

Pro Tools

Avid Mojo Video Peripheral Guide

Version 6.6 for Pro Tools|HD Systems on Macintosh

Digidesign

2001 Junipero Serra Boulevard
Daly City, CA 94014-3886 USA
tel: 650-731-6300
fax: 650-731-6399

Technical Support (USA)

tel: 650-731-6100
fax: 650-731-6384

Product Information (USA)

tel: 650-731-6102
tel: 800-333-2137

International Offices

Visit the Digidesign Web site
for contact information

Web Site

www.digidesign.com



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Product features, specifications, system requirements, and availability are subject to change without notice.

PN 932914140-00 REV B 1/05

Warnings and Cautions

- Never install equipment if it appears damaged.
- Disconnect the power cord before servicing unit.
- Only perform the services explicitly described in this document. For services or procedures not outlined in this document, speak with authorized Avid service personnel.

“CLASS 1 LED PRODUCT”

- Follow all warnings and cautions in the procedures.
- Operate the device within its marked electrical ratings and product usage instructions.

Note: Certification information for Avid Mojo is contained in the Avid Mojo documentation.

FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian ICES-003

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice



Australia and New Zealand EMC Regulations



N1709

John Kells, Australian Operations Manager
Avid Technology (Australia)
Unit B
5 Skyline Place
French Forest NSW 2086
Australia
Phone: 61-2-8977-4800

Taiwan EMC Regulations

Taiwan EMC Regulations BSMI Class A EMC Warning

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Declaration of Conformity

(According to ISO/IEC Guide 22 and EN 45014)

Application of Council Directives:	73/23/EEC, 89/336/EEC.
Standards to which Conformity is Declared:	EN60950:1999 Third Edition CISPR 22:1997 / EN55022:1994 + A1:1995 + A2:1997 Class A EN55024:1998/EN61000 — 3-2, 4-2, 4-3, 4-4, 4-5, 4-6, 4-8, 4-11
Manufacturer's Name:	Avid Technology, Inc. 1925 Andover Street Tewksbury, MA 01876, USA
European Contact:	Nearest Avid Sales and Service Office or Avid Technology International B.V. Sandyford Business Center Unit 3, Dublin 18, Ireland
Type of Equipment:	Information Technology Equipment
Product Name:	Products for the Windows NT, Windows 2000, or Windows XP Operating System: Avid Adrenaline DNA, Avid DS Nitris DNA, Avid Equinox Break-Out-Box, Avid DS, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock 2+, MediaDock LVD, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, NewsCutter, NewsCutter DV, NewsCutter XP, Pro Tools AVoption V10, Symphony Products for the Mac OS X Operating System: Avid Adrenaline DNA, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock 2+, MediaDock LVD, MediaDrive, MediaRAID, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Meridien I/O box, Pro Tools AVoption V10, Symphony Products for the UNIX Operating System: AirPlay, VideoSPACE Products for MediaNetwork and Workgroups: Avid ProEncode, Avid Unity MediaManager, Avid Unity MediaNetwork, Avid Unity TransferManager, LANserver, LANserver EX, MEDIArray, MEDIArray Drive, MEDIArray II, MEDIArray II Drive, Nearchive, PortServer, Xdeck
Base Model Numbers:	None
Product Options:	All

(1) Products for the Windows NT, Windows 2000, or Windows XP Operating System: Products were tested in a typical Avid Adrenaline DNA, Avid DS Nitris DNA, Avid Equinox Break-Out-Box, Avid|DS, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock 2+, MediaDock LVD, MediaDrive, MediaRAID, MEDIAArray, MEDIAArray Drive, MEDIAArray II, MEDIAArray II Drive, Meridien I/O box, NewsCutter, NewsCutter DV, NewsCutter XP, Pro Tools AVoption|V10, or Symphony configuration.

(2) Products for the Mac OS X Operating System: Products were tested in a typical Avid Adrenaline DNA, Avid Xpress, Avid Xpress DV, Film Composer, Media Composer, MediaDock 2+, MediaDock LVD, MediaDrive, MediaRAID, MEDIAArray, MEDIAArray Drive, MEDIAArray II, MEDIAArray II Drive, Meridien I/O box, Pro Tools AVoption|V10, or Symphony configuration.

(3) Products for the UNIX Operating System: Products were tested in an AirPlay or VideoSPACE configuration.

(4) Products for MediaNetwork and Workgroups: Products were tested in a typical Avid ProEncode, Avid Unity MediaManager, Avid Unity MediaNetwork, Avid Unity TransferManager, LANserver, LANserver EX, MEDIAArray, MEDIAArray Drive, MEDIAArray II, MEDIAArray II Drive, Nearchive, PortServer, or Xdeck configuration.

