Avid® File-Based
Workflows Guide

Legal Notices

The following disclaimer is required by the Independent JPEG Group:

This software is based in part on the work of the Independent JPEG Group.

This Software may contain components licensed under the following conditions:

Copyright (c) 1989 The Regents of the University of California. All rights reserved.

Redistribution and use in source and binary forms are permitted provided that the above copyright notice and this paragraph are duplicated in all such forms and that any documentation, advertising materials, and other materials related to such distribution and use acknowledge that the software was developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED ``AS IS'' AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Copyright (C) 1989, 1991 by Jef Poskanzer.

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. This software is provided "as is" without express or implied warranty.

Copyright 1995, Trinity College Computing Center. Written by David Chappell.

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. This software is provided "as is" without express or implied warranty.

Copyright 1996 Daniel Dardailler.

Permission to use, copy, modify, distribute, and sell this software for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of Daniel Dardailler not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. Daniel Dardailler makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

Modifications Copyright 1999 Matt Koss, under the same license as above.

Copyright (c) 1991 by AT&T.

Permission to use, copy, modify, and distribute this software for any purpose without fee is hereby granted, provided that this entire notice is included in all copies of any software which is or includes a copy or modification of this software and in all copies of the supporting documentation for such software.

THIS SOFTWARE IS BEING PROVIDED "AS IS", WITHOUT ANY EXPRESS OR IMPLIED WARRANTY. IN PARTICULAR, NEITHER THE AUTHOR NOR AT&T MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND CONCERNING THE MERCHANTABILITY OF THIS SOFTWARE OR ITS FITNESS FOR ANY PARTICULAR PURPOSE.

This product includes software developed by the University of California, Berkeley and its contributors.

The following disclaimer is required by Nexidia Inc.:

© 2010 Nexidia Inc. All rights reserved, worldwide. Nexidia and the Nexidia logo are trademarks of Nexidia Inc. All other trademarks are the property of their respective owners. All Nexidia materials regardless of form, including without limitation, software applications, documentation and any other information relating to Nexidia Inc., and its products and services are the exclusive property of Nexidia Inc. or its licensors. The Nexidia products and services described in these materials may be covered by Nexidia's United States patents: 7,231,351; 7,263,484; 7,313,521; 7,324,939; 7,406,415, 7,475,065; 7,487,086 and/or other patents pending and may be manufactured under license from the Georgia Tech Research Corporation USA.

The following disclaimer is required by Paradigm Matrix:

Portions of this software licensed from Paradigm Matrix.

The following disclaimer is required by Ray Sauers Associates, Inc.:

"Install-It" is licensed from Ray Sauers Associates, Inc. End-User is prohibited from taking any action to derive a source code equivalent of "Install-It," including by reverse assembly or reverse compilation, Ray Sauers Associates, Inc. shall in no event be liable for any damages resulting from reseller's failure to perform reseller's obligation; or any damages arising from use or operation of reseller's products or the software; or any other damages, including but not limited to, incidental, direct, indirect, special or consequential Damages including lost profits, or damages resulting from loss of use or inability to use reseller's products or the software for any reason including copyright or patent infringement, or lost data, even if Ray Sauers Associates has been advised, knew or should have known of the possibility of such damages.

Avid File-Based Workflows Guide • July 2012

Contents

Section 1: Introduction

The scenarios in this guide are best practice recommendations for file-based workflows using Avid products. This guide augments the product manuals, and does not contain all possible functions that can be accomplished by the products. It also assumes that the reader already has a reasonable working knowledge of the products.

In this information, the general term "offline editing system" refers to Avid applications such as Media Composer®, Symphony™, and NewsCutter®. The term "online editing system" refers to Avid DS.

This section contains the following:

3 **Section 1: Introduction**

1 Digital Post Production

For many years, 24-fps or 25-fps film has been the highest resolution master for film production. During the post production process, this film footage has normally been transferred to HD tape for the offline editing process, and the final cut then scanned to DPX files to preserve the maximum quality to either 2K or 4K resolution for the finishing process.

Modern advances in cinematography, like the digital cameras from RED®, Arri® and Silicon Imaging®, are changing the media-creation industry. They allow you to bypass the film lab conversion process, and load your footage directly onto your editing system. As a result, productions can now be edited from start to end using an all-digital format.

Avid provides an easy and cost-effective way to manipulate high-resolution images during the finishing and mastering stages of post production. You can either capture and edit material directly from file, or perform the offline editing using a film-to-tape workflow. Using the original high-res media, you can then finish as file-based for the mastering and delivery requirements to film (2K or higher), HD or SD formats.

The following illustration shows the key steps for editing and finishing footage that originates either from digital files or from a film reel.
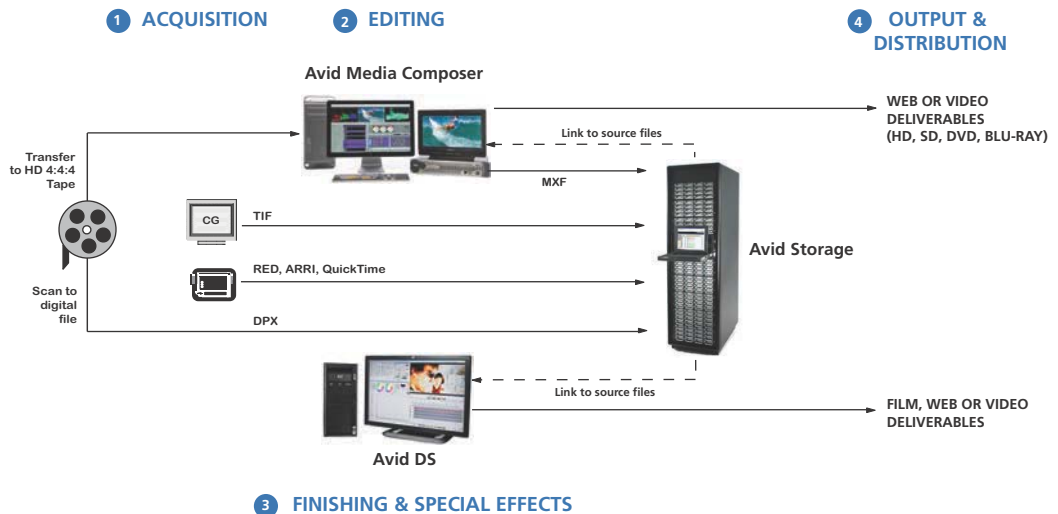
The diagram above shows examples of file formats that can be edited by Avid systems. For a comprehensive list of all formats supported by Avid, refer to "Avid Editing Systems Supported Formats" on the Avid Knowledge Base.

Step 1: Acquisition

With the traditional film-to-tape workflow, the footage from a film reel needs to be transferred through Telecine onto a digital HD tape, for the offline editing on an Avid editing system.

With a file-based workflow, the footage is already in digital file format (originating from digital cameras or CGI applications), so the media can be placed on storage and linked directly from the editing system. Media Composer supports links to high-resolution source material (2K or higher) and saves it as HD frame size.

The Avid DS finishing system supports frame sizes higher than HD, so if you need to output in a format for digital cinema, then only the necessary footage from a traditional film reel needs scanning to high-res DPX files. These files, like other digital file footage can be linked or imported in Avid DS at 2K or higher frame sizes.

Alternatively, high-res file formats that cannot be read by Media Composer (such as DPX), can first be transcoded using Avid MetaFuze. MetaFuze merges consecutive single-frame files (with metadata contained as part of the format) into an MXF file that can be read by Avid Media Composer.

Step 2: Editing in HD on Media Composer

If you will be delivering the final master in HD format, you can perform all your editing in Avid Media Composer, which can link to and output file-based footage in HD RGB 4:2:2 or 4:4:4.

Step 3: High-Resolution Effects & Finishing in Avid DS

To output to higher-than-HD formats, you should either work entirely in Avid DS or do the offline in Media Composer using HD proxies. From Media Composer you can output an AFE for the online conform in Avid DS. Using the original high-res media, you can then finish in the mastering and delivery requirements for film (2K or higher), HD or SD formats.

When conforming from Media Composer to Avid DS, the effects and finishing workflow can be conducted as follows:

- Perform the offline edit using HD or lower resolution MXF proxies in Avid Media Composer.

- Transcode your sequence and output to AFE.

- Open a high-res sequence in Avid DS and import the AFE. Relink to the original footage (e.g. DPX or RED) and finish with special effects.

- Process the final sequence at high-res.

📄 *This guide refers to DPX (Digital Picture eXchange) as it is a common file format used to store a single motion picture frame to a file. Other formats such as Cineon are also supported.*

Step 4: Output and Distribution

Avid editing applications give you the ability to output your sequences to any format (web, SD, HD, or higher). In cases where you need a film out, you can use Avid DS to output to a series of DPX or Cineon™ images (with an appropriate LUT) for recording to film.

Avid File-Based Workflows

Avid supports the following file-based workflows with the Avid MetaFuze, Avid Media Composer family, and Avid DS products. The term *high-resolution* in these workflows refers to file formats that are higher than HD.

- "Workflow: Film Reel Editing" on page 16 - Ingest film footage that was transferred to HD tape, and perform the offline edit in Media Composer at HD or lower proxy resolution. If you need to output at film resolution, then finish in Avid DS with DPX files scanned from the original film reel at 2K or higher.

- "Workflow: File-based Editing with MXF Proxies" on page 17 - High resolution file formats that are not supported by Media Composer can be transcoded to MXF in MetaFuze, and offlined in Media Composer at HD. If you need to output at high resolution, then finish in Avid DS with the original 2K or higher files.

- "Workflow: File-based Editing with AMA" on page 19 - Link to file-based footage via AMA, offline in Media Composer at HD, and finish in Avid DS by linking to the original files.

- "Workflow: File-based Editing with Avid DS" on page 21 - Link to file-based footage in Avid DS at HD or higher resolution for both editing and finishing.

In addition, you may also want to share media and projects between Avid editing applications. If so, make sure that you set up your storage and workstations accordingly.

- If your workstations are sharing projects and media using Avid shared storage, see "Managing Shared Storage for Avid Editing Systems" on page 77.

- If your workstations are sharing projects and media in an Avid Interplay environment using Avid Unity/Avid ISIS, then refer to the *Avid Editing on Interplay Workflow Guide*.

Workflow: Film Reel Editing

When footage is shot on film, it can be digitized in one of two ways. It can either be scanned to DPX files to preserve the maximum resolution, or it can be transferred to tape in HD 4:4:4 format. Through a telecine transfer to HD digital videotape, you can edit the footage and defer the costs of transferring all of the original camera negative to 2K scans to the final finishing and delivery stages.

The recommended method is to transfer the film to HD tape for offline editing. The sequences can be edited in Media Composer at HD or lower resolution, then only the necessary footage can be scanned to DPX for finishing in Avid DS at film resolution.
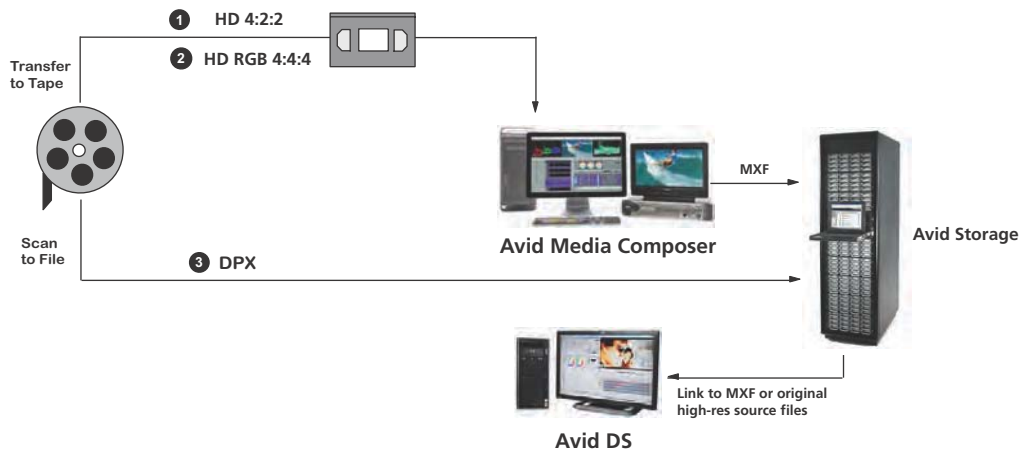
Step 1: Transfer of film to video

The telecine process is the most common practice used for transferring the film dailies to videotape. The next phase of the process is to import the film transfer files (FLEx, Evertz, Aaton, ALE) into Media Composer project bins and batch capture the footage from the dailies. The audio can be captured directly from the BWF file-based recorder, and synced during the editing process.

Step 2: Retransfer of film to higher-quality video

Once the offline editing process is complete, you can easily generate a pull list with handles using Avid FilmScribe. The pull list provides a concise list of footage to be transferred or scanned, thus allowing for an efficient final conform process that minimizes costs in the telecine or scanner room. If you are editing on an Avid Media Composer or Symphony, the original footage can be transferred to HD format in 4:4:2 YCrCB or RGB 4:4:4. The source

timecodes and tape name are easily matched using the common denominator which is the KeyKode information of the original camera negative. Once the bins are relinked, the sequence will point to the newly transferred sources, tape, timecode, etc. for the final edit before output of a video master.

Step 3: Retransfer of film to high-res files

If you are conforming and finishing on an Avid DS system for HD or film delivery, you can scan the final footage to HD or higher-resolution files, and conform the offlined sequence into Avid DS using the AFE.

If you are linking to DPX files, necessary information such as KeyKode (key number) and timecode is inserted as metadata into each DPX file during the scanning process. If the DPX files do not contain the timecode information, an ALE is required in order to make the necessary correspondence to the associated DPX files. The ALE is usually supplied by the film-scanning facility or output by Media Composer.

