

# Reel Tape™ Plug-ins

Version 7.4



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# chapter 1

## Introduction

For years, engineers have relied on analog tape to add a smooth, warm sound to their recordings. When driven hard, tape responds with gentle distortion rather than abrupt clipping. Magnetic tape also has a frequency-dependent saturation characteristic that can lend punch to the low end, and sweetness to the highs.

The Digidesign Reel Tape plug-ins simulate the classic sound of analog tape by carefully modeling the frequency response, noise, and saturation characteristics of analog tape machines and tape formulations.

*Digidesign Reel Tape plug-ins are not connected with, or approved or endorsed by, the owners of the 3M, Studer, Ampex, or Quantegy trademarks. These names are used solely to identify the sonic characteristics of the Reel Tape plug-ins.*

This guide describes the Reel Tape plug-ins, which are all available as TDM, RTAS, and AudioSuite:

- Reel Tape Saturation
- Reel Tape Delay
- Reel Tape Flanger

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### Contents of the Boxed Version of Your Plug-In

Your plug-in package contains the following components:

- Installation disc
- Activation card with an Activation Code (for authorizing plug-ins with an iLok USB Smart Key, not supplied)
- Digidesign Registration Information card

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## System Requirements

To use Digidesign plug-ins you need the following:

- An iLok USB Smart Key (an iLok.com account is also required for managing iLok licenses)  
– and –
- One of the following systems:
  - A Digidesign-qualified Pro Tools system (TDM versions of Reel Tape Delay and Reel Tape Flanger require a Pro Tools HD system with one or more HD Accel cards)
  - A Digidesign-qualified Pro Tools system and a third-party software application that supports the Digidesign TDM, RTAS or AudioSuite plug-in standards
  - A qualified Avid Xpress, Avid Xpress DV, or Avid DNA system (AudioSuite only)
  - A qualified Digidesign VENUE™ system

For complete system requirements visit the Digidesign website ([www.digidesign.com](http://www.digidesign.com)).

### Compatibility Information

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, visit the Digidesign website ([www.digidesign.com](http://www.digidesign.com)).

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## Register Your Plug-Ins

If you purchase a plug-in online from the Digi-Store ([www.digidesign.com](http://www.digidesign.com)) using Internet Activation, you are automatically registered.

If you purchase a plug-in boxed version, check the enclosed Digidesign Registration Information Card for information about how to register online.

Registered users will receive periodic software update and upgrade notices.

Refer to the Digidesign website ([www.digidesign.com](http://www.digidesign.com)) or the Digidesign Registration Information Card for information on technical support.

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## Working with Plug-ins

Refer to the *DigiRack Plug-ins Guide* for information on working with plug-ins, including:

- Inserting plug-ins on tracks
- Using Clip indicators
- Navigating the Plug-in window
- Adjusting parameters
- Automating plug-ins
- Using the Librarian

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## Conventions Used in This Guide

All Digidesign guides use the following conventions to indicate menu choices and key commands:

Convention	Action
File > Save	Choose Save from the File menu
Control+N	Hold down the Control key and press the N key
Control-click	Hold down the Control key and click the mouse button
Right-click	Click with the right mouse button

The following symbols are used to highlight important information:



*User Tips are helpful hints for getting the most from your Pro Tools system.*



*Important Notices include information that could affect your Pro Tools session data or the performance of your Pro Tools system.*



*Shortcuts show you useful keyboard or mouse shortcuts.*



*Cross References point to related sections in the Pro Tools Guides.*

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## About [www.digidesign.com](http://www.digidesign.com)

The Digidesign website ([www.digidesign.com](http://www.digidesign.com)) is your best online source for information to help you get the most out of your Pro Tools system. The following are just a few of the services and features available.

**Registration** Register your purchase online. See the enclosed registration form for details.

**Support** Contact Digidesign Technical Support or Customer Service; download software updates and the latest online manuals; browse the Compatibility documents for system requirements; search the online Answerbase or join the worldwide Pro Tools community on the Digidesign User Conference.

**Training and Education** Study on your own using courses available online or find out how you can learn in a classroom setting at a certified Pro Tools training center.

**Products and Developers** Learn about Digidesign products; download demo software or learn about our Development Partners and their plugins, applications, and hardware.

**News and Events** Get the latest news from Digidesign or sign up for a Pro Tools demo.

To learn more about these and other resources available from Digidesign, visit the Digidesign website ([www.digidesign.com](http://www.digidesign.com)).





