Pro Tools
What's New

Version 4.3 for Macintosh

digidesign®

A division of **Avid**

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chapter 1

What's New in Pro Tools 4.3

This chapter lists the main new features and manual corrections for Pro Tools 4.3. For more detailed information, refer to the remaining chapters of this guide.

Support for Pro Tools 24 MIX Systems

Pro Tools 4.3 for Macintosh adds support for the Pro Tools 24 MIX Core and MIX Farm cards, (known collectively as "MIX cards"), which dramatically increase the power of Pro Tools.

Benefits of Pro Tools 24 MIX technology include:

• Increased mixing power

• More Plug-Ins per DSP chip

• Ability of Plug-Ins to share DSP chips

• More efficient overall DSP usage

On Pro Tools 24 MIX-equipped systems, Digidesign's new DSP Manager and Multi-Shell technologies ensure that all available DSP is used as efficiently as possible.

MIX Farm cards can also be added to Pro Tools 24 systems to enhance their DSP processing capacity.

New DigiRack EQ and Dynamics Plug-Ins

Pro Tools 4.3 for Macintosh includes a new DigiRack Plug-In set with TDM and AudioSuite versions of new EQ and Dynamics Plug-Ins.

◆ The new EQ II Plug-Ins feature improved high- and low-shelf filters, and a soft-clipping feature that helps prevent clipping at higher gain values.

◆ The new Dynamics II Plug-Ins include separate Compressor, Limiter, Gate and Expander Plug-Ins, each with a graphic display of the Plug-In response curve. In addition, each Dynamics Plug-In supports side-chain/key input, which allows you to use external inputs or Pro Tools busses for sidechain control of Plug-In parameters.

Smart Tool

In Pro Tools 4.3 for Macintosh, a new Smart Tool has been added to the Edit window toolbar. The Smart Tool combines the functions of the Selector, Grabber, and Trimmer tools, switching its function automatically depending on where you move the cursor in the Edit window. The

Smart Tool also allows you to create fades and crossfades with a single mouse click.

Muting of 888/24 I/O DAC Outputs

A new DAC Muting option in Pro Tools eliminates idle noise levels on 888/24 I/O output channels. This feature is useful when monitoring discrete 888/24 outputs through a mixing console at extreme levels.

Track Arming with Pro Tools MachineControl

Pro Tools 4.3 for Macintosh adds track-arming capability when using Digidesign's MachineControl option. Now, with any standard Sony 9-pin or V-LAN deck, you can perform frame-accurate assemble and audio insert edits (up to 8 tracks) directly from Pro Tools.

Universal Slave Driver Fader Start Feature

In Pro Tools 4.3 for Macintosh, a Fader Start feature has been implemented that allows you to control external devices based on the position of select faders in Pro Tools, via certain GPI outputs of the Universal Slave Driver.

Support for DigiSerial Port on Pro Tools 24 and Pro Tools 24 MIX Systems

The serial port on both the d24 and MIX cards is now available in Pro Tools, providing an additional serial port for connecting machine-controlled devices when using Digidesign's MachineControl option, or for connecting a Universal Slave Driver peripheral. This new DigiSerial Port appears as an additional serial port option in the Pro Tools Peripherals dialog.

MIDI Machine Control Update

A chapter of updated and corrected information about using MIDI Machine Control in Pro Tools is included in this guide.

Support for AIFC File Format

Pro Tools 4.3 for Macintosh now supports the AIFC (Audio Interchange File Compressed) audio file standard, a variant of the AIFF format and the native file format of the most recent versions of Avid Media Composer. Files of this format now appear in the Import Files dialog. This ensures OMF (Open Media Framework) compatibility between Pro Tools and Media Composer without the need for file format conversion.

Card order in Pro Tools 24 MIX and Pro Tools 24 systems

In chapter 3 of the Pro Tools System Installation Guide for Macintosh, the section on card order indicates that the display card for the computer should go in the lowest alphanumeric slot.

Instead, this card should go in the *highest-numbered* slot, and the first d24 or MIX card should go in the lowest-numbered slot, with other cards following in the same order indicated in the Installation Guide.

chapter 2

Editing and Playback Enhancements

The Smart Tool

The Pro Tools 4.3 Edit window includes the new Smart Tool, which lets you use the functions of the Grabber, Selector and Trimmer, as well as create fades, all without having to switch tools. The Smart Tool changes its function and appearance automatically, according to the cursor position and the current track display format in the Edit window.

Changing the Smart Tool Default

By default, the Smart Tool functions as the Selector, and you hold the Command key to change it to the Grabber. You can switch these and make the Grabber the default function of the Smart Tool by selecting the "Use Grabber as Default for the Smart Tool" option in the Editing Preferences. When this option is selected, you then hold the Command key to turn the Smart Tool cursor into the Selector.

Using the Smart Tool in Waveform View

Selector function By default, when you move the Smart Tool cursor near the center of a region displayed in Waveform view, it functions as the Selector tool. All standard key shortcuts for the Selector tool are available in this mode, *except* the Pop-up Takes List function.

Grabber function By default, when you use the Smart Tool in a region displayed in Waveform view and hold the Command key, it functions as the Grabber tool. All applicable key shortcuts for the Grabber tool are available in this mode.

Trimmer function When you move the Smart Tool cursor near the boundary of a region displayed in Waveform view and position it vertically within the central half of the region, it functions as the Trimmer tool. All applicable key shortcuts for the Trimmer tool are available in this mode (such as holding the Option key to reverse the direction of the Trimmer).

✳ The Trimmer requires adequate screen resolution to function. If you are working on a small region and the Trimmer does not appear, zoom in to increase the width of the region and use the Trimmer.

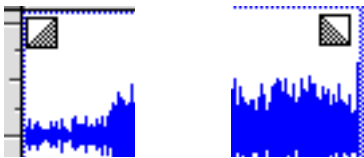**Fade In/Fade Out function** When you move the Smart Tool cursor near the boundary of a region displayed in Waveform view *and* position it vertically within the upper 25% of the region, it functions as a Fade In/Out tool. This tool allows you to create a fade in (at a left region boundary) or fade out (at a right region boundary) by clicking near the region boundary and dragging inward toward the center of the region to set the length of the fade.

The Smart Tool Fade In and Fade Out Cursors

When you do this, a fade is created automatically, using the last settings defined in the Fades dialog. The resulting fade can be edited or trimmed in the same manner as other fades.

Crossfade function When you move the Smart Tool cursor near the boundary of two contiguous regions displayed in Waveform view and position the cursor vertically within the lower 25% of the region, it functions as a Crossfade tool. This tool allows you to create crossfades at region boundaries by clicking near the region boundary and dragging away from it to set the length of the crossfade.

The Smart Tool Crossfade Cursor

When you do this, a crossfade is created automatically, using the last settings defined in the Fades dialog. The resulting crossfade can be edited or trimmed in the same manner as other fades.

Using the Smart Tool in Automation View

Selector function By default, when you position the Smart Tool cursor anywhere in the bottom 75% of a region displayed in Automation view, it functions as the Selector tool, which you can use to select automation data.

Grabber function By default, when you use the Smart Tool in a region displayed in Automation view and press the Command key, it functions as the Grabber tool, which lets you create, edit or delete individual automation breakpoints. All applicable key shortcuts for the Grabber are available in this mode (such as holding the Shift key to vertically constrain movement).

You can release the Command key after you begin moving a breakpoint to edit with coarse control. If you hold the Command key *after* you begin moving a breakpoint with the Grabber, you can edit with fine control.

Trimmer function When you move the Smart Tool in the top 25% of a region displayed in Automation view, it functions as the Trimmer tool, allowing you to trim the automation breakpoints in the region or selection. If you hold the Command key *after* you being trimming, you can trim with fine control.

Muting of 888/24 I/O DAC Outputs

A new DAC Muting option in Pro Tools eliminates idle noise levels on 888/24 I/O output channels. This feature is useful when monitoring discrete 888/24 outputs through a mixing console at extreme levels.