In Avid DS, you can scan and import files directly from the folders containing the raw file footage. This allows you to refine the look using the established offline settings. You can open a 4K RGB sequence, switch into proxy mode, then grade and output to HDCAMSR 4:4:4 for screenings. For final film out, you can then go back to full resolution 4K and render out DPX or Cineon images with the proper LUT (look-up table) for the film recorder.

For detailed steps on this workflow, see and .

Workflow: File-based Editing with MXF Proxies

High-resolution media files can originate from digital film cameras, film-scanning facilities, or CGI applications. The following workflow describes how you can to edit and finish projects with footage that is in a digital file format that cannot be ingested by Media Composer (e.g. DPX or ARRI.)

Avid MetaFuze is a no-cost software that transcodes high-resolution files to lower-resolution MXF media for the offline edit in Avid Media Composer. If you need to output at higher-than-HD resolution, or add special effects, you can conform the sequence in Avid DS and relink to the original high-resolution files to do the finishing.
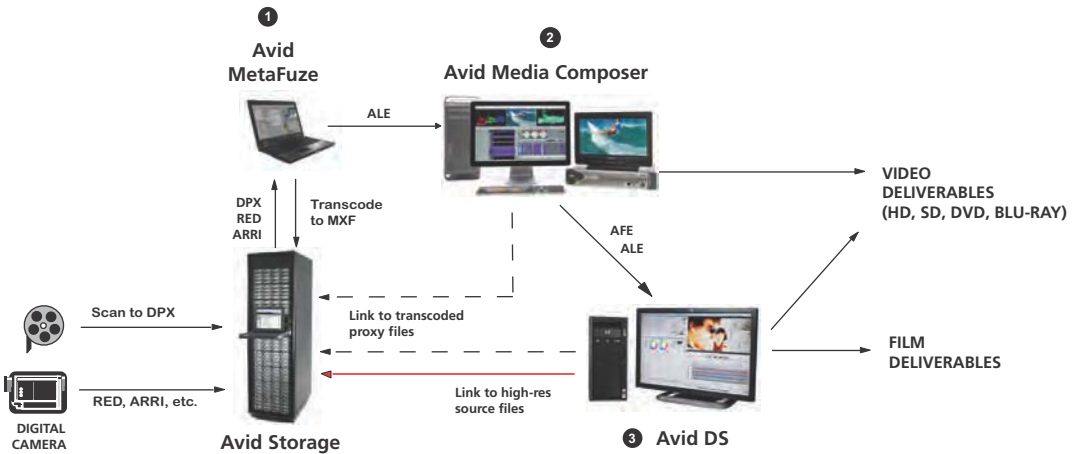
Step 1: Acquisition of media

If you need to work with high-res file formats that cannot be read by Media Composer (such as DPX or ARRI), start by using Avid MetaFuze to transcode these files to a compressed or uncompressed HD resolution. MetaFuze merges consecutive single-frame files (with metadata contained as part of the format) into an MXF file that can be read by Avid Media Composer.

MetaFuze also reads other file types supported third-party parsers.

Step 2: Edit sequence using HD media in Media Composer

In Media Composer, edit your sequence using the compressed or uncompressed MXF media. From here, you can output directly to HD or SD, or send the sequence for finishing on another Avid editing system. If you need to finish in Avid DS, export the sequence as an AFE.

Step 3: Conform AFE for high-res finishing in Avid DS

On Avid DS, you can conform the AFE and connect to the original high-resolution files.

In the case of DPX files, necessary information such as KeyKode™ (key number) and timecode is inserted as metadata into the DPX file during the scanning process. If the DPX files do not contain the timecode information, an ALE is required to make the necessary correspondence to the associated DPX files. The ALE is usually supplied by the film-scanning facility or can be output by Avid MetaFuze.

> *The transcoded MXF file used in Media Composer is not required for the finishing process but it could be imported onto a separate video track in Avid DS and used as part of the conform check process.*

Depending on your system configuration, high-resolution formats are playable in real time—for a specific list of these formats, see the Avid DS support web at www.avid.com. When editing high-resolution projects where real-time playback is not achievable, you can use the proxy mode to apply effects and view the results in HD 4:2:2 or HD 4:4:4.

Step 4: Output to tape or file

Avid editing applications give you the ability to output your sequences to any format (web, SD, HD, or higher). In cases where you need a film out, you can use Avid DS to output to a series of DPX or Cineon™ images (with an appropriate LUT) for recording to film.

For detailed steps on this workflow, see "Checklist: File-based Editing in Media Composer with MXF Proxies" on page 27 and "Checklist: File-based Conforming and Finishing in Avid DS" on page 28.

Workflow: File-based Editing with AMA

Modern advances in cinematography, like the digital film cameras from RED® and other DSLR mechanisms, are starting to have an impact on the media-creation industry. They allow you to bypass the film lab conversion process, and load your footage directly onto your editing system. As a result, films can now be produced from start to end using an all-digital format.

Avid provides an easy and cost-effective way to manipulate high-resolution images during the finishing and mastering stages of post production. In Media Composer, you can link to, and edit the media at HD resolution directly from file, and output at HD resolution. To deliver the final sequence at higher-than-HD resolution, you can conform the sequence in Avid DS and relink to the original high-resolution files to do the finishing.

The following workflow shows you how to link to digital file formats via AMA to edit your projects in Media Composer. You can then link to the same media in Avid DS to do the conform and finishing.
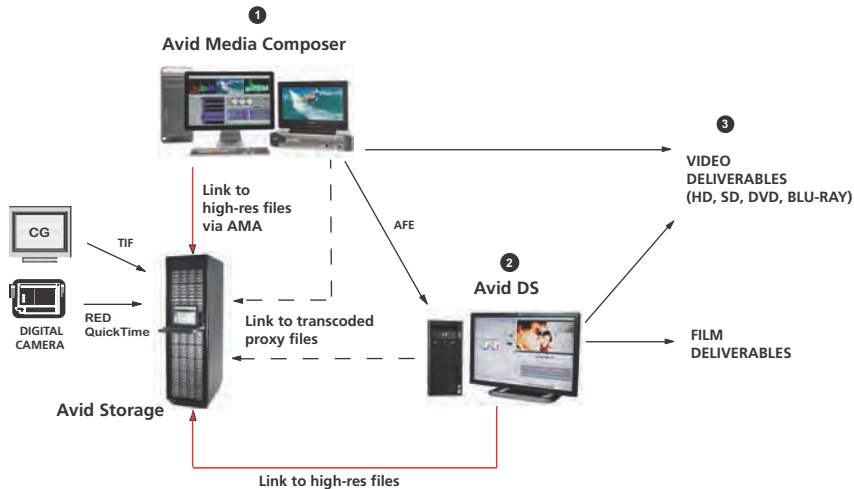
Step 1: Acquisition and editing of media

Media Composer can link to RED and other high-resolution footage via AMA. This media can be edited in HD or transcoded to a lower resolution for more efficiency during the offline editing process.

After editing, you can output directly to HD RGB 4:2:2 or 4:4:4. If you need to finish at a higher-than-HD resolution, transcode and export the sequence as an AFE to an online editing system such as Avid DS.

Step 2: Conform AFE for high-res finishing in Avid DS

When you conform your sequence from Media Composer to Avid DS, you will still be able to link to the original high-resolution footage for the finishing and output.

Depending on your system configuration, high-resolution formats are playable in real time—for a specific list of these formats, see the Avid DS support web at www.avid.com. When editing high-resolution projects where real-time playback is not achievable, you can use the proxy mode to apply effects and view the results in HD 4:2:2 or HD 4:4:4.

Step 3: Output to tape or file

Avid editing applications give you the ability to output your sequences to any format (web, SD, HD, or higher). In cases where you need a film out, you can use Avid DS to output to a series of DPX or Cineon™ images (with an appropriate LUT) for recording to film.

Workflow: File-based Editing with Avid DS

Avid DS supports footage from digital film cameras, film-scans, or CGI applications, at frame sizes of 2K and higher for editing and output. If you will be delivering the final master in a film format, you can work entirely in Avid DS.

When editing these high-resolution sequences, you have a choice of displaying and processing either in full resolution or real-time proxy resolution. To work more quickly and efficiently, you can also apply effects in the proxy resolution. In this mode, real-time effects do not need to be processed. If any effects do require processing, the resulting caches are also generated in real-time proxy resolution to save disk space.

Depending on your system configuration, many high-resolution formats are playable in real time—for a specific list of these formats, refer to the Avid DS Support site at www.avid.com/ds/support.

The following workflow shows you how to link to file-based footage in Avid DS to edit and finish at film resolution.
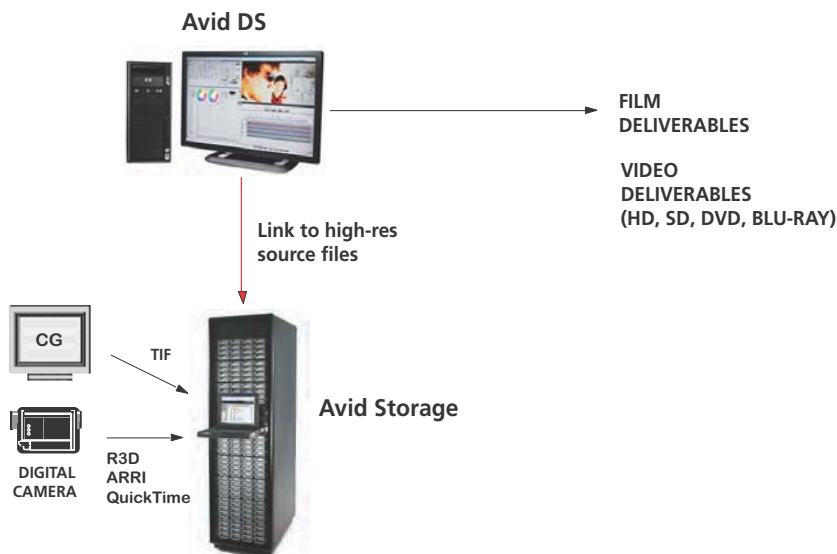
Step 1: Acquisition and editing of media

Avid DS can capture or link to RED, ARRI, DPX, TIF and other high-resolution footage at their original frame sizes.

When editing these high-resolution sequences, you have a choice of displaying and processing either in full resolution or real-time proxy resolution. The proxy is a lower-sized HD resolution that provides excellent visual quality for editing and previewing your sequence in a video monitor.

Step 2: Applying effects

To work more quickly and efficiently, you can apply effects in the lower, real-time proxy resolution. In this mode, real-time effects do not need to be processed. If any effects do require processing, the resulting caches are also generated in real-time proxy resolution to save disk space.

If you need to finish your audio on another system such as Avid Pro Tools, you can export OMF files for the audio portion of your sequence. When the audio mix is complete, it can be imported back into Avid DS via an AAF file.

Step 3: Output to tape or file

When you are ready to output your final sequence, you can switch back to full resolution to process your effects. Processing in full resolution has the advantage of highly accurate processing using 4:4:4 RGB values.

Avid DS, you can output to any required format. In the case of a film out, output the final sequence to master as a series of DPX or Cineon™ images (with an appropriate LUT) for recording to film.

For detailed steps on this workflow, see

2 Checklists: Film Reel Editing

When footage is shot on film, it can be digitized in one of two ways. It can be scanned to DPX files to preserve the 2K or 4K film resolution, or it can be transferred to tape in HD 4:4:4 format. Through a telecine transfer to HD digital videotape, Avid editing applications capture and store film frames as 24-fps progressive media, or 24p. An important aspect of the 24p format is that it lets you output either HD, NTSC or PAL video from the same project. Also, since the footage is transferred to videotape, you can retain all the advantages of shooting and editing film without incurring the costs of transferring to 2K scans until the final finishing and delivery stages.

The scenario below describes how to edit footage that is transferred to tape for offline editing. The sequences are edited in Media Composer at HD or lower resolution, and finished with 2K or higher scanned files in Avid DS at film resolution.

Checklist: Editing Film Reel Footage in Media Composer

A 24p or 25p project is one that uses 24p or 25p media, which is created and stored in your Avid editing application. In most cases, the source footage is film shot at 23.976 fps, 24 fps (for 24p) or 25 fps (for 25p), however new technology is introducing 24p and 25p videotape formats, both for cameras and VTRs.

Progressive media is composed of single frames, each of which is vertically scanned as one pass. Avid editing applications create 24p media by combining (deinterlacing) two video fields into a single full, reconstructed frame. For NTSC film-to-tape transfers, Avid editing applications create 24p media by removing the extra fields inserted by the 2:3 pulldown process and by creating progressive frames.

The 25p format is primarily for use in countries where PAL video is standard. When you transfer 25-fps film footage to 25-fps PAL video, no modifications are necessary due to matching frame rates.

This section outlines the workflows for 24/25-fps film source. Certain steps will have differences based on the project format and source footage you are using. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

	Step	Refer to this section
❏	The telecine process syncs picture and sound to create the videotape. The process also creates a shot log that will be used during the capture process. Transfer the 24-fps film to NTSC or PAL.	"Transferring Film to Tape" on page 41.
❏	Convert the shot log file with Avid Log Exchange (ALE), then import the shot log file into Media Composer to create a bin or bins.	
❏	Open a project with the appropriate settings. 📋 *If you are outputting for NTSC HDTV broadcast, create a 23.976p SD project.*	"Creating a Film-Based Project" on page 50.
❏	Use the ALE to batch capture the footage in an offline resolution.	"Selecting a Project Format during Capture" on page 53.
❏	Use the low-res media to edit at 24/25/23.976 fps.	"Viewing Video Dailies" on page 49. "Displaying 24p and 25p Media" in the Help for the Media Composer family.
❏	If a retransfer is needed, use Avid FilmScribe to create an OCN (original camera negative) pull list for another telecine process, of the footage used in the final edit.	
❏	Perform the offline edit to produce the final sequence.	"Editing with File-Based Media" on page 54.
❏	(Option) Export an OMFI or AAF file to a Pro Tools digital audio workstation to create a final audio mix.	"Transferring Audio Files" in the Help for the Media Composer family.
❏	The telecine process uses the pull list and full color-corrected transfer to create HD, NTSC or PAL videotape with selects from the original negative (picture only). The process also creates a new shot log file. Convert the new shot log with ALE and import it into the online system.	
	Finishing on Avid DS:	
❏	To finish on an Avid DS system, export an AFE of your final project or sequence from Media Composer. (You should first make a copy of the sequence, decompose it, and then export the bin.)	"Exporting the AFE File to Avid DS" on page 56.