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directives and Standards.

George R. Smith, Director of Hardware Engineering

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chapter 1

Introduction to Pro Tools with Avid Video

This guide describes how to use Avid Mojo™ with Pro Tools|HD systems running on Mac OS X.

Pro Tools and Avid Mojo combine the powerful audio post-production features of Pro Tools|HD with integrated support for import and playback of Avid video media.

Capabilities of Pro Tools with Avid Mojo

Pro Tools with Avid Mojo lets you:

- Import and play back Avid video on the Pro Tools Movie track with near sample-accurate precision against audio tracks.
- Spot individual video clips to new locations in the Movie track.
- View video edits and clip names in the Movie track.
- View the Movie track as a series of picture frames.
- Play video on an external NTSC or PAL monitor.
- Import mixed video resolutions to the Movie track.
- Import and play back true 24P and 25P (Progressive Scan) picture media created in Avid video workstations.


Avid Xpress Pro Capabilities

Avid Xpress Pro software with Avid Mojo (both purchased separately) lets you:

- Capture NTSC or PAL video.
- Import, batch digitize, and render Avid sequences, then export them as AAF sequences to Pro Tools.
- Digitize audio and video from an EDL by creating an Avid sequence with Avid EDL Manager™.
- Lay back audio and video simultaneously with Digital Cut.
- Export audio and video sequences as QuickTime or other format digital files.


DigiTranslator 2.0 Integrated Option

Use DigiTranslator to convert AAF and OMFI sequences into Pro Tools session files. You can also use it to export audio material from Pro Tools sessions to AAF sequences or OMFI sequences and files for import into other systems.

 *DigiTranslator 2.0 may be purchased separately by Avid Mojo users. For more information, refer to the DigiTranslator 2.0 Integrated Option Guide*

MachineControl

You can use Digidesign'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*.

System Requirements

Pro Tools 6.6 can be used on a Pro Tools|HD system on a Digidesign-qualified Macintosh.

For complete system requirements, visit the compatibility page of the Digidesign Web site (www.Digidesign.com/compato).

Pro Tools with Avid Mojo requires the following:

- A Digidesign-qualified Pro Tools|HD system
- SYNC I/O
- Digidesign-qualified SCSI storage, in the form of separate SCSI drives for audio and video. A Digidesign-qualified dual-channel SCSI HBA (such as the Digidesign SCSI|128 or ATTO UL3D) is required. For more information, see "Setting Up Local Storage" on page 11.

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, refer to the latest compatibility information on the Digidesign Web site (www.digidesign.com/compato).

Digidesign Registration

Make sure to complete and return the registration card included with your Avid Mojo. Registered users will receive periodic software update and upgrade notices. Refer to the registration card for information on technical support.

About the Pro Tools Guides


In addition to the printed guides included with your system, PDF versions of the Pro Tools guides are installed automatically with Pro Tools in the Program Files\Digidesign\Pro Tools\Documentation folder, and are accessible from the Pro Tools Help menu (Windows) or Pro Tools menu (Macintosh). To view or print the PDF guides, you can install Acrobat Reader (included on the Pro Tools Installer CD-ROM).


Conventions Used in This Guide


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


Convention	Action
File > Save Session	Choose Save Session 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 (Windows)	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 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 other Digidesign guides.*

Avid Mojo Hardware Overview

Supported Resolutions

Pro Tools with Avid Mojo supports import and playback of any combination of the following video resolutions created with the Avid DV, JFIF or MXF video codecs:

- 1:1 (Uncompressed)
- 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

Caveats

The following caveats apply to supported resolutions:

- Quicktime video is not supported for playback with Avid Mojo. In order to use Avid Mojo for Quicktime playback, you must first import the movie into an Avid editing application (such as Avid Xpress Pro) and export it as an Avid movie.
- At the time of this writing, IMX files (MPEG-IMX 30, MPEG-IMX 40 and MPEG-IMX 50) are not supported by Pro Tools.



For updates, check the Digidesign Web site (www.digidesign.com/compato) on support for these formats.

- Pro Tools with Avid Mojo supports video input of NTSC (29.97 fps), PAL (25 fps), 24 fps, and 23.976 video clips. However, only video output of NTSC and PAL is supported, with any 24 fps or 23.976 fps video clips being interpolated by the software. This interpolation can produce visible artifacts. Pro Tools video playback is intended for monitoring purposes only, and it not suitable for professional lay-back or broadcast, regardless of the resolution or frame rate of the video clip. Video output from Avid Xpress Pro software is professional quality.

