

Avid® Pro Tools® LE

User's Guide

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Digi 002 Communications & Safety Regulation Information

Compliance Statement

The model Digi 002 complies with the following standards regulating interference and EMC:

- FCC Part 15 Class B
- EN55022
- EN55024
- AS/NZS 3548 Class B
- CISPR 22 Class B

Radio and Television Interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

DECLARATION OF CONFORMITY

We Digidesign,

2001 Junipero Serra Boulevard, Suite 200

Daly City, California 94014-3886, USA

650-731-6300

declare under our sole responsibility that the product

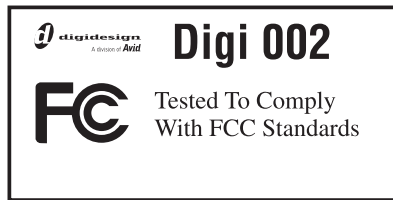
Digi 002

complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or locate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



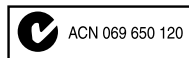
Any modifications to the unit, unless expressly approved by Digidesign, could void the user's authority to operate the equipment.

Canadian Compliance Statement:

This Class B digital apparatus complies with Canadian ICES-003

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

Australian Compliance



European Compliance



Safety Statement

This equipment has been tested to comply with USA and Canadian safety certification in accordance with the specification of UL Standards : UL1419 and Canadian CAN C22.2NO.1-98, IEC60950. Digidesign Inc., has been authorized to apply the appropriate UL & CUL mark on its compliant equipment.

Warning!



Important Safety Instructions

When using electric or electronic equipment, basic precautions should always be followed, including the following:

- Read all instructions before using this equipment.
- To avoid the risk of shock, keep this equipment away from rain water, and other moisture. Do not use this equipment if it is wet.
- The equipment should only be connected to the correct rating power supply as indicated on the product.
- Do not attempt to service the equipment. There are no user-serviceable parts inside. Please refer all servicing to authorized Digidesign personnel.

- Any attempt to service the equipment will expose you to a risk of electric shock, and will void the manufacturer's warranty.
- The product should be connected only to the correct power supply as indicated on the product.
- Do not block any ventilation openings. Install in accordance with the manufacture's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 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 an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Clean only with dry cloth.

Mbox Communications & Safety Regulation Information

DECLARATION OF CONFORMITY

We Digidesign,

2001 Junipero Serra Boulevard, Suite 200

Daly City, CA 94014 USA

tel: 650-731-6300

declare under our sole responsibility that the product

Mbox

complies with Part 15 of FCC Rules.

Current Consumption 500mA

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or locate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

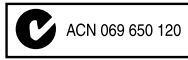
Any modifications to the unit, unless expressly approved by Digidesign, could void the user's authority to operate the equipment.

Canadian Compliance Statement:

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Australian Compliance



European Compliance



Avid Pro Tools LE User's Guide • 0130-06218-01 Rev. A • June 2004

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Using This Guide

Welcome to Avid® Pro Tools® LE for Avid Xpress Studio. This version of Pro Tools combines the audio post-production features of Pro Tools LE and DV Toolkit™ with integrated support for import and playback of Avid video media.

This guide includes information on the following Avid Pro Tools LE hardware and software components:

- Digi 002 and Mbox audio interfaces
- Pro Tools LE with DV Toolkit software, including
 - DV Toolkit post-production features
 - DINR LE Broadband Noise Reduction plug-in
 - Vocalign Project plug-in from Synchro Arts Limited
 - DigiTranslator option for Pro Tools LE

Avid Pro Tools LE Capabilities

Avid Pro Tools LE includes the following capabilities:

- Sound effects editing and design
- Music composition and editing
- Dialog conforming and editing
- Voice-over recording and editing
- Foley recording and editing
- Mixing and signal processing

Avid Pro Tools LE Interfaces

Depending on the version of Avid Xpress Studio you purchased, you will have one of the following Pro Tools interfaces:

- Digi 002
- Mbox



The documentation describes the features and hardware of both models. Therefore, your system might not contain certain features and hardware that are covered in the documentation.

Symbols and Conventions

Avid documentation uses the following symbols and conventions:

Symbol or Convention	Meaning or Action
	A note provides important related information, reminders, recommendations, and strong suggestions.
	A caution means that a specific action you take could cause harm to your computer or cause you to lose data.
	A warning describes an action that could cause you physical harm. Follow the guidelines in this document or on the unit itself when handling electrical equipment.
>	This symbol indicates menu commands (and subcommands) in the order you select them. For example, File > Import means to open the File menu and then select the Import command.
►	This symbol indicates a single-step procedure. Multiple arrows in a list indicate that you perform one of the actions listed.
⌘	This symbol represents the Apple or Command key. Press and hold the Command key and another key to perform a keyboard shortcut.

Symbol or Convention	Meaning or Action
<i>Margin tips</i>	In the margin, you will find tips that help you perform tasks more easily and efficiently.
(Windows), (Windows only), (Macintosh), or (Macintosh only)	This text indicates that the information applies only to the specified operating system, either Windows XP or Macintosh OS X.
<i>Italic font</i>	Italic font is used to emphasize certain words and to indicate variables.
Courier Bold font	Courier Bold font identifies text that you type.
Ctrl+key or <i>mouse action</i> ⌘+key or <i>mouse action</i>	Press and hold the first key while you press the last key or perform the mouse action. For example, ⌘+Option+C or Ctrl+drag.

If You Need Help

If you are having trouble using Avid Pro Tools LE:

1. Retry the action, carefully following the instructions given for that task in this guide. It is especially important to check each step of your workflow.
2. Check for the latest information that might have become available *after* the documentation was published in one of two locations:
 - If release notes are available, they ship with your application.
 - If ReadMe files are available, they are supplied in your Avid application folder. ReadMe files are also available from Help.



Release notes and ReadMe files are also available on the Avid Support Center.

3. Check the documentation that came with your Avid application or your hardware for maintenance or hardware-related issues.
4. Visit Avid Online Support at www.avid.com/support. Online support is available 24 hours per day, 7 days per week. Search the Knowledgebase to find answers, to view error messages, to access troubleshooting tips, to download updates, and to read/join online message-board discussions.
5. For Technical Support, please call 800-800-AVID (800-800-2843).

For Broadcast On-Air Sites and Call Letter Stations, call 800-NEWSDNG (800-639-7364).

Accessing the Online Library

The *Avid Xpress Studio Online Library* DVD contains all the product documentation in PDF format and tutorials. Avid recommends the tutorials as your first resource for learning how to use your application. You can access the documentation and tutorial from the Online Library DVD or from the Help menu.



You will need Adobe® Acrobat® Reader® installed to view the documentation online. The Acrobat folder on the CD-ROM contains an installer for Acrobat Reader. The tutorial and the effects reference guide requires Apple's QuickTime® application to view the QuickTime movies. You can download the latest version of QuickTime from the Apple® Web site.

To access the online library and tutorial from the Online Library DVD:

1. Insert the Online Library DVD into the drive.
2. Double-click the Mainmenu file.

To access the online library and tutorial from the Help:

1. Insert the Online Library DVD into the drive.
2. In your Avid application, select Help > Online Library.

How to Order Documentation

To order additional copies of this documentation from within the United States, call Avid Sales at 800-949-AVID (800-949-2843). If you are placing an order from outside the United States, contact your local Avid representative.

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Using This Guide

Chapter 1

Welcome to Digi 002

Welcome to Digi 002, Digidesign's cross-platform Pro Tools workstation for music, sound design, and multimedia production.

Digi 002 Features

Digi 002 includes the following features:

Audio and MIDI Features

Digi 002 provides the following input and output capacity:

- 8 analog audio inputs (4 with mic preamps), with A/D converters supporting up to 24-bit, 96 kHz audio
- 48V phantom power on mic preamps, switchable in channel pairs
- –10 dBV input pair for direct monitoring of tape or CD input sources
- Eight analog audio outputs, with D/A converters supporting up to 24-bit, 96 kHz audio
 - Monitor Output pair (+4 dBu) mirrors Main Outputs 1–2 with dedicated volume control for direct connection to powered speakers
 - Alternate Main Output pair (–10 dBV) mirrors Main Outputs 1–2 for direct output to –10 dBV devices
- Stereo headphone output with level control
- Optical connectors for 8 channels of ADAT I/O (up to 48 kHz) or 2 channels of Optical S/PDIF I/O (up to 96 kHz)
- RCA connectors for 2 channels of S/PDIF digital I/O supporting up to 24-bit, 96 kHz audio

- 1 MIDI In port and 2 MIDI Out ports, providing up to 16 channels of MIDI input and up to 32 channels of MIDI output
- Footswitch jack for punching in and out while recording

Control Surface Features

Digi 002 provides an integrated control surface for software control that includes the following:

- Eight touch-sensitive moving faders and dedicated solo, mute and channel select/record arm controls
- Eight multi-function rotary encoders for operating pan, send, and plug-in controls
- Transport and navigation controls
- Ten scribble strips for channel information display

Stand-Alone Mixing Features

Digi 002 can be used as a stand-alone 8-channel digital mixer with the following features:

- 8 analog inputs (4 with mic preamps), with dedicated volume, pan, solo, and mute controls
- Dedicated three-band EQ available on input channels 1–8
- Dedicated Compressor/Limiter available on input channels 1–4
- Built-in high-quality Reverb and Delay
- Four sends on each input channel:
 - Sends 1–2 dedicated to internal Delay and Reverb effects
 - Sends 3–4 for integrating external effects
- Stereo outputs with dedicated Master Fader controls, including:
 - Main Output pair (+4 dBu fixed signal)
 - Monitor Output pair (+4 dBu) mirrors Main Outputs 1–2 with dedicated volume control for direct connection to powered speakers
 - Alternate Main Output pair (–10 dBV) mirrors Main Outputs 1–2 for direct output to –10 dBV devices
- Stereo headphone output with level control

- Ten scribble strips for pan/volume and effects control, send levels, and track names
- Channel metering available using rotary encoder LED rings (in Meter mode)

Pro Tools LE Capabilities

Pro Tools LE software provides the following capabilities with Digi 002:

- Record and play back up to 32 mono digital audio tracks, depending on your computer's capabilities
- Sessions can include up to 128 audio tracks (with 32 voiceable tracks maximum), 256 MIDI tracks, 128 Auxiliary Input tracks, and 64 Master Fader tracks
- 16-bit or 24-bit audio resolution, at sample rates up to 48 kHz
- Nonlinear, random-access editing and mix automation
- Audio processing with up to five RTAS plug-ins per track, depending on your computer's capabilities
- Up to five inserts and five sends per track
- Up to 16 internal mix busses



Pro Tools LE uses your computer's CPU to mix and process audio tracks (host processing). Computers with faster clock speeds yield higher track counts and more plug-in processing.

System Requirements

Digidesign can only assure compatibility and provide support for hardware and software it has tested and approved.

For a list of Digidesign-qualified computers, operating systems, hard drives and third-party devices, refer to the latest compatibility information on the Digidesign Web site (www.digidesign.com/compato).

MIDI Requirements

USB MIDI and serial MIDI interfaces work effectively with Pro Tools systems on Windows.

For a list of supported adapters, refer to the Digidesign Web site (www.digidesign.com).

Digi 002 Top Panel

Digi 002 Operating Modes

Digi 002 can be in any of three states when it is turned on: Standby mode, Pro Tools mode, or Stand-alone mode.

Standby Mode

Digi 002 is in Standby mode when you first turn on the unit, waiting for you to either start Pro Tools or put the unit in Stand-alone mode.

In Standby mode, the unit displays “Digi 002” and “Standby” in the Scribble Strips, and the Standalone LED flashes.

Pro Tools Mode

Digi 002 is in Pro Tools mode when the Digi 002 unit is connected to a computer and Pro Tools LE software is running.

If no Pro Tools session is open, the unit displays “Open or create a new session.” When a Pro Tools session is open, the unit mirrors the on-screen controls. In this mode, the Stand-alone LED is off.

To put Digi 002 in Pro Tools mode:

1. Make sure the Digi 002 unit is properly connected to the computer and in Standby mode.
2. Launch Tools LE and open or create a Pro Tools session.

Stand-Alone Mode

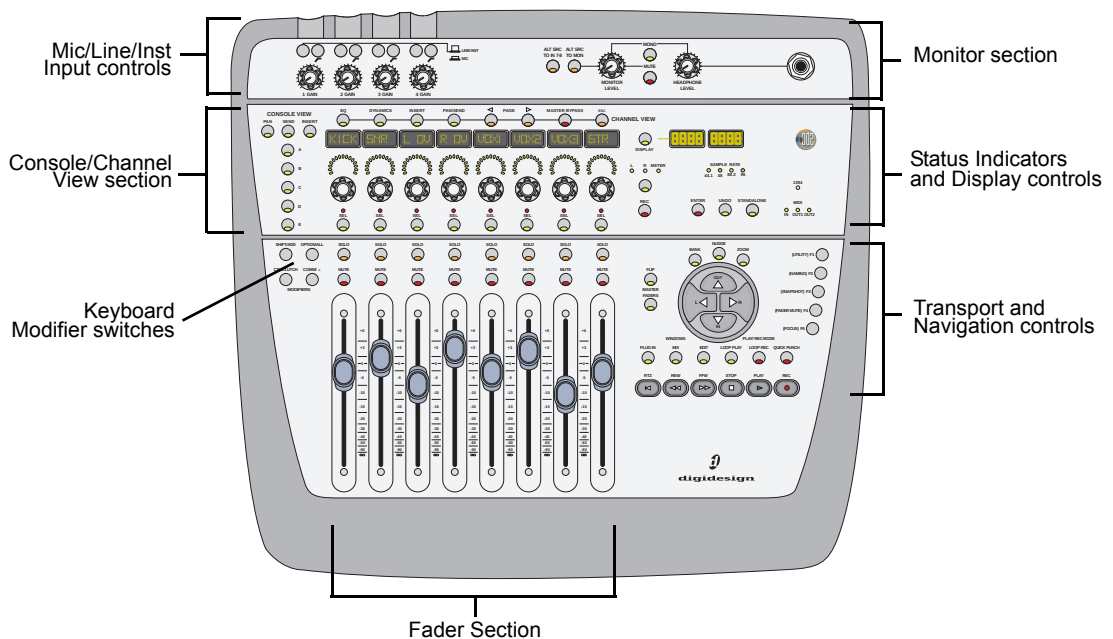
When you put Digi 002 in Stand-alone mode, the unit becomes an 8-channel digital mixer that operates independently from Pro Tools.

See [“Using Digi 002 as a Stand-Alone Mixer” on page 67](#) for more information on stand-alone operation of Digi 002.

The Digi 002 Top Panel

The Digi 002 top panel is arranged in sections of controls with related functions. The Fader section includes standard channel strip controls, similar to any small-format mixer. The Console/Channel View section provides powerful multi-state controls for viewing and controlling inserts, plug-ins, and sends in Pro Tools. The Transport and Navigation controls provide access to many of the on-screen navigation features of Pro Tools.

This section covers each of the Digi 002 panel sections in relation to its function while in Pro Tools mode.



Views in Pro Tools Mode

When Digi 002 is used with Pro Tools, many of its controls perform more than one function, depending on which *view* you are in. When in Pro Tools mode, the Digi 002 control surface operates in one of three main views: *Home View*, *Console View*, or *Channel View*.

Home View

Home View is the default view in Pro Tools that you see when you first open a session, and is the same as Console View with the Pan controls displayed.

To put Digi 002 in Home View:

- ▶ Press the Pan switch in the upper left corner of the Console View area.

Console View

Console View lets you toggle the Digi 002 to show pan position, send assignments, or insert assignments for all channels on the control surface. You can think of Console View as a global view of a given control (pan, send, or insert) on each channel. (See “Console View Selectors” on page 34.)

- In Console view, the touch-sensitive faders on Digi 002 mirror the volume faders in Pro Tools. Fader assignments are shown on-screen in Pro Tools by blue outlines around the track names.
- In Console view, the LED rings above the rotary encoders indicate either the pan position, the send level, or the insert level for each channel, depending on which Console View switch is lit.



When you first open a Pro Tools session, Digi 002 is in Console View with the Pan switch lit. This default view is also known as “Home View.”

Digi 002 is in Console View when any of the Console View selectors (Pan, Send, or Insert) are lit in the Console View area.

To put Digi 002 in Console View:

- ▶ Press the Pan, Send, or Insert switch in the upper left corner of the Console View area.

Channel View

Channel View lets you display all of a selected channel's plug-in assignments, insert names, or send assignments at the same time. You can think of Channel View as a way to temporarily focus on all the inserts or sends on a single channel.

- In Channel View, the touch-sensitive faders on Digi 002 mirror the volume faders in Pro Tools.
- In Channel View, the LED rings above the rotary encoders indicate values for the selected control, such as plug-in parameters, insert levels, or pan values and send levels, depending on which Channel View switch is lit.

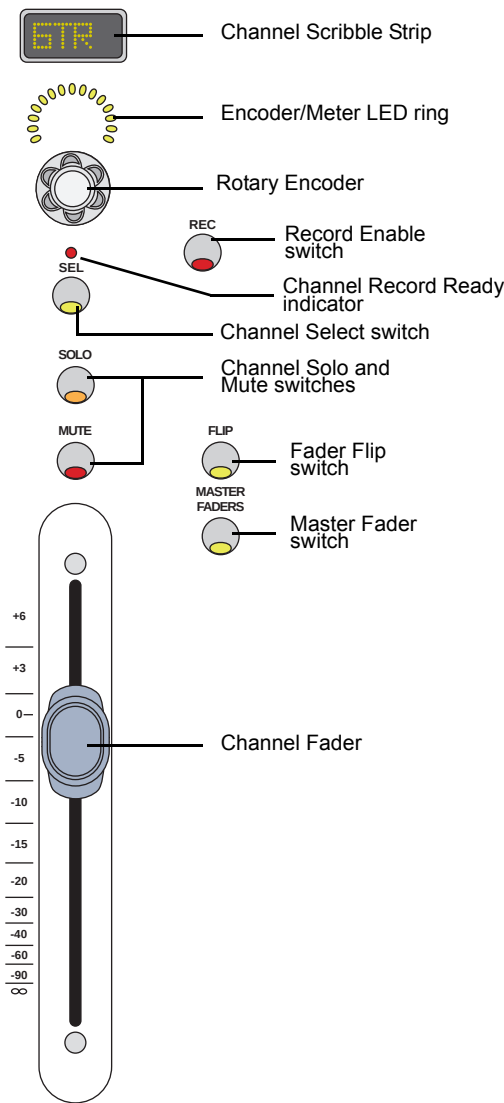
Digi 002 is in Channel View when any of the Channel View selectors (EQ, Dynamics, Insert or Pan/Send) are lit in the Channel View area.

To put Digi 002 in Channel View:

- ▶ Press the EQ, Dynamics, Insert, or Pan/Send switch in the Channel View area above the Channel Scribble Strips.

Fader Section

The Digi 002 fader section consists of 8 identical channel strips, each with a touch-sensitive fader, solo and mute switches, a multi-state select switch, and a rotary encoder.



Channel Strip Controls

Channel Faders

Each channel has its own touch-sensitive, motorized fader for controlling levels of audio and MIDI tracks, Auxiliary Inputs, and Master Faders. In Flip mode, other controls, such as send levels or plug-in parameters, can be controlled by the faders.

Channel Solo/Mute Switches

Each channel has Solo and Mute switches located above the fader. These switches show the Pro Tools solo and mute status for each track. When a track is soloed, the Mute switches on other tracks in the session flash. When a track is muted, the Mute switch is lit continuously.

The Solo switch function follows the Pro Tools Operation preference for latched operation.



For details, see the Pro Tools Reference Guide. You can view an electronic PDF version of the Reference Guide by choosing it from the Pro Tools menu, or choosing Start > All Programs > Avid > Digidesign > Documentation in Windows. The Reference Guide is also available on the Avid Xpress Studio Online Library DVD.

Channel Select Switch

Each channel has a Channel Select switch that performs several functions, depending on the view:

Home View

The Channel Select switches allow you to select the corresponding track (indicated on-screen by a highlighted track name) for grouping and other channel-related commands in Pro Tools.

Console View

The Channel Select switches are used to select inserts on a particular channel for editing, or to select pre- or post-fader operation for sends.

Channel View

The Channel Select switches are used to select and edit individual send or insert settings as displayed across the Channel Scribble Strips.

Channel Record Ready Indicator

Each channel has a Record Ready LED. When a track is record-enabled and the transport is stopped, this LED flashes. When Pro Tools is recording, the LED is lit continuously. (See [“Record Enable Switch” on page 31](#) for details on record-enabling tracks.)

Rotary Encoders

These knobs control a variety of parameters, depending on the view:

Home View	The rotary encoders control pan position for each track, with the LED rings indicating the pan position with a single LED.
Console View	The rotary encoders control send levels for each track, with the LED rings indicating the send levels with an expanding series of LEDs.
Channel View	The rotary encoders control plug-in, pan/send, or insert settings, depending on the Channel View selection, with the LED rings showing corresponding states.

Encoder/Meter LED Ring

Each rotary encoder has a circle of 15 LEDs above it for indicating data values controlled by the encoder. The style of display depends on the type of data. For example, discrete or stepped information such as pan position or frequency value is shown by a single LED, while an expanding series of LEDs shows values such as send levels, gain, or filter bandwidth.

The LED rings can also be set to show track levels by pressing the Encoder/Meter Mode switch to the right of the encoder area. When set to Meter mode, the LED rings show increasing levels in a clockwise manner, with the last red LED indicating clipping.

Channel Scribble Strip

Each channel has a 4-character scribble strip that displays a variety of information, including track, send and insert names, pan position, send levels, or plug-in control information. The default display is the name of the displayed element. When you move a fader or rotary encoder, the scribble strip will temporarily display the value for that control, then return to the default display.

Global Fader Controls

Immediately to the right of the channel faders, there are global controls that affect the assignment and operation of all the faders.

Record Enable Switch

Pressing the Record Enable switch followed by a Channel Select switch arms the corresponding track for recording.

To enable tracks for recording:

1. Press the Record Enable switch. When the Record Enable function is active, the Record Enable switch flashes.
2. Press the Channel Select switch for the tracks you want to enable for recording. When a track is armed for recording, its Record Ready indicator flashes. During recording, its Record Ready indicator is lit continuously.
3. To deactivate the Record Enable function, press the Channel Select switch for the track, then press the Record Enable switch again.

To disable tracks for recording:

1. Press the Channel Select switch on any track whose Record Ready indicator is flashing to disarm the track for recording.
2. Press the Record Enable switch again to deactivate the Record Enable function.

Fader Flip Switch

The Fader Flip switch invokes Flip mode, which transfers control assignments from the rotary encoders to the corresponding channel faders, allowing you to use the touch-sensitive faders to edit and automate control values. There are several types of Flip mode, depending on the view.

To transfer controls from the rotary encoders to the touch-sensitive faders:

- ▶ Press the Flip switch. This switch flashes when Flip mode is activated.
- ▶ To exit Flip mode, press the Flip switch again.

Send Flip Mode - When you are in Home View or Console View, the Flip switch moves the send level controls to the channel faders, and the send pan controls to the rotary encoders. The Channel Scribble Strips display the selected send (A–E) for each channel.

For stereo tracks with stereo sends, you can toggle the encoder display between left and right send pan by pressing the Encoder Mode switch immediately to the right of the encoders. Both the Scribble Strip and the LEDs above the Encoder Mode switch indicate whether the left or right pan position is displayed.

For mono tracks with stereo sends, only the left pan indicator shows a pan position; the right pan indicator is inactive.

Plug-In Flip Mode - When you are in Channel View and working with a plug-in insert, the Flip switch moves any plug-in control assignments from the rotary encoders to the faders, allowing you to use the touch-sensitive faders to edit and automate plug-in control values. The details of the controls depend on the particular plug-in you are using.

See [“Channel View Selectors” on page 35](#) for more details on working with plug-ins in Channel View.

Pan/Send Flip Mode - When you are in Channel View and working with the pan and send assignments on a channel, the Flip switch moves the send level controls to channel faders 3–7, and the send pan controls to rotary encoders 3–7. (The first Channel Scribble Strip and encoder continue to show track pan position for that track.)

In this mode, the Channel Select switches toggle pre- and post-fader metering for the corresponding send.

For stereo tracks with stereo sends, you can toggle the encoder display between left and right send pan by pressing the Encoder Mode switch immediately to the right of the encoders.

See [“Channel View Selectors” on page 35](#) for more details on working with pan controls and sends in Channel View.

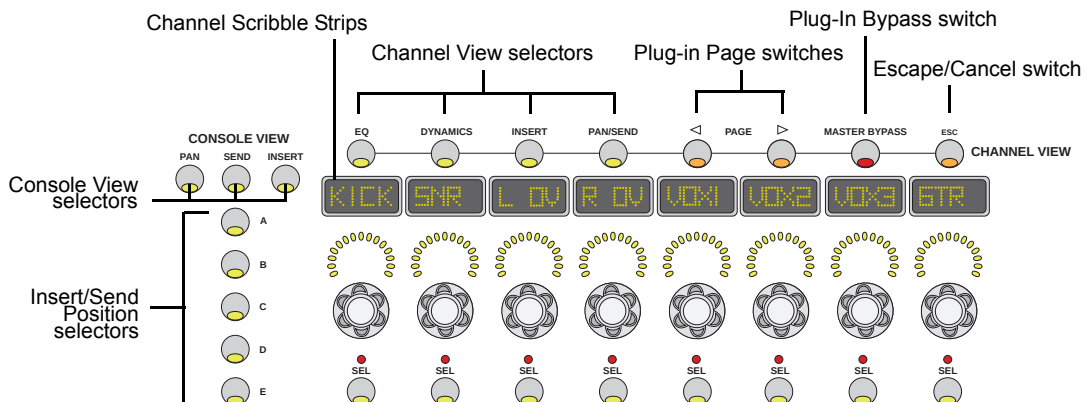
Master Fader Switch

Pressing the Master Fader switch arranges all Master Fader tracks in the current session on the right side of the control surface. Pressing this switch again returns the control surface to the previous view.

Console/Channel View Section

The Console/Channel View section uses many of the channel fader controls to display and edit pan, send, and insert controls, giving you control over many on-screen elements in Pro Tools.

Digi 002 Console and Channel View Controls



Console View Selectors

Console View lets you toggle the Digi 002 to show pan position, send controls, or insert names for all channels on the control surface.

The Console View switches toggle the center section of Digi 002 to display one of the three following types of controls: pan, sends, or inserts.

Pan View - This is the default view that appears when you first start a Pro Tools session, where the faders control track volume and the rotary encoders control channel pan positions. The Channel Scribble Strips show the track names, and temporarily show the channel pan positions when the encoder is moved, or volume information when the fader is moved. In this view, pressing a Channel Select switch selects the corresponding track in Pro Tools.

Send View - This view assigns send level controls to the rotary encoders. The Channel Scribble Strips show the names of currently assigned sends across all channel strips for a given send position (Sends A–E in Pro Tools).

In this view, pressing a Channel Select switch toggles the selected send on that track between pre- and post-fader operation. (For details, see the *Pro Tools Reference Guide*.)

Insert View - This view displays the names of currently assigned inserts (hardware inserts or plug-ins) across all channel strips for a given insert position (Inserts A–E in Pro Tools) in the Channel Scribble Strips.

If a hardware insert or plug-in is selected in Pro Tools, its name flashes in the Scribble Strip. In this view, pressing a Channel Select switch directly under a plug-in name puts Digi 002 into Channel View and displays the plug-in controls across all channel strips.

Insert/Send Position Selectors

The Insert/Send switches determine which of the five available send or insert positions (marked A–E in Pro Tools) are displayed in Console View.

Channel View Selectors

Channel View zooms in on a single track and displays all controls of a certain type (sends, inserts, or plug-ins) horizontally, across all of the Channel Scribble Strips on Digi 002. From this view, you can recall and edit parameters for all the sends on a single track, or all the parameters of a single plug-in.

The Channel View switches determine the type of information displayed for a selected track. The first two switches focus on particular types of plug-ins, while the second two address all types of inserts and sends.

EQ - When you press the EQ switch, Digi 002 identifies channels with equalizer plug-ins assigned to them by illuminating their Channel Select switches. If no EQ plug-ins are present, no Channel Select switches will be lit.

When you press an illuminated Channel Select switch, controls for the first EQ plug-in on that track are assigned to the rotary encoders and displayed in the Channel Scribble Strips. Switched controls, such as Master Bypass or Phase Invert functions, are controlled by the Channel Select switches.

To cycle through all the EQ plug-ins on a channel, hold the EQ switch and repeatedly press the track's Channel Select switch. If a plug-in window is open on-screen, it will update to reflect the plug-in selected on the Digi 002.

Dynamics - When you press the Dynamics switch, Digi 002 identifies channels with dynamics plug-ins (such as compressors or limiters) assigned to them by illuminating their Channel Select switches. If no dynamics plug-ins are present, no Channel Select switches will be lit.

When you press an illuminated Channel Select switch, controls for the first Dynamics plug-in on that track are assigned to the rotary encoders and displayed in the Channel Scribble Strips.

Switched controls, such as Phase Invert or In/Out for EQ bands, are controlled with the Channel Select switches below the corresponding Scribble Strips.

To cycle through all the Dynamics plug-ins on a channel, hold the Dynamics switch and repeatedly press the track's Channel Select switch. If a plug-in window is open on-screen, it will update to reflect the plug-in selected on the Digi 002.

Inserts - When you press the Inserts switch, Digi 002 identifies channels with any insert assigned to them (including software plug-ins or hardware I/O inserts) by illuminating their Channel Select switches. If no inserts are present, no Channel Select switches will be lit.

When you press an illuminated Channel Select switch, the names of all inserts on that track are displayed in the Channel Scribble Strips. To select a plug-in insert for editing, press the corresponding Channel Select switch. (While the names of hardware I/O inserts are displayed, they have no editable parameters, so the Channel Select switches and the rotary encoders have no effect on them.)

To cycle through all the inserts on a channel, hold the Insert switch and repeatedly press the track's Channel Select switch.

Pan/Send - When you press the Pan/Send switch, Digi 002 identifies channels with sends assigned to them by illuminating their Channel Select switches. If no sends are present, no Channel Select switches will be lit.

When you press an illuminated Channel Select switch, Channel Scribble Strip 1 and the first rotary encoder show track pan position for that track. (If the track is a stereo track, you can toggle between left and right pan by pressing the Encoder Mode switch immediately to the right of the encoders.)

Channel Scribble Strips 3–7 show the names and their rotary encoders control the levels for all five sends on that track. (Channel Scribble Strip 2 is inactive.) In this mode, the Channel Select switches on channels 3–7 toggle pre- and post-fader metering for the corresponding send.

Plug-In Page Switches - Plug-In controls are organized in *pages*. In a process much like banking of channel faders, when a plug-in has more controls than can fit on the Channel Scribble Strips at one time, you can use these switches to page through the plug-in controls.

When a plug-in has multiple pages of controls, one of the Plug-In Page switches will flash to indicate a next or previous page. The total number of pages is shown in the Status Display when you press the flashing Plug-In Page switch.

Multi-mono Plug-ins

When working with a multi-mono plug-in, you can toggle the view between the left and right sides of the plug-in by holding down the Display switch when you press the Channel Select switch to select a plug-in from Channel view.

The resulting display shows “left” and “right” in the Scribble Strips, allowing you to choose between the two sides of the multi-mono plug-in by pressing the corresponding Channel Select switch.

Plug-In Master Bypass Switch - This switch bypasses either a single plug-in or all plug-ins on a channel, depending on the current view. If the controls for only one plug-in are displayed, only that plug-in will be bypassed. If all the plug-ins on a channel are displayed, all of those plug-ins will be bypassed.

If no plug-ins are displayed, the Master Bypass function is unavailable.



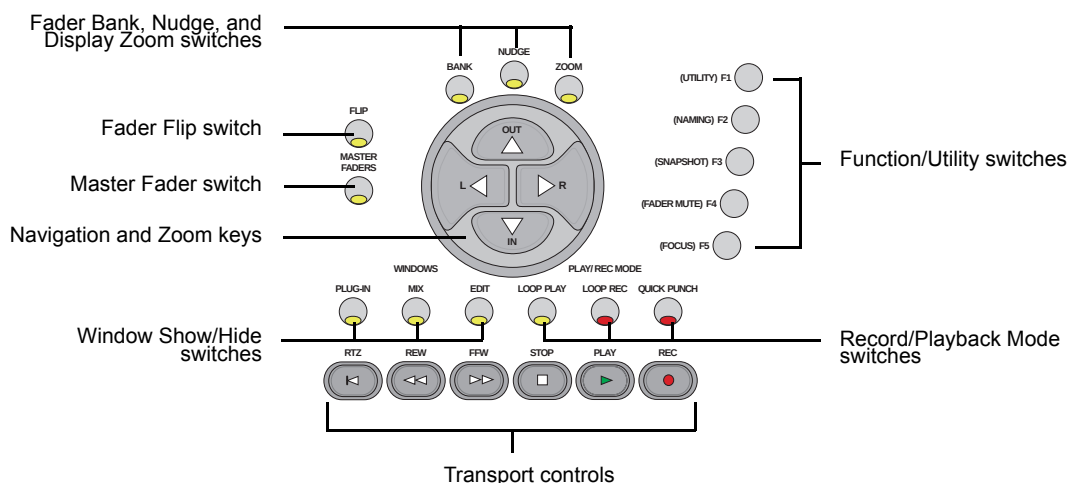
Hardware I/O inserts cannot be bypassed in Pro Tools, so the Plug-In Master Bypass switch has no effect on them.

Esc (Escape/Cancel) Switch - When flashing, this switch allows you to cancel certain operations on the Digi 002, such as Channel View selections. The Escape/Cancel switch also functions as a “cancel” button for many on-screen dialog boxes in Pro Tools.

Transport and Navigation Controls

These Digi 002 controls mirror the operation of on-screen transport and navigation controls in Pro Tools. In addition, Function keys allow you to invoke special control surface commands and move quickly between different display modes.

Digi 002 Transport and Navigation Controls



Transport Controls

These switches correspond to transport functions in Pro Tools.

RTZ (Return to Zero)	Sets the playback cursor to the beginning of the session
REW (Rewind)	Rewinds through the session from the current cursor position
FFW (Fast Forward)	Fast-forwards through the session from the current cursor position
STOP	Stops playback or recording
PLAY	Begins playback from the current cursor position
REC (Record)	Arms Pro Tools for recording

Record/Playback Mode Switches

Loop Play	Toggles Loop Playback on and off
Loop Rec	Toggles Loop Record mode on and off
QuickPunch	Toggles QuickPunch Record mode on and off

Window Show/Hide Switches

Plug-In	Opens or closes the window for the currently selected plug-in
Mix	Opens, brings forward, or closes the Pro Tools Mix window
Edit	Opens, brings forward, or closes the Pro Tools Edit window

Navigation and Zoom Section

These multi-purpose keys control the display of Pro Tools tracks on the Digi 002 control surface, on-screen zoom functions, and other Pro Tools navigation functions.

Fader Bank, Nudge, and Display Zoom Switches

Bank	When the Bank switch is lit, the Left and Right arrow keys move the Digi 002 tracks across the Pro Tools mixer eight faders at a time.
Nudge	When the Nudge switch is lit, the Left and Right arrow keys move the Digi 002 tracks across the Pro Tools mixer one track at a time.
Zoom	When the Zoom switch is lit, the Left and Right arrow keys zoom the Pro Tools Edit window display horizontally, and the In and Out keys zoom the display vertically.

Navigation and Zoom Keys

Text Entry Fields

When you are editing numerical values such as Selection Start, End, and Length, or Pre- and Post-Roll in the Edit or Transport windows, the Left and Right arrow keys let you navigate among editable fields. The In and Out keys increment or decrement the selected value.

Selection In/Out Points

In Bank and Nudge modes, the Navigation keys mirror the function of the Up and Down arrow keys on the computer keyboard. You can press these keys to mark In and Out points during playback, in order to make selections in the Pro Tools Edit window. If you have already made a selection in the Edit window, the Up and Down arrow keys move the selection up and down your track list.

Function/Utility Switches

F1 (Utility)

Enters Utility mode during Digi 002 stand-alone operation only. This is where you set control surface and input preferences, as well as run pre-programmed diagnostic tests on the Digi 002 unit.

F2 (Naming)

Allows you to name channels while using Digi 002 in Stand-alone mode only. (See “Naming Channels” on page 80.)

F3 (Snapshot)

Allows you to store and recall up to 24 mixer configurations for quick recall or for use as mixer templates, in Stand-alone mode only.

F4 (Fader Mute)

Temporarily disables Digi 002 fader movement while working with Pro Tools, allowing you to monitor audio playback without fader noise. To disable fader movement, press F4 while in Pro Tools mode. To restore fader movement, press F4 again.

The Fader Mute feature has no effect on fader automation or audio levels during playback.

F5 (Focus)

Displays controls in the Digi 002 Channel Scribble Strips for the currently active plug-in window, as in Channel View. To return to the last Console view, press F5 again.

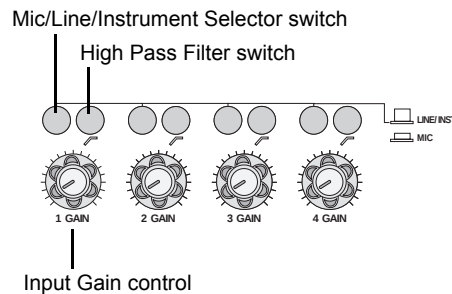
Mic/Line/Instrument Input Controls

Digi 002 is equipped with four high-quality preamplifiers with adjustable gain and phantom power (switchable in pairs, for Inputs 1–2 and Inputs 3–4). The phantom power switches are on the back panel of Digi 002.

Inputs 1–4 accept microphone, instrument (direct in), or line-level signals. Inputs 5–8 accept line-level signals only.

When Digi 002 is used to control Pro Tools, these inputs show up as “Mic/Line 1–4” in the default Pro Tools I/O Setup.

Digi 002 Input Controls for Inputs 1–4



Inputs 1–4 have the following controls:

Mic/Line/Instrument Selector	This switch toggles the input between microphone or line (instrument) operating levels.
High Pass Filter Switch	This switch enables a high pass filter (75 Hz, 12 dB/octave rolloff) on the input, for filtering out rumble or AC hum.
Input Gain Control	This knob adjusts gain for the input, with a range of +15 dB to +60 dB of gain.

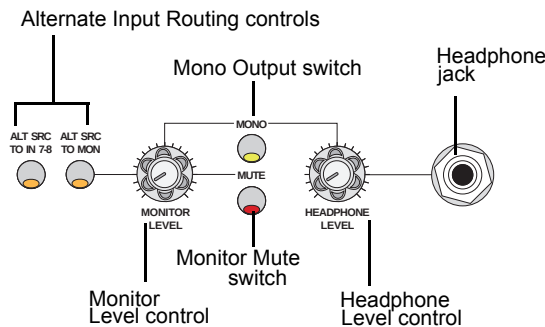


Engage the Mic Selector only if you have an XLR cable plugged in to the mic connector. Leaving the switch engaged with nothing connected might introduce low-level noise.

Monitor Section

The Monitor section of Digi 002 provides options for routing outputs and monitoring alternate input sources.

Digi 002 Monitor and Headphone Controls



Alternate Input Routing Controls

In addition to its 8 standard analog inputs, Digi 002 provides a separate –10 dBV input pair for a device such as a CD player or tape deck.

Alt Src to Mon	This switch routes the –10 dBV input pair directly to the Monitor and Headphone Outputs on Digi 002. This function also works when Digi 002 is in Stand-alone mode.
Alt Src to 7–8	This switch routes the –10 dBV input pair directly to Inputs 7 and 8 of Pro Tools, and does not send it to the Monitor Outputs. This allows you to route the input signal directly into Pro Tools without the need to repatch any cables. When Alt Src to 7–8 is enabled, analog inputs 7–8 (1/4-inch TRS connectors on the back panel of Digi 002) are disabled.

Monitor and Headphone Level Controls

Monitor Level Control	Digi 002 provides a pair of Monitor Outputs that mirror its Main Outputs (or outputs 1–2), which correspond to outputs 1–2 in Pro Tools. This knob controls the volume of those Monitor Outputs.
Headphone Level Control	The Headphone Output on Digi 002 also mirrors outputs 1–2 in Pro Tools, and is independent of the Monitor Outputs. This knob controls the volume of the independent Headphone Output.
Monitor Mute Switch	This switch mutes the Digi 002 Monitor Outputs only, and has no effect on the Main Outputs or the Headphone Output. Monitor Mute is automatically engaged when you turn on the Digi 002 unit.
Mono Output Switch	This switch temporarily combines the output signals 1 and 2 in both the Monitor Outputs and the Headphone Output. This is helpful for checking phase relationships of stereo material. The Mono Output switch has no effect on the Main Outputs.

Headphone Jack This jack accepts a standard 1/4-inch stereo headphone connector.

