Avid® Video Peripherals Guide

Version 10.0

Documentation Feedback

At Avid, we are always looking for ways to improve our documentation. If you have comments, corrections, or suggestions regarding our documentation, email us at *techpubs@avid.com*.

Contents

Chapter 1: Introduction to Pro Tools with Avid Video

This guide describes the use of Avid® Mojo® SDI peripherals (referred to here as *Avid video peripherals*) with Pro Tools® systems.

Pro Tools and Avid video peripherals combine the powerful audio post-production features of Pro Tools with integrated support for capture, import, and playback of Avid video media.

Capabilities of Pro Tools with Avid Peripherals

Pro Tools with Avid video peripherals lets you:

- Import, play back, and edit Avid video on the Pro Tools video track with near sample-accurate precision against audio tracks

- Digitize video to the Pro Tools Timeline (with Pro Tools HD and HD Native only)

- View Avid video edits on the video track

- Play QuickTime movies and Avid video on an external monitor

- Import mixed video resolutions to the video track

- Import and play back true 24P and 25P (Progressive Scan) picture media created in Avid video workstations

Pro Tools also supports many features that apply both to QuickTime movies and Avid video. See the Pro Tools Reference Guide for detailed information on working with video in Pro Tools.

Working with AAF and OMFI Sequences

Pro Tools can convert AAF and OMFI sequences (like those that can be generated by Avid Media Composer™ systems) into Pro Tools session files. Pro Tools also lets you export audio material from Pro Tools sessions to AAF sequences or OMFI sequences and files for import into other systems.

MachineControl

You can use Avid's MachineControl™ software to remotely control your external audio and video decks from Pro Tools. MachineControl is a Pro Tools software option that can be purchased separately.

For more information, see the MachineControl Guide.

Support for Avid ISIS and MediaNetwork Storage Systems

Pro Tools with an Avid video peripheral supports Avid ISIS 7000, ISIS 5000, and Unity MediaNetwork high-speed network storage systems, which let multiple users store and share media through a gigabit Ethernet connection (for ISIS) or fibre channel connection (for MediaNetwork).

Users of Pro Tools, Media Composer, and other Avid applications can use a Unity system to share the same media as follows:

- Stream audio and video media in real time.
- Push/pull audio and video media
- Configure multiple Pro Tools and Video Satellite users on the same ISIS or MediaNetwork *workgroup*
- Share AAF and OMF sequences, and OMF and MXF audio and video media
- Share AAF sequences using the Avid Interplay asset management system (Avid Interplay system required)

For detailed information on configuring your Pro Tools system with an Avid video peripheral as an Avid Unity ISIS or Unity MediaNetwork client, see the *Pro Tools Unity ISIS Guide* or *Pro Tools Unity MediaNetwork Guide*. Also, refer to the Avid website (www.avid.com), as well as the Avid Unity ISIS or Unity MediaNetwork documentation.

System Requirements and Compatibility

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

For complete system requirements and a list of Avid-qualified computers, operating systems, hard drives, and third-party devices, visit:

www.avid.com/compatibility

The system requirements for Pro Tools with an Avid Mojo SDI are as follows:

- One of the following:
  - An Avid-qualified Pro Tools HD system with Pro Tools|HD or HD Native hardware

  – or –
  - An Avid-qualified Pro Tools system with a qualified non-HD audio interface (such as 003 and Digi 002 families, Eleven Rack, Mbox 2 and Mbox 3rd generation families)

⚠ *Using an Avid Mojo SDI with a Pro Tools software or Avid audio configuration that does not feature S/PDIF or word clock connections may work, however, audio/video sync is not guaranteed.*

- Separate drives for audio and video media
- SYNC HD or SYNC I/O (required only when using Pro Tools HD or HD Native)

💡 *All references to SYNC peripheral refer to SYNC HD and SYNC I/O except where noted.*

- Black burst generator (required only when using Pro Tools HD or HD Native)

Conventions Used in This Guide

All of our 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 names of Commands, Options, and Settings that appear on-screen are in a different font.

The following symbols are used to highlight important information:

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

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

⌨ *Shortcuts show you useful keyboard or mouse shortcuts.*

▤ *Cross References point to related sections in this guide and other Pro Tools guides.*

About www.avid.com

The Avid website (www.avid.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.

Product Registration Register your purchase online.

Support and Downloads Contact Avid Customer Success (technical support); download software updates and the latest online manuals; browse the Compatibility documents for system requirements; search the online Knowledge Base or join the worldwide Pro Tools community on the 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 Avid products; download demo software or learn about our Development Partners and their plug-ins, applications, and hardware.

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

Chapter 2: Avid Video Peripherals Hardware Overview

Supported Video Resolutions

Pro Tools with Avid Mojo SDI supports the import and playback of all non-HD video resolutions and codecs supported by Avid video editing applications, including the following:

- All standard-definition Avid MXF and OMF video files

- Avid IMX MPEG50, MPEG40, MPEG30, and OP1a files

- DV50, DV25 and DVC Pro 25 resolutions compressed with the Avid codec, including:

    - DV25 411: DV25 interlaced scan at 4:1:1 sampling (for NTSC 30i and PAL 25i projects)

    - DV25 420: DV25 interlaced scan at 4:2:0 sampling (for PAL 25i projects)

    - DV25p 411: DV25 progressive scan at 4:1:1 sampling (for NTSC 23.976p and NTSC 24p projects)

