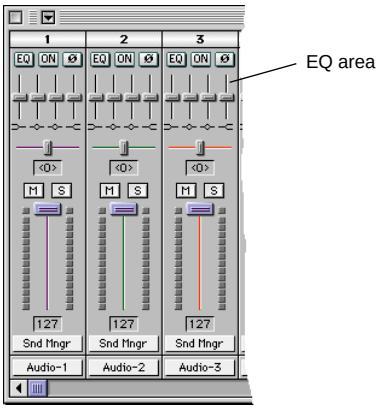


Figure 7.9: EQ area with Gain faders

To enable a channel's EQ, click the **On** button in the EQ area. Then move the "mini" Gain faders to audition different EQ settings.

NOTE: You can also display the EQ area without the Gain faders by choosing **EQs>Basic**. *To hide the EQ area in the Console Window, choose* **EQs>Hidden**.

Anatomy of the EQ Area

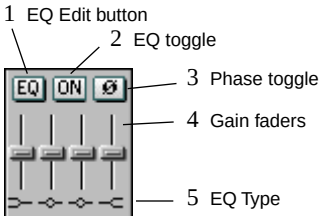


Figure 7.10: EQ area in the Console Window

The EQ area, once enabled, includes the following items:

A **EQ Edit** button: Click this button to open the EQ Window, where you can disable and enable individual EQ bands, specify the EQ type for each band, and view the EQ curve.

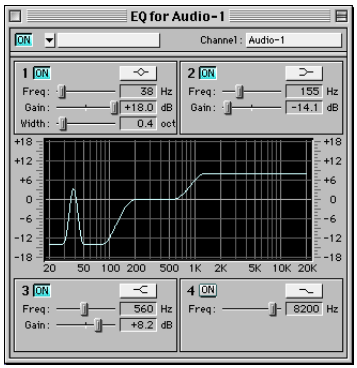


Figure 7.11: EQ Window

For a complete explanation of the components in the EQ Window, please see *Chapter 9: Acadia: EQ Window*.

B **EQ Toggle** button: Turns on and off the EQ for the audio channel.

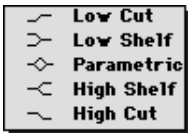
The EQ toggle is duplicated in the EQ Window, changing it in either location updates the other. The EQ Window also has independent toggles for each EQ band.

C **Phase Toggle** button: When clicked, this button inverts the “phase” for the audio channel. For an explanation, please see *Phase (pg. 54)*.

D **Gain** faders: These faders adjust the Gain for each of the four EQ bands. Gain faders are only displayed if the EQ band is enabled and set to Low Shelf, Parametric, or High Shelf. Gain faders are not available if an EQ band is set to either Low Cut or High Cut.

The Gain faders are also displayed in the EQ Window. Changing the Gain value in either location, updates the other.

E **EQ Type**: These graphics indicate the type of EQ used for each band, which include...



A band’s EQ type can only be changed from the EQ Window.

PHASE

Pressing the Phase button in the EQ area of a console channel inverts the phase for the assigned audio channel. This 180 degree shift makes positive signals negative, and negative signals positive. The phase switch is used to prevent signal cancellation that occurs when two signals are out of phase with each other.

In general, if your mix seems “weaker” when you play a particular audio channel, *that* audio is probably out of phase with the rest of your mix—try inverting its phase to “strengthen” it in the mix.

IMPORTANT: Within the signal flow of an audio channel, Phase occurs before sends (both pre and post). Phase is not available for console channels assigned to hardware outputs.

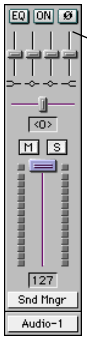
NOTE: You can permanently affect the phase of an audio file with the **Invert Phase** *command in the DSP menu. For details, see Chapter 31: DSP Menu in your Audio Reference manual.*

To invert the phase for an audio channel:

a **Open a Console Window and assign the desired audio channel to a console channel.**

b **From the Console Window menu choose, EQs>Gain Faders.**

The EQ area is added to the audio channels in the Console Window.



EQ area (with Phase toggle)

c **In the EQ area, for the desired channel, click the Phase button so it’s highlighted.**

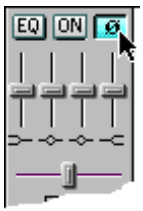


Figure 7.12: Phase inverted

Vision inverts the phase for the audio channel.

Audition the mix to see if the problem has been fixed. If desired, click the Phase toggle again to return the channel to normal.

AUDIO SENDS

Each console channel supports up to four Audio Sends. These work very much like an effects send on a regular mixing console. Destinations for sends can be hardware outputs or any of 16 busses.

Some possible uses for sends include:

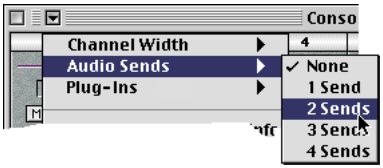
- Route Audio Instruments to a hardware output for external processing;
- Route groups of Audio Instruments to a bus for sub and master mixes;
- Route groups of Audio Instruments to a bus for sharing plug-ins;
- Route Audio Instruments to busses to record a mix of the group.

Displaying Audio Sends

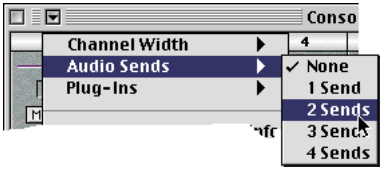
To display Audio Sends for audio channels in the Console Window:

a **From the Console Window's menu, press and hold the mouse on the Audio Sends item.**

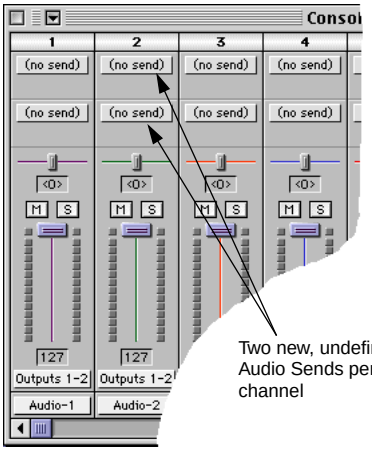
Vision produces a submenu of send options.



b **From the submenu, select the number of Audio Sends you want to display per channel.**



Vision adds a Send area to each audio channel in the console.



Anatomy of the Send Area

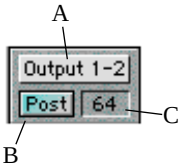


Figure 7.13: Anatomy of the Send area

The Send area, once enabled, contains the following items:

A Send Selector pop-up

B Pre/Post Fader button

C Send Level

NOTE: The Pre/Post Fader button and Send Level numerical are disabled and invisible until you specify a send destination using the Send Selector pop-up. This provides a visual way to quickly locate active channel sends on a busy mixing console.

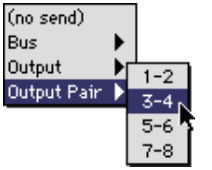
The following sections discuss each of the Audio Send parameters in detail.

Send Selector

Use the Send Selector to tell Vision where to send the audio signal:

a **Press and hold the mouse on the Send Selector.**

Vision opens a pop-up menu of routing options.



You can choose between the following audio send destinations:

- **No send**

  The audio signal is not sent to an external output or bus.

- **Bus**

  Choose “Bus” to open a submenu of 16 busses.

  Sending audio to a bus is a great way to create submixes (see page 74) or to share a single plug-in with numerous audio channels (see page 73).

  Audio channels sent to busses will not be routed until the bus output is assigned to an actual hardware output.

  Busses can be mono or stereo as specified in the Audio Instruments & Routings Window. For more information, see *Mono & Stereo Busses (pg. 58)*.

- **Output**

  Choose “Output” to open a submenu of monophonic outputs for your digital audio hardware.

  The available outputs is determined by your audio hardware, and whether they are enabled in the Audio Instruments & Routings Window.

  Sending audio to a mono output allows you to use external signal processing to modify the audio signal.

- **Output Pair**

  Choose “Output Pair” to open a submenu of stereo output pairs for your digital audio hardware.

  The available output pairs is determined by your audio hardware, and whether they are enabled in the Audio Instruments & Routings Window.

  Sending audio to a stereo output allows you to use external stereo signal processors to modify the audio signal.

Pre / Post Fader Button

Click this button to toggle the Audio Send between two states: *pre fader* and *post fader*.

The button always displays the Audio Send’s current state—clicking it changes both the state and the label of the button. Specifically:

- **Pre Fader** Pre

  When the button looks like this, Vision sends the audio signal to the selected destination *before* it passes through the channel’s plug-in modules, EQ settings, and volume fader.

  The send signal is, however, affected by the velocity of audio events, and by the status of the channel’s Phase mode.