Keyboard Modifier Switches

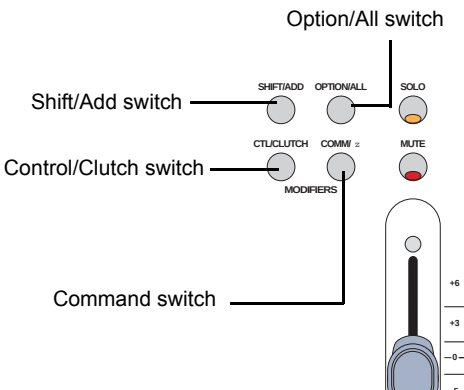
Many keyboard commands in Pro Tools use *modifier keys*, which are pressed in combination with other keys or with a mouse action.



For more information, refer to the Pro Tools Reference Guide and the Keyboard Shortcuts. You can view an electronic PDF version of either of these documents by choosing them from the Pro Tools menu, or choosing Start > All Programs > Avid > Digidesign > Documentation in Windows. Both documents are also available on the Avid Xpress Studio Online Library DVD.

The Modifier switches on the left side of Digi 002 mirror the functions of modifier keys on the computer keyboard. You can use these switches on Digi 002 in any combination with keys on your computer while working with Pro Tools.

Digi 002 Keyboard Modifier Keys



Shift/Add Switch Allows you to extend a track selection or add to a group of selected items

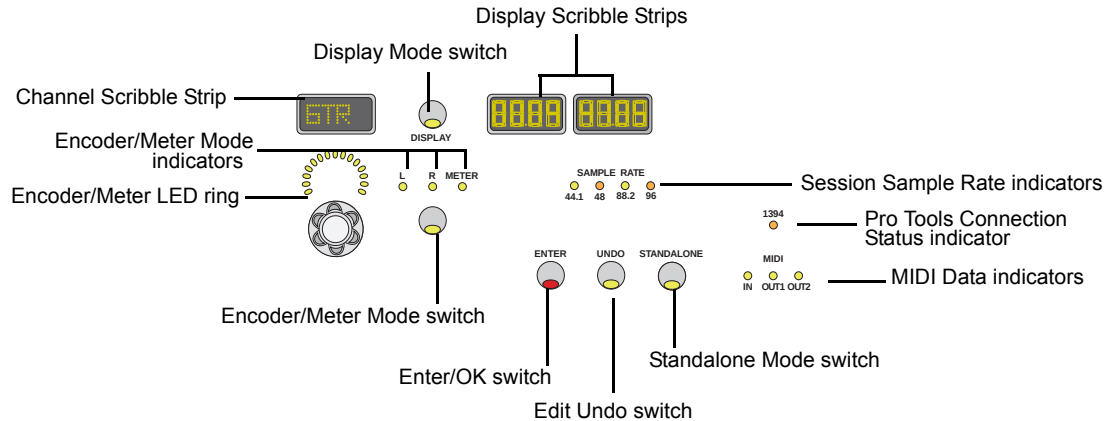
Option/All Switch Applies an action or command to all tracks in a Pro Tools session

Control/Clutch Switch	Temporarily disengages a control from grouped behavior
Command Switch	Allows fine adjustment of controls and automation breakpoints

Status Indicators and Display Controls

The area above the Transport and Navigation Controls on Digi 002 contains status indicators, an 8-character LED Scribble Strip, and controls for displaying information about Pro Tools sessions.

Digi 002 Status Indicators and Display Controls



Display Scribble Strips and Display Mode Switch

The Display Scribble Strips have two modes: Status mode, which shows the current status of the Channel Scribble Strips, and Counter mode, which mirrors the main counter in Pro Tools. To toggle between the two display modes, press the Display Mode switch directly to the left of the Display Scribble Strips.

In addition, pressing the Command switch in tandem with the Display Mode switch allows you to set channels to display numerical parameter values by default, rather than control names. For example, in Pan view, when you press Command+Display, fader volume levels (in dB) are the default display.

Status Mode

In Status mode, the Display Scribble Strips show information about the current view.

Console View - When Digi 002 is in Console View, the Display Scribble Strips show which Console mode is active (Pan, Send, or Insert).

When in Pan mode, the Display Scribble shows which pan controls are visible in the rotary encoders, left pan or right pan. (Right pan controls are available for stereo tracks only.)

When in Send mode, the Display Scribble shows the position of the displayed send (A–E).

When in Insert mode, the Display Scribble shows the position of the displayed insert (A–E).

Channel View - When Digi 002 is first put into Channel View, the Display Scribble Strips on the right side of the unit identify which Channel View Selector is active (EQ, Dynamics, Inserts, or Pan/Send).

When plug-in controls are displayed in the Channel Scribble Strips, the Display Scribble shows the name of the plug-in.

When pan and send controls are shown in the Channel Scribble Strips, the Display Scribble shows the name of the parent track.

While in Channel View, you can hold the Display Mode switch and press an active track's Channel Select switch to temporarily display an expanded description of its function.

Counter Mode

In Counter mode, the Display Scribble Strips show the current value in the Pro Tools Main Location Indicator. This value can be in Bars:Beats, Minutes:Seconds, or Samples, depending on which of these is chosen as the Main Time Scale in Pro Tools.

The Display Mode switch is lit when Digi 002 is in Counter mode.

Pan/Meter Indicators and Encoder/Meter Mode Switch

The Pan/Meter indicators show what type of data is displayed in the Encoder/Meter LED ring: *L* indicates left pan, *R* indicates right pan (available on stereo channels or sends), and *Meter* indicates that the Encoder LEDs are functioning as level meters.

For stereo tracks or sends, when *L* and *Meter* are both lit, the LED rings display levels for the left channel; when *R* and *Meter* are both lit, the LED rings display levels for the right channel.

Enter/OK Switch

Pressing the Enter/OK switch is equivalent to pressing Return or Enter on the computer keyboard. This allows you to OK on-screen dialog boxes and create new Memory Locations in Pro Tools directly from the control surface.

Edit Undo Switch

Pressing the Edit/Undo switch is equivalent to choosing Edit > Undo in Pro Tools. (For details on multiple undo capabilities, see the *Pro Tools Reference Guide*.)

Standalone Mode Switch

The Standalone Mode switch turns Digi 002 into a stand-alone 8-channel mixer. (See “Using Digi 002 as a Stand-Alone Mixer” on page 67.)

Session Sample Rate Indicators

The Session Sample Rate LEDs indicate the sample rate of the current Pro Tools session.

Pro Tools Connection Status Indicator

This status LED, marked “1394,” indicates that communication has been established between Digi 002 and Pro Tools LE software via FireWire.

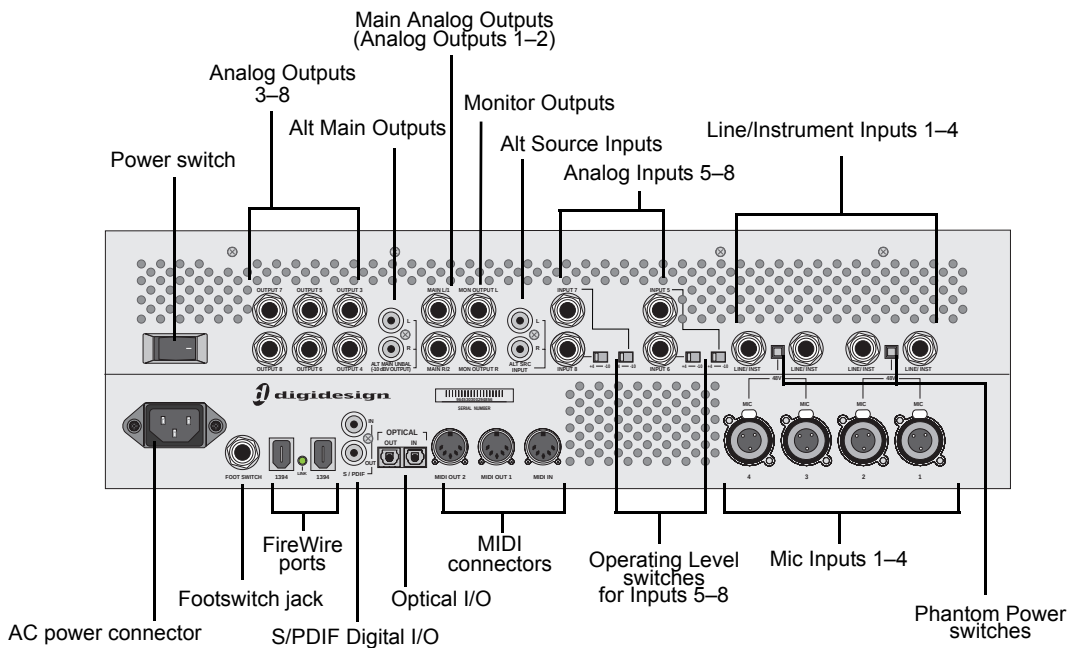
MIDI Data Indicators

The MIDI Data LEDs indicate the presence of MIDI data on the Digi 002 MIDI In or MIDI Out ports.

Digi 002 Back Panel

The Digi 002 back panel houses all the audio, MIDI and computer connectors for the unit. The function of each connector and their associated switches are explained in this section.

Digi 002 Back Panel



Operating Levels and Headroom

All Digi 002 audio inputs and outputs are set for 14 dB of headroom below 0 dB, or full code. This means at the nominal reference input level (+4 dBu or –10 dBV) you can have up to 14 dB of headroom before input or output clipping occurs.

The maximum input and output of Digi 002 using balanced TRS cables on any of the +4 dBu, 1/4-inch connectors is +18 dBu (6.15 Vrms).

Sample Rate and Resolution Support

The Analog-to-Digital and Digital-to-Analog converters on all Digi 002 analog inputs and outputs, as well as the S/PDIF Digital I/O ports, support sample rates of 44.1, 48, 88.2, and 96 kHz. The Optical I/O ports support sample rates of 44.1 and 48 kHz in ADAT Optical mode, and sample rates up to 96 kHz in Optical S/PDIF mode.

All the analog and digital inputs and outputs on Digi 002 support up to 24-bit resolution audio.



Not all applications in the Avid Xpress Studio Complete and Avid Xpress Studio Essentials support audio files with sample rates above 48 kHz. Refer to the documentation for each application.

Analog Inputs

Mic Inputs 1–4

These are balanced, three-conductor XLR connectors for microphone-level analog inputs. Gain is controlled by the corresponding Input Gain control (on the top panel of Digi 002).

Line/Instrument Inputs 1–4

These are balanced, 1/4-inch TRS jacks for line-level or instrument-level analog audio input connections. Operating levels for these line/instrument inputs are fixed at +4 dBu. Gain is controlled by the corresponding Input Gain knob (on the top panel of Digi 002).

Unbalanced connections are also possible with the use of standard 1/4-inch mono plugs.



Digidesign does not recommend the use of unbalanced cables. Unbalanced connections may introduce noise into your audio system. Whenever possible, use balanced cables to make connections to Digi 002.

Phantom Power

These switches apply 48V phantom power to Inputs 1–2 and Inputs 3–4 channel pairs respectively, for microphones that require phantom power to operate.

Dynamic microphones (like a Shure SM57) do not require phantom power to operate, but are not harmed by it. Most *condenser* microphones (like an AKG C3000) *do* require phantom power to operate. If you are not sure about the phantom power requirements for your microphone, contact the manufacturer, or read your microphone’s documentation.



Although phantom power can be used safely with most microphones, ribbon microphones can be damaged by it. Always turn off phantom power and wait at least 30 seconds before connecting a ribbon microphone.

Analog Inputs 5–8

These are balanced, 1/4-inch TRS jacks for line-level analog audio input connections.

Operating levels for each of these line-level inputs is switchable between +4 dBu and –10 dBV, using the Operating Level switches immediately to the right of the input jacks.

While Inputs 5–8 do accept unbalanced connections, this may result in a noisier signal than a balanced-to-balanced connection. If the devices you are connecting to Digi 002 have balanced outputs, be sure to use balanced cables for optimal signal-to-noise performance.

Alt Source Inputs

These are unbalanced, two-conductor RCA-connectors for connecting alternate audio sources such as CD players or tape decks. The signal from these inputs can be routed directly to the Monitor Outputs (for monitoring) or to Inputs 7–8 (for direct input into Pro Tools) from the top panel of Digi 002. Operating levels for these inputs are fixed at –10 dBV.

Analog Outputs

Monitor Outputs

These are balanced, 1/4-inch TRS jacks for line-level analog audio output connections. These outputs correspond to Outputs 1–2 in Pro Tools, allowing you to route mixes to a studio monitoring system. Operating levels for these outputs are fixed at +4 dBu.

Monitor Output level is controlled by the Monitor Level knob on the top panel of Digi 002.

Main Analog Outputs 1–2

These are balanced, 1/4-inch TRS jacks for line-level analog audio output connections. Operating levels for these outputs are fixed at +4 dBu.

While the Main Analog Outputs do accept unbalanced connections, this may result in a noisier signal than a balanced-to-balanced connection. If the devices you are connecting to Digi 002 have balanced inputs, be sure to use balanced cables for optimal signal-to-noise performance.

Alt Main Analog Outputs 1–2

These are unbalanced, two-conductor RCA connectors for direct output to devices such as stereo receivers or tape decks. Operating levels for these inputs are fixed at –10 dBV.

Analog Outputs 3–8

These are balanced, 1/4-inch TRS jacks for line-level analog audio output connections. Operating levels for these outputs are fixed at +4 dBu. Unbalanced connections are also supported with the use of standard 1/4-inch mono plugs.



If you plan on connecting Analog Outputs 3–8 to –10 dBV gear, you might want to place a transformer-based line level attenuator between the Digi 002 output and the input of the destination device to compensate for level differences.

Digital I/O

S/PDIF Digital I/O

The Sony Phillips Digital Interface Format (S/PDIF) is used in many professional and consumer CD players and DAT recorders. These S/PDIF input and output jacks are unbalanced 2-conductor phono (RCA) jacks that utilize a full 24-bit, 2-channel digital data stream. To avoid RF interference, use 75-ohm coaxial cable for S/PDIF transfers and keep the cable length to a maximum of 10 meters.

Digi 002 supports *consumer mode* S/PDIF output format (IEC-958 Type 2) at sample rates of 44.1 kHz and 48 kHz, and *professional mode* S/PDIF output format (IEC-958 Type 1) at sample rates of 88.2 kHz and 96 kHz. For information on which S/PDIF formats are supported by your S/PDIF-compatible gear, refer to the manufacturer's documentation.

With Avid Xpress Studio, the S/PDIF input can be used to resolve the audio clock to video reference signal coming from the Avid Mojo™ DNA. For configuration steps, refer to "Clock" on page 145.

Optical I/O

These are a pair of TOS-link style connectors for ADAT Optical (8 channels of I/O) or S/PDIF Optical (2 channels of I/O) devices. You can choose between these Optical I/O formats in the Pro Tools Hardware Setup dialog box. When transferring material in one of these formats to Pro Tools, be sure to select the appropriate Optical I/O format as the Clock Source in the Hardware Setup dialog box.

The Optical I/O ports support sample rates of 44.1 and 48 kHz in ADAT Optical mode, and sample rates up to 96 kHz in Optical S/PDIF mode. The Optical I/O ports support 24-bit, 20-bit and 16-bit resolutions in both modes.

The Optical I/O ports use a standard optical "lightpipe" cable.

About Lightpipe-Compatible Devices

Lightpipe is an industry standard, eight-channel optical digital audio connection developed by Alesis. Lightpipe is found on many devices, including Optical (ADAT) decks, modular digital multitracks (MDMs), sound cards, stand-alone A/D or D/A converters, and digital consoles.

MIDI Connectors

Digi 002 can act as a MIDI interface. With one MIDI input and two MIDI outputs, Digi 002 provides 16 channels of MIDI input and 32 channels of MIDI output.

A MIDI driver for these MIDI ports is installed when you install Pro Tools LE, and is recognized automatically by Windows Multimedia (Windows). These connectors accept standard 5-pin MIDI cables.

IEEE-1394 (FireWire) Ports

These ports, marked “1394” in reference to their IEEE specification, are commonly known as *FireWire* ports. These provide connections to the computer and other FireWire devices.

FireWire offers a high rate of data transfer and reliability that makes it ideal for audio applications. FireWire devices can be daisy-chained together without the need for terminators.

When the FireWire connection between the computer and Digi 002 is established, the Link LED, located between the FireWire ports, is lit.

Connecting Digi 002 and Avid Mojo

Avid Mojo requires a dedicated Firewire bus, and cannot be daisy-chained with the Digi 002 or any other device. The Avid Mojo should be attached to the built-in FireWire port of your CPU. The Digi 002 and any other FireWire device must be attached to a separate PCI FireWire card (such as the ADS Pyro). For hardware configuration requirements, go to the Avid Xpress Studio products page at www.avid.com, and click Specifications.

With Avid Xpress Studio, the S/PDIF input can be used to resolve the audio clock to video reference signal coming from the Avid Mojo. For configuration steps, refer to “Clock” on page 145.

Connecting other FireWire Devices to Digi 002

The second FireWire port on Digi 002 is available for daisy-chaining FireWire devices such as digital cameras or digital video recorders. Even when turned off, Digi 002 supplies power from the computer through their FireWire ports, letting you recharge batteries in other FireWire devices.

Footswitch Jack

This connector allows footswitch control of QuickPunch audio punch-in and punch-out, and MIDI punch-in and punch-out recording features. Both continuous on/continuous off and instantaneous on/off pedals with a 1/4-inch TRS connector are supported. For more information, see [“QuickPunch Recording” on page 176](#).

Power Switch and AC Power Connector

The AC power connector on Digi 002 accepts a standard modular AC power cable.

Digi 002 is auto power-selecting (100V to 240V) and will work automatically when plugged into an AC power receptacle in any country.

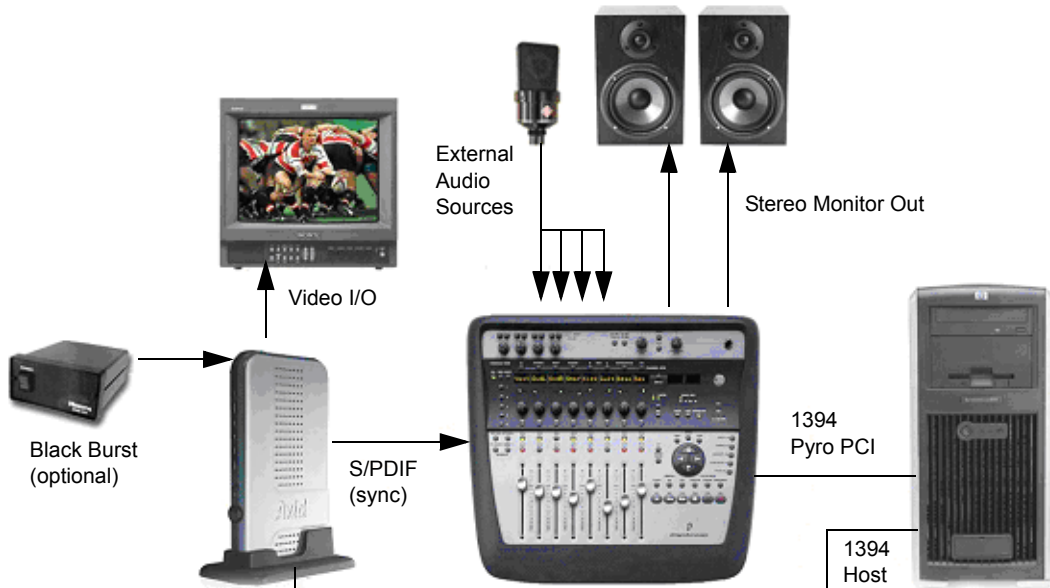
Connecting Your Digi 002

This section explains how to connect your Digi 002 to a monitoring system, digital recorders, and other studio devices, and how to connect audio sources for recording.

Connecting Digi 002 to a Computer

Your setup will differ depending on the type of work you do and the equipment you have. The following illustration shows a possible setup with Digi 002.

Digi 002 Configuration Running Pro Tools on a Desktop Computer



Monitoring Audio

You can use Digi 002 with a variety of audio monitoring setups, including a power amplifier and speakers, self-powered speakers, and headphones.

The Digi 002 Monitor Outputs and Headphone Output mirror the output signal on Main Outputs 1–2.

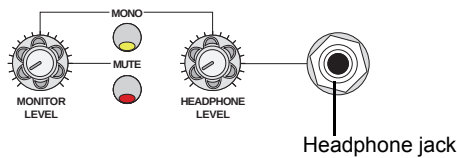
Monitor Mute - When you turn on Digi 002, the Monitor Outputs are automatically muted.

To unmute the Monitor Outputs:

- ▶ Press the Mute switch (located at the top right corner of Digi 002).

Monitor Output levels and Headphone Output levels are adjusted separately with the level controls (located in the upper right side of the Digi 002 top panel).

Monitor Level Controls (Located on the Top Panel of Digi 002)



To connect headphones:

1. Connect headphones to the Headphone jack on the Digi 002. The Headphone input accepts a stereo 1/4-inch plug. If your headphones have a smaller mini-plug, you can purchase an adapter from your local dealer. For best results, use high-quality, closed-ear headphones.
2. Adjust headphone volume with the Headphone Level knob.

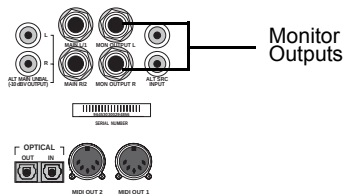


The Digi 002 Headphone Output can produce very loud output levels. Prolonged exposure can cause hearing damage. Adjust headphone volume carefully.

To connect monitor speakers with a power amp or self-powered monitor speakers:

1. Connect 1/4-inch cables to the left and right Monitor Outputs on the back of the Digi 002.
2. Connect the other end of the cables to the left and right power amp inputs, or to the left and right self-powered speakers.

Monitor Outputs (back panel)



Connecting Audio Sources to Digi 002

You can connect both analog and digital audio signal sources to Digi 002.



Before making any audio connections to Digi 002, turn down Monitor and Headphone levels or mute the Monitor Output to prevent damage to your monitoring system.

Analog Audio Connections

Digi 002 has eight analog inputs, plus two additional inputs for alternate analog sources, such as a tape deck or CD player.

Microphone-Level Signals

Analog audio signals are output by microphones, synthesizers, mixers, and instruments with magnetic pickups. Of these sources, microphones and magnetic pickup instruments (such as electric guitars) output the quietest signals and generally require the most amplification.

Digi 002 includes preamps for these sources on Inputs 1–4, with adjustable gain and available 48-volt phantom power. These inputs have both XLR and 1/4-inch connectors; the XLR inputs are specifically for connecting microphones, and the 1/4-inch inputs are for connecting instrument outputs.

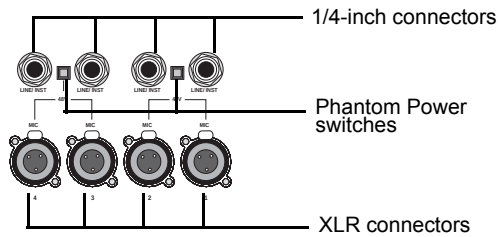
Line-Level Signals

Keyboards, preamps, and mixers output line-level audio, which varies with each device between the –10 dBV and +4 dBu standards.

You can connect line-level devices to any of Digi 002's Inputs 1–8, as follows:

Inputs 1–4 - Inputs 1–4 have both XLR and 1/4-inch TRS connectors. The XLR connectors are for connecting microphones only. The 1/4-inch TRS connectors are for connecting line-level devices or instruments. Since these inputs have adjustable gain, they are especially useful for devices that output low-level signals.

Mic/Line Inputs 1–4 (back panel)

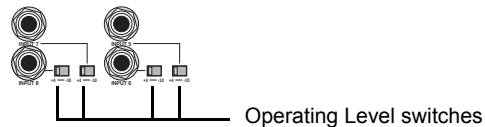


The XLR connectors on Inputs 1–4 are wired specifically to match the impedance of microphones. Do not use these XLR connectors for line inputs; use the 1/4-inch connectors instead.

Inputs 5–8

These inputs accept 1/4-inch balanced or unbalanced connections, and can be switched between -10 dBV and $+4$ dBu operation.

Line Inputs 5–8 (back panel)

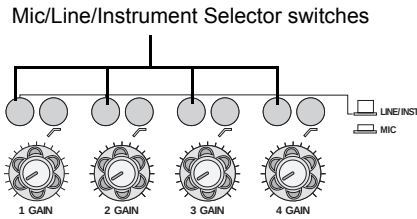


Making Analog Audio Connections

To connect an analog audio source to Digi 002, do the following for your type of input:

Microphones

1. Plug a microphone directly into any of the available XLR Microphone Inputs 1–4 on the back panel of the Digi 002.
2. Press the Mic/Line/Instrument Selector switch (located on the top panel of Digi 002) for the corresponding input so that it is in the “Mic” position.



3. If your microphone requires phantom power, press the Phantom Power switch (labeled 48V) on the back panel for the corresponding input pair.



Although phantom power can be used safely with most microphones, ribbon microphones can be damaged by it. You should always turn off phantom power and wait at least 30 seconds before connecting or disconnecting a ribbon microphone.

Instruments Without Preamps

1. Plug instruments that output low-level signals (such as electric guitars) directly into any of the available 1/4-inch TRS Inputs 1–4 on the back panel of Digi 002. Since these inputs have adjustable gain, they are especially useful for devices that output low-level signals
2. Press the Mic/Line/Instrument Selector switch (located on the top panel of Digi 002) for the corresponding input so that it is in the “Line/Inst” position. Inputs 1–4 are designed for input signals with a nominal operating level of +4 dBu. (The Input gain knob should be turned down all the way for +4 dBu devices at unity gain.)

Line-Level Devices

1. Plug line-level sources (such as a synthesizer, or a microphone or guitar that has been amplified by an outboard preamp) into any of the 1/4-inch analog inputs on the back of Digi 002.
2. For Inputs 1–4, press the Mic/Line/Instrument Selector switch (located on the top panel of Digi 002) for the corresponding input so that it is in the “Line/Inst” position. Inputs 1–4 are designed for input signals with a nominal operating level of +4 dBu. (The Input gain knob should be turned down all the way for +4 dBu devices at unity gain.)

3. For Inputs 5–8, choose either a –10 dBV or +4 dBu operating level for the corresponding input using the switch on the back panel. For information on the appropriate operating level for your input device, refer to the manufacturer’s specifications.

Digital Audio Connections

Digi 002 provides up to ten digital inputs and outputs, including:

- Optical input and output for eight channels of ADAT input or two channels of Optical S/PDIF input
- Two channels of S/PDIF digital input and output (RCA connectors)

ADAT Format

The ADAT format was developed by Alesis for use in their ADAT multitrack recorders. Each ADAT optical connection provides eight channels of digital audio with 24-bit capability. You can connect an ADAT or other ADAT optical format device directly to the Optical I/O on the Digi 002 (see [“Connecting an ADAT” on page 65](#)). The optical I/O connectors accept optical cables.

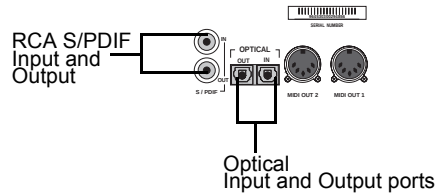
When set for ADAT format, these Optical ports support 44.1 kHz or 48 kHz sample rates only.

S/PDIF

S/PDIF (Sony/Phillips Digital Interchange Format) I/O is available on many DAT decks, compact disc players, and other digital devices. Each S/PDIF connection provides 2 channels of digital audio with 24-bit capability. You can connect a S/PDIF digital input to either the Optical connector or to the S/PDIF RCA connector on the back panel of the Digi 002 (see [“Connecting a Digital Deck \(DAT\)” on page 65](#)). The Optical connectors accept standard optical lightpipe cables; the RCA connectors accept standard RCA cables.

Both the RCA and Optical ports accept S/PDIF signals at sample rates up to 96 kHz.

Digital Connectors (Back Panel)



Only one S/PDIF input pair can be used at a time. For example, if you use the optical input for S/PDIF data, you cannot use the RCA inputs.

Using External Effects Devices

The Digi 002 can make dedicated connections to external analog or digital devices. You can send and return signals to analog devices using the analog inputs and outputs on the Digi 002. You can also send and return a digital signal to an external device that supports digital I/O (such as a reverb unit), and monitor the return by connecting its analog outputs to available inputs on Digi 002.

When you use the digital inputs and outputs on your Pro Tools LE system as effects sends and returns to a digital effects device, Pro Tools LE should be the clock master in most cases. Set your digital effects device to accept an external digital clock so that it synchronizes to Pro Tools LE.

To connect an external analog device to your system:

1. Connect each input of the external signal processor to an available analog output on the Digi 002.
2. Connect each output of the external signal processor to an available analog input on the Digi 002.



If you plan to use the external device as an Insert in Pro Tools, connect it to inputs and outputs of the same number (for example, Input 5 and Output 5) of Digi 002.

To set up a send to an external digital effects device (digital sends/returns only):

1. Connect the digital inputs and outputs of the external signal processor to the appropriate digital connectors (the S/PDIF RCA connectors or the Optical ports) on Digi 002.
2. In Pro Tools, choose Setups > Hardware Setup.
3. Under Digital Input, select one of the following options:
 - If the external effects device is connected to the S/PDIF RCA jacks, select “RCA = S/PDIF.”
 - If the external effects device is a S/PDIF device and connected to the Optical ports, select “Optical = S/PDIF.”
 - If the external effects device is an ADAT Optical compatible device, select “Optical = ADAT.”
4. Choose Internal from the Clock Source pop-up menu.
5. Click OK.

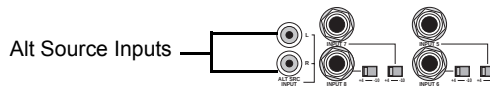


You can use the I/O Setup dialog box (Setups > I/O Setup) to label the inputs and outputs you are using in Pro Tools LE and identify them as inserts or sends when working in a session. (For details, see the Pro Tools Reference Guide.)

Monitoring and Recording from Alternate Sources

Digi 002 provides a pair of additional inputs for monitoring and recording from an external sound source such as a CD player or tape deck. This alternate input is equipped with standard RCA connectors and is designed for input signals with a nominal operating level of –10 dBV.

Alternate Source Input connectors (back panel)



To monitor an alternate sound source through the Digi 002 Monitor Outputs:

1. Connect the outputs of the external device to the left and right Alternate Source Inputs on the back panel of Digi 002.
2. Press the “Alt Src to Mon” switch (located on the top panel of Digi 002) to route the signal to the Monitor Output.
3. Adjust Monitor Output or Headphone Output levels to audition the input.



To monitor an external device through the Alternate Source Inputs, Digi 002 must be turned on.

To record an alternate sound source directly into Pro Tools:

1. Connect the outputs of the external device to the left and right Alternate Source Inputs on the back panel of Digi 002.
2. Press the “Alt Src to 7–8” switch (located on the top panel of Digi 002) to route the signal directly to Inputs 7–8 in Pro Tools.
3. When the “Alt Src to 7–8” switch is engaged, Inputs 7 and 8 on the back panel are inactive. Also, because the signal can be monitored from Pro Tools, it no longer passes directly to the Monitor Outputs.

Mirroring the Main Outputs

When using Digi 002 with Pro Tools, you can send any pair of outputs (such as outputs 1–2) to the S/PDIF digital outputs at the same time by assigning the stereo mix to multiple output destinations. This is commonly known as *mirroring* the outputs.

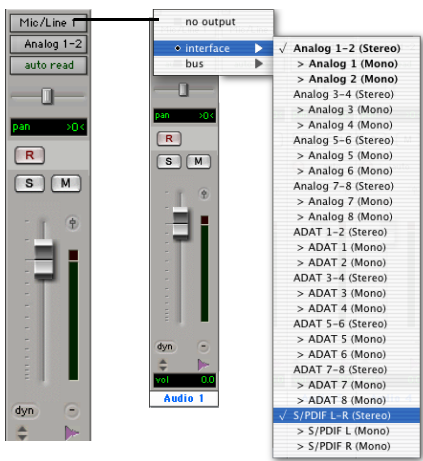
Output mirroring is useful for recording to multiple media, creating separate monitoring mixes, or for output to digital effects processors.

To mirror the Digi 002 Main Outputs on the S/PDIF outputs:

1. Open the Pro Tools session whose channel outputs you want mirror.
2. In the Mix window, click the Output Selector of any audio or Auxiliary Input track to select the main output destination, for example, Analog 1–2.
3. Hold the Control key and click the same Output Selector again, then select a second output for the same track (for example S/PDIF L-R).

The newly selected destination is indicated by an additional check mark in the output pop-up menu, and a plus sign in the Output Selector.

Choosing Multiple Output Destinations for a Track



Connecting a Recorder for Mixdowns

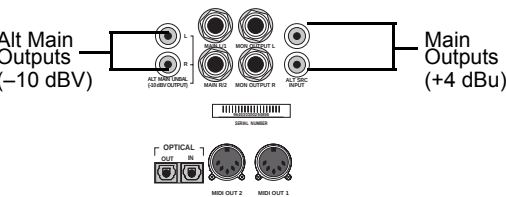
After you record and mix your sessions using Digi 002, you might want to mix them down to a DAT, audio cassette, or other stereo 2-track recording device.

Connecting an Analog Deck

If your recorder operates at -10 dBV level, connect its inputs to the Alt Main Outputs on the back of the Digi 002. These outputs are RCA connectors.

If your recorder operates at +4 dBu level, connect its inputs to the Main Outputs 1-2 on the back of the Digi 002. These outputs are 1/4-inch jacks. You may need adapter cables if your mixdown deck has RCA inputs.

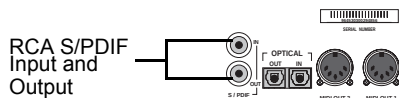
Alt Main and Main Outputs (back panel)



Connecting a Digital Deck (DAT)

If you have a DAT or other digital device that can receive S/PDIF digital audio data, connect it to the S/PDIF In and S/PDIF Out RCA jacks on the back of the Digi 002.

S/PDIF Input and Output

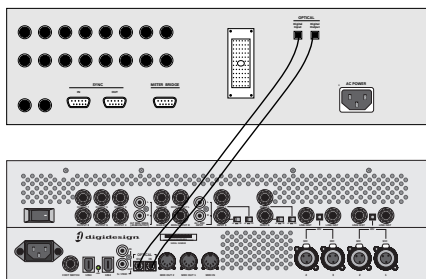


Connecting an ADAT

To connect an ADAT to Digi 002:

1. Connect the Optical output on the ADAT to the Optical In port on the Digi 002.
2. Connect the Optical input on the ADAT to the Optical Out port on the Digi 002. (When the Digi 002 is on, its Optical Out port emits a red light.)

Connecting an ADAT to Digi 002



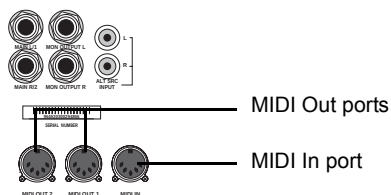
MIDI Connections

Using the Digi 002 built-in MIDI ports, a MIDI keyboard controller and MIDI instruments, you can take full advantage of the MIDI features of Pro Tools LE. These include recording and editing MIDI tracks, synchronizing to MIDI Time Code or MIDI Beat Clock (this requires an appropriate MIDI interface) and using a MIDI control surface.

To connect MIDI devices to Digi 002:

1. Using standard 5-pin MIDI cables, connect the MIDI Out port of the MIDI device or controller to the MIDI In port of your Digi 002.
2. Connect the MIDI In port of your MIDI device or controller to either of the two MIDI Out ports of the Digi 002.

MIDI In and Out ports (back panel)



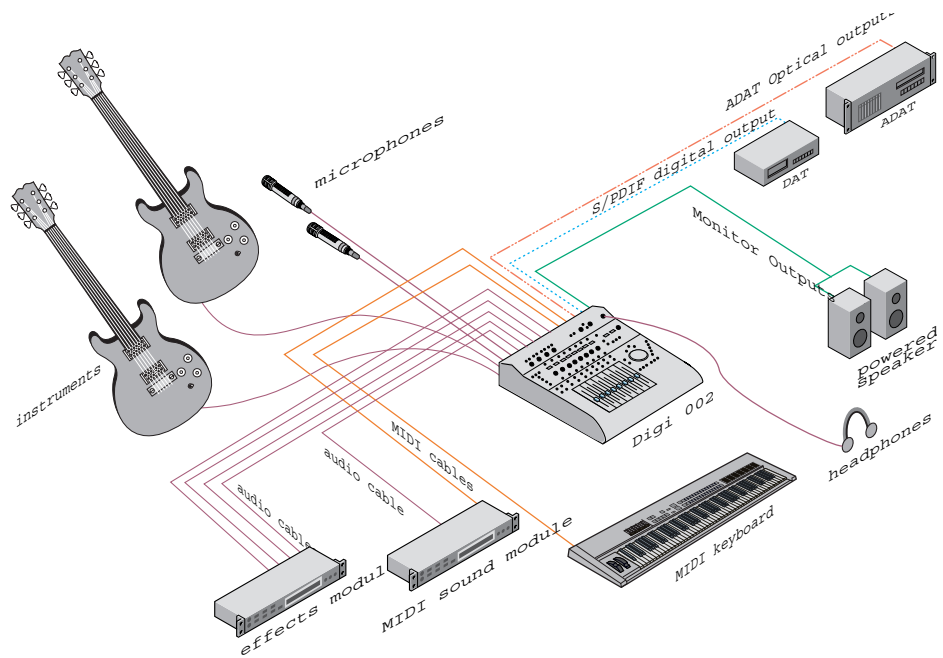
3. Connect the audio outputs of your device to available audio inputs of the Digi 002.

Using Digi 002 as a Stand-Alone Mixer

In addition to its function as an integrated front end and control surface for Pro Tools, Digi 002 can operate as a stand-alone digital mixer in a variety of settings. See the following figures.

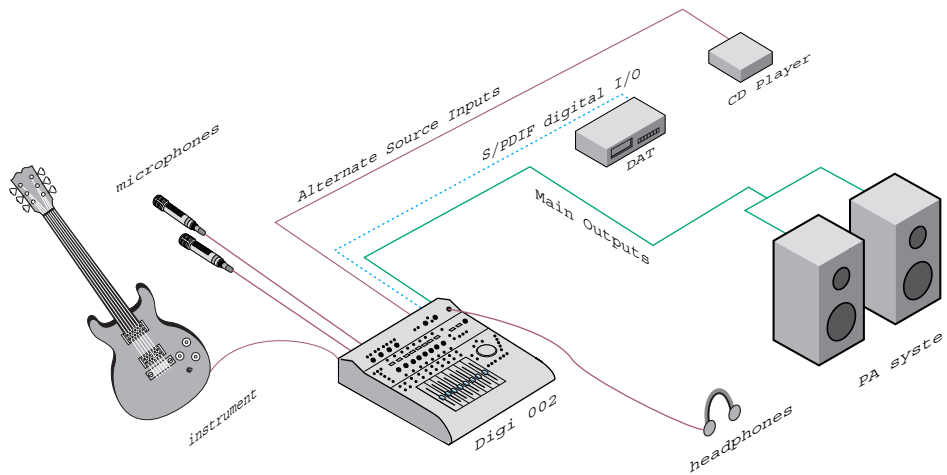
See [“Connecting Your Digi 002” on page 54](#) for details on analog audio and MIDI connections, and see [“Digital Audio Connections in Stand-Alone Mode” on page 72](#) for details on making digital audio connections to Digi 002.

Digi 002 Stand-alone Studio Configuration



The stand-alone mixing and processing capabilities of Digi 002 are provided by a powerful built-in digital signal processor (DSP). The Digi 002 unit does not need to be connected to a computer to operate in Stand-alone mode.

Digi 002 Stand-alone Live Configuration



Overview

When operating in Stand-alone mode, Digi 002 is a 8x4x2 digital mixer, consisting of:

- Eight inputs corresponding to Analog Inputs 1–8 on the Digi 002 back panel, controlled by the eight channel strips on the top panel
 - Dedicated, in-line three-band EQ on input channels 1–8
 - Dedicated, in-line compressor on input channels 1–4
- Four available sends on each channel, for adding internal Delay or Reverb effects, or for integrating external effects processors
- A stereo output corresponding to Main Outputs 1–2 on the Digi 002 back panel

Digital Mixer Sample Rate

In Stand-alone mode, Digi 002 functions as a digital mixer with a nominal sample rate of 44.1 kHz. Analog input signals are converted to digital signals for processing and mixing.

In Stand-alone mode, Digi 002 supports digital inputs at sample rates up to 48 kHz.



In Stand-alone mode, Digi 002 will not operate correctly with an external clock source greater than 48 kHz.

Mixer Inputs

Inputs 1–4	These inputs accept microphone-, line-, or instrument-level signals, and provide variable gain with the Input Gain control on the Digi 002 top panel. Phantom power is available to Inputs 1–4, in channel pairs, using the Phantom Power switches on the back panel of Digi 002.
Inputs 5–8	These inputs accept line-level signals and are switchable between –10 dBV and +4 dBu with the operating level switches on the Digi 002 back panel.
Alt Src Inputs	These inputs are active in Stand-alone mode, allowing you to connect and monitor alternate audio sources such as CD players or tape decks. The signal from the Alt Src Inputs can be routed directly to the Monitor and Headphone Outputs (by pressing the Alt Src to Mon switch) or to Input channels 7–8 (by pressing the Alt Src to 7–8 switch). When Alt Src to 7–8 is enabled, analog inputs 7–8 (1/4-inch TRS connectors on the back panel of Digi 002) are disabled.
S/PDIF Digital Inputs	In Stand-alone mode, you can activate these digital inputs so that they appear on inputs 5–6, allowing you to bring a stereo digital signal into the Digi 002. (See “Digital Audio Connections in Stand-Alone Mode” on page 72.)