## chapter 2

# Installation

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### Installing Plug-Ins

Installers for your plug-ins can be downloaded from the DigiStore ([www.digidesign.com](http://www.digidesign.com)) or can be found on the plug-in installer disc (included with boxed versions of plug-ins). An installer may also be available on a Pro Tools software bundle installer disc.

Installation steps are essentially the same, regardless of the bundle, package, or system you purchase.

### Installation

#### To install a plug-in:

- 1 Do one of the following:
  - Download the installer for your computer platform from the Digidesign website ([www.digidesign.com](http://www.digidesign.com)). After downloading, make sure the installer is uncompressed. Compressed files have the suffix .ZIP (Windows) or .SIT (Mac).
  - or –
  - Insert the Installer disc into your computer.
- 2 Double-click the plug-in installer application.
- 3 Follow the on-screen instructions to complete the installation.
- 4 When installation is complete, click Finish (Windows) or Quit (Mac).

When you launch Pro Tools, you will be prompted to authorize your new plug-in.

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## Authorizing Plug-ins

Plug-ins are authorized using the iLok USB Smart Key (iLok), manufactured by PACE Anti-Piracy, Inc.




### *iLok USB Smart Key*

An iLok can hold over 100 licenses for all of your iLok-enabled software. Once an iLok is authorized for a given piece of software, you can use the iLok to authorize that software on any computer.

**⚠** *The iLok USB Smart Key is not supplied with your plug-in or software option. You can use the one included with certain Pro Tools systems (such as Pro Tools|HD-series systems), or purchase one separately.*


If you purchased a plug-in online at the DigiStore ([www.digidesign.com](http://www.digidesign.com)), authorize the plug-in by downloading licenses from [iLok.com](http://iLok.com) to an iLok.

 *See the iLok Usage Guide for details, or visit the iLok Web site ([www.iLok.com](http://www.iLok.com)).*

If you purchased a boxed version of a plug-in, it comes with an Activation Code (on the included Activation Card).

## Authorizing Plug-ins Using an Activation Code

### **To authorize a plug-in using an Activation Code:**

- 1** If you do not have an existing [iLok.com](http://iLok.com) account, visit [www.iLok.com](http://www.iLok.com) and sign up for an [iLok.com](http://iLok.com) account.
  - 2** Transfer the license for your plug-in to your [iLok.com](http://iLok.com) account by doing the following:
    - Visit <http://secure.digidesign.com/activation>.
    - Input your Activation Code (listed on your Activation Card) and your [iLok.com](http://iLok.com) User ID. Your [iLok.com](http://iLok.com) User ID is the name you create for your [iLok.com](http://iLok.com) account.
  - 3** Transfer the licenses from your [iLok.com](http://iLok.com) account to your iLok USB Smart Key by doing the following:
    - Insert the iLok into an available USB port on your computer.
    - Go to [www.iLok.com](http://www.iLok.com) and log in.
    - Follow the on-screen instructions for transferring your licenses to your iLok.
-  *For information about iLok technology and licenses, see the iLok Usage Guide.*
- 4** Launch Pro Tools.
  - 5** If you have any installed unauthorized plug-ins or software options, you will be prompted to authorize them. Follow the on-screen instructions to complete the authorization process.

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## Removing Plug-Ins

If you need to remove a plug-in from your system, follow the instructions below for your computer platform.

### Windows

#### To remove a plug-in:

- 1 From the Start menu, choose Settings > Control Panel and double-click Add or Remove Programs.
- 2 Select the expired plug-in from the list of installed applications and click the Change/Remove button.
- 3 Follow the on-screen instructions to remove the plug-in.
- 4 When removal is complete, click OK to close the window.

### Mac OS X

#### To remove a plug-in:

- 1 Launch the Installer for the plug-in you want to uninstall.
- 2 Follow the on-screen instructions and select Uninstall from the Install pop-up menu.
- 3 Click Uninstall.
- 4 When uninstallation is complete, click Quit.



## chapter 3

# Reel Tape Plug-Ins

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### Reel Tape Common Controls

Each of the Reel Tape plug-ins has the following controls:

#### Drive

Drive controls the amount of saturation effect by increasing the input signal to the modeled tape machine while automatically compensating by reducing the overall output. Drive is adjustable from  $-12$  dB to  $+12$  dB, with a default value of 0 dB.

#### Output

Output controls the output signal level of the plug-in after processing. Output is adjustable from  $-12$  dB to  $+12$  dB, with a default value of 0 dB.