- **Post Fader** Post

  When the button looks like this, Vision sends the audio signal to the selected destination *after* it passes through the channel’s plug-in modules, EQ settings, and volume fader.

IMPORTANT: Regardless of whether pre or post is used, the channel’s pan fader (if active) has no effect on the Audio Send.

For an illustration of the signal flow for pre and post sends, see Figure 7.2 on page 46.

Send Level

Use this numerical to set the level of the audio signal sent to the destination specified in the Send Selector.

Values range between 0 and 127, where:

- 0 = no audio signal is sent to the send destination.
- 127 = 100% of the audio signal level is sent to the send destination.

To adjust the Send Level, click in the field and type in a new value, or click and drag with the mouse.

Mono & Stereo Busses

Busses can be mono or stereo as specified in the Audio Instruments & Routings Window. This means that if you have a stereo Audio Instrument and want it sent to a bus, you should make sure that the destination is a stereo bus.

You can, however, mix and match stereo and mono signals when routing to busses. In doing so, the following rules apply:

- When sending a stereo console channel to a mono bus, the signal is summed.
- When sending a mono console channel to a stereo bus, the signal is sent to both the left and right channels of the bus.

In addition, the following rules apply for busses when used as record sources:

- When recording from a stereo bus, without Link Pairs enabled, to a mono Audio Instrument, only the left signal is recorded.
- When recording from a mono bus, with Link Pairs enabled, to a stereo Audio Instrument, the mono signal is recorded to the left channel with the right channel being silent.

CONSOLE OUTPUTS

Audio console channels have an Output Selector pop-up specifying the channel's output assignment.

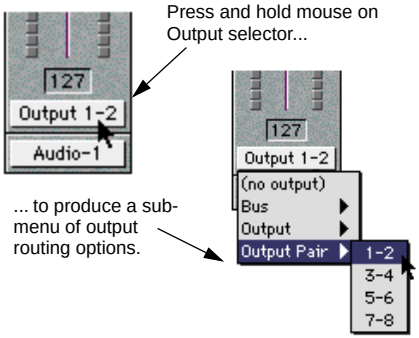
This pop-up is duplicated in the Output column of the Audio Instruments & Routings Window. Changing an audio channel's output assignment in either window updates it in the other.

For information on using the Output column in the Audio Instruments & Routings Window, see *Output Assignments (pg. 42)*.

To assign an output to an audio channel in the Console Window:

a **For the desired audio channel, press and hold the mouse on the Output Selector pop-up.**

Vision produces a submenu of Output routing options.



b **From the submenu, select an output assignment for the audio channel.**

For information about the various output options, see *Output Assignments (pg. 59)*.

NOTE: Audio outputs are only provided for audio console channels—not those assigned to MIDI Instruments.

Output Assignments

The items in the Output pop-up include:

- **No output**: Select this option to disable the output assignment for the channel.
- **Bus**: Select one of sixteen internal busses. By outputting numerous channels to the same bus, you can create a submix (or "group")—controlling all grouped channels with one fader and a shared collection of sends and plug-ins.

  Audio channels assigned to busses will not be heard until the bus output is assigned to an actual hardware output.
- **Output**: Select a single, mono output from this submenu. The number of outputs is determined by your audio hardware.
- **Output Pair**: Select a pair of audio outputs from this submenu. If your audio signal is mono, use the pan fader to position the signal within the stereo field. See *Outputs and Panning (pg. 60)*.

If you have entered custom names for any of your outputs or busses (from the Audio Instruments & Routings Window), they are reflected in the Output pop-up.

The **Output** and **Output Pair** routings are hardware-based. They let you route audio signals to devices that are external to your computer (such as signal processors, mixers, or power amps).

The **Bus** routings are software-based outputs. They let you route audio signals to other software-based components within your computer (such as plug-ins and other console channels).

To preserve the stereo signal for stereo audio channels, you must assign their outputs to a stereo bus or stereo hardware output.

As when routing signals to busses via sends, the following rules apply:

- When outputting a stereo console channel to a mono bus or output, the signal is summed.
- When outputting a mono console channel to a stereo bus or output, the signal is sent to both the left and right channels.

Outputs and Panning

When **Master Instrument** is checked in the Console Window's menu, the vertical and horizontal faders are hard-wired to volume and pan, and always assigned to the same Instrument. However, with regards to audio console channels, the pan (horizontal) fader is only displayed if:

- A mono audio channel's output is assigned to an output pair or stereo bus.

Use the pan fader to position the mono signal in the stereo field.

NOTE: The pan fader is not available if the source for the audio console channel is stereo, or if a mono signal is assigned to a mono output.

Console channels with stereo input sources (Audio Instruments, inputs, outputs, or busses), are not affected by pan data (controller #10).

When you uncheck **Master Instrument**, pan faders are always visible since, in this mode, pan faders can control any Instrument and any type of controller data (not just controller #10).

CLEARING CONSOLES

To return a console to its default state with Instrument Selectors set to "none," choose **Clear Console** from the Console Window menu.

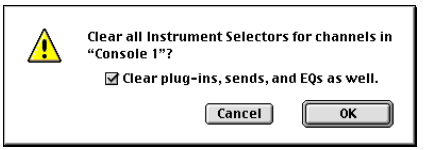


Figure 7.14: Clear Console dialog

This dialog also gives you a checkbox option for clearing plug-ins, sends, and EQs that were assigned in *that* Console Window.

CHAPTER 8: Acadia: Plug-In Edit Window

PLUG-IN EDIT WINDOW

This chapter discusses the components found in the Plug-In Edit Window, which is used to display and edit plug-in parameters, and store and recall plug-in programs. For details on assigning VST plug-ins from the Console Window, please see *Assigning Plug-Ins (pg. 47)*.

To open an Edit Window for a VST plug-in from the Console Window:

a **Click the Plug-In Edit button that contains the desired plug-in number.**

Vision opens an Edit Window for the selected plug-in.

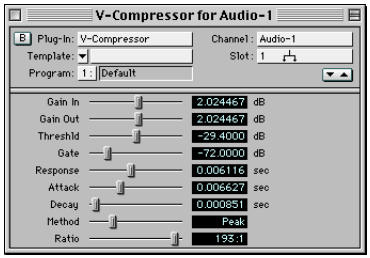


Figure 8.1: Typical Plug-In Edit Window

You can have multiple Plug-In Edit Windows open at the same time. If an existing Plug-In Edit Window is open, Option-click a plug-in number from the Console Window to display *that* plug-in in the current Plug-In Edit Window—this helps you cut down on the proliferation of open windows.

The title bar of each Plug-In Edit Window is based on the name of the plug-in and the audio channel it affects. For instance, the name of the window in Figure 8.1 is "V-Compressor for Audio-1," which means that window is displaying the plug-in *V-Compressor* for Audio Instrument *Audio-1*.

You can leave Plug-In Edit Windows open while Vision plays, auditioning different plug-in presets and tweaking plug-in parameters as necessary. You can even switch the plug-in type during playback.

Some VST plug-ins, commonly referred to as “faceless” plug-ins, display and edit their parameters with basic sliders (see Figure 8.1), while others have more elaborate graphic controls for their parameters (see Figure 8.2).

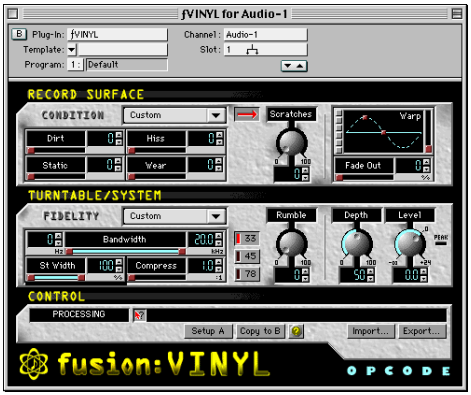


Figure 8.2: Opcode’s Vinyl plug-in

In addition to the plug-in’s display of parameters, Vision adds some additional controls at the top (as shown in Figure 8.3) or bottom of the window.

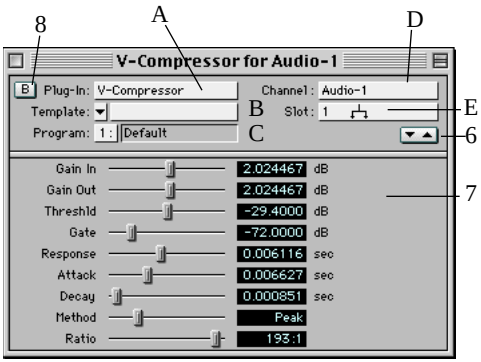


Figure 8.3: Plug-In Edit Window

Specifically:

A **Plug-In Selector**: Choose a plug-in from this pop-up menu to assign it to the console channel, or choose “no plug-in” to remove the current one. This pop-up menu, which is duplicated in the Console Window, displays your installed VST plug-ins.