Mixed Resolutions

Avid Mojo supports Avid video clips of mixed resolutions in the Movie track. For example, the Movie track can contain Avid DV25 and 15:1s clips. However, all clips must be Avid clips of the same frame rate. Mixed clips with different frame rates are not supported. Mixing Avid and QuickTime video clips is *not* supported.

Synchronization Hardware

Synchronization Peripheral

Avid Mojo requires the Digidesign SYNC I/O for use with Pro Tools|HD systems.

Synchronization Source

For accurate synchronization during capture and playback, a common video reference is required:

- Black burst
- House Reference Synchronization source
- Local video source (such as the TBC video output of the machine)

Installing Avid Mojo

Installing hardware and software for a Pro Tools system with Avid Mojo involves the following steps:


- 1 “Installing Pro Tools Hardware” on page 7 (if necessary)
- 2 “Installing Avid Mojo Hardware” on page 8.
- 3 “Installing Pro Tools Software” on page 9.
- 4 “Setting Up Local Storage” on page 11 (if necessary)

Installing Pro Tools Hardware

If you do not already have a currently supported Pro Tools system installed, you must install your Pro Tools hardware. For detailed Pro Tools hardware installation information, see your *Getting Started Guide*.

If you already have Pro Tools hardware installed, proceed by installing the Avid Mojo (see “Installing Avid Mojo Hardware” on page 8).

Be sure to follow the correct PCI slot placement of your Pro Tools cards according to the information in Appendix B, “PCI Slot Configurations for Avid Mojo.”

 For the latest information on supported computers and PCI slot configuration, be sure to check the compatibility pages on the Digidesign Web site (www.digidesign.com/compato).

Installing Avid Mojo Hardware

To install Avid Mojo hardware:

- 1 Connect the power cable for the Avid Mojo.
- 2 Connect one end of the FireWire cable to the Host port on the Avid Mojo, and connect the other end to any internal FireWire port on your computer.

⚠ *The Avid Mojo should be the only device attached to this FireWire bus. No other FireWire devices should be attached to this FireWire bus.*

⚠ *It is critical to follow the card installation directions in Appendix B, “PCI Slot Configurations for Avid Mojo.”*

💡 *All analog video outputs are active during capture and playback, except during capture of DV25 video.*

Connecting a DV Device

To connect a DV device to the Avid Mojo:

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

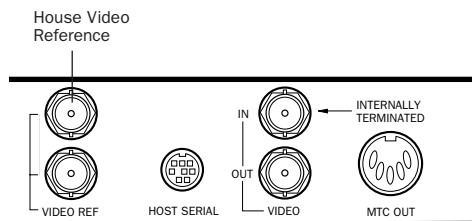
⚠ *All Firewire decks and cameras that are connected to an Avid Mojo must be powered on after powering on the Avid Mojo.*

Connecting a SYNC I/O

The SYNC I/O is required for Pro Tools|HD with an Avid Mojo. Connect the house video reference to the Video Ref In port on the SYNC I/O, and connect the Loop Sync on the SYNC I/O to the corresponding Loop Sync on the primary Pro Tools|HD audio interface. For more information on configuring and using the SYNC I/O, see the *SYNC I/O Guide*.

Video Reference In

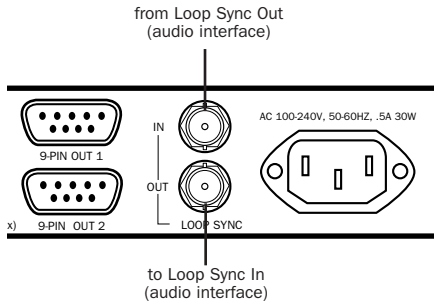
Connect a BNC cable to the Video Ref In port on the SYNC I/O and to a black burst (house video reference) generator or a standard video signal, for clock reference and window burn purposes. The Video Ref Out port must be terminated (using the 75-ohm terminator included with the SYNC I/O) or connected to another terminated video device (such as the Avid Mojo).



SYNC I/O video connections

Loop Sync In/Out

Loop Sync is the clock signal used to synchronize Pro Tools|HD-series audio interfaces. Connect Loop Sync In on the SYNC I/O to Loop Sync Out on the primary Pro Tools|HD audio interface. Connect Loop Sync Out on the SYNC I/O to Loop Sync In on the primary Pro Tools|HD audio interface. If you have multiple Pro Tools audio interfaces, connect Loop In on the SYNC I/O to Loop Out on the last Pro Tools interface.