### Tape Machine

The Tape Machine control lets you select one of three tape machine types emulated by the plug-in, each with its own sonic characteristics:

**US** Emulates the audio characteristics of a 3M M79 multitrack tape recorder.

**Swiss** Emulates the audio characteristics of a Studer A800 multitrack tape recorder.

**Lo-Fi** Simulates the effect of a limited-bandwidth analog tape device, such as an outboard tape-based echo effect.

### Tape Formula

The Tape Formula control lets you select either of two magnetic tape formulations emulated by the plug-in, each with its own saturation characteristics:

**Classic** Emulates the characteristics of Ampex 456, exhibiting a more pronounced saturation effect.

**Hi Output** Emulates the characteristics of Quantegy GP9, exhibiting a more subtle saturation effect.

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## Reel Tape Saturation

(TDM, RTAS, and AudioSuite)

Reel Tape Saturation simulates the saturation effect of an analog tape machine, modeling its frequency response, noise and distortion characteristics, but without any delay or wow and flutter effects.



*Reel Tape Saturation*

### How Reel Tape Saturation Works

Reel Tape Saturation models the sonic characteristics of analog tape, including the effects of tape speed, bias setting, and calibration level of the modeled tape machine.

Reel Tape Saturation can be placed on mono, stereo, or multichannel tracks.

### Reel Tape Saturation Controls

In addition to the Drive, Output, Tape Machine, and Tape Formula controls, Reel Tape Saturation has the following controls:

#### Speed

The Speed control adjusts the tape speed in ips (inches per second). Tape speed affects the frequency response of the modeled tape machine. Available tape speeds include 7.5 ips, 15 ips, and 30 ips, with a default setting of 15 ips.

#### Noise

Reel Tape Saturation produces noise only during playback and recording, and not when the transport is stopped.

The Noise control adjusts the level of simulated tape noise that is added to the processed signal. The characteristics of the noise depend on the Speed, Bias, and Tape Machine settings, and the relative level of the noise depends on the Drive, Cal Adjust, and Tape Formula settings.

Noise is adjustable from Off (-INF) to -24 dB, with the default value being Off.

#### Bias

The Bias control simulates the effect of under- or over-biasing the modeled tape machine. Bias is adjustable from -6 dB to +6 dB, with a default value of 0.0 dB. The 0.0 dB value represents a standard overbias calibration of 3 dB for analog tape machines, so the control acts as a bias offset rather than as an absolute bias control.

## Cal Adjust

Cal Adjust simulates the effect of three common calibration levels on the modeled tape machine and magnetic tape formulations.

With the evolution of tape formulations, it was possible to increase the fluxivity level, or magnetic strength, of the signals on tape. Over the years, this resulted in an elevation of recorded levels relative to a standard reference fluxivity (185 nW/m at 700 Hz). The Cal Adjust value expresses the elevated level in dB over this standard reference level.

The Cal Adjust control does not affect the overall gain, but does affect the amount of saturation effect for a given input signal.

Available Cal Adjust values are:

- +3 dB (equivalent to 250 nW/m)
- +6 dB (equivalent to 370 nW/m)
- +9 dB (equivalent to 520 nW/m)

The default value is +6 dB.

## Reel Tape Saturation Tips

- ◆ Use Reel Tape Saturation on individual tracks to round out sharp transients or add color to sustained tones.
- ◆ Use Reel Tape Saturation on a group of tracks (for example drums) to add cohesiveness to the sound of the group.
- ◆ Use Reel Tape Saturation on a Master Fader to apply analog tape-style compression to a mix.

## Reel Tape Saturation Presets

The sonic effect of Reel Tape Saturation depends on many factors, including the signal level of the source material; these presets are just starting points. With some experimentation, Reel Tape Saturation can yield warmer-sounding results than conventional digital compression.

**Bass Drum** Rounds out and adds consistency to bass drum hits

**Bass Gtr** Adds consistency and warmth to bass guitar sound while avoiding compression artifacts

**Snare Drum** Reduces harsh peaks resulting from EQ-boosted snare drum or rim shots

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## Reel Tape Delay

(TDM, RTAS, and AudioSuite)

Reel Tape Delay simulates an analog tape echo effect, modeling the frequency response, noise, wow and flutter, and distortion characteristics of analog tape. It also reproduces the varispeed effect you get when the tape speed control is adjusted.