    - DV25p 420: DV25 progressive scan at 4:2:0 sampling (for PAL 25p and PAL 24p projects)

    - All standard-definition Avid Multi-Cam Resolution files (see "Avid Multi-Cam Resolution Files" on page 19)

- The following video resolutions created with the Avid DV, JFIF or MXF video codecs:

    - 1:1 (Uncompressed JFIF/MXF)

    - DV50

- DV25 4:1:1
- DV25 4:2:0
- DV25P 4:1:1
- DV25P 4:2:0
- 15:1s 4:2:2
- 14:1P 4:2:2
- 28:1P 4:2:2
- 35:1P 4:2:2

Playback of QuickTime Movies through Avid Video Peripherals

Pro Tools lets you play most standard-definition or high-definition QuickTime movies through an Avid video peripheral to an external monitor.

Avid has specifically tested DV25 movies. Other codecs may work but have not been tested. ("Uncompressed" QuickTime movies are known to play back poorly.) In general, performance varies depending on the movie dimensions and compression rates, the number of tracks, plug-ins and automation in your session, and the speed of your processor.

When playing back QuickTime movies through Avid video peripherals, the following limitations may apply:

- Playing QuickTime video through any FireWire peripheral, including an Avid video peripheral, delays the output. You can compensate for this with the QuickTime Video Offset setting (located in the Set Video Sync Offset dialog). The best setting depends on your specific system, but when using Avid video peripherals 18 quarter frames is a good starting point. See "Compensating for Video Monitoring Delays" on page 25 for details.

- Large-dimension movies (such as 1080i) may affect system performance, so you may want to work with movies of smaller dimensions.

- Currently supported Avid video peripherals output only standard-definition images with a 4:3 aspect ratio. When playing back files with different aspect ratios (such as 16:9), the image will be stretched to 4:3. Some professional monitors can compensate for this by letter-boxing the image.

- Currently supported Avid video peripherals accept only video reference input at standard definition rates (25 and 29.97 fps). When playing back QuickTime movies with higher frame rates, only every other frame will output to the NTSC/PAL monitor.

- When playing back movies with frame rates of 50, 59.94, or 60 fps, set the Pro Tools session rate to one half of the movie's frame rate.

Support for Mixed Video Resolutions

Avid video peripherals support video files of mixed resolutions and codecs in the video track. For example, the video track can contain DV25 and 15:1s files. However, all files must be Avid files of the same frame rate. Mixed files with different frame rates are not supported. Mixing Avid video and QuickTime movies in the same Timeline is also supported, but you cannot have both on the same video track.

Caveats

The following caveats apply to all supported resolutions:

- Pro Tools with Avid video peripherals outputs video to NTSC and PAL monitors only. 24 fps and 23.97 fps video output is converted to NTSC (29.97 fps) or PAL (25 fps) output in Pro Tools.

- Pro Tools video digitizing and playback is intended for monitoring purposes only, and is not suitable for professional layback or broadcast.

  - Applying a pull-up to video in a session may have unpredictable effects on the playback of any Avid video in that session. Only use video pull-up feature for sessions that do not contain Avid video.

  - Heavy usage of host-based plug-ins with QuickTime or Avid video may cause video output to be erratic or skip frames. If possible, convert host-based plug-ins to TDM plug-ins.

Avid Mojo SDI Interface

For detailed information on the Avid Mojo SDI interface, see the *Using the Avid Mojo SDI Guide,* which you can download at the Avid support pages at www.avid.com/support.

Synchronization

Setting Up Audio and Video Synchronization with Pro Tools|HD and HD Native Systems

Video Synchronization

For accurate capture and playback of video with VTRs and other video devices, one of the following common video references must be connected to the Reference input of the Avid video peripheral:

- Black burst

- House Reference Synchronization source

- Local video source (such as the TBC video output of the machine)

Audio Synchronization

To keep audio in sync with video capture and playback, the video reference signal must also be connected to a SYNC peripheral (which in turn is connected to the Pro Tools system). For more information on connecting a SYNC HD or SYNC I/O to your Pro Tools system, see the *SYNC HD Guide*.

Setting Up Audio and Video Synchronization with Pro Tools and a Qualified Non-HD Audio Interface

Before synchronizing an Avid Mojo SDI with this type of Pro Tools system, you must have the following:

- Video input/output cable (included with the Avid Mojo SDI)

– and –

- RCA to BNC adapter (not included with the Avid Mojo SDI)

To synchronize an Avid Mojo SDI with your Pro Tools system:

1 Connect the DVI end of the Avid input/output video cable to the Avid Mojo SDI Video Output port.

2 Connect the RCA to BNC adapter to the black Ref/Word Clock BNC cable on the Avid input/output video cable.

3 Connect the RCA cable (which is now connected to the black Ref/Word Clock BNC cable via the adapter) to the S/PDIF Input of your audio hardware.

4 In Pro Tools, open the Session Setup window (Setup > Session) and select S/PDIF from the Clock Source pop-up menu.

⚠ *Using an Avid Mojo SDI with Pro Tools software and an audio interface (or internal soundcard) without S/PDIF connections may work, but video/audio sync cannot be guaranteed in that configuration*

Chapter 3: Installing Avid Video Peripherals

This chapter describes hardware and software installation for a Pro Tools system with an Avid video peripheral.

Checking Local Storage and Before Installation

Before installing Avid video peripherals, you may want to set up local storage (if necessary.) For more information, see "Setting Up Local Storage" on page 15.

