MOTU 8pre™

User's Guide for Windows

MOTU

SAFETY PRECAUTIONS AND ELECTRICAL REQUIREMENTS

⚠️ **CAUTION! READ THIS SAFETY GUIDE BEFORE YOU BEGIN INSTALLATION OR OPERATION. FAILURE TO COMPLY WITH SAFETY INSTRUCTIONS COULD RESULT IN BODILY INJURY OR EQUIPMENT DAMAGE.**

⚡ **HAZARDOUS VOLAGES: CONTACT MAY CAUSE ELECTRIC SHOCK OR BURN. TURN OFF UNIT BEFORE SERVICING.**

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR OTHER MOISTURE.

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: DO NOT PERMIT FINGERS TO TOUCH THE TERMINALS OF PLUGS WHEN INSTALLING OR REMOVING THE PLUG TO OR FROM THE OUTLET.

WARNING: IF NOT PROPERLY GROUNDED THE MOTU 8pre COULD CAUSE AN ELECTRICAL SHOCK.

The MOTU 8pre is equipped with a three-conductor cord and grounding type plug which has a grounding prong, approved by Underwriters' Laboratories and the Canadian Standards Association. This plug requires a mating three-conductor grounded type outlet as shown in Figure A below. If the outlet you are planning to use for the MOTU 8pre is of the two prong type, DO NOT REMOVE OR ALTER THE GROUNDING PRONG IN ANY MANNER. Use an adapter as shown below and always connect the grounding lug to a known ground. It is recommended that you have a qualified electrician replace the TWO prong outlet with a properly grounded THREE prong outlet. An adapter as illustrated below in Figure B is available for connecting plugs to two-prong receptacles.
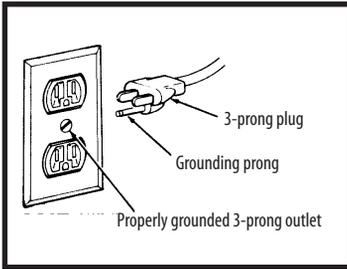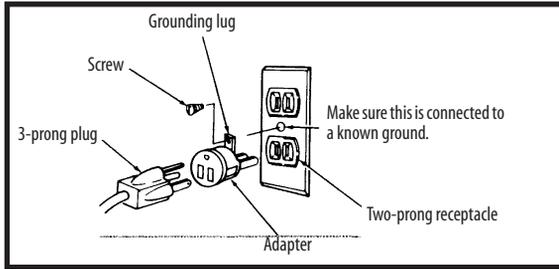
Figure A

- 3-prong plug
- Grounding prong
- Properly grounded 3-prong outlet

Figure B

- Grounding lug
- Screw
- 3-prong plug
- Make sure this is connected to a known ground.
- Two-prong receptacle
- Adapter

WARNING: THE GREEN GROUNDING LUG EXTENDING FROM THE ADAPTER MUST BE CONNECTED TO A PERMANENT GROUND SUCH AS TO A PROPERLY GROUNDED OUTLET BOX. NOT ALL OUTLET BOXES ARE PROPERLY GROUNDED.

If you are not sure that your outlet box is properly grounded, have it checked by a qualified electrician. NOTE: The adapter illustrated is for use only if you already have a properly grounded two-prong receptacle. Adapter is not allowed in Canada by the Canadian Electrical Code. Use only three wire extension cords which have three-prong grounding type plugs and three-prong receptacles which will accept the MOTU 8pre plug.

IMPORTANT SAFEGUARDS

1. Read these instructions. All the safety and operating instructions should be read before operating the 8pre.
2. Keep these instructions. These safety instructions and the 8pre owner's manual should be retained for future reference.
3. Heed all warnings. All warnings on the 8pre and in the owner's manual should be adhered to.
4. Follow all Instructions. All operating and use instructions should be followed.
5. Do not use the 8pre near water.
6. Cleaning - Unplug the 8pre from the computer and clean only with a dry cloth. Do not use liquid or aerosol cleaners.
7. Ventilation - Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Heat - Do not install the 8pre near any heat sources such as radiators, heat registers, stoves, or another apparatus (including an amplifier) that produces heat.
9. Overloading - Do not overload wall outlets and extension cords as this can result in a risk of fire or electrical shock.
10. Grounding - Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult and electrician for replacement of the obsolete outlet.
11. Power cord - Protect the 8pre power cord from being walked on or pinched by items placed upon or against them. Pay particular attention to cords and plugs, convenience receptacles, and the point where they exit from the 8pre.
12. Power switch - Install the 8pre so that the power switch can be accessed and operated at all times.
13. Disconnect - The main plug is considered to be the disconnect device for the 8pre and shall remain readily operable.
14. Accessories - Only use attachments/accessories specified by the manufacturer.
15. Placement - Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the 8pre. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
16. Surge protection - Unplug the 8pre during lightning storms or when unused for long periods of time.
17. Servicing - Refer all servicing to qualified service personnel. Servicing is required when the 8pre has been damaged in any way, such as when a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the 8pre, the 8pre has been exposed to rain or moisture, does not operate normally, or has been dropped.
18. Power Sources - Refer to the manufacturer's operating instructions for power requirements. Be advised that different operating voltages may require the use of a different line cord and/or attachment plug.
19. Installation - Do not install the 8pre in an unventilated rack, or directly above heat-producing equipment such as power amplifiers. Observe the maximum ambient operating temperature listed below.
20. Power amplifiers- Never attach audio power amplifier outputs directly to any of the unit's connectors.
21. Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
22. Safety Check - Upon completion of any service or repairs to this MOTU 8pre, ask the service technician to perform safety checks to determine that the product is in safe operating conditions.

ENVIRONMENT

Operating Temperature: 10°C to 40°C (50°F to 104°)

TO REDUCE THE RISK OF ELECTRICAL SHOCK OR FIRE

⚠️ **CAUTION** RISK OF ELECTRIC SHOCK DO NOT OPEN ⚡

Do not handle the power cord with wet hands. Do not pull on the power cord when disconnecting it from an AC wall outlet. Grasp it by the plug. Do not expose this apparatus to rain or moisture. Do not place objects containing liquids on it.

AC INPUT

100 - 240VAC ~ • 50 / 60Hz • 7 Watts.

Contents

Quick Reference: 8pre Front Panel

1. Each analog input has individual front panel controls, including an input gain (trim) knob (approximately 40 dB of gain), 48 volt phantom power on/off switch (up is on) and –20 dB pad switch (down is engaged).

2. The VOLUME knob is a rotary encoder that can be pushed as well as turned:

   ▪ Turn it to adjust headphone volume. In the LED section to the right, the row of amber LEDs, second from the top, provides general feedback regarding the headphone level as you turn the knob.

   ▪ Push in the knob twice (so that it clicks two times) and then turn it to adjust the volume of the main outs on the rear panel. In the LED section to the right, the middle row of green LEDs, third from the bottom, provides general feedback regarding the headphone level as you turn the knob.

   ▪ Push in and hold the knob for 3 seconds to enter a mode where you can change the clock source. In this mode, the CLOCK LED flashes, turn the knob to change the clock mode. Push it again to exit clock mode.

   ▪ Push and hold the knob for 5 seconds to enter a mode where you can change 2x optical input and output (88.2 or 96kHz) to Type I (for 2x optical connection to SMUX-compatible products) or Type II (for 2x optical connection to MOTU products). The bottom LED in the "1" or "2" column flashes. Turn the volume knob to switch between Type I and II, respectively.

3. These eight 5-segment meters show input signal level for the mic/instrument XLR/combo inputs on the rear panel. When you turn the volume knob, which is a digital rotary encoder, the row of amber LEDs, second from the top, provides general feedback regarding the headphone level as you turn the knob. The scale goes from left to right, where all LEDs are illuminated at full headphone

   volume. The middle row of green LEDs (third from the bottom) performance a similar role for the main out volume adjustment.

4. When the 8pre is connected to computer via FireWire, and the computer is turned on, the 8pre functions as an audio interface. When the computer is off or not connected, the 8pre functions as a digital-to-analog converter. The *Interface* and *Converter* LEDs indicate which mode the 8pre is in.

5. The CLOCK LEDs indicate the current clock source and sample rate. Choose 44.1, 48, 88.2 or 96kHz to operate the 8pre under its own internal clock at the chosen sample rate. To resolve the 8pre to another digital audio device via connection to its optical input, choose either *optical in 1x* (for 44.1 or 48 kHz) or *optical in 2x* (for 88.2 or 96 kHz). If you are resolving to optical at 2x, choose Type II for MOTU products or Type I for third-party products, as described earlier in item number 2.

6. This is a standard quarter-inch stereo headphone jack. From the factory, its output matches the main outs on the rear panel. But it can be programmed to mirror any other (optical) output pair. It can even be programmed to serve as its own independent output. Use the volume knob above to control its level.

7. These eight trim knobs provide approximately 40 dB of gain for both the lo-Z XLR mic input and the hi-Z TRS guitar/instrument input. Both inputs have preamps, so you can plug just about anything into them: a microphone, a guitar, a synth. Use the trim knob and the analog input level meters over in the metering section to calibrate the input signal level. The meters cover both the TRS and XLR input.

8. The 48V phantom power switches provide phantom power for condenser microphones. Down is off; up is on.

9. Flip the PAD switch down to apply a –20 dB reduction in level. Flip it up to disengage the pad.

Quick Reference: 8pre Rear Panel

1. The two ADAT optical ("lightpipe") ports in the top row provide eight channels of digital input and output at 44.1 and 48 kHz. At the 2x sample rates (88.2 or 96 kHz), the top row provides channels 1-4 (in and out) and the bottom row provides channels 5-8 (in and out). When operating the optical ports at a 2x sample rate, be sure to choose either Type I or Type II operation, as explained in item 2, on the previous page.

   When the 8pre is connected to a computer, these optical ports provide digital input and output to and from the computer.

   When the 8pre is not connected directly to a computer (via FireWire), the optical input is disabled and the eight optical output channels mirror any incoming signal on the 8pre's eight XLR/TRS combo jack analog inputs. By connecting the 8pre to another device, such as another ADAT-optical equipped interface or a digital mixer, you add an additional eight mic inputs to your system.

   When the 8pre is slaving to its optical input, it resolves to the input in the top row, even when operating at the 2x sample rates (88.2 or 96 kHz).

   When the 8pre is operating at the 1x sample rates (44.1 or 48 kHz), the optical output in the bottom row mirrors the 8-channel optical output in the top row, allowing you to send the 8pre optical output to two different destinations in your studio, if needed.

2. Connect a MIDI device here using standard MIDI cables. Connect the 8pre's MIDI OUT port to the MIDI IN port on the other device. Conversely, connect the 8pre's MIDI IN port to the MIDI OUT port on the other device. You can connect different devices to each port, such as a controller device to the IN port and a sound module to the OUT port. You can also daisy-chain MIDI devices, but be sure to manage their MIDI channels (so that they don't receive or transmit on the same channel).

3. Connect the 8pre to the computer here using the standard 1394 FireWire cable provided with your 8pre. Use the second FireWire port to daisy-chain up to four MOTU FireWire audio interfaces to a single FireWire bus. You can also connect other FireWire devices to daisy-chain them to the computer, with the computer serving as the FireWire host.

4. These two balanced, quarter-inch jacks serve as the 8pre's main outputs. You can connect them to a set of powered studio monitors and then control the volume from the front panel volume knob. To hear disk tracks in your audio software on these main outs, assign the disk tracks (and master fader) to these main outs (*Main Out 1-2*). You can also use CueMix DSP to monitor live 8pre inputs here as well.

5. These eight XLR/TRS combo jack accepts either a mic cable or a cable with a quarter-inch plug. Both the low-impedance XLR jack and the high-impedance TRS jack are equipped with 40 dB of front-panel trim control. Each XLR (mic) input can be supplied with 48V phantom power or -20 dB pad via its corresponding front-panel switches.

Quick Reference: MOTU Audio Setup

Click the tabs to access general MOTU interface settings or settings specific to the 8pre (or other connected interface.)

Choose the global sample rate for the system here.

Determines the clock source for your 8pre. If you're just using the analog ins and outs, set this to 'Internal'. The other settings are for digital transfers (via optical) or external synchronization to other systems.

If you have a foot switch connected to another MOTU FireWire interface, these settings let you map the foot switch to any computer keyboard key for both the up and down position. This setting does not apply to the 8pre, which does not have a foot switch input.

When operating the 8pre as an interface, choosing a smaller setting here reduces the delay you may hear when listening to live input that you are running through effects plug-ins in your software. But lower settings also increase the strain on your computer. For details, see "Samples Per Buffer" on page 25.

Check this option if the audio software you are using with the 8pre does not support Windows WDM drivers and instead only supports legacy MME (Wave) drivers. When checked, this option makes all of the 8pre inputs and outputs available to legacy Wave-driver compatible audio software.

This option should always be left on (checked). There are only a few rare cases in which you would want to turn it off. For details, refer to the MOTU tech support database at www.motu.com.
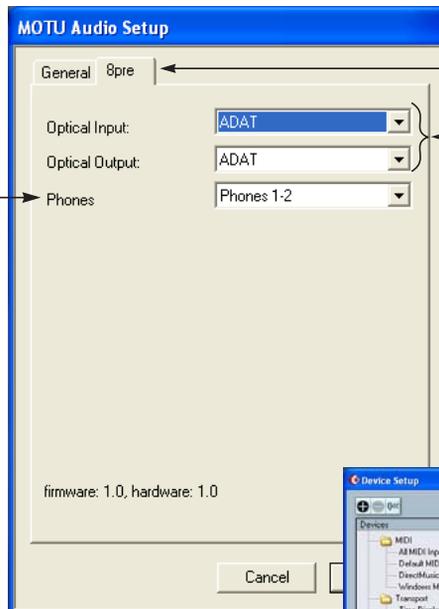
Click the 8pre tab to access these settings.

This menu lets you choose what you will hear from the headphone jack. To mirror the main outs, choose *Main Out 1-2*. Or you can mirror any other output pair. To hear the phones as their own independent output, choose *Phones 1-2*.

Lets you enable or disable the optical input and/or output to conserve FireWire bus bandwidth. For details, see "Optical input/output" on page 26.

Device Setup in Cubase SX

How to access these settings

There are several ways to access these settings:

- From the Windows Start menu, choose Programs>MOTU>MOTU Audio Setup.

- From within Cubase SX, go to the Device Setup window, click the *VST Audiobay* and then choose *MOTU Audio* from the menu. Then click the *MOTU Audio* list item to access the Control Panel button.

- From within other applications, refer to their documentation.

About the 8pre

OVERVIEW

The 8pre is and audio interface that can operate in two general modes: as a FireWire audio interface or as an analog-to-digital converter.

With a standard 19-inch, single-space, rack-mountable I/O form factor, the 8pre connects directly to a computer via a standard FireWire cable or to another interface via an ADAT optical cable.

As a FireWire audio interface, the 8pre is a complete computer-based hard disk recording system for Mac OS X and Windows that offers eight high-quality mic inputs and at any standard sample rate up to 96kHz, plus one bank of ADAT optical digital I/O that provides 8 channels of digital I/O at any sample rate up to 96 kHz. At 88.2 or 96 kHz, a second bank of dedicated ADAT optical jacks provide input and output on channels 5-8.

When the 8pre is not connected to a computer via FireWire, it operates as an analog-to-digital converter. By connecting the 8pre's optical ports to another audio interface, digital mixer or other digital audio system that supports 8-channel ADAT optical I/O, the 8pre becomes as an 8-channel analog to optical expansion interface that adds eight high-quality mic inputs to the system.

The 8pre offers the following features:

■ Eight 24-bit analog combo XLR/TRS mic/ instrument inputs with preamps, each equipped with individually switchable 20 dB pad and 48V phantom power

■ Two 24-bit analog TRS main outputs

■ Eight-channel ADAT optical digital I/O at sample rates up to 96 kHz

■ MIDI I/O

■ On-board SMPTE synchronization

■ Headphone jack

■ Main volume knob (for headphone + main outs)

■ Front-panel 5-segment input meters

■ Front-panel mode and clock status LEDs

■ No-latency analog to digital conversion from the eight analog inputs to the eight ADAT optical digital outputs

With its XLR/TRS combo jack inputs, mic preamps, no-latency monitoring of live input and synchronization capabilities, the 8pre is a complete, portable "studio in a box" when used with a Macintosh or Windows computer. A WDM driver is included for audio applications running under Windows XP. Also included is an ASIO driver for multi-channel operation with any Windows audio software that supports ASIO drivers.