Sends

Each of the eight channels of Digi 002 can send to any or all of the four available sends at the same time. Sends can be either pre- or post-fader.

Send A	Routes the input signal to the internal Delay processor
Send B	Routes the input signal to the internal Reverb processor
Send C	Routes the input signal to output 7 on the back panel of Digi 002
Send D	Routes the input signal to output 8 on the back panel of Digi 002



All the send assignments in Stand-alone mode are fixed and cannot be changed.

Dynamics

Input channels 1–4 have a dedicated, in-line compressor, with controls for the following parameters:

- Input gain
- Threshold
- Compression ratio
- Attack and release times
- Hard or soft knee (slope)
- Phase inversion
- Output gain

EQ

Each of the eight Input channels has a dedicated, in-line 3-band equalizer, consisting of the following:

- Switchable high pass/low shelf EQ band
- Parametric EQ band
- Switchable low pass/high shelf EQ band

These EQ bands can be used in conjunction with the built-in hardware high-pass filters available on Inputs 1–4.

Mixer Outputs

Main Outputs - In Stand-alone mode, all eight Input channels, the Delay return, and the Reverb return are summed to outputs 1–2, which are routed to the Main Outputs, Alt Main Outputs, and the S/PDIF outputs on the back panel of Digi 002. Outputs 1–2 are also mirrored on the Monitor Outputs and Headphone Output.

ADAT Optical Outputs - In Stand-alone mode all eight Input channels are passed directly to the eight ADAT Optical Outputs, pre-fader, pre-effects, except for the high-pass filter on channels 1–4. This allows you to route input signals directly to an ADAT device without repatching cables.

Entering Stand-Alone Mode

You can put Digi 002 into Stand-alone mode when the unit is in Standby mode or in Pro Tools mode. However, if Digi 002 is in Pro Tools mode when you put it in Stand-alone mode, communication with Pro Tools is suspended, and Pro Tools posts a warning dialog box, allowing you to either return to Pro Tools mode, or save your session and quit Pro Tools.

To put Digi 002 in Stand-alone mode:

1. Press the Standalone switch on the right side of the Digi 002 top panel. Digi 002 displays “Enter Standalone mode? Yes/No.”
2. Press the flashing Channel Select switch under “Yes” to enter Stand-alone mode. Press the switch under “No” to remain in the previous state.



If you enter Stand-alone mode while you are in Pro Tools mode, Pro Tools software will prompt you to either exit Standalone mode or quit Pro Tools. If a Pro Tools session is open, you can save the session before quitting Pro Tools.

To exit Stand-alone mode:

- ▶ Press the Standalone switch again. Digi 002 goes into Standby mode, or enters Pro Tools mode automatically if Pro Tools software is still running.

Digital Audio Connections in Stand-Alone Mode

Digital Inputs

In Stand-alone mode, you can set Inputs 5–6 to accept S/PDIF digital input instead of analog input.

When Inputs 5–6 are set to S/PDIF, the 1/4-inch analog connectors for Inputs 5–6 (on the back panel of Digi 002) are inactive.

To set Inputs 5–6 to S/PDIF digital input:

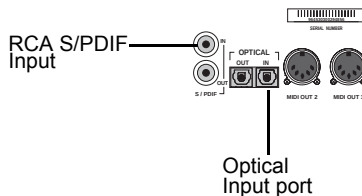
1. In Stand-alone mode, press the Utility (F1) switch.
2. Press the illuminated Channel Select switch under Pref.
3. Press the illuminated Channel Select switch under In56 (Inputs 5–6).
4. Press the illuminated Channel Select switch repeatedly to toggle Inputs 5–6 to Analog or S/PDIF.
5. Press the Escape (Esc) switch to exit Input 5–6 preferences.
6. Press the far right Channel Select switch to save the preference settings.
7. Press the Escape (Esc) switch twice to exit Utility mode.

Digital Input Format

You can set Digi 002 to receive S/PDIF input at the RCA Input connector or the Optical Input port on the back panel of Digi 002. See [“Digital Audio Connections” on page 60](#) for details on S/PDIF input format.

In Stand-alone mode, the RCA and Optical ports accept S/PDIF signals at sample rates up to 48 kHz.

Digital input connectors (back panel)



To change the digital input format for Inputs 5–6:

1. In Stand-alone mode, press the Utility (F1) switch.
2. Press the illuminated Channel Select switch under Pref.
3. Press the illuminated Channel Select switch under SPDF (S/PDIF).
4. Press the illuminated Channel Select switch repeatedly to toggle the digital format to RCA or Optical.
5. Press the Escape (Esc) switch to exit SPDF preferences.
6. Press the far right Channel Select switch to save the preference settings.
7. Press the Escape (Esc) switch twice to exit Utility mode.



Only one S/PDIF input pair can be used at a time. For example, if you use the optical input for S/PDIF data, you cannot use the RCA inputs.

Digital Clock Source

When you connect an external digital source, you can set Digi 002 to synchronize to external Word Clock (the clock signal coming from the device) or internal Word Clock (generated by Digi 002). In most cases, such as with DAT decks, you will use external clock.

To change the clock source for the digital inputs on Inputs 5–6:

1. In Stand-alone mode, press the Utility (F1) switch.
2. Press the illuminated Channel Select switch under Pref.
3. Press the illuminated Channel Select switch under WClk (Word Clock).
4. Press the illuminated Channel Select switch repeatedly to toggle the clock source to Internal or S/PDIF (external).
5. Press the Escape switch to exit SPDF preferences.
6. Press the far right Channel Select switch to save the preference settings.
7. Press the Escape (Esc) switch twice to exit Utility mode.

When the Word Clock source is set to S/PDIF (external), the Sample Rate indicator flashes to indicate that no clock signal is present, or that Digi 002 is not receiving valid clock signal. The Sample Rate indicator lights solid to indicate Digi 002 is receiving valid clock signal.

Digital Outputs

The output configuration of Digi 002 in Stand-alone mode depends on the digital output format chosen in the S/PDIF preference setting. (This is the same setting used to configure the digital input format.)

S/PDIF Outputs

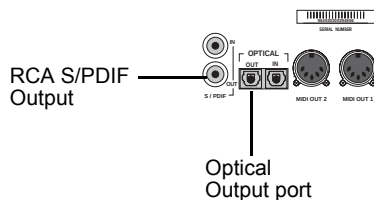
In Stand-alone mode, the S/PDIF outputs on the back panel of Digi 002 mirror outputs 1–2 at all times. If RCA is chosen in the S/PDIF preferences, only the RCA S/PDIF connector is active. If Optical is chosen in the S/PDIF preferences, *both* the RCA and Optical S/PDIF connectors are active.

If Optical is chosen in the S/PDIF preferences, only Main Outputs 1–2 are mirrored in the Optical Output port.

ADAT Optical Outputs

In Stand-alone mode, if RCA is chosen in the S/PDIF preferences, all 8 Input channels are passed directly to the ADAT Optical Output port, pre-fader and pre-effects. This allows you to route input signals directly to an ADAT device and record raw input data on all 8 channels.

Digital Output Connectors (Back Panel)



To change the digital output format:

1. In Stand-alone mode, press F1 (Utility).
2. Press the illuminated Channel Select switch under Pref.
3. Press the illuminated Channel Select switch under SPDF (S/PDIF).
4. Press the illuminated Channel Select switch repeatedly to toggle the digital format to RCA or Optical.
5. Press the Escape (Esc) switch to exit SPDF preferences.

6. Press the far right Channel Select switch to save the preference settings.
7. Press the Escape (Esc) switch twice to exit Utility mode.

Views in Stand-Alone Mode

In Stand-alone mode, Digi 002 can display the mixer controls in several views.

Home View

Home View is the default mixer view that you see when you first enter Stand-alone mode. This view is actually the same as Console View with the Pan controls displayed on the Rotary Encoders, and channel names on the Channel Scribble Strips.

To put Digi 002 in Stand-alone Home View:

- ▶ In Stand-alone mode, press the Pan switch in the upper left corner of the Console View area.

Console View

Console View lets you toggle the Digi 002 to display either the pan position controls or the send controls for each channel.

Pan View - This is the default mixer view that appears when you first enter Stand-alone mode. In Pan View, the faders control Input channel volume and the rotary encoders control pan position.

In this view, the Channel Scribble strips show the channel names. Channel names can be changed in this view. (See “Naming Channels” on page 80.)

To display pan position for all channels:

- ▶ In Stand-alone mode, press the Pan switch in the upper left corner of the Console View area.

Send View - This view displays the send-level controls for each track on the rotary encoders. In Send View, the faders continue to control Input channel volume.

In Send view, the Channel Scribble Strips show the names associated with each send position (Send A=Dly, Send B=Rvrb, Send C=Snd C, Send D=Snd D in Stand-alone mode) across all channel strips.

To display send-level controls for all channels:

1. In Stand-alone mode, press the Send switch in the upper left corner of the Console View area.
2. Press any of the Send Position switches (A–D) to display the levels for the corresponding send in the rotary encoders. (In Stand-alone mode, the switch for Send E is inactive.)

When you are displaying individual sends in Send view, the Channel Select switches toggles the send between pre- and post-fader operation.

When you first display sends, the send names are shown in the Channel Scribble Strips. To see the send-level value in a Scribble Strip, move its Rotary Encoder. By default, send levels are turned all the way down (–INF).

Master Fader View

Master Fader View displays 5 channels in the Digi 002 channel strip area. The Master Faders and Effects Returns appear, with the Master Faders on the right.

To put Digi 002 into Master Fader View:

- ▶ In Stand-alone mode, press the Master Fader switch to the left of the Navigation and Transport controls.

Master Faders	The left and right Master Faders control the output level to Main Outputs 1–2 on the back panel of Digi 002.
Reverb Returns	These are the left and right returns for Send B, the internal Reverb effect. The amount of reverb effect in the mix output can be controlled with these faders.
Delay Return	This is a mono return for Send A, the internal Delay effect. The fader controls the amount of delay effect, and the rotary encoder controls its pan position in the mix output.

Reverb and Delay Mute

You can mute the Reverb and Delay effect returns by pressing the Mute switch on the respective channel while in Master Fader View. This allows you to audition the source tracks with the effects temporarily removed.

Reverb and Delay Solo Safe

In Stand-alone mode, the Reverb and Delay returns have a *Solo Safe* feature. If any input channel (1–8) has a send assigned to the Reverb or Delay and the solo switch is pressed on an input channel, the Reverb and Delay effect returns are not muted, and the effect can still be heard. You can disable the Solo Safe feature by changing the Solo preference setting.

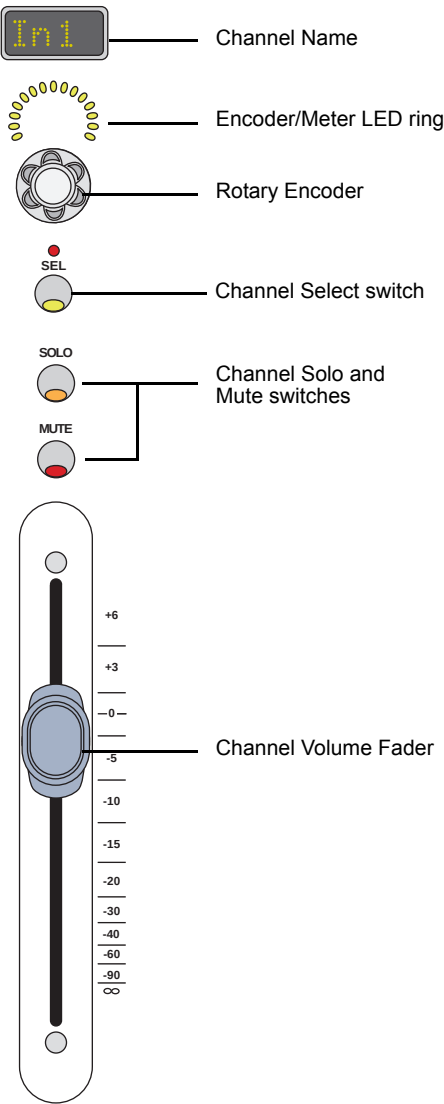
To change the Solo Safe preference:

1. In Stand-alone mode, press F1 (Utility).
2. Press the illuminated Channel Select switch under Pref.
3. Press the illuminated Channel Select switch under Solo.
4. Press the illuminated Channel Select switch repeatedly to toggle the Solo Safe feature On or Off.
5. Press the Escape switch to exit Solo Safe preferences.
6. Press the far right Channel Select switch to save the preference settings.
7. Press the Escape switch twice to exit Utility mode.

Channel Strip Controls

In Console View, each of the 8 channel strips on Digi 002 controls its corresponding input.

Digi 002 Channel Scribble Strip Controls in Stand-alone Mode



Channel Name

The name of each channel appears in the Channel Scribble strips. If you move a fader or rotary encoder, the scribble strip temporarily shows the volume level or pan position. You can rename each of the input channels. (See “Naming Channels” on page 80.)

Encoder/Meter LED Ring

Encoder Mode - In normal mode (when the “L” and “R” Encoder/Meter indicators are lit), the LED rings above the rotary encoders indicate one of the following:

- ▶ In Pan View (or Home View), the LED rings indicate channel pan position.
- ▶ In Send View, the LED rings indicate the level for the selected send (A–D) for each channel.
- ▶ In Master Fader View, the Delay Return LED ring shows pan position. (No other Rotary Encoders are active in this view.)
- ▶ In Channel View, the LED rings display EQ, Compressor, or Pan/Send information.

Meter Mode - When you press the Encoder/Meter mode switch to the right of the Channel View area so the Meter LED is lit, the LED rings act as meters in the following ways:

- ▶ In Pan View and Send View, the LED rings act as post-fader meters for each input channel.
- ▶ In Master Fader View, the LED rings act as post-fader meters for the effect return and Master Fader channels.
- ▶ When viewing EQ controls in the Channel View area, the LED rings act as post-fader meters for each input channel.
- ▶ When viewing compressor controls in the Channel View area, the LED rings act as input, output, and gain reduction meters for the displayed compressor.

Channel Volume Fader

The volume of each input is controlled by its corresponding channel fader.

Pan

The pan position of each input on the stereo output bus is controlled by its corresponding rotary encoder when Digi 002 is in Pan View.

Solo and Mute

The solo and mute status of each channel are controlled by the corresponding switches on each channel strip. In Stand-alone mode, the Solo switches behave in latched fashion, allowing more than one channel to be soloed at the same time.

Channel Select Switch

Depending on the current view, the Channel Select switch performs a variety of functions. In Pan/Send View, this switch toggles the corresponding send between pre- and post-fader operation. In Channel View, you press this switch to select a channel and display the controls for any of the internal effects on Digi 002.

Naming Channels

In Stand-alone mode, you can name the input channels so that the name appears in each Channel Scribble strip. (The names of the Master Fader and Effect Return channels cannot be changed.)

To change the name of an input channel:

1. If Digi 002 is not in Home View, press the Pan switch in the upper left corner of the Console View area to return the unit to Home View.
2. Press F2 (Naming). The Channel Selector switches flash on channels 2–8 and a cursor appears beneath the first character in the Channel Scribble strip of channel 1. The Channel Select switch below channel 1 lights solid to indicate that its name is being edited.
3. Turn the Rotary Encoder for the first channel to select the first character. (Available characters include uppercase and lowercase letters, numerals, and symbols.)

4. Press the Left and Right Arrow keys in the Navigation Section of Digi 002 to move the cursor left and right in the Channel Scribble strip display.
5. When you are finished naming the first channel, you can press the Channel Select switch or move the Rotary Encoder for another channel to edit its name.
6. When you are finished naming channels, press the Escape switch or F2 again to return to Home View.

The new channel names are retained in Stand-alone mode as long as Digi 002 remains turned on.



To save the channel names for recall at a later time, you can store the names as part of a Snapshot. See “Storing Snapshots” on page 88.

Channel View

Channel View lets you display the controls for the internal EQ and Dynamics effects on each channel, and also offers a way to view the all pan and send controls on a single channel.

EQ

Each Input channel offers a dedicated 3-band EQ, accessible from EQ switch in the Channel View area.

To display the EQ controls for a track:

1. In Stand-alone mode, press the EQ switch in the Channel View area.
2. Select a channel whose EQ controls you want to display by pressing its Channel Select switch. The Channel Scribble Strips show “EQ” and the number of the selected channel.

Digi 002 displays the EQ controls across the Channel Scribble Strips.

See “EQ Controls” on [page 84](#) for more information on working with EQ effects.

Dynamics

Input channels 1–4 offer a dedicated compressor, accessible from the Dynamics switch in the Channel View area.

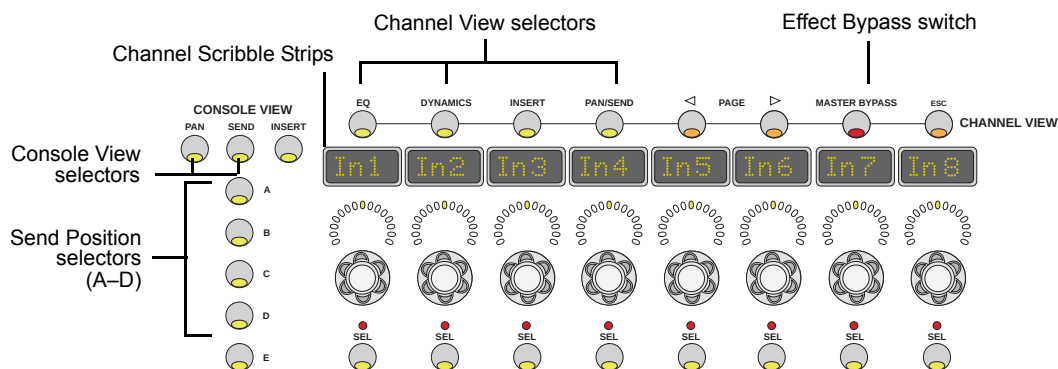
To display the compressor controls for a track:

1. In Stand-alone mode, press the Dynamics switch in the Channel View area.
2. Select from channels 1–4 the channel whose Dynamics controls you want to display by pressing its Channel Select switch.

Digi 002 displays the compressor controls across the Channel Scribble Strips. The Display Scribble Strips on the right side of the unit show “Dyn” and the number of the selected channel.

See [“Dynamics Controls” on page 85](#) for more information on working with Dynamics effects.

Digi 002 Console and Channel View Controls in Stand-alone Mode



Pan/Send

The Pan/Send view allows you to view the pan position and the controls for all of the sends on a selected track across all the Channel Scribble Strips.

To display the pan and send controls for a track:

1. In Stand-alone mode, press the Pan/Send switch in the Channel View area.
2. Select a channel whose Pan and Send controls you want to display by pressing its Channel Select switch. The Display Scribble Strips on the right side of the unit show “P/S” and the number of the selected channel.

Channel Scribble Strip 1 and the first rotary encoder show track pan position for the selected channel.

Channel Scribble Strips 3–6 show the names and their rotary encoders control the levels for all five sends on that track. (Channel Scribble Strips 2, 7 and 8 are inactive.)

When you are displaying sends in Pan/Send view, the Channel Select switches toggles the send between pre- and post-fader operation.

Displaying Parameter Values

The default view for channels, inserts in sends shows the name of the control in the Channel Scribble Strips, and the control’s numerical value is shown only when the control is touched or moved.

By pressing the Command switch and the Display mode switch in tandem, you can change the default view to the numerical value of a control rather than its name.

To revert to the default display, press the Command switch and the Display mode switch again.

In addition, pressing the Command switch in tandem with the Display mode switch allows you to set channels to display numerical parameter values by default, rather than control names. For example, in Pan view, when you press Command + Display, fader volume levels (in dB) are the default display.

Working with Effects

In Channel view, the controls for the Digi 002 EQ and Dynamics effects are displayed across the Channel Scribble Strips.

EQ Controls

To access EQ controls for a track:

1. Press the EQ switch in the Channel View area above the Channel Scribble Strips.
2. Press the Channel Select switch on the channel whose EQ controls you want to display.

The onboard EQ controls are distributed across the Channel Scribble Strips as shown in Table . The second row of the table shows the function of the Rotary Encoders, and the bottom row of the table shows the function of the Channel Select switches in this view.

3. When you are finished setting the EQ controls, return to Home View by pressing the Pan switch in the Console View area.

While EQ controls are displayed, you can bypass EQ processing by pressing the Master Bypass switch in the Channel View area. The Master Bypass switch bypasses all 3 bands of EQ for the selected channel.

To bypass EQ controls for a track:

1. Press the EQ switch in the Channel View area above the Channel Scribble Strips.
2. Press the Channel Select switch on the channel whose EQ controls you want to bypass.

- 3. Press the Master Bypass switch while in Channel View. The switch flashes to indicate that the displayed EQ is currently bypassed.

EQ controls in Digi 002 Stand-alone Mode

Display	Inpt	> F or ~F	> G or ~G	^ F	^ Q	^ G	< F or ~ F	<G or ~ G
Rotary Encoder	Input Gain	Low Shelf Frequency or High Pass Frequency	Low Shelf Gain	Peak Frequency	Peak Q	Peak Gain	High Shelf Frequency or Low Pass Frequency	High Shelf Gain
Channel Select		Toggle between filters	Bypass Low Band			Bypass Mid-Band	Toggle between filters	Bypass High Band

Dynamics Controls

To access Dynamics controls for a track:

- 1. Press the Dynamics switch in the Channel View area above the Channel Scribble Strips.
- 2. Press the Channel Select switch on the channel whose Dynamics controls you want to display.

The onboard compressor controls are distributed across the Channel Scribble Strips as shown in Table . The second row of the table shows the function of the Rotary Encoders, and the bottom row of the table shows the function of the Channel Select switches in this view.

- 3. When you are finished setting the Dynamics controls, return to Home View by pressing the Pan switch in the Console View area.

You can bypass Dynamics processing at any time by pressing the Master Bypass switch in the Channel View area. The Master Bypass switch bypasses compression for the selected channel.

To bypass Dynamics controls for a track:

- 1. Press the Dynamics switch in the Channel View area above the Channel Scribble Strips.
- 2. Press the Channel Select switch on the channel whose Dynamics controls you want to bypass.

- 3. Press the Master Bypass switch. The switch flashes to indicate that the displayed compressor is currently bypassed.

Compressor Controls in Digi 002 Stand-alone Mode

Display	Inpt	Thsh	Rtio	Atck	Rels	Knee	Phas	Outp
Rotary Encoder	Input Gain	Threshold	Compression Ratio	Attack Time	Release Time	Knee Type	Phase Invert	Output Gain
Channel Select						Toggle Hard and Soft Knee	Toggle Normal and Invert	

Working with Sends

In Stand-alone mode, each Input channel has four fixed sends, with the first two dedicated to the internal Delay and Reverb processing of Digi 002.

To display and edit the sends to the Delay:

- 1. Press the Send switch in the upper left corner of the Digi 002 unit, in the Console View area.
- 2. Press the Send A switch (located immediately below the Send switch you just pressed). The rotary encoders show the levels for the corresponding sends on each track.
- 3. Adjust the rotary encoders as desired to send signal to the onboard Delay.
- 4. Press the Master Fader switch, located to the left of the Navigation and Transport section. The return track for Send A is named *Dly*.
- 5. Adjust the fader volume and pan position for the return track.
- 6. Press the Master Fader switch again to return to the previous view, or press the Pan switch to return to Home View.

To display and edit the sends to the Reverb:

- 1. Press the Send switch in the upper left corner of the Digi 002 unit, in the Console View area.
- 2. Press the Send B switch. The rotary encoders show the levels for the corresponding sends on each track.

3. Adjust the rotary encoders as desired to send signal to the onboard Reverb.
4. Press the Master Fader switch, located to the left of the Navigation and Transport section. The stereo return tracks for Send B are named *RvbL* and *RvbR*.
5. Adjust the fader volume for the return tracks.
6. Press the Master Fader switch again to return to the previous view, or press the Pan switch to return to Home View.

Delay Controls

To access the controls for the onboard Delay:

1. Press the Master Fader switch.
2. Press the Channel Select switch on the Delay return channel.

The onboard Delay controls are distributed across the Channel Scribble Strips as shown in Table . The first row of the table shows the function of the Rotary Encoders, and the bottom row of the table shows the function of the Channel Select switches in this view.

3. When you are finished setting the Delay controls, press the Escape key to return to the Master Fader view.

Reverb Controls

To access the controls for the onboard Reverb:

1. Press the Master Fader switch.
2. Press the Channel Select switch on either of the Reverb return channels.

The onboard Reverb controls are distributed across the Channel Scribble Strips as shown in Table . The table shows the function of the Rotary Encoders in this view.

3. When you are finished setting the Reverb controls, press the Escape key to return to the Master Fader view.

Delay Controls in Digi 002 Stand-alone Mode

Display	Time	Fdbak	LPF	D → R
Rotary Encoder	Delay Time	Feedback	Low-pass Filter	Delay Send to Reverb
Channel Select				Pre/Post

Reverb Controls in Digi 002 Stand-alone Mode

Display	Room	PDly	LPF	Smer	Damp	Diff	Time
Rotary Encoder	Room Type	Pre-Delay Time	Low-Pass Filter	Smear	Damping	Diffusion	Reverb Decay Time

Storing Snapshots

Digi 002 allows you to store up to 24 stand-alone mix configurations and recall them at any time. You can use snapshots to create mix templates or to capture a mix in progress.

A 25th mix configuration, containing stand-alone system defaults, can be recalled, but cannot be modified or renamed.

Snapshots store the following information for each input channel:

- Channel name
- Channel fader position
- Channel pan position
- EQ and compressor settings
- Send levels

To store a snapshot of a mix configuration:

1. Arrange mixer controls, name channels, and set effects controls as desired.
2. Return to Home View by pressing the Pan switch in the upper left corner of the Console View area.
3. Press F3 (Snapshot).
4. Press the Channel Select switch under Save.
5. Turn the Rotary Encoder under the snapshot number to set the number (1–24).
6. Press the Left and Right Arrow keys in the Navigation Section of Digi 002 to move the cursor in the Channel Scribble Strip display.
7. If you want to rename the snapshot, press the Left and Right Arrow keys in the Navigation Section, and turn the Rotary Encoder under the snapshot number to change each character in the snapshot name.
8. Press the flashing Channel Select switch to save the snapshot, or press the Escape switch twice to cancel the operation and return to Home View.

To recall a snapshot:

1. Return to Home View by pressing the Pan switch in the upper left corner of the Console View area.
2. Press F3 (Snapshot).
3. Press the Channel Select switch under Load.
4. Turn the Rotary Encoder under the snapshot number to recall the desired snapshot. (Snapshot #25 returns Digi 002 to its default settings.)
5. Press the flashing Channel Select switch to load the snapshot, or press the Escape switch twice to cancel the operation and return to Home View.

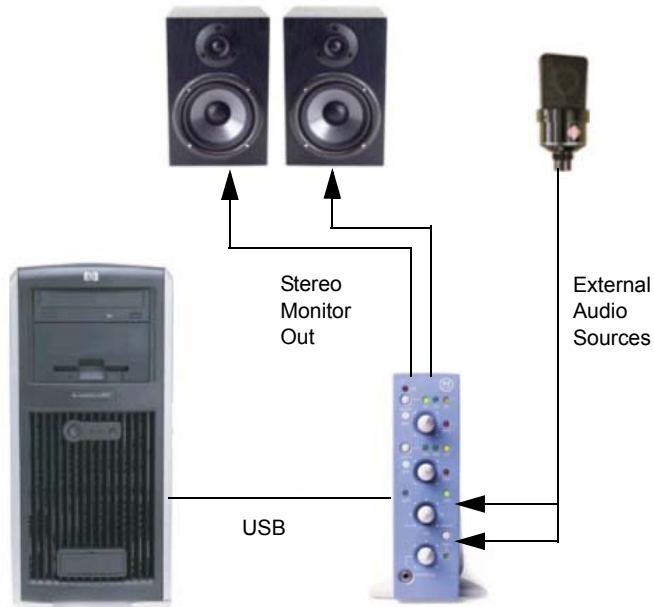
Chapter 2

Welcome to Mbox

Welcome to Mbox, Digidesign's portable Pro Tools micro-studio, designed in collaboration with Focusrite.

Mbox provides your USB-equipped computer with two channels of analog and digital audio input and output, employing professional-quality mic preamps and 24-bit analog-to-digital and digital-to-analog converters.

Mbox Micro Studio Configuration Running Pro Tools LE on a Desktop Computer



Mbox cannot be used as an audio I/O for Avid Xpress Pro if an Avid Mojo is attached to the computer. Mbox and Avid Mojo cannot currently be used on the same system.

Mbox Features

The Mbox desktop audio interface provides the following:

- Two analog audio inputs with Focusrite microphone preamps and switchable 48V phantom power
- Analog input jacks that accept both XLR and 1/4-inch (TRS) connectors, and are switchable between Mic, Line, and Instrument levels
- Two channels of S/PDIF digital input and output
- Two analog monitor outputs
- 24-bit A/D and D/A converters, supporting sample rates of 44.1 kHz and 48 kHz
- Zero-latency analog record monitoring with adjustable balance between input and playback
- Mono switch for summing the input signal with the monitor mix
- Analog 1/4-inch TRS insert on each input
- 1/4-inch (TRS) or 1/8-inch stereo headphone output with adjustable level control
- USB-powered operation



Mbox will not function properly if connected to a USB hub. If you need to use a hub for other USB peripherals, use a separate USB port; Mbox must have a dedicated port in order to function properly.

Pro Tools LE Capabilities

Pro Tools LE software provides the following capabilities with Mbox:

- Playback up to 32 mono digital audio tracks, and playback up to 30 tracks while recording up to 2 tracks, depending on your computer's capabilities.
- Sessions can include up to 128 audio tracks (with 32 voiceable tracks maximum), 256 MIDI tracks, 128 Auxiliary Input tracks, and 64 Master Fader tracks.
- 16-bit or 24-bit audio resolution, at sample rates up to 48 kHz.
- Nonlinear, random-access editing and mix automation.

- Audio processing with up to 5 RTAS plug-ins per track, depending on your computer's capabilities.
- Up to 5 inserts and 5 sends per track
- Up to 16 internal mix busses.



Pro Tools LE uses your computer's CPU to mix and process audio tracks (host processing). Computers with faster clock speeds yield higher track counts and more plug-in processing.

System Requirements

Digidesign can only assure compatibility and provide support for hardware and software it has tested and approved.

For a list of Digidesign-qualified computers, operating systems, hard drives and third-party devices, refer to the latest compatibility information on the Digidesign Web site (www.digidesign.com/compato).

MIDI Requirements

USB MIDI and serial MIDI interfaces work effectively with Pro Tools systems on Windows.

For a list of supported adapters, refer to the Digidesign Web site (www.digidesign.com).

Mbox Basics

This section provides basic information for using the Mbox.

Getting Sound In and Out of your Mbox

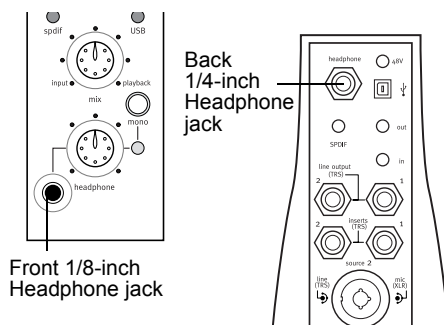
To hear audio recorded into a Pro Tools session, you will need to connect headphones or an external sound system (such as powered monitors or a home stereo) to Mbox. Sound from Mbox cannot be played through your computer's speakers or your computer's sound output.

If you are using a digital device for input or output, see [“S/PDIF Digital I/O” on page 123](#)

Connecting Headphones

There are two headphone jacks on the Mbox, an 1/8-inch mini plug jack on the front, and a 1/4-inch jack on the back. You cannot use both jacks at once.

Headphone Jacks on Front and Back of Mbox



To connect headphones:

- Do one of the following:
 - Connect headphones with an 1/8-inch stereo mini connector (or an adapter) to the front Headphone jack.
 - Connect headphones with a 1/4-inch stereo connector (or adapter) to the back Headphone jack.



The front panel Headphone control adjusts the volume level of both the front and back Headphone jacks.

Connecting a Sound System

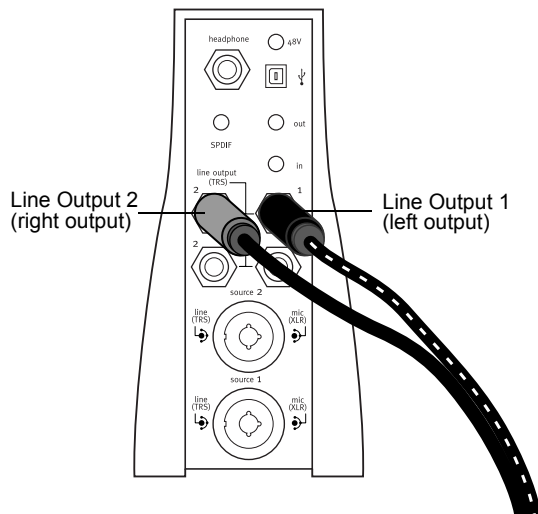
The outputs on the back of the Mbox support 1/4-inch plugs. These connections can be balanced, TRS style connectors, or unbalanced. To listen to your Pro Tools session, these outputs can be connected to any amplification system: powered speakers, a home stereo system, or a music mixer.

When connecting to a stereo system, connect the left channel (often the black plug) to Line Output 1, and right channel (often the red plug) to Line Output 2.



Home stereo systems often use RCA connectors. You can use an adaptor or a special cable to convert from the TRS or TS connectors used by Mbox to the RCA connectors on your home stereo.

Stereo Output from the Mbox

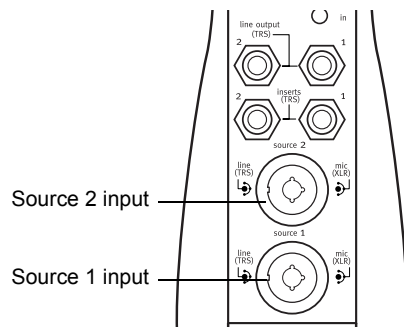


Line Outputs 1 and 2 play the audio that is routed to analog outputs 1 and 2 within Pro Tools.

Connecting Audio Inputs

Mbox inputs (sources) support microphones, guitars, keyboards, and other types of instruments.

Source Inputs on Back of Mbox



Mbox has two audio inputs, labeled Source 1 and Source 2. For stereo inputs, use Source 1 for the left input, and Source 2 for the right input.

For information about connecting specific audio sources, see [“Attaching a Microphone to the Mbox” on page 97](#), and [“Connecting Instruments to the Mbox” on page 101](#).

Connecting a Microphone

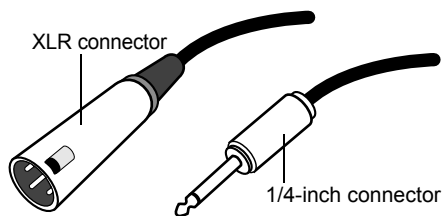
This section covers how to attach a microphone.

Attaching a Microphone to the Mbox

There are several ways to use Mbox with a microphone, depending on the type of microphone and cables that you use.

Some microphone cables use an XLR connector to attach a microphone to an input (such as those on the Mbox); other microphones use a 1/4-inch connector. If you have a choice, use an XLR connector to connect the microphone to the Mbox to yield better results.

XLR and 1/4-inch Connectors



Phantom Power

Some microphones require power to operate. This power, called *phantom power*, is supplied either by a battery in the microphone, or through an audio interface (such as Mbox) that can supply power through the microphone cable.

Most *condenser* microphones (such as an AKG C3000) require phantom power to operate. *Dynamic* microphones (such as a Shure SM57) do not require phantom power to operate, but are not harmed by it.



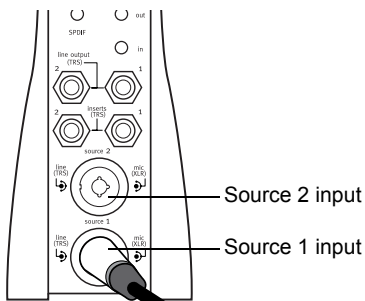
Although phantom power can be used safely with most microphones, it is possible to damage some ribbon microphones with it. Always turn off phantom power and wait at least ten seconds before connecting a ribbon microphone.

The Mbox can only supply power through a microphone cable with XLR connectors. If you are not sure about the phantom power requirements for your microphone, consult your microphone's documentation or contact the manufacturer.

To use a microphone that has an XLR connector:

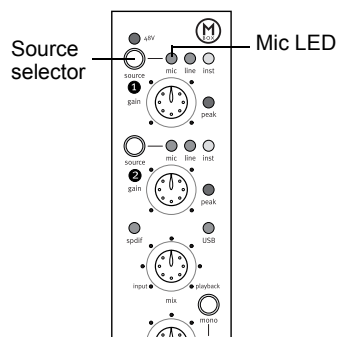
1. Plug your microphone cable into one of the Source inputs on the back of Mbox. The inputs are numbered from the bottom up, so Source 1 is the bottom input.

XLR Connector Plugged into the Source 1 Input



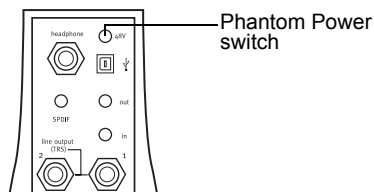
2. Set the Source to Mic (microphone) by pressing the Source selector on the front of Mbox until the Mic LED is lit.

Channel 1 Source Controls on the Mbox Front Panel



3. If your microphone requires phantom power, make sure the microphone is connected, then press the Phantom Power switch on the back of the Mbox (labeled 48V). This switch sends 48V to *both* mic inputs. The 48V LED on the front of the Mbox will light when phantom power is being supplied.

Phantom Power Switch

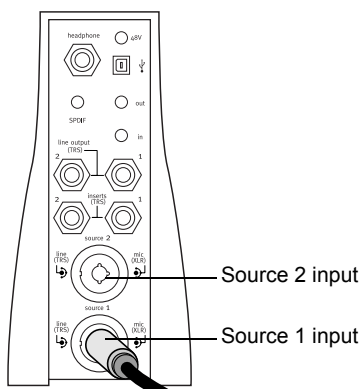


4. On the front of the Mbox, turn the Mix control fully left to Input.
5. On the front of the Mbox, carefully turn the Gain control to the right to increase the input level of your microphone signal.

To use a microphone that has a 1/4-inch connector:

1. On the back of the Mbox, plug the 1/4-inch connector from your microphone into one of the Source inputs. The inputs are numbered from the bottom up, so Source 1 is the bottom input.

1/4-inch Connector Plugged into the Source 1 Input



2. On the front of the Mbox, set the source to Inst (instrument) by pressing the Source selector until the Inst LED is lit.

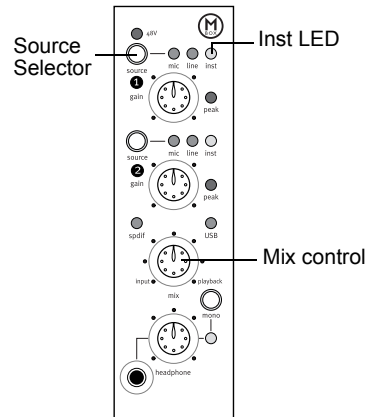


If you are using a microphone with a 1/4-inch connector, do not choose the “Mic” input source because the Mbox will not register any signal.

3. On the front of the Mbox, turn the Mix control fully left to Input.

4. On the front of the Mbox, carefully turn the Gain control to the right to increase the input level of your microphone signal.

Channel 1 Controls and the Mix Control on the Mbox Front Panel



Connecting Instruments

Connecting Instruments to the Mbox

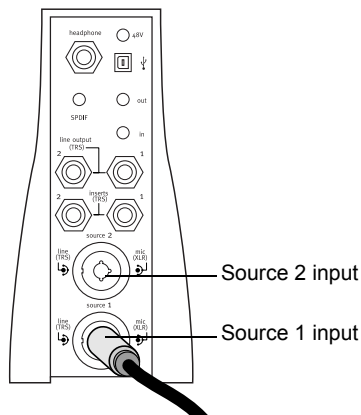
Mbox provides two switchable line input types that correspond to the different signal strengths output by different types of instruments. Instruments such as electric guitar or electric bass usually have a lower level of output than instruments and electronic audio sources such as mixers, samplers, keyboards, turntables, and synthesizers.

If you are connecting a digital audio source, refer to “S/PDIF Digital I/O” on page 123.

To use a guitar with Mbox:

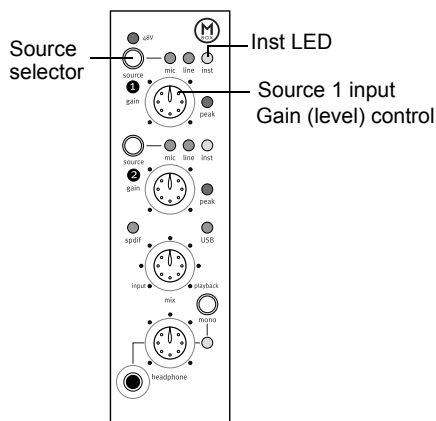
1. On the back of your Mbox, plug your guitar cable into one of the Source inputs. The inputs are numbered from the bottom up, so Source 1 is the bottom input on the back of your Mbox.