SYNC I/O connection to a Pro Tools |HD audio interface

Connecting House Video Reference or Black Burst

In most Avid Mojo setups, three black burst or house video reference (house sync) connections are required:

- To VIDEO REF IN on the SYNC I/O
- To a video input on your VTR (a video reference input if available)
- To the VIDEO REF connector on the Avid Mojo (this connection can come from the Video Ref Out on the SYNC I/O)

Be sure to 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 Mojo. 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 Mojo Composite IN, Component IN, or S-Video IN connectors to the corresponding output or outputs on your VTR.

3 Connect the Avid Mojo Composite OUT, Component OUT, or S-Video OUT connectors to the corresponding inputs on your VTR.

– OR –

Connect the Avid Mojo 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.

Using Centralized Video Switching and Routing

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

Installing Pro Tools Software

For detailed information about installing or upgrading Pro Tools software, refer to the *Upgrading to Pro Tools 6.6 Guide*.

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 any.

⚠ *If you have an expansion chassis and it is not powered on, your computer will not boot.*

2 Turn on any external hard drives.

3 Turn on the SYNC I/O.

4 Turn on the Pro Tools|HD audio interfaces.

5 Turn on the Avid Mojo.

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

7 Start up your computer.

Authorizing DigiTranslator 2.0

DigiTranslator 2.0 is authorized using the iLok USB Smart Key (iLok) and License Card from PACE Anti-Piracy.

The iLok is similar to a dongle, but unlike a dongle, it is designed to securely authorize multiple software applications from a variety of software developers. This key can hold over 100 authorizations 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 the Avid Mojo. You can use the one included with certain Pro Tools systems (such as Pro Tools|HD-series systems), or purchase one separately.*

License Cards are specific to each Pro Tools option or plug-in. You will receive the appropriate License Cards for the software options or plug-ins that you purchase. License Cards have a small punch-out plastic chip called a GSM cut-out.

To authorize the DigiTranslator 2.0 option with iLok:

1 Insert the iLok into an available USB port on your computer.

2 Launch Pro Tools. You will be prompted to authorize any installed unauthorized software options or plug-ins.

💡 *If you are already using a demo version of the software option or plug-in, launch Pro Tools before you insert the iLok, then insert the iLok into any available USB port when prompted by Pro Tools.*

3 Follow the onscreen instructions until you are prompted to insert the License Card into the iLok.

4 Separate the GSM cutout from the larger protective card by pulling it up and out with your thumb. Do not force the cutout down with your finger.

5 Insert the GSM cutout into the iLok. Visually verify that the metal portion of the cutout makes contact with the iLok's metal card reader.



iLok with License Card

6 Follow the onscreen instructions to complete the authorization process for the DigiTranslator 2.0 option.

7 After the authorization has completed, remove the GSM cutout from the iLok. (If you have to remove the iLok from the computer to remove the cutout, be sure to re-insert the iLok in any available USB port on your computer when you are finished.)

Updating Firmware on Application Launch

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

Using NTSC and PAL

When switching between NTSC and PAL formats, settings must be changed in the Pro Tools Session Setup window, as follows:

- Select the correct frame rate from the Frame Rate pop-up menu (for example 25 fps or 29.97 fps).
– or –
- Set the SYNC I/O to the correct format (PAL or NTSC).



When a video clip is imported to the Movie track, Pro Tools sets the correct format (PAL or NTSC) on the SYNC I/O automatically.

If you import an existing video file to the Movie track, Pro Tools will warn you if the frame rate of the imported clip does not match the session's current frame rate setting (NTSC or PAL). You will need to manually change the frame rate setting in the Pro Tools Session Setup window to match the frame rate of the imported video clip.

Setting Up Local Storage

For local storage, Pro Tools|HD with Avid Mojo requires a Digidesign-qualified dual-channel SCSI HBA (host bus adapter) and Digidesign-qualified Avid or SCSI hard drives. Dedicate one SCSI channel to audio drives and one SCSI channel to video drives.



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

Installing the SCSI Host Bus Adapter (HBA)

To install a SCSI HBA:

- 1 Unplug and open your computer according to the manufacturer's instructions.
- 2 Release any static electricity by touching the power supply, or another grounded item.
- 3 Remove the SCSI accelerator card from the anti-static bag, being careful to handle it only by the edges.
- 4 Line up the SCSI accelerator card with the installation slot, and slide the card into place gently so the PCI connector is aligned with the PCI slot.