Upgrading a Pro Tools System with an Avid Video Peripheral

If you are adding an Avid video peripheral to an existing Pro Tools system, you must uninstall all Pro Tools and Avid-related software before proceeding.

To install an Avid video peripheral on a computer that is installed with a previous version of Pro Tools:

1 Uninstall the older version of Pro Tools. See the *Pro Tools Installation Guide* for uninstall instructions.

2 Uninstall the Avid video software (if present). See the installation guide that came with your Avid video software for uninstall instructions.

3 On Windows, turn off or disconnect the Avid video peripheral.

4 Install Pro Tools 10. See the *Pro Tools Installation Guide* for instructions.

5 Reinstall the Avid video software (if necessary). See the installation guide that came with your software for installation instructions.

6 When prompted, complete the installation process and reboot your computer.

7 On Windows, connect and turn on the Avid video peripheral. When the Found New Hardware Wizard appears, follow the steps to automatically find and install the driver for the Avid video peripheral.

8 Launch Pro Tools.

9 If the Avid video peripheral firmware needs to be updated, the software prompts you. (Follow the steps to update the firmware.)

Installing Avid Video Peripherals for the First Time

This section describes the steps for installing Avid video peripherals if you are installing Pro Tools for the first time.

To install Avid video peripherals in this scenario:

1 Install Pro Tools hardware and software. See the guide for your Pro Tools hardware, and the *Pro Tools Installation Guide* for your Pro Tools software.

⚠ *When installing Pro Tools 10, make sure to select the Avid Video Engine option in the installer.*

2 When prompted, complete the installation and reboot your computer.

3 Connect and turn on the Avid video peripheral.

💡 *On Windows, if the correct driver is not chosen automatically, follow the instructions that came with your Mojo SDI to install the current device drivers.*

4 Launch Pro Tools.

5 If the Avid video peripheral firmware needs to be updated, the software prompts you. (Follow the steps to update the firmware.)

Connecting Avid Video Peripheral Hardware

To connect Avid video peripheral hardware:

1 Connect the power cable for the Avid video peripheral.

2 Connect one end of the FireWire cable to the Host port on the Avid video peripheral, and connect the other end to a supported FireWire port on your computer.

⚠ *All FireWire ports on Avid-qualified computers are connected to the same bus, and the Avid video peripheral must be the only device attached to this bus. If it is not the only device attached to this bus, you may see dropped frames, picture distortion, or stuttered playback. Therefore, you must install a PCI FireWire card if you need to connect other FireWire devices. Visit our website at www.avid.com for more information on where to connect a PCI FireWire card.*

Connecting a DV Device

To connect a DV device to the Avid video peripheral:

▪ Connect one end of the FireWire (1394) cable to the DV port on the Avid video peripheral, and connect the other end to any available FireWire port on the DV Device.

⚠ *All Firewire decks and cameras that are connected to Avid video peripheral must be powered on after powering on the Avid video peripheral.*

Connecting Serial Digital Video Input and Output

☼ *Avid Mojo SDI does not support audio embedded in the SDI stream.*

To connect a serial digital video (SDI) input to the Avid Mojo SDI

■ Connect one end of a BNC cable to the serial digital output on a digital video deck, and connect the other end to the SDI IN port on the Avid video peripheral.

To connect the serial digital video output from the Avid Mojo SDI to a digital video deck:

■ Connect one end of a BNC cable to the SDI OUT port, and connect the other end to the serial digital input of the video deck.

Connecting a SYNC HD or a SYNC I/O
(Pro Tools HD or HD Native Only)

A SYNC peripheral is required for systems with Pro Tools HD or HD Native hardware when using an Avid video peripheral. For more information on configuring and using the SYNC HD or the SYNC I/O, see the *SYNC HD Guide*.

Connecting Video Reference In

When connecting video reference in, the unused Video Ref In port must be terminated.

To connect a SYNC peripheral to video reference:

■ Connect one end of a BNC cable to one of the Video Ref ports on the SYNC peripheral, and connect the other end to a black burst generator.

To terminate the unused video reference port, do one of the following:

■ Connect the 75-ohm terminator (included with the SYNC peripheral) into the unused Video Ref port.

– or –

■ Connect one end of a BNC cable to the unused Video Ref port on the SYNC peripheral, and connect the other end to the Video Ref port on a terminated device (such as the Avid Mojo SDI).
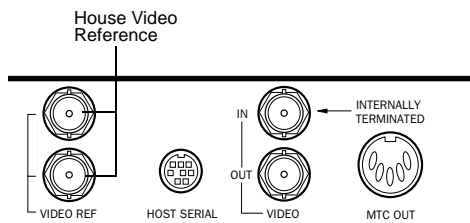
SYNC HD and SYNC I/O video connections

Connecting Loop Sync In/Out

Loop Sync is the clock signal used to synchronize Pro Tools HD audio interfaces.

To connect Loop Sync In and Out with a single Pro Tools HD audio interface:

1 Connect one end of a BNC cable to the Loop Sync Out port on the SYNC peripheral, and connect the other end to the Loop Sync In port on the primary Pro Tools HD audio interface.

2 Connect one end of a BNC cable to the Loop Sync Out port on the Pro Tools HD audio interface, and connect the other end to the Loop Sync In port on the SYNC peripheral.