Only those plug-ins that will work for the selected audio channel and slot are displayed in the Plug-In Selector pop-up. For instance, if using a stereo Audio Instrument, only stereo plug-ins are available (see page 50 for details).

B **Template**: These two pop-ups let you store and recall programs and program banks. See *Saving and Recalling Plug-In Programs and Banks (pg. 63)* for more information.

C **Program**: This pop-up menu chooses from the current bank of programs for the plug-in. See *Saving and Recalling Plug-In Programs and Banks (pg. 63)* for more information.

D **Channel**: Specifies the audio channel (Audio Instrument, hardware input or output, or bus) being processed by the plug-in.

E **Slot**: Displays the plug-in number (1-4) and stereo mode for the plug-in.

F **Flip** button: Click this button to flip the display of the Plug-In Edit Window—placing the plug-in controls either on the top or the bottom of the window.

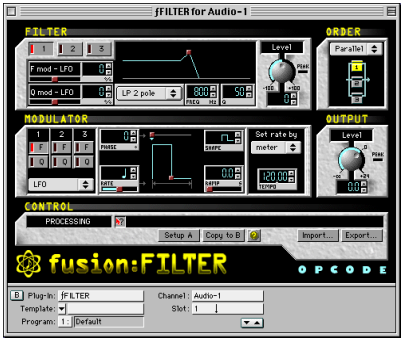


Figure 8.4: Plug-In controls at bottom of window

Vision's plug-in controls are displayed at the top of the Plug-In Edit Window by default. To display them at the bottom, simply click the flip button.

Some third-party VST plug-ins may not display properly in one position or the other. In these cases, use the flip button.

G **Plug-In** parameters: This area displays the parameters for the assigned plug-in. For a description of each parameter, see the manufacturer's documentation.

To get a finer range of values for "faceless" plug-in parameters, hold down the Option key while adjusting its sliders.

H **Bypass** button: Click this button to bypass the plug-in. Other plug-ins within that console channel are not affected—each has its own Bypass button.

The Bypass button is duplicated in the Plug-In area of the Console Window. Clicking it in either location updates it in the other.

SAVING AND RECALLING PLUG-IN PROGRAMS AND BANKS

In Vision, any changes made to plug-in parameters can be saved and recalled as **program** templates.

Groups of programs can be saved and recalled as **bank** templates. The actual number of programs contained within a bank varies from plug-in to plug-in.

Program and bank templates are stored in the *Vision Effects Templates* file, which must reside in the same folder as the Vision application.

Template Pop-up

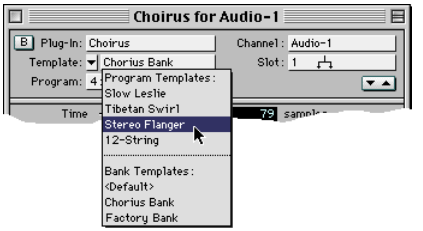


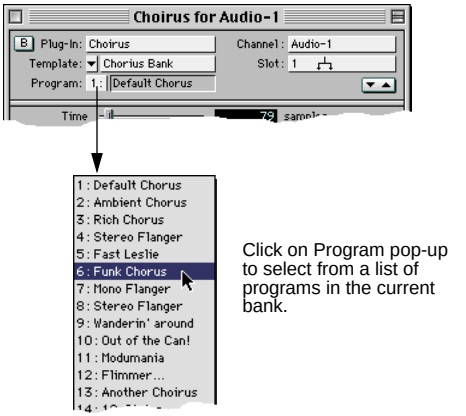
Figure 8.5: Template pop-up

Both programs (at top of menu) and banks (at bottom of menu) are recalled from the Template pop-up menu.

- Recalling a bank template replaces all of the programs in the Program pop-up.
- Recalling a program template replaces the currently selected program location (for the current bank).

When a bank template is chosen, its name is displayed in this pop-up.

Program Pop-up



Click on Program pop-up to select from a list of programs in the current bank.

Figure 8.6: Program pop-up

Individual programs, within the current bank, are selected from the Program pop-up. Doing so recalls the stored plug-in parameters for that program.

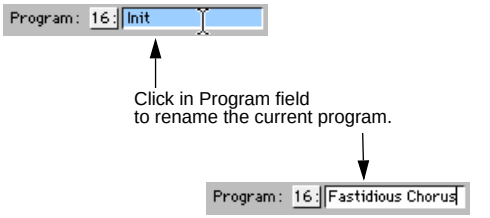


Figure 8.7: Program field

To rename the currently selected program, simply click in the Program field and type in the new name. The newly named program can then be saved as an individual program template, or as part of the current bank template. See the following section, *Template Functions Pop-up (pg. 65)*, for details.

Template Functions Pop-up

The Template Functions pop-up contains commands for saving, importing, exporting, copying and pasting templates for programs and banks.

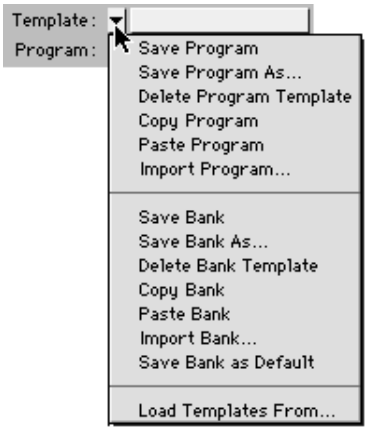


Figure 8.8: Template Functions pop-up

Following is a description of each of the commands in the Template Functions pop-up:

- **Save Program**: Saves the current parameter settings as a program template, using the current program name.

  If the program already exists as a template, this command overwrites it with the current (displayed) set of plug-in parameters.
- **Save Program As**: Saves the current parameter settings to a new program template.

  With this command you are prompted to name the new program template.
- **Delete Program Template**: Deletes the currently selected program template.
- **Copy Program**: Copies the current set of plug-in parameters to the Clipboard, which is handy for pasting programs between banks, or to another program location within the same bank—or to another plug-in slot or console channel using the same plug-in.
- **Paste Program**: Pastes the program from the Clipboard to the current program location for the current bank.
- **Import Program**: Imports individual plug-in programs saved in other VST-compatible applications.
- **Save Bank**: Saves the current bank of programs as a bank template.

  If the bank already exists as a template, this command overwrites it with the current set of programs.
- **Save Bank As**: Saves the current bank of programs as a new bank template.

  With this command you are prompted to name the new bank template.
- **Delete Bank Template**: Deletes the current program bank template.
- **Copy Bank**: Copies the current bank of programs to the Clipboard for pasting to another Plug-In Edit Window.
- **Paste Bank**: Pastes the bank of programs from the Clipboard into the current Plug-In Edit Window.

- **Import Bank**: Imports program banks saved in other VST-compatible applications.

  This command does not automatically save the imported bank as a Vision bank template. To do so, choose “Save Bank.”
- **Save Bank as Default**: Saves the current bank of programs as *default* for the plug-in.

  Each time the plug-in is later assigned to an audio channel, this bank of programs is automatically made current.
- **Load Templates From**: Loads all program and bank templates for this plug-in from a *Vision Effects Templates* file that is not current. The loaded templates are merged with the current set.

CHAPTER 9: Acadia: EQ Window

EDITING EQ SETTINGS

This chapter discusses the components found in the EQ Window, where you can disable and enable individual EQ bands, specify the EQ type for each band, and view the EQ curve.

For details on displaying EQs for audio channels in the Console Window, please see *Assigning EQ (pg. 52)*.

To open an audio channel's EQ Window from the Console Window:

a **Click the small EQ Edit button for the desired console channel.**

Vision opens an EQ Window for the console channel.

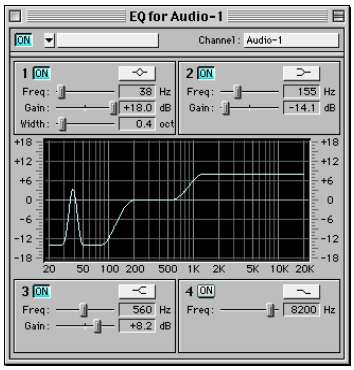


Figure 9.1: EQ Window

You can have multiple EQ Windows open at the same time. Option-click another EQ Edit button from the Console Window to display *that* channel's EQ settings in the current EQ Window—this helps you cut down on the proliferation of open windows.

The title bar of each EQ Window displays the name of the assigned audio channel. For instance, the name of the window in Figure 9.2 is "EQ for Audio-1."

You can leave EQ Windows open while Vision plays, auditioning different EQ templates and tweaking EQ parameters as desired.