THE 8PRE I/O REAR PANEL

The 8pre rear panel has the following connectors:

■ Two gold-plated, balanced +4dB quarter-inch (TRS) analog outputs (with 24-bit 96kHz converters)

■ Eight 24-bit analog combo XLR/TRS mic/ instrument inputs with preamps, each equipped with individually switchable 20 dB pad, 48V phantom power and 24-bit 96kHz converters

- Two sets of ADAT optical 'light pipe' connectors (8 channels of ADAT optical I/O at all supported sample rates)

- MIDI IN and MIDI OUT

- Two 6-pin FireWire jacks

16 inputs and 12 outputs

When operating as a FireWire audio interface, all 8pre inputs and outputs can be used simultaneously, for a total of 16 inputs and 12 outputs:

Connection	Input	Output
Mic preamps 24-bit 96kHz on XLR/TRS combo	8	-
Main outputs 24-bit 96kHz on bal/unbal TRS	-	stereo
Headphone output	-	stereo
ADAT optical digital (from 44.1 up to 96 kHz)	8	8
Total	**16**	**12**

All inputs and outputs are discrete. In other words, using a mic input does not "steal" an input from the ADAT optical I/O bank. The same is true for the headphone outs and the main outs.

The two banks of ADAT optical ports provide eight channels of input and output at 88.2 or 96 kHz. The upper bank provides channels 1-4 and the lower bank provides channels 5-8.

The headphone output can operate as an independent output pair, or it can mirror any other 8pre output pair, such as the main outs.

Mic inputs with 48V phantom power

Eight rear-panel combo (XLR/TRS) jacks with preamps, phantom power and 20 dB pad let you to connect a microphone, guitar or any quarter-inch input. The XLR jack serves as a low-impedance mic input, and the TRS jack serves as a high-impedance guitar/instrument input. Dedicated front-panel trim knobs allow you to adjust each input independently. Defeatable 48V phantom power and 20dB pad are supplied by convenient front panel switches.

Converters

All eight analog inputs are equipped with 24-bit 96kHz, 64x oversampling A/D converters. The main outs have 24-bit 128x oversampling D/A converters. All audio is carried to the computer in a 24-bit data stream.

Main Outs

The main outs are equipped with 24-bit 128x oversampling D/A converters and serve as independent outputs for the computer. The main outputs are on balanced TRS +4dB quarter-inch jacks. Both of these jacks can also accept unbalanced plugs.

Optical

The 8pre provides two banks of optical "lightpipe" jacks that support the ADAT optical digital I/O format. At 44.1 or 48 kHz, the upper bank provides eight channels of 24-bit digital audio, and the lower bank simply mirrors all 8 channels of the upper bank.

At 88.2 or 96 kHz, the upper bank handles channels 1-4 and the lower bank handles channels 5-8 via the industry Standard S/MUX ("Type I") protocol for third-party product or MOTU's own "Type II" protocol for connecting the 8pre optically to any MOTU audio interface. For details, see "Setting the 2x optical mode" on page 27.

MIDI I/O

The 8pre's standard MIDI IN and MIDI OUT jacks supply 16 channels of MIDI I/O to and from the computer via the 8pre's FireWire connection.

1394 FireWire

The two 1394 FireWire jacks accept a standard IEEE 1394 FireWire cable to connect the 8pre to a FireWire-equipped Macintosh or Windows computer. The second jack can be used to daisy

chain multiple interfaces — up to four MOTU FireWire interfaces — on a single FireWire bus. It can also be used to connect other FireWire devices without the need for a FireWire hub.

On-board SMPTE synchronization

The 8pre can resolve directly to SMPTE time code via any analog input, without a separate synchronizer. The 8pre provides a DSP-driven phase-lock engine with sophisticated filtering that provides fast lockup times and sub-frame accuracy.

The included MOTU SMPTE Setup™ software provides a complete set of tools to generate SMPTE for striping, regenerating or slaving other devices to the computer. Like CueMix DSP, the synchronization features are cross-platform and compatible with all audio sequencer software that supports the ASIO2 sample-accurate sync protocol.

THE 8PRE FRONT PANEL

Preamp trims, 48V phantom power and pad

The 8pre front panel provides convenient, individual trim control, 48-volt phantom power switch and 20 dB pad switch for each analog input.

Headphone output and main volume control

The 8pre front panel includes a quarter-inch stereo headphone output jack and volume knob. The volume knob also controls the rear-panel main outs. Push the knob to toggle between them.

Metering section

The front panel of the 8pre displays input metering. The five-segment input meters provide dedicated multi-segment metering for their respective analog inputs.

The *Mode* lights indicate whether the interface is currently operating as a FireWire audio interface or an analog-to-optical converter.

The *Clock* lights indicate the global sample rate and clock source.

16-BIT AND 24-BIT RECORDING

The 8pre system handles all data with a 24-bit signal path, regardless of the I/O format. You can record and play back 16-bit or 24-bit audio files at any supported sample rate via any of the 8pre's analog or digital inputs and outputs. 24-bit audio files can be recorded with any compatible host application that supports 24-bit recording.

HOST AUDIO SOFTWARE

The 8pre system ships with a standard WDM Windows driver that allows you to record, edit, play back and mix your 8pre projects using your favorite Windows audio software. In addition, this driver provides legacy Wave/MME compatibility for older applications that do not yet support WDM.

The 8pre also includes a ASIO and GSIF drivers for multi-channel compatibility with any audio applications that support these drivers.

A COMPUTER-BASED SYSTEM

Regardless of what software you use with the 8pre, the host computer determines the number of tracks the software can record and play simultaneously, as well as the amount of real-time effects processing you can apply to your mix. A faster computer with more RAM and faster hard drives will allow more simultaneous tracks and real-time effects than a slower computer with less RAM and slower hard drives. Today's fastest computers can typically play as many as 72 tracks or more. Standard third-party high-performance hard drive solutions can also help you achieve higher track counts.

CHAPTER 2 Packing List and Windows System Requirements

PACKING LIST

The 8pre ships with the items listed below. If any of these items are not present in your 8pre box when you first open it, please immediately contact your dealer or MOTU.

- One 8pre I/O rack unit
- One set of removable rack ears
- One 6-pin to 6-pin IEEE 1394 "FireWire" cable
- Power cord
- One 8pre Mac/Windows manual
- One AudioDesk Manual
- One cross-platform CD-ROM
- Product registration card

WINDOWS SYSTEM REQUIREMENTS

The 8pre system requires the following Windows system:

- A 1 GHz Pentium-based PC compatible or faster equipped with at least one FireWire port
- A Pentium III processor or faster is recommended
- At least 256 MB (megabytes) of RAM (512 MB or more is recommended)
- Windows XP
- A large hard drive (preferably at least 20 GB)

PLEASE REGISTER TODAY!

Please register your 8pre today. There are two ways to register.

- Visit www.motu.com to register online

OR

- Fill out and mail the included product registration card

As a registered user, you will be eligible to receive technical support and announcements about product enhancements as soon as they become available. Only registered users receive these special update notices, so please register today.

Thank you for taking the time to register your new MOTU products!

IMPORTANT! Run the 8pre Software Installer First

OVERVIEW

INSTALL THE 8PRE SOFTWARE FIRST!

Before you connect the 8pre audio interface to your computer and turn it on, insert the 8pre software CD and run the 8pre Software Installer. This ensures that all the 8pre components are properly installed in your system.

If Windows asks you to locate the drivers

If you've already connected the 8pre to your computer and switched it on, Windows probably issued an alert notifying you that the 8pre requires drivers, followed by another window asking you to locate the drivers on disk. If this happens:

1 Cancel the driver search.

2 Switch off the 8pre.

3 Run the 8pre Software Installer as instructed in the next section.

INSTALLING THE 8PRE SOFTWARE

To install the 8pre software, insert the MOTU Audio CD-ROM and follow the directions it gives you on your computer screen. Also be sure to read the Read Me file for installation assistance. The 8pre ships with the following software and drivers for Windows XP:

Software component	Purpose
MOTU Audio Setup	Provides access to all of the settings in the 8pre hardware.
MOTU CueMix Console	Gives you complete control over the 8pre's CueMix DSP feature, which provides no-latency monitoring of live inputs.
MOTU SMPTE Setup	Provides access to the 8pre's SMPTE time code and video sync features.
MOTU ASIO Driver	Allows Cubase or other ASIO-compliant software to do multi-channel input and output with the 8pre. Only required if you are using Cubase or another ASIO-dependent program.
MOTU WDM Driver	Allows any WDM-driver compatible audio software to do multichannel input and output with the 8pre.
MOTU GSIF Driver	Allows you to use your 8pre with Tascam GigaStudio.
MOTU MIDI Driver	Provides MIDI input and output via the 8pre MIDI ports.

MOTU AUDIO SETUP

MOTU Audio Setup (available in the Start menu) gives you access to all of the settings in the 8pre, such as the clock source and sample rate. For complete details, see chapter 5, "MOTU Audio Setup" (page 23).
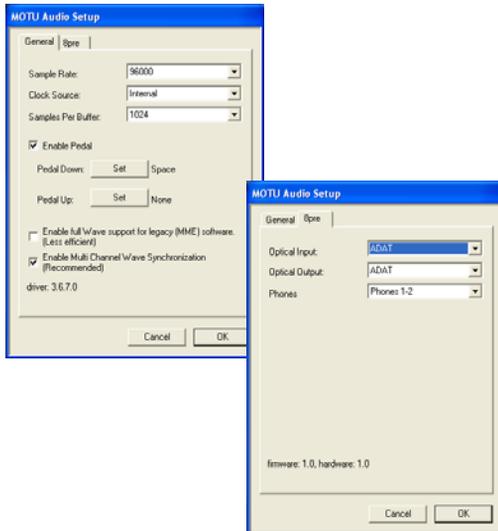
Figure 3-1: MOTU Audio Setup gives you access to all of the settings in the 8pre hardware.

MOTU ASIO DRIVER

ASIO stands for *Audio Streaming Input* and *Output*. The MOTU ASIO audio driver allows 8pre to provide multi-channel input and output for Steinberg's Cubase SX and Nuendo software, or any other audio application that supports ASIO drivers.

The MOTU ASIO audio driver is only required if you are using Cubase SX (or another audio program that relies on the ASIO driver to support multi-channel I/O with the 8pre).

The MOTU ASIO audio driver is installed by the 8pre Software Installer and properly registered with Windows, so you don't need to be concerned about its installation or location.

For details about using Cubase SX and Nuendo with the 8pre, see chapter 7, "Cubase, Nuendo and Other ASIO Software" (page 29).

MOTU WDM DRIVER

The MOTU WDM audio driver provides standard multi-channel input and output for audio applications running under Windows XP. See chapter 8, "SONAR and other WDM Software" (page 35) for details.

The MOTU Audio installer CD installs the MOTU WDM driver into Windows for you.

MOTU GSIF DRIVER

The MOTU GSIF audio driver allows you to access the 8pre as an audio interface for Tascam GigaStudio and related products. The GSIF driver features low-latency multi-channel performance. See chapter 9, "GigaStudio and GSIF" (page 41).

MOTU MIDI DRIVER

This driver allows you to access the 8pre's MIDI input and output ports. The ports are published in Windows and are available to all MIDI software.

MOTU CUEMIX CONSOLE

This program provides a mixing console that gives you control over the 8pre's no-latency CueMix DSP features. For details, see chapter 11, "MOTU CueMix Console" (page 51).

MOTU SMPTE SETUP

The MOTU SMPTE Setup software provides a complete set of tools for resolving the 8pre to SMPTE time code, and to generate SMPTE for striping, regenerating or slaving other devices to the computer. For details, see chapter 12, "MOTU SMPTE Setup" (page 59).

CHAPTER 4   Installing the 8pre Hardware

OVERVIEW

Here's an overview for installing the 8pre:

CONNECT THE 8PRE TO YOUR COMPUTER

1 Plug one end of the 8pre FireWire cable (included) into the FireWire socket on the computer as shown below in Figure 4-1.

2 Plug the other end of the FireWire cable into the 8pre I/O as shown below in Figure 4-1.

Figure 4-1: Connecting the 8pre to the computer.

CONNECT AUDIO INPUTS AND OUTPUTS

The 8pre audio interface has the following audio input and output connectors:

- 8 combo XLR/quarter-inch analog mic/guitar/instrument inputs

- 2 balanced, +4 dB quarter-inch TRS main outs

- 2 pair of ADAT optical ("Lightpipe") in/out

Here are a few things you should keep in mind as you are making these connections to other devices.

Mic/guitar/instrument inputs

Connect a microphone, guitar or other similar instrument to any XLR/quarter-inch combo jack input on the rear panel. If your microphone requires phantom power, move the 48V phantom power switch on the front panel to the up position (enabled). Use the trim knobs on the front panel to adjust the input level as needed for each input. The trim knob provides approximately 40 dB of gain. Use the input level meters on the front panel (labeled *Analog In*) to calibrate the level. These meters register for both the XLR and TRS input.

If a line level signal is still too hot with the trim turned all the way down, engage (flip down) the 20dB pad switch on the front panel.

Main outs

The main outputs serve as independent outputs. The main out volume is controlled by the volume knob on the front panel. Push the knob to toggle between phone and main out volume control. In a standard studio configuration, the main outs are intended for a pair of studio monitors, but they can also be used as additional outputs for any purpose.

Optical

The 8pre provides 8-channel digital input and output at 44.1, 48, 88.2 and 96 kHz. The 8pre rear panel provides two sets of ADAT optical ("lightpipe") connectors: an top row and a bottom row.

Reminder: optical goes OUT to IN and IN to OUT. Input and output are independent. For example, you could connect ADAT optical input from your digital mixer and connect the output to an audio interface connected to your computer.

Optical operation at 44.1 or 48 kHz

When connected to an ADAT "lightpipe" compatible device, the two optical connectors in the top row provide eight channels of digital input and output at 44.1 and 48 kHz.

In addition, when operating the 8pre at a 1x sample rate (either 44.1 or 48 kHz), optical output is duplicated on the second (lower) optical output. This lets you send the 8pre's 8-channel ADAT optical output to two separate destinations in your studio, if needed.

Optical operation at 88.2 or 96 kHz

When operating the 8pre at the 2x sample rates (88.2 or 96 kHz), the top row of optical connectors provides channels 1-4 (in and out) and the bottom row provides channels 5-8 (in and out) when connected to another optical device that supports 88.2/96 kHz optical sample rates.

When operating the optical ports at a 2x sample rate, be sure to choose either Type I or Type II operation, as explained in "Setting the 2x optical mode" on page 27.

Using optical I/O when operating the 8pre as an audio interface

When the 8pre is connected to a computer (Figure 4-4 on page 20), these optical ports provide digital input and output to and from the computer.

Using optical I/O to operate the 8pre as an 8-channel expander

When the 8pre is not connected directly to a computer via FireWire, the optical input is disabled and the eight optical output channels mirror any incoming signal on the 8pre's eight XLR/TRS

combo jack analog inputs. By connecting the 8pre optical output to another device, such as another ADAT-optical equipped interface or a digital mixer, you add an additional eight mic inputs to your system, as demonstrated in Figure 4-5 on page 21. This can be done at any sample rate up to 96 kHz.

To set the sample rate (or clock mode) when operating as an 8-channel optical expander, see "Setting the clock source in converter mode" on page 27.