1 Connect one end of a BNC cable to the Loop Sync Out port on the SYNC peripheral, and connect the other end to the Loop Sync In port on the primary Pro Tools HD audio interface.

2 Connect one end of a BNC cable to the Loop Sync Out port on the Pro Tools HD audio interface, and connect the other end to the Loop Sync In on the next Pro Tools HD audio interface in the chain.

3 Repeat Step 2 until you connect the last two audio interfaces in the chain.

4 On the last audio interface, connect one end of a BNC cable to the Loop Sync Out port, and connect the other end to the Loop Sync In port on the SYNC peripheral.
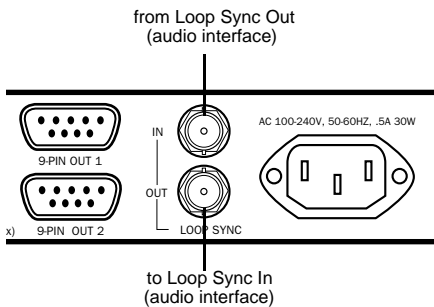
SYNC peripheral connection to a Pro Tools HD audio interface

Using Centralized Video Switching and Routing

Many facilities have centralized video switching and routing systems. These systems can be used to route Avid video peripheral inputs and outputs to flexible input sources and output destinations.

Connecting House Video Reference or Black Burst

In most Avid video peripheral setups, the following black burst or house video reference (house sync) connections are required:

- To the Video Ref connector on the SYNC peripheral
- To a video input on your VTR (a video reference input if available)
- To the Video Ref connector on the Avid video peripheral (this connection can also originate from the unused Video Ref port on the SYNC peripheral)

Read the documentation for your black burst generator for more information.

Connecting a VTR

A VTR can be used to provide video input to and record video output from the Avid video peripheral. In most situations, there are three connections you need to make:

1 Connect a black burst or house sync output to a video input on your VTR (preferably a reference video input).

2 Connect the Avid video peripheral Composite IN, Component IN, S-Video IN, or SDI IN connectors to the corresponding output or outputs on your VTR.

3 Do one of the following:

- Connect the Avid video peripheral Composite OUT, Component OUT, S-Video OUT, or SDI OUT connectors to the corresponding inputs on your VTR.

– or –

- Connect the Avid video peripheral Composite OUT or Component OUT connectors to the corresponding input on an NTSC or PAL video monitor, then connect the outputs from this monitor to the corresponding inputs on your VTR.

Connecting an External Video Monitor

Connect an external NTSC or PAL video monitor to any of the Composite, Component, or S-Video outputs.

For detailed information on compensating for delays introduced by connecting certain types of video displays, see "Compensating for Video Monitoring Delays" on page 25.

Starting Up Your System

To ensure that the components of your Pro Tools system communicate properly with each other, you need to start up your system in the correct order.

Start up your Pro Tools system in the following order:

1 Turn on the expansion chassis (if present).

2 Turn on any external hard drives.

3 Turn on the SYNC peripheral (if present).

4 Turn on the Pro Tools HD audio interfaces (if present).

5 Turn on the Avid video peripheral.

6 Turn on the DV camcorder or digital video deck, if any.

7 Start up your computer.

Updating Firmware on Pro Tools Launch

On launch, Pro Tools checks that the appropriate version of the firmware is installed on the Avid video peripheral. If the correct version of the firmware is not installed, Pro Tools automatically installs it. Once the update is complete, Pro Tools will quit and you will be prompted to power-cycle the Avid video peripheral before the upgrade will take effect.

Fixing Potential Device Issues when Turning on Avid Video Peripheral the First Time

(Windows 7 Only)

The first time you power on an Avid Mojo SDI Windows 7, the system will attempt to find and install the correct driver automatically. the Found New Hardware Wizard may prompt you to locate the driver manually.

To locate the driver:

■ Click Browse and locate the Flamethrower driver at *C:\Program Files\Common Files\Avid.*

Alternatively, the following warning may display: *"The wizard could not find a better match for your hardware than the software you currently have installed."*

You might then see this error:

"A problem occurred during hardware installation. Your new hardware might not work properly."

To fix this issue:

1 Open the Control Panel.

2 To open Device Manager, click on System and Security, then click Device Manager.
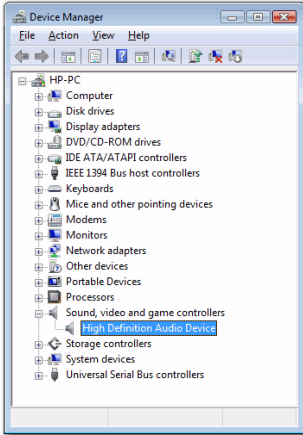
Device Manager dialog

3 In the Device Manager, click the plus sign (+) next to "Sound, Video, and Game Controllers."

4 Right-click the Avid Technology Mojo driver and choose Update Driver.

5 Click Install From a List or Specific Location.

6 Select "Don't search, I will choose a driver to install." One or more drivers should appear in the next window.

7 Choose the driver with the latest version. If multiple drivers with the latest version appear in the list, choose any driver.

8 Click Next.

9 Click Finish.

Using NTSC and PAL

When switching between NTSC and PAL formats, settings must be changed as follows:

- In the Pro Tools Session Setup window, select the correct frame rate from the Timecode Rate pop-up menu (for example, 25 fps or 29.97 fps).

- Use the Session Setup window (or the front panel controls of the SYNC peripheral) to set it to the correct format (PAL or NTSC).