To enable DAC Muting:

1 Choose Setups > Hardware to display the Hardware Setup dialog.
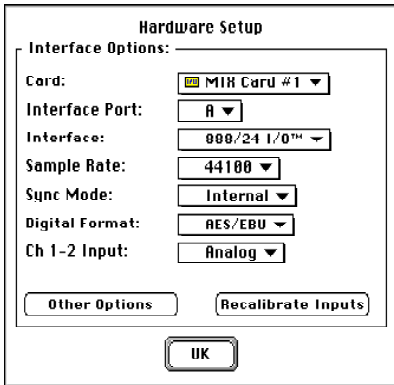
The Hardware Setup dialog

2 Click Other Options.

3 Under DAC Muting, click Enabled.

4 Click Done to close the Other Options dialog.
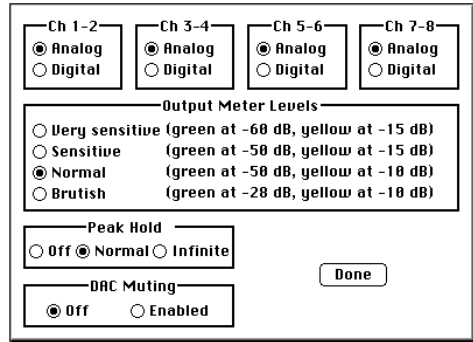
The Other Options dialog for the 888/24 I/O

chapter 3

Pro Tools 24 MIX and New DigiRack Plug-Ins

DSP Usage by Real-Time TDM Plug-Ins

Each real-time TDM Plug-In that you use in a Pro Tools session utilizes a portion of your system's total available DSP resources. Since these DSP resources reside on the cards that make up your particular Pro Tools hardware configuration, the amount of DSP available depends entirely on the number and type of DSP cards in your system.

The tables below list the total number of instances of each DigiRack TDM Plug-In that will fit on a DSP chip on the two types of Digidesign DSP cards (the Pro Tools 24 MIX card or the DSP Farm). Please note that DSP usage differs according to card type.

Please also note that though there are a total of 6 DSP chips on a Pro Tools 24 MIX card, certain Plug-Ins, such as the Mod Delays, require a specific type of DSP chip in order to function. This is why the first table indicates that only 2 DSPs out of the 6 present on MIX cards are compatible with those particular Plug-Ins.

❊ Allocator™, a software utility provided with Pro Tools, allows you to see exactly how much DSP is available on your system and how it is currently being used. We recommend that you run Allocator concurrently with Pro Tools to monitor DSP usage and other key system resources during your Pro Tools sessions. For information on Allocator, please refer to the Appendix of your Pro Tools Reference Guide.

Table 1. Maximum number of real-time TDM Plug-Ins on a Pro Tools 24 MIX card.

Plug-In	Maximum Instances per DSP chip in mono/stereo format	Number of compatible DSP chips per MIX card
EQ II (1-band)	61/31	6
EQ II (4-band)	24/12	6
Compressor II	19/13	6
Limiter II	19/13	6

Table 1. (Continued) Maximum number of real-time TDM Plug-Ins on a Pro Tools 24 MIX card.

Plug-In	Maximum Instances per DSP chip in mono/stereo format	Number of compatible DSP chips per MIX card
Gate II	42/26	6
Expander/Gate II	16/12	6
Mod Delay (short)	2/1	2
Mod Delay (slap)	2/1	2
Mod Delay (medium)	2/1	2
Mod Delay (long)	4/2	2
Procrastinator	not compatible	not compatible
Dither	37/18	6
Time Adjuster	31/15	3

Table 2.   Maximum number of real-time TDM Plug-Ins on a DSP Farm card

Plug-In	Maximum Instances per DSP chip in mono/stereo format	Number of compatible DSP chips per DSP Farm card
EQ II (1-band)	16/8	4
EQ II (4-band)	5/2	4
Compressor II	7/5	4
Limiter II	7/5	4
Gate II	12/8	4
Expander/Gate II	4/3	4
Mod Delay (short)	2/1	4
Mod Delay (slap)	2/1	4
Mod Delay (medium)	2/1	4
Mod Delay (long)	not compatible	not compatible

Table 2. (Continued) Maximum number of real-time TDM Plug-Ins on a DSP Farm card

Plug-In	Maximum Instances per DSP chip in mono/stereo format	Number of compatible DSP chips per DSP Farm card
Procrastinator	1/na	4
Dither	12/6	4
Time Adjuster	23/11	4

DSP Manager Allows DSP Sharing Between Plug-Ins

While the preceding tables show theoretical maximum performance when no other Plug-Ins are sharing available DSP resources, in practice, you will likely be running more than one type of Plug-In simultaneously.

Pro Tools version 4.3 and later allow up to five different types of Plug-Ins to share the same DSP chip at one time through Digidesign's DSP Manager and MultiShell technologies. These allow you to simultaneously use a greater variety of Plug-Ins than ever before by efficiently managing the DSP available on each chip in your system.

In order to take advantage of this capability, Plug-Ins must be MultiShell compatible. The following DigiRack TDM Plug-Ins included with your Pro Tools system are MultiShell compatible: Dynamics II, EQ II, and Dither. If you are not sure whether a Third-party Plug-In is MultiShell-compatible, please check with its developer.

EQ Plug-Ins

The DigiRack EQs included with Pro Tools feature a 1-band and a 4-band EQ. The 4-band EQ provides a wider range of control over the frequency spectrum of an audio signal and thus requires more DSP.

There are two versions of these Plug-Ins: "EQ" and "EQ II." The "EQ" versions of the 1-band and 4-band equalizers are Pro Tools' original EQs. They are provided for compatibility with sessions created with Pro Tools version 4.2 or earlier. (These versions are only installed on your Pro Tools system if you have specifically selected them during installation.)

The "EQ II" versions are entirely new, and provide an enhanced "Classic EQ" sound character that is much favored by contemporary audio engineers and producers.

EQ II Parameters

Input Allows you to control the input gain of the EQ to prevent the possibility of clipping. Since Pro Tools Inserts are pre-fader, Plug-Ins used as Inserts can cause clipping if their levels are boosted excessively.

Phase Invert Allows you to invert the phase (polarity) of the input signal in order to change frequency response characteristics between multi-miked sources (a common technique for miking a guitar cabinet), or to correct for miswired microphone cables.

Type Allows you to select an EQ type (high-pass, low-shelf, peak, high-shelf or low-pass).

Freq Allows you to designate the center of the frequency region to be cut or boosted.

Gain Allows you to control the amount that the selected frequencies are cut or boosted.

Q (Peak only) Allows you to set the bandwidth of the Peak filter. Higher values represent narrower bandwidths. Lower numbers represent wider bandwidths.

Bypass Bypasses the EQ. The 4-Band EQ has individual Bypass buttons for each band (the black buttons with appropriate EQ curve icons), as well as the standard all-band Bypass button at the top of the Inserts/Sends Editor window.

One of the bypass EQ band buttons on the 4-band EQ

The High Pass Filter attenuates all frequencies below the selected cutoff frequency setting at a rate of 12dB per octave while allowing all others above to pass through. For this reason, no gain control is available for this filter. High Pass filters can be useful for removing low frequency rumble or thinning out the lower end of a sound for

special effects such as simulating a "telephone" effect.

The Low-Shelf EQ produces a lift or a cut below the specified frequency.

The Peak EQ boosts or cuts only those frequencies centered around the selected center frequency. The Q button sets the bandwidth of the Peak filter. This determines the width of the filter's overall slope—from a broad "bell" shape to a narrow notch. Broad curves tend to be most useful for musical applications. Narrow curves are useful for special purpose processing such as hum removal. Higher values represent narrower bandwidths. Lower numbers represent wider bandwidths.

The High-Shelf EQ produces a lift or a cut at and above the specified frequency.

The Low Pass filter attenuates all frequencies above the selected cutoff frequency setting at a rate of 12 dB per octave while allowing all others below to pass through. For this reason, no gain control is available for this filter.

▲ Because real-time TDM Plug-Ins are pre-fader, you can accidentally cause clipping if you boost their gain to extremes. This is particularly true on tracks recorded at high amplitude. Be sure to listen to your tracks carefully to avoid clipping when applying EQ. You cannot switch EQ types while audio tracks are being recorded or played back. You can only change the EQ's parameter values or copy and paste EQ settings.

✳ A useful way to audition an EQ is to increase or decrease its gain several dB and then sweep the frequency up or down until you hear its effect. You can then make more precise adjustments to the EQ's settings. You can also fine tune the EQ's frequency range by holding down the Command key while adjusting it.

✳ AudioSuite versions of the 1- and 4-band DigiRack EQ Plug-Ins are also available from the AudioSuite menu. You can use these versions to permanently EQ tracks and free up additional DSP resources for other real-time Plug-Ins.

Dynamics Plug-Ins

DigiRack provides four types of Dynamics processors: Compressor, Limiter, Gate, and Expander/Gate.