Step	Refer to this section
❑ Conform your sequence in Avid DS.	"Checklist: Editing and Finishing Film Reel Footage in Avid DS" on page 25.
Finishing on Avid Symphony:	
❑ Transfer the project information to the Symphony system. If you are using an Avid Unity shared storage system, the project links to the existing media. If you are not using Avid Unity, transfer the media for reference.	
❑ (Option) For HD projects being output at 1080p, you should open the 24p project and change its format to 1080p/23.976.	"Changing the Project Format" in the Help for the Media Composer family.
❑ Review the offline sequence, then modify the format of the sequence to create a new 1080p/23.976 sequence.	"Changing the Sequence Format" in the Help for the Media Composer family.
❑ Batch capture in the desired resolution, based on the new ALE shot log file.	
❑ Relink by KeyKode: relink the sequence and clips by key numbers (FTFT) and complete any other finishing. If necessary, batch capture clips as HD media, using an HD resolution.	
❑ Complete any other finishing, using the original offline sequence for reference.	
❑ (Option) Import the final audio mix.	
❑ Generate multiple formats.	"Selecting a Project Format during Output" on page 53.

Checklist: Editing and Finishing Film Reel Footage in Avid DS

The following checklist guides you through the process of editing and finishing high-resolution footage from film reels. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

	Step	Refer to this section
❑	Learn how to set up your workgroup so that you can share media between your Avid offline and online workstations.	"Sharing Media" in the Help for Avid DS.
❑	If you are working with high-resolution media, make sure the files reside on a high-capacity storage.	"Placing File-based Media on the Storage Device" on page 90.
❑	Refer to the Film Formats table on the Avid DS support site for a list of high-resolution media formats and playback performance.	http://aviddssupport.avid.com Select **Configurations** > **Supported Formats** or **Conversion Formats**
❑	Make sure that your storage has been configured to have read/write access for your high-resolution files.	"Configuring your Storage Locations" on page 92.
❑	Open a new film or HD project.	"Opening an HD or Film Project in Avid DS" on page 105.
❑	If you are conforming a sequence from Avid Media Composer, then open the AFE or EDL, and link to the original high-resolution files. 📖 *If you are using DPX files and they do not contain the timecode information, then you will also need the ALE (either from the film house, MetaFuze or Avid Media Composer) to make the necessary correspondence to the associated DPX files.*	"Conforming with AAF/AFE Files" on page 141.
❑	Perform the necessary editing of your sequence using low-res proxies of your media.	"Film Proxy Mode" on page 120.
❑	Add special effects and do the necessary color correction.	Refer to the appropriate sections in the Avid DS Help.
❑	Process your sequence.	Refer to the Processing section in the Avid DS Help.
❑	Output your final sequence to tape or file.	"Outputting Film Sequences" on page 122.

3 Checklists: File-based Editing with MXF Proxies

File-based footage can originate from digital film cameras, film-scanning facilities, or CGI applications. The following workflow shows you how to edit and finish projects with footage that is in a digital file format, such as DPX or ARRI, which cannot currently be linked via AMA.

If you will be delivering the final master in HD format, use MetaFuze to transcode the high-resolution media to proxy MXF media for the offline edit in Avid Media Composer. If you need to output to film, do the offline editing in Media Composer and then conform the sequence in Avid DS. The AFE from Media Composer will let you relink to the original high-res files to do the finishing at 2K+ resolution.

If you are using file formats that are supported by Media Composer (e.g. RED or QuickTime), then refer to "Workflow: File-based Editing with AMA" on page 19.

Checklist: File-based Editing in Media Composer with MXF Proxies

The following checklist explains how to edit high-resolution files that cannot be read directly by Media Composer. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

Step	Refer to this section
❑ Install and use Avid MetaFuze to transcode your high-resolution media into MXF files.	
If you are working with ARRI media, you must install the ARRI plug-in on the same system where MetaFuze is installed.	Refer to the Avid website for more information.
❑ Open Avid MetaFuze, scan your folders, and set the necessary options for transcoding the files.	"Scanning your Folders" and "Transcoding your Files" in the Avid MetaFuze User Guide.

Step	Refer to this section
❑ If you have multiple MXF files, export an edit list of all these clips via an ALE.	"Exporting an ALE from MetaFuze" in the Avid MetaFuze User Guide.
❑ Import the MXF file(s) into Avid Media Composer.	"Importing MXF Files into Avid Media Composer" in the Avid MetaFuze User Guide.
❑ Edit the sequence with Avid Media Composer.	"Editing with File-Based Media" on page 54.
❑ If you need to finish your sequence in another editing system such as Symphony or Avid DS, export an AFE of your final project or sequence from Media Composer.	"Exporting the AFE File to Avid DS" on page 56.
❑ If the footage originated on a film reel, then you should generate a film pull list that the film transfer facility will use to scan the required frames to DPX files.	
❑ Once you have all the necessary files prepared, transfer the project to the Avid DS system.	For the workflow on finishing in Avid DS, see "Checklist: File-based Conforming and Finishing in Avid DS" on page 28.

Checklist: File-based Conforming and Finishing in Avid DS

The following checklist details all the steps required to edit digital film files in Avid DS. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

Step	Refer to this section
❑ If you are working in a facility where you share media on Avid shared storage, then learn how to set up your workgroup so that you can share media between Avid editing workstations.	"Checklist: Configuring Avid DS on Avid Shared Storage" on page 87.
❑ Make sure all the high-resolution files reside on a high-capacity storage.	"Placing File-based Media on the Storage Device" on page 90.

	Step	Refer to this section
	📖 *If you're project uses different types of high-resolution media (e.g. R3D, ARI, DPX, TIF), make sure that they are each placed in different folders.*	
❑	If you are using ARRI media, you must install the ARRI plug-in.	"Installing and Configuring the ARRI Plug-in" on page 91.
❑	Make sure that your storage has been configured to have read/write access for your high-resolution files.	"Configuring your Storage Locations" on page 92.
	If you are connecting to shared Avid storage, then you must have the appropriate workspaces configured.	"Checklist: Configuring Avid DS on Avid Shared Storage" on page 87.
❑	Open a new project for film or HD.	"Opening an HD or Film Project in Avid DS" on page 105.
❑	Open the AFE or EDL to conform your sequence from Avid Media Composer.	"Conforming with AAF/AFE Files" on page 129.
	📖 *If you are linking to DPX files and they do not contain the timecode information, then you will also need the ALE (either from the film house, MetaFuze or Avid Media Composer) to make the necessary correspondence to the associated DPX files.*	
❑	When working with high-resolution media, Avid DS handles the complicated task of preserving color settings during the transfer and storage of the media. This is known as color management and it is achieved by applying lookup table files (LUTs).	"Color Management in Avid DS" on page 147.
❑	Perform the necessary editing of your sequence using low-res proxies of your media.	"Film Proxy Mode" on page 120.
❑	Add special effects and do the necessary color correction.	Refer to the appropriate sections in the Avid DS Help.
❑	Process your sequence so that you are guaranteed to play back and output the sequence in real time.	Refer to the Processing section in the Avid DS Help.
❑	Output your sequence to tape or file.	"Outputting Film Sequences" on page 122.

3 **Checklists: File-based Editing with MXF Proxies**

# 4 Checklists: File-based Editing with AMA

Modern advances in cinematography, like the digital film cameras from RED®, are starting to have an impact on the film-creation industry. They allow you to bypass the film lab conversion process, and load your footage directly onto your editing system. As a result, films can now be produced from start to end using an all-digital format.

Avid provides an easy and cost-effective way to manipulate high-resolution digital motion picture images during the finishing and mastering stages of post production. You can link to, and edit the media at HD resolution directly from file. You can then output at HD resolution or, if you need to deliver at higher-than-HD, you can use an online editing system such as Avid DS to link back to the original high-res media for finishing, mastering and delivery requirements to film (2K+), HD, or SD formats.

The following checklists provide step-by-step details on how to link to digital file formats via AMA to edit your projects in Media Composer, and link to the same media in Avid DS to do the conform and finishing.

Checklist: File-based Editing in Media Composer via AMA

The following checklist explains how to link and edit file-based media in Media Composer. This checklist has some specific details pertaining to RED media, however, it does apply to other file-based formats. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

	Step	Refer to this section
❑	Make sure that you have the necessary AMA plug-ins installed on your workstation.	
❑	Open Media Composer and create a project.	
❑	Link to the source files.	"Linking Media with AMA" in the Media Composer help.

	Step	Refer to this section
❑	Set the appropriate storage locations for your media.	"Media Creation Settings" in the Media Composer help.
❑	Begin editing your sequence.	
❑	If you are working with media of varying frame sizes in your project, then you need to set the formatting options on each clip that is of a different frame size than the project.	
❑	**If you are editing with RED media:**	
❑	Read the workflow recommendations for editing with RED media.	"Editorial Workflows for RED" on page 57. "Working with RED Media" on page 60.
❑	At the same time, understand the current limitations with AMA-linking so that you can make better decisions about your workflow.	"Known Limitations for Linking RED Files via AMA" on page 60.
❑	Connect your RED drive to your system.	
❑	(Optional) Place your RED media on a shared storage device such as Avid ISIS. 📑 *To get realtime playback of this media from your shared storage, you will require a 10GB ethernet connection. For a list of performance expectations refer to the ReadMe document for your Avid editing application.*	
❑	Link to the source files.	"Linking Media with AMA" in the Media Composer help.
❑	Linking to RED files via AMA is both processor and storage intensive. If you require better performance, you may want to transcode your RED media and work with low-res proxies.	"Editing with Low-Res RED Media" on page 63.

Step	Refer to this section
❑ You may need to change the color values (color balance, exposure, and contrast) on your RED media.	"Color Management with RED Media" on page 65.

"Adjusting RED Source Settings" on page 66.

"Applying a Source Setting" on page 70.

"Adjusting the Source Settings Histogram" on page 71. |

❑ Render the effects in your final sequence.

If you are using high-resolution media (such as RED), you should render your clips to avoid any dropping of frames during the output process.

❑ Output the final sequence.

or

❑ If you need to finish your sequence in another editing system such as Symphony or Avid DS, export an AFE of your final project or sequence from Media Composer.

If your high-resolution media is on a shared storage device where Avid DS also has access, Avid DS automatically relinks to the files.

Some AMA-linked media may need to be transcoded before being transferred to Avid DS. In this case you need to transcode your sequence before exporting the AFE. Transcoded media is placed in the Avid MediaFiles\MXF folder on your storage. In a networked environment using Avid shared storage, this path may include your machine name.

    ❑ If you are not using AMA-linked clips, you should first make a copy of the sequence, move it to its own bin, decompose it (with handles as desired), select ALL master clips, and export as ALE with appropriate columns visible in the bin.

    📄 *If you are working with high-res files, do not use the option to extend handles beyond the master clip edges.*

Checklist: Conforming and Finishing AMA-Linked Sequences in Avid DS

The following checklist details all the steps required to conform sequences with AMA-linked clips from Media Composer to Avid DS. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

	Step	Refer to this section
❑	Learn how to set up your workgroup so that you can share media between Avid editing workstations.	"Checklist: Configuring Avid DS on Avid Shared Storage" on page 87.
❑	If you are using a shared storage area with your offline editing system, make sure that Avid DS has access to the media used/generated by Media Composer.	"Placing File-based Media on the Storage Device" on page 90 or "Sharing MXF Media" on page 90.
	Optionally, you can create a specific Avid MediaFiles folder on your Avid DS storage and place the source media in that location. (For best performance, high-resolution files should reside on a high-capacity storage.)	
	📖 *If you are working with different types of high-resolution media (e.g. R3D, ARI, DPX, TIF), make sure that they are each placed in different folders.*	
❑	Make sure that your storage has been configured to have read/write access for your high-resolution files.	"Configuring your Storage Locations" on page 92.
❑	Open a new project for film or HD.	"Opening an HD or Film Project in Avid DS" on page 105.
❑	Open the AFE or EDL that you exported from Avid Media Composer.	"Conforming with AAF/AFE Files" on page 129.
❑	When working with high-resolution media, Avid DS handles the complicated task of preserving color settings during the transfer and storage of the media. This is known as color management and it is achieved by applying lookup table files (LUTs).	"Color Management in Avid DS" on page 147.
❑	Perform the necessary editing of your sequence using low-res proxies of your media.	"Film Proxy Mode" on page 120.

Step	Refer to this section
❏ Add special effects and do the necessary color correction.	Refer to the appropriate sections in the Avid DS Help.
❏ Process your sequence so that you are guaranteed to play back and output the sequence in real time.	Refer to the Processing section in the Avid DS Help.
❏ Output your sequence to tape or file.	"Outputting Film Sequences" on page 122.

4 **Checklists: File-based Editing with AMA**

5 **Checklist: File-based Editing in Avid DS**

Avid DS supports frame sizes of 2K and higher for editing and output. If you will be delivering the final master in a film format, you can work entirely in Avid DS.