Guitar Cable Plugged into the Source 1 Input



2. On the front of the Mbox, set the Source to Inst (instrument) by pressing the Source selector until the Inst LED is lit.

Source Selector and Gain Control for the Source 1 Input



3. On the front of the Mbox, turn the Mix control fully left to Input.

4. On the front of the Mbox, carefully turn the Gain control to the right to increase the input level of your guitar.

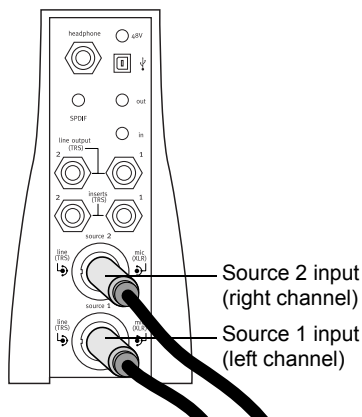


When you record a guitar (or any mono instrument that uses only one source input) you will hear the sound in only one side of the stereo field. Pushing the “mono” button on the front of the Mbox brings the sound from one side of the stereo field to both.

To use a keyboard or mixer with Mbox:

1. Plug your keyboard, mixer, or other audio source into either the Source 1 or Source 2 input on your Mbox. If your source is stereo (such as a stereo keyboard or the stereo output from a mixer,) connect the left channel (often the black plug) to Source 1, and right channel (often the red plug) to Source 2. The inputs are numbered from the bottom up, so Source 1 is the bottom input on the back of your Mbox.

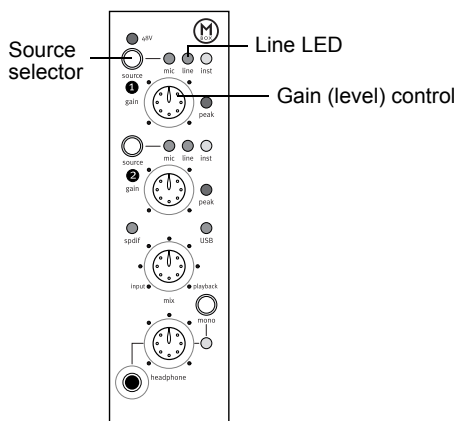
Mbox Configuration for Stereo Input



Do not plug any sound source into the 1/4-inch jacks labeled “Inserts.” These are not inputs. They are special connectors for using an external effects processor such as a compressor or EQ.

2. On the front of Mbox, set the source to Line (line level) by pressing the Source selector until the Line LED is lit.
3. On the front of the Mbox, turn the Mix control fully left to Input.

Source Selector and Gain Control for the Source 1 Input



4. Set your instrument's volume to its optimal level. For example, the optimal level for most keyboards is between 80% and 100% of maximum volume.
5. On the front of the Mbox, carefully turn the Gain control to the right to increase the input level of your keyboard.

Recording a Pro Tools Session

Recording with Pro Tools and the Mbox involves creating a Pro Tools session, preparing an audio track for recording, and recording.

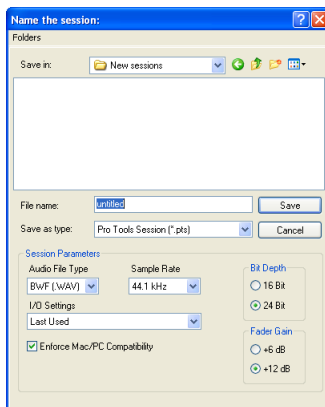
To create a session in Pro Tools:

1. Verify the connections between the Mbox and your instrument or microphone.
2. Launch Pro Tools.
3. Choose File > New Session.

- Set Session Parameters in the New Session dialog box as needed, or leave them at their default settings.



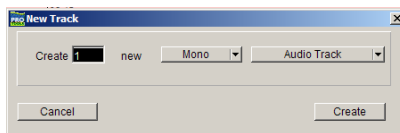
For details on New Session settings, see the Pro Tools Reference Guide.



- Select where you want to save your session.
- Type a name for your session.
- Click Save. Pro Tools creates a new session.

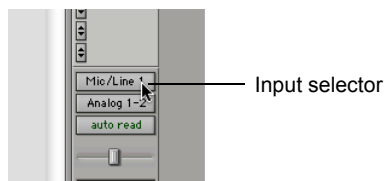
To prepare an audio track for recording:

- Create a new track to record on by choosing File > New Track.
- Specify 1 Mono Audio Track if your source is mono, or 1 Stereo Audio Track is your source is stereo, and click Create.

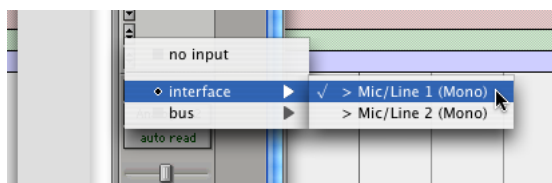


A mono instrument uses one input on the Mbox, and a stereo instrument uses two. Creating a stereo track in Pro Tools will not make a mono instrument into a stereo instrument. If a mono instrument is recorded on a stereo track, one of the sides of the stereo track will show no signal.

3. Make certain the Mix window is open by choosing Windows > Show Mix.
4. In the Mix window, click the Input Selector on the new track.



5. From the pop-up menu, select the interface input you want to record. For example, select Mic/Line 1 if your audio source is plugged into the Source 1 jack on the back of the Mbox.



6. Use the Gain controls on Mbox to maximize the signal going into Pro Tools while avoiding clipping.

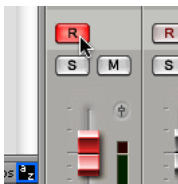


Clipping occurs when you feed a signal to an audio device that is louder than the circuitry can accept. To avoid clipping, adjust the Gain control to a level where the Peak LEDs on the front of the Mbox flicker occasionally.

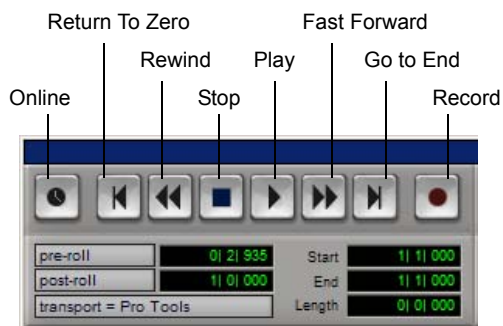
7. On the front of the Mbox, turn the Mix control fully left to Input (to hear only the input signal). Or, to hear an equal mix of playback and input signals, turn the Mix control to the center. See [“Controlling Delay \(Latency\) During Monitoring” on page 113](#) for more information on using the Mix control during recording.

To record an audio track:

1. Click the Record Enable button for the track.



2. Choose Windows > Show Transport to display the Transport window. Click Return To Zero to cue to the beginning of the session.



3. Click Record in the Transport window to arm Pro Tools for recording. The Record button will flash red to indicate that Pro Tools is ready to record.
4. When you are ready to start recording, click Play or press the Spacebar.
5. Record your performance.
6. Click Stop in the Transport window or press the Spacebar when you are finished recording.

To play back a recorded track:

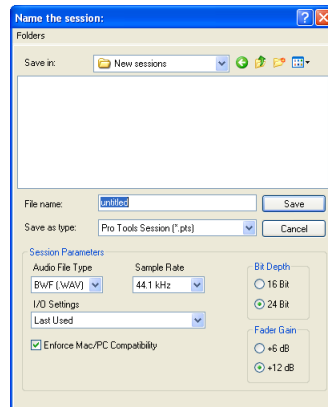
1. If the track's Record Enable button is lit, click on it to take it out of Record mode.
2. On the front of the Mbox, turn the Mix control fully right to Playback (to hear only playback signal). To hear an equal mix of playback and input signals, turn the Mix control to the center. See [“Controlling Delay \(Latency\) During Monitoring” on page 113](#) for more information on using the Mix control during recording.

3. Click Play in the Transport window or press the Spacebar to start playback.
4. Click Stop in the Transport window or press the Spacebar to stop playback.

Importing Audio from a CD

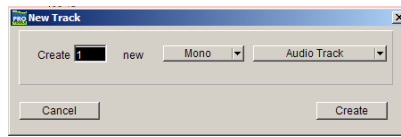
To import audio from a compact disc:

1. Put the source CD into your computer's CD drive.
2. Use a third party software program of your choice to extract audio from the CD.
3. Launch Pro Tools.
4. Choose File > New Session.
5. Set Session Parameters in the New Session dialog box as needed, or leave at their default settings.

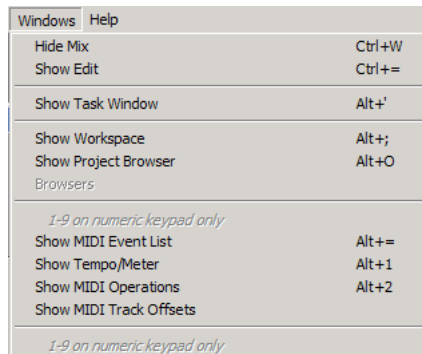


6. Select where you want to save your session.
7. Type a name for your session and click Save. Pro Tools creates a new session.

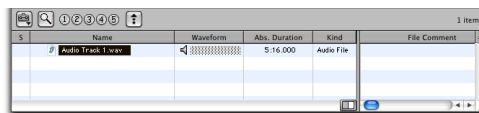
8. In the session, create a new track by choosing File > New Track.



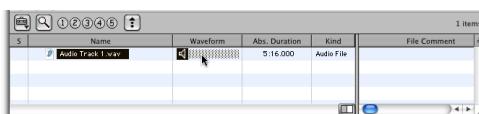
9. In the New Track dialog box, specify 1 Stereo Audio Track, and click Create.
10. Open the Workspace Browser by choosing Windows > Show Workspace. The Workspace Browser is a window where you can find, audition, and manage your audio files.



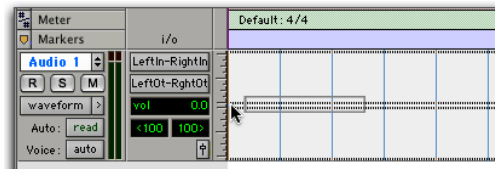
11. In the Workspace Browser, navigate to the location where you saved the audio you extracted from your CD in step 2.



12. You can audition the audio file by clicking on the speaker icon in the waveform window.



13. Drag the audio file from the Workspace Browser to the audio track you created in your session.



To play back the new track:

1. In the Transport window, click Return To Zero to cue the beginning of the track.
2. On the front of the Mbox, turn the Mix control fully right to Playback.
3. Click Play in the Transport window to begin playback. The CD track you extracted should begin playing back.

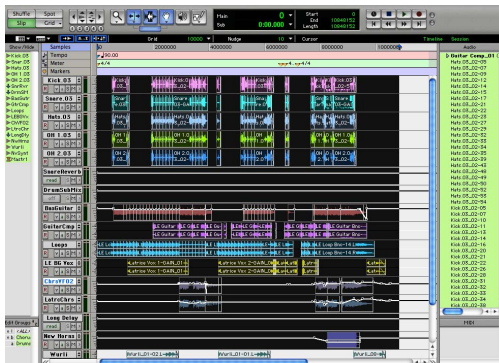
Creating an Audio CD from a Pro Tools Session

Pro Tools does not create audio CDs directly, but you can create stereo audio files from your Pro Tools sessions that can be used by most common CD-burning programs.

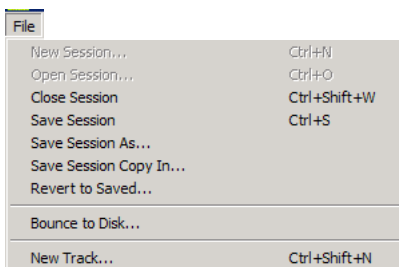
Use the Pro Tools Bounce to Disk feature to combine all your audible tracks into a single “master” audio file. After the new audio file has been bounced to disk, you can burn it to a CD.

To use the Bouncing Audio to Disk feature:

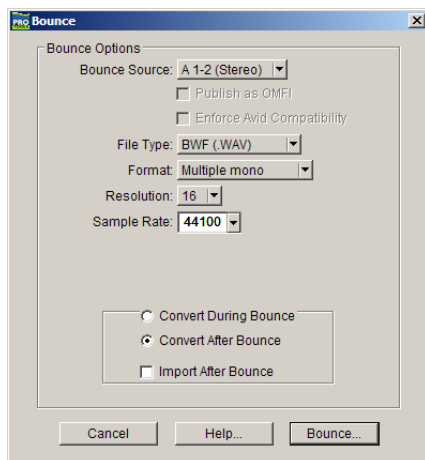
1. After you have finished recording and mixing a session in Pro Tools, highlight the length of the session in the timeline ruler, plus an additional amount of time to avoid cutting off any reverb tails that might continue past the end of the region.



2. Choose File > Bounce to Disk.



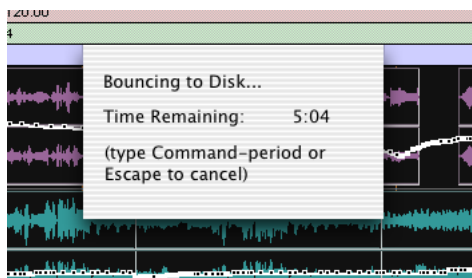
3. In the Bounce Options dialog box, choose Analog Outputs 1–2 as the Bounce Source.
4. Choose BWF (.WAV) for the File Type.
5. Choose Stereo Interleaved for the Format.
6. Choose 16 for the Resolution and 44100 for the Sample Rate.
7. Choose “Convert after Bounce,” and click Bounce.



8. In the Bounce dialog box, give the bounce tracks a name and choose where they should be saved.

9. Click Save.

Pro Tools will begin bouncing to disk. Pro Tools bounces are done in real time, so you hear audio playback of your mix during the bounce process (though you cannot adjust it).



Burning a CD

After the bounce is completed, you will have an audio file that is ready for burning onto a CD. Quit Pro Tools and start any common third-party CD burning application to burn your bounced mix to CD.



Make certain that you configure your CD burning application to create an audio CD rather than a data CD.

Controlling Delay (Latency) During Monitoring

Mbox and Pro Tools LE use your computer for all audio processing, playback, and recording. This causes a small amount of audio delay, or latency.

Latency is most obvious when monitoring during recording. It takes time for the computer to convert an analog input signal to a digital signal and back to an analog output signal. You hear this as a slight delay between when you produce the sound and when you hear the sound through the speakers or headphones.

Mbox gives you the ability to monitor your analog input signals while recording, without hearing any latency. This zero-latency analog monitoring is controlled by the Mbox front panel Mix control, which you can use to blend and adjust the ratio between the Mbox analog input and Pro Tools playback.

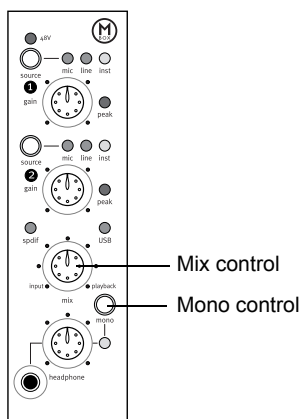
To use zero latency monitoring while recording:

1. Launch Pro Tools and set up a session. See “Recording a Pro Tools Session” on page 104.
2. Mute the track you are recording on. This prevents you from hearing the delayed signal coming back from Pro Tools through the Mbox.



3. Use the Mix control on the front of the Mbox to blend the playback tracks with the analog tracks that you are recording.
4. If the audio signal that you are recording is mono, press the “Mono” button on the front of the Mbox to bring the sound from one side of the stereo field to both sides.

Mix and Mono Controls on Mbox Front Panel



The Mix control has no effect when you are using S/PDIF digital inputs.

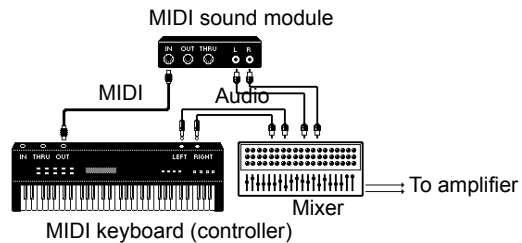
Mbox and MIDI

What is MIDI?

MIDI (Musical Instrument Digital Interface) is not audio, and has no sound. MIDI is a way for musical devices to communicate. MIDI is data that can trigger a MIDI device (such as a keyboard or software synthesizer.)

In order to create or play a MIDI recording, you must have a MIDI keyboard or sound module (real or virtual) connected to the computer through a MIDI interface. Audio from your MIDI instrument can be sent to an external mixer or monitored through the Mbox.

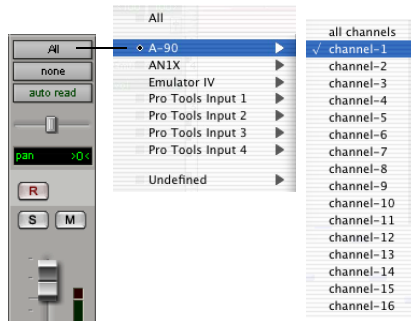
Signal Paths for MIDI Instruments



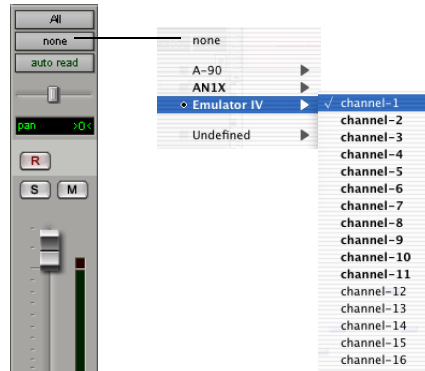
For more information on monitoring through the Mbox, see [“Monitoring MIDI Instruments Without a Mixer”](#) on page 117.

To configure a MIDI track for recording:

1. Choose File > New Track and specify 1 MIDI Track, then click Create.
2. In the Mix window, click the track’s MIDI Input Selector and assign the device and channel that will be recorded.



3. In the Mix window, click on the track's MIDI Device/Channel Selector and choose the destination (assignment) for that MIDI track by choosing a MIDI interface port, a channel, or a device from the pop-up menu (choices vary depending on the operating system and Pro Tools version).



4. In the Mix Window, record-enable the MIDI track.
5. Make sure MIDI > MIDI Thru is selected, then play some notes on your MIDI controller. The MIDI instrument assigned to the track should sound, and the track's meters move. Remember, MIDI is not audio, and the meters are not registering sound, but MIDI activity.

To record a MIDI track:

1. Verify that the MIDI track you want to record to is record-enabled and receiving MIDI.
2. In the Transport window, click Return To Zero to start recording from the beginning of the session. You can also record according to a selection or from the cursor location in the Edit window.
3. Click Record in the Transport window.
4. Click Play in the Transport window or press the Spacebar to begin recording.
5. Play your MIDI instrument.
6. When you have finished recording, click Stop in the Transport window, or press the Spacebar. The newly recorded MIDI data appears as a MIDI region on the track in the Edit window, as well as in the MIDI Regions List.

To play back a recorded MIDI track:

1. Click the Record Enable button to take the MIDI track out of Record mode.
2. In the Transport window, click Return To Zero to play back from the beginning of the track.
3. Click Play in the Transport window to begin playback. The recorded MIDI data plays back through the track's assigned instrument and channel.

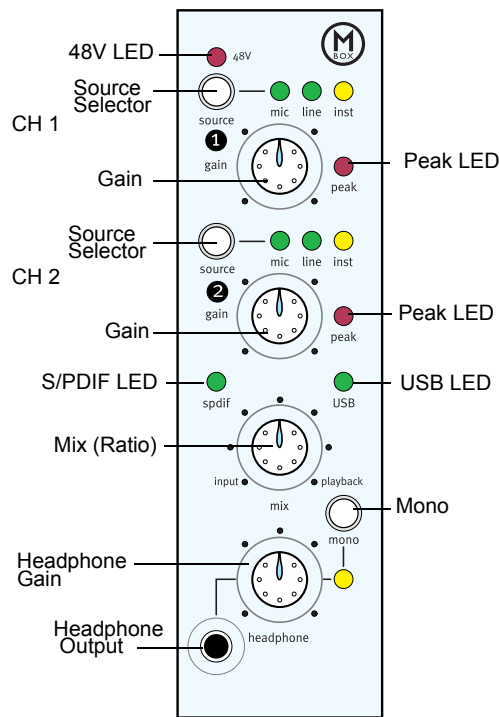
Monitoring MIDI Instruments Without a Mixer

To monitor your MIDI instrument's analog output in Pro Tools, you can use an Auxiliary Input. Auxiliary Inputs function as inputs for both internally bussed signals and external audio sources.

To configure an Auxiliary Input for MIDI monitoring:

1. Connect the MIDI instrument's audio output to the appropriate inputs on your Mbox.
2. Choose File > New Track and specify 1 mono or stereo Auxiliary Input, then click Create.
3. Click the Input selector of the Auxiliary Input channel and choose the input to which your MIDI instrument is connected to the Mbox.
4. Adjust the level of the Auxiliary Input with its volume fader. Now you will hear the audio output of your MIDI device in Pro Tools.

Mbox Front Panel Features



The Mbox front panel has the following features:

48V LED

This LED, when lit, indicates that 48V phantom power is active on the Mic/Line inputs. These inputs provide phantom power for microphones that require it to operate. Phantom power is activated by the switch labeled 48V on the top of the back panel of Mbox.



Enabling phantom power enables 48V through both mic inputs.

Dynamic microphones (such as a Shure SM57) do not require phantom power to operate, but are not harmed by it. Most *condenser* microphones (like an AKG C3000) *do* require phantom power to operate.



Although phantom power can be used safely with most microphones, it is possible to damage some ribbon microphones with it. Always turn off phantom power and wait at least ten seconds before connecting or disconnecting a ribbon microphone.

If you are not sure about the phantom power requirements for your microphone, consult your microphone's documentation or contact the manufacturer.

Source Selector

These switches select among three types of inputs:

- Mic (microphone) for XLR inputs
- Line for line level signals on TRS or TS inputs
- Inst (instrument) for other 1/4-inch TRS or TS connections

For more information, see [“Getting Sound In and Out of your Mbox” on page 94](#).

Gain Controls

These knobs adjust the input gain levels of the Mic/Line inputs.

Peak LEDs

These LEDs are triggered just below analog clipping levels. In other words, if the Peak LEDs flicker occasionally, the signal is *approaching* clipping levels, but they do not necessarily indicate distortion or clipping.

USB LED

The USB LED indicates that the Mbox has received power from its USB connection. Once the USB light is on, audio can pass in or out of the system.

S/PDIF LED

This LED indicates that channels 1 and 2 are set to receive digital input rather than analog input. See “S/PDIF Digital I/O” on page 123.

Mix (Ratio) Control

Mbox gives you the ability to monitor your analog input signals while recording, without the delay incurred by A/D/A converters and host-based processing.

This zero-latency analog monitoring is controlled with the Mix knob, which you can use to blend and adjust the monitor ratio between Mbox analog inputs and Pro Tools playback. The Mix knob has no effect when you are using S/PDIF digital inputs, since it controls the signal before it reaches the A/D converters.

To listen to just the Source input signal, turn the Mix knob fully left to Input. To listen to Pro Tools output only, turn the knob fully right to Playback.

The output from the Mix control is routed directly to the TRS line outputs, and is mirrored in the Headphone ports and S/PDIF output ports.

This ability to blend and control the relative levels of Pro Tools playback and latency-free live analog inputs can be particularly effective when overdubbing.

Mono Switch

The Mono switch sums the stereo signal to a mono signal (delivering that identical signal to both speakers). This has no effect on Pro Tools playback monitoring or on the main outputs. Switching your stereo signal to mono is useful when you are recording a mono input while listening to stereo playback, or for checking the phase relationship of stereo inputs.

Monitoring while Overdubbing

By panning signals to the center, or using the Mono switch, as opposed to panning them hard left and right in the Headphone outputs, you can create a more focused monitor mix to help minimize distractions while overdubbing.

In situations where you are monitoring stereo microphones, stereo synthesizers, or any source pairs with a comfortable balance, you will probably not want to use the Mono switch.

Checking Phase Relationships

The Mono switch can also be used for a quick check of the phase relationship between Channel 1 and Channel 2 inputs.

When the two input signals are out of phase, pressing the Mono switch will result in a sudden “hollow” sound that is the result of phase cancellation. This quick test with the Mono switch can help to avoid phase problems later when mixing these tracks. Frequent checking of phase relationships with the Mono switch can also assist you in finding the optimal microphone placement.

Headphone Gain

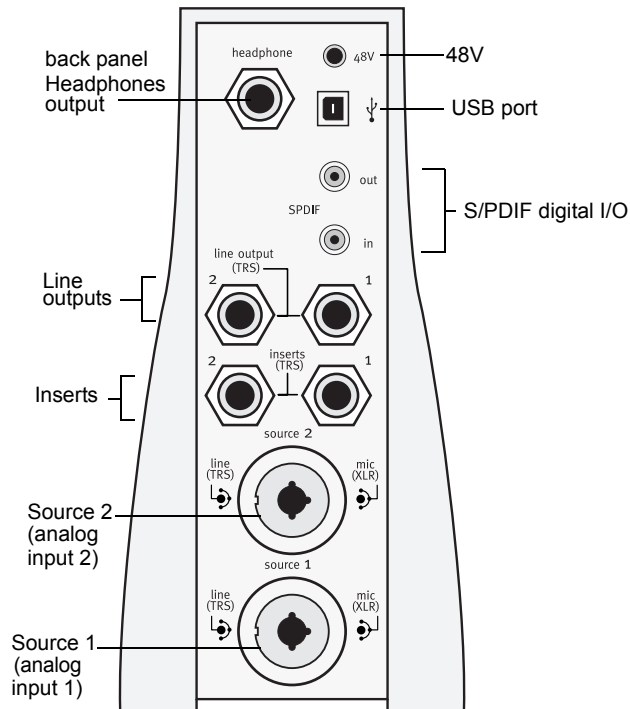
The headphone gain control adjusts the output level of the front and back Headphone ports, which output the signal that is routed to Outputs 1–2 in Pro Tools LE, and mirrors the Line Outputs.

Front Panel Headphone Output

Use the front panel Headphone port to connect stereo headphones with a 1/8-inch stereo mini connector.

The front panel 1/8-inch Headphone port is disabled when a 1/4-inch stereo connector is inserted into the back panel Headphone port.

Mbox Back Panel Features



The Mbox back panel has the following features:

Back Panel Headphone Output

Use this Headphone Output to connect stereo headphones with a 1/4-inch stereo connector.

When a 1/4-inch stereo connector is inserted into the back panel Headphone port, the front panel 1/8-inch Headphone port is disabled.

48V Switch

This button activates phantom power on the Mic inputs for microphones that require it to operate.



Be sure to check the 48V LED on the front panel of Mbox before plugging in any microphones. The 48V switch on the back is located directly above the USB connector and may be inadvertently activated when connecting the USB Cable.

USB Port

This standard USB v1.1 connector is used to connect your computer to the Mbox. One standard USB cable is included with your system.

The Mbox is compatible with USB 2.0 ports. However, the USB 2.0 bus will switch to the slower USB v.1.1 speed to accommodate Mbox.

S/PDIF Digital I/O

Mbox provides digital inputs and outputs for connecting devices that support S/PDIF (Sony/Philips Digital Interchange Format) audio. The Sony/Philips Digital Interface Format (S/PDIF) is used in many professional and consumer CD recorders and DAT recorders.

The S/PDIF in and out ports are unbalanced two-conductor phono (RCA) connectors that utilize a full 24-bit, two-channel digital data stream. To avoid RF interference, use 75-ohm coaxial cable for S/PDIF transfers and keep the cable length to a maximum of 10 meters.

If you have a CD recorder, DAT deck or other device that accepts S/PDIF connections, connect it to the S/PDIF In and S/PDIF Out RCA ports on the back of Digi 002.



When recording from Pro Tools to a digital device, make sure Pro Tools is in Internal clock mode.



To configure Mbox to record from a digital source, choose Setups > Hardware Setup in Pro Tools, then select S/PDIF in the Clock Source and Ch 1-2 Input pop-up menus.

S/PDIF Mirroring

Pro Tools LE uses S/PDIF mirroring to automatically “mirror” the audio that is sent to Line Outputs 1 and 2 on the S/PDIF RCA outputs. This is useful, for example, if you are monitoring a mix using your Line Outputs, and also recording the same source to an external S/PDIF device.

Line Outputs

These outputs support balanced TRS, or unbalanced TS, 1/4-inch connections. To monitor your mix, these outputs can be connected to a mixing board, directly to a monitoring system such as a stereo power amp, or another stereo destination.

The Line Outputs 1 and 2 play the audio that is routed to analog outputs 1 and 2 from within Pro Tools, respectively. These analog outputs feature 24-bit digital-to-analog converters, capable of maximum output of +4 dBu/+2 dBV (balanced/unbalanced signal).



Home stereo systems often use RCA connectors. You can use an adaptor or a special cable to convert from the TRS or TS connectors used by Mbox to the RCA connectors on your home stereo.

Source 1 and 2

These balanced/unbalanced analog audio inputs support a broad range of input levels, including microphone, instrument, or line-level inputs. The ports accept XLR, TRS, or TS audio input connectors. The input signal is adjusted by the Gain control for each channel, in conjunction with the Source switch.

Of these sources, microphones and magnetic pickup instruments output the quietest signals, and generally require the most amplification. Keyboards, preamps, and mixers output “line-level” audio, which varies with each device between the –10 dBV and +4 dBu standards.



The XLR connectors only support microphone level inputs. If Line or Inst are chosen, the XLR portion of the port is ignored. Likewise, if you choose Mic, the 1/4-inch part of the connector is ignored.

Inserts 1 and 2

Mbox provides an insert point on each input channel. These hardware inserts break the analog input path before it is converted to a digital signal and sent to Pro Tools. This is where you can insert analog processors (such as compressors or equalizers), which are typically used as inserts on traditional analog recording consoles.



Do not plug instruments, speakers, or headphones into the 1/4-inch jacks labelled “Inserts.” These are not inputs. They are special connectors for using an external effects processor such as a compressor or EQ.



Because the inserts on Mbox are hardware inserts that divert the signal path before it reaches Pro Tools, they are not available as hardware inserts within Pro Tools. (For more information, see the Pro Tools Reference Guide.)

To insert a device you will need a TRS Insert cable that has a TRS connector on one end, breaking out to two unbalanced (T/S) Y-connectors. The connector attached to the tip is the send, and the connector attached to the ring is the return.

To insert a device in the signal path:

1. You will need a cable that breaks a TRS connector on one end out to two unbalanced connectors. The type of unbalanced connector is determined by the inputs of the device.
2. Locate the unbalanced connectors and determine which corresponds to tip, and which to ring.
3. Connect the unbalanced connector that corresponds to tip to the input port of the device.
4. Connect the unbalanced connector that corresponds to ring to the output port of the device.
5. Insert the TRS connector into an insert port on Mbox.

Chapter 3

Configuring Your System for Avid Pro Tools LE

Configuring your computer system for Avid Pro Tools LE software and hardware includes the following steps:

1. Test the Digi 002 unit. (See [“Testing Digi 002” on page 128.](#))
2. Configure Windows System Software settings. (See [“Windows System Settings” on page 129.](#))
3. Connect the Digi 002 or Mbox unit to your computer.



When connecting Digi 002 or Mbox to your computer the first time, your computer should be off. If your computer is on, turn it off.

4. Install Pro Tools LE Software. (See the *Avid Xpress Studio Installation Instructions*.)
5. Install additional required and optional software. (See [“Installing Additional Software for Avid Pro Tools LE” on page 132.](#))
6. Configure (and maintain) your hard drives. (See [“Hard Drive Configuration and Maintenance” on page 136.](#))
7. Configure your Pro Tools system. (See [“Configuring Avid Pro Tools LE” on page 140.](#))
8. Make audio and MIDI connections to the Digi 002. (See the *Avid Xpress Studio Installation Instructions*.)

Testing Digi 002

You can test Digi 002 before you install Pro Tools LE software or connect Digi 002 to your computer for the first time.



When connecting Digi 002 to your computer the first time, your computer should be off. If your computer is on, turn it off.

To set up and test the Digi 002:

1. Plug the Digi 002 into a standard AC receptacle, using the AC power cable included with the unit.
Digi 002 is auto power-selecting (100V to 240V) and will work automatically when plugged into an AC power receptacle in any country.
2. Turn on the Digi 002 unit by turning on the power switch on the back panel. After a short power-up sequence, the Channel Scribble Strips on the unit show “Digi 002 Standby,” and the Standalone switch flashes to indicate Standby mode.
3. Press the Standalone switch in the upper right of the top panel of Digi 002. The Channel Scribble Strips on the unit will show “Enter Standalone Mode?”
4. Press the Channel Select switch under “Yes” to enter Stand-alone mode. The Channel Scribble Strips on the unit will show the default names of the channel inputs, “In1” through “In8.”
5. To return Digi 002 to Standby mode, press the Standalone switch again. The Channel Scribble Strips on the unit will show “Exit Standalone Mode?”
6. Press the Channel Select switch under “Yes” to return to Standby mode.

Windows System Settings

Configure your Windows system settings, as follows:

Required Settings - These instructions must be followed before installing Pro Tools.

Recommended Configuration - These instructions should be followed to optimize your system's capabilities, or to let older computers run Pro Tools LE.



If problems occur after configuring all required settings, see “[Windows System Optimizations](#)” on page 251 for information on troubleshooting and configuring advanced settings.

Required Settings

To ensure optimum performance with Pro Tools LE, configure the following Control Panel settings for your version of Windows XP.

Disable Hyper-Threading

For Pentium IV computers with Hyper-Threading, disable Hyper-Threading in the BIOS.

Enable DMA

Enabling your computer's DMA (Direct Memory Access) frees up CPU bandwidth so your computer can do other Pro Tools tasks.

In most cases the DMA option will already be set correctly, as Windows XP detects and activates DMA mode by default.

To enable DMA for any IDE hard drives:

1. Choose Start > Control Panel.
2. Launch System.
3. Click the Hardware tab.
4. Under Device Manager, choose Device Manager.

5. In the Device Manager window, double-click IDE ATA/ATAPI controllers, then double-click the Primary IDE Channel for your IDE hard drive.
6. Click the Advanced Settings tab.
7. For each device, set the Transfer Mode to “DMA if available,” and click OK.

In most cases, this will already be set correctly as Windows XP will detect and activate DMA mode by default.

8. Repeat steps 5–7 for any additional IDE Channels.
9. Close the Computer Management window.

Disable System Standby and Power Management

When using Pro Tools, the Windows System Standby power scheme must be set to Always On. This helps prevent long record or playback passes from stopping due to system resources powering down.

To configure Windows Power Management:

1. Choose Start > Control Panel.
2. Launch Power Options.
3. Click the Power Schemes tab.
4. From the Power Schemes pop-up menu, select Always On.
5. Click OK.

This sets System Standby, System Hibernate, and “Turn off hard disks” to Never.

Disable ClearType Font Smoothing

When using Pro Tools, the Effects “Clear Type” setting must be disabled.

To disable ClearType font smoothing:

1. Choose Start > Control Panel.
2. Launch Display.
3. Click the Appearance tab.
4. Click Effects.
5. Deselect “Use the following methods to smooth edges of screen fonts.”

6. Click OK to save your settings and close the Effects dialog box.
7. Click OK.

Disable Disk Indexing for Audio and Video Drives

When using Pro Tools, Disk Indexing must be disabled for audio and video drives.

To disable Disk Indexing:

1. Choose Start > My Computer.
2. Right-click on one of your audio or video drives and choose Properties.
3. Deselect “Allow Indexing Service to index this disk for fast file searching.”
4. Click OK.
5. Repeat the above steps for other audio and video drives.

Disable nVidia Services

When using Pro Tools, the nVidia Services option must be disabled.

To disable nVidia Services:

1. Choose Start > Control Panel.
2. Launch Administrative Tools.
3. Launch Services.
4. Double-click on NVIDIA Driver Helper Service in the Name list.
5. From the Startup type pop-up menu, select Disabled.
6. Click OK.

Completing Required Windows System Settings

When finished updating required Windows system settings, restart your computer.

Recommended Configuration

Pro Tools LE can also be affected by other software and hardware drivers installed on your computer. For best possible performance, it is recommended (but not required) that you:

- Avoid running other Windows programs at the same time as Pro Tools LE.
- Turn off any software utilities that run in the background, such as Windows Messenger, calendars, and disk maintenance programs.
- Disable screen savers and sleep mode.
- Turn off any non-essential USB devices while using Digi 002.
- If your video display card supports it, enable Bus Mastering in the manufacturer's Control Panel.
- Disable any networking cards (other than any 1394 "FireWire" card that you might use to connect an external device to your system).

For information on disabling networking cards, see ["Disabling Network Cards" on page 252](#).

Installing Additional Software for Avid Pro Tools LE

Your Avid Xpress Studio application DVD includes several software options (as available for your system). In addition, some third-party software may be required for your setup.

QuickTime

QuickTime 6.5 or later is required for Pro Tools LE if you plan to include movie files in your sessions. QuickTime is available as a free download from the Apple Web site (www.apple.com).

Digidesign ASIO Driver

The Digidesign ASIO (Audio Sound Input Output) Driver is a multichannel, multimedia sound driver that lets third-party audio applications record and play back through channels 1–2 of an Mbox or Digi 002. With Xpress Pro Complete, the Digi 002 provides eight channels of audio I/O. With Avid Xpress Pro Essentials, the Mbox provides two channels of audio I/O.

The Digidesign ASIO Driver is required if you want to use your Mbox or Digi 002 with Avid Xpress Pro for audio I/O. This driver option is automatically installed when you install Pro Tools. For information on installing, using, and removing the Digidesign ASIO Driver, see [“Digidesign ASIO Driver” on page 254](#).



Mbox cannot be used as an audio I/O for Avid Xpress Pro if an Avid Mojo is attached to the computer. Mbox and Avid Mojo cannot currently be used on the same system.

Digidesign WaveDriver

The Digidesign WaveDriver is a single-client, multichannel sound driver that lets third-party audio applications play back through channels 1–2 of an Mbox or Digi 002. The Digidesign WaveDriver is not required to use Pro Tools LE with Mbox or Digi 002.

The Digidesign WaveDriver option is automatically installed when you install Pro Tools. For information on installing, using, and removing the Digidesign ASIO Driver, see [“Digidesign WaveDriver” on page 257](#).

Installing the Demo Session

The Avid Xpress Studio application DVD includes a demo session that you can use to verify that your system is working.

Before installing the demo session to your audio drive, make sure the drive is configured as described in [“Formatting an Audio Drive” on page 137](#).

To install the demo session:

1. Insert the Avid Xpress Studio application DVD in your CD-ROM drive.
2. Locate and double-click the Pro Tools LE Demo Setup.exe file in the Pro Tools LE Demo Session Installer folder, located at D (CD-ROM drive):\Goodies_PTLE\Additional Files. Follow the on-screen instructions to install the demo session. After installation is complete, restart your computer.
3. Set the install location to your audio drive and click Install.
4. When installation is complete, click OK.

MacOpener

MacOpener 6.0.5 and higher lets you mount HFS/HFS+ drives on a Windows-based Pro Tools system, as a Transfer drive.



Transfer drives can be used for storage, but not for playback or recording.



The MacDrive utility can be used instead of MacOpener. Refer to the MacDrive Web site (www.macdrive.com).

To share Pro Tools sessions between Macintosh and Windows systems, select the “Enforce Mac/PC Compatibility” option when creating the session, or when saving a session copy to a Windows audio drive formatted using NTFS or FAT32.



Avoid using MacOpener on HFS-formatted drives. It is recommended that you use MacOpener on NTFS or FAT32 drives instead. To move material from HFS-formatted drives to NTFS or FAT32 drives, use the Save Session Copy In command in Pro Tools.



While SDII files can be exported or converted on import, they cannot be used within Pro Tools sessions on Windows.

To install and configure the MacOpener demo included with Pro Tools:

1. Insert the Avid Xpress Studio application DVD into your CD-ROM drive.
2. Locate and double-click the MacOpener installer file in the MacOpener Demo Installer folder, located at D (CD-ROM drive):\Goodies_PTLE\Additional Files. Follow the on-screen instructions to install the MacOpener demo. After installation is complete, restart your computer.
3. Choose Start > Programs > MacOpener > MacOpener Driver Preferences.
4. Verify that the MacOpener Driver is enabled. Under Driver Settings, select “Enable MacOpener Driver.”
5. Under Extension Mapping, select “Do not add the PC extension to the Mac file name.”
6. Click OK to quit the MacOpener Driver Preferences.
7. Choose Start > Programs > MacOpener > Mac Lic.exe. When installation is complete, close the installer.

All formatting and maintenance of HFS/HFS+ drives should be carried out when the drive is connected to a Macintosh.



For more information about MacOpener and its performance limitations, see the Pro Tools Reference Guide.

Starting Pro Tools LE

When starting Pro Tools LE the first time, you are prompted to enter an authorization code to validate your software.