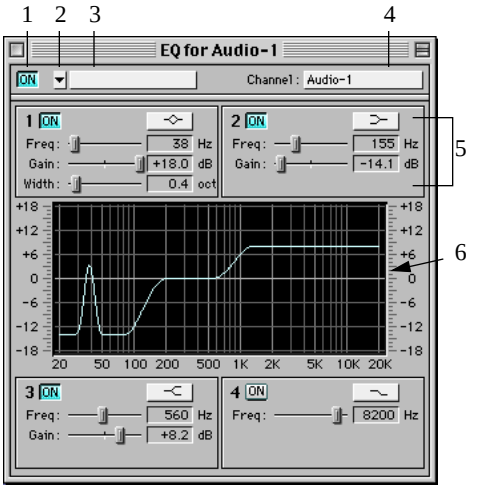


Figure 9.2: EQ Window

Following is a description of the components in the EQ Window:

A **EQ** toggle (main): Click on this button to turn the EQ on and off for the displayed audio channel. This toggle button is duplicated in the EQ area of the Console Window.

In addition to the main EQ toggle, each of the four EQ bands have their own toggle. In order for an individual EQ band to be heard, both *its* toggle and the main toggle must be on.

B **Template Functions** pop-up: Use this pop-up menu to save, copy, and paste EQ settings (see page 71 for details).

C **Template** pop-up: Use this pop-up menu to select from your list of saved EQ templates (see page 70 for details).

D **Channel**: Specifies the audio channel (Audio Instrument, hardware input or output, or bus) being processed by the EQ.

E **EQ Panel** (1-4): Determines the EQ type and parameter settings for each EQ band, and whether the band is on or off. For a complete explanation, see *EQ Panel (pg. 69)*.

F **EQ Curve**: Displays the frequency response for all four bands of EQ for the assigned audio channel.

Frequency is plotted on the *x* (horizontal) axis and amplitude on the *y* (vertical) axis.

EQ PANEL

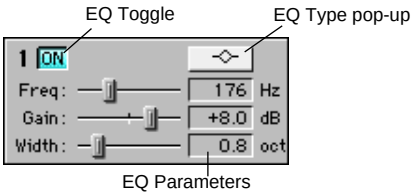


Figure 9.3: EQ Panel, toggled On with Parametric

The EQ Window has four panels displaying the settings for each EQ band. Any of the four EQ bands can be turned on or off independently of the others with their **EQ toggle**.

IMPORTANT: Make sure to turn off any unused EQ bands. This preserves valuable CPU resources, which means you'll be able to get more simultaneous audio tracks and use more plug-ins and sends.

NOTE: Turning off an EQ band in the EQ Window, removes that band's Gain fader from the EQ Area of the Console Window for that audio channel.

The **EQ Type** pop-up determines the type of EQ used for the band, which, in turn, determines the available EQ parameters. Following is a description of each EQ type, along with its accompanying parameters:

- **Low Cut** uses a high pass filter, which eliminates frequencies below the specified cutoff frequency.

This EQ type has just one fader (labeled Frequency) controlling the cutoff frequency, below which frequencies are removed.

When using Low Cut, there is no accompanying Gain fader displayed in the EQ area of the Console Window.

- **Low Shelf** boosts or reduces all frequencies below the specified cutoff frequency.

The Frequency fader for this EQ type determines the cutoff frequency, below which all frequencies are attenuated with the Gain fader.

When using Low Shelf, the Gain fader is also displayed in the EQ area of the Console Window.

- **Parametric** (sometimes referred to as "Peak") boosts or reduces a certain range of frequencies.

The Frequency fader specifies the center frequency and the Width fader determines the range of surrounding frequencies (bandwidth) affected—both of which are attenuated by the Gain fader.

When using Parametric, the Gain fader is also displayed in the EQ area of the Console Window.

- **High Shelf** boosts or reduces all frequencies above the specified cutoff frequency.

The Frequency fader for this EQ type determines the cutoff frequency, above which all frequencies are attenuated with the Gain fader.

- **High Cut** uses a low pass filter, which eliminates frequencies above the specified cutoff frequency.

This EQ type has just one fader (labeled Frequency) controlling the cutoff frequency, above which frequencies are removed.

When using High Cut, there is no accompanying Gain fader displayed in the EQ area of the Console Window.

SAVING AND RECALLING EQ SETTINGS

In Vision, any configuration of EQ settings can be saved and recalled as a template. This lets you save your favorite EQ settings for a wide range of applications (male vocals, 6-string guitar, kick drum, etc.). EQ settings can also be copied and pasted between audio channels.

IMPORTANT: An audio channel's Phase status (on or off) is not saved as part of an EQ template.

EQ templates (along with plug-in programs and banks) are stored in the *Vision Effects Templates* file, which must reside in the same folder as the Vision application.

Template Pop-up

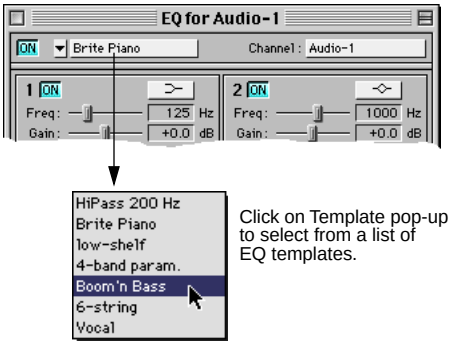


Figure 9.4: EQ Template pop-up

EQ templates are recalled from the Template pop-up in the EQ Window, see Figure 9.4.

Simply click on the pop-up and choose from the list of EQ templates stored in the *Vision Effects Templates* file. Choosing a template automatically reconfigures the EQ Window for the displayed audio channel.

Template Functions Pop-up

The Template Functions pop-up contains commands for saving, copying, and pasting EQ settings.

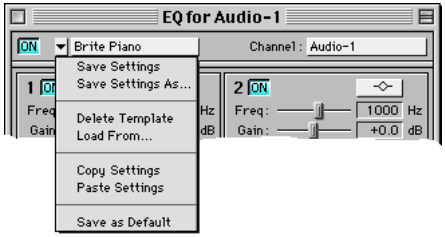


Figure 9.5: Template Functions pop-up for EQ

Following is a description of the commands found in the EQ Template Functions pop-up:

- **Save Settings**: Saves the current EQ settings as a template.

  If the template already exists, this command overwrites it with the currently displayed EQ settings.
- **Save Settings As**: Saves the current EQ settings to a new template.

  With this command you are prompted to enter a name for the new EQ template.
- **Delete Template**: Deletes the currently selected EQ template.
- **Load From**: Loads a set of EQ templates from a *Vision Effects Templates* file that is not current. The loaded templates are merged with the current set.
- **Copy Settings**: Copies the current EQ settings to the Clipboard, which is handy for pasting EQ settings to another audio channel.
- **Paste Settings**: Pastes the EQ settings from the Clipboard to the current EQ Window for the displayed audio channel.
- **Save as Default**: Saves as default the current EQ settings. Then, each time a new file is created in Vision, audio channels will use those settings by default.

CHAPTER 10: Acadia: Bussing, Routing, & Bouncing to Disk

USING BUSSES AND SENDS

The following sections illustrate some uses for busses and sends with the Acadia audio system.

Routing to Shared Plug-Ins (Creating Effects Sends)

This example illustrates how to configure a Console Window with two sends routed to two shared VST plug-ins (see Figure 10.1).

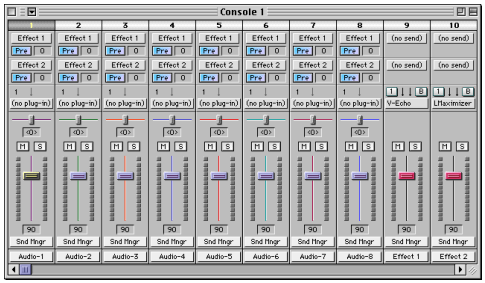


Figure 10.1: Audio Instruments routed to shared plug-ins

This particular scenario conserves CPU resources by allowing audio channels to share plug-ins. While this example uses just two sends, you could use up to four per channel.

a **In the Audio Instruments & Routings Window, set two of your busses to stereo and name them as "Effect 1" and "Effect 2."**

b **Open a Console Window and assign the desired Audio Instruments to console channels.**

You can automatically assign the Audio Instruments in use by your sequences by choosing **Build Console From> Audio Instruments in Use** in the Console Window menu.

c **Assign the busses Effect 1 and Effect 2 to their own console channel.**

Make sure these console channels are assigned to an output pair so you can hear them in stereo.

d **From the Console Window menu, choose Audio Sends>2 Sends.**

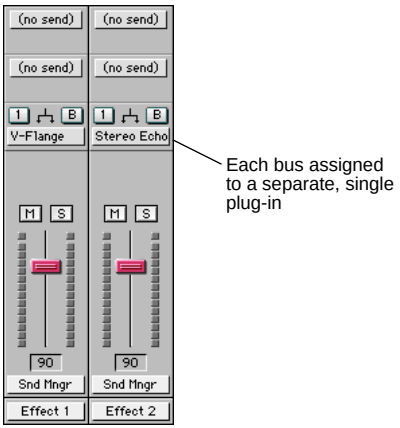
Vision adds two Send areas for each audio channel in the console.

e **For the Audio Instrument channels, assign Audio Send 1 to the Effect 1 bus, and assign Audio Send 2 to the Effect 2 bus.**

f **From the Console Window menu, choose Plug-Ins>1 Plug-In.**

Vision adds one Plug-In area for each audio channel in the console.

g **Assign a plug-in to the console channels assigned to Effect 1 and Effect 2.**



h **Adjust the Send levels for each Audio Instrument.**

If you want a channel's signal to be sent to the busses without being processed by its EQ, or its own plug-ins, set the Pre/Post button **Pre**.