CONNECT MIDI GEAR

Connect your MIDI device's MIDI IN jack to the 8pre's MIDI OUT jack (Connection A below). Conversely, connect the MIDI device's MIDI OUT jack to the 8pre's MIDI IN jack (Connection B).
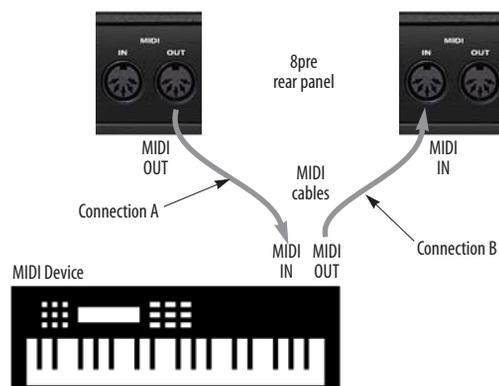
Figure 4-2: Connecting a MIDI device to the 8pre.

One-way MIDI connections

MIDI devices that do not receive MIDI data, such as a dedicated keyboard controller, guitar controller, or drum pad, only need Connection B shown in Figure 4-2. Similarly, devices that never send data, such as a sound module, only need Connection A. Make both connections for any device that needs to both send and receive MIDI data.

Connecting additional gear with MIDI THRUs

If you need to connect several pieces of MIDI gear, run a MIDI cable from the MIDI THRU of a device already connected to the 8pre to the MIDI IN on the additional device as shown below in Figure 4-3. The two devices then share the 8pre's MIDI OUT port. This means that they share the same set of 16 MIDI channels, too, so try to do this with devices that receive on only one MIDI channel (such as effects modules) so their receive channels don't conflict with one another.
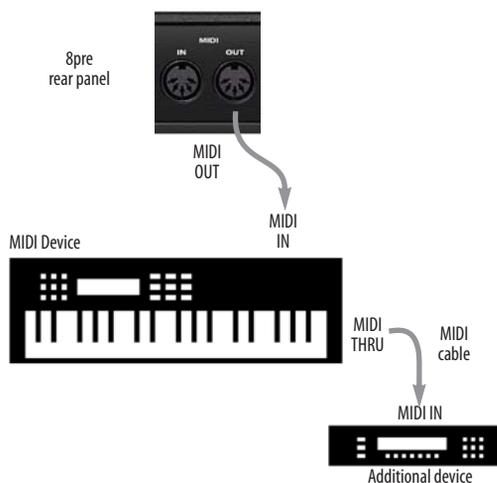
Figure 4-3: Connecting additional devices with MIDI THRU ports.

I N S T A L L I N G   T H E   8 P R E   H A R D W A R E

OPERATING THE 8pre AS AN INTERFACE

Here is a typical studio setup for using the 8pre as an audio interface. All mixing and processing can be done in the computer with audio software. During recording, you can use the 8pre's CueMix™ DSP no-latency monitoring to listen to what you are recording via the main outs, headphone outs, or any other output pair. You can control monitoring from the included MOTU CueMix Console software.

headphones

8pre front panel

monitors

PC

FireWire

other inputs
(mics, guitars, etc.)

mic

8pre back panel

Optical
In   Out

Optical
Out

Optical
In

Digital mixer

guitar
(with or without an amp)

MIDI IN/OUT

quarter-inch
analog outs

synthesizer
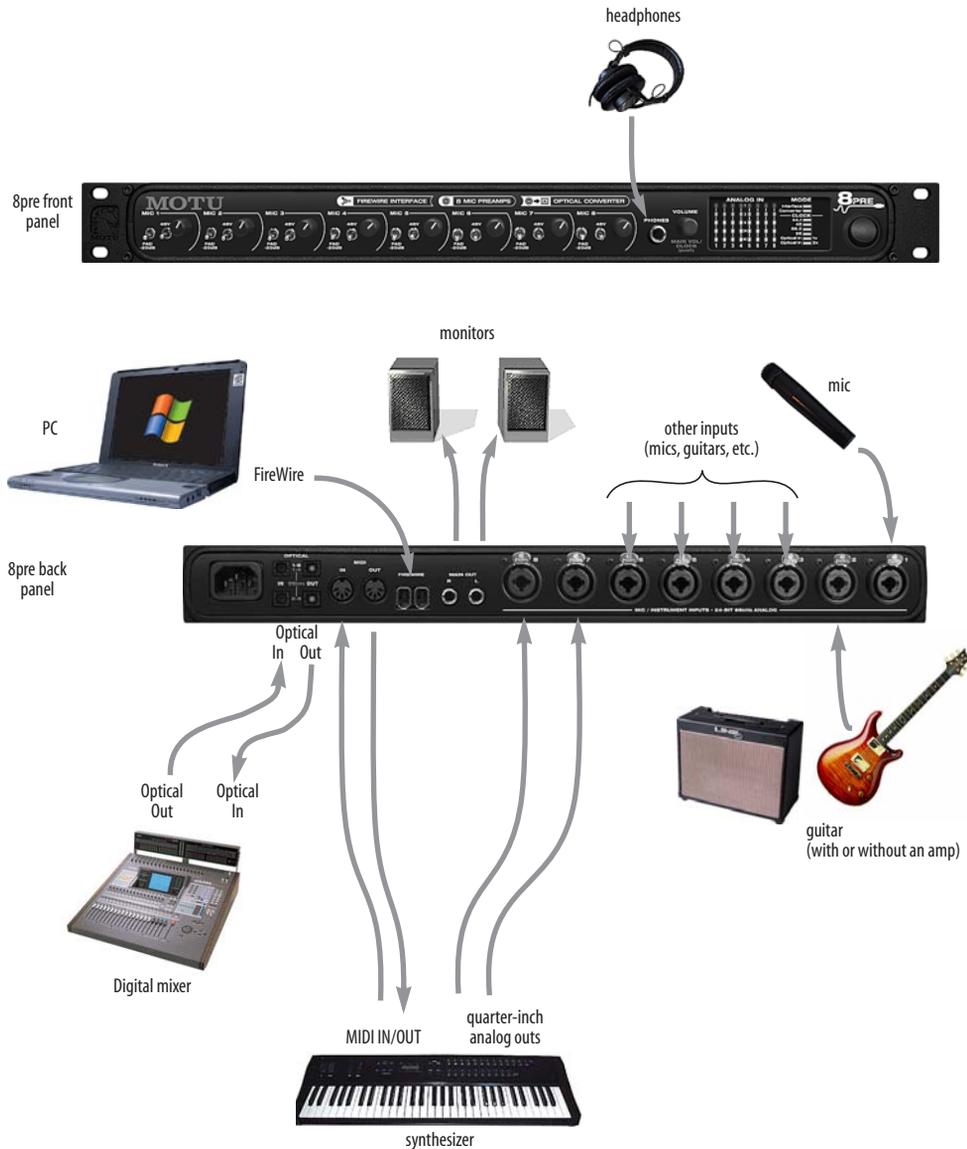
Figure 4-4: A typical 8pre studio setup.

OPERATING THE 8pre AS A CONVERTER

As explained earlier in "Using optical I/O to operate the 8pre as an 8-channel expander" on page 18, the 8pre can serve as an 8-channel analog-to-digital converter when disconnected from the computer and instead connected to another device equipped with an ADAT optical input. For example, you could connect the 8pre optical output to the optical input on a MOTU audio interface, such as the 828, 828mkII, Traveler, 896, 896HD or UltraLite. The 8pre then serves as an 8-channel expander that adds an additional 8 mic inputs to the interface. The benefit of connecting the 8pre in

this manner (instead of as another FireWire interface) is that you can seamlessly integrate the 8pre's inputs into the on-board no-latency CueMix monitor mixing in the interface, since the 8pre's inputs are fed into CueMix via the interface's optical inputs.

If the device to which you are connecting the 8pre supports 2x optical sample rates (88.2 or 96 kHz), you'll need to use both banks of connectors as discussed in "Optical operation at 88.2 or 96 kHz" on page 18.

PC

USB2

828mkII-USB
(UltraFast USB 2
audio interface)

ADAT optical In

other inputs
(mics, guitars, etc.)

mic

ADAT optical Out

8pre rear panel

quarter-inch
analog outs

guitar
(with or without an amp)

synthesizer
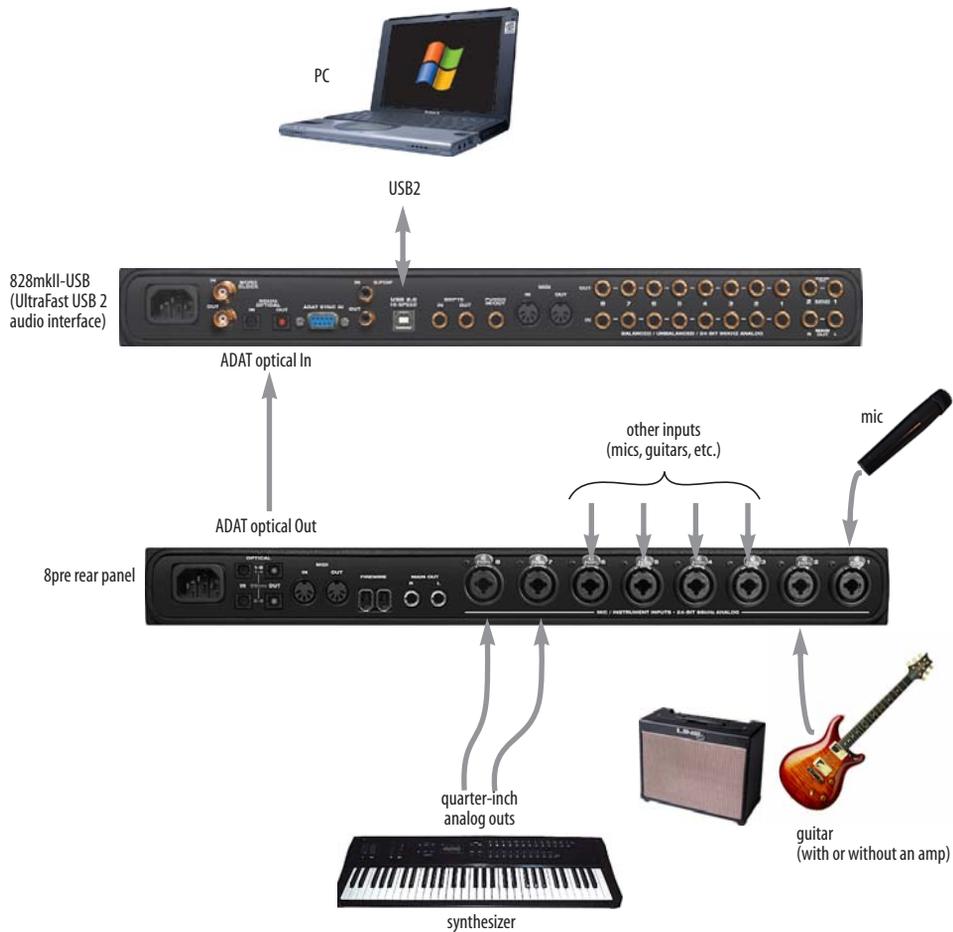
Figure 4-5: Using the 8pre as an optical converter.

SYNCING OPTICAL DEVICES

The word *optical* is our short-hand way of referring to any device that connects to the 8pre via an optical cable. An example is an audio interface with optical connectors on it. There are many other devices that fall into this category, including digital mixers, digital effects processors, synthesizers and many more.

When connecting *optical* devices, make sure that their digital audio clock is phase-locked (in sync with) the 8pre. There are two ways to do this:

- Slave the optical device to the 8pre

- Slave the 8pre to the optical device

Two banks of optical

The 8pre has two banks of optical connectors: a top row and a bottom row:

Figure 4-7: Two optical banks.

When you are operating at the 1x sample rates (44.1 or 48 kHz), use the top two connectors.

When you are operating at the 2x sample rates, (88.2 or 96 kHz), use both sets of connectors. The top row provides channels 1-4 and the bottom row provides channels 5-8, as indicated by the blue labeling on the rear panel (Figure 4-7).

Setting the clock source

In *ADAT optical* clock mode (as demonstrated in the right-hand diagram below), the 8pre always resolves to the optical input in the *top row*, even during 88.2 or 96 kHz operation. So be sure to connect the device that is the ADAT optical clock master to the 8pre's optical input in the top row.

Optical bank mirroring

When the 8pre is operating at the 1x sample rates (44.1 or 48 kHz), the optical output in the bottom row mirrors the 8-channel optical output in the top row.

8pre Clock Source setting = *Internal*, or any clock source setting except *Optical*. The optical device slaves to the 8pre (via its optical cable connection).

8pre

ADAT Optical OUT

ADAT Optical IN

Audio interface or other optical device

With this setup, in MOTU Audio Setup, choose the *Optical* clock source setting. The 8pre slaves to the optical device via their optical cable connection.

Audio interface or other optical device

ADAT Optical OUT

ADAT Optical IN

8pre

8pre Clock Source setting = optical

Figure 4-6: Two setups for synchronizing an optical device with the 8pre.

CHAPTER 5 **MOTU Audio Setup**

OVERVIEW

ACCESSING THE 8PRE SETTINGS

There are several ways to access MOTU Audio Setup settings:

■ From the Windows Start menu, choose *Programs>MOTU>MOTU Audio Setup*

■ In Cubase SX or Nuendo, open the Device Setup window, click *VST Audiobay* and choose *MOTU Audio* from the *Master ASIO Driver* menu. Then click the *MOTU Audio* item in the list and click the *Control Panel* button as shown below.
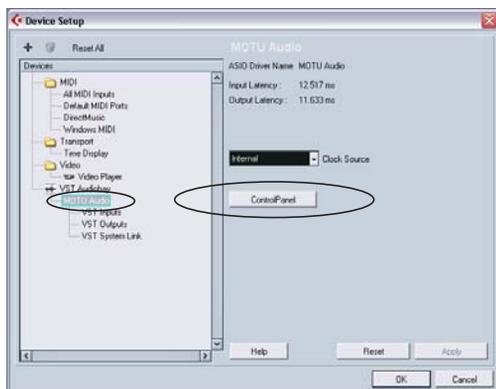
■ From within other ASIO-compatible programs, refer to their documentation.

General tab settings

The General tab provides settings that apply globally to all connected MOTU interfaces.

8pre tab settings

The 8pre tab provides settings that apply to a specific 8pre interface. If you have several 8pres (or other MOTU audio interfaces) connected, you'll see a separate tab for each one.

'GENERAL' TAB SETTINGS

Sample Rate

Choose the desired *Sample Rate* for recording and playback. The 8pre can operate at 44.1 (the standard rate for compact disc audio), 48, 88.2 or 96 kHz. Make absolutely sure that all of the devices connected digitally to the 8pre match the 8pre's sample rate. Also make sure that your Digital Timepiece, MIDI Timepiece AV or other digital audio synchronizer matches it as well.

☞ Mismatched sample rates cause distortion and crackling. If you hear this sort of thing, check the sample rate settings in your hardware and here in MOTU Audio Setup.

Clock Source

The *Clock Source* determines the digital audio clock that the 8pre will use as its time base. The following sections briefly discuss each clock source setting.

Internal

Use the *Internal* setting when you want the 8pre to operate under its own digital audio clock. For example, you may be in a situation where all you are doing is playing tracks off hard disk in your digital audio software on the computer. In a situation like this, you most often don't need to reference an external clock of any kind.

ADAT optical

The *ADAT optical* clock source setting refers to the clock provided by the 8pre's optical input, when it is connected to an ADAT optical device. This setting can be used to slave the 8pre directly to the optical input connection. In this scenario, the *ADAT Optical* clock source setting lets you slave the 8pre to the other device via its digital connection to the 8pre.