The authorization code is located on the inside cover of the Avid Xpress Studio application DVD.

To authorize Pro Tools LE software:

1. Double-click the Pro Tools LE shortcut on your desktop (or the application in the Pro Tools folder inside the Digidesign folder).



If you get a warning dialog box about updating the Digi 002 firmware, follow the on-screen instructions to perform the firmware update. See “Updating Digi 002 Firmware” on page 136.

2. Enter the authorization code in the dialog box (making sure to type it exactly as printed, and observing any spaces and capitalization), then click Validate.

Updating Digi 002 Firmware

When you start Pro Tools software, it automatically checks the version of the unit's firmware, and prompts you to update it if a newer version is available.

If you update your unit's firmware, let the update complete before disconnecting or turning off your system.

When the download and reprogramming process is complete, you might get a message that Pro Tools cannot communicate with Digi 002. In this case, wait up to 30 seconds. If the message does not go away, disconnect then reconnect Digi 002 and click OK.

Hard Drive Configuration and Maintenance

For local storage, audio and video record and playback are supported with SCSI drives.



For a list of Digidesign-qualified hard drives, refer to the latest compatibility information on the Digidesign Web site (www.digidesign.com/compato).



Pro Tools requires separate drives for audio and video.

SCSI Drive Requirements

For SCSI Drive usage, Avid Pro Tools LE requires separate SCSI drives for audio and video. A Digidesign-qualified dual-channel SCSI HBA (such as the Digidesign SCSI128 or ATTO UL3D) is required, unless your computer has built-in dual channel SCSI that has been qualified by Digidesign (such as the HP xw8000). The audio drives and the video drives should each be connected to separate SCSI channels.

Striped SCSI drives are supported for video. You can play any resolution of compressed video from a single SCSI drive, but if you want to play uncompressed video, you need at least two SCSI drives in a striped set.



For the most current storage requirements and compatibility information, see the Digidesign Web site at (www.digidesign.com/compato).

Formatting an Audio Drive

On Windows, it is recommended that you start with newly formatted drives dedicated for audio. For optimum performance, audio drives should be formatted with the FAT32 or NTFS file system.

To format and configure an audio drive:

1. Right-click My Computer and choose Manage.
2. Under Storage, choose Disk Management.
3. In the Disk Management window, right-click the hard drive you will use for audio and choose Format.
4. For optimal disk performance, select 32K from the Allocation unit size pull-down. This increases how efficiently audio data is written to and read from the drive.
5. Make sure the Quick Format option is deselected, then click Start, and follow the on-screen instructions.



Pro Tools only supports Basic drive types for audio. Dynamic drives (such as striped drives) are not supported for audio.

6. When formatting is complete, close the Format window.

Audio Drives and Disk Cleanup

The process of recording, editing, and deleting tracks and sessions can quickly decrease overall drive performance. It is suggested that you regularly use Disk Cleanup (or an equivalent utility) to assess the condition of drives and, if necessary, delete temporary files and other unused data.

To use Disk Cleanup:

1. Choose Start > Control Panel.
2. Launch Administrative Tools.
3. Double-click Computer Management.
4. Double-click Storage.
5. Double-click Disk Management.
6. Select the desired volume in the list, then choose File > Options.

Disk Cleanup determines how performance is being affected by drive condition, and lets you review and delete temporary and other unnecessary files from the selected volume. For more information on using Disk Cleanup, see your Windows XP documentation.

Defragmenting an Audio Drive

Periodically *defragment* audio drives to maintain system performance.

To defragment an audio drive:

1. Right-click My Computer and choose Manage.
2. Under Storage, choose Disk Defragmenter.
3. In the Disk Defragmenter window, choose the drive you want to defragment
4. Click the Defragment button and follow the on-screen instructions.
5. When defragmenting is complete, close the Computer Management Window.

Avoid Recording to System Drives

Although Pro Tools will let you record to your system drive, this is generally not recommended. Recording and playback on system hard drives results in lower track counts and fewer plug-ins. You should record to system drives only when necessary (for example, if your computer system has just one hard drive).

Improving External Drive Performance

For better performance when working with larger sessions, turn off Windows drive indexing.

To turn off drive indexing for external audio and video drives:

1. Choose Start > My Computer.
2. Control-click each external audio or video drive.
3. Right-click on the selected external drives and choose Properties.
4. In the Properties dialog box, uncheck “Allow Indexing Service to index this disk for fast file searching.”

Hard Disk Storage Space

Mono audio tracks recorded with 16-bit resolution at 44.1 kHz (CD-quality) require approximately 5 MB of hard disk space per minute.

The same tracks recorded with 24-bit resolution require about 7.5 MB per minute. Recording at higher sample rates (88.2 kHz or 96 kHz) requires about twice the hard disk space.

The following figure lists the required disk space for certain track numbers and track lengths, to help you estimate your hard disk usage.

Required hard drive space for audio tracks

Number of tracks and length	16-bit at 44.1 kHz	16-bit at 48 kHz	24-bit at 44.1 kHz	24-bit at 48 kHz	16-bit at 88.2 kHz (Digi 002 Only)	16-bit at 96 kHz (Digi 002 Only)	24-bit at 88.2 kHz (Digi 002 Only)	24-bit at 96 kHz (Digi 002 Only)
1 mono track 1 minute	5 MB	5.5 MB	7.5 MB	8.2 MB	10 MB	11 MB	15 MB	16.4 MB
1 stereo track 5 minutes	50 MB	55 MB	75 MB	83 MB	100 MB	110 MB	150 MB	164 MB
1 stereo track 60 minutes	600 MB	662 MB	900 MB	991 MB	1.2 GB	1.3 GB	1.8 GB	2 GB
32 mono tracks 5 minutes	800 MB	883 MB	1.2 GB	1.4 GB	1.6 GB	1.8 GB	2.4 GB	2.8 GB
32 mono tracks 60 minutes	9.4 GB	10.4 GB	14 GB	15.5 GB	18.8 GB	20.8 GB	28 GB	31 GB

Configuring Avid Pro Tools LE

Pro Tools System Settings

Pro Tools LE lets you adjust the performance of your system by changing *system settings* that affect its capacity for processing, playback, and recording

In most cases, the default settings for your system provide optimum performance, but you might want to adjust them to accommodate large or processing-intensive Pro Tools sessions.

Hardware Buffer Size

The Hardware Buffer Size (H/W Buffer Size) controls the size of the hardware cache used to handle host processing tasks such as Real-Time AudioSuite (RTAS) plug-ins.

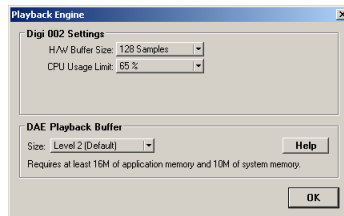
- Lower Hardware Buffer Size settings reduce monitoring latency, and are useful when you are recording live input.
- Higher Hardware Buffer Size settings allow for more audio processing and effects, and are useful when you are mixing and using more RTAS plug-ins.



In addition to causing slower screen response and monitoring latency, higher Hardware Buffer Size settings can affect the accuracy of plug-in automation, mute data, and timing for MIDI tracks.

To change the Hardware Buffer Size:

1. Choose Setups > Playback Engine.



2. From the H/W Buffer Size pop-up menu, select the audio buffer size, in samples.
3. Click OK.

CPU Usage Limit

The CPU Usage Limit controls the percentage of CPU resources allocated to Pro Tools host processing tasks such as Real-Time AudioSuite (RTAS) plug-ins.

- Lower CPU usage settings reduce how much Pro Tools processing affects other CPU-intensive tasks (such as screen redraws), and limit the amount of processor resources available for Pro Tools tasks. They are useful when you are experiencing slow system response, or when running other applications at the same time as Pro Tools.
- Higher CPU Usage Limit settings allocate more processing power to Pro Tools, and are useful for playing back large sessions or using more real-time plug-ins.



Increasing the CPU Usage Limit may slow down screen response on slower computers.

The maximum CPU Usage Limit is 85 percent for single-processor computers, and 99 percent for multi-processor computers. (The 99 percent setting dedicates one entire processor to Pro Tools.)

To change the CPU Usage Limit:

1. Choose Setups > Playback Engine.
2. From the CPU Usage Limit pop-up menu, select the percentage of CPU processing you want to allocate to Pro Tools.
3. Click OK.

DAE Playback Buffer Size

The DAE Playback Buffer Size determines the amount of memory DAE uses to manage disk buffers, which affects system performance.

- Lower DAE Playback Buffer Size settings can improve playback and recording initiation speed. However, a lower setting can make it difficult for slower hard drives to play or record tracks reliably.
- Higher DAE Playback Buffer Size settings can allow for a higher density of edits in a session. However, a higher setting can cause a time lag to occur before playback or recording begins. It can also cause a time lag to occur when you are editing during playback.

To change the DAE Playback Buffer Size:

1. Choose Setups > Playback Engine.
2. From the DAE Playback Buffer pop-up menu, select a buffer size.
3. Click OK.

Pro Tools Hardware Settings

Using the Hardware Setup dialog box, you can select the default sample rate and clock source for your system, and configure the clock source for your system.

Default Sample Rate

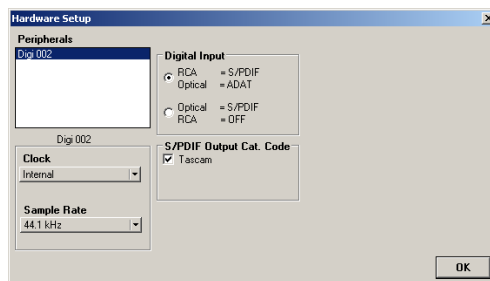
The Sample Rate setting appears as the default sample rate when you create a new session. (This setting is available in the Hardware Setup dialog box only when no session is open.)



You can change the sample rate when creating a new Pro Tools session by selecting a different sample rate in the New Session dialog box. (For details, refer to the Pro Tools Reference Guide.)

To change the default Sample Rate:

1. Make sure that no Pro Tools session is open.
2. Choose Setups > Hardware Setup.



3. Select the sample rate from the Sample Rate pop-up menu.



For the easiest interchange between Pro Tools and other Avid Xpress Studio applications, select 48 kHz.

4. Click OK.

Digital Input Source (Digi 002 Only)

Use the Pro Tools Hardware Setup dialog box to configure the digital inputs on Digi 002 to receive digital signals.

To configure Digi 002 for a digital source:

1. Connect an ADAT or Optical S/PDIF format device to the Optical In connector, or an RCA S/PDIF format device to the RCA S/PDIF In connector on the back of the Digi 002.
2. Choose Setups > Hardware Setup.
3. Select the correct digital input option for your setup. When you select RCA S/PDIF, the Optical ports are available for standard ADAT Optical (or “Lightpipe”) input. When you select Optical S/PDIF, the RCA digital input connector is inactive.



You can use only one pair of S/PDIF inputs (either RCA or Optical) at a time. For example, if you use the optical input for S/PDIF data, you cannot use the RCA inputs.

Channel 1–2 Input Source (Mbox Only)

Use the Pro Tools Hardware Setup dialog box to configure the two inputs on Mbox to receive analog or digital signals.

To select the Channel 1–2 input format for Mbox:

1. Choose Setups > Hardware Setup.
2. Choose the Channel 1–2 Input format by doing one of the following:
 - Choose Analog if you are sending a microphone, line, or instrument signal through the 1/4-inch TRS or XLR connectors on Mbox.
 - Choose S/PDIF if you are sending signal from a digital device to the S/PDIF input on Mbox.

Clock

Using the Hardware Setup dialog box, you can select the clock source for the system.

Internal - If you are recording an analog signal directly into Mbox or Digi 002, you will usually use the Pro Tools Internal clock source. The clock source automatically changes to Internal when you change the Ch. 1–2 Input to Analog.

S/PDIF, ADAT (Digi 002 only), and Optical (Digi 002 only) - If you are transferring material into Pro Tools from an external digital device, you will usually synchronize Pro Tools to that digital device. On Mbox, the clock source automatically changes to S/PDIF when you change the Ch. 1–2 Input to S/PDIF. On Digi 002, the clock source automatically changes to the digital format, when you change the Digital Input to that format.



Your digital input device must be connected and turned on for Pro Tools to synchronize to it. If your input device is not turned on, leave the Clock Source set to Internal.



With Avid Xpress Studio Complete, use the Digi 002 S/PDIF connector to resolve video reference (black burst) from the Avid Mojo, as described below.

To select the clock source:

1. Choose Setups > Hardware Setup.
2. Verify the Channel 1–2 Input Source (Mbox) or Digital Input (Digi 002) is correct.
3. Choose the clock source from the Clock Source pop-up menu.
4. Click OK.

To configure Digi 002 to resolve to video reference (black burst) from the Avid Mojo:

1. Make sure you have an Avid Mojo with a label over one of the audio outputs labelled CLK.
2. Make sure you have attached a single RCA connector from the CLK output on the Avid Mojo to the S/PDIF input on the Digi 002.
3. Launch Pro Tools.
4. Choose Setups > Hardware Setup.

5. Select RCA-S/PDIF as the digital input.
6. Choose S/PDIF as the clock source.
7. Click OK.

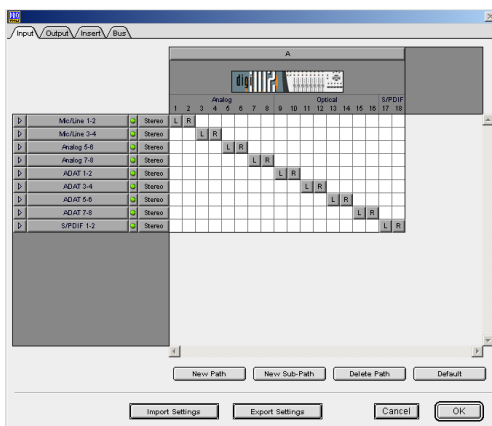
Configuring I/O Setup

Using the I/O Setup dialog box, you can label Pro Tools LE input, output, insert, and bus *signal paths*. The I/O Setup dialog box provides a graphical representation of the inputs, outputs, and signal routing of the Digi 002.

Pro Tools LE has default I/O Setup settings that will get you started. Use the I/O Setup dialog box only if you want to rename the default I/O paths.

To rename I/O paths in I/O Setup:

1. Choose Setups > I/O Setup.



2. Click the Input, Output, Insert, or Bus tab to display the corresponding connections.
3. To change the name of a path or subpath, double-click directly on the Path Name, type a new name for the path, and press Return.
4. Click OK.



For more information on renaming I/O paths, refer to the Pro Tools Reference Guide.



After configuring Pro Tools LE and your system, you should save an image of your system using Norton Ghost. Norton Ghost lets you save and recall known good configurations of your system and settings, which can help you recover if you encounter any problems in the future.

Chapter 4

Working with Pro Tools LE

This tutorial of Pro Tools LE software introduces its main windows and features, and also includes a step-by-step overview of audio recording (see [“Basic Recording” on page 168](#)).

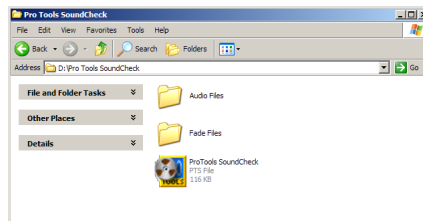
All features described in this chapter are explained fully in the *Pro Tools Reference Guide*.



You can view an electronic PDF version of the Reference Guide by choosing it from the Pro Tools menu, or choosing Start > All Programs > Avid > Digidesign > Documentation in Windows. The Reference Guide is also available on the Avid Xpress Studio Online Library DVD.

Session Basics

Pro Tools LE projects are created and saved as *sessions*. Sessions store all tracks, audio, MIDI, and other session information. Audio and fade files are stored in folders within the session folder.

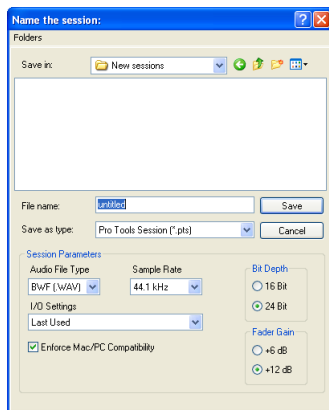


Pro Tools LE remembers audio interface configuration and other system settings and applies them to all new sessions.

Starting a Session

To create a new session:

1. Launch Pro Tools LE.
2. Choose File > New Session.
3. In the New Session dialog box, set the sample rate, bit depth, and other options for the new session.



4. Select where you want to save your session. If you are using external hard drives with your Pro Tools system, make sure you select the appropriate drive in the New Session dialog box.
5. Type a name for your session.
6. Click Save. The new session opens its Mix, Edit, and Transport windows (see [Figure on page 152](#)).

Main Windows

The Mix, Edit, and Transport windows are the main Pro Tools work areas. You can show any of these windows by choosing them from the Windows menu.



*Press **Ctrl+Equals (=)** to switch between the Edit and Mix windows.*

Mix Window	Displays the Pro Tools mixer, with its familiar fader strip controls for volume, pan, solo, mute, and signal routing.
Edit Window	Displays tracks in the session along the Timeline, for editing of audio, MIDI, and automation data.
Transport	Provides standard transport controls for Play, Stop, Rewind, Fast-Forward, Pause, and Record. The Transport window can also show Counter and MIDI Control displays.
Workspace	The Workspace browser is a DigiBase feature available in Pro Tools 6 and higher. For more information see the <i>DigiBase Guide</i>. You can view an electronic PDF version of the <i>DigiBase Guide</i> by choosing it from the Pro Tools menu, or choosing Start > All Programs > Avid > Digidesign > Documentation in Windows. The <i>DigiBase Guide</i> is also available on the Avid Xpress Studio Online Library DVD.

Rulers

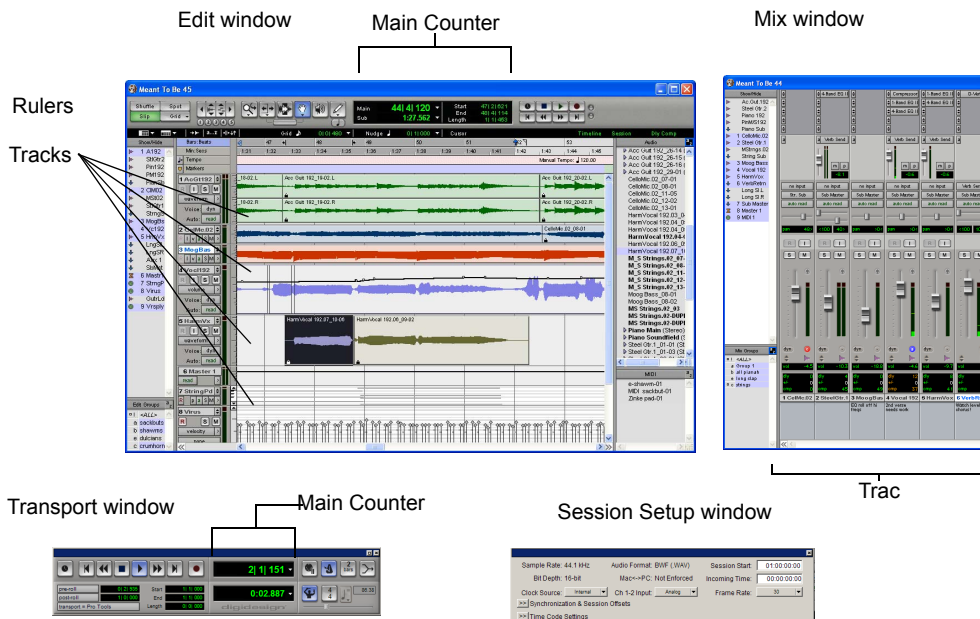
Pro Tools LE provides several different rulers to select as the timebase for your session.

Timebase Rulers, displayed along the top of the Edit window, include *Bars:Beats*, *Minutes:Seconds*, and *Samples*. The current timebase determines the format of the Main counter, and provides the basis for the Edit window Grid.

To select a Timebase Ruler:

- Click the name of the ruler at the top left side of the Edit window (*Bars:Beats*, *Minutes:Seconds*, or *Samples*).

Main Session Windows

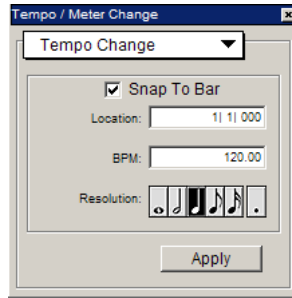


Setting a Tempo

You can set the tempo for your session by using Tempo Events, or by using the MIDI tempo controls in the expanded Transport window.

To insert a tempo event:

1. Choose Windows > Show Tempo/Meter.
2. At the top of the Tempo/Meter Change window, choose Tempo Change from the pop-up menu.



3. Enter the BPM (beats per minute) value you will use for the session and set the Location to 1|1|000 (so the inserted tempo event replaces the default tempo).
4. To base the BPM value on a different note value (such as an eighth-note rather than the default quarter-note), select a note value.
5. Click Apply to insert the new tempo event.

Using the Click Plug-In

The Click plug-in creates an audio click during session playback. This works like a metronome that you can use as a tempo reference when performing and recording.

The Click plug-in is synchronized to the tempo and meter of the Pro Tools session, and follows any changes in tempo and meter.



The Click plug-in is one of many plug-ins that can be inserted on a Pro Tools track. See “Plug-Ins” on page 187.

Click Parameters

MIDI In LED

Illuminates each time the Click plug-in receives a click message from the Pro Tools application, indicating the tempo.

Accented

Controls the output level of the accent beat (beat 1 of each bar) of the audio click.

Unaccented

Controls the output level of the unaccented beats of the audio click.

To use the Click plug-in:

1. Choose one of the following:
 - Choose MIDI > Click to enable the Click option.
 - Click the Metronome button in the Transport window.
2. Create a mono Auxiliary Input (Aux Input) track.
3. Insert a Click plug-in on the Auxiliary Input track.
4. In the Click plug-in window, choose a click sound from the Librarian pop-up menu (this menu displays “factory default” when you first insert the plug-in).
5. Choose MIDI > Click Options and set the Click and Countoff options as desired, and then click OK.



The Note, Velocity, Duration, and Output options in this dialog box are for use with MIDI instrument-based clicks and do not affect the Click plug-in.

Refer to the *Pro Tools Reference Guide* for more information on configuring Click options.

6. Begin playback. A click is generated according to the tempo and meter of the current session and the settings in the Click Options dialog box.

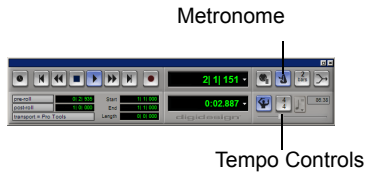
Using an External MIDI Click

Pro Tools also provides a MIDI Click option that lets you use an external MIDI device to play a click. This feature can be turned on and off in the Transport window, and is configured from the MIDI Click Options dialog box.

To configure and enable an external MIDI click:

1. Choose MIDI > Click Options.
2. Configure the click parameters as needed for your MIDI sound source.
3. Select the desired MIDI sound source from the Output pop-up menu and click OK.

4. During recording or playback, you can turn the Click on or off with the Metronome button in the MIDI Controls display of the Transport window.



Saving Sessions

As you build a session by adding tracks and changing session controls, you will want to save your work. Pro Tools provides three ways to save sessions.

To save a session, do one of the following:

- ▶ Choose File > Save Session.
- ▶ Choose Save Session As.
- ▶ Choose Save a Session Copy In.

Save Session

Saves the currently open session file, leaving it open for you to continue working.

Save Session As

Creates a duplicate session file with the name you choose, and leaves the duplicate open for you to continue working. It does not create a new Audio Files folder or Fade Files folder. This can be useful if you want to experiment with different arrangements in the session without affecting the original session.

Save Session Copy In

Saves copies of the session file and the files that you are using in the current session. This can be useful for creating a final copy of the session that does not include audio files or fades you are no longer using.

System Resources and Settings

You can change specific Pro Tools system settings to optimize system performance.

Playback Engine Dialog Box

The Playback Engine dialog box lets you adjust system buffer sizes and allocate CPU processing power to Pro Tools.

To configure system resources:

- ▶ Choose Setups > Playback Engine.

See [“Pro Tools System Settings” on page 140](#).

System Usage Window

The System Usage window displays approximate information on CPU load and DSP usage, so you can gauge your system’s processing capacity.

To view system resources and usage:

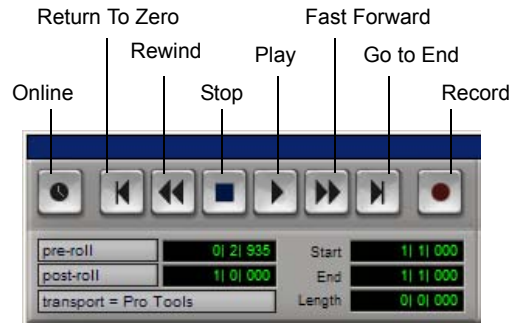
- ▶ Choose Windows > Show System Usage.

Transport Controls

The Transport window provides access to all Pro Tools LE transport commands. Different transport controls can be displayed or hidden in this window.

To show the Transport window:

- Choose Window > Show Transport Window.



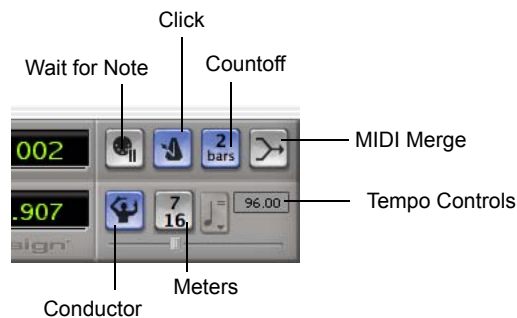
To configure the Transport window:

- Choose Display > Transport Window Shows and select view options.

The Transport window provides Play, Stop, and other standard transport controls.

The Expanded view of the Transport window provides pre- and post-roll, start, end, and length indicators for Timeline selection, as well as the Transport Master selector.

The Transport window can also display the following MIDI controls: Wait for Note, Click, Countoff, MIDI Merge, Conductor, Meter, and Tempo.



To start and stop playback:

1. Click Play in the Transport window to start playback.
2. Click Stop in the Transport window to stop playback.



Press the Spacebar on your computer keyboard to start and stop playback.



Pro Tools LE starts playing from the location of the cursor, or from the beginning of the current selection. The current setting of the Link Edit and Timeline Selection command in the Operations menu also affects playback. See the Pro Tools Reference Guide for more information.

Tracks

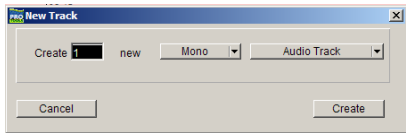
You can create audio and MIDI tracks for audio and MIDI recording, submixing, routing, automating, and editing.

Pro Tools provides four types of tracks: audio tracks, Auxiliary Inputs, Master Faders, and MIDI tracks. Audio tracks, Auxiliary Inputs, and Master Faders can be mono or stereo.

Audio Tracks	Record and play back audio to and from hard disk, monitor audio input when record-enabled, and edit audio regions
Auxiliary Inputs	Audio mixer channels, used for input, routing, and submixing
Master Faders	Provide master channel controls and options for any output or bus path
MIDI Tracks	Record, play back, and edit MIDI data

To create a new track:

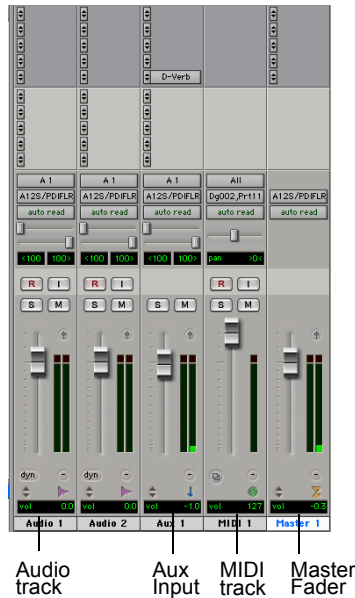
1. Choose File > New Track.



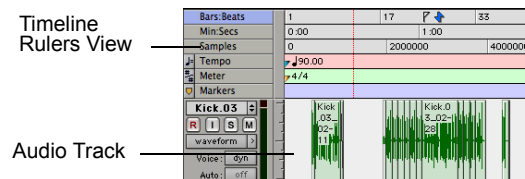
2. Specify the number of tracks, track type, and mono or stereo (for all types except MIDI).
3. Click Create.

In the Mix window, audio tracks, Auxiliary Inputs, Master Faders, and MIDI tracks appear as vertical channel strips.

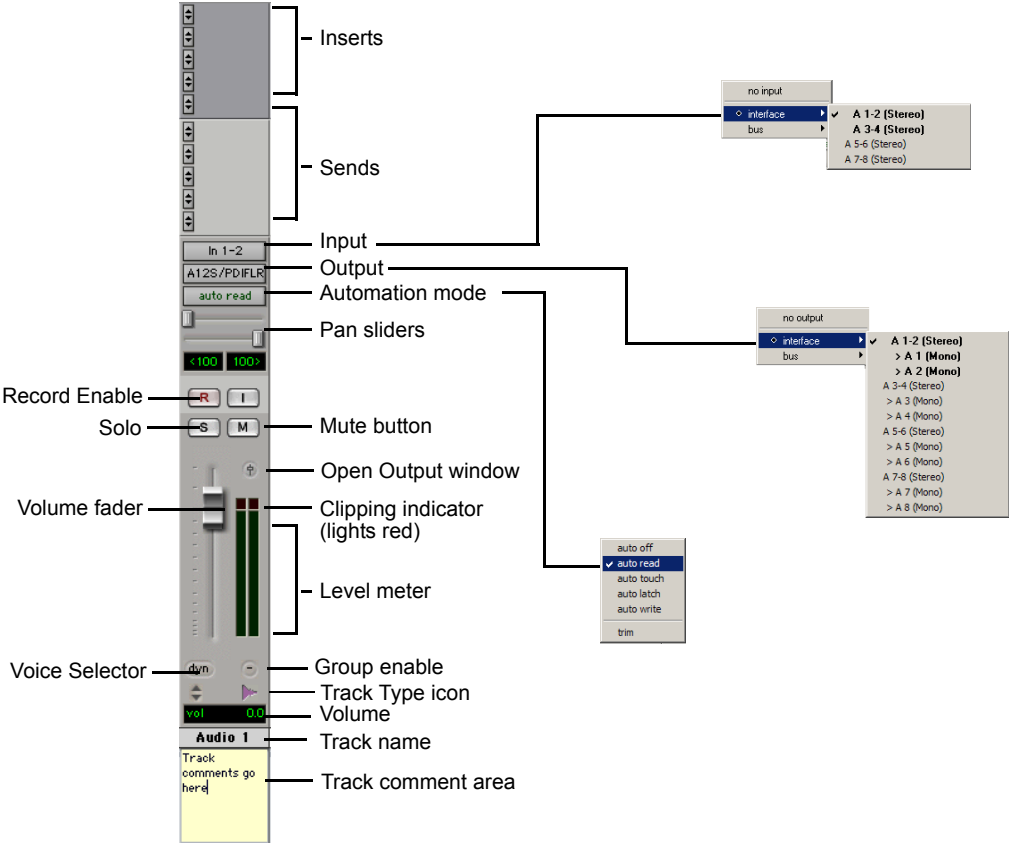
Track type is indicated by the Track Type icons just below the faders.



In the Edit window, tracks are displayed horizontally along the Timeline. The area in which audio appears for each track is the Playlist.



Audio tracks, Auxiliary Inputs, Master Faders, and MIDI tracks can be automated.



Audio Tracks

Audio tracks, Auxiliary Inputs, and Master Faders share many identical controls. Master Faders provide all the same features as audio tracks and Auxiliary Inputs, with the following exceptions:

Input Selector	A Master Fader's output assignment determines its input, or source.
Inserts	Inserts on Master Faders are post-fader only. (Audio track and Aux input track inserts are all pre-fader.)
Sends	Master Faders do not provide sends. To send an output to another destination, use an Auxiliary Input.

MIDI Tracks

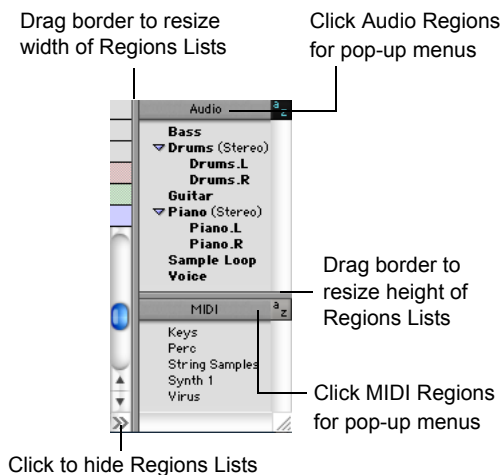
MIDI tracks provide volume, solo, and mute, in addition to MIDI input, output, channel, and program (patch) controls. MIDI volume, mute, and pan can also be automated using Pro Tools automation features (see [“Mix Automation” on page 188](#) for more information).

Regions Lists

A region is a piece of audio or MIDI data that can also have associated automation data. For example, a region could be a loop, a guitar riff, a verse of a song, a sound effect, a piece of dialog, or an entire sound file. In Pro Tools, regions are created from audio or MIDI files, and can be arranged in audio and MIDI track playlists.

All regions that are recorded, imported, or created by editing appear in the Audio and MIDI Regions Lists. Regions can be dragged from either list to tracks and arranged in any order. Audio regions can also be auditioned from the Regions Lists by Option-clicking the audio region name. The Regions List pop-up menus provide features for managing regions and files (such as sorting, selecting, importing, or exporting files).

Audio and MIDI Regions Lists



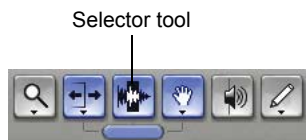
For more information on Regions Lists, refer to the *Pro Tools Reference Guide* or the *DigiBase Guide*.

Navigating in a Session

Pro Tools LE provides many ways to navigate in a session, including using the mouse or entering a memory location into one of the counters.

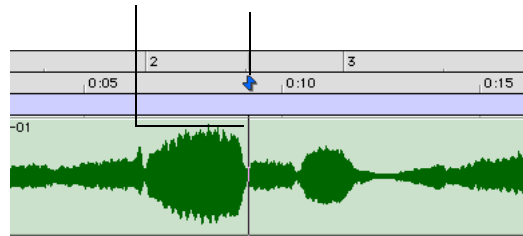
To navigate to a location in the Edit window:

1. In the Operations menu, make sure Link Edit and Timeline Selection is enabled.
2. Enable the Selector tool at the top of the Edit window by clicking it.



3. Click in a track or Timebase Ruler. The cursor appears at the selected location and the counters display the current time location.

Click in a track or on a Timebase Ruler



To navigate using the counters:

1. Click in the Main counter and enter a location using your computer keyboard.
2. Press Enter.



Navigating with the Counter



Press the asterisk () key on the numeric keypad as an alternative to clicking in the counter. (The cursor will always appear in the Transport window's Main Counter if it is displayed.)*

Memory Locations

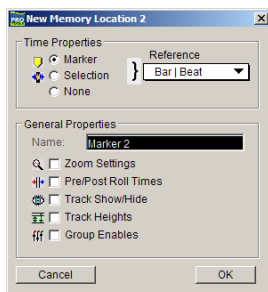
Memory Locations provide another way to navigate within sessions. Memory Locations appear as markers under the Timebase Rulers.

To define a memory location:

1. Do one of the following:
 - Navigate to the location at which you want to store a marker or memory location.
 - Begin playback.
2. Press Enter on the numeric keypad while stopped or during playback (or click the Markers icon).

In the New Memory Location window, you can define a marker, store a selection, or store any combination of the other available settings. These settings include track height, group enables, pre- and post-roll values, and track Show/Hide status.

3. Choose settings for the memory location and click OK.



To go to a stored memory location:

1. Choose Windows > Show Memory Locations.
2. In the Memory Locations window, click the name of the memory location.

Viewing and Zooming

When viewing tracks in the Edit window, you can adjust the height of tracks as well as zoom in vertically and horizontally using the Track Height selector and Zoom tools.

Zoom and Track Height Tools in the Edit Window



To change track height:

- ▶ Click the Track Height Selector, and select a track height from the pop-up menu.



You can apply many commands, including track height selection, to more than just a single track. Hold down the Alt key while performing an operation to apply it to all tracks. Hold down both the Shift and Alt keys while performing an operation to apply it to all selected tracks.

To zoom in or out on any area of a track in the Edit window:

1. Click to select the Zoomer.
2. Do one of the following:
 - Click or drag with the Zoomer to zoom in horizontally for a track or Ruler.
 - Press Option and click or drag with the Zoomer to zoom out horizontally for a track or Ruler.

To zoom in or out incrementally:

- ▶ Click the appropriate Zoom button:
 - Left Arrow (Horizontal Zoom Out)
 - Right Arrow (Horizontal Zoom In)
 - Waveform and MIDI buttons, to increase or decrease vertical zoom of the appropriate track type (audio or MIDI)

Pro Tools also provides five Zoom preset buttons. You can use these to immediately return to established zoom levels; you can define the magnification level for each preset, on a session-by-session basis.

To use a stored Zoom preset:

- ▶ Click the appropriate Zoom preset 1–5.

To store a new Zoom preset definition:

- ▶ Command-click a Zoom preset number to store the current horizontal and vertical Zoom to that preset.

Using Memory Locations for Zoom Control

Pro Tools Memory Locations let you store many attributes with each marker or memory location, including Track Height and Zoom Settings. By creating Memory Locations that are neither Markers nor Selections, but have Track Height, Zoom Settings, or other options enabled, you can use Memory Locations to zoom in and out using just the numeric keypad.

For more information on creating memory locations, see [“Memory Locations” on page 163](#).

Importing Audio

Pro Tools LE lets you import existing audio files from disk. This is very useful if you have audio files already recorded to disk or if you are working with CD-based sample libraries that you want to use in a new session.

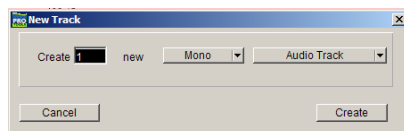
To import audio files or regions from disk:

- ▶ Do one of the following:
 - Choose File > Import Audio to Track to import files and regions to new audio tracks (they will also appear as regions in the Audio Regions List).
 - Choose Import Audio from the Audio Regions List pop-up menu to import files and regions to the Audio Regions List only.

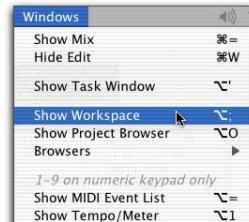
For more information on importing audio into sessions, refer to the *Pro Tools Reference Guide*.

To import a CD audio track:

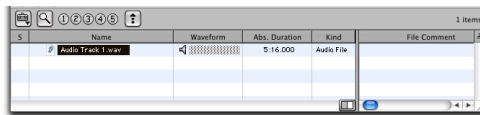
1. Put the source CD into your computer’s CD drive.
2. Use a third-party software program of your choice to extract audio from the CD.
3. In the session, create a new track by choosing File > New Track.



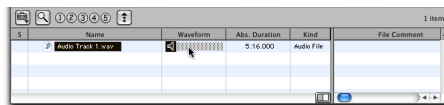
4. In the New Track dialog box, specify 1 Stereo Audio Track, and then click Create.
5. Open the Workspace Browser by choosing Windows > Show Workspace. The Workspace Browser opens. It is a window where you can find, audition, and manage your audio files.



6. In the Workspace Browser, navigate to the location where you saved the audio you extracted from your CD in step 2.



7. You can audition the audio file by clicking on the speaker icon in the waveform window.



If you are running Pro Tools on Mac OS X, you can import audio using the Movie > Import Audio From Other Movie command. For more information, see the Pro Tools Reference Guide.

Importing Video

For information on importing individual video files, see [“Importing an MXF or OMF Video File, or QuickTime Movie into Pro Tools”](#) on page 225.

For information on importing sequences, see [“Opening an AAF or OMF Sequence”](#) on page 220.

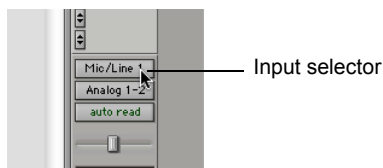
Basic Recording

This section describes how to record audio and MIDI into Pro Tools LE.

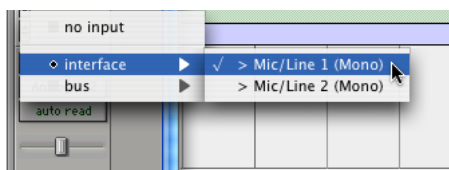
Preparing for Recording

To route audio to a track:

1. Verify the connections to your instruments.
2. Create a new track to record on by choosing File > New Track. Specify 1 Mono Audio Track and click Create.
3. In the Mix window, click the Input Selector on the new track.



4. From the pop-up menu, select the input you want to record. For example, select Mic/Line 1 if your audio source is plugged into the Mic 1 or Line/Inst 1 jack on the back of Digi 002. (This input is listed as Mic/Line 1, or as the name defined in the I/O Setup dialog box.)



Setting Digi 002 Input Levels

Input levels for Mic/Line 1–4 are adjustable using the gain knobs (located on the top panel of the Digi 002). Input levels for all other inputs on Digi 002 cannot be adjusted in Pro Tools, and need to be set at the source.