When editing these high-resolution sequences, you have a choice of displaying and processing either in full resolution or real-time proxy resolution. The proxy is a lower-sized HD resolution that provides excellent visual quality for editing and previewing your sequence in a video monitor.

Depending on your system configuration, many high-resolution formats are playable in real time—for a specific list of these formats, see the Avid DS support web at www.avid.com.

To work more quickly and efficiently, you can apply effects in the proxy resolution. In this mode, real-time effects do not need to be processed. If any effects do require processing, the resulting caches are also generated in real-time proxy resolution to save disk space.

Checklist: File-based Editing and Finishing in Avid DS

The following checklist guides you through the process of editing and finishing high-resolution footage from film reels. Follow these steps in the order that they are listed, and return to this checklist each time you complete a step.

Step	Refer to this section
☐ Learn how to set up your workgroup so that you can share media between your Avid editing workstations.	"Checklist: Configuring Avid DS on Avid Shared Storage" on page 87.
☐ If you are working with high-resolution media, make sure the files reside on a high-capacity storage.	"Placing File-based Media on the Storage Device" on page 90.
☐ Refer to the Film Formats table on the Avid DS support site for a list of high-resolution media formats and playback performance.	http://aviddssupport.avid.com Select **Configurations** > **Supported Formats** or **Conversion Formats**

	Step	Refer to this section
❑	If you are using ARRI media, you must install the ARRI plug-in.	"Installing and Configuring the ARRI Plug-in" on page 91.
❑	Make sure that your storage has been configured to have read/write access for your high-resolution files.	"Configuring your Storage Locations" on page 92.
❑	Open a new film or HD project.	"Opening an HD or Film Project in Avid DS" on page 105.
	📄 *If you are using DPX files and they do not contain the timecode information, then you will also need the ALE (either from the film house, MetaFuze or Avid Media Composer) to make the necessary correspondence to the associated DPX files.*	.
❑	If you are starting your project directly in Avid DS, then link to your clips and start building your sequence.	"Linking to High-Resolution Files" on page 108.
	or	
	If you are working with media from tape, capture your HD 4:4:4 footage into Avid DS.	"Capturing High Resolution Media from Tape" on page 111.
❑	Perform the necessary editing of your sequence using low-res proxies of your media.	"Film Proxy Mode" on page 120.
❑	When working with high-resolution media, Avid DS handles the complicated task of preserving color settings during the transfer and storage of the media. This is known as color management and it is achieved by applying lookup table files (LUTs).	"Color Management in Avid DS" on page 147.
❑	Add special effects and do the necessary color correction.	Refer to the appropriate sections in the Avid DS Help.
❑	Process your sequence.	Refer to the Processing section in the Avid DS Help.
❑	Output your final sequence to tape or file.	"Outputting Film Sequences" on page 122.

Section 2: Media Composer

6 **Section 2: Media Composer**

6 Editing Film-based Projects in Media Composer

The following section contains topics that relate to the editing of film-based projects in the Avid Media Composer product family.

Transferring Film to Tape

You have your film rolls from the day's shooting, and you're ready to edit on your Avid system. To capture that footage into the system, you first need to transfer the film to videotape. This process uses a special film projector called a telecine, which is usually part of a production system that includes audiotape recorders, a controller, and other equipment. The steps in the process will differ, depending on whether you include audio and whether the transfer produces NTSC or PAL videotapes.

This section provides some guidelines to ensure that the film shoot and transfer process is well-planned for the Avid editing session.

Film Shoot Specifications

Use the guidelines in the following table to help you plan for film shoots that will be edited on an Avid.

Element	Supported Formats	Notes
Film type	16mm	Use Standard 16mm or Super 16mm. Super 16's aspect ratio closely matches 16:9.
	35mm: 2, 3, 4, 8, and 12 perf 65mm: 5, 8, 10, and 15 perf	16mm, 35mm 4 perf, and 35mm 3 perf are supported as projects in the Avid system. The remaining formats are supported through ink numbers and auxiliary ink numbers. For more information, see "Film and 24P Settings" in the Help for the Media Composer family.
Film wind	B-wind	Always use camera rolls with key numbers in ascending order.

Element	Supported Formats	Notes
Audio media	BWF file-based recorders	Use to record digital audio.
Audio timecodes	30-fps drop-frame or non-drop-frame	Use for NTSC transfer projects, and for generating audio EDLs.
	25-fps timecode	Use for PAL transfer projects, and for generating audio EDLs in the PAL format.
	Audio sync to in-camera timecode (Arri® 24-fps timecode)	Use for automatic syncing of sound with picture in the Avid system.
Sync methods	Clapsticks	Use for manual syncing of sound with picture.
	Electronic slate (smart slate)	Use for semiautomatic syncing.
	In-camera timecode, with audio sync	Use for automatic, "slateless" syncing in the telecine.
Slate information	Camera roll, scene and take, shoot date, sound-roll ID	Mark sound-roll ID as a backup.
Sound-roll cues	Sound-roll ID, date, start and end time-of-day timecode	Include verbal time-of-day cues as a backup.

Film-to-Tape Transfer Guidelines

Observe the following general guidelines when transferring film to tape:

• Instruct the telecine facility to record timecode on the address track.

• Instruct the facility to use only a telecine transfer process when transferring to NTSC videotape. Do not use a film chain or any other transfer device.

• PAL transfers do not require pulldown, so you can use either a telecine or a film chain. However, quality is much better on a telecine.

• Transfer all of the project's source film footage to disk or tape by using either the NTSC or PAL method.

    - For NTSC projects, you can mix footage transferred at 24 fps (23.976 fps) or 30 fps (29.97 fps), and mix sound transferred at 1.0 or 0.99. Do not mix 24-fps and 30-fps transfers on the same transfer tape.

    - For PAL projects, you cannot mix audio that has been transferred at 4.1 percent speedup (PAL Method 1) with audio that has not been sped up (PAL Method 2).

PAL film-to-tape transfers that use pulldown are not currently supported in Avid editing applications.

Project Format	Source footage	During the telecine process
SD	24 fps	To create ITU-R 601 video, the telecine process adds 2:3 pulldown to film footage to create an NTSC videotape, or uses 4.1% speedup for PAL videotape.
	25 fps	The telecine process transfers 25-fps film footage at 1:1 (no pulldown).
		The sound recording can be synchronized as part of the telecine transfer.
		▤ *For NTSC output, this method slows the audio by 4 percent. If you plan to output to both NTSC and PAL, you might want to shoot at 24 fps and use 24p instead of 25p.*
	23.976 fps	The telecine process syncs audio and transfers film footage at 1:1 (no pulldown).
HD	24 fps	The telecine process transfers 24-fps film footage at 1:1 (no pulldown).
		It can also transfer the footage at HD 1080p/23.976 video at 1:1. This lets you create the project at 24p and later change it to 1080p without having to create a new project and sequence. In addition, you can keep both offline SD material and online HD material available in the same project.
	23.976 fps	The telecine process syncs audio and transfers film footage at HD 1080p/23.976 video at 1:1 (no pulldown).
	25 fps	For PAL broadcast, transfer film at 1080p/25, edit offline in a 25p PAL project, and edit online in a 1080p/25 project.

Film-to-Tape Transfer Quality Options and Production Aids

The quality of the film-to-tape transfers depends upon several options for the telecine transfer. The following table describes common transfer-quality options available from a telecine facility:

Option	Description
One-light	This transfer involves a single setting of color correction values, resulting in the simplest, fastest, and least-costly type of transfer. One-light transfers are often used during offline stages of editing.

Option	Description
Best-light	This transfer involves optimum settings of the color-grade controls, but without scene-by-scene color correction. Best-light transfers are an intermediate level in terms of both quality and cost.
Timed (scene-by-scene)	This transfer involves color correcting each scene or shot during transfer. Timed transfers are the most expensive and time consuming. This option sets up the proper black and white levels so that you can perform a tape-to-tape color correction from the source tapes, if needed.

You can use the film-tape-film-tape feature to perform two separate telecine processes for a project:

• Perform a one-light or best-light transfer to obtain the most material for the initial edits.

• After editing is complete, perform a timed, fully color-corrected transfer of the clips that will be used in the final cut.

For more information on the film-tape-film option, see "Relinking Clips by Key Number" in the Help for the Media Composer family.

After you perform the final telecine operation, you can capture at a finishing resolution, such as 1:1 (uncompressed).

The transfer facility might have available one or more of the production aids described in the following table, which you can include in your film-to-tape transfer:

Aid	Description
Automatic logging	Whenever possible, you should instruct the facility to log tracking information directly into a computer database program. Logs generated automatically are more accurate than manual logs and can be imported easily into the Avid editing system. A log file typically indicates the relative timecode, key numbers, and pullin ("A" frames) for each clip that will be captured.
A keypunch at the head of each camera roll	Ask the lab or transfer house to keypunch the head of each camera roll at the zero frame and give you a list of the corresponding key numbers. After you have captured, you can match this list with your captured material to check for potential transfer errors.
Burn-in code	If the transfer facility is equipped with a timecode or film-code character generator, you can instruct the facility to display or "burn-in" tracking codes on the videotape transfer. Burn-in code provides visual feedback for logging and tracking footage. ⚠ **Burn-in code cannot be removed from the image and should be used only for the offline stage of a project.**

Aid	Description
16:9 wide screen format	Your Avid editing application supports the 16:9 wide-screen display format. You can either shoot your footage by using a 16:9 lens, or transfer the footage anamorphically to display a larger area of the film aspect ratio during offline and online editing. Also, this aspect ratio lets you create media that takes advantage of 16:9 monitors that conform to SDTV and HDTV standards.

Transfer of 24-fps Film to NTSC Video

For an NTSC transfer, the telecine converts your film footage into video running at 29.97 fps. The video can then be captured and edited at 24 fps in the Avid editing system. This approach ensures that all your edits correspond to true film frames so you see an accurate representation of the finished film.

If you transfer sound along with picture, your Avid editing application captures audio at the slowed-down speed. Then during editing and playback, your Avid editing application speeds up the play rate by 0.1 percent to play in sync with the 24-fps video. Audio plays at 44100 Hz (44.1 kHz) or 48000 Hz (48 kHz).

Transferring Film to Video

Film runs at 24 fps, and NTSC video runs at 30 fps. The difference in frame rates between film and video prevents a direct frame-to-frame transfer. To compensate, the telecine process creates an extra six frames every second (the difference between 24 and 30). This method of creating extra frames is known as *pulldown*.

At the same time, the telecine slightly reduces the film's running speed to 23.976 fps. NTSC video, the broadcast standard used in the United States, Japan, and other countries, plays at an actual rate of 29.97 fps, although it is usually referred to as 30 fps. An accurate conversion requires exact adherence to the 4:5 ratio, but this ratio breaks down when you compare 24 fps to 29.97 fps. To achieve a true 4:5 ratio, the film frame rate is slowed down to 23.976 fps. The telecine process makes this correction automatically, slowing NTSC video 0.1 percent from the original film speed, so that the video plays at 99.9 percent of its original speed.

The following table describes the film to video ratio:

Film	Video
24 fps	30 fps
4 frames	5 frames (10 fields)

Film	Video
23.976 fps (0.999 x 24)	29.97 fps (0.999 x 30)

During the capture process, your Avid editing application reverses the pulldown procedure to capture the film footage at 24 fps. It removes the extra fields added by the pulldown process to create full-frame, 24p media. The capture process captures video and audio at the slowed-down speed (0.999).

Maintaining Synchronized Sound

In most cases, the sound for your production has been recorded on a digital audio system, such as a BWF file-based recorder. You need to synchronize the sound with the picture and make sure they are in sync in your Avid editing application. You can take one of three basic paths:

• Transfer only the picture through the telecine process to HD videotape, capture picture from tape and sound from BWF, and sync them in your Avid editing application.

• Transfer the original sound recording to mag track, sync the mag track to the film work print, and transfer both to videotape through a telecine process.

• Sync the original sound recordings to picture during the telecine process, and transfer both to videotape.

If the telecine transfers sound along with picture, the sound intended to be slowed down for telecine is usually recorded at 48.048 kHz, so that it ends up being 48 kHz.

Transfer of 24-fps Film to PAL Video

If you use a PAL transfer, the film-to-video process takes place in two stages:

• Transfer the film to videotape by speeding up the film rate during the telecine process.

• Capture the transferred videotape into the Avid system at the sped-up rate.

There are two approaches to synchronizing sound, which are often referred to as PAL Method 1 and PAL Method 2.

PAL Method 1

With PAL Method 1, you synchronize sound with picture during the telecine process.

As with an NTSC film-to-tape transfer, the telecine process creates two video fields for each film frame. However, because the film rate of 24 fps is close to the PAL video rate of 25 fps, most PAL film-to-tape transfers involve simply speeding up the frame rate. This speedup changes the frame rate from 24 to 25 (an increase of 4.1 percent). There is no pulldown that creates extra fields.

Some PAL film-to-tape transfers use pulldown. This method is not currently supported in Avid editing applications.

With PAL Method 1, there are two ways to sync sound with picture in the telecine process:

- Transfer the original sound recording to mag track, sync the mag track to the film work print, and transfer both to videotape through a telecine process.

- Sync the original sound recordings to picture during the telecine process, and transfer both to videotape.

In either case, the telecine process speeds up sound at the same rate as picture: 4.1 percent.

After you receive the PAL transfer tapes, the next step is capturing the footage in a 24p PAL project. During the capturing process, your Avid editing application captures the material at the PAL rate of 25 fps, capturing every picture frame. It stores the two video fields as a single progressive frame, which you edit at 24 fps.

You must capture audio along with video at the PAL rate of 25 fps if you want to use audio that was transferred along with picture during the telecine process. You set the Audio Transfer rate as Video Rate (100+%) in the New Project dialog box. For more information, see "Audio Transfer Options for 24p PAL Projects" on page 17.