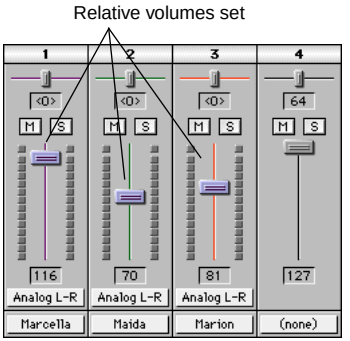
Figure 10.2: Setting an Audio Send to Pre

Creating a Submix

You can use busses and sends to create submixes or "groups" within Vision. For example, assume you've recorded three backup singers—each on a different Audio Instrument (Macella, Maida, and Marion).

a **In one of Vision's consoles, assign three console channels to the three backup singers.**

Use the volume faders in these three channels to mix the singers so that their voices blend together nicely.



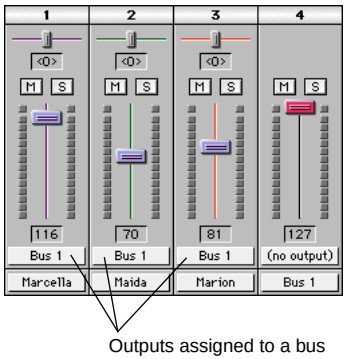
Since we'll be using a stereo bus, you can also use the pan faders for each channel to adjust the stereo field of the mix.

Once you are satisfied with the balance of the three voices, you'll want that "mix" to work as a single unit within the context of the entire song. To do so:

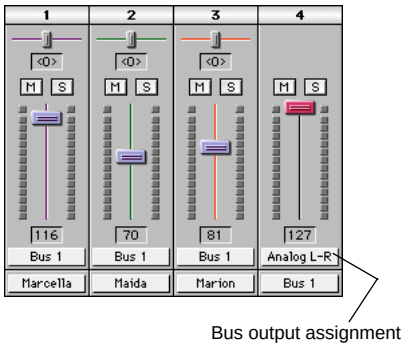
b **Assign a bus to an undefined console channel.**

Make sure the bus you're using is set to "stereo" in the Audio Instruments & Routings Window.

c **Assign the outputs of all three singers' channels to the newly created bus.**

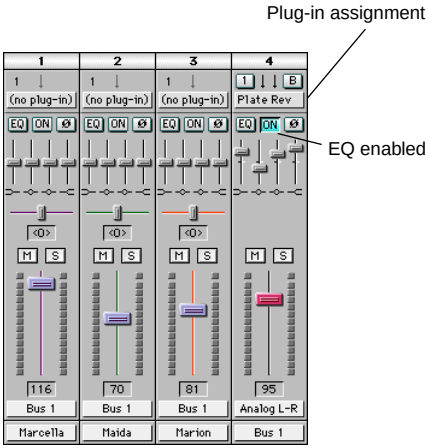


d **Assign the output of the bus to your main L-R outputs.**



e **From the Console Window menu, enable display of some plug-ins, and the EQ Gain faders.**

f **Assign any desired plug-ins to the bus channel; enable the channel's EQ and adjust the EQ gain faders as needed.**



Notice that by processing all three singers as a single group, you're saving valuable CPU resources by affecting all three singers with a single set of plug-ins.

g **Use the bus channel's volume fader to mix the volume of the processed backup singers into the final mix.**

SIGNAL ROUTING AND MONITORING

As discussed in *Monitoring the Input (pg. 28)*, Vision lets you monitor hardware inputs from the Record Monitor Window.

As illustrated in Figure 10.3, notice that:

- In the Record Monitor Window, Input 1 is assigned to Audio-5.
- In the Audio Instruments & Routings Window, Audio-5 is assigned to Output pair 5-6.

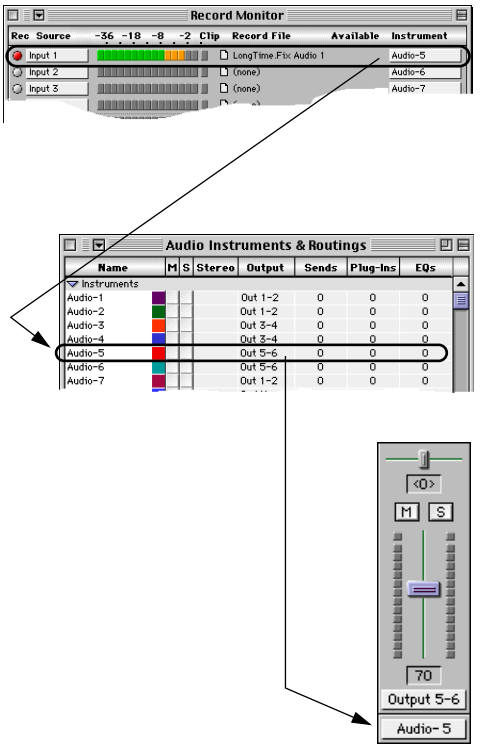


Figure 10.3: Typical audio recording setup

Therefore, when Input 1 is record-enabled and the **Thru** mode is set to either **On** or **Auto**, then:

- The signal present at Input 1 is heard through Output 5-6.

  If you want to change the outputs used to monitor the signal, simply assign different outputs to Audio-5 (or choose a different Audio Instrument).
- The *monitored* signal is affected by the console's volume and pan faders, as well as by any Audio Sends, plug-ins, or EQs that might be in use.

  The *recorded* signal, however, is not affected by the console's volume, pan, sends, plug-ins, or EQs—it's recorded to your hard disk exactly as received.

Virtual Consoles

Since Vision can route hardware inputs through its consoles, you can monitor inputs without record-enabling them. For example, for the scenario illustrated in Figure 10.3, assume you change your console to look as follows:

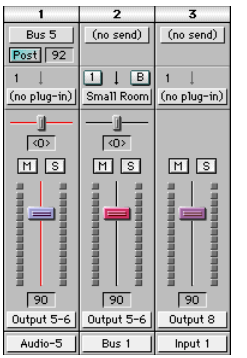


Figure 10.4: Sample console

Based on what you learned earlier, you know that when Input 1 is record-enabled and the **Thru** mode is set to either **On** or **Auto**, then:

- The monitored signal from Input 1 is sent to Output 5-6.
- The monitored signal from Input 1 is also sent to Bus 1 where reverb is added. Bus 1's volume fader controls the amount of reverb that's mixed with the signal.

Here's where things get interesting. Notice that console channel 3 sends the signal present at Input 1 to Output 8. This means that the signal present at Input 1 *always* appears at Output 8, even when...

- ...Input 1 is not record-enabled.
- ...the **Thru** selector pop-up menu is set to **Off**.
- ...you change the Audio Instrument assigned to Input 1 in the Record Monitor Window.
- ...Vision is playing, recording, or simply idle.

Also, if you use any Audio Sends or plug-ins, they too operate on the input signal. This gives you a way to create a "virtual mixing board" within Vision.

As discussed in *Output Assignments (pg. 42)*, you can assign outputs to audio channels from either the Audio Instruments & Routings Window or a Console Window.

NOTE: Some ASIO drivers may exhibit a noticeable latency in thruing audio. In these cases, if at all possible, disable Thru and monitor record sources externally.

RECORDING FROM AUDIO INSTRUMENTS, BUSSES, AND OUTPUTS

You can choose practically any place in the audio signal path as a recording source. This allows you to record digitally and "bounce to disk" without having to patch a single cable. With the Acadia audio system, Vision allows recording from hardware inputs and outputs, Audio Instruments, and busses. For instance, you can:

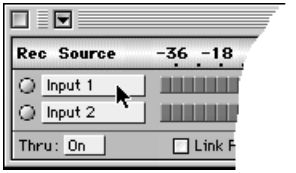
- Record a master mix of all your tracks with effects and EQ. To do this, route all channels to a single stereo bus and record from it.
- Bounce groups of tracks, with or without effects, to a bus for recording a submix.
- "Print the effects" from a track. Record from the output of an Audio Instrument to record its audio events along with any assigned plug-ins and EQ.