The key to setting input levels is to get the peak of the signal as loud as possible while retaining sufficient headroom to avoid digital clipping. Signals that get close to the top of the meter in Pro Tools LE use more of the full bit range (the 16 or 24 bits that make up each audio sample). The more you maximize this bit range, the better your sound quality. In addition, by setting optimum levels, you'll get the lowest possible noise and distortion.



Set levels to avoid digital clipping. Clipping occurs when you feed a signal to an audio device that is louder than the circuitry can accept, resulting in distortion. Digital clipping is indicated by the red clip light at the top of the Pro Tools on-screen meters.

To adjust input gain on Mic/Line inputs 1–4:

1. Connect an audio source to the appropriate input connector on the back panel of Digi 002. Microphones should be plugged into to an XLR connector. Line inputs or instruments should be plugged into a 1/4-inch TRS connector.
2. Press the Mic/Line/Instrument Selector switch (located on the top panel of the Digi 002) to match the type of device you connected.
3. If you connected a microphone that requires phantom power, apply phantom power now by pressing the 48V switch on the back panel of the Digi 002.
4. Choose File > New Track and specify 1 Mono Auxiliary Input track, then click Create.
5. Set the track input to the correct Digi 002 input channel (Mic/Line 1–4).
6. Play the instrument or sound source at the volume you will record.
7. Adjust the input gain for the channel using the gain knob (located on the top panel of the Digi 002). Increase or decrease gain until you are able to achieve maximum peak levels in the Auxiliary Input track meter without clipping. Typically such peak levels are in the yellow area of the meter.

Optimizing Gain Structure

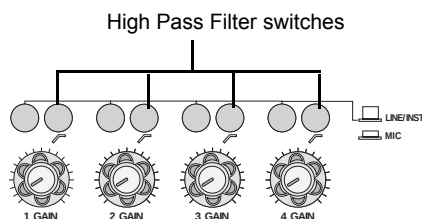
In order to maximize the dynamic range and signal-to-noise ratio of your recording, you'll want to apply the correct gain at each stage of your audio chain.

- With microphones, place the mic close enough to the source to maximize input levels, but far enough away to avoid proximity effect, then set the input gain on Digi 002.
- With line inputs and instrument direct inputs, raise the input level to achieve as strong a signal as possible without excessive noise, then set the input gain on Digi 002.

Mic/Line High-Pass Filters

Mic/Line Inputs 1–4 include a high-pass filter set at 75 Hz. This filter can be useful for filtering out low-end rumble from a noisy recording environment, microphone handling, or AC noise.

High Pass Filter Switches (Front Panel)



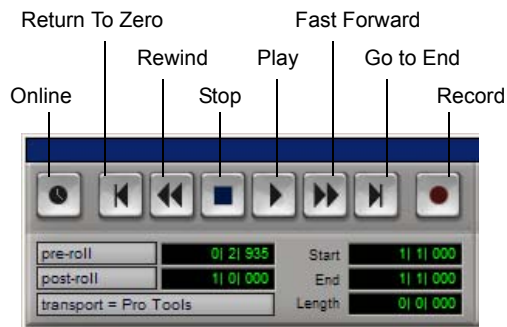
Recording an Audio Track

To record an audio track:

1. Assign the input for a track and set its input levels appropriately.
2. Click the Record Enable button for a track.

See [“Preparing for Recording” on page 168](#) and [“Setting Digi 002 Input Levels” on page 169](#) for more details.

3. Choose Windows > Show Transport to display the Transport window.



4. Click Return To Zero to start recording from the beginning of the session. You can also record according to a selection or from the cursor location in the Edit window.
5. Click Record in the Transport window to enable recording.
6. Click Play or press the Spacebar to record on all record-enabled tracks.
7. Record your performance.
8. Click Stop in the Transport window or press the Spacebar when you are finished recording.

To play back a recorded track:

1. Click the track's Record Enable button again to take it out of Record mode.
2. Click Play in the Transport window or press the Spacebar to start playback.
3. Click Stop in the Transport window or press the Spacebar to stop playback.

Recording to and from Digital Devices

Digi 002 provides S/PDIF (RCA) digital input/output connectors and Optical connectors for transfer of digital audio.

Setting Digital Format and Clock Source

Before recording from a digital source, make sure you have enabled the appropriate Digital Format in the Hardware Setup dialog box. For more information, see [“Pro Tools Hardware Settings” on page 143](#) for Windows.

Recording to and from an ADAT

You can use Digi 002 to interface with an ADAT, either to record tracks from an ADAT into Pro Tools LE for editing, or to record tracks from Pro Tools LE to an ADAT.

To record ADAT tracks into Pro Tools LE:

1. Open or create a session in Pro Tools LE.
2. Record enable up to eight audio tracks (depending on how many tracks are used on the ADAT tape).
3. Assign ADAT Optical Inputs 1–8 to your eight tracks.
4. Verify that Pro Tools LE is synchronized to Optical, and that the Optical Format is set to ADAT.
5. Click Record in the Transport window.
6. Click Play in the Transport window to begin recording, then press Play on the ADAT.
7. When playback from the ADAT tape is finished, click Stop in the Transport window, or press the Spacebar.

To record Pro Tools LE tracks to an ADAT:

1. Open the session you want to record to ADAT.
2. Record enable up to eight audio tracks on the ADAT.
3. Route the output of up to eight audio tracks in Pro Tools to the Optical outputs on Digi 002.
4. Verify that Pro Tools LE is referencing its Internal Clock Source in the Hardware Setup dialog box.

5. Start recording on the ADAT, then click Play in the Transport window in Pro Tools LE. When playback is complete, stop both systems.

For detailed information on connecting an ADAT to your system, see [“Connecting an ADAT” on page 65](#).

Monitoring Latency and Recording

Because Pro Tools LE uses the host processor in your computer for audio processing, playback, and recording, there is a small amount of audio delay, or *latency*, when monitoring audio through the system. You can set the latency to be shorter when you are recording and monitoring through Digi 002, and longer when you are trying to achieve higher track counts with more plug-ins.

Set latency in the Playback Engine dialog box. Latency is controlled by the H/W Buffer Size setting, and is displayed in samples. The recommended setting for listening back to audio is 512–1024 samples. For recording, when monitoring through Digi 002, the recommended setting is 128–256 samples.

To set the Hardware Buffer Size for record or playback:

1. Choose Setups > Playback Engine.
2. Choose the number of samples from the H/W Buffer Size pop-up, then click OK.

Low Latency Monitoring

Pro Tools LE includes a feature called Low Latency Monitoring for Digi 002 systems. This feature allows you to use a built-in mixer in the Digi 002 unit to record and monitor up to 18 inputs (8 analog, 8 ADAT, and 2 RCA-S/PDIF) with extremely low latency. This mode is useful for recording multiple instruments at the same time.

To use Low Latency Monitoring, tracks must be record-enabled, assigned to an actual audio input (not a bus), and assigned to outputs 1 or 2.

To enable Low Latency Monitoring:

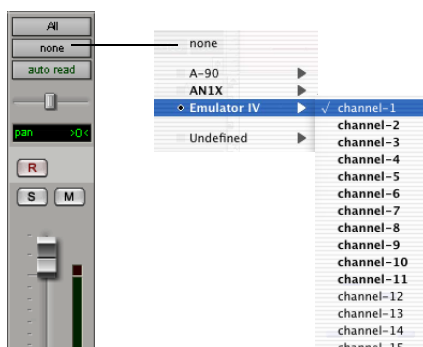
- Select Operations > Low Latency Monitoring.

When Low Latency Monitoring is enabled, any plug-ins and sends assigned to record-enabled tracks (routed to Outputs 1–2) are automatically bypassed, and must remain bypassed. Also, these tracks will not register on meters for Master Faders.

Recording MIDI

To configure a MIDI track for recording:

1. Choose File > New Track and specify 1 MIDI Track, then click Create.
2. In the Mix window, click the track's MIDI Device/Channel Selector and choose the destination (assignment) for that MIDI track by choosing a MIDI interface port, a channel, or a device from the pop-up menu. Choices vary depending on the operating system, Pro Tools version, and the hardware and instruments you have connected.



3. You can assign a default program change to the track by clicking on the Program button in the Mix window and making the necessary selections for program and bank select, and then clicking Done. Default program changes are sent when playing a track.
4. In the Mix Window, record-enable the MIDI track.
5. Make sure MIDI > MIDI Thru is selected, then play some notes on your MIDI controller. The MIDI instrument assigned to the track should sound, and the track's meters should register MIDI activity.

To record onto a MIDI track:

1. Verify that the MIDI track you want to record to is record-enabled and receiving MIDI.
2. In the Transport window, click Return To Zero to start recording from the beginning of the session. You can also record according to a selection or from the cursor location in the Edit window.
3. Click Record in the Transport window.

4. Do one of the following:
 - Click Play in the Transport window or press the Spacebar to begin recording.
 - If using Wait for Note, the Play, Record, and Wait for Note buttons flash. Recording begins when the first MIDI event is received.
 - If using Countoff, click Play. The Record and Play buttons flash during the Countoff, then recording begins.
5. Play your MIDI instrument.
6. When you have finished recording, click Stop in the Transport window, or press the Spacebar. The newly recorded MIDI data appears as a MIDI region on the track in the Edit window, as well as in the MIDI Regions List.

To play back a recorded MIDI track:

1. Click the Record Enable button to take the MIDI track out of Record mode.
2. In the Transport window, click Return To Zero to play back from the beginning of the track. You can also play back according to a selection or from the cursor location in the Edit window.
3. Click Play in the Transport window to begin playback. The recorded MIDI data plays back through the track's assigned instrument and channel.

Monitoring MIDI Instruments Without a Mixer

To monitor your MIDI instrument's analog output, you can use an Auxiliary Input. Auxiliary Inputs function as inputs for both internally bussed signals and external audio sources.

To configure an Auxiliary Input for MIDI monitoring:

1. Connect the MIDI instrument's audio output to the appropriate inputs on your Digi 002.
2. Choose File > New Track and specify 1 mono or stereo Auxiliary Input, then click Create.
3. Click the Input selector of the Auxiliary Input channel and choose the input to which your MIDI instrument is connected.
4. Adjust the level of the Auxiliary Input with its volume fader.

QuickPunch Recording

With QuickPunch recording you can punch in and out of audio recording on armed tracks. Recording can be triggered from the Transport window, or using a standard footswitch. You can use a standard footswitch (such as a keyboard sustain pedal) with QuickPunch to *punch in* when recording audio. You can also punch in when recording MIDI, without enabling QuickPunch.

For more information on QuickPunch and punch recording, see the *Pro Tools Reference Guide*.

To connect a footswitch to Digi 002:

1. Turn off the Digi 002 unit.
2. Plug the footswitch into the Footswitch connector on the back panel of Digi 002.
3. Turn on the Digi 002 unit.



Footswitch polarity is detected by Digi 002 firmware when you turn on the unit. Make sure the footswitch is connected and not pressed when turning on the Digi 002.

To punch in with QuickPunch when recording audio:

1. Select Operations > QuickPunch.
2. Set input routing and click the Record button on each audio track you want to punch in. You can punch in on up to 8 audio tracks while playing back 32 tracks, or you can punch in on up to 16 tracks while playing back 24 tracks.
3. Click Play in the Transport window.
4. Click Record in the Transport window or step on the footswitch to begin recording (punch in) on all record-enabled tracks.
5. Click Record in the Transport window or step on the footswitch again to stop recording (punch out).

Note that the session continues to play, and you can continue to punch in and out as many times as you want.



With QuickPunch enabled, press Ctrl+Spacebar to punch in and punch out.

To punch in when recording MIDI:

1. Set your MIDI input routing and click the Record button on each MIDI track you want to punch in. QuickPunch is not required to punch in on MIDI tracks.
2. Click Play in the Transport window.
3. Click Record in the Transport window or step on the footswitch to begin recording (punch in) on all record-enabled tracks.
4. Click Record in the Transport window or step on the footswitch again to stop recording (punch out).

Editing

Pro Tools LE provides several tools for editing audio and MIDI. In the Edit window, audio and MIDI tracks can be edited into regions or repeated in different locations, to create loops, re-arrange sections or entire songs, or to assemble tracks using material from multiple takes.

Edit Modes and Tools (Slip Mode, Smart Tool Enabled)



Audio and MIDI editing are typically used to:

- Fix or replace mistakes
- Re-arrange songs and projects
- Clean up track timing and rhythm by aligning hits to Grid values like bars and beats
- Create final tracks using selections from multiple takes (also known as *comp tracks*).

Edit Modes

Pro Tools LE has four Edit modes: Shuffle, Spot, Slip, and Grid. The Edit mode is selected by clicking the corresponding button in the upper left of the Edit window.

Edit Mode Buttons



Press F1 (Shuffle), F2 (Slip), F3 (Spot), or F4 (Grid) to set the Edit mode.

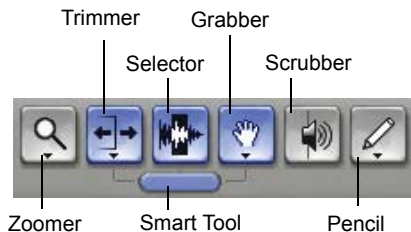
The Edit mode affects the movement and placement of audio and MIDI regions (and individual MIDI notes), how commands like Copy and Paste function, and also how the various edit tools (Trimmer, Selector, Grabber, and Pencil) work.

For more information on Edit modes, refer to the *Pro Tools Reference Guide*.

Edit Tools

Pro Tools LE has seven Edit tools: Zoomer, Trimmer, Selector, Grabber, Scrubber, Pencil, and Smart Tool. Select an Edit tool by clicking it in the Edit window. The Zoomer, Trimmer, Grabber, and Pencil tools have multiple modes, which you can select from a pop-up menu when you click the tool.

Edit Tools in Edit Window



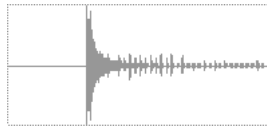
Press the Escape key to cycle through the Edit tools.

For detailed descriptions of the Edit Tools, refer to the *Pro Tools Reference Guide*.

Editing Regions

The Edit tools in Pro Tools LE are used to edit regions in the Edit window.

Audio Region



Trimming Regions

After recording an audio track, you will have an audio region on that track. If there is some silence at the beginning of the region, or there is some extra audio at the end of the region, you can use the Trimmer tool in Slip mode to shorten the beginning or end of the region.



Audio region on a track

To trim an audio region:

1. Select Slip mode.
2. Select the Trimmer tool.
3. Move the cursor near the beginning of the audio region (notice the cursor changes to a “[”).



Trimming the beginning of a region

4. Click at the beginning of the region and drag right to shorten the region.
5. Move the cursor near the end of the audio region (notice the cursor changes to a “]”).



Trimming the end of a region

6. Click at the end of the region and drag left to shorten the region.

The trimmed region



You can also extend a region using the Trimmer tool if there is audio data beyond the current boundaries of the region. If extending the region's beginning, drag to the left; if extending the region's end, drag to the right.

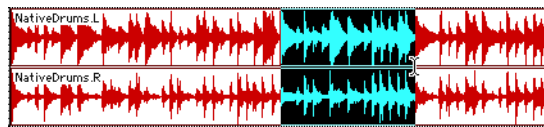
Arranging Regions

There are many ways to edit and arrange regions; the following example demonstrates how you might create and arrange a drum loop to compose a rhythm track.

To create and arrange a rhythm sequence:

1. Open or create a session in Pro Tools LE.
2. Specify the session meter (MIDI > Change Meter) and tempo (MIDI > Change Tempo).
3. Select Grid mode.
4. Prepare to record using a MIDI click (see [“Using the Click Plug-In” on page 153](#) or [“Using an External MIDI Click” on page 154](#)).
5. Do one of the following:

- Record a drum track (see [“Recording an Audio Track” on page 170](#)) keeping in mind that you want to use only the best bar (measure). Your recording should fit the grid at the specified tempo and meter.
 - Import an existing audio file, such as a drum loop from a sample library, and place it on an audio track (see [“Importing Audio” on page 166](#)).
6. Click the Selector tool, and drag on the waveform with the Selector to make a one-bar selection. Note that the selection snaps to the specified grid.

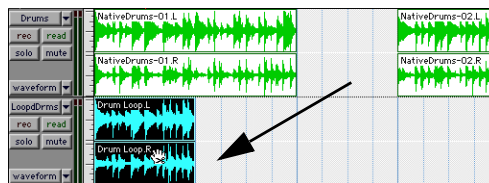


Making a selection in Grid mode

7. Create a new audio track (File > New Track).
8. From the Grabber pop-up menu, select the Separation Grabber tool.



9. With the Separation Grabber tool, drag the selection to the beginning of the new audio track. A new region is created and appears at the beginning of the new track.



Dragging a selection with the Separation Grabber tool

10. With the new region still selected, choose Edit > Repeat.
11. In the Repeat dialog box, enter a number of repeats, and click OK.

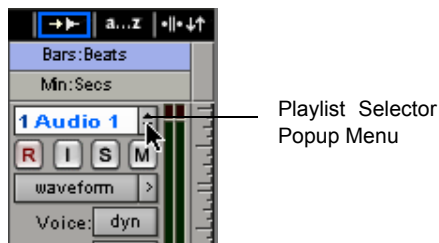
You now have a new rhythm track with a “looped” (repeated) phrase. You can use these editing tools to do much more advanced and involved editing of regions. For example, you could separate beats or “hits” into individual regions and rearrange them in Grid or Shuffle mode as a way of coming up with new and interesting rhythms.

Playlists and Nondestructive Editing

Playlists let you create and retrieve multiple versions of track edits. A playlist can be a complete take, an overdub, or an arrangement of selections from multiple takes. You can duplicate playlists to save edits in their current state, then continue making additional edits to the new playlist knowing you can always go back to the previous version.

To create multiple playlists for editing:

1. Start with a track on which you want to try different edits.
2. From the Playlist Selector pop-up menu, choose Duplicate.



3. Name the duplicated playlist and click OK.
4. Make your first series of edits.
5. Return to the original playlist by selecting it from the Playlist Selector pop-up menu.
6. Repeat steps 2–5 for any further edits.

In this way, you can try out different edits of a track, and switch back and forth between playlists for comparison.

Mixing

The Pro Tools mix environment provides many familiar channel strip controls for setting volume, pan, solo, and mute. Mixer and I/O controls can be shown in both the Mix and Edit windows.

To view the Mix window:

- ▶ Select Windows > Show Mix.



Press Control+Equals (=) to switch between the Edit and Mix windows.

Using Channel Strip Controls

Volume	Increase or decrease the track level by dragging its Volume fader up or down.
Pan	Pan a track left or right in the mix by dragging its Pan slider left or right.
Solo	Solo a track (muting all other tracks) by clicking its Solo button.
Mute	Mute a track by clicking its Mute button.

Basic Signal Routing

Signal routing is accomplished by assigning track inputs and outputs. Audio track inputs can be from any hardware input or bus path. Once recorded, an audio track’s input is its audio file on disk. Auxiliary Inputs can be any hardware input or internal bus path. For all types of audio tracks, outputs can be routed to any hardware output or internal bus path.

You can use these signal routing features to set up virtually any mixer architecture for your projects, including sends and returns for effects processing and submixing.

Send and Return Submixing for Effects Processing

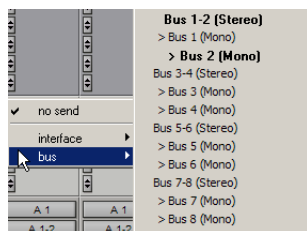
When you are submixing for reverb, delay, and similar effects processing, you can use sends and Auxiliary Inputs to achieve traditional send/return bussing. You can use a real-time plug-in (see “[Plug-Ins](#)” on [page 187](#)) as a shared resource for all tracks included in a submix. The wet/dry balance in the mix can be controlled using the track faders (dry level) and Auxiliary Input fader (wet, or effect return level).

Creating a Send

Pro Tools LE provides up to five sends per audio track. A send can be mono or stereo, routing to an output or one of 16 internal bus paths.

To assign a send on a track:

1. Make sure Sends View is enabled in the Mix window (Display > Mix Window Shows > Sends View).
2. Click the Sends button on an audio track and choose a path from the pop-up menu.



3. Set the output level of the send. You can set the send level to zero by Option-clicking the send fader.



You can configure the default level for new sends to be $-\infty$ or at unity gain (0 dB) by enabling or disabling the Sends to “ $-\infty$ ” option under the Operation Preferences.

Creating a Return

Auxiliary Inputs can be created to act as return channels for busses, as well as for inputs from hardware sources.

Audio and Auxiliary Input Tracks Configured for a Send and Return



To create a return:

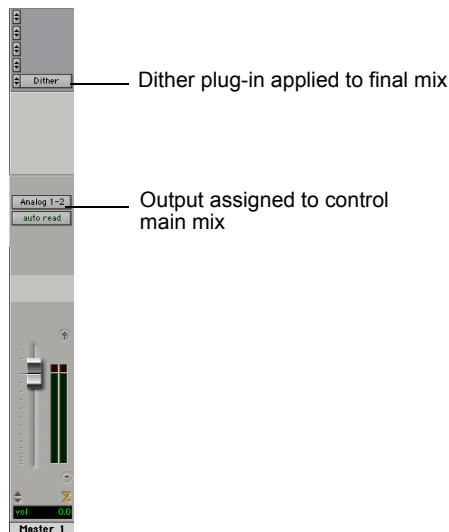
1. Choose File > New Track and specify 1 mono or stereo Auxiliary Input, then click Create.
2. Click the Input Selector of the Auxiliary Input and set it to the bus path you assigned to the sends on the source tracks.
3. Click the Output Selector of the Auxiliary Input and choose an output path.

Master Faders

Master Faders are used as output and bus masters, and can control any mono or stereo output or bus path in a session. You can then use the controls on the Master Fader to control the volume, solo and mute, or apply inserts to those paths.

When you are mastering your final mix, it is recommended that you use a dither plug-in on the Master Fader controlling your main outputs (for more information on dither, see the *Pro Tools Reference Guide*).

Master Fader Controlling Main Outputs



To create a Master Fader:

1. Choose File > New Track and specify 1 mono or stereo Master Fader track, then click Create.
2. In the Mix window, click the Master Fader's Output Selector and choose the output path that you want to control. You can choose either outputs or internal busses.

To use a Master Fader as a master stereo volume control for all tracks in a session:

1. Choose File > New Track and specify 1 stereo Master Fader track, then click Create.
2. Set the outputs of all audio tracks in the session to outputs 1–2 and set the panning of each track.
3. Set the output of the Master Fader to your main output path (outputs 1–2).

Plug-Ins

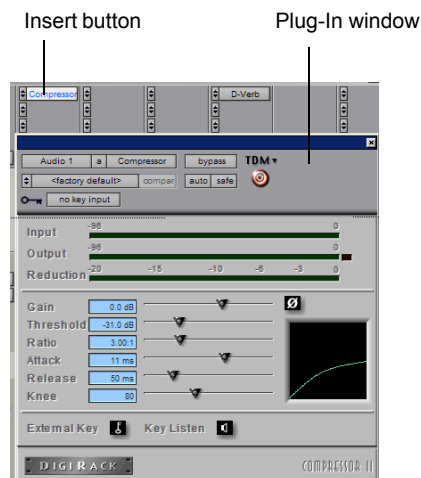
Plug-ins provide EQ, dynamics, delays, and many other types of effects processing. Plug-ins function either in real time or in non-real time.

RTAS plug-ins are nondestructive effects, which are inserted on tracks to process audio in real time—just like an external hardware processor (during playback).

AudioSuite plug-ins are destructive effects that process and create new audio files on disk in non-real-time. (AudioSuite plug-ins can also be used nondestructively, leaving the original, unprocessed audio file on disk.)

Real-time plug-ins are assigned to tracks from the Inserts view in the Mix or Edit windows. Once assigned to a track, plug-ins appear in the track's Inserts view, and can be opened by clicking the Insert button.

Compressor Plug-in



To insert a real-time plug-in on a track:

1. Make sure the Inserts View is shown in the Mix or Edit window.
2. Click the Insert Selector on the track and select the plug-in that you want to use.

Pro Tools comes with a complete set of DigiRack plug-ins, and many more are available from Digidesign and our Development Partners.

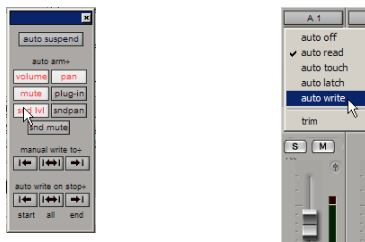
For more information about plug-ins, see the *DigiRack Plug-Ins Guide*, the *Digidesign Plug-Ins Guide*, and the Plug-Ins chapter of the *Pro Tools Reference Guide*.

Mix Automation

Mix automation lets you record, or *automate*, changes to track and send levels, mutes, pan, and plug-in parameters. MIDI tracks provide volume, pan, and mute automation only.

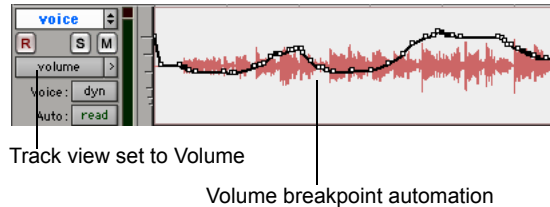
To write automation:

1. In the Automation Enable window (Windows > Show Automation Enable), enable an automation *type* (volume, pan, mute, send level, send pan, send mute, or any plug-in automation).
2. Select an automation *mode* for the tracks to be automated (Write, Touch, or Latch mode).
3. Start playback and begin writing automation by adjusting faders and other controls during playback. Pro Tools LE remembers all moves performed on enabled parameters.



Enabling automation (left) and choosing a track Automation mode (right)

Once written, automation can be re-written or displayed and edited graphically in the Edit window.



Volume automation in a track in the Edit window

For more information on using automation, see the *Pro Tools Reference Guide*.

Final Mixdown

The Bounce to Disk command lets you write a final mix to disk, create a new loop, print effects, or bounce any submix. Once you have bounced your final mix to disk, you can use another program to burn the resulting file to Compact Disc.

When you bounce a track to disk, the bounced mix includes the following:

Audible Tracks	All audible tracks are included in the bounce. Any muted tracks do not appear in the bounce. If you solo a track or region, only the soloed elements appear in the bounced mix.
Automation	All read-enabled automation is played back and incorporated in the bounced mix.
Inserts and Sends	All active inserts, including real-time plug-ins and hardware inserts, are applied to the bounced mix.
Selection or Track Length	If you make a selection in a track, the bounced mix will be the length of the selection. If there is no selection in any track, the bounce will continue until it reaches the end of the session.

To Bounce to Disk:

1. Choose File > Bounce to Disk.
2. Select any mono or stereo output or bus path as the source for the bounce.
3. Select the File Type (such as WAV), Format (such as mono or stereo), Resolution (such as 16-bit), and Sample Rate (such as 44.1 kHz).



To create a mixdown that can be written to an audio CD, be sure to select WAV, stereo interleaved, 16-bit, and 44.1 kHz.

4. Click Bounce.

Using Dither on Mixdown

You should use a dither plug-in when using the Bounce To Disk command, or when mastering to an external device. Bounce to Disk does *not* automatically apply dither. To dither a bounce file, insert an included Digidesign Dither plug-in, or another dither plug-in, on a Master Fader assigned to the bounce source path. Master Faders are often preferable to Auxiliary Inputs because Master Fader inserts are post-fader (which is better for dither applications).

For more information on using dither, refer to the *Pro Tools Reference Guide*.

Chapter 5

DV Toolkit for Pro Tools LE

DV Toolkit

DV Toolkit provides post production features to Pro Tools LE systems (such as Digi 002 and Mbox).

For information on standard Pro Tools LE features, refer to the tutorial in [Chapter 4](#) of this guide, or the *Pro Tools Reference Guide*.



You can view an electronic PDF version of the Reference Guide by choosing it from the Pro Tools menu, or choosing Start > All Programs > Avid > Digidesign > Documentation in Windows. The Reference Guide is also available on the Avid Xpress Studio Online Library DVD.

DV Toolkit Pro Tools Features

DV Toolkit includes the following features:

Time Code Features

DV Toolkit enables the following time code features for working with film, video, or digital video in Pro Tools LE:

- Timebase Rulers (Time Code and Feet+Frames)
- Timecode Rate Selector
- Feet+Frame Rate Selector
- Redefine Current Time Code Position
- Redefine Current Feet+Frames Position
- Use Subframes Option

- Audio Rate Pull Up and Pull Down
- Video Rate Pull Up and Pull Down
- Time Code Mapping Options when importing tracks
- Custom Shuttle Lock Speed

Timebase Rulers

DV Toolkit adds Time Code and Feet+Frames Timebase Rulers to your session, so that you can use Spot mode to spot audio to Time Code or Feet+Frames.

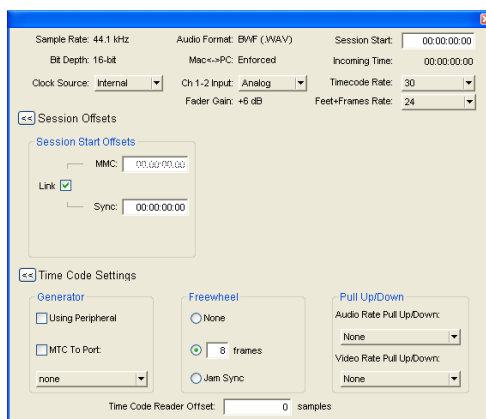
See the *Pro Tools Reference Guide* for more information.

Time Code

Displays the Time Scale in SMPTE frames (hours:minutes:seconds:frames). The Timecode Rate can be set in the Session Setup window with the Timecode Rate selector.

Feet+Frames

Displays the Time Scale in feet and frames (feet+frames). The Feet+Frames Rate can be set in the Session Setup window with the Feet+Frames Rate selector.



Pro Tools supports the following rates: 23.976 fps, 24 fps, 25 fps, 29.97 fps Non-Drop, 29.97 fps Drop, 30 fps Non-Drop, and 30 fps Drop.

When using time code, Pro Tools displays the Time Scale in SMPTE frames (hours:minutes:seconds:frames).

See the *Pro Tools Reference Guide* for more information.

Feet+Frames Rate Selector

Feet+Frame rates for sessions can be set in the Session Setup window with the Feet+Frames Rate selector. Supported rates are 23.976, 24, and 25 fps.

Redefine Current Time Code Position

Use this command to redefine the current time code position and session start time. By creating an insertion point (or selection), and then entering the desired new time code position for that location, the session start time will be recalculated based on the new, relative Time Code location.

This command is located in the Setups menu.

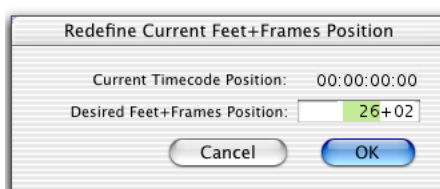
Redefine Current Feet+Frames Position

Use this command to redefine the current Feet+Frames position. By creating an insertion point (or selection), and then entering the desired new Feet+Frames position for that location, the session start time is recalculated based on the new, relative Feet+Frames location.

Typically, this command is used for integrating test tones, pre-roll, Academy leader, and similar pre-program material into Pro Tools sessions.

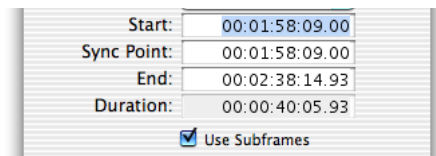
To set a relative frame position for a session (Feet+Frames):

- Choose Setups > Redefine Current Feet+Frames Position and enter a Feet+Frame position to correspond to the timecode shown in the dialog box.



Use Subframes Option

When spotting or shifting material in Pro Tools, or using the Go To dialog box, click the Use Subframes option for greater precision.



Additional time field with "Use Subframes" enabled.

A subframe is 1/100th of a frame. The Use Subframes option enables you to use these smaller units for greater accuracy. This command adds an additional time field in the SMPTE hours:minutes:seconds:frames box, which appears as the far right time field when enabled. Use a period to separate subframe values from whole frames.

The following dialog boxes include a Use Subframe option:

- Spot dialog box
- Shift dialog box
- Go To dialog box



Subframe measurements are not available in the Current Time field.

Pull Up and Pull Down

Use Audio Rate Pull Up/Down and Video Rate Pull Up/Down for audio layback to film or video, or when recording audio for film or video. See the *Pro Tools Reference Guide* for more information.



When using Audio Rate Pull Up/Down, DV Toolkit for Pro Tools LE adjusts only the positions of events (regions, MIDI events, and automation) on the timeline. DV Toolkit does not automatically adjust the Pro Tools sample rate clock during playback or recording. To work with audio pull up or pull down factors in DV Toolkit for Pro Tools LE, you must manually adjust your external (S/PDIF or Optical) clock device accordingly. Failure to do so will prevent pull settings from functioning properly.



Audio Rate Pull Up/Pull Down is not supported when using Avid Mojo as the S/PDIF clock source since the Avid Mojo S/PDIF clock cannot be adjusted for Pull Up/Down.

Audio Rate Pull Up/Down - Applies pull up or pull down factors to session audio record and playback. The Audio Rate Pull Up/Down pop-up menu is located in the Session Setup window.

Video Rate Pull Up/Down - Lets you change the frame rate of video playback independently from the audio pull-ups (if any). The Video Pull Up/Down pop-up menu is located below the Audio Rate Pull Up/Down pop-up menu in the Session Setup window. Choices are determined by the file format of the video clip, as well as its frame rate.

Time Code Mapping Options when Importing Tracks

When specifying where imported tracks are placed in the current session, times include time code.

From the Import Session Data dialog box, the following Import Mapping Options are available:

- Maintain Absolute Time Code Values
- Maintain Relative Time Code Values
- Map Start Time Code to hh:mm:ss:ff

See the *Pro Tools Reference Guide* for more information.

Custom Shuttle Lock Speed

Use the Custom Shuttle Lock Speed preference to customize the highest fast-forward Shuttle Lock speed (key 9) to better match your editing and auditioning needs.

To configure Custom Shuttle Lock Speed:

1. In Pro Tools, select Setups > Preferences, and click the Operations tab.
2. Be sure that the Numeric Keypad mode is set to Transport or Classic.
3. Enter a desired percentage for the Custom Shuttle Lock Speed setting. The range for this setting is 50–800%. You can use the Up and Down Arrow keys to increase or decrease the setting.

4. Click OK.

The Custom Shuttle Lock Speed will be saved with your Pro Tools preferences (not with the session).

To enable Custom Shuttle Lock Speed:

- Press Start+9 on the numeric keypad.

Scrubbing an Avid Movie Track

You can use the Scrubber tool to scrub an Avid Movie track (or Quicktime track) with full-frame accuracy. If you scrub directly on the Movie track, only the movie will scrub (no audio will play). If you scrub on an audio track, audio and the movie will scrub simultaneously.

To scrub the Avid Movie track:

1. Select the Scrubber tool.



2. Click in the Movie track and drag the Scrubber.



Scrubbing a movie track

When you begin to scrub, the Scrub window will appear on your desktop. The Scrub window provides greater accuracy when scrubbing than can be achieved with any FireWire attached video transcoder.



To scrub with finer precision, press the Command key while scrubbing

To resize and place the Scrub window in a different location, choose Movie > Set Scrub Window Size/Location and change the settings.

DV Toolkit Plug-Ins and Options

DigiTranslator

DigiTranslator lets Pro Tools exchange audio and video files, and sequences with other AAF and OMFI-compatible applications.

Refer to [Chapter 6](#) for details on using DigiTranslator.

VocALign Project from Synchro Arts

VocALign Project from Synchro Arts automatically adjusts the timing of one audio signal to match another by applying varying amounts of time stretching or compression to the audio. It is designed for synchronizing replacement dialogue in video and film post production, but is also useful for tightening up doubled vocal or instrumental parts in music.

Refer to the VocALign Project documentation for details.



You can view an electronic PDF version of the VocALign Project documentation by choosing Start > All Programs > Avid > Digidesign > Documentation in Windows.

DINR LE

The LE version of Digidesign Intelligent Noise Reduction (DINR) includes the following type of noise removal:

Broadband Noise Reduction (BNR) provides broadband and narrowband noise reduction for suppressing such unwanted elements as tape hiss, air conditioner rumble, and microphone preamp noise. With DINR LE, BNR is only available as an AudioSuite plug-in.

Refer to the *Digidesign Plug-Ins Guide* for details on using BNR.



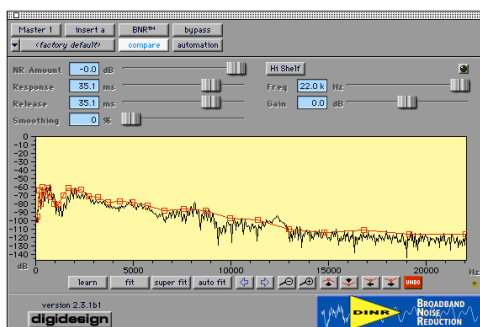
You can view an electronic PDF version of the Digidesign Plug-Ins Guide by choosing it from the Pro Tools menu, or choosing Start > All Programs > Avid > Digidesign > Documentation in Windows. The Digidesign Plug-Ins Guide is also available on the Avid Xpress Studio Online Library DVD.

DINR Broadband Noise Reduction

The LE version of Digidesign Intelligent Noise Reduction (DINR) includes Broadband Noise Reduction (BNR). With DINR LE, BNR is only available as an AudioSuite plug-in.

Broadband Noise Reduction

The Broadband Noise Reduction module (BNR) removes many types of broadband and narrowband noise from audio material. It is best suited to reducing noise whose overall character doesn't change very much: tape hiss, air conditioner rumble, and microphone preamp noise. In cases where recorded material contains several types of noise, the audio can be processed repeatedly according to the specific types of noise.



How Broadband Noise Reduction Works

The Broadband Noise Reduction module uses a proprietary technique called *Dynamic Audio Signal Modeling™* to intelligently subtract the noise from the digital audio file. Noise is removed with multiple downward expanders that linearly decrease the gain of a signal as its level falls.

Creating a Noise Signature

The first step in performing broadband noise reduction is to create what is called a *noise signature* by selecting and analyzing an example of the noise within the source material. Using this noise signature, a *noise contour line* is

created which is used to define the thresholds for the downward expanders that will perform the broadband noise reduction. The noise contour represents an editable division between the noise and non-noise audio signals.

At the same time, DINR also creates a model of what the non-noise audio signal looks like. DINR then attempts to pull apart these two models, separating the bad from the good—the noise from the desired audio. The noise portion can then be reduced or eliminated.

The noise reduction itself is achieved through the use of multiple *downward expanders*. The threshold of these expanders is set so that the noise signal will fall below them and be decreased while the desired audio signal will remain above them, untouched.

The Contour Line

Once the signal level has fallen below the specified Contour Line (which represents BNR's threshold), the downward expanders are activated and decrease the gain of the signal as its level falls. Over five hundred individual downward expanders are used linearly across the audio spectrum to reduce the effects of unwanted noise.

Psychoacoustic Effects of Noise Reduction

One of the psychoacoustic effects associated with broadband noise reduction is that listeners often perceive the loss of noise as a loss of high frequencies. This occurs because the noise in the higher frequency ranges fools the ear into thinking the original signal has a great deal of energy in that range. Consequently, when the noise is removed it feels as if there has been a loss of high-frequency signal. DINR's High-Shelf EQ is useful for compensating for this effect. See "High-Shelf EQ" on page 202.

Limitations of Noise Reduction

It is important to understand that there is a certain amount of trade-off inherent in any type of noise reduction system. Implementing noise reduction means that you have to choose the best balance between the following three things:

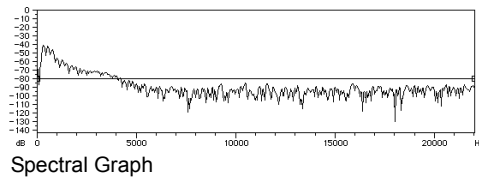
- The amount of *noise* removed from the signal
- The amount of *signal* removed from the signal
- The number of *artifacts* added to the signal

DINR gives you a considerable amount of control over the above three elements, and lets you maximize noise reduction while minimizing signal loss and artifact generation. However, as powerful as it is, DINR does have limitations. In particular, there are two instances in which DINR may not yield significant results:

- Cases in which the noise components of the audio are so prominent that they obscure the actual signal components of the audio.
- Cases in which the noise amplitude of a 24-bit file is less than -96 dB. DINR is not designed to recognize noise that is lower than this level.

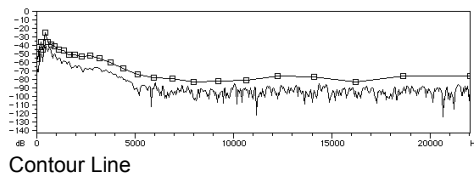
Broadband Noise Reduction Controls

The following section describes the Broadband Noise Reduction controls and their use.



The Spectral Graph - Displays the noise signature and the editable noise Contour Line. The Spectral Graph's horizontal axis shows frequency, which is displayed in Hertz, from 0 Hz to one-half the current audio file's sample rate. The Spectral Graph's vertical axis shows amplitude, which is displayed in dB, from 0 dB to -144 dB (below full-scale output of the audio).