There are two versions of these Plug-Ins: "Dynamics" and Dynamics II. The "Dynamics" Plug-In contains the original versions of Pro Tools' Compressor, Limiter, Gate, and Expander. It is provided for compatibility with sessions created with Pro Tools version 4.2 or earlier. (This Plug-In is only installed on your Pro Tools system if you have specifically selected it during installation.)

The "Dynamics II" Plug-Ins, however, (Compressor II, Limiter II, Gate II, and Expander/Gate II) are entirely new and provide significantly enhanced functionality. The parameters of each of the Dynamics II Plug-Ins are explained in the section that follows.

Compressor II
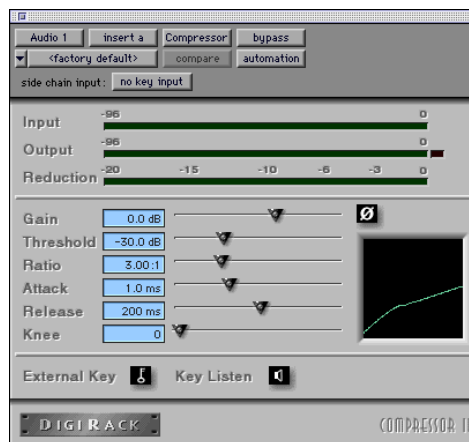
The Compressor reduces the dynamic range of signals that exceed a selected threshold by a specific amount. The increase of input signal needed to cause a 1dB increase in the output signal of the compressor is called the compression ratio. With a ratio of 4:1, for example, an 8dB increase of input produces a 2dB increase in the output.

Audio material often varies in loudness, and can be above the threshold at one moment and below it the next. The Attack slider sets the compressor's response time, or attack. The Release slider sets the amount of time that it takes for the compressor's gain to return to its original level.

Using Compression Effectively

To use compression most effectively, the attack time should be set so that signals exceed the threshold level long enough to cause an increase in the average level. This helps ensure that gain reduction doesn't decrease the overall volume.

Release times should be set long enough that if signal levels repeatedly rise above the threshold, they cause gain reduction only once. If the release time is too long, a loud section of the audio material could cause gain reduction that persists through a soft section. Of course, compression has many creative uses that break these rules.

The Compressor has built-in metering that allows you to monitor the amount of gain reduction taking place. The gain reduction meter usually remains at 0 level when the input signal is below the threshold and falls to the left to show the amount of gain reduction in decibels when the input signal exceeds the threshold.

Compressor Parameters:

Phase Invert Allows you to invert the phase (polarity) of the input signal in order to change frequency response characteristics between multi-miked sources or to correct for miswired microphone cables.

Gain Provides overall output gain adjustment. It allows you to compensate for heavily compressed signals.

Input Meter Indicates the level of the unprocessed input signal to the Compressor.

Output Meter Indicates the output level of the Compressor, including any gain compensation added via the Gain parameter.

Reduction Indicates the amount of gain reduction in dB.

Threshold Allows you to set the threshold level. Signals that exceed this level will be compressed. Signals that are below it will be unaffected. A level setting of 0dB is equivalent to no compression. Unlike

scales on analog compressors, metering scales on a digital device reflect a 0dB value which indicates full scale (fs)—the full-code signal level. There is no headroom above 0db.

Ratio Allows you to set the compression ratio. The range is based on decibels above the threshold. If this is set to 2:1 for example, it will compress changes in signals above the threshold by one half.

Attack Allows you to set the Compressor's attack time. The smaller the value, the faster the attack. The faster the attack, the more rapidly the Compressor applies attenuation to the signal. If you use fast attack times and heavy limiting, you should generally use a proportionally longer release time, particularly with material that contains many peaks in close proximity.

Release Allows you to control how long it takes for the Compressor to be fully deactivated after the input signal drops below the threshold level. In general, if you use heavy compression, you should use proportionally longer release times in order to avoid pumping which may occur when the Compressor is forced to jump back and forth between compressed and uncompressed signal levels. Lengthening the release time will help smooth these changes in level by introducing a lag in the ramp-up/down time of attenuation. Use shorter release times on material with fewer peaks which do not occur in close proximity to each other.

Knee Allows you to set the rate at which the compressor reaches full compression once the threshold has been exceeded. This parameter ranges from 0 (hardest response) to 200 (softest response).

Graph Displays the response curve set by the Compressor's Threshold, Ratio, and Knee settings. As you adjust these parameters, refer to the graph to see how the shape of this curve changes. This will allow you to see the effect of your settings.

External Key Enables and disables side chain processing. Side chain processing allows the Compressor to listen to the varying amplitude of a separate reference track and use it to trigger compression. Setting up and using a key input is covered in greater detail later in this chapter in the section entitled "*Using a Key Input for Side Chain Processing.*"

Key Listen When enabled, this allows you to listen to the reference track controlling the side chain input. This is often useful for fine tuning the Compressor's settings to the key input.

Limiter II
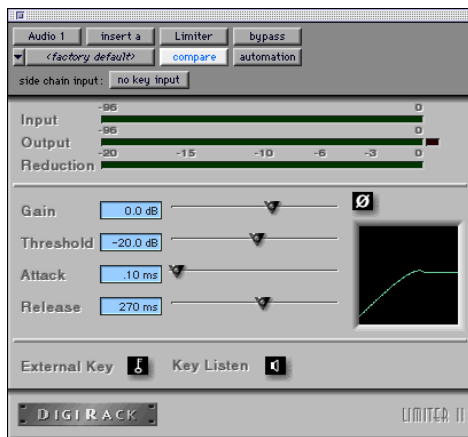
The Limiter is used to prevent signal peaks from ever exceeding a chosen level so that they don't overload amplifiers or recording devices. Most limiters have ratios of 10:1 or 20:1, although some provide ratios of up to 100:1. Large ratios effectively limit the dynamic range of the signal to a specific value by setting an absolute ceiling for the dynamic range.

Limiting is used to prevent short-term peaks from reaching their full amplitude. Used judiciously, limiting allows you to achieve higher average levels, while avoiding overload (clipping or distortion), by limiting only some short-term transients in the source audio. To prevent the ear from hearing the gain changes, extremely short attack and release times are used.

Limiting is used to remove only occasional peaks because gain reduction on successive peaks wouldn't be noticeable. If audio material contains many peaks, the threshold should be raised and the gain manually reduced so that only occasional, extreme peaks are limited.

The Limiter's ratio is internally set to 100:1, and the Attack time is automatically set to 0 milliseconds. The Limiter is similar to heavy compression. It can be useful for reducing pops and clicks, or for hard-limiting dynamic range for broadcast or band-limited mediums such as cassette.

Limiter Parameters:

Phase Invert Allows you to invert the phase (polarity) of the input signal in order to change frequency response characteristics between multi-miked sources or to correct for miswired microphone cables.

Gain Provides overall output gain adjustment.

Input Meter Indicates the level of the un-processed input signal to the Limiter.

Output Meter Indicates the output level of the Limiter, including any gain compensation added via the Gain parameter.

Reduction Indicates the amount by which the signal is being attenuated.

Threshold Allows you to set the threshold level. Signals that exceed this level will be limited. Signals that are below it will be unaffected.

Attack Allows you to set the Limiter's attack time. The smaller the value, the faster the attack. The faster the attack, the more rapidly the Limiter applies attenuation to the signal. If you use fast attack times and heavy limiting, you should generally use a proportionally longer release time, particularly with material that contains many peaks in close proximity.

Release Allows you to control how long it takes for the Limiter to be fully deactivated after the input signal drops below the threshold level. In general, if you use heavy limiting, you should use proportionally longer release times in order to avoid pumping which may occur when the Limiter is forced to jump back and forth between limited and unlimited signal levels. Lengthening the release time will help smooth these changes in level by introducing a lag in the ramp-up/down time of attenuation. Use shorter release times on material with fewer peaks which do not occur in close proximity to each other.

Graph Displays the response curve set by the Limiter's Threshold setting. As you adjust these parameters, refer to the graph to see how the shape of this curve changes. This will allow you to see the effect of your settings.

External Key Enables and disables side chain processing. Side chain processing allows the Limiter to listen to the varying amplitude of a separate reference track and use it to trigger limiting. Setting up and using a key input is covered in greater detail in the section entitled "*Using a Key Input for Side Chain Processing*" later in this chapter.

Key Listen When enabled, this allows you to listen to the reference track controlling the side chain input. This is often useful for fine tuning the Limiter's settings to the key input.

Gate II

Figure caption text partially legible describing the output of the limiter, its playback through its allowed signal by gain, without a dynamic input. The Gate II can also tap out to act on the limit shield level.