You have the option of playing back the footage at 24 fps or 25 fps. If you select 24 fps, the system slows both the picture and the sound by 4.1 percent for playback. This approach lets you edit at the original film rate, but the slowdown creates a limitation for audio. Because you capture the audio at a rate faster than playback, some audio samples are duplicated during playback, and sound quality is compromised.

Select the Edit Play Rate option in the Film and 24p Settings dialog box. For more information, see "Film and 24P Settings" in the Help for the Media Composer family.

If you select 25 fps, there is a different limitation with audio. Because you are playing back at the sped-up rate (4.1 percent), the audio pitch rises slightly. This is usually acceptable for broadcast, so PAL Method 1 is primarily used for PAL television broadcast.

PAL Method 2

With PAL Method 2, you capture sound and picture separately using the same telecine process for picture (create a video frame of two fields for each film frame, speed up rate by 4.1 percent). The difference is that you do not synchronize sound as part of the telecine process.

Some PAL film-to-tape transfers use pulldown. This method is not currently supported in Avid editing applications.

Here's an example where you have your picture-only videotapes (at the rate of 25 fps) and your source recording tapes. To capture at 24 fps, you need to follow a two-step process:

1. Capture the picture to create 24p media.
2. Capture the sound at the film rate of 24 fps.

When you created the project, you set the Audio Transfer rate as Film Rate (100%) in the New Project dialog box. For more information, see "Audio Transfer Options for 24p PAL Projects" on page 17.

In most cases, you will choose to edit at 24 fps. The sound maintains source quality (44.1 kHz and 48 kHz) and plays in sync with 24-fps video.

Audio Transfer Options for 24p PAL Projects

When you create a 24p PAL project, you must specify the appropriate audio transfer rate for the project. (This is not necessary for a 25p PAL project because there is no film speedup during the transfer.) The New Project dialog box provides Audio Transfer options that lets you select either Film Rate or Video Rate. This value is project specific and should not be changed after you create the project unless you have a specific element that you need to transfer at a different rate.

The Audio Transfer options are also located in the Film and 24p Settings dialog box and can be changed after the project is created.

The Info tab in the Project window lets you view the audio transfer rate you selected when you created the project. The actual audio transfer rate might be different from the display if you used the Film and 24p Settings dialog box to change the audio transfer rate.

The following table describes the Audio Transfer options:

Option	Description
Film Rate (100%)	Select this option when your 24-fps film footage has been transferred MOS (roughly translated as "without sound") to 25 fps by speeding up the film, and the audio comes in separately at 100 percent of the actual speed (PAL Method 2).
Video Rate (100%+)	Select this option when your 24-fps film footage has been transferred to 25 fps by speeding up the film, and the audio is synchronized to the video picture. This means that the audio speed is increased by 4.1 percent (PAL Method 1).

Viewing Video Dailies

The video dailies method relies on videotape transfers from negative for screening, transferring, and creating conformed cuts during editing.

The advantage of working with video dailies and film negative is that you can avoid the cost of work print until the finishing stages, or altogether. The disadvantage is you are limited to the aspect ratio, resolution, and contrast range of video previews. For this reason, video dailies are preferred for television projects, but you can also use this method to economize on a feature film production.

The illustration below describes the video dailies method:
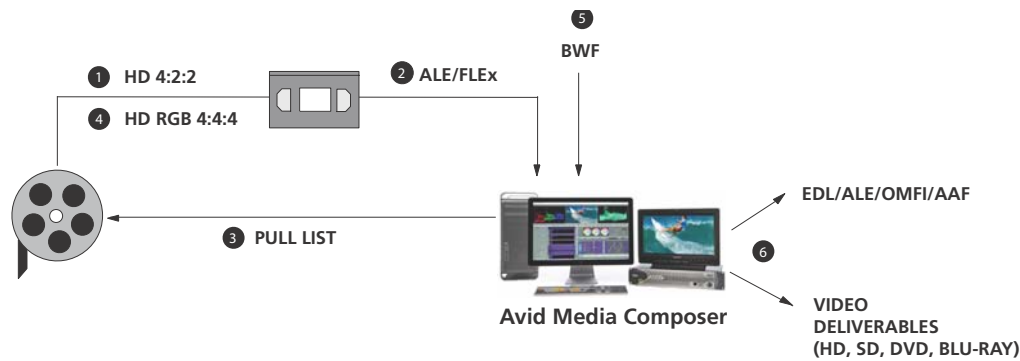
Description
1   Transfer reels of negative via telecine to HD 4:2:2 for the offline editing.

Description (Continued)

2	Import the film transfer files (FLEx, Evertz, Aaton, AFE) into Media Composer project bins and batch capture the footage from the dailies.
3	Generate a Pull List using Avid FilmScribe that provides a concise list of footage to be retransferred at a higher resolution.
4	Retransfer the final footage to HD 4:4:4. The source timecodes and tapename are easily matched using the common denominator which is the KeyKode information of the OCN. Once the bins are relinked, the sequence will point to the newly transferred sources, tape, timecode, etc.
5	Audio can be captured directly from a BWF file-based recorder, and synced with the video during the editing process.
6	Perform the final edit and output the final production. Alternativly, you can export files for audio or video finishing on other editing systems.

Creating a Film-Based Project

When you create a project that uses footage coming either from film reel or high-resolution digital files (2K+), the options that you choose for your project should be determined by:

- The acquisition format (high-res digital files, 16mm or 35 mm film, HD video)
- The audio rate (film speed of 48 kHz, or video speed of 48.048 kHz)
- The finishing and output requirements of the project

To create a new film-based project:

1. Start your Avid editing application.
2. In the Select Project dialog box, select the folder in which you want to create the project: Private, Shared, or External.
3. Click New Project.
4. Type the name of your new project in the text box.
5. Click the Format menu and select the most appropriate project type. The format you choose must take into consideration both the frame rate at which the film was shot, as well as the final delivery format for the production.

Format	Source	Output
24p NTSC	Film-based or other 24-fps footage transferred to Standard Definition NTSC videotape.	Film, HD Broadcast, Video

Format	Source	Output
23.976 NTSC	Film transferred at 23.976 or footage shot at 23.976. Audio remains synchronized with video throughout with no conversion required. In addition, chose this option if the production was shot with a DV (digital video) camera.	HD Broadcast, NTSC Video
24p PAL	Film-based or other 24-fps footage transferred to PAL videotape. Ideal for a dual system production.	Film, HD Broadcast, PAL Broadcast, PAL Video
25p PAL	Film-based material or other 25-fps footage shot at 25 fps transferred to PAL video.	Film, HD Broadcast PAL Broadcast, PAL Video
1080p/23.976	High-resolution files coming from digital film cameras such as RED, film transferred to HD videotape at 23.976 fps, or HD-originated 23.976-fps footage. This is the most commonly used HD project in NTSC-based countries.	Film, HD Broadcast, NTSC Broadcast
1080p/24	High-resolution files coming from digital film cameras such as RED, or HD-video originated production (shot at 24 fps). This format is also used if you're working on older Avid systems that do not support the 23.976 frame rate.	Film, HD Broadcast
1080p/25	High-resolution files coming from digital film cameras such as RED, or HD-video originated production (shot at 25 fps). This is the most commonly used HD project in PAL-based countries.	Film, HD Broadcast, PAL Broadcast
1080i/59.94	High-resolution interlaced files (shot at 59.94 fps).	HD Broadcast, NTSC Broadcast
1080i/50	High-resolution interlaced files (shot at 50 fps).	HD Broadcast, PAL Broadcast

Further options might change depending on the format that you chose.

6. Select Film if your source material originated on film reel.

   This will give you access to film options such as Perf Slip and Film and 24p settings.

7. Set the following additional option(s), where applicable:

Option	SD (NTSC/PAL)	HD and Film
Aspect Ratio	Select either 4:3 or 16:9	Only uses the 16:9 aspect ratio.
	The project uses the aspect ratio setting to determine the display setting in the monitors, and as a factor in determining whether material requires resizing or repositioning in sequences.	
Raster Dimension	N/A	The Raster Dimension menu appears only for HD projects on a supported system.
Color Space	N/A	Select RGB 709 to retain the best color quality from the film shoot.
Film Gauge		Available for 23.976p, 24p, 25p, 720p, and 1080p film projects. If you are using source material originating on film reel, click the Film button and select a format for film gauge tracking from the Default Film Type menu.
Audio Transfer Rate		Available for 24p PAL projects where material originated from tape.
Matchback	Available for 25i PAL, 30i NTSC, 720p, and 1080i Matchback projects only. If you are using source material from film reel, select Matchback, then click the Film button and select a format for film gauge tracking from the Default Film Type menu. The Matchback item appears only if your Avid editing application includes the Matchback option	

8. Click OK.

   Your Avid editing application creates the new project files and folder, and then returns to the Select Project dialog box. The project name is highlighted in the Projects list.

9. Double-click the project name in the Projects list to open the project or click OK with the project name highlighted.

   The Project window, the Composer window, and the Timeline open with the User settings loaded. The Project window, the Source/Record monitor, and the Timeline open with the User settings loaded. The title bar of the Project window contains the project name and the user profile selected in the Select Project dialog box.

10. (Option) If your project uses a film project type, set film preferences immediately after you create the project.

    For more information, see "Film and 24P Settings" in the Help for the Media Composer family.

Before you capture or output film reel footage, refer to the following topics—"Selecting a Project Format during Capture" and "Selecting a Project Format during Output" in the Help for the Media Composer family.

Selecting a Project Format during Capture

Before you capture film reel footage into your editing system, make sure you select the correct project format. The following table explains how the Avid system creates the digitized media from your source footage.

Project Format	Source footage	During the capture process
SD	24 fps	The Avid system removes the 2:3 pulldown and creates 24p media.
	25 fps	Use a 25p deck if you need to downconvert HDTV to ITU-R 601 video. The deck does not need to add pulldown or speed up the audio since the footage will remain at 25 fps. The Avid system creates 25p media.
	23.976 fps	Use a 24p deck if you need to downconvert HDTV to ITU-R 601 SD video. The deck adds 2:3 pulldown for video but maintains audio at 48 kHz. The Avid system removes both normal (2:3:2:3) and advanced (2:3:3:2) pulldown types. It maintains audio at 48 kHz, and creates 23.976p media.
HD		All HD footage is captured in its native format. If you need to downconvert HD media to an SD format, then refer to the appropriate SD rows above.

Selecting a Project Format during Output

Before you output your sequences, make sure you select the correct project format. The following table explains how the Avid system handles the digitized media during the output process.

Project Format	Source footage	During the output process
SD	24 fps	For NTSC and PAL, the system reinserts the pulldown or re-creates the speedup.
	25 fps	For NTSC, the system inserts 2:3 pulldown and slows down the audio by 4%. No adjustment is needed for PAL.
	23.976 fps	For NTSC video, the Symphony system reinserts pulldown.

Project Format	Source footage	During the output process
HD	24 fps	Creates a 24p EDL for use in an online suite.
	25 fps	Creates a 25p EDL for use in an online suite.
	23.976 fps	Creates a 24p EDL for use in an online suite.
		Use the Digital Cut tool to output a 1080p/23.976 master tape. Then convert the master tape to 720p/59.94 or 1080i/59.94 for broadcast. Optionally, use your Avid editing application to crossconvert to 720p/59.94 or 1080i/59.94 for preview or reference. The HD VTR can also create 1080i/50 for PAL broadcast.
Film	24 fps	For conforming film, it creates a 24p cut list.
	25 fps	For film, it creates a 25p cut list.
	23.976 fps	For conforming film, it creates a 24p cut list.

Editing with File-Based Media

Your Avid editing system can work directly with footage that is already in digital file format, such as files from digital video cameras or film scanning processes. For example, media from the RED camera can be linked through your Avid editing application to avoid capturing high-resolution files.

AMA (Avid Media Access) is a plug-in architecture that accelerates file-based (tapeless) video workflows, including RED/RED EPIC, QuickTime, ProRes, AVCHD, HDCAM SR Lite, XDCAM, P2, GFCAM, and Canon XF. With AMA, you can simply connect a supported card/disc or device and begin viewing and cutting footage right away—no need to transcode media or use other software to view or extract the clips.

There are a number of AMA plug-ins that can be downloaded from the Avid web site or participating third-party web sites. Install the plug-ins designed for the types of media that you will be editing.

📄 *If you need to work with other high-res file formats that cannot be read by Media Composer (e.g. DPX/ARI), start by using Avid MetaFuze to convert the files into MXF files at an HD resolution, and then import this MXF into your Avid editing application for offline editing—see "Checklist: File-based Editing in Media Composer with MXF Proxies" on page 27.*

Modifying the Reformat Attribute for a Clip

Your Avid editing application uses the Reformat attribute of a clip to resize and reposition the clip so that it conforms to the current frame size and aspect ratio specified in the Project Settings. When you create a clip or subclip, the Reformat attribute is automatically set to Stretch. If you are using AMA to link to clips, then the default is set to Center Keep Size.

For a list of these options, see "Reformatting Options Reference" in the Help for the Media Composer family.

📄 *If you are working in an Interplay environment, do not change the Reformat attribute from the Stretch setting. If you use a different setting, and you then use Interplay Transcode or Send to Playback, the results might not be what you expect.*

The illustration shows the Reformat bin column and the menu that lets you choose a Reformatting Option.

Changes you make to the Reformat attribute apply only to the selected clip in the bin. You can have several subclips derived from the same master clip, and set different Reformatting Options on each of them.

When you change the Reformat attribute of a clip, it updates if it is loaded in a Source or pop-up monitor, and new edits into a sequence using this clip use the new Reformatting Option. However, previous edits using this clip continue to use the old value. If you want to update a sequence so that all versions of this clip in a sequence use the current Reformat attribute, refresh the Reformatting Options for the sequence. For more information, see Refreshing Sequences to Use Current Clip Attributes in the Help for the Media Composer family.