- Make sure your black burst matches the desired format.

Setting Up Local Storage

For local storage with Pro Tools with Avid video peripherals, Avid recommends using separate drives for audio and video media.

Drive Configuration Requirements

Audio Pro Tools can store audio data to multiple hard drives (which may be necessary, for example, to offset the processing requirements for a large number of tracks). You should allocate audio tracks to different hard drives manually. "Round robin" disk allocation is not recommended in a system that includes video drives. For more information, see the *Pro Tools Reference Guide*.

Video Video files may be played from a single hard drive.

📖 *For further storage information, storage requirements and compatibility information, visit the Avid website (www.avid.com).*

Formatting Video Storage

The following table describes requirements for formatting video storage drives for use with Pro Tools and Avid video peripherals:

Format	Platform-Specific Requirements/Recommendations
HFS+	Required for Mac OS X
NTFS	Recommended for Windows 7
FAT 32	Supports playback but not record in Pro Tools
FAT 16	Not supported

Disabling Windows Drive Indexing
(Windows Only)

In order to optimize the usage and speed of your media drives, it is recommended that you turn off drive indexing.

To turn off drive indexing for external audio and video drives in Windows 7:

1 Choose Start > My Computer.

2 Right-click one of your media drives, and do the following:

- In the pop-up menu, click Properties.

- In the Properties dialog, click the General tab.

- In the General tab, deselect the option called Index this Drive for Faster Searching.

- Click OK to close the Properties dialog.

3 Repeat this process for all media drives in your system.

Test Sessions

When installation is completed, you can check your system by opening and playing one of the test sessions installed in the Pro Tools Utilities Folder (Pro Tools\Pro Tools Utilities\ AVoptionDNA Tests\):

- AVoptionDNA Test NTSC.ptf
- AVoptionDNA Test PAL.ptf

If your system is working correctly, you will see a brief video and hear 2 tracks of audio on playback.

Chapter 4: Working with Avid Video on the Video Track

This chapter describes Avid-specific video features in Pro Tools.

📖 *See the Pro Tools Reference Guide for information on working with video features that apply to both QuickTime movies and Avid video.*

Capabilities of Pro Tools with Avid Video Peripherals

Pro Tools with an Avid video peripheral lets you do the following:

- Digitize video (Pro Tools HD and HD Native only)
- Import, play back, and edit multiple types of video files in the Timeline, including video files created in a compatible Avid video application
- Scrub video in the Video window

Video Track Options with Avid Video Peripherals

When an Avid video peripheral is connected to any Pro Tools system and powered on, you can add Avid video to an empty video track. In addition, all video tracks also display I/O View options and an Avid video icon.

When running Pro Tools HD, video tracks with Avid video display the following:

- Record Enable button

– and –

- Expanded I/O View options

Record Enable Button

The Record Enable button lets you arm the main video track for digitizing video to the Timeline. It displays only on the main video track, and does not appear on video tracks containing QuickTime movies.

Record Enable button
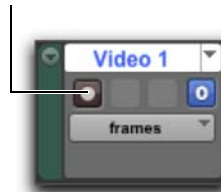
Video track with Record Enable button shown

💡 *Option-clicking (Mac) or Control-clicking (Windows) an audio track's Record Enable button does not arm the video track for recording.*

I/O View

The video track's I/O view displays differently depending on the presence of Pro Tools|HD or HD Native hardware. It also changes due to the presence of Avid or QuickTime movies, as follows:

- When using Pro Tools *without* Pro Tools|HD or HD Native hardware, or when using Quick-Time video in the video track, the I/O View displays the Video Output selector and the current video output format (NTSC or PAL).

- When using Pro Tools *with* Pro Tools|HD or HD Native hardware and Avid video, or no video in the video track, the I/O View has Input, Output, and Video Record Volume selectors, as well as a display for the current video output format (NTSC or PAL) and available record time.

To show the I/O View in the Edit window:

- Choose View > Edit Window > I/O.

📄 *For details on using the Input/Output view with the video track, see "Digitizing Video to the Pro Tools Timeline" on page 20.*

Video Input Selector

(Pro Tools HD Only)

The Video Input Selector lets you choose from the following video inputs on an Avid video peripheral:

- Component
- Composite
- S-Video
- SDI

Current Video Format

The I/O View displays the current session's video format (NTSC or PAL) as designated in the Session Setup window.

Video Record Volume Selector

(Pro Tools HD or HD Native Only)

The Video Record Volume Selector lets you select one volume at a time for video recording. Volumes that are not designated as record volumes in the V column of the DigiBase browser will not be available in this list.

Selecting any volume in this selector will create a session and Video Files folder on that volume, even if you do not record any video there. (If you close a new session without recording any video, however, the empty Video Files folder is automatically deleted.)

Approximate Minutes Available

(Avid Video Only)

When the Record Enable button is enabled in the video track, this indicator shows the approximate recording time (in minutes) available on the volume shown in the Video Record Volume Selector. This display does not update while video is being digitized.

Exporting Sequences from Avid Applications

Projects created on an Avid video editing system (such as Avid Media Composer) can be exported as AAF or OMF sequences and imported into Pro Tools with an Avid video peripheral. This exchange of data between applications is significantly faster and easier than other methods, such as laying off to tape and re-digitizing.