Before reading this section you should be familiar with all recording techniques as discussed in *Chapter 5: Acadia: Recording Audio*, and all the bussing concepts described previously in this chapter.

In general to record from any place in the signal path:

a **Configure your console with plug-ins, sends, EQs, and busses.**

b **In the Record Monitor Window, specify the record source from the Record Source pop-up menu.**



c **Set up the Audio Instrument destination and then record.**

For general recording information, consult *Recording: Step-By-Step (pg. 26)*.

What follows are specific instructions for each type of record source for recording.

Recording from Inputs

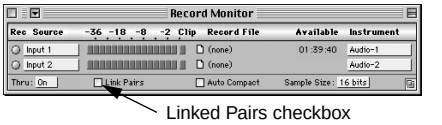
Recording from hardware inputs is the most common way you will record in Vision. The signal coming into one or a pair of the inputs from your audio interface is recorded to a hard disk track and assigned to an Audio Instrument. When recording from an input, no effects or volume fader information is recorded. A description of recording from inputs is found in *Recording: Step-By-Step (pg. 26)*.

Recording from Audio Instruments

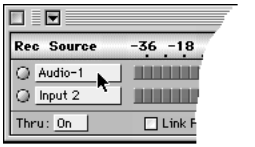
You may want to record your effects and volume information directly to a new Audio Instrument in real time. This is done by recording from an Audio Instrument assigned to existing audio tracks.

To record from a mono Audio Instrument:

a **Make sure Linked Pairs is unchecked in the Record Monitor.**



b **Select the desired (mono) Audio Instrument from the Record Source pop-up.**



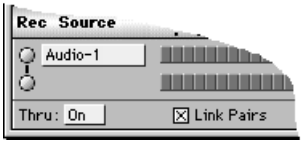
c **Make sure that you are recording to an unused (mono) Audio Instrument.**

d **Record as you would any audio track.**

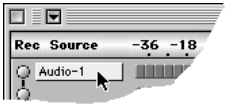
When recording from a mono Audio Instrument, and a series of mono-to-mono plug-ins, the signal goes to the volume fader, then is recorded in mono.

To record from a stereo Audio Instrument, or if you have a mono Audio Instrument using mono-to-stereo plug-ins:

a **Check Linked Pairs in the Record Monitor.**



b **Select the desired (stereo) Audio Instrument from the Record Source pop-up.**



c **Make sure that you are recording to an unused (stereo) Audio Instrument.**

d **Record as you would any audio track.**

When you record from Audio Instruments and busses, your volume fader movements affect the volume of the recording (the actual amplitude of the recorded signal). Any plug-ins EQs that are assigned to those Instruments are also recorded. Vision records the signal from Audio Instruments and busses post volume fader but pre pan fader (unlike hardware inputs). Any real-time changes you make to plug-ins are also recorded. In all cases, you cannot record from an Audio Instrument if its output is not assigned to a hardware output.

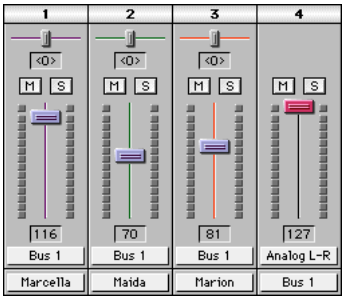
Recording from Busses

You may want to record a master mix, or submix, from the output of a bus that has several plug-ins on it. In this case you would select a bus as your record source in the Record Monitor. Recording from busses is similar to recording from Audio Instruments as previously described. You cannot record from a bus if its output is not assigned to a hardware output.

To record a submix:

a **In a Console Window, assign the output of each audio channel in your mix to a stereo bus.**

This can even include hardware inputs and even other busses.



Then assign the output of that bus to a hardware output pair. This channel will act as your “submaster” fader.

b **Assign any desired plug-ins and EQs to your console channels (including the submix bus),**

c **Check Linked Pairs in the Record Monitor Window.**

d **From the Record Source pop-up in the Record Monitor, select the "submaster" bus.**

e **Record to an unused (stereo) Audio Instrument as you would normally record any audio rack.**

All audio and effects with fader movements for all bussed Instruments are recorded.

While recording, move any of the volume and pan faders for dynamic, real-time changes in your mix.

NOTE: In order for pan automation to be recorded, you must assign the output of a mono Audio Instrument to a stereo bus. Then specify the stereo bus as the record source in the Record Monitor Window.

IMPORTANT: When recording from a stereo bus, you must check Link Pairs in the Record Monitor Window.

When recording from a mono bus, you should uncheck Link Pairs in the Record Monitor Window.

Recording from Outputs

The example covered in *Recording from Busses (pg. 79)* illustrates assigning Audio Instruments to a single bus, and then subsequently using that bus as a record source.

However, you could just as easily have assigned the Audio Instruments to the same (hardware) output pair, which could then act as the record source.

There really is no advantage to recording from busses as opposed to outputs—either can be assigned to console channels with their own plug-ins and EQs.

However, it is very common for most users to start off by assigning the outputs of Audio Instruments to hardware outputs. In these cases, if you don't want to go to the trouble of reassigning everything to a bus, simply use the assigned (hardware) output as a record source.

Busses are more important with regards to grouping Audio Instruments for submixes. For instance, you could have a set of drum channels routed to Bus-1, and a set of vocal channels routed to Bus-2—each acting as a submix fader. Then assign the output of these busses to either another bus (Master) or a hardware output pair.

CHAPTER 11: Acadia: Optimizing for Digital Audio

NUMBER OF AUDIO TRACKS

The number of simultaneous audio tracks you can play varies from system to system. In general, you'll get more tracks if you have a fast CPU and hard disk and lots of RAM. However, the more sends, plug-ins, and EQ bands you use, the fewer tracks you'll get.

So how many tracks can you expect? Well, this could be anywhere from 8-32 tracks—some users may get less, others may get more.

As you will soon see in the following sections on *The Performance Window (pg. 81)* and *The Buffer Size Dialog (pg. 85)*, there are many factors that can affect the number of possible audio tracks.

NOTE: For a list of CPUs along with their number of possible audio tracks, please see the Vision "read me" file.

THE PERFORMANCE WINDOW

Vision's Performance Window, which is only available when using the Acadia audio system, lets you monitor your resources for CPU, hard disk, and RAM.

To open the Performance Window, click the Performance Window button in the Control Bar, see Figure 11.1

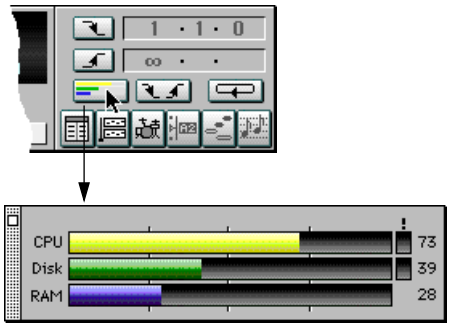


Figure 11.1: Performance Window

The bars in the Performance Window indicate the status of the resources for each item. The larger a bar grows, the fewer the resources there are available. The numbers in the right margin indicate the percentage of resources used.

If you run out of CPU or disk resources, the corresponding alert light becomes lit indicating an audio performance error (the window automatically opens if not already open). Performance errors generally interrupt audio playback for an instant, and in some instances stop it entirely. Encountering a performance error while recording, will interrupt recording.

- In Vision, uncheck **Detailed Track Overview** in the Tracks Window menu.
- In Vision, set **Audio>Waveform Display** to either "Fast" or "Off."
- In Vision, disable any unused hardware inputs and outputs in the Audio Instruments & Routings Window.

Graphics Card

While most Macs have built-in RGB ports, you can achieve better screen resolution and faster screen redraws by using an internal graphics card with dedicated video RAM.

Disk Resources

The green Disk bar in the Performance Window indicates the percentage of disk resources in use by Vision. There are a number of factors that affect disk resources.

Most importantly, make sure you have a "fast" or "wide" SCSI hard disk. When shopping for a hard disk, always look for drives with the fastest speeds for the following parameters:

- Average Seek Time
- Average Access Time
- Rotation Speed
- Sustained Data Transfer Rate

NOTE: Some manufacturers sell hard disks designed specifically for audio and video applications. These hard disks are commonly referred to as "AV" disks.

Your hard disk should have an "asynchronous" driver. In addition, avoid hard disks that use automatic "thermal calibration." If unsure, consult with your computer dealer.