Gate Parameters:

Phase Invert Allows you to invert the phase (polarity) of the input signal in order to change frequency response characteristics between multi-miked sources or to correct for miswired microphone cables.

Gating Indicates the amount of reduction in dB.

Threshold Allows you to set the threshold level. Signals that exceed this level will pass through. Signals that are below it will be gated, depending on the settings of the Attack, Hold, Decay, and Range parameters (explained below).

Attack Allows you to set the attack time of the Gate.

Hold Allows you to specify a duration (in seconds or milliseconds) that the Gate will stay open after the initial attack cycle. This can be used as a one-shot function to keep the Gate open for longer periods of time with a single crossing of the threshold. It can also be used to prevent gate chatter which may occur if varying input levels near the threshold cause the Gate to open and close very rapidly.

Decay Allows you to control how long it takes for the gate to close after the signal falls below the threshold level.

Range Sets the depth of the Gate when closed. It has a maximum depth of -80db. Setting the gate to higher range levels allows more of the gated audio that falls below the threshold to peek through the gate at all times. This is useful for things such as drum leakage, where you may wish to suppress the overall drum kit sound by a specific amount, while emphasizing the gated instrument such as a snare.
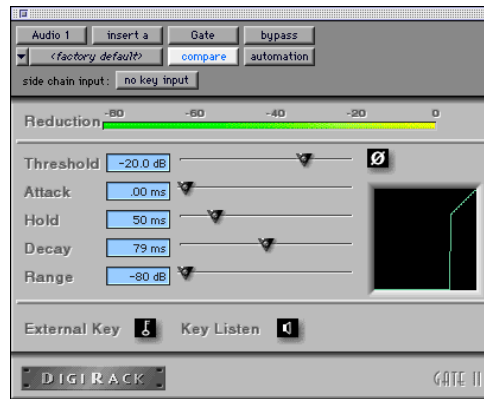
Graph Displays the response curve set by the Gate's Threshold and Range settings. As you adjust these parameters, refer to the graph to see how the shape of this curve changes. This will allow you to see the effect of your settings.

External Key Enables and disables side chain processing. Side chain processing allows the Gate to listen to the varying amplitude of a separate reference track and use it to trigger limiting. Setting up and using a key input is covered in greater detail in the section entitled "*Using a Key Input for Side Chain Processing*" later in this chapter.

Key Listen When enabled, this allows you to listen to the reference track controlling the side chain input. This is often useful for fine tuning the Gate's settings to the key input.

Expander/Gate II
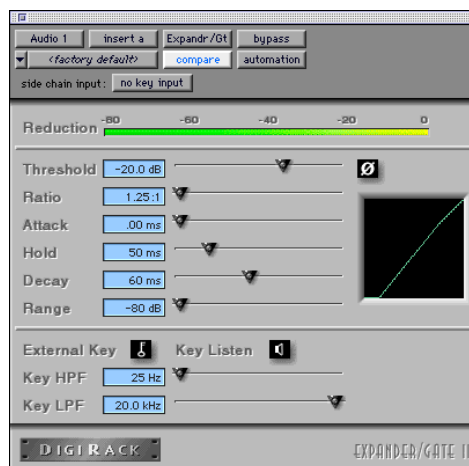
The Expander/Gate reduces noise by decreasing the gain of signals that fall below a user-selectable threshold. Expanders are particularly useful for reducing noise or signal leakage that creeps into recorded material as its level falls, as often occurs in the case of headphone leakage.

Expanders can be thought of as soft noise gates since they provide a gentler way of

cutting off noisy low-level signals than the typically abrupt cutoff of a gate. If you wish, however, you can actually use this Plug-In as gate, simply by setting the Ratio to its maximum value and using short attack, decay, and release settings.

Expander/Gate Parameters:

Phase Invert Allows you to invert the phase (polarity) of the input signal in order to change frequency response characteristics between multi-miked sources or to correct for miswired microphone cables.

Reduction Meter Indicates the amount of signal reduction in dB.

Threshold Allows you to set the threshold level. Signals that fall below the threshold will be reduced in gain. Signals that are above it will be unaffected. (When adjusting the Threshold slider be sure that audio material is playing through the Expander/ Gate to see changes reflected in the Reduction meter.)

Ratio Allows you to set the amount of expansion. If this is set to 2:1 for example, it will lower signals below the threshold by one half. At higher ratio levels (30:1 or 40:1 for example) the Expander/Gate functions like a gate by reducing lower level signals much more dramatically. As you adjust the ratio parameter, refer to the built-in graph to see how the shape of the expansion curve changes.

Attack Allows you to set the Expander's attack time. This determines how quickly a signal's level is reduced once it falls below the threshold. This, along with the ratio setting, allows you to control how soft the Expander's gain reduction curve is.

Hold Allows you to specify a duration (in seconds or milliseconds) that the Expander/Gate will stay open after the initial attack cycle. This can be used as a one-shot function to keep the Expander/Gate open for longer periods of time with a single crossing of the threshold. It can also be used to prevent gate chatter which may occur if varying input levels near the threshold cause the gate to open and close very rapidly.

Decay Allows you to control how long it takes for the gate to close after the input signal falls below the threshold level and the hold time has passed.

Range Sets the depth of the gate when closed. It has a maximum depth of -80db. Setting the gate to higher range levels allows more and more of the gated audio that falls below the threshold to peek through the gate at all times.

Key HPF Is a high-pass filter which removes low frequencies in the Key Input signal. This allows you to define a specific frequency range of the Key Input to trigger the Expander/Gate. A typical use for this feature is to filter a drum track used as a Key Input so that low frequencies (such as those from a kick drum), will not open the Gate, and only higher frequencies (such as those from a snare drum), will.

Key LPF Is a low-pass filter which removes high frequencies in the Key Input signal. This allows you to define a specific frequency range of the Key Input to trigger the Expander/Gate. A typical use for this feature is to filter a drum track used as a Key Input so that only specific low-frequencies (such as a kick drum or tom) trigger the Expander/Gate.

Graph Displays the response curve set by the Expander/Gate's Threshold, Ratio, and Range settings. As you adjust these parameters, refer to the graph to see how the shape of this curve changes. This will allow you to see the effect of your settings.

External Key Enables and disables side chain processing. Side chain processing allows the Expander/Gate to listen to the varying amplitude of a separate reference track and use it to trigger expansion. Setting up and using a key input is covered in greater detail in the section entitled "*Using a Key Input for Side Chain Processing*" later in this chapter.

Key Listen When enabled, this allows you to listen to the reference track controlling the side chain input. This is often useful for fine tuning the Expander/Gate's settings to the key input.

Using a Key Input for Side Chain Processing

If you wish, you can use the side-chain processing capabilities of the Compressor, Limiter, Gate, or Expander/Gate to trigger any of these Plug-Ins from a separate reference track or external audio source.

By using the External Key input, you can control the dynamics of one audio signal via the dynamics of another signal (the key input). A typical use for this feature is to use one instrument to trigger gating of another: a kick drum to gate and tighten up a bass track, a rhythm guitar to gate a keyboard pad, and many other creative applications.

To use a key input for side chain processing:

1 Click the Insert pop-up on the desired track to select the desired Plug-In.

2 Click the Side Chain Input pop-up and select the input/bus that carries the audio you wish to use to trigger the Plug-In.

3 Click the Key Input button. This activates side chain processing.

4 If you wish to hear the audio source you have selected to control side chain input, click the Key Listen button.

5 If you wish to filter the Key Input so that only certain frequencies trigger the Plug-In, use the Key HPF and Key LPF controls to select the desired frequency range.

6 Begin playback. The Plug-In is now using the input/bus that you chose as a side chain input to trigger its effect.

7 Adjust the Plug-In's Threshold parameter to fine tune the side chain triggering.

8 Adjust other parameters of the Plug-In to achieve final effect that you wish.

Machine Control and USD Features

Remote Track Arming via MachineControl

Pro Tools 4.3 (and later) software provides the ability to arm audio or video tracks remotely when using Digidesign's Machine-Control™ option for Pro Tools.

MachineControl is an optional Pro Tools DAE Extension that allows Pro Tools to remotely control 9-pin and V-LAN devices.

To facilitate remote track arming, the new item Show Machine Track Arming Window has been added to the Pro Tools Display menu on MachineControl-equipped systems.

Before you begin:

Make sure you have correctly installed your new Pro Tools software, as well as the MachineControl DAE Extension (refer to your MachineControl User's Guide for installation instructions).