The Noise Signature - The jagged line is a graph of noise. It is created when you use the Learn button in the Broadband Noise Reduction window. Once you have the noise signature of an audio file, you will be able to begin removing the noise by generating and editing a threshold or Contour Line (covered next) between the noise and the desired audio signal.



The Contour Line - The line with a series of square breakpoints is called the *noise contour line*. The Contour Line is an editable envelope that represents the division between the noise and the non-noise signal in the current audio file. The Contour Line is created by clicking the Fit or AutoFit button in the Broadband Noise Reduction window after you have learned a section of noise. By moving this envelope up or down, or by moving the individual breakpoints, you can modify which signals are removed and which remain.

The noise modeling process treats audio below the line as mostly noise, and audio above the line as mostly signal. Therefore, the higher you move the Contour Line upwards, the more audio is removed. To maximize noise reduction and minimize signal loss, the Contour Line should be above any noise components, but below any signal components.

To fine-tune the broadband noise reduction, move breakpoints at different locations along this line to find out which segments remove the noise most efficiently. Editing the Contour Line to follow the noise signature as closely as possible will also help maximize noise reduction and minimize signal loss. See “Editing the Contour Line” on page 208.



Noise Reduction Amount - Controls how much the noise signal is reduced. It is calibrated in decibels. A setting of 0 dB specifies no noise reduction. Increasing negative amounts specify more noise reduction. The default value is 0 dB.

In many cases, as much as 20–30 dB of noise reduction can be used to good effect. However, because higher amounts of noise reduction can generate unwanted audio artifacts, you might want to avoid setting the NR Amount slider to its maximum value.

Response - Adjusts how quickly the downward expanders and noise reduction process responds to the overall changes in the noise in milliseconds. Depending on the character of the noise, different settings of this control will produce varying amounts of artifacts in the signal, as the modeling process attempts to track the noise signal faster or slower.

The Response speed ranges from 0 ms to 116 ms. A setting of 116 ms (slow) specifies that the modeling process should not attempt to track very fast changes in the noise character. A setting of 0 ms (fast) specifies that the modeling process should attempt to follow every change in the noise character very closely.

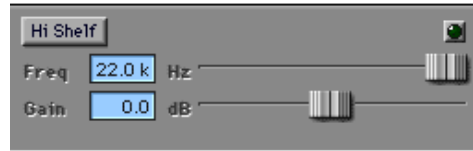
A faster setting can yield more noise removal, but it may generate more artifacts. This is similar to how a noise gate produces chatter when attempting to track highly dynamic material. A slower setting will allow slightly less noise removal, but will generate much fewer artifacts.

Release - Use in conjunction with the Response slider. It controls how quickly DINR reduces the amount of noise reduction when the amount of noise present in the audio diminishes. Release times range from 0 ms to 116 ms. Like the Response control, a faster setting can yield more noise removal, but it may also generate artifacts. You might want to avoid setting this control to its slowest position, since it will cause the noise tracking to slow to the point that the other controls seem to have no effect.

Smoothing - Controls the rate at which noise reduction occurs once the threshold is crossed. It lets you reduce the audibility of any artifacts generated in the modeling process, at the expense of noise reduction accuracy. This is done by limiting the rate of change of the Response and Release controls to the specified Smoothing setting. As soon as the frequency threshold is reached, the full NR amount value is immediately applied according to Response and Release settings. When the frequency threshold is reached, DINR will ramp to the NR Amount level. Settings range from 0 to 100%. A setting of 0% specifies no smoothing. A setting of 100% specifies maximum smoothing.

High-Shelf EQ

The High-Shelf EQ (Hi Shelf) is a noiseless filter that can be applied after noise reduction has been performed in order to compensate for a perceived loss of high-frequency content. It is unique because it operates only on the signal, not on any remaining noise. The Freq slider controls the center frequency of the filter. Values range from 20 Hz to 22 kHz.



The Gain slider controls the gain of the filter. Values range from -12 dB to $+6$ dB. The High-Shelf EQ can be enabled and disabled by clicking the Enable button.

You can also use the High-Shelf EQ to reduce the amount of high frequencies in a signal. This is particularly useful if you are working with older recordings that are band-limited, since the high-frequency content in these is probably made up of noise and not signal.

Learn



Clicking the Learn button creates a noise signature based on the audio segment currently selected on screen. There are two Learn modes: Learn First Audio mode and Learn Last Audio mode.

Learn First Audio Mode - Learn First Audio mode is the default Learn mode. It is designed for use with audio that has an identifiable noise-only section that you can locate and pre-select. To use this mode, locate and select the noise-only portion of the audio, click the Learn button, start playback, and BNR will build a noise signature based on the first 16 milliseconds of audio playback. First Audio Learn mode can be thought of as a trigger-learn mode, since noise capturing is triggered by the first audio that DINR receives.

Learn Last Audio Mode - Learn Last Audio mode is designed to let you locate and identify a segment of noise on-the-fly as you listen to audio playback. In this mode, you first Alt-click the Learn button, then initiate audio playback. When you hear the portion of audio that contains the noise you want to identify and remove, click the Learn button again. BNR will build a noise signature based on the last 16 milliseconds of audio playback. The Spectral Graph displays data in real-time in Learn Last Audio mode.

Fit



The Fit button computes a noise Contour Line with approximately 30 breakpoints to fit the shape of the current noise signature. The Contour Line can then be edited to more closely fit the noise signature or to reduce specific frequency bands by dragging, adding or deleting breakpoints.

Pressing the Up Arrow or Down Arrow keys on your computer keyboard lets you raise or lower the entire Contour Line, or a selected portion of the Contour Line. The Left/Right arrows let you move a selection left or right. To select a portion of the Contour Line with multiple breakpoints, Control-drag to highlight the desired area.

After you use the Fit function, BNR will automatically boost the entire Contour Line 6 dB above the noise signature so that all noise components of the audio file are below the Contour Line. You might want to adjust the Contour Line downwards as needed to modify the character of the noise reduction.

Super Fit



The Super Fit button creates a noise Contour Line consisting of over five hundred breakpoints in order to follow the shape of the noise signature more precisely.

Auto Fit



The Auto Fit function is designed to generate a noise curve for audio that lacks a noise-only portion for DINR to learn. Clicking Auto Fit computes this generic noise curve based on the points contained within the currently selected audio, then fits the Contour Line to it. To use the Auto Fit function, you must first make a selection in the Spectral Graph by Control-dragging.

If the selected audio has both noise and desired sound components, you can generate an approximate noise-only Contour Line by selecting a frequency range that appears to be mostly noise, then pressing the auto fit button. You can then edit the resulting noise Contour Line to optimize the noise reduction.

Scroll Left/Right



The Scroll Left and Scroll Right buttons scroll the Spectral Graph to the left or right, respectively.

Zoom Out/In



Clicking on the Zoom Out or the Zoom In button zooms in or out of the Spectral Graph. This lets you view and edit the noise contour with greater precision. If you have selected a breakpoint or breakpoints, press Alt+Start+Plus to zoom the beginning of the selection to the center of the screen. Press Alt+Start+Minus to zoom back out.

Move Breakpoints Up/Down/Left/Right



These arrows behave differently depending on whether or not there is a selection of points along the Contour Line.

No Selection - When there is no selection, the Up and Down arrows move the entire Contour Line up or down by 1 dB, respectively, and the Left and Right arrows scroll the display left and right.

With a Selection - Clicking these buttons moves a selected breakpoint or breakpoints up, down, right, or left. If there is currently a selection in the Spectral Graph, clicking the Left and Right Arrow buttons will move the selected breakpoints left or right. The Up and Down arrows will move the selected breakpoints up or down, respectively. Alt-Start key-clicking the Arrow keys on your computer keyboard performs the same function.

Undo



Clicking the Undo button undoes the last edit to the Spectral Graph Display. The Undo button does not undo changes made to slider positions.

Using Broadband Noise Reduction

Before you start using BNR, take a moment to think about the nature of the noise in your session and where it's located: Is it on a single track, or several tracks? Is it a single type of noise, or several different types? The answers to these questions will affect how you use BNR.

If there is a single type of broadband noise on a single track, insert the BNR plug-in onto the track. Solo the track to make it easier hear as you remove the noise. If a single track contains different types of noise, you might need to use more than one DINR insert to remove the other types of noise. If multiple tracks contain the same noise, you might want to bus them all to an Auxiliary Input so you can use a single DINR plug-in insert. This will minimize the amount of DSP you use.

To use Broadband Noise Reduction:

1. From the Insert pop-up on the track with the noise, select BNR. The Broadband Noise Reduction window appears.
2. In the Edit window, select the noisiest portion of the track—ideally, a segment with as little of the desired signal as possible. This will make it easier for BNR to accurately model the noise. If the track contains a segment comprised of noise only, select that portion.
3. Choose from the following:
 - a. Start audio playback, and in the Broadband Noise Reduction window, click the Learn button. BNR samples the first 16 milliseconds of the selected audio and creates its noise signature.
 - b. Locate and identify noise on the fly, during playback, using BNR's Learn Last Audio mode. To do this, Alt-click the Learn button. Begin playback, and when you hear the segment that you want DINR to sample as noise, click Learn again. BNR will build a noise signature based on the 16 milliseconds of audio immediately preceding the second click.
4. Click Fit. BNR will fit a Contour Line to the noise signature just created. If you want to create a Contour Line that follows the noise signature even more precisely, click the Super Fit button. A Contour Line with five hundred breakpoints is created.
5. To audition the effects of the noise reduction interactively, in the Edit window, select a portion of audio containing the noise. Then select Loop Playback from Pro Tools Options menu and press the Spacebar to begin looped audio playback.
6. Adjust the NR amount slider to reduce the noise by the desired amount. To compare the audio with and without noise reduction, click the Bypass button.
7. To fine-tune the effects of the noise reduction, adjust the Response, Release, and Smoothing sliders to achieve optimal results.

8. To further increase noise reduction, edit the Contour Line. The quickest way to do this is to move the entire Contour Line upwards. In the Spectral Graph, Control-drag to select the entire waveform range. Then click the Move Breakpoint Up button. The higher you move the Contour Line above the noise signature, the more noise is removed. See “Editing the Contour Line” on page 208.
9. If you feel that some of high end frequencies of the audio have been lost due to the noise reduction process, try using the High-Shelf EQ to compensate. To do this, click BNR’s Hi Shelf button and adjust the frequency and gain sliders until you are satisfied with the results.

If you are happy with the results of the noise reduction, use the Settings and Librarian menus to save the settings so that you can use them again in similar sessions.



To enable Learn Last Audio mode, Alt-click the Learn button. This button flashes red when armed for Learn Last Audio mode. When you hear the target noise, click Learn again.

Performing Noise Reduction on Audio that Lacks a Noise-Only Portion

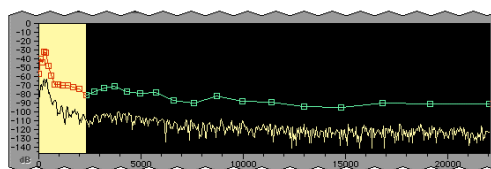
Ideally, audio that you want to perform noise reduction on will have a noise-only portion at the beginning or end of the recording that DINR can analyze and learn. Unfortunately this is not always the case, and in many recordings some amount of signal is always mixed with the noise. Obviously, analyzing such audio will produce a noise signature that is based partially on signal. Luckily, DINR has provisions for cases such as this, and this is where the Auto Fit feature comes in.

If your audio file lacks a noise-only portion for DINR to analyze, you can still obtain reasonable results by selecting and learning a segment of audio that has a relatively low amount of signal and a high amount of noise (as in a quiet passage). By then selecting a frequency range of the noise signature and using the Auto Fit function to generate a generic noise curve, you can recompute the Contour Line based on this selection.

Some editing of the newly generated Contour Line will probably be necessary to yield optimum results, since it is not based entirely on noise from your audio file. See “Editing the Contour Line” on page 208.

To generate a Contour Line for audio that lacks a noise-only portion:

1. In the Edit window, select a segment of audio with a relatively low amount of signal and a high amount of noise.
2. Click the Inserts pop-up on the track with the noise and select BNR. The Broadband Noise Reduction window appears.
3. Click the Learn button to create a preliminary noise signature.
4. Click the Fit button to fit a Contour Line to it.
5. In BNR's Spectral Graph, Control-drag to make a selection. Select points where the high-frequency noise components are most evident. In general, the flatter areas of the Spectral Graph are better, since they represent quieter areas where there is probably less signal and more noise.
6. Click the Auto Fit button. DINR computes a generic noise curve and corresponding Contour Line based on your selection. If you want to remove the selection in the Spectral Graph Display, Control-click once.
7. Follow the steps for removing the noise using the NR Amount slider and other controls, as described in "To use Broadband Noise Reduction:" on page 206.
8. Since the Contour Line is not based entirely on noise from your audio file, you might also want to edit its envelope in order to fine-tune the noise reduction. See "Editing the Contour Line" on page 208.



Noise components on the Spectral Graph

Editing the Contour Line

One of the most effective ways to fine-tune the effects of broadband noise reduction is to edit the Contour Line. The Contour Line treats audio below the line as mostly noise, and audio above the line as mostly signal. Therefore, the higher you move the Contour Line upwards, the more audio is removed.

To maximize noise reduction and minimize signal loss, the Contour Line should be above any noise components, but below any signal components. To fine-tune the broadband noise reduction, try moving individual breakpoints at

different locations along this line to find out which segments remove the noise most efficiently. For more dramatic results, try moving the entire Contour Line upwards. One drawback of the latter technique is that it will typically remove a considerable amount of signal along with the noise.

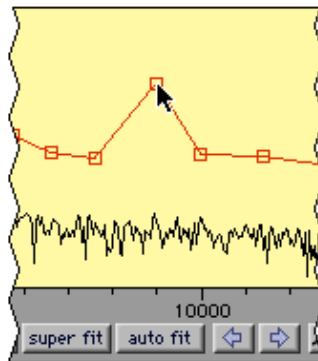
Remember that high-frequency noise components are typically more evident in the flatter, lower amplitude areas of the Spectral Graph. Try editing the Contour Line in these areas first.

To hear the changes you make to the Contour Line in real time:

1. Select the target audio in Pro Tools Edit window. Make sure the selection is at least a second or two in length. If the selection is too short, you won't be able to loop playback.
2. Select Options > Loop Playback.
3. Begin playback.

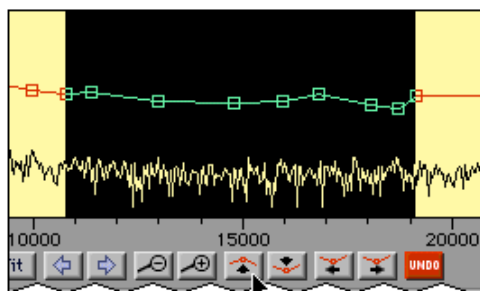
To edit the Contour Line:

1. To move a breakpoint, click directly on it and drag it to the desired position. Moving a breakpoint higher increases noise reduction at that range. Moving a breakpoint lower decreases noise reduction at that range.



Dragging a breakpoint

2. To move multiple breakpoints, Control-drag to select the desired breakpoints. Click the appropriate Move Breakpoint button (below the Spectral Graph) to move the selected breakpoints in 1 dB increments. Control-Shift-drag to extend your selection.



Moving selected breakpoints

3. To move the entire Contour Line, Control-drag to select the entire range. Click the appropriate Move Breakpoint button (below the Spectral Graph) to move the selected breakpoints in 1 dB increments. The higher you move the Contour Line above the noise signature, the more noise is removed.
4. To create a new breakpoint, click on the Contour Line.
5. To delete a breakpoint, Alt-click the breakpoint. As long as you click and hold the mouse, you will delete all breakpoints that the cursor passes over.

Using BNR AudioSuite

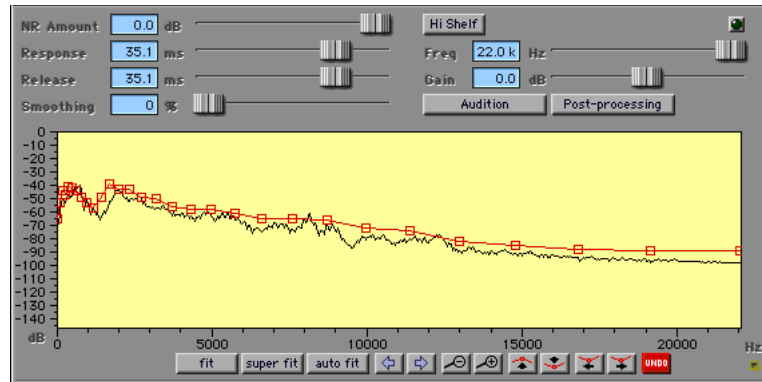
BNR AudioSuite is identical to the real-time version of BNR, with the addition of two features to enhance the noise reduction process. These features are:

Audition - Lets you listen specifically to the noise portion being removed from the target material. This makes it easier to fine-tune noise reduction settings to maximize noise reduction and minimize signal loss.

Post-processing - Applies post-processing to the audio file to help remove undesirable artifacts that are a result of noise reduction.

To enable either of these features, click the corresponding button. To disable them, click again.

BNR AudioSuite



To process a region with the BNR AudioSuite plug-in:

1. Select the desired regions in the target tracks or the Audio Regions List. Only tracks and regions that are selected will be processed.
2. From the Pro Tools AudioSuite menu, choose BNR.
3. Click Learn to capture the noise signature of the selected material. If you have selected more than one track or region, BNR will build the noise signature based on the first selected track or region when used in Mono mode, or the first two selected track or region when used in Stereo mode.
4. Click Fit or Super Fit to create a Contour Line that matches the noise signature.
5. Click Preview to begin playback of the selected material.
6. Adjust BNR controls and fine-tune the noise reduction using the techniques explained above (See [“Using Broadband Noise Reduction” on page 205.](#))
7. To hear the noise components that are being removed, click Audition. Adjusting BNR’s controls while toggling this on and off will let you fine-tune the noise reduction. It also lets you hear exactly how much signal is being removed with the noise, and adjust your controls accordingly.
8. If unwanted artifacts are generated by the noise reduction process, click Post-processing. For best results, set the Response and Release controls to zero.

To begin AudioSuite processing:

1. Adjust the AudioSuite File controls. These settings will determine how the file is processed and what effect the processing will have on the original regions. Here are some guidelines:
 - a. To process the selected region only in the track in which it appears, choose Playlist from the Selection Reference pop-up.
 - b. To process the selected region in the Audio Regions List only, choose Region List from this pop-up.
 - c. To process and update every occurrence of the selected region throughout your session, enable the Use In Playlist button (and also choose Region List from the Selection Reference pop-up).
 - d. If you do not want to update every occurrence of the selected region, disable the Use In Playlist button.
 - e. If you have selected multiple regions for processing and want to create a new file that connects and consolidates all of these regions together, choose Create Continuous File from the File mode pop-up menu.



BNR AudioSuite does not allow destructive processing, so the Overwrite Files option is not available in the File mode pop-up menu.

2. From the Destination Track pop-up, choose the destination for the replacement audio.
3. Click Process.

Chapter 6

Introduction to DigiTranslator

The DigiTranslator™ 2.0 option lets Pro Tools exchange audio, video, and sequences with other AAF, OMF, and MXF-compatible applications (such as Avid Xpress Pro).



For extensive documentation of Avid workflows, visit the Avid Web site (www.avid.com).



DigiTranslator 2.0 supports OMF version 2 files. OMF version 1 files are not supported.

AAF, OMF, and MXF Overview

Media Data (Media Files)

Media data represents raw audio or video material and is stored in individual media files. Every time you record a piece of video or audio material into an application, you are creating a media file containing media data. Audio media data is stored as “samples” (such as 44,100 or 48,000 samples per second of recording) while video media is typically stored as “frames” (24, 25, or 30 frames per second of recording).

The size of each media file depends on how much audio or video material it contains. For example, if you record ten minutes of continuous video material at a high resolution, you might end up with a video media file that is 1.8 GB in size, whereas a one minute recording at the same resolution might result in a

180 MB file. Media files tend to be large, since high quality audio and video signals are data intensive. Video data generally requires considerably more storage than audio data.

Metadata

Metadata is used to describe:

- Information about each media file. This may include sample rate, bit depth, region names, the name of the videotape from which the media file was captured, and even time code values that specify where a file was used in a Pro Tools session.
- Information about Pro Tools sessions or other *sequences*, including what files are used, where they appear in a timeline, and automation.
- For AAF or OMF sequences, metadata also includes information about unrendered AudioSuite effects (such as real-time EQ) on Avid workstations. Pro Tools skips unrendered effects on import. Rendered effects are media files, that can be imported or skipped on import into Pro Tools.
- For AAF or OMF sequences, information about automation (clip-based gain or keyframe gain).

AAF, OMF, and MXF Basics

AAF and OMF are mechanisms for storing and retrieving *media data* and *metadata* so that projects can be freely exchanged between different applications and platforms.

Media data and metadata enable an application that receives AAF and OMF sequence files (such as Pro Tools) to automatically and quickly reassemble the composition. A simple metaphor for this approach is that media data files are the pieces of a puzzle and metadata is the set of instructions for assembling the puzzle.

In the simplest case, only an AAF or OMF sequence is exchanged. If this sequence refers to “external” media data, the size of the sequence file is relatively small and the export/import process is relatively fast. AAF and OMF sequences can also have media data embedded in them. This creates a single, larger file that is slower to export and import, but which may be easier to manage than thousands of files stored on different volumes.

MXF

MXF is a media file format. There are MXF video files and MXF audio files, but there is no such thing as an MXF sequence. Pro Tools can currently import and play back MXF video files, but not MXF audio files.

AAF

AAF is a sequence format. An AAF sequence can refer to OMF and/or MXF media files, or have OMF and MXF media files embedded within it. There is no such thing as an AAF audio or video media file. Pro Tools will import, play back and export an AAF sequence that refers to external media files, but it does not support AAF sequences with media files embedded within them.

OMF

OMF is both a media file and sequence format.

OMF media files can be audio or video, and Pro Tools can import and play back OMF audio and video. Pro Tools can also export OMF audio, but not OMF video.

An OMF sequence can refer to OMF and/or MXF media files, or have OMF and MXF media files embedded within it. Pro Tools can import an OMF sequence with embedded audio, but not embedded video.

Pro Tools and Avid Terminology

Pro Tools and Avid use different terms to describe the same items. For example, a Pro Tools *session* is equivalent to an Avid *sequence*. The following table lists common Pro Tools elements and their Avid equivalents.

Pro Tools	Avid (OMF)
session	sequence
whole file region	master clip
region	subclip
plug-ins	real-time audio effects
automation	automation gain (clip-based gain or key-frame gain)



Whole audio files in the Regions List normally appear in bold type. However, master clip audio files imported from AAF or OMF into Pro Tools will not appear in bold type (indicating regions) in the Pro Tools Regions List even though they are audio files.

Embedded Media and External Media

There are two ways to handle media files when exporting OMF files: Embedded Media and External File References.



Pro Tools with DigiTranslator does not support AAF files with embedded media. Pro Tools with DigiTranslator only supports AAF export with external file references.

Embedded Media (OMF Only)

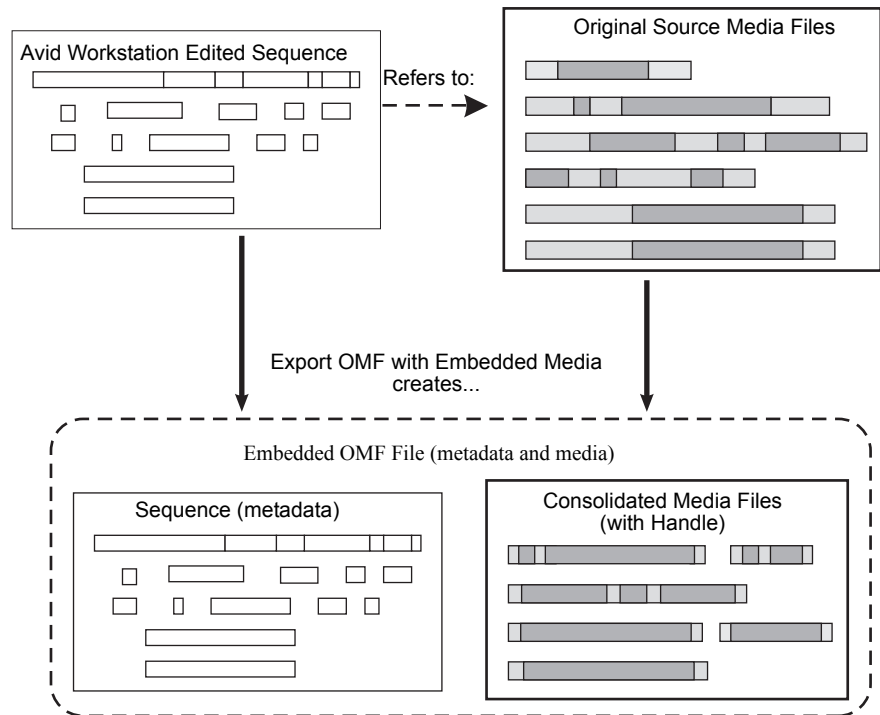
Exporting to OMF with embedded media results in one large OMF file containing both the metadata and all associated media files. However, it is important to note that OMF limits file size to 2 GB.



Pro Tools does not support embedded video.

The following illustration is a sample OMF workflow with embedded media.

OMF Interchange Workflow with Embedded Media



External File References

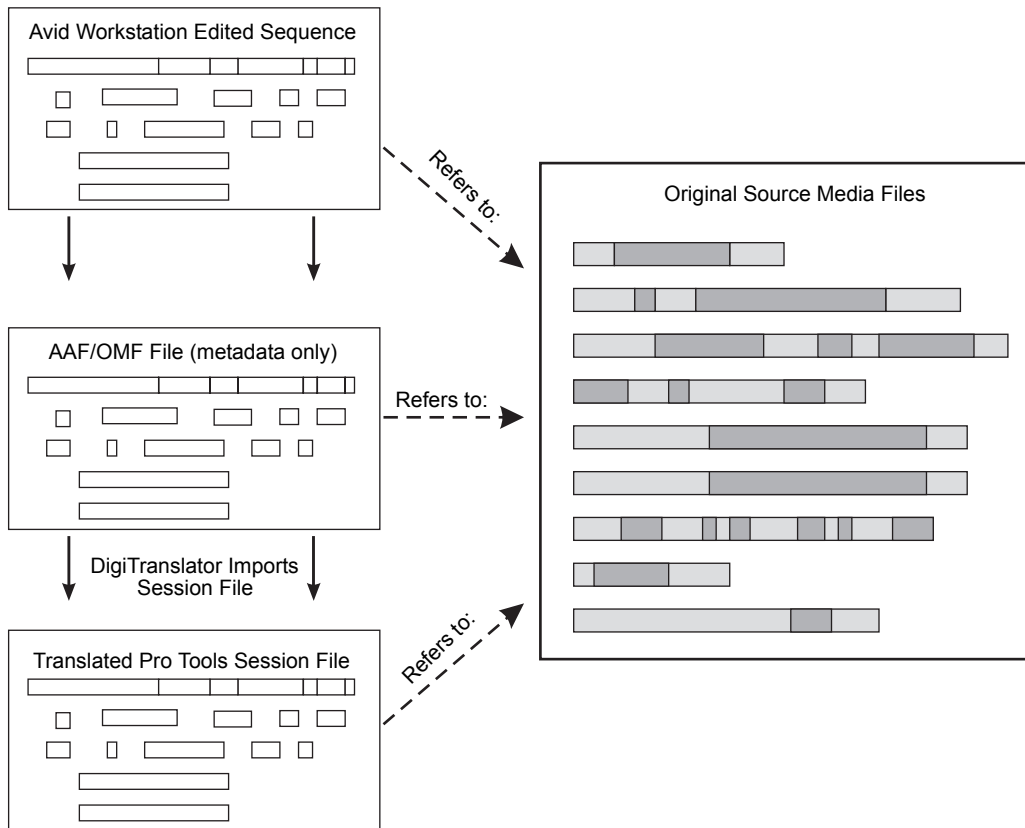
Exporting AAF or OMF with external file references results in a single metadata file (.aaf or .omf) and all associated media stored as separate files.

The main benefit to this approach is that fewer copies of media files may need to be made, so the export and import process can be much faster. Using this approach, it is less likely that you will encounter any file size limitations since the data is broken up into many smaller files.

The main disadvantage to this approach is that there are potentially many files (for example, one AAF or OMF file and hundreds of media files) that must be transported between systems.

The following illustration is a sample OMF and AAF workflow with external media.

AAF and OMF Interchange Workflow with External Media



Audio File Format Compatibility Issues

This section covers audio file compatibility issues.

AIFC Audio File Format

The Avid editing application supports audio files in the AIFC format, a version of the Audio Interchange File Format (AIFF) that supports compressed media. Although Pro Tools does not compress audio in this file format, Pro Tools can import and use this format.

Importing Audio and Video into Pro Tools

With DigiTranslator 2.0, you can import AAF or OMF sequences (including OMF sequences with embedded audio) into Pro Tools with the *Import Session Data* or *Open Session* commands. You can also drag and drop AAF or OMF sequences from any DigiBase browser. (For more information about DigiBase, see the electronic pdf of the *DigiBase Guide*.)

Individual MXF and OMF video files, or Quicktime movies, can be imported into Pro Tools with the *Movie > Import Movie* or *Import Session Data* commands.

Individual MXF and OMF video files, as well as Quicktime movies can be imported into Pro Tools with the *Movie > Import Movie* or the *File > Import Session Data* commands.

OMF audio files can be imported into Pro Tools with the *Import Track*, *Import Audio to Track*, or *Import Audio* commands. (For more information about importing audio, see [“Importing Audio” on page 166](#), or the electronic pdf of the *Digidesign Reference Guide*.)

You can also drag and drop audio files from any DigiBase browser. (For more information about DigiBase, see the electronic pdf of the *DigiBase Guide*.)

Opening an AAF or OMF Sequence

You can open and import AAF or OMF sequences directly into Pro Tools with the DigiTranslator 2.0 Option.

There are two kinds of AAF and OMF sequences:

- AAF and OMF sequences that refer to other media files.
- AAF and OMF sequences that contain embedded media.

Pro Tools can open and import AAF sequences that refer to other media files, but AAF sequences that contain embedded media cannot be imported into Pro Tools. If a known AAF sequence appears in a DigiBase browser as Kind Unknown, it is likely an embedded AAF sequence, or it was incorrectly exported. Embedded AAF sequences are not supported in Pro Tools and cannot be imported.



If you plan to perform perf-based edits with a film project in Avid Xpress Pro, you should capture all media as OMF, and choose OMF instead of AAF when exporting a sequence for use in Pro Tools. Pro Tools does not recognize perf-based edits in an AAF sequence, and will place the audio at the full frame boundary. If you decide to use OMF media in your project, be sure to transcode master clips to MXF before exporting to Avid 3D.

When opening and importing an AAF or OMF sequence, the New Session dialog box opens, prompting you to name and save the sequence as a new session. Once you name and save the new session, the Import Session Data dialog box opens. For more information, see [“AAF/OMF Translation Settings” on page 226](#).

If your AAF sequence was exported from Avid Xpress Pro using the Send To Pro Tools LE template, you will have one of the following AAF sequences, depending on the template you used:

- Avid Pro Tools LE (002) template — One AAF file that references the audio and video media files used in the sequence.
- Avid Pro Tools LE (Mbox_Ref) template — One AAF file that references the audio files in the sequence and a QuickTime Reference movie.
- Avid Pro Tools LE (Mbox_Mov) template — One AAF file that references the audio media files used in the sequence and a QuickTime movie.

Importing Sequences in a New Session with the Import Session Data Command

The steps in this section are based on a workflow of importing an AAF sequence that was previously exported from Avid Xpress Pro (using the Send To Pro Tools LE template).

To start a new session in Pro Tools LE:

1. Launch Pro Tools LE.
2. Choose File > New Session.

The Name the Session dialog box opens.

3. In the Save In area, navigate to the location where want to create a new folder for the session. This location must be a Basic drive. Dynamic (striped) drives are not supported for Pro Tools session of audio files.
4. In the File Name area, type in a name for the session. Pro Tools LE uses this name to crete a new folder and new session.
5. In the Session Parameters area, set the following parameters.
 - Audio File Type (Audio File Format in Avid Xpress Pro)
 - Sample Rate
 - Bit Depth



Use the same values that you used when you exported the files from Avid Xpress Pro.

6. Click Save.



Pro Tools will create an Audio Files folder, a Fade Files folder, a Video Files folder, a cache.wfm file, and a session file in the same folder as the AAF or OMF sequence.

To import the sequence files into your Pro Tools LE session.

1. Select File > Import Session Data.

The “Choose a file to import session data from” dialog box opens.

2. Navigate to the AAF file that you want to import.
3. Click Open.

The Import Session Data window opens.

4. Select the following selections:
 - Audio Media Options - Link to source media (where possible)
 - Video Media Options - Link to source media



For information on other parameters, see “Importing AAF or OMF Tracks into Pro Tools” on page 223.

5. Click Ok.
6. If the source media has a different frame rate than the Session, Pro Tools prompts you to allow it to change the frame rate for the project to the session frame rate. Click Ok.
7. If your audio source media is on a Dynamic disk drive, Pro Tools displays a dialog box that allows you to copy the media to a Basic disk drive. Click Yes.
8. If you are importing files created by the Mbox_Ref or Mbox_Mov templates, do the following:
 - ▶ Select Movie > Import Movie.
The “Select Video Files to Import” dialog box appears.
 - ▶ Navigate to the QuickTime Reference movie or QuickTime movie that you created when you performed the Send To operation in Avid Xpress Pro.
 - ▶ Click on the movie.
Pro Tools LE creates a track for the movie in the timeline and displays the movie a a QuickTime movie window.

Now you are ready to edit the audio files in Pro Tools LE.

Importing Sequences with the Open Session Command

To open and import an AAF or OMF sequence in Pro Tools:

1. Choose File > Open Session.
2. Select the AAF or OMF sequence you want to import.
3. Click Open.



You can also double-click the AAF or OMF sequence that you want to open and import in any DigiBase browser.

4. You will be prompted to name and save the imported sequence as a new session. After you click Save, the Import Session Data dialog box opens. Select the session data, media, and import settings parameters you want, and click OK. For more information, see [“Importing AAF or OMF Tracks into Pro Tools” on page 223](#).



When you are prompted to save the new session, create a new folder and save the session to that folder. Pro Tools will create an Audio Files folder, a Fade Files folder, a Video Files folder, a cache.wfm file, and a session file in the same folder as the AAF or OMF sequence.

5. If you are opening an OMF sequence that contains embedded video, click Skip All when prompted to locate the video files.



Pro Tools does not support embedded video.

If you are opening an OMF sequence created on an Avid system you might be prompted to locate Fade files. It is recommended that you choose to Skip All Fades because fades created on an Avid system are not compatible with Pro Tools. Pro Tools always recreates all fades.



If there are any errors, region name truncations, or other notes (such as missing effect renderings), during the import, a dialog box appears asking you if you want a detailed report of the changes. Click Yes and choose where you want to save the log. The log is a text file that you can open in any text editing application.



Every AAF and OMF file has a file name and unique identifier stored in the AAF and OMF metadata, and a name which is displayed in the finder. Truncating a region name in the translation process will not change the AAF or OMF file name or unique ID.

Importing AAF or OMF Tracks into Pro Tools

To import AAF or OMF tracks into Pro Tools:

1. Create a new Pro Tools session or open an existing session.
2. Choose File > Import Session Data.

3. Select the AAF or OMF sequence which contains the tracks you want to import.

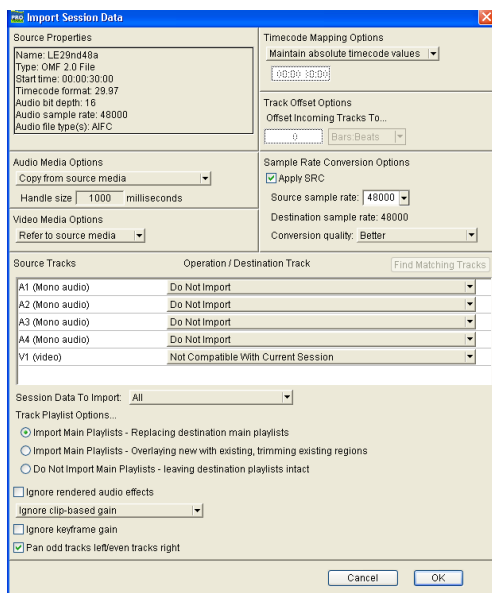


You can drag and drop AAF or OMF sequences from the Workspace browser to the Timeline.



Pro Tools does not support embedded AAF. AAF sequences with embedded media will display unknown in the Type column in DigiBase browsers.

4. Deselect any source tracks that you do *not* want to be imported. (If you are importing Session Data from AAF or OMF sequences, all tracks are selected by default. If you are importing tracks from a Pro Tools session, no tracks are selected by default.)



Shift-click to select multiple contiguous tracks, and Control-click to select multiple non-contiguous tracks.

5. Select the desired AAF/OMF translation settings (see [“AAF/OMF Translation Settings”](#) on page 226).
6. Select the desired Audio Media Options, if any (see [“Audio Media Options”](#) on page 228).

7. Select the desired Sample Rate Convert Options, if any (see “[Sample Rate Conversion Options](#)” on page 229).
8. Select the desired Time Code Mapping Options, if any (see “[Time Code Mapping Options](#)” on page 231).
9. Select the desired Track Offset Options, if any (see “[Track Offset Options](#)” on page 232).
10. Click OK.

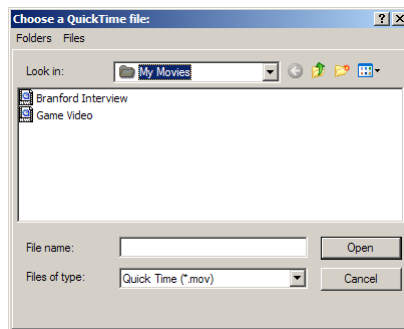


If there are any errors or region name truncations, a dialog box will appear asking you if you want a detailed report of the changes. Click Yes and choose where you want to save the log.

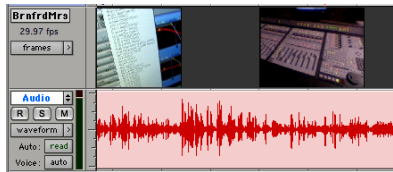
Importing an MXF or OMF Video File, or QuickTime Movie into Pro Tools

To import an MXF or OMF video file, or QuickTime movie into Pro Tools:

1. Launch Pro Tools and create a new session, or open an existing one.
2. Check the time code settings of the session to make sure they match those of the movie you want to import, and save the session.
3. Choose Movie > Import Movie.



4. Select the movie and click Open. Pro Tools imports the movie and displays it in its own Movie track in the Edit window as well as in a floating Movie window. The first frame of the movie is automatically placed at the start time of your session.



5. Select the movie and click Open. Pro Tools imports the movie and displays it in its own Movie track in the Edit window as well as in a floating Movie window.

MXF and OMF video are automatically spotted to the location they were placed in the Avid sequence (their original timestamp). QuickTime movies are always automatically spotted to the start of the session.

Import Options

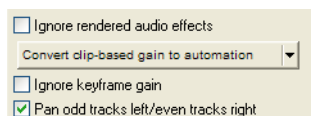
When importing AAF or OMF sequences, Pro Tools provides several import options through the Import Session Data dialog box:

- AAF/OMF Translation Settings
- Audio Media Options
- Sample Rate Convert Options
- Time Code Mapping Options
- Track Offset Options

AAF/OMF Translation Settings

DigiTranslator 2.0 provides specific options for “translating” audio clips when importing AAF sequences or OMF files and sequences.

Translation settings



Ignore Rendered Audio Effects

Enabling the Ignore Rendered Audio Effects option imports clips as audio regions without the rendered effects, such as EQ, that are applied to the clip. You might do this if you want to use Pro Tools audio effects and audio processing exclusively for your audio post production work. The resulting audio with this setting is the unprocessed source material.

Clip-Based Gain

Avid products provide clip-based gain to adjust the volume of an individual audio clip. This differs from Pro Tools volume adjustments for an entire track, or volume breakpoint automation. You can use Digi 002's Clip-Based Gain pop-up menu to map clip-based gain settings to Pro Tools breakpoint automation, to process audio to include clip-based gain, or to ignore clip-based gain entirely.

Ignore Clip-Based Gain

Use this setting to discard the project's clip-based gain settings, and adjust volume using Pro Tools mixing capabilities.

Convert Clip-Based Gain to Breakpoint Automation

Clip-based gain is translated to breakpoint automation in Pro Tools. Breakpoint automation is ramped across crossfades. Clip-based gain exceeding +6 dB will be ignored by versions of Pro Tools earlier than 6.4.

Ignore Keyframe Gain

Enable the Ignore Keyframe Gain option to discard the project's keyframe gain settings. Disable the Ignore Keyframe Gain option (it is disabled by default) to translate keyframe gain to breakpoint automation in Pro Tools. Keyframe gain exceeding +6 dB will be ignored by versions of Pro Tools earlier than 6.4.