5 Press down firmly on the card with even pressure. The connector should click into place in the PCI slot.


6 Fasten the card in place using the included screw to attach the card bracket to the computer mounting bracket.

Drive Configuration Requirements

This section describes audio and video drive configuration requirements for Pro Tools with Avid Mojo:

Audio Pro Tools can store audio data to multiple hard drives. 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 must be stored on separate drives from the audio files. Video files may be played from a single hard drive, though you must use a “striped set” of two or more SCSI drives if you are playing 1:1 video, or if the size of a single video file exceeds the free space on a single drive. It is not possible to create a striped set of FireWire drives.

 *Striped drives are supported for video only, and not supported for audio record and playback.*

Striped Drive Requirements (Video Storage Only)

Striped drives are configured so that multiple hard drives behave as if they are one hard drive. This makes higher data throughput possible. Requirements will vary depending on the drives. For example, the 5th-Generation DigiDrives™ (released November 2001) require 2-way striped

drive sets when capturing or playing uncompressed (1:1) video. For earlier generations of drives, 4-way striped drives or greater (4 or more drives acting as one) are required when capturing or playing uncompressed (1:1) video; and 2-way striped drives (2 drives acting as one) are required when capturing or playing 2:1 and 3:1 compressed video.


 *To create a striped set of SCSI drives for Mac OS X, you should use ATTO ExpressStripe 2.1 or later (supplied with Avid Xpress Pro or available separately from ATTO).*

Checking and Updating ATTO Firmware

The cards listed below must be set correctly for maximum performance:

- Digidesign SCSI128 card
- ATTO EPCI-UL3D SCSI Host Bus Adapter card

If you are using one of these cards, it is recommended that you verify that you have the proper ATTO firmware and drivers (and update them if necessary). Refer to the electronic pdf version of the ATTO Firmware Read Me (located in the ATTO Utilities folder) for detailed information.

 *Installing Avid Xpress Pro may also install older versions of ATTO drivers. Make sure that you have already installed Avid Xpress Pro before updating ATTO firmware and drivers.*

chapter 4

Pro Tools Movie Track

Pro Tools with Avid Mojo can import files created in a compatible Avid video application (such as Avid Xpress Pro) into the Pro Tools Movie track.

⚠ *Avid Xpress Pro software and Pro Tools cannot run simultaneously. Quit Pro Tools before launching Avid Xpress Pro, and quit Avid Xpress Pro before launching Pro Tools.*

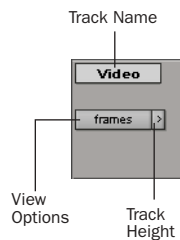
Avid Movie Track in Pro Tools

The Movie track holds the video clips you add into Pro Tools. A Pro Tools session can only contain one Movie track.

To create a new Movie track:

- Choose Movie > New Avid Movie Track.

The new, empty Movie track appears in the Edit window.



Movie track controls

To name the Movie track:

- 1 Double-click the Track Name button to open the Name and Comments dialog.
- 2 Type a name (and any optional comments), then click OK.

To delete the Movie track:

- 1 Select the track by clicking the Track Name button in the Edit window.
- 2 Choose File > Delete Selected Tracks.

To clear all video from the Movie track:

- Choose Movie > Clear Movie Track.

You cannot change names of clips after they have been added to the Movie track. When added, clips retain the name they were given by the original Avid application.

Movie Track Options

The Movie track can be viewed in frames or in blocks. Frames view lets you see an overview of the actual video content in a session. Blocks view lets you see where clips begin and end, and the names of clips.

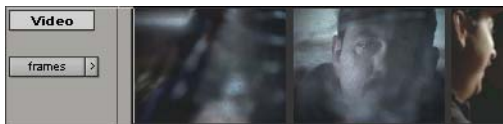
To set the view for the Movie track:

- On the Movie track, select Frames or Blocks from the View Options pop-up menu.

⚠ *When switching from Blocks mode to Frames mode during playback, the movie track will not update to displaying frames until playback is stopped.*

Frames

In Frames view, video data is displayed as pictures in the Movie track. These pictures are computed based on the video image, and scale according to your track zoom and height settings. They do not provide a frame-accurate reference, but allow you to easily find a scene or sequence in the Movie track.



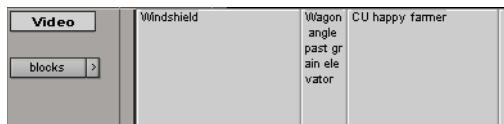
Movie track in Frames mode

Frames do not display properly if you change zoom settings during playback. Black frames are drawn until playback is stopped. You should stop playback before changing zoom settings if you want to view frames.