✱ Your Machine Control 9-pin cable can be connected to the DigiSerial Port, but only in the absence of a Universal Slave Driver. It is recommended that machine control connections be made to one of your CPUs serial ports.

To display the Machine Track Arming Window:

1 Choose Display > Show Machine Track Arming Window. (If your setup includes a Digidesign ProControl™, simply press the STATUS switch.
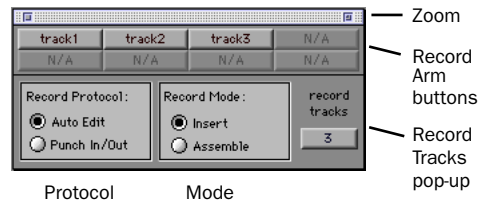
The Machine Track Arming Window

Zoom Box

A zoom box is located in the upper right-hand corner of the Machine Track Arming window. In "small view" only the track enable buttons appear. In "large view" all the other controls of the window are visible (i.e., Record Protocol and Record Mode buttons, etc.). Once you've configured these other controls for your setup, you may find it convenient to leave the Track Arming window in small view, giving you access to just the record enable buttons and conserving display space on your computer monitor.

Configuring Track Arming

Pro Tools provides automatic, direct support for track configuration of most common video decks. (For a complete listing of these machines, see Appendix 1 at the back of this document.) Assuming your deck is supported in this way, Machine-Control™ will be able to identify and display your machine's particular track layout (for example, Audio1, Audio2, timecode, or whatever particular arrangement of tracks is utilized by your machine.

Even if your machine is not directly supported, the Track Arming window provides features which allow you to designate the number of record tracks, arm the tracks, set the Record Protocol and configure the Record Mode for the machine.

✳ Please note that not all machines support independent arming of their audio tracks locally or remotely, or require a separate utility menu selection on the target deck. On these types of machines, Pro Tools' remote track arming cannot overcome these limitations.

Identifying your Machine

When you select a port for machine control in Pro Tools Peripherals > Machine Control window, the software polls the serial port to see what kind of machine is connected. (This process is referred to as "auto detection.")

If the software receives the identity of a machine it recognizes, it loads the corresponding track layout and automatically enters the name of that machine (or machine family) into the Track Arming window.

If the software encounters a machine which sends back an identity it doesn't recognize, the generic personality is loaded. In this case, "generic" appears in the Track Arming window. Luckily, MachineControl recognizes most all common video machines.

▲ One word of caution about "generic": While it will almost always be possible to arm tracks using the "generic" track layout, it may act unpredictably. For example, arming audio track 1 in software may result in track 3 being armed on the target machine, arming the address track might result in audio channel 2 being armed, etc. Always double check how "generic" behaves when driving your particular target machine.

If you disconnect the target machine or connect the serial cable to a different machine, a dialog box will appear explaining that communication between Pro Tools and the machine has stopped, and asking if Pro Tools should attempt to re-establish communication. If you select OK, MachineControl attempts to contact whatever machine is connected to the serial cable (i.e. it "re-polls" and attempts to auto detect in case you've switched machines).

Requesting additional machine profiles for Track Arming

If you would like Digidesign to facilitate auto-detection of a specific machine's track layout in an upcoming release, email us the manufacturer and machine model at *postprod@digidesign.com*

▲ If using a "generic" device, be sure to double-check record behavior using non-essential tapes before attempting to use MachineControl's remote track arming modes.

Configuring the Number of Tracks

Use the Record Tracks pop-up to specify the number of record tracks for the target deck under control. The maximum number of supported record tracks is 8.

▲ If you specify more record tracks than the machine possesses, they will be ignored. Pro Tools has no way of knowing how many record tracks there are other than the Record Tracks popup.

After the number of record tracks is specified in the Record Tracks popup, the record-arming track buttons are active.

The Record Arm buttons will be named with the appropriate machine-specific track name(s). These buttons' display similarly to Pro Tools' track record-ready buttons (i.e., their text appears in red when armed).

Choosing a Record Protocol

The following two choices are available for configuring the recording protocol to be utilized by the target deck:

Auto Edit

This mode, though not supported on some decks, is a highly accurate (and the safest) way to ensure that the target deck will record only within the boundaries of an on-screen selection. (If your deck does not support Auto Edit, use Punch In/Punch Out, explained below.) In this mode, the record start/end times are downloaded to the target deck (along with any pre- or post-roll), and the deck is responsible for performing the insert punch in/out at the specified times (be sure to read the section *Selection Rules for Recording with the Machine* later in this section for more details on this).

Because this protocol removes the vagaries of CPU timing from the remote recording process, Auto Edit is frame-accurate, making it the most accurate choice from a timing stand-point. It is also the "safest" mode to use. For example, if your computer were to crash during an auto-edit pass, the machine would still know when to punch out and therefore wouldn't accidentally erase later audio. (In Punch In/Out mode, on the other hand, the deck would continue recording until you manually stop it. This is because the crashed computer would not be able to send the punch out command that the machine would be waiting for in Punch In/Out mode.)

If your deck does not support Auto Edit, use Punch/In, Punch/Out (explained below).

Punch In/Out

This mode uses Pro Tools to control the process of punch in/out. Instead of downloading the punch points (as in Auto Edit), Pro Tools actually "performs" them during the record pass. Because the CPU may be busy with many other tasks, timing with Punch In/Punch Out mode cannot guarantee frame-accuracy (it will almost always be within ± 2 to 3 frames).

Choosing a Record Mode

The Remote Track Arming window provides two choices for Record Mode:

Insert

This mode is used to perform insert editing (i.e., punching in individual tracks) where one or more audio tracks is replaced by new material and the video material is *retained*.

✳ Note: As a safety precaution, Pro Tools does not support arming of video for insert editing.

Assemble

This mode is used to replace all of the material on the target deck's tape at once. Assemble mode should be used with caution and only when your goal is to:

• Begin recording program onto a completely blank tape (unformatted)

– or –

• Append program to the remainder of a tape which already has program you wish to keep

Assemble mode is not appropriate for audio laybacks to video masters, for example.

The danger with Assemble mode arises from the fact that all tracks on the target deck are armed for recording - including the video track, time code track and control track. When performing an Assemble edit, all material on all tracks after the edit in point will be replaced. Because a break in control track will result at the edit out point, all program after an Assemble edit may be unusable.

To avoid accidentally recording over program material you had intended to keep, make sure to experiment with Assemble and Insert modes on a dispensable tape and to familiarize yourself with the edit capabilities of your target deck(s).

▲ Remember, Assemble mode replaces all the elements on the target tape deck - audio, video and time code. Use with caution.

Rules for On-Screen Selections during Remote Track Arming/Recording

The Record Protocol buttons allow you to choose between the two different record protocol choices described above (Auto Edit and Punch In/Punch Out). Regardless of which choice is used, however, Pro Tools will follow these rules for record selection:

◆ If there is an on-screen selection, recording will take place over the period of the selection and punch out at the end of the selection.

◆ If pre/post roll is enabled, recording takes place only in the selection area, not during pre/post roll.

◆ If there is no selection (i.e., only a start location) recording will continue until it is manually stopped (i.e., "record to end of time").

◆ Avoid selections that cross the "midnight" line (i.e., a selection which starts at 23:59:00:00 and ends at 00:00:15:00). Like most decks, Pro Tools will not wrap around this time location.

Using Remote Track Arming

The first step in utilizing Remote Track Arming is to configure the parameters of the Track Arming window for your deck.

To configure Track Arming:

1 Make sure your machine is properly connected and configured to slave to Pro Tools as described in your MachineControl and Pro Tools User's Guides.

2 Open the Track Arming Window. If the entire window is not visible, click the zoom box.

3 If not already selected, choose your deck from the ID pop-up, then designate the number of record tracks using the Record Tracks popup.

4 Select a Record Protocol (Auto Edit or Punch In/Out).

5 Select a Record Mode (Insert or Assemble).

Once the above parameters are configured, you can change the window to "small view" so that you can leave it open without taking up unnecessary monitor real estate (the track arm buttons remain visible in small view).

To perform a layback:

1 In Pro Tools, select the audio to layback, or place the playback cursor at the desired start point.

2 In the Remote Track Arming Window, arm the appropriate tracks.

3 Select Transport = Machine in Pro Tools' Transport window.

4 Press the Transport's Record button to arm recording.

5 Press Play, or press the Space bar. Your machine will cue to the selection start minus all relevant pre-roll, then begin to play back. Pro Tools will then sync to the deck, and the target deck will record as determined by your settings for Record Protocol and Record Mode. If you did not create an on-screen selection, be aware that deck recording will continue until you manually stop playback (or until it reaches 23:59:59:xx).