When purchasing a hard disk, get the largest you can. Digital audio can take up a lot of space (for each minute of stereo audio at 44.1 kHz, you will use 10 MB of disk space). It's also smart to have an external hard disk dedicated solely for your Vision files and audio files, with another hard disk reserved for your system software and applications.

When your disk resources become low, check the following:

- If your hard disk becomes defragmented, as is often the case with writing and deleting large amounts of files, use "defragmenting" software to make your disk more efficient (in some cases, it may even be necessary to reformat).
- You can ease the burden of disk access for digital audio by adjusting Vision's Buffer Size dialog (see page 85 for details).

  Make sure your computer has lots of memory—64 MB or more is not unreasonable. The more memory you have, the more you can allocate for digital audio buffers.

- Avoid trying to play lots of small audio events across many tracks, this makes disk access much less efficient.

  If a track has lots of audio events and you are happy with the way it sounds, use the **DSP>Mix** command to write a single, contiguous audio event.

In addition, use Vision's File Management Window to consolidate audio files and delete unused audio files. And, as always, make sure to regularly back up your data.

SCSI Interfaces

For optimum disk performance, use a "fast" or "wide" SCSI hard disk connected directly to a dedicated SCSI controller card installed inside your computer.

Using a separate SCSI bus for audio (as opposed to using your Mac's internal hard disk, or connecting to its built-in SCSI port) is an excellent way to optimize system performance.

RAM Resources

The blue RAM bar in the Performance Window indicates the percentage of Vision's allocated memory that is in use. Vision's available RAM determines the number of notes and audio events that can be recorded, and how Vision allocates memory for the digital audio's Buffer Size (see page 85).

To find out the number of available notes (events), click on the RAM bar for a pop-up menu.

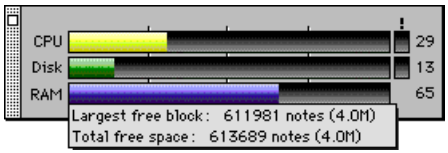


Figure 11.2: Performance Window, Memory pop-up

The "Largest free block" shows the largest contiguous amount of available memory. If the "Total free space" is substantially larger than the "Largest free block," you may have fragmented memory. You can sometimes correct this by quitting and re-launching Vision.

To increase the available memory for Vision, **Get Info** on the application from the Finder and increase the "Preferred Size." This must be done while Vision is not launched.

IMPORTANT: Before allocating more memory to Vision, make sure your computer has enough installed RAM. See your Macintosh operating manuals for more information.

THE BUFFER SIZE DIALOG

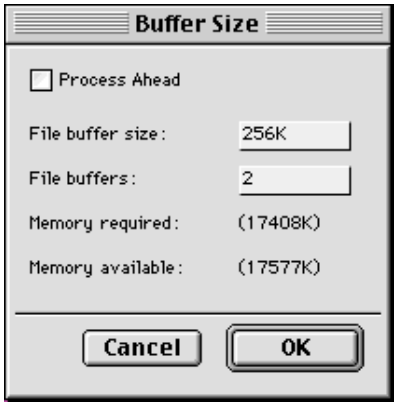


Figure 11.3: Buffer Size dialog

In addition to the RAM required to run the Vision application, the Acadia audio system also needs to set aside memory for use as a RAM buffer. This buffer is used to store digital audio temporarily before recording it to your hard disk, or before playing it.

IMPORTANT: Don't confuse the digital audio buffers with the Vision's application RAM. The audio buffers determine the amount of RAM dedicated to temporarily storing digital audio—the application size determines the amount of memory dedicated to Vision.

When you configure the Buffer Size dialog, Vision attempts to use your System RAM for the digital audio buffers, but if you ask for more RAM than is available, it will use the RAM allocated to Vision.

File Buffers

There are two pop-ups that determine the size and number of file buffers.

The **File Buffer Size** pop-up determines the buffer size (256k, 512k, 768k, or1024k) used for each Audio Instrument channel. When using larger buffer sizes, your Macintosh will store more digital audio in RAM and will not need to access your hard disk as often.

The **File Buffers** pop-up determines the number of file buffers (2, 3, or 4) used for each Audio Instrument channel. Again, the more file buffers you use, the less frequently the disk is accessed.

If you are running out of CPU or disk resources, as determined by the Performance Window (see page 81), try increasing the File Buffer Size. If after reaching a buffer size of 1024k you are still encountering performance errors, try then increasing the number of File Buffers.

Still other users may find that they get better results with a smaller Buffer Size and more File Buffers. In these cases, you might start out with a a Buffer Size of 256k and gradually increase the number of File Buffers until an optimum performance level is achieved.

You may even have to experiment with changing the number of File Buffers for each of the File Buffer sizes until you find the combination that works best for you.

Increasing either the File Buffers or the File Buffer Size is likely to increase the number of simultaneous audio tracks you can play, as well as the number of plug-ins, sends, and EQ bands you can use. As a result, however, you may notice that it takes longer to start and stop playing digital audio. This is because your Macintosh needs to fill the buffer with digital audio from your hard disk.

The amount of RAM required for the file buffers is determined by the File Buffer Size, File Buffers, and the number of specified Audio Instruments.

Process Ahead

When **Process Ahead** is checked, general processing of audio for Vision is more efficient, thereby allowing you to use more audio tracks, sends, plug-ins and EQ bands without encountering performance errors.

However, when Process Ahead is checked, Vision is less efficient in other ways. The latency for “thruing” of audio is more evident; using mute, solo, and faders in Console Windows is less responsive; and initial playback of audio takes a little longer after clicking the Play button.

For general recording and editing, you will probably want to disable Process Ahead. However, when you are ready to do your final mix down, you should enable Process Ahead.

AUDIO PREFERENCES

Use the Audio Preferences dialog to set various record and playback options for the Acadia audio system. To open the Audio Preferences dialog, choose **Audio>Audio Preferences**.

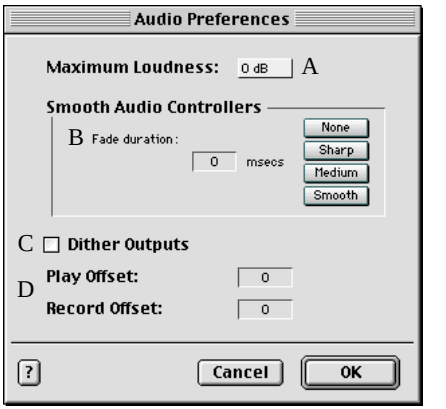


Figure 11.4: Audio Preferences for the Acadia audio system

The components in the Audio Preference dialog include the following:

A Maximum Loudness

B Smooth Audio Controllers

C Dither Outputs

D Play and Record Offsets

All settings in the Audio Preferences dialog are saved in your Vision Prefs file. In addition, the settings for Maximum Loudness, Smooth Audio Controllers, and Dither Outputs are saved with each Vision file.

Maximum Loudness

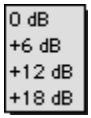


Figure 11.5: Audio Preferences, Maximum Loudness settings

Use the Maximum Loudness pop-up to boost output volumes by up to 18 dB. Adjusting the Maximum Loudness recalibrates volume faders, send amounts, and volume events.

For instance, the default setting of +6 dB calibrates the faders so that a fader value of 90 corresponds to 0 dB, which gives you the capability of boosting audio signals by 6 db by simply moving the fader (to a value of 127).

To boost signals even more than this, you'll need to set the Maximum Loudness to +12 dB or even +18 db.

IMPORTANT: Increasing the Maximum Loudness boosts all volume faders, including those for outputs and busses. So, if you change the Maximum Loudness from +6 dB to +12 dB, faders for Audio Instruments and outputs will be 6 dB louder— resulting in an overall boost of 12 dB.

And if the Audio Instrument is routed to a bus and the bus routed to an output, the overall output boost will be 18 dB.

NOTE: When boosting audio signals, you should assign your outputs to console channels and monitor their LEDs. If any clipping occurs, make the necessary adjustments for the channels routed to these outputs.

In extreme cases where you are dealing with very low amplitudes, you should use the **DSP>Normalize** command on individual audio files as needed (for details, see *Chapter 31: DSP Menu* in your Audio Reference Manual).

Setting the Maximum Loudness to 0 dB doesn't offer any extra "head room" for boosting audio signals with low amplitudes.

When to Set the Maximum Loudness

There will be times when working with a Vision file that you'll notice that your audio files were recorded too low. In these cases you can go to the Audio Preferences dialog and set the Maximum Loudness to +12 dB or +18 dB. In doing so you will instantly notice that all of your audio files sound louder—though your fader values for audio channels remain unchanged.

This is because the calibration of where 0 dB is for fader values has changed. For instance, when the Maximum Loudness is set to +6 dB, a fader value of 90 is equal to 0 dB. With a Maximum Loudness of +12 dB, a fader value of 64 equals 0 dB.