Reel Tape Delay

### How Reel Tape Delay Works

Reel Tape Delay models a studio tape machine in record/playback mode, with a fixed distance between the record head and the play head, and a continuously variable tape speed.

Reel Tape Delay automatically applies tape saturation effects that correspond to the following control settings in Reel Tape Saturation:

- Speed: 15 ips
- Bias: 0.0 dB
- Cal Adjust: +9 dB

You can use the BPM Sync feature to synchronize the Reel Tape Delay effect to the current tempo of the Pro Tools session.

### Reel Tape Delay Controls

Reel Tape Delay can be placed on mono, stereo, or multichannel tracks.

In addition to the Drive, Output, Tape Machine, and Tape Formula controls, Reel Tape Delay has the following controls:

#### Speed

The Speed control adjusts the delay time, calibrated to tape speed. A slower tape speed results in a longer delay. A faster tape speed results in a shorter delay.

The displayed tape Speed value corresponds to the delay time resulting from the distance between the record and play heads on an Ampex 440-series tape transport.

Tape speed is adjustable from approximately 1 7/8 ips (1486 ms delay) to approximately 30 ips (93 ms delay), with a default value of approximately 15 ips (172 ms delay).

You can synchronize the delay time to the current tempo of the Pro Tools session. See “Synchronizing Delay to Session Tempo” on page 14.

#### Feedback

The Feedback control adjusts the amount of delayed output fed back into the input, allowing generation of multiple echoes. A higher feedback amount results in more echo regeneration. A lower feedback amount results in less echo regeneration. Feedback amount is adjustable from 0 to 100 percent, with a default value of 30 percent.



## Wow/Flutter


The Wow/Flutter control adjusts the amplitude of the tape machine's wow and flutter, or the amount of fluctuation in tape speed. A higher setting results in wider fluctuations in speed. A lower setting results in narrower fluctuations in speed. Wow/Flutter is adjustable from 0 to 1 percent, with a default value of 0.20 percent.

## Wow Speed

### (Plug-in Automation Playlist or Control Surface Access Only)


The Wow Speed parameter adjusts the frequency of the tape machine's wow effect, or the rate of fluctuation in tape speed. A higher value results in faster fluctuations in speed. A lower value results in slower fluctuations in speed. Wow Speed is adjustable from 0 to 100 percent, with a default value of 50 percent.

This parameter is accessible only from the plug-in automation playlist or from a supported control surface.

 *Settings for this parameter are saved with plug-in presets. If you use a preset for the TDM, RTAS or AudioSuite version of this plug-in, any settings for this parameter will be active.*


## Bass

The Bass control boosts or cuts the amount of low frequencies fed to the echo feedback loop. Bass amount is adjustable from -10 dB to +10 dB, with a default value of 0 dB.

 *Note that this control does not affect the first delayed signal, only the repeated delays caused by the Feedback control.*

## Treble

The Treble control boosts or cuts the amount of high-mid frequencies fed to the echo feedback loop. Treble amount is adjustable from -10 dB to +10 dB, with a default value of 0 dB.

 *Note that this control does not affect the first delayed signal, only the repeated delays caused by the Feedback control.*

## Mix


The Mix control adjusts the amount of processed signal mixed with the input signal in the final output of the plug-in. The default Mix value is 25 percent.

## Noise

### (Plug-in Automation Playlist or Control Surface Access Only)

The Noise parameter controls the level of simulated tape hiss that is added to the processed signal. Noise is adjustable from Off (-INF) to -24 dB, with a default value of -80 dB.

This parameter is accessible only from the plug-in automation playlist or from a supported control surface.

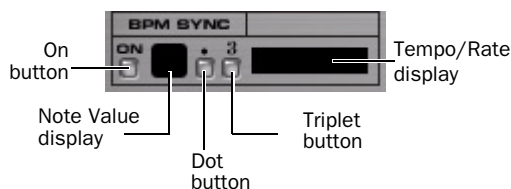
 *Settings for this parameter are saved with plug-in presets. If you use a preset for the TDM, RTAS or AudioSuite version of this plug-in, any settings for this parameter will be active.*

## Synchronizing Delay to Session Tempo

You can set the delay time (Speed control) in the Reel Tape Delay to synchronize to the session tempo (in beats per minute).