When to use the DigiSerial Port

Pro Tools 24 Mix and Pro Tools 24 Audio Cards feature a DigiSerial Port. Though this port is identical in appearance to the serial ports on your CPU, it is designed to only be used by either

1 a Digidesign Universal Slave Driver's proprietary serial connection

– or –

2 a serial-to-9-pin cable in combination with the MachineControl™ option for Pro Tools. This should only be connected to the DigiSerial Port when there is no Universal Slave Driver present in the system.

▲ The DigiSerial Port should NOT be used for connecting MIDI Interfaces.

If you are using a Universal Slave Driver, it should always be connected to the DigiSerial Port.

If you are using MachineControl without a Universal Slave Driver, then the DigiSerial Port should be used for MachineControl.

Rules for using the DigiSerial Port in Expanded Pro Tools systems

Only one DigiSerial Port is ever active at once in any Pro Tools system, whether it is a core or expanded system. This will always be the DigiSerial Port on the bus master card of your system (i.e., the disk engine or primary Audio Card). Here are some example setups to further explain how this works:

• If your system includes one or more Pro Tools 24 audio cards, connect your USD (or MachineControl cable, if no USD) to the DigiSerial Port on the first Pro Tools Mix or d24 card (i.e, the bus master card).

• If you have a combination of Pro Tools 24 Mix and Pro Tools d24 cards, use the DigiSerial Port on the first Pro Tools 24 Mix card.

• If you have more than one d24 card, and only d24 cards, use the DigiSerial Port on the first d24 card in your system.

• If you are using a USD, MachineControl and a Mackie HUI or other MIDI device, connect the USD to the DigiSerial Port, the MachineControl cable to one CPU serial port, and connect the HUI to the other serial port via a MIDI Interface.

Configuring Pro Tools for the DigiSerial Port

To properly configure Pro Tools and your USD or MachineControl connections when using the DigiSerial Port, simply choose "DigiSerial Port" in the appropriate popup menus in the Peripherals dialog windows. This choice will appear right alongside the Modem and Printer port options.

Machine Profiles

The following is a list of many of the machines (and machine families) whose track configuration will be auto-detected by Pro Tools:

• AG-DS555
• AJ-D350
• ASC Virtual Recorder
• BVH-2000
• BVH-2000 PS
• BVH-2180
• BVH-2500
• BVH-2500 PS
• BVH-2700
• BVH-2800
• BVH-2830
• BVH-3000
• BVH-3000 PS
• BVH-3100
• BVH-3100 PS
• BVU-800
• BVU-900
• BVU-920
• BVU-950
• BVW-10
• BVW-11
• BVW-15
• BVW-35
• BVW-40
• BVW-60
• BVW-65
• BVW-70
• BVW-75
• BVW-75P
• BVW-95
• BVW-96

- DVR-10
- DVR-18
- DVR-20
- DVR-1000
- DVR-2100
- DVRC-10
- DVW-500
- Fostex D-10
- Otari R-DAT (DTR-90, etc.)
- PCM-7000 series
- PVW-2800
- SVO-9600
- Tascam DA-88
- Tascam DA-98
- UVW-1800
- VO-9800
- VO-9850

Requesting additional machine profiles for Track Arming

If you would like Digidesign to facilitate auto-detection of a specific machine's track layout in an upcoming release, send us the manufacturer and machine model via email at *postprod@digidesign.com*.

New USD Feature: Fader Start Trigger (GPI)

The USD provides 6 GPI outputs in total, 2 TTL-level and 4 relays. In versions prior to 4.3, the 2 TTL-level GPI outputs reflected whether Pro Tools was currently in fast-forward or rewind. Beginning in 4.3, these 2 GPI outputs are dedicated to a new "fader-start" feature.

The "fader-start" feature is used to control external devices based on the position of select faders in Pro Tools. In a typical scenario, the fader-start feature controls playback of a CD player. The CD player's outputs are routed into a Pro Tools' stereo aux return. As the aux return's fader is moved above -120dB, playback of the CD player is automatically started. Likewise, as the fader is moved below -120dB, playback is automatically stopped. This behavior relieves you of having to manually start playback of the CD and simultaneously move the fader up.

To implement fader-start, Pro Tools maps the first two visible auxiliary input channels in a session to GPI TTL-level outputs 0 & 1 (first being left-to-right in the Mix window, top-to-bottom in the Edit window). When the first visible aux track in a Pro Tools session is above -120dB, GPI TTL-level output 0 will be enabled; otherwise, it will be disabled.

Likewise, when the second visible aux track in a Pro Tools session is above -120dB, GPI TTL-level output 1 will be enabled; otherwise, it will be disabled.

As you create/delete/reorder tracks in a session, which particular auxiliary tracks are the first "visible" may change. As they do, the two GPI outputs will update dynamically to reflect the current state.

▲ Note: The aux tracks must be in a Show state (i.e., not hidden) for this functionality to be available.

GPI TTL Wiring

The Universal Slave Driver provides two TTL-level GPI outputs, on pins 1 and 2 of the DB25 connector (see the circuit diagram *GPI (TTL)/MTC Outputs* at the end of this document). The circuit employs a 74FCT541T device to drive each output. Note that some USDs may employ a 74HC541 instead, which has similar drive characteristics.

The two GPI TTL outputs were intended to drive TTL loads only. In Appendix I of the *Universal Slave Driver 3.0 User's Guide, t*he technical specifications section entitled "GPI Out (TTL)" should read "Loading: can drive a minimum of 5 TTL loads."

The circuit can drive approximately 2 mA through a load of 1.6K and maintain a logic high level of 3.3V. In an application where the equipment being controlled has more demanding power requirements, an external buffer or relay circuit must be used. This would typically be constructed as part of a custom electrical interface.

Each GPI TTL output is fully short-circuit protected via a 220-ohm series resistor. In Appendix I of the *Universal Slave Driver 3.0 User's Guide, t*he technical specifications section entitled "GPI Out (TTL) Current:" should read "15 mA max (short-circuit)" instead of simply "15 mA."

▲ Before attempting to wire any type of custom interface, always check the electrical specifications provided by the equipment manufacturer, including voltage levels, current, loading and polarity. Incorrect wiring may damage your equipment, your USD or cause personal injury.

GPI Triggers

GPI output signals information:

- 0 = stop

- 1 = play

- 2 = record enable (armed)

- 3 = record (place device into record mode)

- 4 = fader start #1

- 5 = fader start #2

Logical GPI numbers 0 through 3 are associated with GPI relay outputs 0 through 3 (pins 3 though 10). GPI numbers 4 and 5 are associated with GPI TTL outputs 0 and 1 (pins 1 and 2).

MIDI Machine Control Update

Using MIDI Machine Control with Pro Tools

Pro Tools provides the capability to transmit location information and transport controls from Pro Tools to external devices via MIDI Machine Control.

Controlling External Devices using MMC

Any device which supports MMC (such as an Alesis ADAT or Tascam DA-88) can be controlled directly from within Pro Tools, with either the device or Pro Tools acting as clock master.

Pro Tools uses OMS to facilitate MIDI Machine Control. In order to use MMC with Pro Tools you must configure your MMC device as an OMS device and enable MMC as an attribute of the device in OMS (you can find an example of this type of setup at the end of this section).

By using the OMS IAC buss, you can also make a MIDI sequencer act as location master. Refer to the documentation for OMS and your MMC-compatible devices for details.

The external devices supported by Pro Tools implement "open loop" communications only. Because of this, while Pro Tools is the transport master, any direct operation of the receiving device's transport will not be communicated back to Pro Tools. Instead, you can use the Transport pop-up to select the external device (MMC in the pop-up) and use the Pro Tools on-screen transport controls to drive the device.

Pro Tools does not support remote track arming of MMC-controlled external devices. You will need to manually arm tracks for recording directly on the external device.

✽ By adding Digidesign's MachineControl™ option, however, Pro Tools does support remote track arming of 9-pin and V-LAN devices.

Enabling MIDI Machine Control in Pro Tools
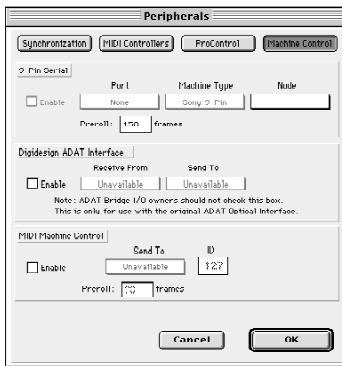
To enable MIDI Machine Control:

1 Choose Setups > Peripherals, then click Synchronization.

2 Select your synchronization peripheral (i.e., a USD, SSD or MIDI interface) from the Synchronization/Device: pop-up. (If

you are using a MIDI interface, select "Generic MTC Reader.")