Pan Odd Tracks Left/Even Tracks Right

Although pan automation is translated into Pro Tools pan automation breakpoints, a track's default pan setting may not be translated (for example, from Media Composer). The Pan Odd Tracks Left/Even Tracks Right setting enables you to set the basic track pan setting so that odd-numbered tracks

translate with full-left panning, and even-numbered tracks translate with full-right panning. This is useful if some or all of the audio does not have keyframe automation associated with it, and you want to pan the currently unpanned audio full-left or full-right.

Audio Media Options



When importing AAF or OMF tracks into Pro Tools, use the Source Media pop-up menu to copy, consolidate, or refer to the source audio media.

Refer to Source Audio Media (Where Possible)

This setting instructs DigiTranslator to translate the OMF file to a Pro Tools session that refers to as many of the original media files as possible. In this case, the Pro Tools session points to the BWF (WAV), AIFC, or SDII files from the source project. This setting will not duplicate, copy, or make any duplicates of media.

Copy Source Audio Media

Use this setting to copy referenced audio to a new drive or folder.

You can perform sample rate conversion on the audio during this translation.

Consolidate Source Audio Media

Use this setting to copy the audio from the source project to the Pro Tools session, while removing all unused areas in the copies. For example, you might only be using ten seconds of a ten-minute audio file in your project. Consolidating this audio saves a great deal of disk space by preserving only the audio you use and a user-defined amount of *handle*, and discarding the rest.

You can sample-rate convert the audio during this translation.

Consolidate Handle Length (ms)

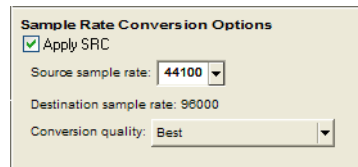
If you have selected Consolidate Source Audio Media, you can specify the number of milliseconds of each original audio file to retain both before and after the region boundaries defined in the source project. This enables you to extend region boundaries even after you’ve consolidated, by the amount you specify.

It’s a good idea to have at least 1000 milliseconds of handle, so you can “trim out” edits that sound “clipped” or “up-cut.”

Force Audio Media to Target Session Format

Use this setting to convert source media to the session audio file format if the source media file format differs from the session file format.

Sample Rate Conversion Options



These settings let you convert the sample rate of the session’s audio files. For example, you can convert from 48 kHz to 44.1 kHz, or from 44.1 kHz to 48 kHz. Digi 002 support sample rates higher than 48 kHz (88.2 kHz and 96 kHz). These settings also enable you to convert to compensate for the 0.1% speed change (pull-up or pull-down) between 24 fps film and 29.97 fps NTSC video, or the 4% speed change (pull-up or pull-down) between 24 fps film and 25 fps PAL video.

See [“Speed Correction for Film, NTSC Video, and PAL Video Using Digi 002” on page 249](#), for information about converting between different speeds and sample rates.

Source Audio Sample Rate

This setting enables you to specify the sample rate of the material you are working with in Pro Tools, independent of the project sample rate settings.

For example, you might receive a project originated on an Avid editing system at 44.1 kHz. If you want to work at 48 kHz in Pro Tools, you should set the Source Audio Sample Rate setting to 44,100 and the Destination Audio Sample Rate to 48,000.

These settings can also be used to correct for pull-up or pull-down problems. For example, you might receive an OMF transfer from a Film Composer that contains audio media at “film speed” when played back at 48 kHz. You might want to convert all the audio files and edits to play back at NTSC video speed and 48 kHz.

In this case, set the Source Audio Sample Rate setting to 47,952 and the Destination Audio Sample Rate to 48,000. These settings tell Digi 002 that you want to fit 47,952 of the original “film speed” samples into 48,000 of the new “video speed” samples. With these settings, you sample-rate-convert the material to NTSC video speed.

You can set the Source Audio Sample Rate either by selecting one of the predefined sample rates from the pop-up menu, or by typing a value into the text box.

Destination Audio Sample Rate

This setting determines the target session’s sample rate setting, as shown in the Session Setup window, and the sample rate of all audio files in the target session. Available settings include Pro Tools standard sample rates of 44.1 kHz or 48 kHz. Pro Tools|HD systems support sample rates higher than 48 kHz (88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz).

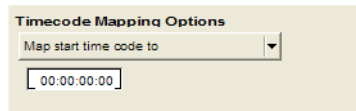
See [“Speed Correction for Film, NTSC Video, and PAL Video Using Digi 002” on page 249](#), for information about converting between different speeds and sample rates using Digi 002.

If this setting differs from the Source Audio Sample Rate setting, audio is sample-rate converted digitally to the Destination Audio Sample Rate.

Sample Rate Conversion Quality

These settings correspond to Pro Tools sample rate conversion settings. The “Tweak Head (Slowest)” setting provides the best results.

Time Code Mapping Options



You can specify where the imported tracks are placed in the current session. Times are indicated in time code for TDM systems or Pro Tools LE systems with the DV Toolkit option, and minutes:seconds for Pro Tools LE systems.

Maintain Absolute Time Code Values

This option places tracks at the locations where they were located in the source session. For example, if the current session starts at 00:01:00:00, and the session from which you are importing starts at 10:00:00:00, the earliest imported tracks can appear in your session is 9 hours and 59 minutes after the start of the session.

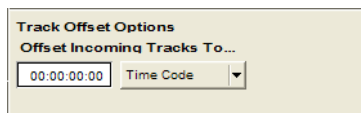
Maintain Relative Time Code Values

This option places tracks at the same offset from session start as they had in the source session. For example, if the source session starts at 01:00:00:00 and contains a track that starts at 01:01:00:00, and the current session start is 02:00:00:00, the track will be placed at 02:01:00:00 in the current session.

Map Start Time Code to hh:mm:ss:ff

This option places tracks relative to their original session start time. For example, if the current session starts at 00:01:00:00, and the session from which you are importing starts at 10:00:00:00, you can reset the start time code to 00:01:00:00, to avoid placing files 9 hours and 59 minutes from the start of your session.

Track Offset Options



Specify a track offset in addition to any offset incurred with the Time Code Mapping options. Any imported audio is offset in the current session's timeline by the specified amount. Values can be entered in Minutes:Seconds, Bars|Beats, Samples, Time Code, or Feet/Frames.

Exporting AAF and OMF from Pro Tools

You can export AAF and OMF files from Pro Tools with the DigiTranslator 2.0 Option using the *Bounce to Disk*, *Export Selected as Files*, and *Export Selected Tracks as OMF/AAF* commands.

Pro Tools with the DigiTranslator 2.0 Option exports specific information about AAF sequences and OMF files and sequences. AAF sequences and OMF sequences and files exported from Pro Tools only retain time code addresses, region names, and definitions.

AAF and OMF sequences exported from Pro Tools do not support video files, or retain information about plug-in assignments or parameters, routing, or grouping. It is recommended that you render any effects prior to export. Pro Tools does export volume automation to AAF and OMF, but only if the Quantize edits to frames boundaries option (Avid Compatibility Mode) is disabled.

Export Selected Tracks as OMF/AAF Sequences

Use Export Selected Tracks as OMF/AAF to export individual tracks or an entire Pro Tools session in AAF or OMF format.



Tracks are exported in their entirety and time selections are ignored.



Volume and pan automation is not retained on export if Quantize Edits to Frame Boundaries is enabled (Avid Compatibility Mode).



The Movie track cannot be exported to AAF or OMF from Pro Tools.

The steps in this section use the Avid Xpress Studio workflow of exporting an AAF sequence from Pro Tools.

To export selected audio tracks from Pro Tools LE as an AAF (or OMF) sequence:

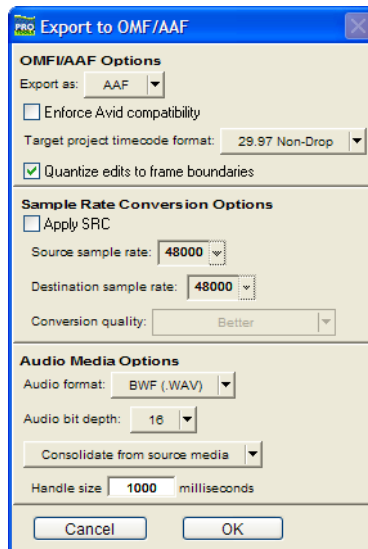
1. Select the tracks in the Pro Tools LE session (choose either mixed or unmixed files).



Shift-click to select multiple tracks. Alt-click to select all tracks.

2. Select File > Export Selected Tracks as OMF/AAF.

The Export to OMF/AAF dialog box appears.



3. In the OMF/AAF Options area, choose OMF (or AAF) from the Export As pop-up menu, and click Enforce Avid Compatibility.

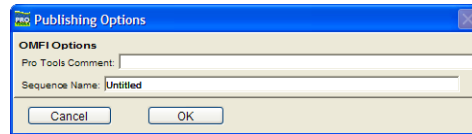


Enforce Avid Compatibility limits the sample rate options to 44.1 or 48 kHz. Dithering without noise shaping will be applied to files being exported from 24-bit to 16-bit.

4. Check that the Target project timecode format is correct for the Avid Xpress Pro project.

This is probably correct because Pro Tools LE automatically detected the value when you imported the AAF file into Pro Tools LE.
5. In the Audio Media Options area, ensure that the Audio format and Audio bit depth match your Avid Xpress Pro Audio settings.
6. Choose Consolidate from source media from the pop-up menu.
7. Click OK.

The Publishing Options dialog box appears.



8. Enter the Pro Tools comment and sequence name.

Pro Tools LE creates a sequence with the name you supply. The Pro Tools comment appears in the Avid Xpress Pro bin in a Pro Tools Comment column.

9. Click OK.

The Name the OMFI file to export dialog box appears.

10. Navigate to a folder where you can easily locate the Pro Tools composition when it is time to import it into Avid Xpress Pro.
11. Click Save

The Please choose a folder for converted audio files dialog box appears.

12. Navigate to an OMFI MediaFiles folder.
13. Click Use Current Folder.

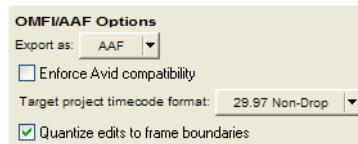
Pro Tools LE exports the composition to the Import Audio Files folder and exports the related media to the OMFI MediaFiles folder.

14. If you are ready to import the files into Avid Xpress Pro, exit Pro Tools LE.

Translation Settings

DigiTranslator 2.0 provides several translation settings when exporting tracks to OMF/AAF, including OMF/AAF Options, Sample Rate Conversion Options, and Audio Media Options.

OMF/AAF Options



Enforce Avid Compatibility

If the Enforce Avid Compatibility option is enabled, all AAF sequences and OMF files and sequences will meet the specific requirements of Avid Video workstations. Sample rates are limited to 44.1 kHz or 48 kHz. Exported regions will be padded to the nearest frame boundaries (Quantize Edits to Frame Boundaries). This padding ensures that the placement of a file in the Avid timeline will be the same on sample-accurate as well as frame-accurate systems.

Target Project Time Code Format

Select the time code format for the project into which this file or sequence will be imported. This may be different from the time code format of the current session. This parameter allows regions to be placed correctly in sessions with different time code formats, and also calculates how many samples must be added to pad regions to frame boundaries.

Quantize Edits to Frame Boundaries

Pro Tools allows sample-accurate placement of regions. In Pro Tools, you can place a region of any length at any position, without any requirement for aligning regions with frame boundaries.

However, most video editing programs, such as Media Composer, only support frame-accurate editing. In these programs, you can only edit sounds on whole frame boundaries, limiting your precision.

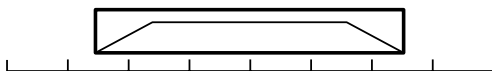
Selecting Enforce Avid Compatibility will automatically select Quantize Edits to Frame Boundaries.

The Quantize Edits to Frame Boundaries setting allows Digi 002 to export your sample-accurate Pro Tools edits into an OMF file so they appear as frame-accurate. See the following figures.

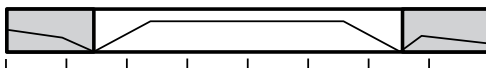


The Quantize Edits to Frame Boundaries setting must be selected when you are translating your Pro Tools session for use in frame-accurate editing workstations. Therefore, it is automatically selected whenever you export tracks with Enforce Avid Compatibility checked.

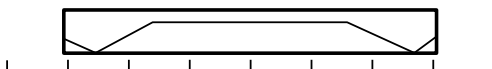
Original Region



Region Exported with Handles



Subclip: Region Stretched to Farthest Frame Boundaries



Subclip with OFFs (One Frame Files) Laid Over End Frames



When you quantize edits to frame boundaries, you must enter the desired handle length (under Audio Media Options). See [“Source Media” on page 240](#).

A master clip consisting of the region plus the handle length on both front and back will be exported. The exported sequence creates a subclip which is equivalent to the original region, but extended to the farthest frame boundaries. For example, if the region starts at 1:15 and 500 samples, the subclip would start at 1:15; and if the region ends at 4:00 and 500 samples, the subclip would end at 4:01.

Because quantizing edits to frame boundaries extends the regions, extra undesired audio may be heard. To prevent this extra audio from playing, special one-frame sound files are rendered to duplicate the original boundaries of the region. In the exported sequence, these one-frame files are placed over the start and end frames of the extended region so you cannot hear the extension.

One-frame files (OFFs) are imported into Avid workstations as part of the OMF sequence like any other sound file. In the Avid Timeline, they appear as one-frame edits on either side of a subclip.

If you decide you need to extend the subclip at any point, discard the OFF and trim the subclip as needed.

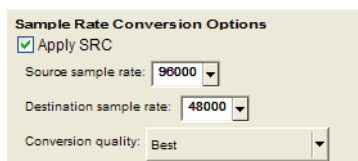


This solution is only available when you export a sequence, not when you export individual files.



If Quantize Edits to Frame Boundaries is selected, Pro Tools volume automation will not be exported.

Sample Rate Conversion Options



These settings allow you to convert the sample rate of your Pro Tools session during export to AAF or OMF by sample-rate converting each audio file, and adjusting the edits in the resulting AAF or OMF file to compensate for this change.

See [“Speed Correction for Film, NTSC Video, and PAL Video Using Digi 002” on page 249](#), for information about converting between different speeds and sample rates using Digi 002.

You might want to change the sample rate of a session if you are exporting to a system or are at a stage in the process that requires a different sample rate.

Check the Audio and Video pull options before applying a sample rate conversion to the entire session.

As another example, you might use Sample-Rate Conversion if you record and edit 48 kHz voice-over files in sync with 29.97 fps video, then need to export these edited files to a Film Composer system that plays back at 24 fps and 44.1 kHz.

In this case, set the Source Audio Sample Rate setting to 48 kHz and the Destination Audio Sample Rate to 44.1 kHz. These settings tell DigiTranslator that you want to fit 48,000 of the original “video speed” samples into 44,100 of the new “film speed” samples. With these settings, you instruct Digi 002 to pull up the material to film speed and sample-rate convert to 44.1 kHz.

Source Audio Sample Rate

This setting allows you to specify the sample rate of the material you are working with in Pro Tools, independent of the session’s sample rate settings.

Destination Audio Sample Rate

This setting allows you to specify the sample rate for audio files after the AAF or OMF translation.

If this setting differs from the Source Audio Sample Rate setting, audio is sample-rate converted digitally to the Destination Audio Sample Rate.

Sample Rate Conversion Quality

These settings correspond to Pro Tools sample rate conversion settings. It is not recommended that you use the “Low (Fastest)” setting. The “Tweak Head (Slowest)” setting provides the highest quality sample rate conversion.

Audio Media Options



Audio Format

Choose whether you want the resulting OMF file to refer to BWF (.WAV), AIFF, or embedded files. The audio files will be converted accordingly.



If you create AIFF or BWF (.WAV) audio, the audio files have extra OMF data attached to them. Though most applications will not have problems reading these audio files, they may not be compatible with all applications.

Audio Bit Depth

Select 16-bit or 24-bit as the target bit-depth for the exported media. Pro Tools will apply the AudioSuite dithering algorithm, without noise shaping, when reducing bit-depth from 24-bit to 16-bit.

Source Media

When exporting tracks from Pro Tools to OMF, there are three ways that DigiTranslator can handle source audio media (as set in the Export to OMF/AAF dialog box's Audio Media Options pop-up menu).

Refer To Source Media - Creates an OMF file that refers to as many of the original media files as possible. In this case, the OMF file points to the BWF (.WAV), AIFC, or Sound Designer II files from the source project.

Copy From Source Media - Copies audio to another drive or folder. You can sample-rate convert the audio during this translation.

Consolidate From Source Media - Copies only the part of the files that are actually used by the session. For example, you might only be using a ten second region of a ten-minute audio file in your session. Consolidating this audio saves a great deal of disk space by copying only the audio you use, and discarding the rest.

Consolidate Source Audio Media is the only usable option for a Pro Tools to OMF translation when Quantize Edits to Frame Boundaries is selected. See [“Quantize Edits to Frame Boundaries” on page 235](#).

Consolidate Handle Length (ms) - Specifies the number of milliseconds of the original audio file to retain at the beginning and end of each audio clip that is created. This allows you to extend clip boundaries even after you've consolidated, by the amount you specify. It's a good idea to have at least 1000 milliseconds (one second) of handle, so you can “trim out” edits that sound “clipped” or “up-cut.” Consolidate Handle Length is only available when Consolidate From Source Media is selected.

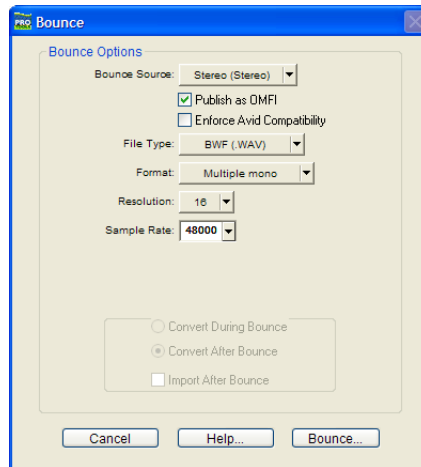
Bounce to Disk (OMF Only)

Use the Bounce to Disk command to export selections of all audible audio from the Timeline to OMF. This method is useful for rendering real-time plugins and automation on export.

To export to OMF using Bounce to Disk:

1. In Pro Tools, prepare the session for bouncing to disk and make the desired selection to bounce to disk.

2. Choose File > Bounce to Disk.

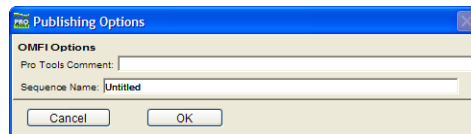


3. Select Publish as OMF.
4. If desired, select Enforce Avid Compatibility.



Enforce Avid Compatibility limits the sample rate options to 44.1 or 48 kHz. Dithering without noise shaping will be applied to files being exported from 24-bit to 16-bit.

5. Click Bounce to open the Publishing Options window.
6. In the Publishing Options dialog box, enter the Pro Tools Comment and Clip Name.



7. Click OK to complete the export.

All audible audio in the selection will be exported to multi-mono OMF files.

Export Selected as Files (OMF Only)

Use the Export Selected as Files command to export individual regions from the Regions List in OMF format. Regions exported to OMF from the Regions List will not render any real-time effects (plug-ins) or track automation.

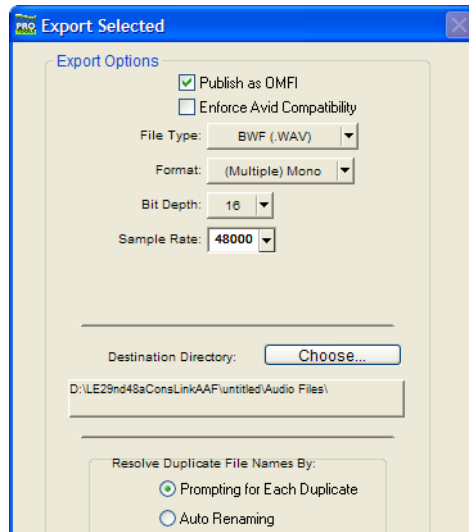
To export selected regions as files:

1. Select the regions you want to export in the Regions List.



Shift-click to select multiple regions.

2. Choose Export Selected as Files from the Audio Regions List pop-up menu.



3. From the Export Selected dialog box, check Publish as OMF.
4. If desired, select Enforce Avid Compatibility.



Enforce Avid Compatibility limits the sample rate options to 44.1 or 48 kHz. Dithering without noise shaping will be applied to files being exported from 24-bit to 16-bit.

5. Select a location for the Destination Directory.
6. Click Export.

7. In the Publishing Options dialog box, enter the Pro Tools Comment and Clip Name, and select the Target Project Time Code Format. If you selected more than one region for export, the Clip Name field will not be available and DigiTranslator will use the names of the regions for the exported files.
8. Click OK to complete the export.

OMF Export Options

- Publish As OMF
- Enforce Avid Compatibility

Publish As OMF

If the Publish As OMF option is enabled, any files and sequences you export will contain the AAF or OMF information required for interchange with Avid and other AAF or OMF-compatible applications.

To ensure OMF compatibility:

- Limit file type to AIFF and BWF (.WAV).
- Limit format to (Multiple) Mono.
- When you Bounce to Disk, choose Convert After Bounce.

Enforce Avid Compatibility

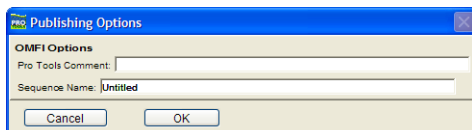
If the Enforce Avid Compatibility option is enabled, all OMF files and sequences will meet the specific requirements of Avid Video workstations.

When Enforce Avid Compatibility is enabled:

- Sample rates are limited to 44.1 kHz or 48 kHz.
- When exporting an OMF sequence from Pro Tools, exported regions will be padded to the nearest frame boundaries. While Pro Tools allows sample-accurate editing of up to 1/192,000th of a second with Pro Tools|HD systems, many video editing systems only allow edits on frame boundaries (depending on the frame rate, approximately every 30th of a second). This padding ensures that the placement of a file in the Timeline will be the same on sample-accurate as well as frame-accurate systems.

Publishing Options

When exporting OMF files from Pro Tools, specific OMF publishing options that provide information about the OMF sequence or media are available through the Publishing Options dialog box. These options will vary depending on which method of exporting OMF files you user.



OMFI Options

Pro Tools Comment - Identifies the source of the file, and defaults to the name of the current session. The Pro Tools Comment field does not appear if you are using the Export Selected as Tracks command, since audio on one track may have many different sources.

Sequence Name - This is the name that will be displayed when the file is imported into another AAF- or OMF-compatible program. The sequence name is not the file name that will appear in the finder. This field defaults to the Pro Tools region name. When exporting more than one region, all clip names are automatically set to the region name.

Timestamping

When you export to AAF or OMF, all exported OMF media is *time stamped*. A timestamp is a specific time code location stored within an individual media file.

The timestamp can indicate:

- Time Code location on the source tape
- Where the file was originally recorded in the Pro Tools Timeline
- Where a region was placed in an Avid or Pro Tools Timeline
- User entered time codes

Timestamps can be stored in three different places within a media file:

- In a region definition
- In the file format metadata (for example, .WAV file wrappers)
- In the AAF or OMF wrapper

Exporting a Region

If you are exporting a region, the timestamp will be the start point of the region, relative to the point where the file originally started to record. For example, if you record a file from 1:00 to 1:30, then trim it to start at 1:15, the timestamp for the exported region would be 1:15. This is true even if the region is slipped elsewhere in the Timeline.

Exporting a Region as Part of a Sequence

When you export a region as part of a sequence, the region's original timestamp reflects the region's position in the Timeline of the sequence.

Exporting a File

Recorded in Pro Tools - If the file was recorded in Pro Tools, the timestamp is the location in the Timeline at which the recording began. For instance, if you record the file from 1:00 to 2:00, the timestamp would be 1:00.

AudioSuite with Playlist - If the file was created by AudioSuite, using the Playlist option, the timestamp is the location in the Timeline to which the source region was spotted. For example, if you record a file from 1:00 to 2:00, then move it to start at 4:00, the file would be duplicated, processed with the plug-in and the new timestamp for the duplicate would be 4:00.

AudioSuite with Region List - If the file was created by AudioSuite, using the Region List option, the timestamp reflects the original timestamp of the source file. For example, if you record a file from 1:00 to 2:00m then trim it to start at 1:15, the file is duplicated, processed with the plug-in, and the new timestamp is 1:15.

Existing Timestamp - If a file is imported with an existing timestamp, it will remain the timestamp for the exported file as well. If the original file contained a timestamp in the format wrapper, it will be copied to the OMF wrapper when exported.

Exporting a File With No Timestamp

If you import a file that does not contain a timestamp (such as a sound effect from a CD), the timestamp will be 0 when it is exported.

Importing Files from an Avid AAF or OMF Sequence

If you import a file from an Avid AAF or OMF sequence, the media file's source tape timestamp becomes the original timestamp of the new Pro Tools file. The User Timestamp maintains the original timestamp.



DigiBase provides columns for specific Avid OMF metadata, including: Clip Name, Tape, FPS, Original Timestamp, and User Timestamp.

DigiTranslator Reference Information

Translation Notes File

If there are any errors, region name truncations, or other notes (such as missing effect renderings), during import of an AAF sequence or OMF file or sequence, a dialog box appears asking if you want a detailed report of the changes. Click Yes and choose where you want to save the translation notes file.

The Translation Notes File can be opened by most word processing applications that can read plain text files.

Translation Notes Format

Translation Notes are presented in the following format:

Track Name <Time Code Start–Time Code End> “clip name (if available)”;
message

Translation Notes and Categories

The Translation Notes File is separated into different categories. The following are sample messages in each category, with explanations of what has happened and solutions if necessary.

Parsing Errors

Example

A1<01:00:00:00–01:00:04:20>

error reading component “Assertion in OMF_Objects2x.cpp”, line 2871;
substituting fill

This error indicates a problem that may have originated in Digi 002 or the application that produced the OMF file. In the translated composition, there will be silence or video black at the given interval.

Missing Renderings

Example 1

A1<01:00:02:00–01:00:07:01>

no rendering for effect:EFF_AUDIO_EQMB;
using bypass clip

This indicates the presence of an effect for which there is no rendering. The “bypass clip” is the (unprocessed) source material for the effect.

Example 2

V1<01:00:48:25–01:00:49:26>

no rendering for effect: omfi:effect:
VideoRepeat;substituting silence/video black

For some effects, the length of the output is different than the length of the input. In this case, substituting a bypass when a rendering is missing doesn't make sense, because it won't sync properly. Digi 002 substitutes silence or video black.

Ignored Effects

A1<01:00:02:00–01:00:07:01>

ignoring rendering for effect: EFF_AUDIO_EQMB;using bypass clip.

This indicates that the user has selected “Ignore Rendered Audio Effects” in Digi 002. This note is a convenience so that if something is odd in the translated sequence, the user can determine if an effect that was ignored is actually required.

Incomplete Rendering

A1<00:00:28:29-00:00:31:17>incomplete rendering for effect; using bypass clip.A2<00:00:28:29-00:00:31:17>incomplete rendering for effect Audio MultiBand EQ; using bypass clip.

This indicates that an effect was not rendered completely at a fade boundary in an Avid system. On import, Pro Tools bypassed the incomplete rendering and imported the audio without the effect. If you need the effect, re-render the effect and fade on the Avid system, and export again.

Truncated Names

Example

A1<01:00:02:02-01:00:07:01>
“Jag film to Whirl.01.Sub.03.new.01”=>
“Jag film to Whirl.01.Sub.03”

Pro Tools limits clip names to 31 characters, while Media Composer (and OMF) have no limitation on clip name length. These entries enable you to determine which clip a given Pro Tools region represents if the name has been truncated.

Miscellaneous Errors (Misc Errors)

Example

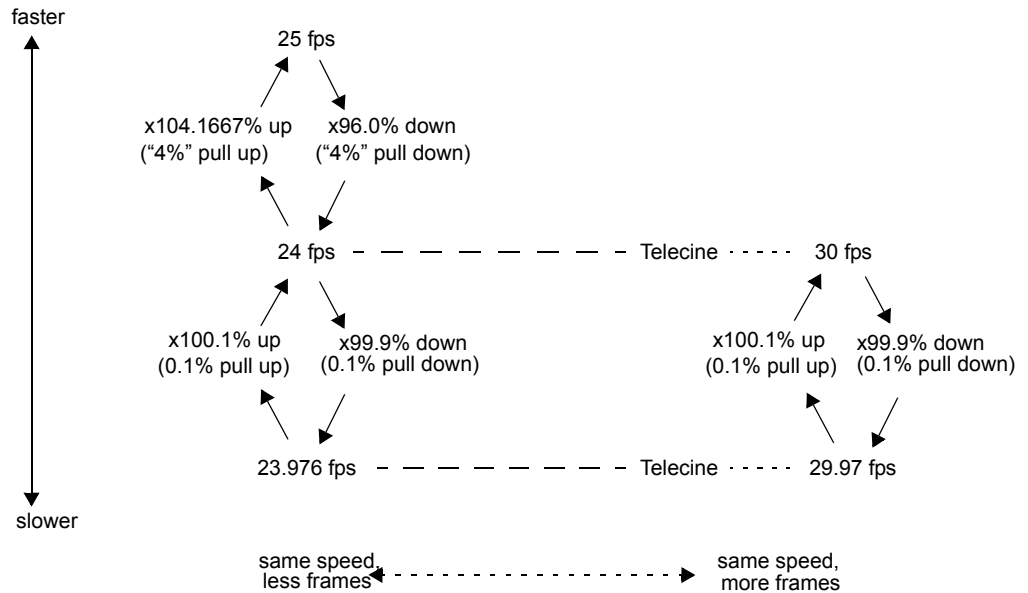
A1<01:00:00:00-01:00:16:06>
“Jag film to Whirl.01.Sub.06.new.01”;
insufficient source material for clip;
shortening clip by 1 sample

This Translation Note is primarily informational, informing you that Digi 002 was not able to translate the OMF sequence exactly, and has had to make an adjustment so Pro Tools can understand it.

This error occurs because applications don’t always calculate the number of samples in a frame in the same way. In some cases, there may be one too few samples of media to support a given clip from the Pro Tools standpoint. In this situation, there can potentially be an audio “pop.”

Speed Correction for Film, NTSC Video, and PAL Video Using Digi 002

Frame rates, telecine transfers, and relative playback speeds



Sample Rates at Pull Up and Pull Down Settings

Pull Up/Down	Sample Rate					
	44100	48000	88200	96000	176400	192000
+4.1667% and +0.1%	45983	50050	91967	100100	n/a	n/a
+4.1667%	45938	50000	91875	100000	n/a	n/a
+4.1667% and -0.1%	45892	49950	91783	99900	n/a	n/a
+0.1%	44144	48048	88288	96096	176576	192192
-0.1%	44056	47952	88112	95904	176224	191808
-4.0% and +0.1%	42378	46126	84757	92252	n/a	n/a

Sample Rates at Pull Up and Pull Down Settings

Pull Up/Down	Sample Rate					
	44100	48000	88200	96000	176400	192000
−4.0%	42336	46080	84672	92160	n/a	n/a
−4.0% and −0.1%	42294	46034	84587	92068	n/a	n/a



In Pro Tools, set the Destination Sample Rate to the desired target sample rate.

Chapter 7

Optimizations and Drivers

Windows System Optimizations

When installing Pro Tools on Windows XP, there are many system variables that affect performance. If you have followed all the Windows configuration instructions in [Chapter 3](#) and are still experiencing problems, try the following troubleshooting suggestions.



Norton Ghost is highly recommended, as it lets you save your system in a working state and easily revert to that state should you accidentally disable anything that your computer needs.

Blue Screen at Startup

If, after installing Pro Tools and QuickTime, your computer crashes with a blue screen, do the following:

- Use Add/Remove Programs to uninstall Pro Tools.
- Use Add/Remove Programs to uninstall QuickTime.
- Repeat the steps for installing Pro Tools and QuickTime.

Advanced Settings

The following system optimizations may help Pro Tools perform better on some systems. It is recommended that you only try these optimizations if necessary, as they may disable or adversely affect the functionality of other programs on your system.

Disabling Network Cards

If applicable, disable any networking cards (other than a 1394 “FireWire” card that you might use to connect an external drive to your system).

To disable a network card:

1. Right-click My Computer and choose Manage.
2. Under System Tools, select Device Manager.
3. In the Device Manager window, double-click Network adapters, then double-click the Network Adapter card you want to disable.
4. Under the General tab, choose “Do not use this device (disable)” from the Device Usage pop-up menu, and click OK.
5. Close the Computer Management window.

Processor Scheduling

To adjust processor scheduling performance:

1. Choose Start > Control Panel.
2. Launch System.
3. Click the Advanced tab.
4. Under the Performance section, click the Settings button.
5. Click the Advanced tab.
6. Under the Processor scheduling section, select the Background Services option.
7. Under the Memory Usage section, select the System cache option.
8. Click OK twice. You will need to restart your computer for the changes to take effect.

Startup Items

The fewer items in use by your computer, the more resources are available for Pro Tools LE. Some startup applications might be consuming unnecessary CPU resources, and should be turned off.

Be very careful when disabling startup items, including (but not limited to) the following:

- Portable media serial number (required for applications that utilize a copy protection key)
- Plug and play
- Event log
- Cryptographic services
- DHCP Client, TCP/IP Net BIOS, and other networking-related items (unless the computer has no network or internet connection, in which case these items can be disabled)



Norton Ghost is highly recommended, as it lets you save your system in a working state and easily revert to that state should you accidentally disable anything that your computer needs.

To disable system startup items:

1. From the Start menu, choose Run.
2. Type “msconfig” and click OK. The System Configuration Utility opens.
3. Under the General tab, choose Selective Startup.
4. Deselect Load Startup Items and click OK.
5. Click Restart to restart the computer.
6. After restarting your computer, a System Configuration message dialog box is displayed. Try Pro Tools to see if performance has increased before you uncheck the don't show this message again box. If performance has not changed, run “msconfig” and return your computer Selective Startup back to Normal Startup. Alternatively, try disabling start up items and non-essential processes individually.

Digidesign ASIO Driver

Introduction

The Digidesign ASIO Driver is a multichannel, multimedia sound driver that allows third-party audio programs that support the ASIO standard to record and play back through Digidesign and Avid Xpress Pro hardware.



Mbox cannot be used as an audio I/O for Avid Xpress Pro if an Avid Mojo is attached to the computer. Mbox and Avid Mojo cannot currently be used on the same system.



The ASIO Driver is not multi-client. Only one application at a time can use the ASIO Driver. Be sure to disable the Windows system sounds. It is also recommended that you use a separate sound card for games or other general work.



Check the Digidesign Web site (www.digidesign.com) for the latest third-party drivers for Pro Tools hardware, as well as current known issues.

Full-duplex playback of 24- and 16-bit audio are supported at sample rates up to 96 kHz, depending on the Digidesign hardware and ASIO Driver program used.

The Digidesign ASIO Driver will provide up to 18 channels of input and output, depending on your Pro Tools hardware:

- Up to 8 channels of input and output with Pro Tools|HD systems
- Up to 18 channels of input and output with Digi 002 and Digi 002 Rack
- Up to 2 channels of input and output with Mbox

Compatible Software

For a list of ASIO Driver-compatible software, see the compatibility documents available on the Digidesign Web site (www.digidesign.com/compato).

Installing the ASIO Driver

The ASIO Driver is installed by default when you install Pro Tools.

Removing the ASIO Driver

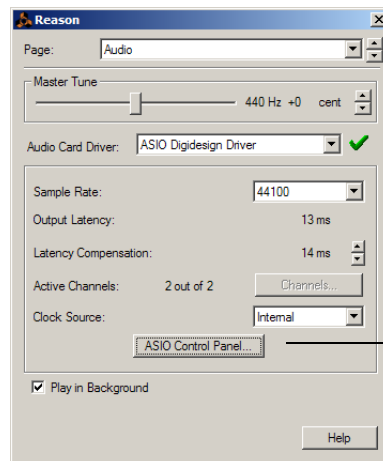
If you need to remove the ASIO Driver from your computer, complete the following steps.

To remove the ASIO Driver:

1. Choose Start > Control Panel.
2. Launch Add or Remove Programs.
3. From the Currently installed programs list, select Digidesign Pro Tools.
4. Click the Change/Remove button.
5. Modify your installation by unchecking the Digidesign ASIO Driver option only.

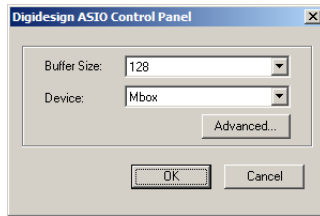
Changing ASIO Driver Settings

Changing ASIO Driver settings is done in your third party ASIO program. Refer to the documentation that came with your software program. For example, with Propellerhead Reason, click on the ASIO Control Panel button (shown below).



ASIO Control
Panel button

ASIO Driver Control Panel



The Digidesign ASIO Driver Control Panel cannot be accessed under the following circumstances:

- When Pro Tools is running.
- When playing or recording in an audio program that does not support the ASIO Driver.
- When using a third-party audio program that has an option to keep the ASIO Driver “open” even when you are not playing or recording. (You must close the audio program before you can open the ASIO Driver Control Panel.)

Buffer Size Control

When you play a file from a client audio program, the client program divides the file into buffers and sends each of these to the ASIO Driver. The ASIO Driver copies the client program’s buffers to your Digidesign hardware’s own buffers in a double-buffering scheme. The Buffer Size control in this dialog box allows you to set the size of each of the two buffers the ASIO Driver uses on Digidesign hardware. You may select from the following buffer sizes:

- 128 samples
- 256 samples
- 512 samples
- 1024 samples
- 2048 samples

Small buffers have the advantage of low latency in the record monitor path. Larger buffers have the advantage of making the ASIO Driver more immune to audio dropouts during playback and recording.

In some third-party audio programs, performing various tasks such as maximizing or minimizing windows will interrupt the ASIO Driver and create glitches in the audio. Choosing medium or large buffers (such as 256–1024) can help alleviate this problem.

Changing the Buffer Size for the ASIO Driver does not affect the H/W Buffer Size settings in the Pro Tools Playback Engine dialog box.

Device

The Device Type will always be set to your installed Pro Tools hardware.

Advanced Button

The Advanced button opens the Hardware Setup dialog box for your Digidesign system.

Digidesign WaveDriver

Introduction

The Digidesign WaveDriver is a multichannel, multimedia sound driver that allows third-party audio programs that support the WaveDriver standard to play back through Digidesign hardware.



Check the Digidesign Web site (www.digidesign.com) for the latest third-party drivers for Pro Tools hardware, as well as current known issues.



The WaveDriver is not multi-client. Only one application at a time can use the WaveDriver. Be sure to disable the Windows system sounds. It is also recommended that you use a separate sound card for games or other general work. For third-party soft-synthesizer and samplers, use the Digidesign ASIO Driver (see “Digidesign ASIO Driver” on page 254).

Playback of 24- and 16-bit audio are supported at sample rates supported by the hardware and WaveDriver program used.

The Digidesign WaveDriver will provide up to 18 channels of output, depending on your Pro Tools hardware:

- Up to 8 channels of output with Pro Tools|HD systems
- Up to 18 channels of output with Digi 002 and Digi 002 Rack
- Up to 2 channels of output with Mbox

Compatible Software

For a list of WaveDriver-compatible software, see the compatibility documents available on the Digidesign Web site (www.digidesign.com/compato).

Installing the WaveDriver

The WaveDriver is installed by default when you install Pro Tools.

Removing the WaveDriver

If you need to remove the WaveDriver from your computer, complete the following steps.

To remove the WaveDriver:

1. Choose Start > Control Panel.
2. Launch Add or Remove Programs.
3. From the Currently installed programs list, select Digidesign WaveDriver.
4. Click the Change/Remove button.
5. Click OK to remove the WaveDriver.

Configuring WaveDriver for QuickTime Player (Required for Using iTunes)

In order to let Digidesign hardware play back through iTunes for Windows, you must configure WaveDriver in the waveOut option of the QuickTime Player SoundOut settings to waveOut.

To configure WaveDriver as the iTunes default device:

1. Close all WaveDriver third-party applications (including iTunes).
2. Choose Start > Programs > QuickTime > QuickTime Player.
3. In QuickTime Player, choose Edit > Preferences > QuickTime Preferences.
4. From the pop-up menu, choose Sound Out.
5. From the Choose a device for playback pop-up menu, select the waveOut option (and the name of your Digidesign device, if any).
6. Close QuickTime Player.
7. Re-launch iTunes.

Configuring WaveDriver for Windows Media Player and Other Third-Party WaveDriver Programs

WaveDriver is configured in the Sounds and Audio Devices Control Panel (for programs that use the Windows Sound Playback Default Device, such as Windows Media Player), or as a preference for third-party WaveDriver programs (such as Sound Forge).

To configure WaveDriver as the Windows Sound Playback Default Device (for example, for Windows Media Player):

1. Choose Start > Control Panel.
2. In Classic View, launch Sounds and Audio Devices.
3. Click the Audio tab.
4. Select the Digidesign audio interface in the Sound Playback default device lists.
5. Close the Control Panel. When you run Windows Media Player, it automatically outputs to your Digidesign hardware.

To configure WaveDriver for a third party WaveDriver application:

- In the third-party program, select the Digidesign audio interface as the preference for your playback hardware. Refer to your program's documentation.

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