To set the Reformat value for an individual clip or subclip:

1. Open the bin containing the clip or subclip you want to modify.

    For more information, see Opening and Closing Bins in the Help for the Media Composer family.

2. Click the Text tab.

3. (Option) If it is not already visible, display the Reformat bin heading.

   For more information, see Using Text View in the Help for the Media Composer family.

4. Click the Reformat field for the clip or sub-clip, and select an option.

   Options apply only to clips that do not match the frame size and aspect ratio of the project.

   For more information, see Reformatting Options Reference in the Help for the Media Composer family.

Exporting the AFE File to Avid DS

Once the edits are completed in the Avid Media Composer, export the sequence as an AFE to Avid DS for finishing.

Some file formats that are linked by AMA (such as XDCAM), may require transcoding to MXF before being exported to Avid DS. These MXF files are saved to the \Avid MediaFiles\MXF\1 folder on your system. You need to make sure that Avid DS has access to this folder on the Media Composer system, or that the folder is copied to the Avid DS system in the same path.

You should also consult the Avid DS Conform Guide which provides information on sequence and clip metadata transferred from one editing application to the other.

To export an AFE from Avid Media Composer to Avid DS:

1. Select the sequence in the bin, right-click on it and select Send To > Avid DS.

   The Send To: Avid DS dialog box opens with the default export template.

2. (Optional) Change the file name.

3. Click the Set button and browse to the drive and folder to which you want to export the sequence, and click OK.

4. Select Export Settings 1.

   All current settings are displayed in the summary panel below.

5. Click the button after the Export Settings 1, and select Avid DS from the drop-down list.

6. Click the Options button.

   The Export Settings - Avid DS dialog box opens.

7. Select AFE from the Export As drop-down list and click Save.

8. In the Send To: Avid DS dialog box, click OK.

7 Editing with AMA

AMA (Avid Media Access) is a plug-in architecture that accelerates file-based (tapeless) video workflows, including RED/RED EPIC, QuickTime, ProRes, AVCHD, HDCAM SR Lite, XDCAM, P2, GFCAM, and Canon XF. With AMA, you can simply connect a supported card/disc or device and begin viewing and cutting footage right away—no need to transcode media or use other software to view or extract the clips.

There are a number of AMA plug-ins that can be downloaded from the Avid web site or participating third-party web sites. Install the plug-ins designed for the types of media that you will be editing.

The following section contains topics that relate to editing with RED media. For other types of media, refer to the format-specific AMA workflow guides in the Avid Knowledge Base.

Editorial Workflows for RED

When editing with RED media it's important to determine which process will be the most efficient for the quality at which you want to edit and output your sequences. This process will depend on the program type, turnaround time, number of dailies, offline/online considerations, conform process, deliverables, etc.

REDCODE (R3D) is a proprietary video format owned by Red Digital Cinema Camera Company. The RED ONE camera uses a 12-megapixel CMOS sensor to capture images at higher-than-HD resolution. The raw format is stored in a bayer pattern that must be debayered to create a RGB image that can be used in an Avid editing application.

The camera records data directly to hard drives or CompactFlash cards that can be connected directly to your system. Refer to the documentation that came with your RED ONE camera for more detailed information. Copy the media to your storage as directed in "Copying RED Files to a FireWire or Network Drive" on page 61.

R3D files can be linked to from Media Composer or transcoded to an Avid DNxHD format for ingest. There are some advantages and disadvantages to each of these options depending on the resolution that you need to work with and output. Transcoding can be a lengthy, space-consuming process, so here are some possible workflows to consider:

Option 1: Transcode all R3D files to the final resolution

- If you do not intend to go back to the original media, create your DNxHD dailies in a finishing resolution (115, 175, 175x), transcoded in MetaFuze or a 3rd-party application such as REDCINE-X.

- Edit and finish in HD.

Option 2: Edit natively via AMA and transcode only necessary R3D files to the final resolution

- Link and edit R3D files via AMA to do your first cut.

- Transcode your final cut with handles to the final resolution.

- Finish in HD on the same system.

Option 3: Transcode R3D files to a proxy resolution, edit and deliver for conform on an online system

- If you are working with several hours of footage that will require large amounts of storage to work natively, you should transcode all R3D files to an offline proxy resolution (e.g. DNxHD 36).

- Edit with the proxy media and then relink back to the original R3D for finishing on the same system

  or,

  Edit your sequences and deliver EDL, AAF, AFE to an online application for finishing.

RED Media Support in Avid Applications

This section provides information specific to editing with RED media in Avid Media Composer.

Avid provides solutions to RED workflows with the following products:

- Avid Media Composer family 5.0.3

- Avid FilmScribe (shipping with Media Composer 5.x)

- EDL Manager (shipping with Media Composer 5.x)

- Avid DS 10.5

- Avid MetaFuze 2.3

This document also discusses the workflows using the RED ONE camera and REDCINE-X from Red Digital Cinema.

Free Tools available for MXF/DNxHD Dailies Creation

Avid recommends using Avid MetaFuze or REDCINE-X to create the dailies for editing in Avid Media Composer or Avid DS. The following table shows the capabilities of each application:

	REDCINE-X	MetaFuze	
Mac	ü	ü	(via VMWare)
PC	ü	ü	
Direct ALE Creation	ü	ü	
Full Color Manipulation	ü	ü	Via "look" file (RLX, RSX, RMD support)
QT-wrapped or MXF-wrapped Avid DNxHD	All DNxHD formats	All DNxHD formats	
	Except 1080p/29.97, HD RGB or interlace	Except 1080p/29.97, HD RGB or interlace	

Some Considerations

- The RED Rocket accelerator card generates transcodes in real-time when used with Avid MetaFuze and REDCINE-X.

- Both MetaFuze and REDCINE-X insert the filename in the TAPE column. This filename is also displayed in a FILE column to indicate that it's from a file source. In Media Composer, AMA inserts the filename in the SOURCE FILE column. Either method allows full metadata management.

  This filename is also displayed in a FILE column to indicate that it's from a file source.

📄 *3rd-party AAF developers need to accomodate these new columns to allow seamless conform of file-based sources in Avid AAFs. Refer to the Avid Knowledge Base Tech Note #377471.*

- EDL Manager with Media Composer 5 has been updated to allow EDL creation from TAPE and SOURCE FILE and will look to TAPE first, then to SOURCE FILE if needed.

- If you use REDCINE-X, you should select the "Use restricted SMPTE range" option before exporting your media. This ensures that your color range falls within the SMPTE constrained range for REC 709 monitoring.

📰 *You may also opt to constrain this range by adjusting the color sliders in the AMA Source Settings dialog box in Media Composer.*

Working with RED Media

Avid Media Access (AMA) is a plug-in architecture that allows you to link directly to clips on a storage device without importing the media directly on your system. AMA allows you to be more productive by browsing and editing directly from the storage device or volume.

To link to RED media, you need the RED AMA plug-in installed on your system. You must also configure the necessary AMA settings as outlined in "The Avid Media Access (AMA)" in the Help.

When you link to RED files, the images are scaled to the frame size of the sequence. Assuming that you are working in HD sequences, the images will be scaled to HD frame size with a choice of color precision as high as RGB 4:4:4. In addition, you have access to all the metadata and color values in the raw RED files as well as any other "look" files associated with this media (e.g. RLX, RSX, RMD).

You may begin editing with the linked RED source material immediately. If the project is short, the media management needs of the project are not great, the project does not require several streams of video and effect to play concurrently, and the CPU and storage is up to the task, the offline process can continue using linked media. Otherwise, it might be best to transcode the RED files to a format optimized for the offline workflow such as DNxHD 36. See

Finally, all rendering or transcoding can be done at full HD-RGB quality. Note that linking to RED files via AMA is both processor and storage intensive. Refer to "Feature Performance" in the Avid Media Composer Readme for technical requirements on RED editing via AMA.

Known Limitations for Linking RED Files via AMA

The following limitations apply when linking/relinking/conforming sequences between Avid Media Composer systems:

• Sequences that were edited from sources created by REDCINE-X and MetaFuze will not conform with Avid AMA .

• Your Avid editing application cannot relink sequences/sources if there is a mix of SOURCE FILE and TAPE for the source references. For example, if you create your dailies in Avid MetaFuze or REDCINE-X and then conform to R3D files via Avid AMA.

- When sending a bin with a sequence from one system to another, open the sequence first before linking to the R3D files via AMA, or all your user-entered metadata will be lost (e.g. clip names, locators, etc.)

- Refer to the "RED AMA Plug-in" document on the Avid web site for other late-breaking information.

Copying RED Files to a FireWire or Network Drive

After you attach the RED drive or insert a REDFlash card, you can copy the RED media to a FireWire drive or a network drive and then disconnect the drive. You might find it convenient to copy several cards to other drives so you can reuse the cards quickly.

You can connect a FireWire drive, for example, and store the contents of several cards on it so you can keep using the cards in the camera.

To copy the REDFlash cards to another drive:

1. On the drive, set up a folder for each card or drive you want to copy.

   Avid recommends that you do not place the media folder at the top level of the drive.

2. Give each folder a unique name that identifies the card or drive.

   The name does not have to be the same as the actual drive or card name.

3. Navigate to the actual drive or card and select the contents of the folder.

   You can select the top directory of several RDC folders (containing an R3D file and a color metadata file such as RSX or RMD).

4. Do one of the following:

   ▶ Copy and paste the contents of the folder to the folder on the other drive.

   ▶ Click the drive or card folder and drag it to the folder on the other drive.

5. Remove the drive.

RED Folder Structure

When you record to a flash card, it creates a folder structure for all the R3D files and metadata.

The RDM folder holds all files for a given recording. This folder contains one or more RDC folders, where every take has it's own RDC folder. Within the RDC folder are the actual R3D files with the sound and picture essence. The take may be spanned over multiple files as the limit for each file is 2GB. Each time this limit is reached, a new R3D file is created with an incremented suffix _001, _002, etc.

The RED camera also has the option to create QuickTime proxy files which are represented with the .mov extension. These QT reference files to the R3D essence will have the _F, _H, _M, _P suffixes which indicate the resolution (Full, High=1/2, Medium=1/4, Proxy=1/8) at which you can view the source footage.

Red Digital Magazine ➡	▾ 📁 L075_1208WR.RDM	6/10/10 6:25 PM	12/8/09 7:48 PM	17.73 GB	Folder
Directory for each "take" ➡	▾ 📁 L075_C009_120925.RDC	12/9/09 11:00 PM	12/9/09 11:00 PM	3.41 GB	Folder
R3D file (1 of 2) 2GB limit ➡	🔴 L075_C009_120925_001.R3D	12/9/09 11:01 PM	12/9/09 11:00 PM	2.15 GB	RED RAW R3D
R3D file (2 of 2) 2GB limit ➡	🔴 L075_C009_120925_002.R3D	12/9/09 11:01 PM	12/9/09 11:01 PM	1.27 GB	RED RAW R3D
QT Reference Full ➡	🎬 L075_C009_120925_F.mov	12/9/09 11:01 PM	12/9/09 11:01 PM	25 KB	QuickTime movie
QT Reference High (1/2) ➡	🎬 L075_C009_120925_H.mov	12/9/09 11:01 PM	12/9/09 11:01 PM	25 KB	QuickTime movie
QT Reference Medium (1/4) ➡	🎬 L075_C009_120925_M.mov	12/9/09 11:01 PM	12/9/09 11:01 PM	25 KB	QuickTime movie
QT Reference Proxy (1/8) ➡	🎬 L075_C009_120925_P.mov	12/9/09 11:01 PM	12/9/09 11:01 PM	25 KB	QuickTime movie
	▸ 📁 L075_C005_1209F0.RDC	12/9/09 8:42 PM	12/9/09 8:42 PM	2.51 GB	Folder
	▸ 📁 L075_C010_12095F.RDC	12/10/09 12:32 AM	12/10/09 12:32 AM	1.71 GB	Folder
	▸ 📁 L075_C002_120928.RDC	12/9/09 8:27 PM	12/9/09 8:27 PM	1.54 GB	Folder

The RDC folder may also include RMD and RSX files which hold the additional file metadata such as color information.

If you transcode using MetaFuze, the metadata from all these files is merged and carried over in the resulting MXF file.

After you copy the contents of the flash card to your storage, do not rename any of the files or folders inside the .RDM folder. Similarly, each time you copy new recordings onto your storage, do not combine the contents with existing .RDM folders. Keep each recording in its own structure.

R3D Filename Format

The diagram below explains the nomenclature of the R3D filename.
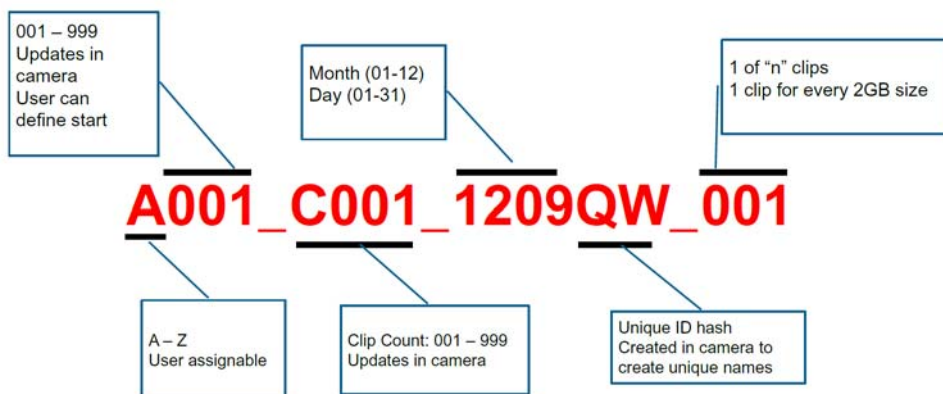
Editing with Low-Res RED Media

AMA offers the advantage of allowing you to transcode material to a lower resolution at any stage of the process. At a logical break in the process, such as at the end of the work day, or after the rough cut is complete, you simply select AMA-linked clips in the bin and choose the ones that need transcoding.