3 Select the appropriate port for synchronization information. This will be the port to which your synchronization peripheral is attached: for the USD, this would be the DigiSerial port, or the serial port on your computer.

☞ *For more information on configuring synchronization devices and assigning ports, refer to the* **Pro Tools System Installation Guide** *for your platform.*

4 Click the Machine Control button at the top of the window to open this page of the Peripherals dialog.

The Machine Control page of the Peripherals dialog

5 In the MIDI Machine Control section, click the Enable checkbox to enable MMC in Pro Tools.

6 Select your external device from the Send To popup. The list of available devices is determined by the OMS devices declared in your OMS Studio Setup.

The OMS port on which this information will be transmitted is set in the "ID" field.

MMC commands contain an ID number to identify which machine should respond to the MMC command. There are 128 MMC ID numbers, from 0-127. ID #127 (the Pro Tools default setting) is a special "broadcast to all" of the 128 MMC IDs. With this setting, any device on the specified OMS port will respond to MMC commands.

7 Set a preroll time for your MMC device by entering a value in the MMC preroll text box. (Refer to the "Setting Minimum Sync Delay" section later in this chapter for suggestions about how to set MMC preroll.) Preroll is needed to provide Pro Tools with sufficient time to lock to the incoming timecode. This value will vary depending on the external device. If the preroll time is insufficient, Pro Tools may not be ready to lock until after the current timecode position has been passed.

8 Click OK to close the Peripherals dialog. Pro Tools will now be able to control the selected device's transport.

Operating the Pro Tools Transport with MMC

To control external devices from the Pro Tools Transport:

■ Select either Pro Tools or MMC from the Transport popup in the Pro Tools Transport window. The selected item will act as Transport Master.

When the Transport Master is set to Pro Tools, the playback position is governed by the on-screen cursor in Pro Tools.

When the Transport Master is set to MMC, the playback position is governed by the external device's play position.
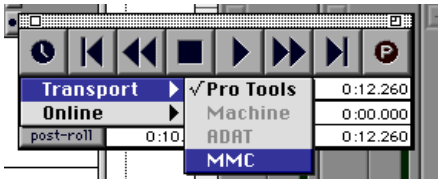
Choosing a Transport Master

Machine Transport Settings

When using MMC, you can set the following options for machine transport behavior in the Operation page of the Preferences dialog:

Machine Chases Memory Location When this option is enabled, navigating to a specific location in a session with a Memory Location will cause a connected transport to chase to that location.

Machine Follows Selection/Scrub With this option enabled, navigating to a specific location in a session by moving the selection point or by scrubbing a track will cause a connected transport to chase to that location.

Setting Minimum Sync Delay

Lock up delay is the amount of time your system's devices need to achieve synchronization "lock." This amount varies depending on the capabilities of each device. Pro Tools lock delay is set by entering a value for Minimum Sync Delay within the Synchronization window of the Peripherals dialog. The minimum delay is 15

frames. This allows you to find the shortest possible lock-up time for your equipment and set it to operate consistently at that level.

Configuring Minimum Sync Delay for External MMC Devices Locked to House Sync

When controlling a house-synced device from Pro Tools via MMC, the device will first lock to the MMC location and then align the color framing. Within house sync code are 4 frames for ensuring color frame lock. If the minimum synchronization set up time is less than the time required to achieve both location and color frame lock, playback will begin before the device has aligned the color frames. In this scenario, you should set the Minimum Sync Delay to be more than the time required for color frame lock. (Note that this is not a problem with the Universal Slave Driver, which will drop out of lock until the color frame is locked.)

Example: Using MMC to synchronize an ADAT to Pro Tools

The following section presents one real-world example of how you can use MMC to slave an ADAT to Pro Tools.

Setup Description:

Hardware: Pro Tools III system, Opcode Studio 64X MIDI Interface, JL Cooper DataMaster, Alesis ADAT (original version).

Software: Pro Tools, OMS

Cable Connections: The Studio 64X's Mac/Serial port is connected to one of the

CPU serial ports (Modem or Printer). MIDI In and MIDI OUT connections are made between the appropriate ports of the 64X and the MIDI IN/MIDI OUT ports of the JL Cooper DataMaster. Sync (9-pin) In/Out connections are made between the JL Cooper DataMaster and the ADAT.

In OMS Setup:

1 Make sure the OMS IAC Driver is installed and configured as described in the previous section *Synchronizing an OMS-compatible Sequencer to Pro Tools.*

2 Define a new device for the JL Cooper DataMaster and the ADAT.

3 Configure the JL Cooper OMS device by double-clicking its icon in the OMS Studio Setup window. For the JL Cooper Data-Master, enable Is Controller, then enable both Sends and Receives MIDI Time Code. (Be sure to leave Is Multitimbral unchecked.) Select channel 1 as the Receive Channel.

4 Configure the ADAT OMS device by double-clicking its icon. Leave Is Controller and Is Multitimbral unchecked (disabled). Enable both Sends and Receives MIDI Time Code and MIDI Machine Control. You do not need to have any Receive channels enabled.

5 Save/Make Current and then close the new OMS Studio Setup.

In Pro Tools

6 Choose Setups > Peripherals and open the Synchronization window.

7 In the Synchronization window, select Generic MTC Reader as the Synchronization device (this represents the 64X), then select the port to which your MIDI Inter-

face is connected to (in this example, the port choice would appear as "Studio64X / Printer.")

8 Open the Machine Control window of the Peripherals dialog. In the MIDI Machine Control section, enable MMC, then select JLCooper DataMaster as the Send To destination.

9 Set the ID to 127 (this is the "broadcast to all" setting, and the Pro Tools default setting for MMC device ID).

10 Choose Display > Session Setup Window (a Pro Tools session must be open for this option to be available).

11 In the Session Setup Window, set the frame rate and start frame as appropriate.

12 Next, enable the MTC to Port option (click in the box so that it is enabled), then select JLCooper DataMaster in the popup next to MTC to Port. This routes MIDI Time Code from Pro Tools to the JLCooper. device, which then sends the data on to the ADAT.

13 Close the Session Setup window.

14 Press Play on the Pro Tools Transport, or press the Space bar. The ADAT will cue to the play point and begin playing back in sync with Pro Tools. You do not need to put Pro Tools online to control the ADAT.

15 To control the ADAT from the Pro Tools Transport, select MMC from the Transport popup (in the Transport window). Pressing Play, Rewind, FFWD, RTZ or Go To End will cause the ADAT to respond accordingly.

❋ This example uses the JL Cooper Data-MASTER, which has several settings which must be configured correctly for the above to work. Among these are configuring the ADAT as a slave (not master), enabling MTC as the sync source, and enabling MIDI Machine Control. The ADAT itself must be set to Internal mode. Consult the documentation that came with these devices for more details. If you are using a Digidesign ADAT Bridge, refer to the ADAT Bridge manual for additional information.

Synchronizing Pro Tools to an OMS-Compatible Sequencer using MMC

If you work extensively with a full-featured, OMS-compatible MIDI sequencing program, such as Vision, Cubase or Logic, you can "lock" the MIDI sequencer to Pro Tools for synchronized operation, while using the *sequencer* as the transport and location master. In this case, Pro Tools is still the system clock master, while the sequencer is the transport/location master.

Pro Tools provides this functionality using MIDI Machine Control (MMC) protocol, which allows for control of various transport functions on MIDI Machine Control-capable devices. The following Pro Tools transport functions can be controlled via MIDI Machine Control commands: Play, Record, Fast Forward, Rewind, Stop, and Locate (Cue).

MIDI Machine Control and OMS Synchronization

When using MIDI Machine Control, you still must have the OMS-compatible sequencer configured to synchronize to Pro Tools using the OMS IAC Driver (see the previous section *Synchronizing an OMS-compatible Sequencer to Pro Tools).* When controlled by a sequencer via MIDI Machine Control, Pro Tools will continue to serve as clock master for the sequencer. This allows for synchronized playback of both Pro Tools and the sequencer when using transport control from either application.

However, Pro Tools will also be a transport and location slave to the sequencer. When starting and stopping playback in the sequencer, the sequencer will send out location information to Pro Tools via MIDI Machine Control commands. Pro Tools will then cue to the location, begin playback, and in turn send MIDI Time Code back to the sequencer. The sequencer will then lock to the MIDI Time Code from Pro Tools for synchronized playback.