⚠ *When exporting sequences from an Avid application, AAF is the recommended format because it carries more data and is more recognized than OMF as a standard.*

When an AAF or OMF sequence exported from Avid software is imported into Pro Tools, video tracks display each of the video files as clips in the Edit window. Generally, these clips reflect the clips on the Avid timeline, unless an effect spans more than one video clip.

All video effects, including fades, titles and multi-stream effects, must be *rendered* before they can be exported in an AAF or OMF sequence for import into Pro Tools. Rendering means that a media file called a "precompute" is created. This precompute is what is referenced by the exported sequence and what appears in the Pro Tools Edit window. For example, if there are three video clips in the Avid timeline and a title effect is laid across all three, the title would have to be rendered before export, creating a single precompute file. Then, instead of seeing the three original video files in the Pro Tools Edit window, only the one pre compute clip will be displayed.

Pro Tools can import and play sequences containing one or more single-stream clips, video editing metadata video tracks, or video mixdown tracks.

Exporting AAF Sequences with Special Options

Most Avid applications released after May, 2006 let you export AAF sequences that reference an audio or video mixdown and its corresponding metadata for individual edits. Avid applications can also export directly to DigiDelivery or Avid Interplay.

To export both a video mixdown and its corresponding editing metadata, the Avid video editor should choose Video Mixdown from the Export Method pop-up menu, then select Mixdown with Video Edits in the Export Settings dialog.

To export both an audio mixdown and its corresponding editing metadata, the Avid video editor should select Add Audio Mixdown Tracks in the Export Settings dialog.

To export directly to DigiDelivery, the Avid video editor should choose DigiDelivery from the Export Method pop-up menu.

Avid Multi-Cam Resolution Files

Pro Tools with any Avid video peripheral supports all standard-definition Avid Multi-Cam Resolution files for import and playback.

Pro Tools will play the clip of an Avid Multi-Cam Resolution file that was being used as the active camera angle when the file was exported to AAF or OMF.

Importing Sequences from Avid Applications

Pro Tools with an Avid video peripheral lets you import AAF and OMF sequences exported from Avid editing applications by doing one of the following:

- Selecting File > Import > Session Data

- Selecting File > Open when no session is open, and selecting an AAF or OMF sequence

- Dragging them from the desktop or a DigiBase browser to Pro Tools

- Selecting File > Import > Sequence from Avid Interplay (Avid Interplay system only)

📖 *For more details on the Import Session Data dialog, see the Pro Tools Reference Guide.*

If the sequence contains a video mixdown, the video mixdown and its corresponding metadata are displayed in two separate video tracks on the Timeline.

If the sequence contains an audio mixdown, the audio mixdown and its corresponding metadata are displayed in two separate audio tracks on the Timeline.

Digitizing Video to the Pro Tools Timeline

(Pro Tools HD and HD Native Only)

Pro Tools HD or HD Native with an Avid video peripheral lets you digitize video directly to the video track for use in the Pro Tools editing environment.

Video is digitized in the Avid DV25 file format, and may be used in the video track along with Avid OMF and MXF video files of other resolutions that are from other sources. Though the

video files which are captured in Pro Tools are technically MXF files, they are intended only for use in Pro Tools. They have not been tested for import into other applications, and may not be of standard broadcast quality.

⚠ *Up to six hours of video can be digitized in a single record pass.*

⚠ *Each record pass can only record to a single volume (or a set of striped drives). One video file cannot be recorded across multiple volumes.*

Hardware Requirements and Options

SYNC HD and SYNC I/O Requirement

For digitizing video, Pro Tools requires a SYNC HD or SYNC I/O locked to video reference.

For information about setting up SYNC hardware and locking the synchronization peripheral to video reference, see the *SYNC HD User Guide*.

To configure a SYNC peripheral for digitizing video in Pro Tools:

1 Ensure that the SYNC peripheral is locked to the appropriate video reference for your system setup. For more information, see the *SYNC HD Guide* or the *MachineControl Guide*.

2 In the Session Setup window (Setup > Session), select SYNC from the Clock Source pop-up menu.

3 Choose a Timecode Rate for the type of video you want to record.

💡 *Ensure that the Timecode Rate is compatible with the type of video format you plan to use. For example, NTSC is not compatible with a Timecode Rate of 25 frames per second.*

4 Under the SYNC Setup & Timecode Offsets section, select Video Reference (SD) or Video Reference (HD) from the Clock Reference pop-up menu.

5 Choose the appropriate format from the Video Format pop-up menu, as follows:

- If you selected Video Reference (SD) in the Clock Reference pop-up menu, you can choose from NTSC or PAL.

- If you selected Video Reference (HD) from the Clock Reference pop-up menu, you can choose from multiple HD video formats.

6 The Video format you choose is reflected in the video track's I/O View.

7 Under the Timecode Settings section, deselect the Using SYNC option.

⚠ *The SYNC peripheral must be locked to video reference in order to digitize video and play back in sync.*

Timebase Correction

Avid video peripherals require that all sources be timebase corrected. Most professional video decks have built-in timebase correction. To find out whether or not your video deck has built-in timebase correction, refer to the manufacturer's documentation.

MachineControl

You can use Avid MachineControl software (purchased separately) to remotely control your external video deck during Pro Tools capture. When recording to the video track with MachineControl, it is recommended that the Track View be set to Blocks.

⚠ *Avid MachineControl does not control FireWire-connected devices.*

For more information, see the *MachineControl Guide*.