**To synchronize the delay time to the session tempo:**

**1** In the BPM Sync section, click the On button. The Tempo/Rate display changes to match the current session tempo.



### BPM Sync controls

**2** To set a rhythmic delay, click the Note Value to choose from the available note values (whole, half, quarter, eighth, sixteenth, or thirty-second note)

**3** To adjust the rhythm further, do any of the following:

- To enable triplet rhythm delay timing, click the Triplet (“3”) button so that it is lit.
- To set a dotted rhythm delay value, click the Dot (“.”) button so that it is lit.



*You can override the settings derived from BPM Sync at any time by manually adjusting the plug-in Speed control.*

## Reel Tape Delay Tips

◆ To set the delay time to a specific time value, turn off BPM Sync and enter the delay time (in msec) in the Tempo/Rate display.

## Reel Tape Delay Presets

The Reel Tape Delay presets coordinate Speed, Wow/Flutter, Feedback and the Bass and Treble controls for different tape speeds.

**3.75 ips** Sets the delay time to correspond to a Speed Control setting of 3.75 inches per second.

**3.75 ips Flutter** Includes the 3.75 ips setting plus Wow/Flutter.

**7.5 ips** Sets the delay time to correspond to a Speed Control setting of 7.5 inches per second.

**7.5 ips Flutter** Includes the 7.5 ips setting plus Wow/Flutter.

**30 ips Flutter** Adds Wow/Flutter to the highest Speed Control setting.

**Rockabilly** A common tape slap effect, useful on vocals or electric guitar. Sets the delay time to 130 ms, which corresponds to the delay time resulting from the distance between the record and play heads on an Ampex 300-series or Ampex 350-series tape transport.

**Rockabilly Plus** Includes the Rockabilly setting plus Feedback, Wow/Flutter, Bass and Treble adjustments on feedback.

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## Reel Tape Flanger

(TDM, RTAS, and AudioSuite)

Reel Tape Flanger simulates a tape machine flanging effect, modeling the frequency sweep and “crossover” comb-filtering effects that can result when the flanger variable delay is adjusted. It also reproduces the frequency response, noise, wow and flutter, and distortion characteristics of analog tape recording.



Reel Tape Flanger

## How Reel Tape Flanger Works

Reel Tape Flanger models a classic tape flanging setup with two analog tape machines and a mixer, where one tape machine has a fixed delay and the other has a continuously variable delay.

The two machines are fed an input signal in parallel, and the output of the machines is then mixed. When the variable delay on the second machine is changed at a constant rate (using an LFO), the resulting frequency cancellations cause a periodic phasing of the original signal.

The use of a fixed delay on the first machine makes it possible to adjust the variable delay on the second machine to pass the “zero” point (to a delay value less than the fixed delay), resulting in phase cancellation (or the “crossover” flanging effect).

Reel Tape Flanger automatically applies tape saturation effects that correspond to the following control settings in Reel Tape Saturation:

- Speed: 15 ips
- Bias: 0.0 dB
- Cal Adjust: +9 dB

You can use the BPM Sync feature to synchronize the Reel Tape Flanger effect to the current tempo of the Pro Tools session.

Reel Tape Flanger can be placed on mono, stereo, or multichannel tracks.

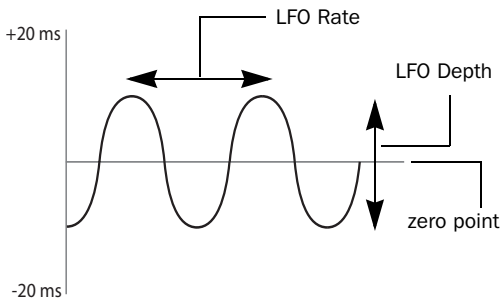
## Reel Tape Flanger Controls

In addition to the Drive, Output, Tape Machine, and Tape Formula controls, Reel Tape Flanger has the following controls:

### Range

The Range control adjusts the overall magnitude of the variable delay, which determines the offset between the two modeled tape machines. A center or “zero” setting results in no offset. Range is continuously adjustable from -20 ms to +20 ms, and is divided into two types of effects: flanging and automatic double tracking.

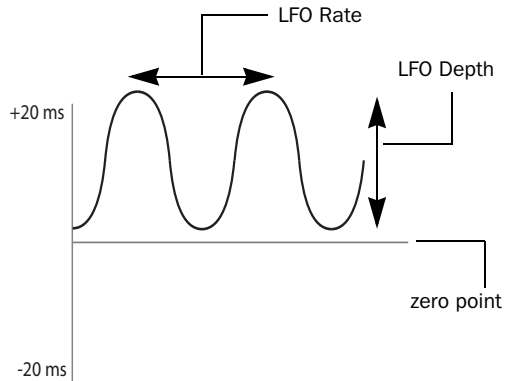
**Flange** Range settings within the narrow center band around “zero” simulate tape *flanging*, with a phase cancellation effect as the variable delay crosses the “zero” point.