☞ The 8pre has two banks of optical connectors: a top row (for 8-channel operation at 44.1 or 48 kHz) and a bottom row (for channels 5-8 at 88.2 or
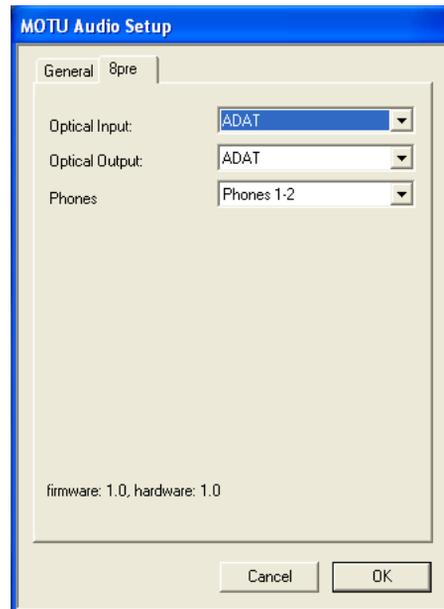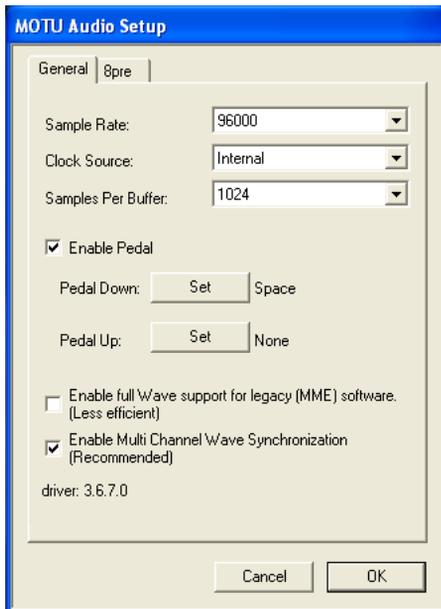
Figure 5-1: MOTU Audio Setup gives you access to all of the settings in the 8pre hardware.

96 kHz). In ADAT optical clock mode, the 8pre always resolves to the optical input in the *top row*, even during 88.2 or 96 kHz operation. So be sure to connect the ADAT optical clock master to the optical input in the top row.

If the *ADAT Optical* setting does not appear in the menu, it means that the 8pre's optical input is currently turned off. Choose the *ADAT optical* format from the Optical input menu (Figure 5-1 on page 24).

For further details about this setting, see "Syncing optical devices" on page 22.

SMPTE
Choose this setting to resolve the 8pre directly to SMPTE time code (LTC) being received via any analog input. For details, see chapter 12, "MOTU SMPTE Setup" (page 59).

Samples Per Buffer
The *Samples Per Buffer* setting lets you reduce the delay you hear when patching live audio through your audio software. For example, you might have a live microphone input that you would like to run through a reverb plug-in that you are running in your host audio software. When doing so, you may hear or feel some "sponginess" (delay) between the source and the processed signal. If so, don't worry. This effect only affects what you hear: it is not present in what is actually recorded.

You can use *Samples Per Buffer* setting to reduce this monitoring delay—and even make it completely inaudible.

☛ If you don't need to process an incoming live signal with software plug-ins, you can monitor the signal with no delay at all using MOTU CueMix Console, which routes the signal directly to your speakers via hardware. For details, see chapter 11, "MOTU CueMix Console" (page 51).

Adjusting the *Samples Per Buffer* setting impacts the following things:

■ The strain on your computer's CPU

■ The delay you hear when routing a live signal through your host audio software plug-ins

■ How responsive the transport controls are in your software

This setting presents you with a trade-off between the processing power of your computer and the delay of live audio as it is being processed by plug-ins. If you reduce the *Samples Per Buffer*, you reduce patch thru latency, but significantly increase the overall processing load on your computer, leaving less CPU bandwidth for things like real-time effects processing. On the other hand, if you increase the *Samples Per Buffer*, you reduce the load on your computer, freeing up bandwidth for effects, mixing and other real-time operations. But don't set the *Samples Per Buffer* too low, or it may cause distortion in your audio.

If you don't process live inputs with software plug-ins, leave this setting at its default value of 1024 samples. If you do, try settings of 256 samples or less, if your computer seems to be able to handle them. If your host audio software has a processor meter, check it. If it starts getting maxed out, or if the computer seems sluggish, raise the *Samples Per Buffer* until performance returns to normal.

If you are at a point in your recording project where you are not currently working with live, patched-thru material (e.g. you're not recording vocals), or if you have a way of externally monitoring input, choose a higher *Samples Per Buffer* setting. Depending on your computer's CPU speed, you might find that settings in the middle work best.

The *Samples Per Buffer* setting also impacts how quickly your audio software will respond when you begin playback, although not by amounts that are

very noticeable. Lowering the *Samples Per Buffer* will make your software respond faster; raising the *Samples Per Buffer* will make it a little bit slower, but barely enough to notice.

Monitoring live inputs without plug-in effects
As mentioned earlier, CueMix Console allows you to monitor dry, unprocessed live inputs with no delay at all. For complete details, see chapter 10, "Reducing Monitoring Latency" (page 45).

Enable Pedal
This setting applies to other MOTU FireWire audio interfaces, but it does not apply to the 8pre.

Wave support for legacy (MME) software
Windows only exposes the first two channels of a multi-channel WDM audio stream to applications which use the legacy (MME) multimedia interface. The *Enable full Wave support for legacy (MME) software (less efficient)* option forces the 8pre multimedia driver to expose all channels as stereo pairs, providing full MME support.

If your host audio software does *not* directly support WDM audio and instead only supports legacy MME drivers, use this option to access multiple 8pre input and output channels.

If your host audio software *does* directly support WDM audio, leave this option unchecked for optimal performance.

This option is only available when the multimedia driver has been installed, and it defaults to being not checked.

'8PRE' TAB SETTINGS

Optical input/output
The *Optical input* and *Optical output* settings let you enable or disable the optical ports. For example, when operating the 8pre as an audio interface, you can conserve FireWire bus bandwidth by disabling the optical ports when

they are not in use. This frees up the FireWire bus for other devices that may also be connected to the bus (such as additional interfaces).

Phones
The *Phones* setting lets you choose what you will hear from the headphone jack. Choose *Main Outs 1-2* if you'd like the headphone output to match the main outs. Choose *Phones 1-2* if you would like the headphones to serve as their own independent output, which you can access as an independent output destination in your host audio software and as an output destination for the four on-board CueMix DSP mix busses.

Disable interface
You can disable an interface at any time with the *Disable interface* option. Doing so frees up the FireWire bandwidth required by the interface without turning it off. Switching off an interface accomplishes the same thing. To get MOTU Audio Setup to forget about an interface entirely, you'll see a *Forget* button in MOTU Audio Setup. Just click the *Forget* button and MOTU Audio Setup will no longer consider the interface to be present but off line (turned off).

Front Panel Settings

OVERVIEW

The VOLUME knob is a rotary encoder that can be pushed as well as turned. By pushing it repeatedly, or by pushing and holding it in for varying amounts of time, you can adjust several 8pre settings as described in the following sections.
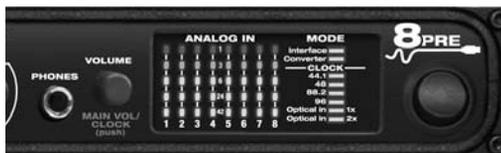
Figure 6-1: The VOLUME knob is a push-button rotary encoder.

Except where noted, all of the features described in this chapter are available when the 8pre is operating as either an audio interface or an optical converter.

ADJUSTING HEADPHONE VOLUME

Turn the VOLUME knob to adjust headphone volume. In the *Analog In* LED section to the right, the row of amber LEDs, second from the top, provides general feedback regarding the headphone level as you turn the knob.
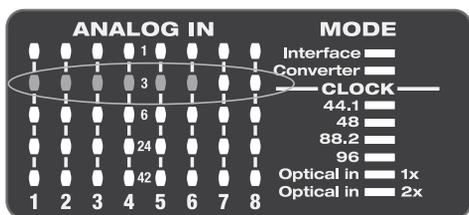
Figure 6-2: When you adjust headphone volume, the amber row of LEDs (second from the top) provides feedback as you turn the rotary encoder.

ADJUSTING MAIN OUT VOLUME

Push in the knob twice (so that it clicks two times) and then turn it to adjust the volume of the main outs on the rear panel. In the LED section to the right, the middle row of green LEDs, third from the bottom, provides general feedback regarding the headphone level as you turn the knob.
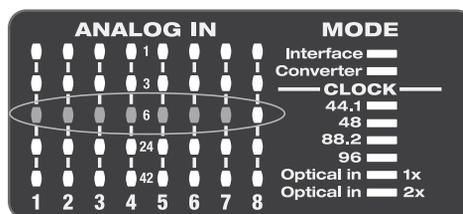
Figure 6-3: When you adjust main out volume, the top-most green row of LEDs, third from the bottom, provides feedback as you turn the rotary encoder.

SETTING THE 2X OPTICAL MODE

Push and hold the knob for 5 seconds to enter a mode where you can change 2x optical input and output (88.2 or 96kHz) to Type I (for 2x optical connection to SMUX-compatible products) or Type II (for 2x optical connection to MOTU products). The bottom LED in the "1" or "2" column flashes. Turn the volume knob to switch between Type I and II, respectively.
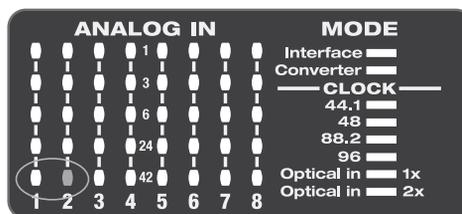
Figure 6-4: Setting the optical mode.

SETTING THE CLOCK SOURCE IN CONVERTER MODE

When the 8pre is operating as an optical converter (when it is not connected to a computer via Firewire), push in and hold the VOLUME knob for 3 seconds to enter a mode where you can change the clock source. In this mode, the CLOCK LED

flashes, turn the knob to change the clock mode.
Push it again to confirm the current clock setting
exit clock mode.

Cubase, Nuendo and Other ASIO Software

OVERVIEW

The 8pre includes an ASIO driver that provides multi-channel I/O and sample-accurate synchronization with Steinberg's Cubase family of digital audio sequencers, including Cubase SX and Nuendo.

WHAT IS ASIO?

ASIO is an acronym for *Audio Streaming Input* and *Output*. The ASIO MOTU Audio driver allows the 8pre to provide multi-channel audio input and output for any audio application that supports ASIO drivers.

Attention: Other software users

The 8pre ASIO driver also provides multi-channel I/O with any ASIO-compatible audio software. Cubase is used for the examples in this chapter. However, the basic procedures are the same and can be easily applied to any ASIO-compatible software. Just follow the general descriptions at the beginning of each main section in this chapter. Consult your software documentation for details about each topic, if necessary.

If your audio software doesn't support ASIO

If your host audio software does not support ASIO, but instead supports WDM (or legacy Wave) audio drivers, refer to the next chapter.

PREPARATION

To make sure that everything is ready for Cubase, install Cubase first (if you haven't already done so), and then see these chapters before proceeding:

■ chapter 3, "IMPORTANT! Run the 8pre Software Installer First" (page 15)

■ chapter 4, "Installing the 8pre Hardware" (page 17).

RUN MOTU AUDIO SETUP

Before you run Cubase, launch MOTU Audio Setup to configure your 8pre hardware. MOTU Audio Setup lets you configure your audio interface, and it lets you enable optical inputs and outputs. Only enabled inputs and outputs will be available to Cubase, so this is an important step. For complete details regarding MOTU Audio Setup, see chapter 5, "MOTU Audio Setup" (page 23).
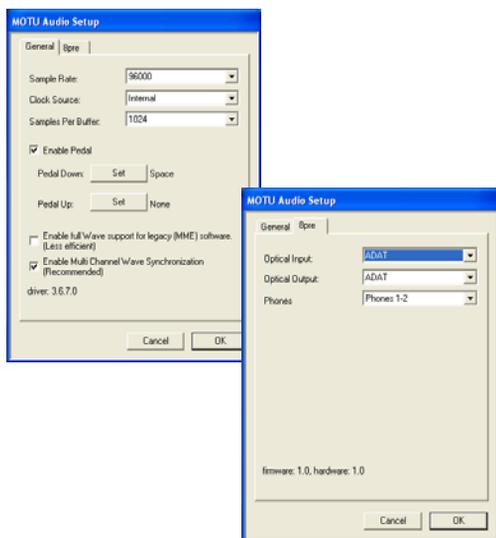
Figure 7-1: MOTU Audio Setup gives you access to all of the settings in the 8pre hardware, including the clock source, sample rate and optical I/O enable/disable.

For complete details about the 8pre settings, see chapter 5, "MOTU Audio Setup" (page 23). The following sections provide a brief explanation of each 8pre setting for use with Cubase.

Sample rate

Choose the desired overall sample rate for the 8pre system and Cubase. Newly recorded audio in Cubase will have this sample rate.

Clock Source

This setting is very important because it determines which audio clock the 8pre will follow.

If you do not have any digital audio connections to your 8pre (you are using the analog inputs and outputs only), and you will not be slaving Cubase to external SMPTE time code, choose *Internal*.

If you have digital audio devices connected to the 8pre, or if you are not sure about the clock source of your setup, be sure to read "Syncing optical devices" on page 22 and "Clock Source" on page 24.

If you are slaving the 8pre and Cubase to SMPTE time code via the 8pre itself, choose *SMPTE* and follow the directions in "Setting up for SMPTE time code sync" on page 62.

☛ If you are using an ASIO host application other than Cubase or Nuendo, it must support the ASIO 2.0 sample-accurate positioning protocol in order to support the 8pre's direct SMPTE sync (and sample-accurate sync) feature.

Samples Per Buffer

The *Samples Per Buffer* setting can be used to reduce the delay — or *monitoring latency* — that you hear when live audio is patched through your 8pre hardware and Cubase. For example, you might have MIDI instruments, samplers, microphones, and so on connected to the analog inputs of the 8pre. If so, you will often be mixing their live input with audio material recorded in Cubase. See chapter 10, "Reducing Monitoring Latency" (page 45) for complete details.

Optical input and output

To make a 8pre optical input or output available in Cubase, choose *ADAT* from the optical input and/or output menu. If you won't be using the optical connectors, turn them off.

Phones

This 8pre setting lets you choose what you'll hear from the headphone jack. For example, if you choose *Main Outs 1-2*, the headphones will duplicate the main outs. Or you can choose any other output pair. If you choose *Phones 1-2*, this setting makes the headphone jack serve as its own independent output pair. As a result, you'll see *Phones 1-2* as an additional audio destination in Cubase's audio output menus.

CHOOSING THE MOTU ASIO DRIVER

Once you've made the preparations described so far in this chapter, you're ready to run your audio software and enable the MOTU ASIO driver.

Check the audio system or audio hardware configuration window in your software. There will be a menu there that lets you choose among various ASIO drivers that may be in your system. Choose the MOTU ASIO driver from this menu.

Nuendo, Cubase SX and V-Stack

To activate the 8pre driver in Nuendo or Cubase SX, go to the Device Setup window, click *VST Audiobay* and choose *MOTU Audio* from the *Master ASIO Driver* menu as shown below. Make the other settings in the dialog as need for your system and synchronization scenario.

Figure 7-2: Activating the 8pre ASIO driver in Nuendo and Cubase.

NUMBER OF CHANNELS

In Cubase, be sure to choose enough channels in the System dialog (as shown above in Figure 7-2) to cover the 16 channels of input and 12 channels of output provided by your 8pre — although the number of channels may depend on how your 8pre is configured:

■ 8 channels for analog input and output

■ Zero or 8 channels for optical, depending on whether you have optical turned on or off

For example, if you are using analog only, you only need 8 voices. If you are using analog and optical, you need 16 voices.

In Cubase, set the number of channels in the System dialog (as shown above in Figure 7-2).

ASIO DIRECT MONITORING

The ASIO Direct Monitoring option (Figure 7-2) allows you to monitor inputs directly in the 8pre hardware with no drain on your computer and near zero latency. When you enable this option, Cubase uses the 8pre's CueMix DSP monitoring features whenever you use Cubase's monitoring features. For further information, see "Controlling CueMix DSP from your audio software" on page 49.

OTHER SYSTEM DIALOG SETTINGS

Consult your Cubase or Nuendo documentation for details about the rest of the settings in this dialog.