Digitizing Video in Pro Tools

To set video recording options:

1 Choose Track > New.

2 In the New Tracks dialog, do the following:

- Select Video Track from the Track Type pop-up menu.

– and –

- Enter the number of new video tracks.

3 Click Create.

4 Select View > Edit Window > I/O.

5 In the Edit window, with I/O View enabled, use the video track's Input Selector to choose one of the following video inputs:

- Component
- Composite
- S-Video
- SDI

☼ *All outputs on the Avid Mojo SDI are active at all times.*

6 Select the video record volume from the Video Record Volume selector.

☼ *Clicking the Record Enable button in the video track will display the approximate recording time available (in minutes) under the Video Record Volume Selector.*

Pro Tools will create a Video Files folder in the session folder on the video record volume. If this volume is different than the volume on which your session was originally saved, Pro Tools will also create a new session folder on the target volume matching the name of the current session.

To digitize video to the video track:

1 In the Edit window, do one of the following:

- Place the Playback cursor where you want to start recording.

☼ *If you want to digitize video without specifying a selection in the Timeline, the video record volume must have at least 200 MB of available space. You can also limit the amount of recording time by changing the Open Ended Record Allocation settings (located in Setups > Preferences > Operations).*

– or –

- Make a selection on a Timebase Ruler or on a track to select a range of time for the recording. (To make a selection on a track, Link Edit and Timeline Selection must be enabled in the Operations menu.)

☼ *Because it is not possible to record a partial frame of video, selections in the video track are rounded to the frame boundaries. This means that the in point of the selection is moved earlier to the nearest frame boundary, and the out point of the selection is moved later to the next frame boundary.*

2 Confirm the video track is online (blue).

3 Record enable the video track by clicking the Record Enable button. The approximate recording time available on the selected video record volume will be displayed (in minutes) below the Video Record Volume selector. This display does not update while video is being digitized.

4 Do one of the following:

- To record with the video's timecode synchronized to the session timecode when the MachineControl option is installed, click the Online button in the Transport window to enable it, then click Record in the Transport window. The VTR will locate to the correct timecode and begin recording.

- To record with the video's timecode synchronized to the session timecode when the MachineControl option is *not* installed, first slave Pro Tools to incoming LTC or VITC timecode, then click the Online and Record buttons in the Transport window. Manually start playback on the VTR to begin recording.

See the Pro Tools Reference Guide for information about slaving to LTC or VITC timecode.

- To record video without synchronizing to timecode, ensure the Online button in the Transport window is not enabled. Manually start playback on the VTR, then click Record and Play in the Transport window to begin recording.

Online
button

Transport window

5 When you have finished recording, click Stop in the Transport window.

⚠ *If you record over existing video clips in the video track, the actual video files remain intact. All video recording in Pro Tools is nondestructive.*

To abort a record pass:

- Press Command+period (Mac) or Control+period (Windows) to abort a record pass in progress and restore the video track to its original state. The video that you digitized before aborting will be deleted from disk.

To undo a record pass:

- Choose Edit > Undo to undo a record pass after it has completed. The digitized video will be removed from the video track, and any video clips that were overwritten will be restored.

When you undo a record pass, the digitized video will be removed from the video track, but will not be removed from disk until you quit Pro Tools.

Dropouts During Video Digitize

When recording video, a dropout may occur in the video signal. Dropouts can be caused by bad cable connections, dropouts in the source tape, or other problems. When Pro Tools detects a dropout in video signal while recording, a warning dialog appears. The recording will continue as specified and may still be usable.

Because the Location Indicators freeze when the warning dialog appears, it is recommended that you make a note of the location shown in the indicators before dismissing the dialog, then do the following:

- Check the recorded video near that location to see if the error caused an unacceptable dropout.

– and –

- Check the video recorded after the initial dropout, as the warning is only posted for the first occurrence and there may be other errors later in the recording.

Matching Audio and Video Names for Digitized Video

When Pro Tools with an Avid video peripheral completes a single video capture, it appends the captured audio and video files with matching suffixes (such as _01). For example, captured audio and video files might be called *Audio 1_01*, *Audio 2_01*, and *Video 1_01* where *_01* is the shared suffix.

On each successive capture, Pro Tools increments the numbered suffix to the filenames by one to distinguish the new set of captured media files from the last. For example, the new captured media files would be appended with *_02* if the last were appended with *_01*.

Editing Avid Video in the Timeline

Once you have digitized or imported Avid video to the Timeline, you can select, move, group, and edit video clips with or without audio clips.

📖 *See the Pro Tools Reference Guide for detailed information on working with video clips in the Timeline.*

Scrubbing Avid Video in the Video Window

Due to the latency introduced by all FireWire-based video peripherals, the video on an external monitor will not be in sync with the Scrubber tool. To scrub video without latency, you can scrub in the Video window on the desktop.

To scrub in the Video window:

1 Select Options > Scrub in Video Window.

2 Select the Scrubber tool and drag within the main video track.

📖 *See the Pro Tools Reference Guide for detailed information on moving, resizing, and changing other options for the Video window.*

Compensating for Video Monitoring Delays

You can compensate for delays in video output introduced by certain types of displays, such as plasma monitors.

To compensate for delays caused by video monitoring devices:

1 Choose Setup > Video Sync Offset.

2 In the Video Sync Offset dialog, enter a value appropriate to compensate for the delay caused by your video monitor chain. (Third-party devices are available to help you measure this delay.)