⚠ *If video pull-up or pull-down is enabled, frames do not change position.*

Blocks

Blocks view displays the Movie track as blocks of compositional data. Blocks are outlined wherever clip boundaries exist.



Movie track in Blocks mode

In Blocks mode, you can place the cursor on the Movie track, then press Tab to move to the next video edit in the track.

💡 *With the Selector Tool, you can also double-click any segment to create a selection. This is helpful if you want to add an audio effect for the exact duration of a scene.*

Exporting Files from Avid Programs

Projects created on an Avid video authoring system, such as Avid Xpress Pro, can be exported as AAF or OMFI 2.0 sequences and imported into Pro Tools with Avid Mojo. This exchange of data between applications is significantly faster and easier than other methods, such as laying off to tape and re-digitizing.

When an AAF or OMF sequence exported from an Avid software is imported into Pro Tools, the video track displays each of the video files as regions in the Edit window. Generally, these regions reflect the regions on the Avid timeline, unless you have an effect which 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 sequence for import into Pro Tools. Rendering means that a media file called a “precompute” is created. This precompute is what is exported 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 clips in the Pro Tools Edit window, only the one precompute clip will be displayed.

Pro Tools does not require the entire sequence to be rendered into one continuous clip (often referred to as a “video mixdown”). Pro Tools can import and play sequences containing multiple single-stream clips.

Avid Multi-Cam Resolution Files


Pro Tools supports all 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.


Adding Video Clips

Using the Add Avid Movie command, you can add several Avid video clips to a single Movie track in Pro Tools.

If there are already clips on the Movie track and you add over them, the overwritten material will be removed from the Movie track. You can undo and restore the original clips. For more information, refer to “Undo/Redo for Video Editing Commands” on page 16.

Individual OMFI video and audio files can be added to your Pro Tools session just like other files. To open or export an OMF or AAF sequence, you must have the DigiTranslator 2.0 option installed. DigiTranslator 2.0 is available separately for Avid Mojo users.

 *For more information, see the DigiTranslator 2.0 Integrated Option Guide.*


 *Using the Import Movie command to import OMF video is not recommended because it clears the Movie track of its contents, replacing it with the imported video clip.*

To add OMFI video to the Avid Movie track:

- 1** If the Pro Tools session does not already have an Avid Movie Track, add one by choosing Movie > New Avid Movie Track.
- 2** Choose Movie > Add Movie, select the desired Avid video file, and click OK.
- 3** In the Spot dialog that appears, specify the SMPTE frame number for the start of the video clip.
- 4** Click OK when you are done.

Undo/Redo for Video Editing Commands

You can undo or redo the most recent video editing command, including Add Movie, Clear Selection, Copy Clip, Separate Video, and Move Video Clip. If there are already video clips on the Movie track, and you edit over them, the overwritten material is removed from the Movie track. You can undo the video editing command and restore the original clips.

 *Undo/Redo works only for the single most recent video editing command.*

To undo the most recent video editing command:

- Choose Movie > Undo.
 - or –

To redo the command, choose Movie > Redo.

If you added or moved a clip over a pre-existing clip and consequently truncated it, Undo will also restore the trimmed clip to its original length.

Movie Online

When the movie is online, the Movie track plays along with the audio session. The movie's frame location is updated every time you place your cursor in a new location, and the Movie track scrubs along with the audio tracks. The movie is online by default.

Online Edit and Selection Behavior

When Pro Tools is in Grid mode or set for Loop Playback, and the movie is online, Pro Tools will always place your cursor or Edit selection on legal frame boundaries. If you make a selection that is outside of frame boundaries, or you place your cursor outside a frame boundary, Pro Tools will move your cursor to the nearest frame boundary and play.

Movie Offline

If you temporarily do not want to view the movie or have the movie frame location updated, you can take the movie offline.

This is useful if you are working with audio and do not need to see the video.

To take the movie offline:

- Deselect Movie > Movie Online.

To put the movie back online:

- Select Movie > Movie Online.



The keyboard shortcut for Movie Online and Movie Offline is Shift+Command+J.

Moving the Movie Track or Video Clips

In Pro Tools with Avid Mojo, you can spot the entire Movie track, or just a selected video clip, to a new SMPTE frame location. When you move the Movie track, the whole track or sequence is moved to the new frame location you specify. When you move a single video clip, it is moved to the new specified location within the Movie track.