VIEWING AND MANAGING 8PRE INPUTS

Once you've chosen the MOTU Audio driver in the Audio System dialog as explained earlier, click *VST Inputs* beneath the *MOTU Audio* item (Figure 7-3). The list on the right displays inputs supplied by the 8pre, as well as any other connected MOTU audio interfaces. If the list does not match what you expect to see, click the *Reset* button.
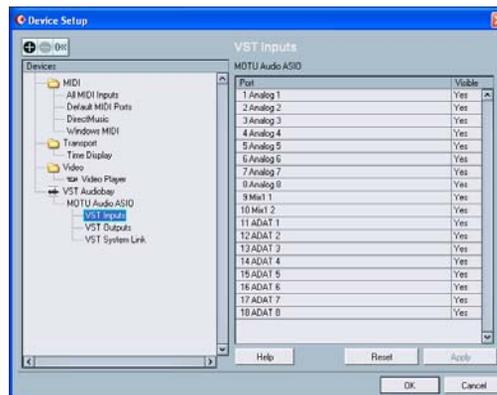
Figure 7-3: Creating 8pre inputs in Nuendo or Cubase SX.

The "Mix1 1-2" input

In the Cubase Inputs window, you'll see an 8pre input called *Mix1 1-2*. This input source delivers the output of CueMix DSP "MIX1" (the first mix bus of the four on-board no-latency monitor mixes

in the 8pre) back to your computer. This input serves, for example, as a convenient way for you to record the 8pre's MIX1 monitor mix back into Cubase (for reference and archiving purposes). Further, if you are sending audio from Cubase to the same output pair as MIX1, you can choose to either include or exclude the audio from the computer in the stream being sent back to Cubase. For details on how to do this, see "Mix1 Return Includes Computer" on page 55.

☞ Warning: the Mix1 1-2 input can cause feedback loops! DO NOT assign this input to a track that shares the same 8pre output pair as MIX1.

VIEWING AND MANAGING 8PRE OUTPUTS

To view and manage 8pre outputs, click *VST Outputs* beneath the *MOTU Audio* item (Figure 7-4).
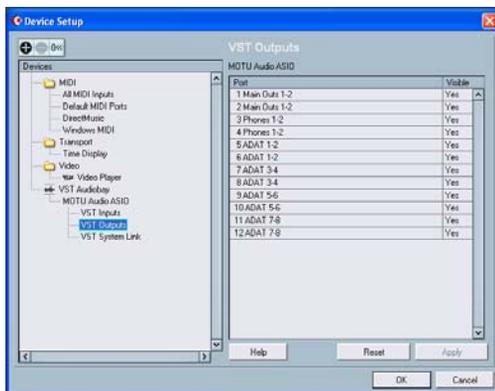
Figure 7-4: Working with 8pre outputs in Nuendo or Cubase.

The "Phones 1-2" output

If you've chosen to treat the 8pre headphones as an independent output, you'll see *Phones 1-2* as a 8pre output destination. Audio tracks assigned to this output pair will be heard on the headphone jack only. For further explanation, see "Phones" on page 30.

CHANGING 8PRE SETTINGS

To change the 8pre settings at any time, go to the Device Setup window in Nuendo or Cubase SX and click the ASIO Control Panel button, as shown in Figure 7-2 on page 31. Be sure to click the Reset button after making any changes.

PROCESSING LIVE INPUTS WITH PLUG-INS

If you patch a live input (such as MIDI synthesizer) through a VST plug-in effect in Cubase, you might hear a slight delay. There are several ways to reduce this delay. For details, see chapter 10, "Reducing Monitoring Latency" (page 45).

SYNCING TO SMPTE TIME CODE

Cubase or Nuendo can run under its own transport control or slave to SMPTE time code via the 8pre. For details, see "Resolving Cubase or Nuendo to SMPTE time code" on page 63.

MIDI I/O VIA THE 8PRE MIDI PORTS

Once you've run the 8pre's software installer as explained in "Installing the 8pre software" on page 15, the 8pre MIDI ports will appear as a input source and output destination in the MIDI input and output menus of your ASIO-compatible host software.

24-BIT OPERATION

Your 8pre hardware fully supports Cubase and Nuendo's 24-bit recording capabilities. Simply enable 24-bit operation as instructed in your Cubase or Nuendo manual. The 8pre always supplies a 24-bit data stream, and when you enable 24-bit operation in Cubase or Nuendo, it simply uses all 24-bits supplied by the 8pre hardware.

MONITORING SYSTEM PERFORMANCE

Because it has so many inputs and outputs, the 8pre may push the limits of your computer's processing power. Keep the VST Performance window open to keep tabs on the load on your CPU and disk buffers. If the meters get too high, you can reduce the load by reducing the number of inputs and

outputs you are working with. Use MOTU Audio
Setup to disable the optical I/O, if it is not being
used.
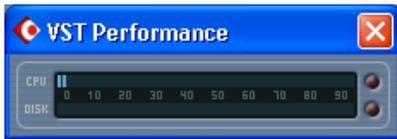
*Figure 7-5: Keep the Audio Performance window open to keep tabs
on your computer's processing power and hard disk performance.*

SONAR and other WDM Software

OVERVIEW

The 8pre WDM driver provides standard multi-channel input and output for WDM-compatible audio software running under Windows XP.

WDM AND WAVE DRIVER COMPATIBILITY

WDM is an acronym for *Windows Driver Model*. The MOTU Audio WDM driver allows the 8pre to provide multi-channel audio input and output for any audio application that supports WDM audio drivers.

Attention: Cakewalk users

Cakewalk SONAR is used for the WDM driver setup examples in this chapter. If you prefer to use the 8pre ASIO driver with SONAR, refer to the previous chapter.

Attention: other software users

SONAR and Sound Forge are used for the WDM driver setup examples in this chapter. However, the basic procedures are similar and can be easily applied to any WDM-compatible software. Consult your software documentation, if necessary.

INSTALLING THE MOTU AUDIO WDM DRIVER

The MOTU Audio Installer CD installs the MOTU Audio WDM driver into Windows for you. That's pretty much all the preparation you need. See chapter 3, "IMPORTANT! Run the 8pre Software Installer First" (page 15).

ENABLING WAVE (MME) COMPATIBILITY

If your host audio software does not yet support Windows WDM drivers, enable Wave driver compatibility in the MOTU Audio WDM driver so that all of the 8pre's inputs and outputs show up in your software. For details, see "Wave support for legacy (MME) software" on page 26.

☛ If your host audio software *does* support WDM audio drivers, *don't* enable Wave driver compatibility.

MAKING SETTINGS IN MOTU AUDIO SETUP

Before you run your audio software, launch MOTU Audio Setup to configure your 8pre hardware. MOTU Audio Setup lets you choose the audio clock source, and it lets you enable the optical input and output, if needed. For details, see chapter 5, "MOTU Audio Setup" (page 23).
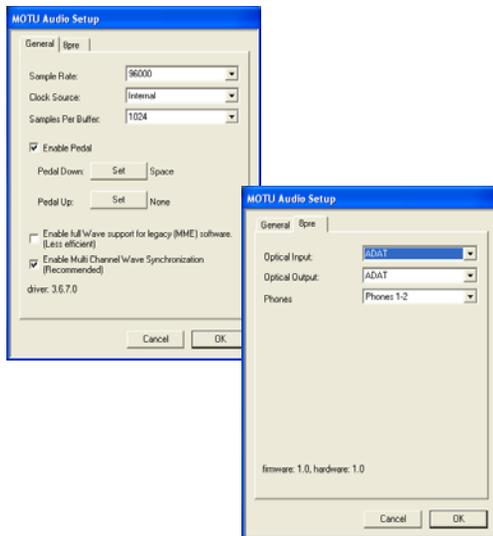
Figure 8-1: MOTU Audio Setup gives you access to all of the settings in the 8pre hardware, including the clock source, sample rate and optical I/O enable/disable.

For complete details about the 8pre settings, see chapter 5, "MOTU Audio Setup" (page 23). The following sections provide a brief explanation of each 8pre setting for use with SONAR.

Sample rate

Choose the desired overall sample rate for the 8pre system and SONAR. Newly recorded audio in SONAR will have this sample rate.

Clock Source

This setting is very important because it determines which audio clock the 8pre will follow.

If you do not have any digital audio connections to your 8pre (you are using the analog inputs and outputs only), and you will not be slaving SONAR to external SMPTE time code, choose *Internal*.

If you have digital audio devices connected to the 8pre, or if you are not sure about the clock source of your setup, be sure to read "Syncing optical devices" on page 22 and "Clock Source" on page 24.

Samples Per Buffer

The *Samples Per Buffer* setting can be used to reduce the delay — or *monitoring latency* — that you hear when live audio is patched through your 8pre hardware and SONAR. For example, you might have MIDI instruments, samplers, microphones, and so on connected to the analog inputs of the 8pre. If so, you will often be mixing their live input with audio material recorded in SONAR. See chapter 10, "Reducing Monitoring Latency" (page 45) for complete details.

Optical input and output

To make a 8pre optical input or output available in SONAR, choose *ADAT* from the optical input and/or output menu. If you won't be using the optical connectors, turn them off.

Phones

This 8pre setting lets you choose what you'll hear from the headphone jack. For example, if you choose *Main Outs 1-2*, the headphones will duplicate the main outs. Or you can choose any other output pair. If you choose *Phones 1-2*, this setting makes the headphone jack serve as its own independent output pair. As a result, you'll see *Phones 1-2* as an additional audio destination in SONAR's audio output menus.

ENABLING THE MOTU AUDIO WDM DRIVER

Once you've made the preparations described so far in this chapter, you're ready to run your audio software and enable the MOTU Audio WDM driver. Check the audio system or audio hardware configuration window in your software.

Enabling the MOTU Audio WDM driver in SONAR

To activate the MOTU Audio WDM driver in SONAR:

1 Choose *Audio* from the Options menu.

2 Click the *Drivers* tab.

3 Highlight the 8pre inputs and outputs that you wish to use and unhighlight the ones you don't as shown in Figure 8-2.
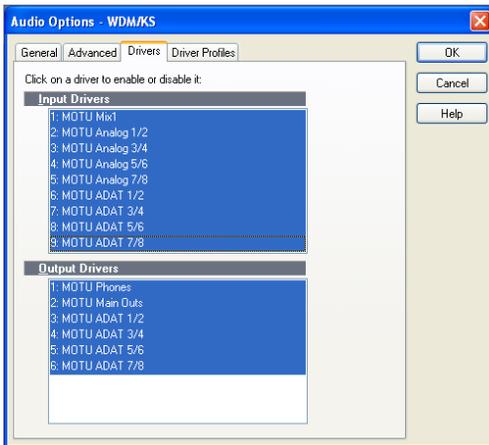
Figure 8-2: Activating the MOTU Audio WDM driver in SONAR by highlighting 8pre inputs and outputs.

Enabling the MOTU ASIO driver in SONAR

As an alternative to the 8pre's WDM driver, you can use the 8pre's ASIO driver. Note, however, that you can only use one audio interface at a time under ASIO. Go to the Advanced tab and choose *ASIO* from the *Driver Mode* menu:
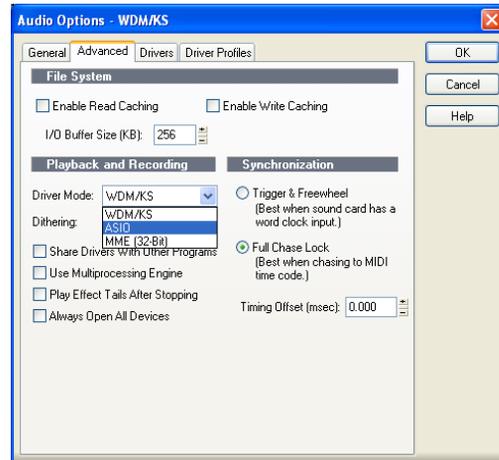
Figure 8-3: Enabling the ASIO driver instead of the WDM driver.

Other audio settings in SONAR

There are a few other settings in SONAR that impact 8pre operation:

1 In the Audio Options window, click the *General* tab.

2 Choose a 8pre input and output for recording and playback timing as shown below in Figure 8-4. It doesn't matter which input or output you choose.
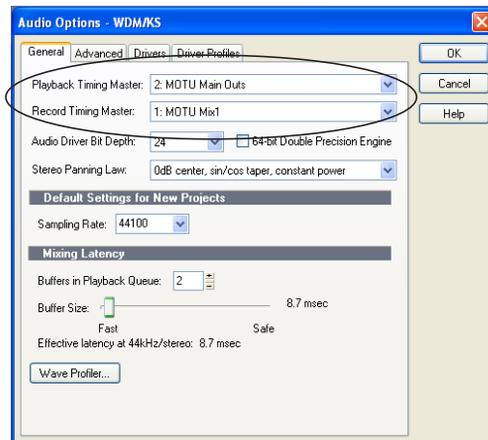
Figure 8-4: Make sure you have chosen a 8pre input and output for the playback and recording timing master settings.

3 In the General tab, click the Wave Profiler button and run the Wave Profiler. This process chooses the optimum settings for the 8pre hardware.

Figure 8-5: Running the Wave Profiler in Cakewalk's SONAR.

Enabling the MOTU Audio WDM driver in Sound Forge

To activate the MOTU Audio WDM driver in Sound Forge, go to the Preferences window, click the *Audio* tab, and then choose *MOTU Audio* from the *Audio device type* menu as shown below.
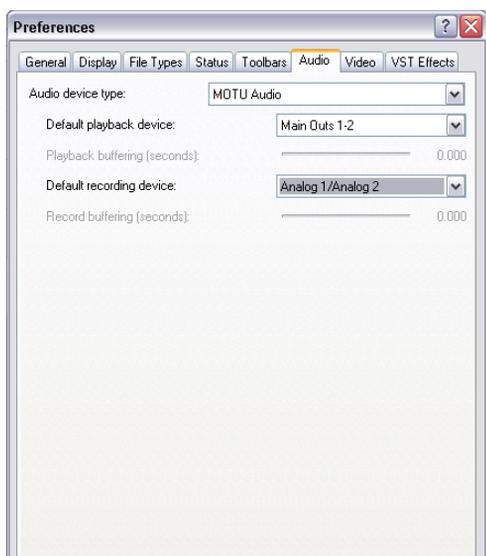
Figure 8-6: Enabling the 8pre driver in Sound Forge.

NUMBER OF CHANNELS

If your audio software requires that you specify the number of audio input and output channels, be sure to choose enough to cover the 16 channels of input and 12 channels of output provided by your 8pre — although the number of channels may depend on how your 8pre is configured:

- 8 channels for analog input and output

- Zero or 8 channels for optical, depending on whether you have optical turned on or off

For example, if you are using analog only, you only need 8 voices. If you are using analog and optical, you need 16 voices.

WORKING WITH 8PRE INPUTS AND OUTPUTS

Once you've enabled the 8pre inputs and outputs, 8pre audio inputs and outputs will appear in your host software's input/output menus, and you can set them up and use them as any standard audio input and output. If you don't see the optical inputs and/or outputs, check MOTU Audio Setup to make sure they are turned on. If you don't plan to use the optical input or output, turn it off to conserve computer bandwidth.

The "Mix1 1" input

In your host software's Input Drivers list, you'll see an 8pre input called *Mix1 1-2*. This input source delivers the output of CueMix DSP "MIX1" (the first mix bus of the four on-board no-latency monitor mixes in the 8pre) back to your computer. This input serves, for example, as a convenient way for you to record the 8pre's MIX1 monitor mix back into the computer (for reference and archiving purposes). Further, if you are sending audio from the computer to the same output pair as MIX1, you can choose to either include or exclude the audio from the computer in the stream being sent back to your host software. For details on how to do this, see "Mix1 Return Includes Computer" on page 55.

☞ Warning: the Mix1 1-2 input can cause feedback loops! DO NOT assign this input to a track that shares the same 8pre output pair as MIX1.

The "Phones 1-2" output

If you've chosen to treat the 8pre headphones as an independent output, you'll see *Phones 1-2* as a 8pre output destination. Audio tracks assigned to this output pair will be heard on the headphone jack only. For further explanation, see "Phones" on page 26.

CHANGING 8PRE SETTINGS

You can change the 8pre settings at any time by accessing MOTU Audio Setup.