Avid Video Offset When playing Avid video through an Avid video peripheral, Pro Tools automatically compensates for the delay introduced by the peripheral. This means you can leave the setting at 0 frames and the output of the Avid video peripheral will be in sync with the audio. If a plasma monitor or other device introduces additional delay, you can compensate for it by entering the amount of the delay here.

QuickTime Video Offset Pro Tools does not automatically compensate for the delay when playing QuickTime video through any FireWire peripheral, including Avid video peripherals. The amount of delay introduced varies based on your system and the type of video peripheral you are using. When using an Avid peripheral with QuickTime, 18 quarter-frames is a good starting point, but you will need to verify the precise setting for your system. (Third-party devices are available to help you measure this delay.)

Set Video Sync Offset dialog

Once this value has been set, it should not need to be updated unless you change components in your video monitoring chain (such as projectors or plasma screens).

Adjusting Video Black Output Level

When outputting NTSC Avid video from Pro Tools, you can adjust the level of NTSC video black output to 7.5 IRE or 0 IRE.

⚠ *Changing this option requires you to restart Pro Tools.*

The black level of NTSC signals for the United States and many other countries are generally calibrated to 7.5 IRE, also known as *Setup*. Some other countries (such as Japan) require NTSC signals to be output at a black level of 0 IRE.

To adjust the level of black output in Pro Tools:

1 Choose Setup > Preferences, and click the Operation tab.

2 Do one of the following:

- To output black level at 0 IRE, select the NTSC Has Setup option.

  – or –

- To output black level at 7.5 IRE, deselect the NTSC Has Setup option.

3 Click OK.

4 Restart Pro Tools.

Looping Audio with Avid Video Present

When working with a session containing Avid video, you can now select and loop a portion of audio without having the loop selection snap to video frame boundaries. For example, you can create a loop lasting exactly four bars regardless of where the video frame boundaries lie.

To make an audio selection that does not snap to frame boundaries:

1 With the Selector tool, select the track range you want to loop in an audio track, making sure not to include any video tracks in the selection.

2 Select Options > Loop Playback. When enabled, a loop symbol appears in the Play button in the Transport window.

Loop Playback enabled

– or –

You can also enable Loop Playback by doing one of the following:

- Control-clicking (Mac) or Right-clicking (Mac or Windows) the Play button in the Transport window.

  – or –

- With the Numeric Keypad mode set to Transport, press 4 on the numeric keypad.

3 Click Play in the Transport window.

Appendix A: 24fps Workflows

Audio Layback to Video

Although you cannot output 24P video to a video recorder with Pro Tools, you can "Punch Down" by adding audio that has been posted to a 24P video clip in Pro Tools to videotape that was created on another video system.

⚠ *Pro Tools with an Avid video peripheral does not support 24 or 23.976 fps video output. Though 24 and 23.976 fps video files are supported, the actual output of Pro Tools is limited to NTSC (29.97 fps) and PAL (25 fps) standards. On playback, the 24 fps files are converted in software to these standards. The conversion can produce visible artifacts. Therefore, Pro Tools video playback is intended for monitoring purposes only, and is not suitable for professional layback or broadcast, regardless of the resolution or frame rate of the video clip.*

Playing in Sync with 24 fps Video Tapes

To play back synchronized to a video transport playing at 24 fps:

1 In Pro Tools, open the Session Setup window (Setup > Session).

2 Set the Frame Rate to 24 fps.

3 Do one of the following:

- Slave Pro Tools to the video transport.

  – or –

- If the MachineControl option is installed, select the appropriate profile to control the video transport.

Playing in Sync with 29.97 fps (NTSC) Video Tapes

To play in sync with a 29.97 fps video created from a 24 fps source:

1 Slave Pro Tools to the VTR.

📄 *For more information on slaving Pro Tools to the VTR, see the Synchronization chapters of the Pro Tools Reference Guide.*

2 Choose Setup > Session.

3 From the Frame Rate pop-up menu, select 29.97 FPS.

4 If the audio in Pro Tools is running at film speed (24 fps), choose 0.1% Down from the Audio Rate Pull Up/Down pop-up menu.

⚠ *Audio pull-down is required when you are posting to a 29.97 fps video clip made from a 24 fps source. This is because the 24 fps source is also "pulled down" by the telecine process which produces the 29.97 fps tape.*

Playing in Sync with 25 fps (PAL) Video Tapes

To lay back a 24P session directly to a 25 fps (PAL) tape:

1 Choose Setup > Session.

2 From the Frame Rate pop-up menu, select 25 FPS.

3 From the Audio Rate Pull Up/Down pop-up menu, select 4.0% Up.

Appendix B: Video Buffer Underrun Errors

This appendix describes the three different types of video buffer underrun errors in Pro Tools with an Avid video peripheral.

The Video Engine ("DIO Video Engine") can encounter three different types of buffer underrun errors.

"Video playback stopped due to a disk fifo buffer underrun."

Indicates a disk buffer underrun in which data could not be read from the hard drive fast enough to play video.

"Video playback stopped due to a software decompression buffer underrun."

Indicates a software decompression buffer underrun in which there weren't enough CPU cycles to decompress video fast enough to maintain play back.

"Video playback stopped due to a hardware or driver buffer underrun."

Indicates a low level software buffer underrun in which the hardware or low level software could not keep up with the system load and needed to duplicate frames at the video output.

Visit http://www.avid.com/online support to search for possible solutions for any of these errors.

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