Operation with “Flange” Range setting (no offset)

**ADT (Artificial Double Tracking)** Range settings outside the narrow center band simulate *artificial double tracking*, in which the variable delay does not cross the “zero” point. This varying delay creates a unique doubling effect, essentially

an analog precursor to chorusing. (You can hear ADT-type effects on many classic analog recordings, such as those of the Beatles or Led Zeppelin.)



Operation with “ADT” Range setting (positive offset)



When the LFO Depth control is set to zero, you can still achieve a “manual” flanging or ADT effect by varying the Range control.

### Feedback

The Feedback control adds a short delay to the flanged signal. Feedback amount is adjustable from 0 to 100 percent, with a default value of 0 percent. (This is not the same feedback effect as on an electronic flanger or delay.)

## **Wow/Flutter**

The Wow/Flutter control adjusts the amplitude of the variable delay tape machine's wow and flutter, or the amount of fluctuation in tape speed. A higher setting results in wider fluctuations in speed. A lower setting results in narrower fluctuations in speed. Wow/Flutter is adjustable from 0 to 1 percent, with a default value of 0.03 percent.

## **Rate**

The LFO Rate control adjusts the rate of change in the variable delay. A higher setting results in faster fluctuations in speed. A lower setting results in slower fluctuations in speed. LFO Rate is adjustable from 0.05 Hz to 5 Hz, with a default setting of 0.14 Hz.

You can set the LFO Rate control to synchronize to the tempo of the current Pro Tools session. See “Synchronizing the Flanger to Session Tempo” on page 18.

## **Depth**

The LFO Depth control adjusts the amplitude of the change in variable delay. A higher setting results in wider fluctuations in speed. A lower setting results in narrower fluctuations in speed. LFO Depth is adjustable from 0 to 100 percent, with a default value of 65 percent.

## **Mix**


The Mix control adjusts the amount of fixed delay signal mixed with the variable delay signal in the final output of the plug-in. The default Mix value is adjustable from -100 (all fixed delay signal) to +100 (all variable delay signal) percent, with a default value of 0 (50% fixed delay, 50% variable delay signals).

## Invert

### (Plug-in Automation Playlist or Control Surface Access Only)

The Invert parameter inverts the polarity of the signal coming from the variable delay tape machine, so that complete audio cancellation occurs when the flanger effect crosses the zero point. The default setting for the Invert parameter is Off.

This parameter is accessible only from the plug-in automation playlist or from a supported control surface.


 *Settings for this parameter are saved with plug-in presets. If you use a preset for the TDM, RTAS or AudioSuite version of this plug-in, any settings for this parameter will be active.*

## Noise

### (Plug-in Automation Playlist or Control Surface Access Only)

The Noise parameter controls the level of simulated tape hiss that is added to the processed signal. Noise is adjustable from Off (-INF) to -24 dB, with a default value of Off.

This parameter is accessible only from the plug-in automation playlist or from a supported control surface.

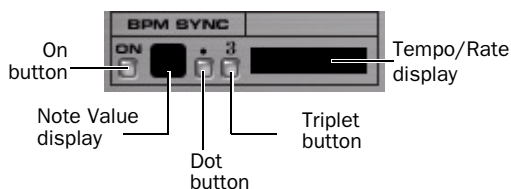
 *Settings for this parameter are saved with plug-in presets. If you use a preset for the TDM, RTAS or AudioSuite version of this plug-in, any settings for this parameter will be active.*

## Synchronizing the Flanger to Session Tempo

You can set the LFO Rate in Reel Tape Flanger to synchronize to the session tempo (in beats per minute).

### To synchronize the LFO Rate control setting to the session tempo:

**1** In the BPM Sync section, click the On button. The Tempo/Rate display changes to synchronize with the current session tempo.



### BPM Sync controls

**2** To set a rhythmic LFO rate, click the Note Value to choose from the available note values (whole, half, quarter, eighth, sixteenth, or thirty-second note)

**3** To adjust the rhythm further, do any of the following:

- To enable triplet rhythm delay timing, click the Triplet (“3”) button so that it is lit.
- To set a dotted rhythm delay value, click the Dot (“.”) button so that it is lit.