REDUCING DELAY WHEN MONITORING LIVE INPUTS

If you have live audio inputs connected to the 8pre, such as MIDI synthesizers, samplers, microphones or other live instruments, you might hear a slight delay when their audio is being monitored through your 8pre hardware and your host audio program. There are several ways to reduce — and eliminate — this audible monitoring delay. For details, see chapter 10, "Reducing Monitoring Latency" (page 45).

MIDI I/O VIA THE 8PRE MIDI PORTS

Once you've run the 8pre's software installer as explained in "Installing the 8pre software" on page 15, the 8pre MIDI ports will appear as a input source and output destination in the MIDI input and output menus of your WDM-compatible host software.

24-BIT OPERATION

Your 8pre hardware fully supports 24-bit recording in any audio software that supports it. Simply enable 24-bit operation as instructed by the software. The 8pre system always supplies the software with a 24-bit data stream, and when you enable 24-bit operation, it simply uses all 24-bits supplied by the 8pre hardware.

CHAPTER 9   GigaStudio and GSIF

OVERVIEW

The 8pre includes a GSIF driver that provides multi-channel I/O with Tascam's GigaStudio family of virtual sampler products.

WHAT IS GSIF?

GSIF is an acronym for *Giga Sampler Interface*. The MOTU Audio driver allows the 8pre to provide multi-channel audio input and output for the Tascam GigaStudio family of products.

PREPARATION

Install GigaStudio first (if you haven't already done so), and then see these chapters before proceeding:

■ chapter 3, "IMPORTANT! Run the 8pre Software Installer First" (page 15)

■ chapter 4, "Installing the 8pre Hardware" (page 17).

RUN MOTU AUDIO SETUP

Before you run GigaStudio, launch MOTU Audio Setup to configure your 8pre hardware. MOTU Audio Setup lets you configure your audio interface, and it lets you enable the optical inputs and outputs. Only enabled inputs and outputs will be available to GigaStudio, so this is an important step. For complete details, see chapter 5, "MOTU Audio Setup" (page 23).
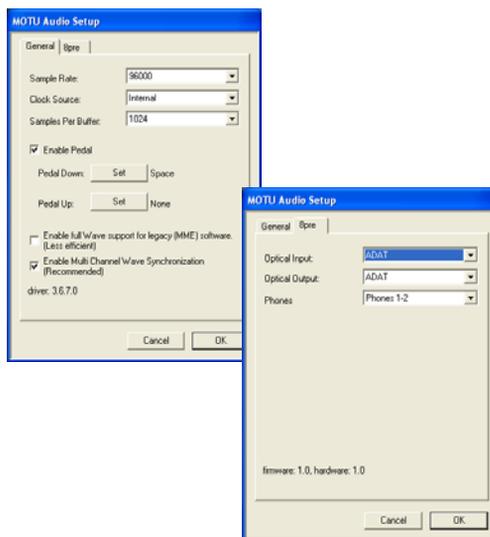
Figure 9-1: MOTU Audio Setup gives you access to all of the settings in the 8pre hardware, including the clock source, sample rate and optical I/O enable/disable.

Sample rate

Choose the desired overall sample rate for the 8pre system and GigaStudio. This should match the sample rate at which you intend to operate GigaStudio.

Clock Source

This setting is very important because it determines which audio clock the 8pre will follow.

If you do not have any digital audio connections to your 8pre (you are using the analog inputs and outputs only), choose *Internal*.

If you have an ADAT optical digital audio device connected to the 8pre, or if you are not sure about the clock source of your setup, be sure to read "Syncing optical devices" on page 22 and "Clock Source" on page 24.

Samples Per Buffer

The *Samples Per Buffer* setting can be used to reduce the delay — or *latency* — that you hear when playing GigaStudio from your MIDI controller or MIDI sequencer. In general, you have better timing accuracy with lower buffer settings, but the trade-off is that lower buffer settings require the computer that is running GigaStudio (with the 8pre) to work harder. So in general, you want to keep the buffer size a low as possible while still maintaining the performance you need from GigaStudio.

Optical input and output

To make a 8pre optical input or output available in GigaStudio, choose *ADAT* from the optical input and/or output menu. If you won't be using the optical connectors, turn them off.

Phones

This 8pre setting lets you choose what you'll hear from the headphone jack. For example, if you choose *Main Out 1-2*, the headphones will duplicate the main outs. Or you can choose any other output pair. If you choose *Phones*, this setting makes the headphone jack serve as its own independent output pair. As a result, you'll see *Phones 1-2* as an additional audio destination in GigaStudio's audio output menus.

CHOOSING THE MOTU GSIF DRIVER

Once you've made the preparations described so far in this chapter, you're ready to run GigaStudio and enable the MOTU GSIF driver. To activate the 8pre GSIF driver, go to the File menu, choose System Settings and click the *Hardware* tab. In the *Hardware Adapter* section, choose *MOTU Audio* from the menu.
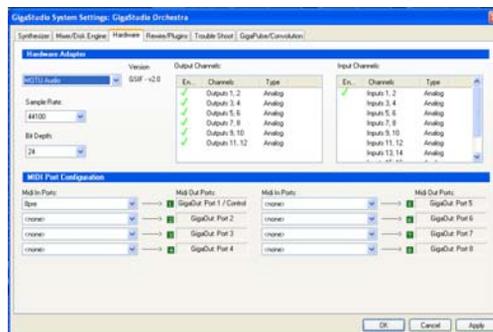
Figure 9-2: Activating the 8pre GSIF driver in GigaStudio.

ENABLING 8PRE OUTPUTS & INPUTS

To enable 8pre inputs and outputs for use with GigaStudio, click in the *Enable* column to put a check mark next to each input and output you wish to use. Here is how you can identify each input and output. Inputs are always listed in the same order as follows:

Input	Channels	List position	Comment
Analog	8	1-8	-
Mix1	2	9-10	See "The "Mix1 1-2" input" below.
ADAT	8 (at all supported sample rates)	11-18	If the optical bank is set to *None*, then no ADAT inputs are displayed.

Outputs are listed in this order:

Output	Channels	List position	Comment
Main outs	2	1-2	-
Phones	2	3-4	-
ADAT	8 (at all supported sample rates)	5-12	If the optical bank is set to *None*, then no ADAT outputs are displayed.

The "Mix1 1-2" input

In the GigaStudio Inputs list, you'll see an 8pre input called *Mix1 1-2*. This input source delivers the output of CueMix DSP "MIX1" (the first mix bus of the four on-board no-latency monitor mixes in the 8pre) back to your computer. This input serves, for example, as a convenient way for you to record the 8pre's MIX1 monitor mix back into GigaStudio (for reference and archiving purposes). Further, if you are sending audio from GigaStudio to the same output pair as MIX1, you can choose to either include or exclude the audio from the computer in the stream being sent back to GigaStudio. For details on how to do this, see "Mix1 Return Includes Computer" on page 55.

☞ Warning: the Mix1 1-2 input can cause feedback loops! DO NOT assign this input to a track that shares the same 8pre output pair as MIX1.

MIDI I/O VIA THE 8PRE MIDI PORTS

Use the *MIDI Port Configuration* section (Figure 9-2) as instructed in your GigaStudio manual to use the 8pre's MIDI ports with GigaStudio.

CHANGING 8PRE SETTINGS

To change the 8pre settings at any time, run MOTU Audio Setup (Figure 9-1 on page 41).

24-BIT OPERATION

Your 8pre hardware fully supports GigaStudio 24-bit operation. Simply enable 24-bit operation in the Hardware Adapter section (Figure 9-2). The 8pre always supplies a 24-bit data stream, and when you enable 24-bit operation, it simply uses all 24-bits supplied by the 8pre hardware.

Reducing Monitoring Latency

OVERVIEW

When operating the 8pre as an audio interface, *monitoring latency* is that slight delay you hear when you run an input signal through your host audio software. For example, you might hear it when you drive a live mic input signal through a reverb plug-in running in your audio sequencer.

This delay is caused by the amount of time it takes for audio to make the entire round trip through your computer, from when it first enters an 8pre input, passes through the 8pre hardware into the computer, through your host audio software, and then back out to an 8pre output.

If you don't need to process a live input with plug-ins, the easiest way to avoid monitoring latency is to use the 8pre's CueMix DSP feature to patch the input directly to your monitor outs via the 8pre audio hardware. This is just like bussing inputs to outputs in a digital mixer. For details, see "CueMix DSP hardware monitoring" on page 48.

If you *do* need to process a live input with plug-ins, or if you are playing virtual instruments live through your 8pre audio hardware, you can significantly reduce latency — and even make it completely inaudible, regardless of what host audio application software you use. This chapter explains how.

It is important to note that monitoring delay has no effect on when audio data is recorded to disk or played back from disk. Actual recording and playback is extremely precise.

☛ Monitoring latency does not occur when operating the 8pre as an optical expander (in converter mode).

MONITORING LIVE INPUT

There are two ways to monitor live audio input with an 8pre: 1) through the computer or 2) via CueMix™ DSP hardware monitoring. Figure 10-1 below shows method 1, which allows you to add effects processing such as reverb and guitar amp effects via plug-ins in your audio software. See the next section, "Adjusting the audio I/O buffer" for details about how to reduce — and possibly eliminate — the audible monitoring delay that the computer introduces.

Figure 10-2 on page 47 shows how to use CueMix™ DSP hardware-based monitoring, which lets you hear what you are recording with no monitoring delay and no computer-based effects processing. (You can add effects later, after you've recorded the live input as a disk track.) See "CueMix DSP hardware monitoring" later in this chapter for details on how to use CueMix DSP with your audio software, or with the included MOTU CueMix Console software.

If the material you are recording is suitable, there is a third way to monitor live input: use both methods (Figure 10-1 and Figure 10-2) at the same time. For example, you could route vocals to both the computer (for a bit of reverb) and mix that processed signal on the main outs with dry vocals from CueMix DSP.

4. Mic signal (with plug-in processing, if any) is routed to the main outs (or other outputs that you've specified in the software).

1. Live input (from mic, guitar, etc.) enters the MOTU interface.

2. Mic signal goes immediately to the computer (dry, with no effects processing).

3. Mic signal is 'patched thru' back to the audio interface with reverb or other plug-in effects, if any.

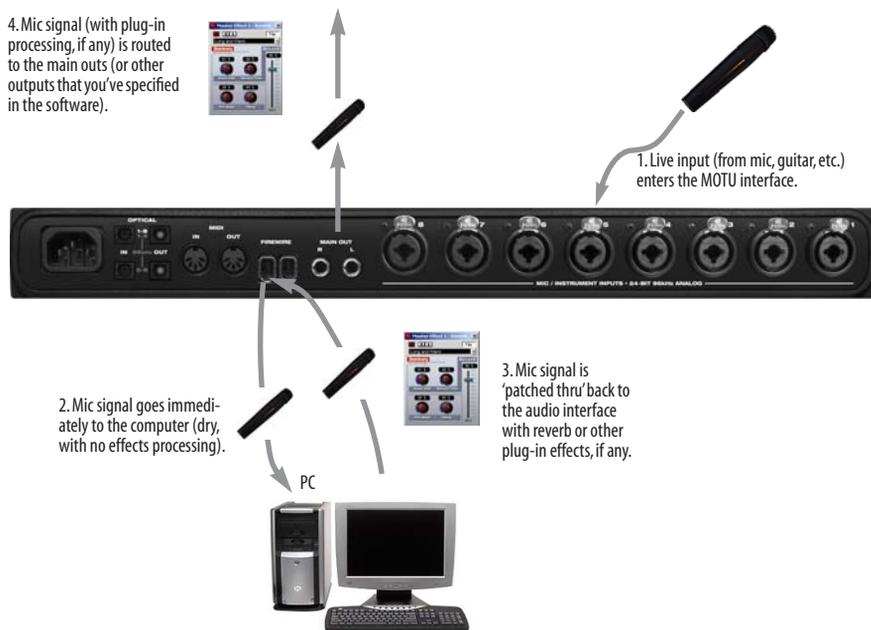PC

Figure 10-1: There are two ways to monitor live audio inputs with an 8pre: 1) through the computer or 2) via CueMix™ DSP hardware monitoring. This diagram shows method 1 (through the computer). When using this method, use your host software's buffer setting to reduce the slight delay you hear when monitoring the live input, but don't lower it too much, or your computer might get sluggish.

ADJUSTING THE AUDIO I/O BUFFER

A *buffer* is a small amount of computer memory used to hold data. For audio interfaces like the 8pre, buffers are used for the process of transferring audio data in and out of the computer. The size of the buffers determines how much delay you hear when monitoring live inputs through your audio software: larger buffers produce more delay; smaller buffers produce less.

Buffer size adjustment is made in MOTU Audio Setup, as shown in Figure 10-3 via the *Samples Per Buffer* setting.
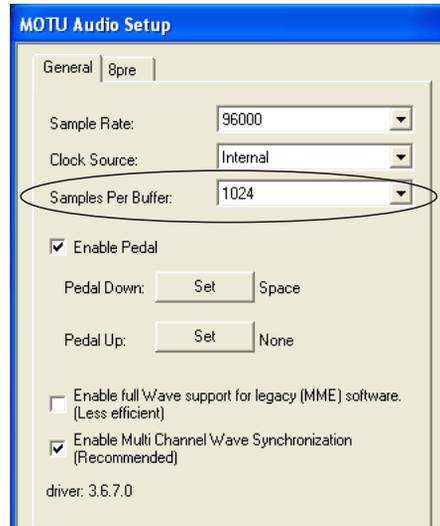
Figure 10-3: Lowering the 'Samples Per Buffer' setting in MOTU Audio Setup reduces patch thru latency. But doing so increases the processing load on your computer, so keep an eye on the Performance Monitor in your host audio software.

1. Live input (from mic, guitar, etc.) enters the MOTU interface.

3. Mic signal is mixed with the main outs, and you can control the volume (relative to the rest of the mix) with the mic's fader in CueMix Console.

2. CueMix™ DSP immediately patches the live mic signal directly to the main outs (or other output), completely bypassing the computer (dry, with no effects processing).

Figure 10-2: This diagram shows the signal flow when using CueMix™ DSP no-latency monitoring. Notice that this method does not allow you to process the live input with plug-ins in your audio software while it is being monitored. You can, however, add effects later — after recording the live input as a disk track. CueMix™ DSP lets you hear what you are recording with no delay and no computer-based effects.

Lower latency versus higher CPU overhead

The buffer setting has a large impact on the following things:

- Patch thru latency

- The load on your computer's CPU

- Possible distortion at the smallest settings

- How responsive the transport controls are in your audio software

The buffer setting presents you with a trade-off between the processing power of your computer and the delay of live audio as it is being patched through your software. If you reduce the size, you reduce patch thru latency, but significantly increase the overall processing load on your computer, leaving less CPU bandwidth for things like real-time effects processing. On the other hand, 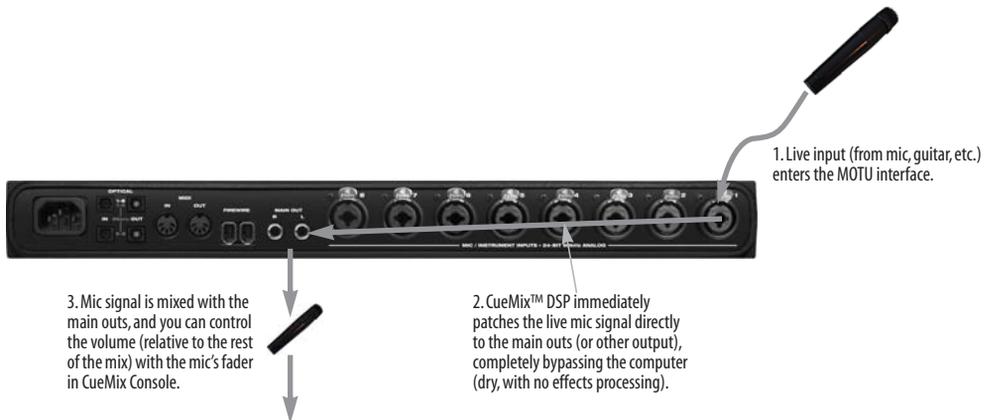if you increase the buffer size, you reduce the load on your computer, freeing up bandwidth for effects, mixing and other real-time operations.