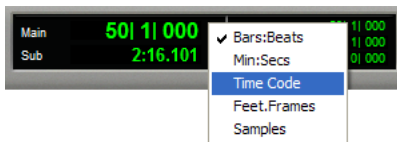
⚠ *If there are already clips on the Movie track, and you edit over them, the overwritten material will be removed from the Movie track. You can undo Move Clip and restore the original clips. For more information, see “Undo/Redo for Video Editing Commands” on page 16.*

To spot the entire Movie track to a new frame location:

1 Select Display > Time Code.

– or –

Select Time Code from the Main Location Indicator pop-up menu.

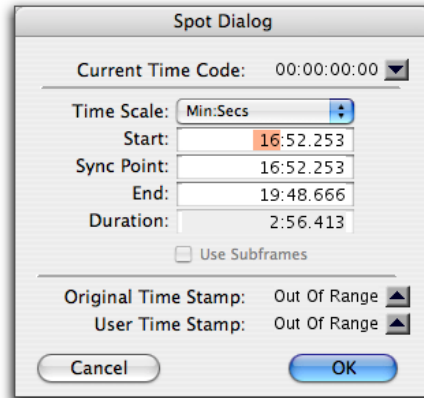


2 Enable Spot mode by clicking the Spot button.



3 Shift-click the Movie track with the Grabber tool.

4 In the Spot dialog that appears, specify a new SMPTE frame number for the start of the Movie track. In this dialog, you can press Plus (+) or Minus (–) on the numeric keypad, enter a number, and press the Enter key to add or subtract that number of frames from the currently selected time field.



Spot dialog

5 Click OK when you are done.

To spot a single video clip to a new frame location:

1 Select Display > Time Code.

– or –

Select Time Code from the Main Location Indicator pop-up menu.

2 Enable Spot mode by clicking the Spot button.

3 Select the clip you want to move on the Movie track with the Grabber tool.

4 In the Spot dialog, specify a new SMPTE frame number for the start of the clip. In this dialog, you can press Plus (+) or Minus (–) on the numeric keypad, enter a number, and press the Enter key to add or subtract that number of frames from the currently selected time field.

5 Click OK when you are done.

Copying Video Clips

You can copy video clips to a new SMPTE frame location within the Movie track.

To copy a video clip to a new frame location:

1 Select Display > Time Code.

– or –

Select Time Code from the Main Location Indicator pop-up menu.

2 Enable Spot mode by clicking the Spot button.

3 Alt-click the clip on the Movie track with the Grabber tool.

4 In the Spot dialog, specify a new SMPTE frame number for the start of the clip. In this dialog, you can press Plus (+) or Minus (–) on the numeric keypad, enter a number, and press the Enter key to add or subtract that number of frames from the currently selected time field.

5 Click OK when you are done.

Clearing Selected Video Clips

You can clear material from the Movie track.

To clear a selection:

1 Using the Selector, click and drag in the Movie track to select the material you want to clear. You can also double-click to select an entire existing video clip.

2 Choose Movie > Clear Selection.

Locking the Movie Track

If you want to permanently associate your video clips with a certain location on your Movie track, you can lock it in place so that it cannot be moved accidentally.

To lock or unlock the Movie track:

1 Using the Grabber, select the Movie track.

2 Choose Edit > Lock Region/Unlock Region.



You can also lock the Movie track by triple-clicking in the Movie track (to select all clips), and then pressing Command+J.

When the Movie track is locked, a small lock icon appears in the track, indicating that the Movie track has been locked and cannot be moved. If you attempt to move a locked region, you will receive an error message.

Once a Movie track is locked, you cannot Add video clips to it without first unlocking it.

QuickTime Movie Sync Offset

There is a certain amount of latency inherent in the decompression process for video. Consequently, the video output needs to be advanced by a certain number of frames to give the video transcoder time to decompress each frame before it needs to be displayed. This offset is determined in the QuickTime Movie Sync Offset dialog. This only affects QuickTime Movie tracks. How much offset is required appears to depend on the decompression hardware, not the CPU, session load or source material.

Pro Tools with Avid Mojo automatically compensates for the latency in playing back Avid video with the Avid Mojo.

Scrub Movie Window

Due to the latency inherent in the decompression process for video, it is not possible to accurately scrub the Movie track with an external reference monitor. When playing back, Pro Tools automatically compensates for this latency because play speed is predictable and consistent. However, the play speed when scrubbing is neither predictable nor consistent. The result is that as you scrub, the video display is not in sync with the cursor while scrubbing. When you stop on a particular frame, the display jumps to the cursor location.