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## DSP Delay Incurred by Reel Tape Flanger

Reel Tape Flanger incurs the delays shown in the following tables. These delays can be automatically compensated only on Pro Tools HD systems.

On Pro Tools LE, Pro Tools M-Powered, and Pro Tools Academic systems, you will need to manually compensate for these delays by adjusting track material or by using the TimeAdjuster plug-in on other tracks.

On VENUE systems, these delay amounts exceed the system's internal delay compensation capacity, and cannot be fully compensated when inserting Reel Tape Flanger on an output bus.

## RTAS Delay

*Delay incurred by Reel Tape Flanger RTAS*

Session Sample Rate	Samples of Delay
44.1 kHz	2206
48 kHz	2401
88.2 kHz	4411
96 kHz	4801
176.4 kHz	8821
192 kHz	9601

## TDM Delay

*Delay incurred by Reel Tape Flanger TDM*

Session Sample Rate	Samples of Delay
44.1 kHz	2210
48 kHz	2405
88.2 kHz	4415
96 kHz	4805

## VENUE Delay

*Delay incurred by Reel Tape Flanger on VENUE*

Session Sample Rate	Samples of Delay
48 kHz	2403

## Reel Tape Flanger Tips

- ◆ To achieve a flanging effect, set the Range control within the “Flange” range and adjust the LFO Depth control to a value that is greater than the offset (so that the variable delay crosses the “zero” point.)
- ◆ To achieve an ADT (doubling) effect, set the Range control within either of the “ADT” ranges and adjust the LFO Depth control to a value that is smaller than the offset (so that the variable delay does not cross the “zero” point).
- ◆ To achieve a manual flanging effect, set the LFO Depth control to 0 and vary (or automate) the Range control within the “Flange” range. For fine control, hold Control (Windows) or Command (Mac) while varying the Range control.
- ◆ To add complexity to flanging or ADT effects, turn up the Wow/Flutter control to introduce more fluctuation in the variable delay.
- ◆ Use the Reel Tape Flanger plug-in in a send/return configuration to mix the dry signal with an aggressively driven, flanged signal to control the amount of “grunge” in the final mix.
- ◆ When you start playback, the LFO sweep always starts at the bottom of the cycle, so each time you start playback from the same location (for example, at a bar line), the effect will be applied in the same way.

## Reel Tape Flanger Presets

**12-String** Moderate-depth ADT setting that works well with acoustic guitar sounds

**Flutter Flange** Moderate-depth flange setting with Wow/Flutter

**Flutter** Extreme Wow/Flutter setting with flanging turned off and a Mix setting that passes only the variable delay

**Manual Flange** Settings with LFO Depth set to zero, ready for manual flanging by adjusting or automating the Range control

**Slow Flange** High Depth setting combined with slow LFO Rate, suitable for flanging vocals

**Vocal ADT** Settings for creating doubling effect without flanging “crossover” effect, suitable for vocals

**Vocal Walrus** Drive-boosted settings for extreme vocal doubling effect

**Wobble** A high LFO Rate setting combined with a Mix setting that passes only the variable delay. Works well on sustained parts.



## appendix a

# DSP Requirements for TDM Plug-ins

The number of TDM plug-ins you can use at one time depends on how much DSP power is available in your system. Since the TDM hardware on Pro Tools cards provide dedicated DSP for plug-ins, plug-in performance is not limited by CPU processing power.

The DSP tables on the following pages show the theoretical number of instances of each plug-in that can be powered by a single DSP chip on Pro Tools|HD cards. DSP usage differs according to card type.

**A** *DSP tables show the theoretical maximum performance when no other plug-ins or system tasks (such as I/O) are sharing available DSP resources. You will typically use more than one type of plug-in simultaneously. The data in these tables are provided as guidelines to help you gauge the relative efficiency of different plug-ins on your system. They are not guaranteed performance counts that you should expect to see in typical real-world sessions and usage.*

There are a total of nine DSP chips on a Pro Tools|HD card (HD Core, HD Process, and HD Accel). HD Core and HD Process cards provide identical chip sets. HD Accel cards provide newer, more powerful DSP chips (making the HD Accel card ideal for DSP-intensive plug-ins, and for high sample rate sessions).

Not all plug-ins are supported on all types of chips. The following tables indicate the number of compatible chips per card.

### Using Multi-Mono Plug-ins on Greater-Than-Stereo Tracks

Plug-ins used in multi-mono format on greater-than-stereo tracks require one mono instance per channel of the multi-channel audio format. For example, a multi-mono plug-in used on a 5.1 format track, requires six mono instances since there are six audio channels in the 5.1 format.