If you are at a point in your recording project where you are not currently working with live, patched-thru material (e.g. you're not recording vocals), or if you have a way of externally processing inputs, choose a higher buffer size. Depending on your computer's CPU speed, you might find that settings in the middle work best (256 to 1024).

Transport responsiveness

Buffer size also impacts how quickly your audio software will respond when you begin playback, although not by amounts that are very noticeable. Lowering the buffer size will make your software respond faster; raising the buffer size will make it a little bit slower, but barely enough to notice.

Effects processing and automated mixing

Reducing latency with the buffer size setting has another benefit: it lets you route live inputs through the real-time effects processing and mix automation of your audio software.

CUEMIX DSP HARDWARE MONITORING

The 8pre has a more direct method of patching audio through the system. This method is called *CueMix DSP.* When enabled, CueMix activates hardware patch-thru in the 8pre itself. CueMix DSP has two important benefits:

- First, it completely eliminates the patch thru delay (reducing it to a small number of samples — about the same amount as one of today's digital mixers).

- Secondly, CueMix DSP imposes no strain on the computer.

The trade-off, however, is that CueMix DSP bypasses your host audio software. Instead, live audio inputs are patched directly through to outputs in the 8pre itself and are mixed with disk tracks playing back from your audio software. This means that you cannot apply plug-ins, mix automation, or other real-time effects that your audio software provides. But for inputs that don't need these types of features, CueMix DSP is the way to go.

On the other hand, if you really need to use the mixing and processing provided by your audio software, you should not use CueMix DSP. Instead, reduce latency with the buffer setting (as explained earlier in this chapter).

TWO METHODS FOR CONTROLLING CUEMIX DSP

There are two ways to control CueMix DSP:

- With MOTU CueMix Console

- From within your host audio software (if it supports direct hardware monitoring)

You can even use both methods simultaneously.

Using MOTU CueMix Console

If your host audio software does not support direct hardware monitoring, you run CueMix Console side-by-side with your audio software and manage your monitor mix in CueMix Console.

CueMix Console allows you to create up to four separate 8pre monitor mixes, or any other desired routing configurations. These routings are independent of your host audio software. For complete details, see chapter 11, "MOTU CueMix Console" (page 51).

Controlling CueMix DSP from your audio software

Some ASIO-compatible audio applications, such as Cubase and Nuendo, allow you to control CueMix DSP monitoring from within the application (without the need to use CueMix Console). In most cases, this support consists of patching an 8pre input directly to an output when you record-arm a track. Exactly how this is handled depends on the application.

CueMix DSP routings that are made via host applications are made "under the hood", which means that you won't see them in CueMix Console. However, CueMix DSP connections made inside your host audio software dovetail with any other mixes you've set up in CueMix Console. For example, if your host application routes audio to an output pair that is already being used in CueMix Console for an entirely separate mix bus, both audio streams will simply be merged to the output.

Follow the directions below in the section that applies to you.

Controlling CueMix DSP from within Cubase or Nuendo

To turn on CueMix in Cubase SX or Nuendo, enable the Direct Monitoring check box in the Device Setup window (Figure 7-2 on page 31).

Other ASIO 2.0-compatible host software

If your ASIO-compatible host audio software supports ASIO's direct monitoring feature, consult your software documentation to learn how to enable this feature. Once enabled, it should work similarly as described for Cubase (as explained in the previous section).

Using CueMix DSP with WDM- or Wave-compatible software

Run CueMix Console (chapter 11, "MOTU CueMix Console" (page 51)) and use it to route live inputs directly to outputs, control their volume and panning, etc. If necessary, you can save your CueMix Console setup with your project file.

MOTU CueMix Console

OVERVIEW

When operating the 8pre as an audio interface, MOTU CueMix Console provides access to the flexible on-board mixing features of the 8pre. CueMix lets you route any combination of inputs to any stereo output pair. These mixes can be set up entirely independently of your host audio software. CueMix allows you to set up four completely independent mix configurations with the 8pre. You can also save and load mix configurations.

CueMix Console can be used independently of host audio software, or together with it. CueMix mixing dovetails with the direct monitoring (hardware patch thru) features of your host audio software, allowing you to seamlessly mix in both environments.
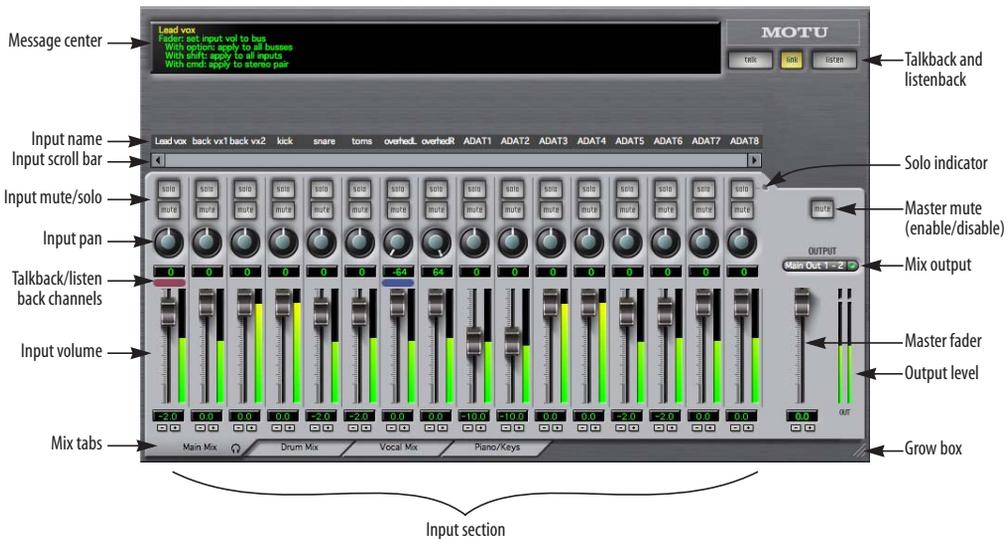
Figure 11-1: MOTU CueMix Console is a virtual mixer that gives you control over the 8pre's on-board mixing features.

ADVANTAGES OF CUEMIX MONITORING

CueMix Console provides several major advantages over monitoring live inputs through your host audio software:

■ CueMix has no buffer latency. Thanks to the 8pre's DSP chip, CueMix provides the same throughput performance as a digital mixer.

■ CueMix imposes absolutely no processor drain on the computer's CPU.

■ CueMix routing can be maintained independently of individual software applications or projects.

CueMix Console does not provide effects processing. For information about using your audio software's native plug-ins together with CueMix, see chapter 10, "Reducing Monitoring Latency" (page 45).

CUEMIX CONSOLE INSTALLATION

CueMix Console is installed with the rest of your 8pre software.

CUEMIX CONSOLE BASIC OPERATION

The CueMix console is simple to operate, once you understand these basic concepts.

Four mixes

CueMix provides four separate mixes: Mix1, Mix2, Mix3 and Mix4. Each mix can have any number of inputs mixed down to any 8pre output pair that you choose. For example, Mix1 could go to the headphones, Mix2 could go to the main outs, Mix3 could go to a piece of outboard gear connected to optical outputs 7-8, etc.

Many inputs to one output pair

It might be useful to think of each mix as some number of inputs all mixed down to a stereo output pair. CueMix Console lets you choose which inputs to include in the mix, and it lets you specify the level and pan for each input being fed into the mix.

Viewing one mix at a time

CueMix Console displays one mix at a time. To select which mix you are viewing, click its tab at the bottom of the window, as shown in Figure 11-1. The mix name appears in the tab. Double-click the name to change it.

Each mix is completely independent

Each mix has its own settings. Settings in one mix will not affect another. For example, if an input is used in one mix, it will still be available in other mixes. In addition, inputs can have a different volume, pan, mute and solo setting in each mix.

Widening the CueMix Console window

To view more input faders at once, drag the right-hand edge of the window to the right.

WORKING WITH A MIX

Each mix has the following components:

■ A stereo output with master fader

■ Name

■ Master mute (to enable/disable the entire mix)

■ Any number of mono or stereo inputs

■ Pan, volume, mute and solo for each input

These elements are visually grouped together in the lightly shaded area in the lower half of the CueMix Console window.

Viewing a mix

To view a mix, click its tab at the bottom of the window, as shown in Figure 11-1. The mix name appears in the tab.

Naming a mix

Double-click the mix name in the tab.

Master mute

The master mute button (Figure 11-1) temporarily disables (silences) the mix.

Master fader

The master fader (Figure 11-1) controls the overall level of the mix (its volume on its stereo output). Use the individual input faders to the left to control individual input levels.

Output level meters

The OUT level meters show you the output for the mix's physical output, which may include audio from your host audio software. The clip indicators clear themselves after a few seconds.

Input section

The channel strips to the left of the master fader represent each input in your 8pre. Use the input scroll bar to view additional inputs.

Input mute/solo

To add an input to a mix, or remove it, click its MUTE button. To solo it, use its SOLO button. To toggle these buttons for a stereo pair, hold down the control key while clicking either channel. The Solo indicator LED (Figure 11-1) lights up when any input is soloed (including inputs that may currently be scrolled off-screen).

Input volume and pan

Use the input fader and pan knob (Figure 11-1) to adjust these settings for the input in the mix. Again, all settings within the gray-shaded channel strip area belong to the mix currently being viewed. Note that an input can have different settings in different mixes.

To adjust the volume or panning for a stereo input pair, hold down the control key while dragging the fader or knob for either the left or right input.

SHORTCUTS

Hold down the following modifier keys as shortcuts:

Shortcut	Result
Shift key	Applies your action to all inputs in the mix.
Control key	Applies your action to the stereo input pair
Space bar	Applies your action to all busses
Double-click	Returns the control to its default value (pan center, unity gain, etc.)

COPYING & PASTING (DUPLICATING) ENTIRE MIXES

To copy and paste the settings from one mix to another:

1 Select the source mix (Figure 11-1) and choose Copy from the file menu (or press control-C).

2 Choose the destination mix and choose Paste from the file menu (or press control-V).

MESSAGE CENTER

The Message Center displays fly-over help for items in the CueMix Console window. It also displays messages regarding the overall operation of the 8pre.

SAVING AND LOADING PRESETS

The 8pre can store up to 16 presets in its on-board memory. A preset includes of all CueMix DSP settings for all for mix busses, but it excludes global settings like clock source and sample rate.

The *Load Preset* and *Save Preset* commands in the CueMix Console file menu let you name, save and load presets in the 8pre.

SAVING AND LOADING PRESETS TO/FROM DISK

The *Save* and *Load* commands in the CueMix Console File menu allow you to save 8pre presets to and from your hard drive. This allows you to save an unlimited number of 8pre presets on disk. (Use

the *Load Preset* and *Save Preset* commands to get presets from — and save them to — the 8pre itself.) Click the Save button to save the current configuration; click the Load button to open an existing configuration that you have previously saved on disk.

TALKBACK AND LISTENBACK

CueMix Console provides *Talkback* and *Listenback* buttons. Talkback allows an engineer in the control room to temporarily dim all audio and talk to musicians in the live room. Conversely, Listenback allows musicians to talk to the control room.

Hardware setup

Figure 11-2 below shows a typical hardware setup for Talkback and Listenback. For Talkback, set up a dedicated mic in your control room and connect it to a mic input on your MOTU audio interface. For Listenback, set up a dedicated listenback mic in the live room for the musicians and connect it to another mic input. For talkback output, set up a headphone distribution amp or set of speakers in the live room, and connect it to the 8pre's headphone out, as demonstrated below in Figure 11-2.
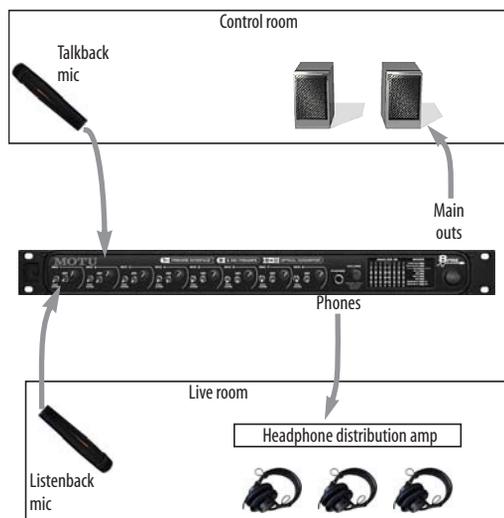
CueMix Console setup

To set up Talkback and/or Listenback in CueMix Console, choose *File menu> Talkback settings> Configure Talkback/Listenback* to open the window shown in Figure 11-3:
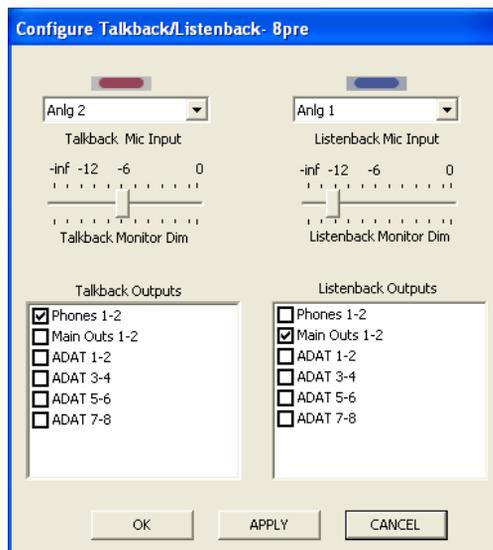

Figure 11-3: Configuring Talkback and Listenback.

Figure 11-2: Typical hardware setup for Talkback and Listenback.

Talkback / Listenback Mic Input

Choose the audio input to which your Talkback and/or Listenback mic is connected. These inputs are labeled with a purple and blue swatch, respectively, just above the channel fader.

These labels identify the Talkback and Listenback mic inputs.

Figure 11-4: The purple label identifies the Talkback mic input; the blue label indicates the Listenback mic. Use the input fader to control the mic volume.

Talkback / Listenback Monitor Dim

Choose the amount of attenuation you would like to apply to all other audio signals (besides the talkback/listenback volume) when Talkback and/or Listenback is engaged. To completely silence all other CueMix audio, move the slider all the way to the left (-Inf). Audio playing back from disk (your host software) is not affected.

Talk / Listen signal routing

As shown in Figure 11-3, check the boxes next to the outputs on which you'd like to hear the Talkback mic and/or Listenback mic. For example, as demonstrated in the diagram in Figure 11-2, to hear the Talkback mic on the headphones in the live room, check the *Phones* check box in the *Talkback Outputs* column as demonstrated in Figure 11-3. To hear the Listenback mic on the main monitors in the control room, check the *Main Out*s check box in the *Listenback Outputs* column, also demonstrated in Figure 11-3.

Engaging/disengaging Talkback and Listenback

To engage Talk back or Listenback, press on the Talk or Listen buttons and then release to disengage. Talkback and/or Listenback is engaged for as long as you hold down the mouse button. Hold down the spacebar and click to make the buttons "sticky" (stay engaged until you click them again — so you don't have to hold down the mouse). If you would like to engage both Talkback and Listenback at the same time, enable the *Link* button.

Figure 11-5: The Talkback and Listenback buttons.

Controlling Talkback and Listenback volume

To control the volume of the Talkback and/or Listenback mics, adjust their input fader in CueMix Console. This fader controls the volume of the input, regardless of which bus mix is being displayed in the CueMix Console window. In other words, once an input has been designated as a Talkback or Listenback input, its fader becomes global for all CueMix buses.

MIX1 RETURN INCLUDES COMPUTER

The *Mix1 return includes computer output* item in the CueMix Console File menu refers to the *Mix1* bus that the 8pre driver provides as an input to host audio software. This input source delivers the output of CueMix DSP "MIX1" (the first mix bus of the four on-board no-latency monitor mixes in the 8pre) back to your computer. This input serves, for example, as a convenient way for you to record the 8pre's MIX1 monitor mix back into your host audio software (for reference and archiving purposes).