Transcoding to DNxHD 36 is an acceptable quality for editing your sequences. However, if you plan on doing finishing work to your sequence, it's advisable to transcode your final sequence to DNxHD 145, DNxHD 220, or DNxHD 220x.

To transcode your RED Media:

1. Create a rough cut of your sequence by linking to the RED clips via AMA.

2. When you are ready to transcode, you can speed up the transcode process by setting a lower R3D Source Quality Setting. Select Tools > Media Creation.

3. Select the Mixdown & Transcode tab of the Media Creation setting.

4. Set the video playback quality from the R3D Source Quality (Debayer) menu to Quarter or Eighth. For many offline workflows this is an acceptable quality when transcoding to DNxHD 36.

5. Click OK.

6. Select the clip or sequence in the bin, and transcode your clip or sequence as required.

   For more details, see "Using the Transcode Command" in the Help.

7. After the transcode process is complete, new master clips are created in the bin that point to the transcoded media.

   If you transcoded a clip from within a sequence, the new master clip is automatically used in your sequence.

   If you transcoded an entire sequence, you have the option of creating a new sequence which will use the newly created master clips. If you do not choose to create a new sequence, then the existing clips in your sequence will be replaced with the new master clips.

At this point, you can take your original media offline by unmounting the AMA folder containing the source RED media. Select File > Unmount.

To relink to the original media:

1. After the editing process is complete and you are ready to relink to the original media, make sure that your original RED media is online. If you un-mounted your RED volume, remount it.

2. In the bin, select the completed offline sequence, and all the original RED master clips. The master clips need to be selected so that the original linked path can be restablished.

   To alleviate space on your storage, you may delete previously-transcoded media. If you do this, then you do not need to also select the original RED master clips. If the relink mechanism does not find any other media online, it will automatically revert to the originally-linked media.

3. Select Relink from the clip menu, and set the following settings in the Relink window.

   a. Choose Relink selected items to: Selected items in ALL open bins.

   b. Select Allow relinking of Imported/AMA clips by Source File Name.

   c. Select Version Separator, and set the separator to a period (.).

       This may differ depending on how the version is appended to your transcoded clips.

4. Set any other options as necessary.

5. If you would like to change the any Source Settings to achieve the look or quality to you want, you can do so at the clip level, and refresh the sequence to apply the changes at the sequence level.

6. When you are ready for final output, right-click the sequence and transcode to the online resolution including handles. This will transcode only the required media.

Color Management with RED Media

Avid's RED workflow allows you to work with RSX, RLX, and RMD files to manage a clip's color. You may also make non-destructive, custom color adjustments to the R3D clip. These adjustments can be made at any stage of the process—see "Adjusting RED Source Settings" on page 66.

Color adjustments made after editing has begun will not be automatically applied to instances of the source media that have been previously edited into sequences, unless you refresh the sequence. For procedures on how to refresh your sequence, see "Refreshing Sequences to Use Current Clip Attributes" in the Help.

Once you start working with offline low-res proxies, any color adjustments you make to the transcoded media will not be saved if you decide to link back to the original RED media.

Adjusting RED Source Settings

When you link to R3D (RED) files, the Avid editing system reads each REDCODE RAW file directly. You can then change the clip's color values: color balance, exposure, and contrast in the Source Settings window. This color value information is encoded with the R3D file through an RLX, RSX or RMD file. These files hold the camera's original color values of your clip.

The RLX, RSX or RMD files might be created if you set the color values outside of the Avid editing application. These files can be loaded and applied to the associated RED clip through the Source Settings window.

When a RED clip displays in the bin, the system displays the metadata columns of the clip's color values. For example: Color Space, Gamma Space, Kelvin, Tint. You can export this information to ALE (Avid Log Exchange) and XML (through Avid FilmScribe) for downstream use in your workflow.

The Source Settings window also has three color spaces to choose from: REDSpace, Camera RGB, and REC.709. You can set up different color options (or presets) in each of these color spaces and then apply their color values to multiple clips.

To change the RED source settings:

1. Link the RED clip through the AMA Link to Volume option.

2. Right-click the RED clip in the bin and select Set Source Settings.

   The Source Settings dialog box opens. The clip displays in the video area.

You can choose from the Settings menu to select a camera metadata setting or an RSX, RLX or RMD setting (template), or adjust your own custom parameters. This procedure details the custom parameters.
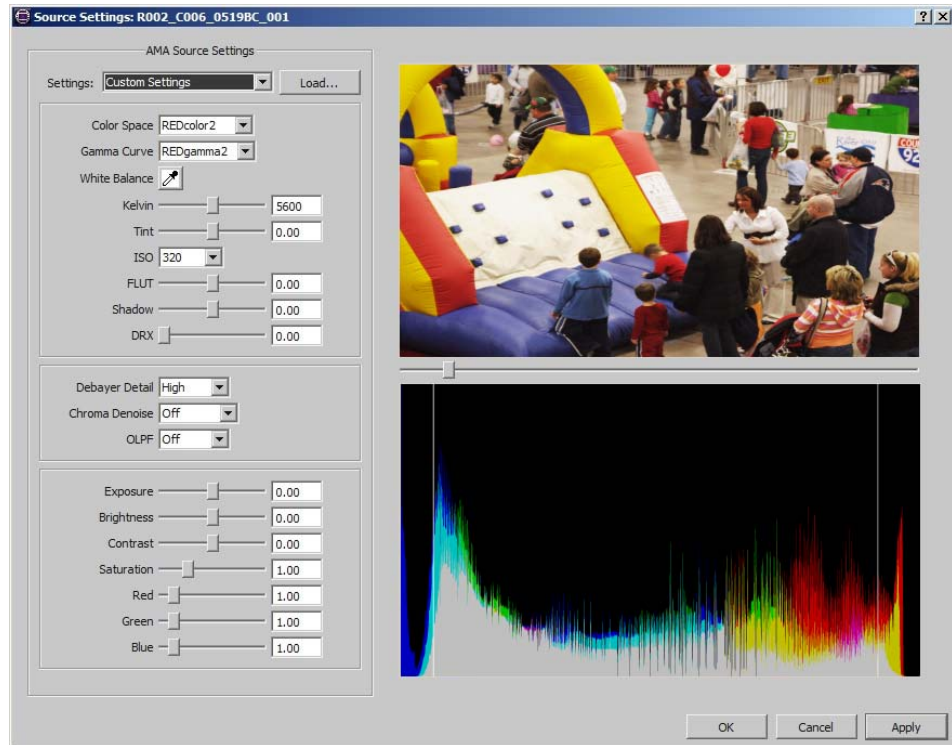
3. Drag the video slider to the frame you want to view.

   The new frame displays and the histogram updates.

   The histogram is a tool that helps you more precisely adjust Source Settings. For more information about the histogram, see "Understanding the Source Settings Histogram" in the Help for the Media Composer family.

4. Set the appropriate options:

Option	Description
Color Space	Choose from: Camera RGB: as close to RAW REC.709: SMPTE standard color space for HD REDcolor: newest, more accurate color science from RED REDSpace (default): based on the camera's RGB but more saturated

Option	Description
Gamma Curve	Lets you override the gamma curve. Choose from: REC.709: a REC.709 gamma curve with a linear portion at black and a gamma at 2.2 curve REDLog: maps the 12-bit sensor data on to a 10-bit curve with minimal loss REDSpace: (default) based on REC.709 but with more contrast REDGamma: gamma curve from RED with a smoother highlight rolloff
Kelvin	Adjusts the RGB color to compensate for red - blue tinting of the scene at different color temperatures of the ambient light while you shoot. Common values are 3200 (tungsten) and 5600 (daylight). Click and drag the slider from 1700 to 9400. Default is 5600.
Tint	Adjusts the RGB color to compensate for yellow - green tinting of the scene at different color temperatures of the ambient light while you shoot. This is valuable when the ambient light source contains a significant amount of yellow or green, such as fluorescent. Click and drag the slider from -100 to 100. Default is 0.00.
ISO	Allows the ISO level to change from 50 to 2000. Default is 320.
FLUT™	The latest color science developed by RED. Allows you to balance your mid-grays in the center of the histogram without pushing highlight details over the edge.
Shadow	Adjusts the overall black level of the image without affecting the white level. Click and drag the slider from 0.00 to 1.00. Default is 0.00.
DRX	Lets you recover potentially lost dynamic range by extending and balancing highlights, taking into account the rendering intent of the desired Klevin and Tint white balance. Click and drag the slider from 0.00 to 1.00. Default is 0.00.
Debayer Detail	Choose from High (default), Medium, or Low.
Chroma Denoise	Choose from Off (default), Minimum, Milder, Mild, Strong, or Maximum.
OLPF	Controls the optical low-pass filter. Choose from Off (default), Low, Medium, or High.
Exposure	Allows adjustment to the clip exposure. Click and drag the slider from -7.00 to 7.00. Default is 0.00.

Option	Description
Brightness	Adjusts the overall brightness of the image. Lifts blacks without affecting the white level. Click and drag the slider from -10.00 to 10.00. Default is 0.00.
Contrast	Adjusts the tonal range of the image, which usually improves sharpness and detail. When you increase the Contrast, it increases tonal separation between adjacent gray levels but decreases the total number of discreet gray levels in the image. Click and drag the slider from -1.00 to 1.00. Default is 0.00.
Saturation	Affects the intensity of the red, green and blue channels. As the value increases color saturation increases. As the value decreases, so does the color decrease. If the value is set to high, colors might clip. If the level is set to 0.00, a monochromatic image with only gray tones appear. Click and drag the slider from 0.00 to 4.00. Default is 1.00
Red	Increases or decreases the camera's sensitivity to red light by amplifying the R channel digital video signal received from the sensor. A 0 (zero) no Red is visible, the image has a strong cyan cast. Click and drag the slider from 0.00 to 10.00. Default is 1.00.
Green	Increases or decreases the camera's sensitivity to green light by amplifying the G channel digital video signal received from the sensor. At 0 (zero), no green is visible, the image has a strong magenta cast. Click and drag the slider from 0.00 to 10.00. Default is 1.00.
Blue	Increases or decreases the camera's sensitivity to blue light by amplifying the B channel digital video signal received from the sensor. At 0 (zero), no blue light is visible, the image has a strong yellow cast. Click and drag the slider from 0.00 to 10.00. Default is 1.00.

5. Click Apply.

   The changes apply to your clip. You can continue to make additional changes.

   If the clip is in the Source viewer, the changes are reflected in the Source viewer and in the Client monitor (if you have one attached).

   If you click Cancel after you click Apply, the Set Source Settings window closes with the changes you made.

6. Click OK to save your change and close the window.

   The system updates the bin column metadata with the new parameters.

📃 *If you make changes in the Source Settings window and then relink the clip through AMA again, you still keep all the parameters that you set.*

Applying a Source Setting

To apply a source setting to a RED clip:

1. Right-click a RED clip in the bin (or Shift-click multiple clips), then choose Set Source Settings.

   The Set Source Settings window opens and your clip displays in the viewer.

2. Select a setting (template) from the Source Settings menu.

   Source Settings vary depending on the files or templates loaded on your system.

Setting	Origin
Camera Metadata Settings	Default
Default Settings	Default
Grade (RSX) Settings	RED Alert!
filename RLX Setting	RED Alert!
Grade (RMD) Setting	REDCINE-X
Custom	User created in Avid

3. Click Apply.

   The settings apply to the clip and if the clip is loaded in the Timeline, the video updates and displays in a Client monitor (if one is attached) and the Source monitor.

4. Click OK to save your settings and close the window.

   The system updates the bin column RED metadata with the parameters.

   If you make additional changes after you select a setting, the system creates a Custom setting and Custom appears in the Settings list. You cannot make changes to a system generated setting, however you can use a system setting and make changes to create your own Custom setting.

To import additional source settings:

1. From the Source Settings window, click the Load button.

   The Load External Settings window opens.

2. Browse to the Settings file.

3. Change the filter to display RSX, RLX or RMD files.

4. Select your setting and click OK.

The new source setting appears in the Source Settings menu, and is immediately applied to the clip.

Adjusting the Source Settings Histogram

You can adjust the Source Settings Histogram in two ways. You can toggle drawing a histogram for an individual color, and you can zoom the vertical axis.

To adjust the Source Settings Histogram:

▸ Right-click anywhere inside the histogram graph, and then select one of the following options.

Option	Result
Red Green Blue	Enables or disables the histogram display for the selected color. A check mark indicates that the histogram for that particular color displays.
Zoom In	Zooms in on the lower half of the vertical axis. Changes the scaling of the vertical axis so that the height is half that of the maximum value in the plot. You can zoom in indefinitely to display, for example, 1/4, 1/8, or 1/16 of the maximum value.
Zoom Out	Zooms out of the vertical axis by a factor of two. Changes the scaling of the vertical axis to be twice that of the maximum value in the plot. You can zoom out indefinitely to display, for example, 4, 8, or 16 times the height of the maximum value.
Reset Zoom	Resets the zoom so that the vertical axis boundary is equal to the maximum value in the plot.
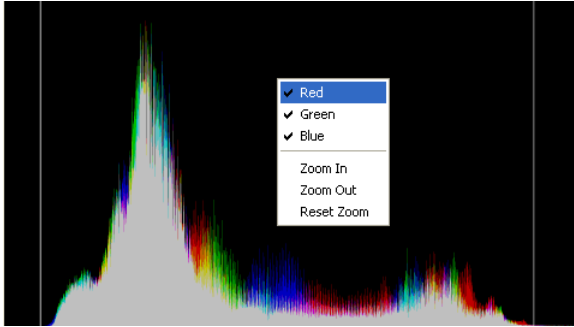
Preparing your RED Clip for Transcode, Mixdown, or Render

If you want to take a RED clip and offline it to another application, you can create a different resolution RED file, depending on your requirements. This changes the speed and quality of the clip, which could affect the playback performance. The higher the video quality the slower the process (transcode, mixdown, render). The lower the video quality the faster the process. Before you transcode, mixdown or render your clip or sequence, set the appropriate quality in the Media Creation dialog box.