## HD Accel Card

Digidesign TDM plug-ins on HD Accel cards have the following DSP requirements:

### 44.1/48 kHz (Mono and Stereo)

*Maximum instances of real-time TDM plug-ins per DSP chip for an HD Accel card at 44.1 or 48 kHz sample rates (mono and stereo)*

Sample Rate	44.1/48 kHz Mono		44.1/48 kHz Stereo		Compatible DSP Chips per HD Accel Card
	Instances on Chips with SRAM	Instances on Chips without SRAM	Instances on Chips with SRAM	Instances on Chips without SRAM	
Reel Tape Saturation	6	6	3	3	9
Reel Tape Delay	3	n/a	1	n/a	4
Reel Tape Flanger	3	n/a	1	n/a	4

### 88.2/96 kHz (Mono and Stereo)

*Maximum instances of real-time TDM plug-ins per DSP chip for an HD Accel card at 88.2 kHz or 96 kHz sample rates (mono and stereo)*

Sample Rate	88.2/96 kHz Mono		88.2/96 kHz Stereo		Compatible DSP Chips per HD Accel Card
	Instances on Chips with SRAM	Instances on Chips without SRAM	Instances on Chips with SRAM	Instances on Chips without SRAM	
Reel Tape Saturation	3	3	1	1	9
Reel Tape Delay	1	n/a	n/a*	n/a	4
Reel Tape Flanger	1	n/a	n/a*	n/a	4

\* Plug-in can run as multi-mono on stereo tracks (using additional available DSP)

## 174/192 kHz (Mono and Stereo)

Maximum instances of real-time TDM plug-ins per DSP chip for an HD Accel card at 174 or 192 kHz sample rates (mono and stereo).

Sample Rate	176.4/192 kHz Mono		176.4/192 kHz Stereo		Compatible DSP Chips per HD Accel Card
	Instances on Chips with SRAM	Instances on Chips without SRAM	Instances on Chips with SRAM	Instances on Chips without SRAM	
Reel Tape Saturation	1	1	n/a*	n/a*	9
Reel Tape Delay	n/a	n/a	n/a	n/a	0
Reel Tape Flanger	n/a	n/a	n/a	n/a	0

\* Plug-in can run as multi-mono on stereo tracks (using additional available DSP)

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## HD Core and Process Card

Digidesign TDM plug-ins on HD Core and Process cards have the following DSP requirements:

### Mono and Stereo

Maximum instances of real-time TDM plug-ins per DSP chip for an HD Core or HD Process card at different sample rates (mono and stereo)

Sample Rate	44.1/48 kHz		88.2/96 kHz		176.4/192 kHz		Compatible DSP Chips per HD Core or HD Process Card
	Mono	Stereo	Mono	Stereo	Mono	Stereo	
Reel Tape Saturation	3	1	1	n/a*	n/a	n/a	9
Reel Tape Delay	n/a	n/a	n/a	n/a	n/a	n/a	0
Reel Tape Flanger	n/a	n/a	n/a	n/a	n/a	n/a	0

\* Plug-in can run as multi-mono on stereo tracks (using additional available DSP)

## Monitoring DSP Usage

The System Usage window (Windows > Show System Usage) shows approximately how much DSP is available in your system and how it is being used in the current Pro Tools session.



*For more information about DSP usage and allocation, see the Pro Tools Reference Guide.*

## appendix b

# DSP Delays Incurred by TDM Plug-ins

Virtually all TDM plug-ins incur some amount of signal delay.

If you are working with mono tracks, or are processing all channels with the same plug-in, the signal delays are not long enough to be significant and should not be a concern.

This signal delay is significant only if you use a plug-in on one channel of a stereo or multichannel signal but not the others, since this can cause the channels to be slightly out of phase.



*Pro Tools|HD systems provide automatic Delay Compensation to compensate for signal processing delays. For detailed information, see the Pro Tools Reference Guide.*

The following table shows the delays inherent in each Reel Tape TDM plug-in:

**Samples of delay incurred by each TDM plug-in on HD cards**

Plug-in	Samples of Delay on Pro Tools HD Cards
Reel Tape Saturation	4
Reel Tape Delay	4
Reel Tape Flanger	2210 (44.1 kHz) 2405 (48 kHz) 4415 (88.2 kHz) 4805 (96 kHz)







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