55

When the *Mix1 return includes computer* menu item is checked, any audio being sent from your audio software on the computer to the same output as Mix1 will be included in the Mix1 return bus. When it is unchecked, computer output is excluded.

This menu item is essentially a pre/post switch for the computer audio insert to the stream of audio going to Mix1's 8pre output pair (and also back to the computer).

PHONES MENU

The Phones menu allows you to choose what you will hear on the headphone output, just like the Phones setting MOTU Audio Setup. However, this menu provides one extra option that is exclusive to CueMix Console: *Follow Active Mix*. This menu item, when checked, causes the headphone output to mirror the output of the current mix being viewed in CueMix Console. For example, if you are currently viewing Mix3 (the Mix3 tab is active), the headphones will mirror the Mix3 output (whatever it is assigned to).

CONTROL SURFACES MENU

CueMix Console can be controlled from an automated control surface such as the Mackie Control™. Use the commands in the *Control Surfaces* menu to enable and configure this feature.

Application follows control surface

When checked, the *Application follows control surface* menu command makes the CueMix Console window scroll to the channel you are currently adjusting with the control surface, if the channel is not visible when you begin adjusting it. The same is true for the bus tabs: if you adjust a control in a bus that is not currently being displayed, CueMix Console will jump to the appropriate tab to display the control you are adjusting.

Share surfaces with other applications

When the *Share surfaces with other applications* menu command is checked, CueMix Console releases the control surface when you switch to another application. This allows you to control your other software with the control surface. Here's a simple way to understand this mode: the control surface will always control the front-most application. Just bring the desired application to the front (make it the active application), and your control surface will control it. When you'd like to make changes to CueMix Console from the control surface, just bring CueMix Console to the front (make it the active application).

When this menu item is unchecked, your control surface will affect CueMix Console all the time, even when CueMix Console is not the front-most application. In addition, you will not be able to control other host audio software with the control surface at any time (because CueMix Console retains control over it at all times). This mode is useful when you do not need to use the control surface with any other software.

Mackie Control Surfaces

CueMix Console includes support for the following control surface products:

- Mackie Control™

- Mackie HUI™

- Mackie Baby HUI™

Use the sub-menu commands in the *Mackie Control Surfaces* menu item to turn on and configure control surface support, as described briefly below.

Enabled

Check this menu item to turn on control surface operation of CueMix Console. Uncheck it to turn off control surface support.

Configure…

Choose this menu item to configure your control surface product. Launch the on-line help for specific, detailed instructions for configuring CueMix Console for operation with your control surface product.

When operating the 8pre at a 2x sample rate (88.2 or 96 kHz), the two optical output banks work in concert to provide channels 1-4 and 5-8, respectively, for a total of 8 channels of high-resolution.

Figure 11-6: Refer to the extensive on-line help for details about configuring CueMix Console for operation with your control surface product.

CUEMIX IN OPTICAL EXPANDER MODE

When the 8pre operates as an optical expander (as discussed in "Operating the 8pre as a converter" on page 21), CueMix is hard-wired to route each analog input to its corresponding optical output channel (analog in 1 to optical out 1, analog in 2 to optical out 2, and so on).

In addition, when operating the 8pre at a 1x sample rate (either 44.1 or 48 kHz), the analog input signals are duplicated and sent to both optical output banks. This lets you send the analog input signals to two separate optical destinations, if desired.

MOTU SMPTE Setup

OVERVIEW

The 8pre can resolve directly to SMPTE time code via any analog input, without a separate synchronizer. The 8pre can also generate time code via any analog output. The 8pre provides a DSP-driven phase-lock engine with sophisticated filtering that provides fast lockup times and sub-frame accuracy. Direct time code synchronization is supported by Cubase, Nuendo and other audio sequencer software that supports the ASIO2 sample-accurate sync protocol.

Any analog input and output on the 8pre can be used for time code (LTC) input and output, respectively.

MOTU SMPTE SETUP

The included MOTU SMPTE Setup™ software provides a complete set of tools to generate SMPTE for striping, regenerating or slaving other devices to the computer.

CLOCK/ADDRESS

The *Clock/Address* menu (Figure 12-1) provides the same global *Clock Source* setting as in MOTU Audio Setup ("Clock Source" on page 28 in the 8pre manual), but it includes additional information: each setting shows both the clock and the address (time code or sample location), separated by a forward slash (/). To resolve the 8pre to SMPTE time code, choose the *SMPTE / SMPTE* setting in the Clock/Address menu. This means that the system will use SMPTE as the clock (time base) and SMPTE as the address.

FRAME RATE

This setting should be made to match the SMPTE time code frame rate of the time code that the system will be receiving. The 8pre can auto-detect

The Reader section provides settings for resolving to video and/or SMPTE time code.

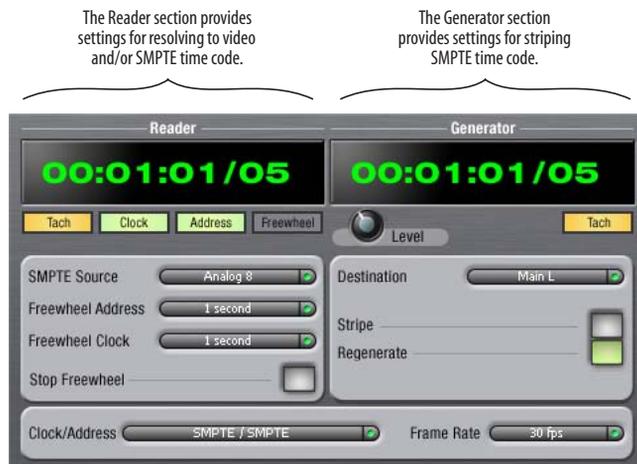The Generator section provides settings for striping SMPTE time code.

Figure 12-1: SMPTE Setup gives you access to your 8pre's on-board SMPTE time code synchronization features.

and switch to the incoming frame rate, except that it cannot distinguish between 30 fps and 29.97 fps time code. So if you are working with either of these rates, make sure you choose the correct rate from this menu.

READER SECTION

The Reader section (on the left-hand side of the window in Figure 12-1) provides settings for synchronizing the 8pre to SMPTE time code.

Status lights

The four status lights (Tach, Clock, Address and Freewheel) give you feedback as follows.

Tach

The Tach light blinks once per second when the 8pre has successfully achieved lockup to SMPTE time code and SMPTE frame locations are being read.

Clock

The Clock light glows continuously when the 8pre has successfully achieved lockup to an external time base, such as SMPTE time code or the optical input.

Address

The Address light glows continuously when the 8pre has successfully achieved lockup to SMPTE time code.

Freewheel

The Freewheel light illuminates when the 8pre is freewheeling address (time code), clock or both. For details about Freewheeling, see "Freewheel Address" and "Freewheel clock" below.

SMPTE source

Choose the analog input to which the SMPTE time code source is connected. This is the input that the 8pre "listens" to for time code.

Freewheel Address

Freewheeling occurs when there is a glitch or drop-out in the incoming time code for some reason. The 8pre can freewheel past the drop-out and then resume lockup again as soon as it receives readable time code. Choose the amount of time you would like the 8pre to freewheel before it gives up and stops altogether.

The 8pre cannot freewheel address without clock. Therefore, the *Freewheel Address* setting will always be lower than or equal to the *Freewheel Clock* setting, and both menus will update as needed, depending on what you choose.

Keep in mind that freewheeling causes the system to keep going for as long as the duration you choose from this menu, even when you stop time code intentionally. Therefore, if you are starting and stopping time code frequently (such as from the transports of a video deck), shorter freewheel times are better. On the other hand, if you are doing a one-pass transfer from tape that has bad time code, longer freewheel times will help you get past the problems in the time code.

The 'Infinite' freewheel setting

The *Infinite* freewheel setting in the *Freewheel Address* menu causes the 8pre to freewheel indefinitely, until it receives readable time code again. To make it stop, click the *Stop Freewheeling* button.

Freewheel clock

Freewheeling occurs when there is glitch or drop-out in the incoming SMPTE time code for some reason. The 8pre can freewheel past the drop-out and then resume lockup again as soon as it receives a stable, readable clock signal.

The 8pre cannot freewheel address without clock. Therefore, the *Freewheel Address* setting will always be lower than or equal to the *Freewheel Clock* setting, and both menus will update as needed, depending on what you choose.

The 'Infinite' freewheel setting

The *Infinite* freewheel setting in the *Freewheel Clock* menu causes the 8pre to freewheel indefinitely, until it receives readable time code again. To make it stop, click the *Stop Freewheeling* button.

Stop Freewheeling

The Stop Freewheeling button stops the system if it is currently freewheeling.

GENERATOR SECTION

The Generator section (on the right-hand side of the window in Figure 12-1) provides settings for generating SMPTE time code.

Level

Turn the level knob to adjust the volume of the SMPTE time code being generated by the 8pre. The level knob disappears when the Destination is set to *None*.

Tach light

The Tach light blinks once per second when the 8pre is generating SMPTE time code.

Destination

In the *Destination* menu, choose the analog output from which SMPTE time code will be generated. This is the output that sends time code.

Stripe

Click this button to start or stop time code. To set the start time, click directly on the SMPTE time code display in the Generator section and type in the desired start time. Or drag vertically on the numbers.
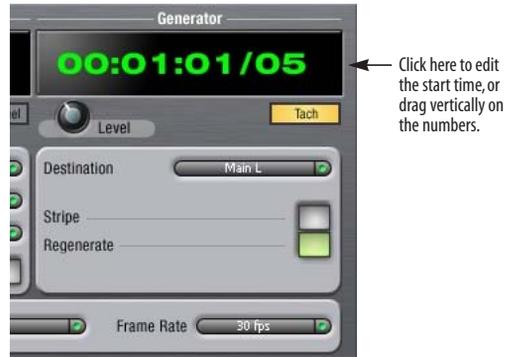
Figure 12-2: Setting the time code start time.

Regenerate

This option, when enabled, causes the generator to generate time code whenever the 8pre is receiving SMPTE time code.

SETTING UP FOR SMPTE TIME CODE SYNC

In summary, the 8pre system can resolve directly to SMPTE time code. It can also generate time code and a time base, under its own clock or while slaving to time code. Therefore, the 8pre can act both as an audio interface and digital audio synchronizer. You can use the 8pre to slave your audio software to SMPTE as well, as long as your software supports ASIO2 sample-accurate sync, which is the means by which the software follows the 8pre. The accuracy may not be sample-accurate, but in most cases it will be very close.

Use this setup if you have:

✓ A SMPTE time code source, such as a multitrack tape deck.

✓ Host software that supports sample-accurate sync.

This setup provides:

✗ No sample-accurate locating.

✓ Continuous sync to SMPTE time code.

✓ Sub-frame timing accuracy.

✓ Transport control from the SMPTE time code source.

SMPTE time code source

Choose *SMPTE* as the clock source in the MOTU Audio Setup. This setting can also be made in the MOTU SMPTE Setup software (shown below).

audio cable bearing LTC (Longitudinal Time Code)

In Cubase SX, go to the Sync Setup window and choose the *ASIO Audio Device* option.

Any analog input

8pre interface

When lockup is achieved, the CLOCK light illuminates and the TACH light blinks once per second.

FireWire cable

Windows computer running Cubase or other sample-accurate ASIO2 software

Launch the MOTU SMPTE Setup and specify the *SMPTE Source*, which is the input receiving the SMPTE time code. Also, confirm that the *Clock Source/Address* is *SMPTE/SMPTE*.

Figure 12-3: Connections for synchronizing the 8pre directly to SMPTE time code.

RESOLVING CUBASE OR NUENDO TO SMPTE TIME CODE

To resolve your 8pre directly to SMPTE time code with no additional synchronization devices, use the setup shown in Figure 12-3. Make sure the *Clock Source* setting in the MOTU Audio Setup window is set to *SMPTE*. Also, make sure that you've connected an LTC input signal to an 8pre analog input, and that you've specified that input in the SMPTE Setup.

Performance Tips & Troubleshooting

The computer freezes when it starts up
If the computer is unable to boot up, it may be a conflict with the WDM Driver. As soon as the computer boots up, Windows will try and initialize the WDM Driver. If this fails, your computer will hang. To determine if the WDM Driver is the problem, boot up in Safe Mode or remove the MOTU Audio software with the Add/Remove Programs Control Panel then restart. Reinstall the 8pre software and choose only to install the MOTU ASIO driver, not the WDM Driver. Restart again.

'New hardware detected' window
If you connect your 8pre before running the 8pre Software Installer CD, Windows will prompt you that new hardware has been detected. Cancel this, and run the 8pre Software Installer, rather than allowing Windows to locate the drivers.

Audio in SONAR speeds up or slows down
This could be caused by having incorrect SMPTE/MTC Sync settings when you record audio into SONAR. These settings are located in the *Advanced* Tab in the Audio Options window, accessed from SONAR's Options menu. Make sure that you have the SMPTE/MTC Sync set to "Trigger and Freewheel" before recording audio while slaved to external time code.

8pre inputs and outputs are not available in SONAR
Make sure that the inputs and/or outputs that you want to use are enabled in SONAR in the Audio Options window under the Drivers tab.

8pre inputs and outputs are not available in Cubase
Make sure that the inputs and outputs are enabled in Cubase in Device Setup> VST Audiobay>MOTU Audio> VST inputs/outputs.

Sound Forge and 'Smooth Scroll'
If the Smooth Scroll option under the Options menu is turned on, you may experience clicks and pops or other anomalies in the audio playback. This gets worse as you zoom in more to the waveform while playing. For the best quality playback, turn this option off.

Clicks and pops due to hard drive problems
If you have checked your clock settings sync cable connections and you are still getting clicks and pops in your audio, you may have a drive related problem. Set the 8pre Clock Source to Internal and try recording just using the analog inputs and outputs of the 8pre. If you encounter the same artifacts you may want try using another drive in your computer. Clicks and pops can also occur when the drive is severely fragmented, the disk drivers are outdated, or if you are using a SCSI accelerator that is not optimally configured for working with audio.

Connecting or powering gear during operation
It is not recommended that you connect/disconnect, or power on/off devices connected to the 8pre while recording or playing back audio. Doing so may cause a brief glitch in the audio.

Monitoring - How to monitor inputs?
Please refer to the documentation for the audio application that you are using. If your application does not support input monitoring, you will need to use the 8pre's hardware-based CueMix DSP monitoring feature. Please see chapter 10, "Reducing Monitoring Latency" (page 45).

No optical inputs or outputs are available in host audio application
Check to make sure you have the desired optical inputs and/or outputs enabled in MOTU Audio Setup.

Controlling monitoring latency
See chapter 10, "Reducing Monitoring Latency" (page 45).

CUSTOMER SUPPORT
We are happy to provide customer support to our registered users. If you haven't already done so, please take a moment to register your 8pre either on line at www.motu.com or by filling out and mailing the included product registration card. You'll be placed on our mailing list for free software updates and information about new products.

REPLACING DISKS
If your 8pre installer CD becomes damaged and fails to provide you with fresh, working copies of the program, our Customer Support Department will be glad to replace it. You can request a replacement disc by calling our business office at (617) 576-2760 and asking for the customer service department. In the meantime, you can download the latest drivers from www.motu.com.

TECHNICAL SUPPORT
If you are unable, with your dealer's help, to solve problems you encounter with the 8pre system, you may contact our technical support department in one of the following ways:

■ Tech support hotline: (617) 576-3066 (Monday through Friday, 9 am to 6 pm EST)

■ Tech support 24-hour fax line: (617) 354-3068

■ Tech support email: techsupport@motu.com

■ Web site: www.motu.com

Please provide the following information to help us solve your problem as quickly as possible:

■ The serial number of the 8pre system. This is printed on a sticker placed on the bottom of the 8pre rack unit. You must be able to supply this number to receive technical support.

■ Software version numbers for the audio software you are using, the MOTU Audio WDM Driver, MOTU ASIO driver, etc.

■ A brief explanation of the problem, including the exact sequence of actions which cause it, and the contents of any error messages which appear on the screen.