Whenever launching Vision, or opening a new file, the default fader values for audio channels correspond to 0 dB—and, this actual fader value will vary depending on your Maximum Loudness setting.

If you are curious as to how the range of fader values is mapped to dB values, see Table 1, which lists these values for each of the four Maximum Level settings.

Fader Value	0 dB	+6 dB	+12 dB	+18 dB
127	0 dB	+6 dB	+12 dB	+18 dB
90	-6 dB	0 dB	+6 dB	+12 dB
64	-12 dB	-6 dB	0 dB	+6 dB
45	-18 dB	-12 dB	-6 dB	0 dB
32	-24 dB	-18 dB	-12 dB	-6 dB
22	-30 dB	-24 dB	-18 dB	-12 dB
16	-36 dB	-30 dB	-24 dB	-18 dB
11	-42 dB	-36 dB	-30 dB	-24 dB
8	-48 dB	-42 dB	-36 dB	-30 dB
6	-54 dB	-48 dB	-42 dB	-36 dB
4	-60 dB	-54 dB	-48 dB	-42 dB
3	-66 dB	-60 dB	-54 dB	-48 dB
2	-72 dB	-66 dB	-60 dB	-54 dB
1	-78 dB	-72 dB	-66 dB	-60 dB
0	- inf	- inf	- inf	- inf

Table 1: Mapping of fader values to dB levels

Smooth Audio Controllers

Figure 11.6: Audio Preferences, Smooth Audio Controllers

The Smooth Audio Controllers section lets you smooth out rapid changes in volume and pan for audio, thereby eliminating unwanted clicks and pops.

The **Fade duration** value sets the length of the smoothing ramp used when encountering abrupt changes in volume and pan. You can manually enter a value between 0-200 msecs, or you can click on one of the four preset buttons, which include None (0), Sharp (50), Medium (100), or Smooth (200).

For instance, Figure 11.7 displays an audio signal with abrupt changes in amplitude:

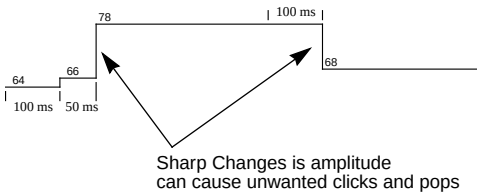


Figure 11.7: Abrupt amplitude changes for original audio envelope.

If we set the Fade Duration to 100 ms by clicking the “Medium” button, Vision will automatically smooth the signal within 100 ms of the amplitude change.

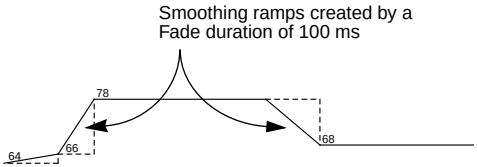


Figure 11.8: Smoother amplitude changes after applying Smooth Audio Controllers

Dither Outputs

Figure 11.9: Audio Preferences, Dither Outputs

Once audio has been recorded or imported into Vision, it is processed and routed using floating-point calculations, which is more flexible and precise than using 16 or 24 bits.

However, when the audio is output, or “bounced to disk,” it is first converted to either 16 or 24 bits (depending on your ASIO driver). In doing so, some amount of digital quantizing occurs, which can lead to unwanted digital artifacts in the audio signal (noticeable as a certain “grainy” quality when fading a sound out).

When you click **Dither Outputs**, a very small amount of random noise is added to the signal in order to mask the digital quantizing, resulting in cleaner fades.

Play and Record Offsets

Figure 11.10: Audio Preferences, Play and Record Offsets

The Play and Record Offsets are used to improve the synchronization of audio and MIDI.

The following sections discuss the purpose of these two controls, their default values, why you might need to modify them, and how to do so.

Play Offset

Use the Play Offset to “shift” audio playback time relative to the sequence’s MIDI playback time. The shift is expressed as a number of audio samples, and can be either positive or negative.

- Positive numbers make Vision start processing audio playback *before* its designated start time. This is desirable because your computer requires a certain amount of processing time to play the audio. By adding a positive offset equal to the time required to process the audio, your MIDI and audio tracks sound synchronized.
- Negative numbers make Vision start processing audio playback after its designated start time.

Record Offset

Use the Record Offset to “shift” audio recording time relative to the sequence’s MIDI recording time. The shift is expressed as a number of audio samples, and can be either positive or negative.

- Positive numbers make Vision start recording audio *before* its designated start time (shifting recorded material to the left in the Graphic Window).
- Negative numbers make Vision start recording audio playback after its designated start time (shifting recorded material to the right in the Graphic Window).

NOTE: In general, you can set Record Offset values as big (positive) as you want. However, there is a limit to the amount of negative offset that you can set.

Default Offset Values

Default values for the Record and Play Offsets are provided for the ASIO drivers included with Vision (Sound Manager and Digidesign Direct IO).

Offset values for all other ASIO hardware default to “0.” The next section discusses how to determine optimum offset values for your audio hardware.

Modifying the Offset Values

To determine an optimum Record Offset for your audio hardware:

a **Make sure Vision’s session sample rate is set to 44.1, and the SMPTE frame rate is 30 ND. In addition, set the sequence’s tempo to 120.**

b **In the Audio Preferences dialog, set both the Record and Play Offsets to 0.**

c **Step record four quarter notes into a MIDI track and set the track to loop for one measure. In addition, set the sequence length to infinity.**

Make sure to use a sound with a sharp attack and quick release, like a hihat.

d **Route the audio output of your MIDI device into your audio interface and record four measures of audio.**

Assign this material to Audio-1 and name the record file “record offset.”

e **Highlight the recorded audio event and choose Audio>Strip Silence.**

Configure the Strip Silence dialog with the following values and click **OK**.

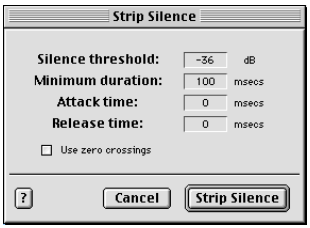
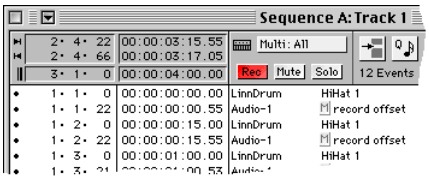


Figure 11.11: Strip Silence dialog

Make sure the **Attack** and **Release** times are both set to 0 msecs.

f **Combine the MIDI track and audio track into a single track and then view its contents in the List Window.**

Make sure **Absolute SMPTE** is checked in the List Window menu.



Make note of the difference in SMPTE bits between the MIDI events (hihat note) and audio events (record offset audio). In the above example, the distance between the first two events is 55 bits. If this number varies throughout the recorded measures, try to find an average value.

NOTE: There are 80 bits to a single SMPTE frame.

g **Use the following formula to calculate an appropriate record offset value (in samples). "N" is the number of SMPTE bits arrived at in the previous step.**

record offset = 44100 * N / 2400

If we use 55 (bits) for N, your optimum record offset would be around 1011 samples.

After entering the Record Offset in the Audio Preferences dialog, as determined by the previous procedure, you are ready to determine an optimum Play Offset for your audio hardware:

a **Route the output of your audio hardware back into one of its inputs.**

b **Record a copy of the "record offset" file from the previous steps.**

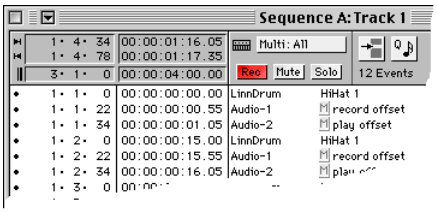
Assign this material to Audio-2 and name the record file "play offset."

c **As done previously, perform Strip Silence on the newly recorded file.**

d **Combine the newly recorded "play offset" track with the previous track containing the MIDI notes and "record offset" audio events.**

e **View the contents of the combined track in the List Window.**

Again, make sure **Absolute SMPTE** is checked in the List Window menu.



Make note of the difference in SMPTE bits between the audio events for Audio-1 (record offset audio) and Audio-2 (play offset audio). In the above example, the distance between the first two events is 30 bits. If this number varies throughout the recorded measures, try to find an average value.

(Remember, there are 80 bits to a SMPTE frame.)

f **Use the following formula to calculate an appropriate play offset value (in samples). “N” is the number of SMPTE bits arrived at in the previous step.**

play offset = 44100 * N / 2400

If we use 30 (bits) for N, your optimum play offset would be around 551 samples.

NOTE: Some users may find after recording with an accurate Record Offset that a Play Offset is not needed.

NOTE: If you intend to do most of your audio work at 48k, you can perform the previous examples with that rate. Just make sure to use a value of “48000” (instead of 44100) in the equation at the end of each procedure.