The following instructions describe the general steps that you should take, using Opcode's Vision software as an example and Pro Tools as transport and cueing slave. The exact synchronization setup your sequencer requires will vary depending on the software and your specific OMS setup.

To slave the Pro Tools transport to an OMS-compatible MIDI sequencer using MIDI Machine Control:

1 Make sure the OMS IAC Driver is installed in the OMS Folder inside your Sys-

tem Folder. If necessary, run the OMS Installer and choose Custom Install to install the OMS IAC driver.

2 In Pro Tools, choose Setups > OMS Studio Setup to launch the OMS Setup application.

In OMS Setup:

3 Choose Edit > Preferences, make sure the "Use Serial DMA driver when available" option is deselected, and click OK.

4 Choose Edit > OMS MIDI Setup, make sure the "Run MIDI in background" option is selected, and click OK.

5 Choose Setup > MIDI Cards and Interfaces, and click Update Setup.

6 Confirm that the OMS IAC driver appears in the OMS Studio Setup window. Save the setup document and make it your current setup.

7 In the OMS Studio Setup window, define two IAC busses by double-clicking the IAC Driver, then naming the first field "IAC1" and the second field "MMC."

In Vision:

8 Choose Setups > Enable Input Devices, and select the IAC bus ("IAC1").

9 Choose Options > Sync Options

10 In the Sync Options dialog, set the Receive Sync Mode popup to MTC/Machine Control, set the Receive Sync Device popup to IAC1, and enable Remote Start. (Leave the Send Sync option set to None.) Also, configure the frame rate to match your Pro Tools session. Click OK to close the Sync Options dialog.

11 Set the sequence start time (01:00:00:00 for example). The Offset at the top of the Sequence window should usually match the Offset in Pro Tools.

12 Select Wait Note in the Transport.

Vision should now be ready to start synchronized playback.

In Pro Tools:

13 Choose Options > Active in Background.

14 Choose Display > Show Session Setup Window, and choose the appropriate frame rate and SMPTE Start Frame to match the offset (start time) in Vision.

15 In the Output Time Code section of the Session Setup Window, enable the MTC to Port option. In the pop-up menu just below the MTC to Port option, choose IAC1. You can now close the Session Setup Window, or leave it open (settings are active as soon as they are enabled in the Session Setup Window).

16 Next, choose Setups > Peripherals, and open the Synchronization page of the Peripherals dialog.

17 First, select Generic MTC Reader as the synchronization device, and select Any as the port.

18 Next, click to Enable Control of Pro Tools via MMC, and set the ID to 0.

▲ If MMC is also currently enabled in the Pro Tools Peripherals > Machine Control dialog, you must assign a unique ID number in both of the corresponding MMC ID# fields. If not, an MMC feedback loop will occur. This can also happen if you use the default "broadcast to all" ID number of 127 in both places. If you are only slaving Pro Tools to a sequencer via MMC, without an external device requiring MMC from Pro Tools, you can/should disable MMC entirely in the Machine Control window.

In Vision:

19 Engage any of the following Transport functions in Vision: Play, Stop, Fast Forward, Rewind, Record, or Locate (Cue). Vision will send MIDI Machine Control commands to Pro Tools via the IAC bus, and Pro Tools will follow.

When starting and stopping playback in the sequencer, Vision will send out location information to Pro Tools via MIDI Machine Control commands. Pro Tools will then cue to the location, begin playback, and in turn send MIDI Time Code back to Vision. Vision will then lock to the MIDI Time Code from Pro Tools for synchronized playback.

About Remote Track Arming

Digidesign's MachineControl™ option for Pro Tools allows you to remotely arm tracks on supported 9-pin or V-LAN decks. Without MachineControl, Pro Tools does not support remote track arming of external devices (you will need to manually arm tracks for recording directly on the external device). MachineControl is a DAE Extension which allows Pro Tools to act as the master or slave to external Sony 9-pin or V-LAN machines, in addition to providing remote track arming from within Pro Tools. Contact your Digidesign Dealer for information about the MachineControl option.

▲ Pro Tools does not support track arming functions via MIDI Machine Control.

ProControl Features and Updates

Using the Smart Tool from ProControl

To access the Smart Tool from ProControl, press any two of the following switches: Trimmer, Selector and/or Grabber. When the Smart Tool is selected, the Trim, Select and Grabber switches will be lit. Refer to Chapter 2 of this guide for details on using the Smart Tool.

MacOS 8.1+ on G3 computers

In order to use ProControl on a G3 computer that is running Macintosh OS 8.1+, AppleTalk must be active, and the Apple-talk port assignment must match the Ethernet card selected for ProControl in the Pro Tools Peripherals > ProControl window. Failure to do so will cause Pro Tools to not be able to see your Pro-Control units.

If this is not an option for your setup (due to networking requirements, for example) then we suggest installing "regular" MacOS 8.1 (or 8.0).

To determine if you are running MacOS 8.1+, choose About This Computer from the Apple Menu. If you are running 8.1+, the version will show "System Enabler 777 version 1.0."

ProControl Firmware Update

With the release of 4.3 software for TDM equipped Pro Tools systems, we have up-dated the ProControl firmware. Version 1.01 of the ProControl firmware corrects a problem whereby devices connected to a shared Ethernet with ProControl could cause connected ProControl units to mo-mentarily go off-line if maximum size Ethernet packets were transmitted by these devices and subsequently received by Pro-Control.

Determining your Firmware Version

To determine if your ProControl unit(s) need this upgrade:

1 Turn on the power to your ProControl unit(s). You do NOT need to launch Pro Tools to check your firmware version.

2 On the ProControl Main unit, press the "UTILITY" switch located to the left of the CHANNEL MATRIX.

3 The top-most scribble strip, located in the DSP EDIT/ASSIGN section above the CHANNEL MATRIX, will be labeled "SYS-TEM". Press and hold the switch immediately to the left of the scribble strip.

The upper row of scribble strips located on the Fader Section of each ProControl unit will display the following series of messages:

FIRMWARE | COM vx.xx | FDR vx.xx | HARDWARE | FSW vxxx | MTR vxxx | <> |<>|

The two fields labeled "COM" and "FDR" are the ones to pay attention to here. If either one of these fields reads "v1.00", you will want to upgrade to the new version 1.01 firmware included with the Pro Tools 4.3 application. If either field reads "v1.01" you already have the new firmware and you can skip the rest of this procedure.

4 Once you have determined the version of firmware currently installed in your ProControl unit(s), release the "SYSTEM" switch and press the "UTILITY" switch to exit the mode.

Upgrading your ProControl Firmware

To install your ProControl firmware:

1 If you haven't already done so, install the new 4.3 software for your Pro Tools system by following the instructions supplied with your 4.3 upgrade package.

2 Launch the Pro Tools application. You do NOT need to open or create a new session to install the new ProControl firmware.

3 Choose Setups > Peripherals and click ProControl.

4 Select Enable. For more information on configuring ProControl units in Pro Tools see the section "Software Configuration" in your ProControl User's Guide.

5 Pro Tools will now scan the Ethernet for connected ProControl units. Following the scan, click on the name fields pop-up to enter the ProControl unit(s) you have connected to the system. For more information on configuring ProControl units in Pro Tools see the section "Software Configuration" in your ProControl User's Guide.

6 Click OK. A dialog will appear indicating that there is a mismatch between the existing firmware on your ProControl units with that of the new version 1.01. Click Download to upgrade your units. The "COM" portion of the firmware will update to show the new firmware version.

7 To update the "FDR" portion, re-open the Peripherals window and click on any name pop-up menu which contains a ProControl unit. Set this field to None. Then re-open the name pop-up menu and set the selection back to the name of the ProControl unit.

8 Click OK. A dialog will appear indicating that there is a mis-match between the existing firmware on your ProControl units with that of the new version 1.01. Click Download to upgrade your units. The "FDR" portion of the firmware will have been updated to version 1.01.

To ensure that all connected ProControl units have been upgraded to the 1.01 firmware:

◆ Press the "UTILITY" switch located to the left of the CHANNEL MATRIX and then hold the "SYSTEM" switch in the DSP EDIT/ASSIGN section. Both the "COM" and "FDR" scribble strip fields located on the Fader Section of each ProControl unit should now display "v1.01".

✳ If you have any difficulties in performing this firmware upgrade or need additional assistance, please contact your local Digidesign dealer or call Digidesign Technical Support.

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