Pro Tools with Avid Mojo provides a Scrub window, which displays the video at quarter-resolution, but accurately scrubs the video. When the Scrub window is open, video output alternates automatically between the Scrub window and the video reference monitor, depending on whether or not you are scrubbing.

The Scrub window only opens when Pro Tools is in Scrub mode. When not in Scrub mode, the Scrub window disappears and video is routed to the video reference monitor.

To open the Scrub window:

- Choose Movie > Scrub window.

A *The Scrub window is only available when there is Avid video in the Movie track. There is no Scrub window for QuickTime video.*

To place and resize the Scrub window:

- 1 Stop playback.
- 2 Choose Movie > Set Scrub Window Size/Location. The Scrub Movie window opens.
- 3 Place and resize the Scrub Movie window as desired.
- 4 Close the Scrub Movie window.

Window placement and size are saved for the next time the window is opened. The window closes automatically if you start playback.

appendix a

24 Frames Per Second Workflows

This appendix describes workflows for playing back digital media that was originally created at 24 frames per second.

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.

A *Pro Tools with Avid Mojo supports video input of NTSC (29.97 fps), PAL (25 fps), 24 fps, and 23.976 video clips. However, only video output of NTSC and PAL is supported, with any 24 fps or 23.976 fps video clips being interpolated by the software. This interpolation can produce visible artifacts. Pro Tools video playback is intended for monitoring purposes only, and it not suitable for professional layback or broadcast, regardless of the resolution or frame rate of the video clip. Video output from Avid Xpress Pro software is professional quality.*

Playing in Sync with 24 fps Video Tapes

To playback synchronized to a video transport playing at 24 fps:

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

2 Set the Frame Rate to 24 fps.

3 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 Windows > Show Session Setup.

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

4 In Pro Tools, from the Audio Rate Pull Up/Down pop-up menu, select 0.1% Down.

A *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.*

24P Clips and Pull Down

When the SYNC I/O is set to pull down, the playback of the 24P clip is pulled down along with the audio. This way, when laying back audio to an NTSC video tape running at 29.97 fps, the Pro Tools video display and the output of the video deck will remain in sync.

Playing in Sync with 25 fps (PAL) Video Tapes

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

- 1** Select the Video Output from the Movie track's Track Options pop-up menu.
- 2** Choose Windows > Show Session Setup.
- 3** From the Frame Rate pop-up menu, select 25 FPS.
- 4** From the Audio Rate Pull Up/Down pop-up menu, select 4.0% Up.

appendix b

PCI Slot Configurations for Avid Mojo

This appendix documents supported PCI slot configurations for Pro Tools|HD systems with Avid Mojo, with or without an expansion chassis.

 *Slot orders are labeled from top (starting with the monitor card) to bottom.*

Apple G5

Slot	Card
CPU Slot 1 (AGP)	Monitor card
CPU Slot 2	HD Core card
CPU Slot 3	HD Process card
CPU Slot 4 (133MHz 64-bit)	UL3D

Apple G5 with 64-bit 7-Slot Expansion Chassis

Slot	Card
CPU Slot 1 (AGP)	Monitor card
CPU Slot 2	Chassis Host Bust Adapter
CPU Slot 3	Empty
CPU Slot 4 (133MHz 64-bit)	UL3D
Backplane Chassis Slot	Chassis Controller card
Chassis Slot 1	HD Core card
Chassis Slots 2–7	HD Process/Accel cards (6 maximum)

Apple G4

Slot	Card
CPU Slot 1 (AGP)	Monitor card
CPU Slot 2 (32-bit)	Empty
CPU Slot 3 (32-bit)	Empty
CPU Slot 4 (64-bit)	HD Process/Accel card (if any)
CPU Slot 5 (64-bit)	HD Core card
CPU Slot 6 (64-bit)	UL3D SCSI HBA

Apple G4 with 64-bit 7-Slot Expansion Chassis

Slot	Card
CPU Slot 1 (AGP)	Monitor card
CPU Slot 2 (32-bit)	Empty
CPU Slot 3 (32-bit)	Empty
CPU Slot 4 (64-bit)	Empty
CPU Slot 5 (64-bit)	Chassis Host Bus Adapter
CPU Slot 6 (64-bit)	UL3D SCSI HBA
Backplane Chassis Slot	Chassis Controller card
Chassis Slot 1	HD Core card
Chassis Slots 2–7	HD Process/Accel cards (6 maximum)

appendix c

Video Buffer Underrun Errors

This appendix describes common video buffer underrun errors in Pro Tools with Avid Mojo.

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.”

This error 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.”

This error 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.”

This error indicates a DIO 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.

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