If you apply any Reformat options (stretch, letterbox, etc.) to your clip, when you perform a transcode, the reformatting options will apply.

To prepare your RED clip for transcoding, mixdown or rendering:

1. Before you transcode, mixdown or render, select Tools > Media Creation.

2. Click the Mixdown & Transcode tab or click the Render tab.

3. Select the playback quality from the R3D Source Quality (Debayer) menu.

    ▶ Full

    ▶ Half (Best Quality)

    ▶ Half (Good Quality)

    ▶ Quarter

    ▶ Eighth

    ▶ Sixteenth

4. Click OK.

5. Transcode, mixdown or render your clip or sequence as required.

Modifying the Reformat Attribute for a Clip

Your Avid editing application uses the Reformat attribute of a clip to resize and reposition the clip so that it conforms to the current frame size and aspect ratio specified in the Project Settings. When you create a clip or subclip, the Reformat attribute is automatically set to Stretch. If you are using AMA to link to clips, then the default is set to Center Keep Size.

For a list of these options, see "Reformatting Options Reference" in the Help for the Media Composer family.

If you are working in an Interplay environment, do not change the Reformat attribute from the Stretch setting. If you use a different setting, and you then use Interplay Transcode or Send to Playback, the results might not be what you expect.

The illustration shows the Reformat bin column and the menu that lets you choose a Reformatting Option.

Changes you make to the Reformat attribute apply only to the selected clip in the bin. You can have several subclips derived from the same master clip, and set different Reformatting Options on each of them.

When you change the Reformat attribute of a clip, it updates if it is loaded in a Source or pop-up monitor, and new edits into a sequence using this clip use the new Reformatting Option. However, previous edits using this clip continue to use the old value. If you want to update a sequence so that all versions of this clip in a sequence use the current Reformat attribute, refresh the Reformatting Options for the sequence. For more information, see Refreshing Sequences to Use Current Clip Attributes in the Help for the Media Composer family.

To set the Reformat value for an individual clip or subclip:

1. Open the bin containing the clip or subclip you want to modify.

   For more information, see Opening and Closing Bins in the Help for the Media Composer family.

2. Click the Text tab.

3. (Option) If it is not already visible, display the Reformat bin heading.

   For more information, see Using Text View in the Help for the Media Composer family.

4. Click the Reformat field for the clip or sub-clip, and select an option.

   Options apply only to clips that do not match the frame size and aspect ratio of the project.

   For more information, see Reformatting Options Reference in the Help for the Media Composer family.

Linking Media with AMA

If you link to media which originates on a volume (P2, XDCAM EX, XDCAM, or GFCAM), use the File > Link to AMA Volume(s) option. If you link directly to the media file clip (QuickTime or MXF), use the File > Link to AMA File(s) option.

For optimum viewing and playing, Avid recommends a single clip length should not exceed more than 12 hours.

The decompose option from the Clip menu is not available with AMA. You do not need to decompose clips when you use the AMA method.

To link clips on a volume automatically with AMA:

1. Insert a P2 card, an XDCAM EX card, an XDCAM disk, RED card, into the device.

   The system scans the device and links the clips into a bin (based on the AMA settings).

To manually link clips from another volume with AMA:

1. Select File > Link to AMA Volumes.

   The Browse For Folder dialog box opens.

2. Navigate to the P2, XDCAM, RED or GFCAM clips, and then click OK.

   For P2, navigate one level above the Contents folder. For XDCAM disks, navigate to one level above the Clip folder. For XDCAM EX, navigate to one level above the BPAV folder. For RED, navigate to the root directory of the RED card. For GFCAM, navigate to the root directory of the GFPAK.

   Depending if you are using an existing bin or creating a new bin, the Bin Selection dialog box opens.
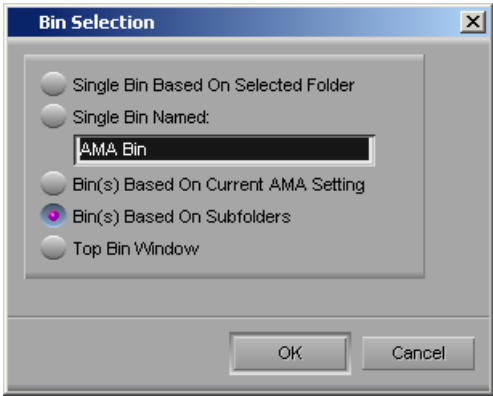
3. Select Bin Selection options.

Option	Description
Single Bin Based On Selected Folder	Places all linked clips into one default bin.
Single Bin Named	Lets you create a new bin and type in a new bin name. Places all linked clips into that bin.
Bin(s) Based on Current AMA Setting	Places the clips in the bin(s) you set up in the AMA Settings Bins tab.
Bin(s) Based on Subfolders	Places the clips in bin(s) based on their subfolders.
Top Bin Window	Places the clips in the active bin.

If you relink a sequence and the bin that stores the AMA referenced clips is closed, the media does not relink. Before you relink, open the bin of the referenced clips.

4. Click OK.

   The clips appear in the bin or bins depending on the options you selected, they highlight in yellow.

To manually link clips from a file with AMA:

1. Select File > Link to AMA File(s).

   You can also right-click a bin and select Link to AMA File(s).

The system ignores the settings you have selected in the AMA Volume Mounting settings.

2. If there is no active bin, a dialog box appears asking you to select a bin.

   The Select file(s) for AMA linking dialog box opens.

3. From the AMA Plugin Filter menu, select the type of file.

Option	Description
All AMA Plugins Files	Searches and displays all files.
QuickTime	Searches and displays only QuickTime files.
MXF	Searches and displays only MXF files.
RED R3D	Searches and displays only RED files.

4. Select the file(s) you want to link. Ctrl+click or Shift+click to select multiple files.

5. Click Open.

   The clips appear in the active bin, they highlight in yellow.

   If the system cannot link a file, an error message displays informing you to open the Console window for more information about the file(s) in error.

   If you move the clip from the original drive to another drive on your system, the clip displays as offline in your bin.

If you move a source file from one location to another and then back to the original location, you might need to refresh the bin to redisplay the clip. Close and reopen the bin to refresh the bin.

8 Managing Shared Storage for Avid Editing Systems

Before you begin working on your projects, you must plan out your storage solutions carefully so that you can share media between Avid applications. The topics here provide useful information for working with shared bins and projects in Avid Media Composer and Symphony.

Avid DS clients require additional configuration of the shared storage and media indexing services—see "Setting up Storage and Media for Projects on Avid DS" on page 87.

📖 *For information about sharing bins and projects within an Avid Interplay environment, refer to the Avid Editing on Interplay Workflow Guide.*

Setting up a Workgroup with Shared Projects and Storage

In cases where there is a large need to share projects and media between workstations, the media storage can be centralized on an Avid shared storage. Set up your environment as illustrated in the following figure, so that Avid editing systems workstations can access media stored on an Avid shared storage device.
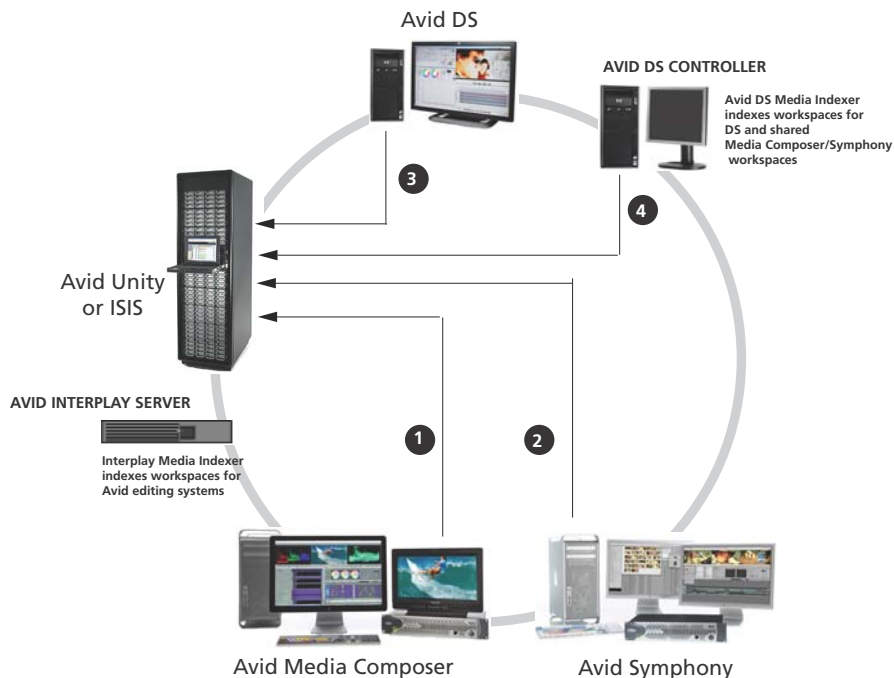
Element	
1	Avid Media Composer has its own workspace on the Avid shared storage.
2	Avid Symphony has its own workspace on the Avid shared storage.
3	Each Avid DS client has a workspace on the Avid shared storage.
4	The Avid DS Controller indexes all DS project and media in an Avid DS workgroup. If Media Composer/Symphony needs to share files with Avid DS, then the Avid DS Controller indexes these workspaces as well.

The Avid shared storage needs to have a workspace for each editing client. Within the workspace, set up separate folders for video and audio, and set the necessary permissions. Refer to the documentation that came with the shared storage.

In addition, you will need to make sure that these workspaces are indexed by the Interplay Media Indexer. Refer to the Interplay help for details on configuring the Media Indexer to monitor shared storage for the Media Composer/Symphony editing systems.

If Media Composer/Symphony needs to share files with Avid DS, then additional workspaces are required for the shared media. The Avid DS Controller indexes these shared workspaces.

The Avid DS indexing services need to be configured separately—.

Creating New Workspaces

Workspaces are locations to store and segregate data. You can allow users to access some or all of the Workspaces, and you can assign permissions for how each user can access the data in a Workspace.

If you have created Storage Groups but you have not created any Workspaces, the Create Workspace dialog box opens by default when you select the Workspaces list.

To create a new Workspace:

1. From the Management Console home page, do one of the following:

   ‣ Click Workspaces in the ISIS Setup icon, located in the System section.

   ‣ Click Workspaces in the pop up navigation menu.

   The Workspaces tool opens.

2. Click the New button.

   The Create Workspace dialog box opens.

3. In the Name text box, type a name for the Workspace.

For more information about entering text in name fields, see "Entering Text" in the Help for your Avid shared storage device.

   If there is already a Workspace with the name entered in the Name text box, an error message tells you to type a new name.

4. (Option) Click the Protection menu and select the available Workspace protection option.

The protection type available for the Workspace depends upon the protection type specified for the Storage Group it is assigned to. For more information on types of protection, see "Storage Group Protection" in the Help for for your Avid shared storage device.

5. Click the Storage Group menu, and select the Storage Group in which you want to create the Workspace.

   The Storage Group name appears in the Storage Group text box.

6. Type a size for the Workspace in the Capacity text box. The minimum size (1.0) is listed in the Capacity text box, and the maximum size is listed next to the Capacity text box.

   If all storage in the Storage Group is allocated to existing Workspaces, you can make an existing Workspace smaller.

7. (Option) In the Warning Event Trigger text box, do one of the following:

   ▶ To set a warning event trigger based on percentage of used storage, type in a percentage value and select '%'.

   ▶ To set a warning event trigger based on gigabytes (GB) of unused storage, type in a gigabyte value and select 'GB'.

8. (Option) In the Error Event Trigger text box, do one of the following:

   ▶ To set an error event trigger based on percentage of used storage, type in a percentage value and select '%'.

   ▶ To set an error event trigger based on gigabytes (GB) of unused storage, type in a gigabyte value and select 'GB'.

9. In the User Access area, set the User and User Group access privileges.

10. Click the Apply button to create a new Workspace containing the selected Storage Group and users.

    The new Workspace appears in the Workspace dialog box, and the Create Workspace dialog box refreshes to allow you to create a new Workspace.

11. (Option) Repeat steps 3–10 to create new Workspaces.

12. Click the Close button to close the Create Workspace dialog box to return to the Workspaces tool.

    The new Workspace appears in the Workspaces list.

Mounting and Unmounting Workspaces

Your Avid Unity/ISIS user account must have access to at least one workspace. For information on workspace access, see "Creating Client Accounts for Users" in the Avid Unity/ISIS Administration Guide.

When you have one or more workspaces mounted and the connection to the System Director is subsequently lost, a message in the taskbar (for Windows systems) or the dock (for Macintosh systems) indicates the workspace is unavailable.

The Client Manager then automatically attempts to reestablish the connection with the System Director. When the connection is successfully reestablished, a message in the taskbar or dock informs you of the connection state.

To mount an Avid workspace on your system:

1. Open the Client Manager.

   The Workspaces list opens. The Online field displays a green ball for workspaces that are already mounted. You can filter the Workspaces list by Workspace name.

2. Do one of the following:

   ▶ Click (mount) in the Online column for the selected workspace.

   ▶ Click to select a workspace, then right-click, and select Mount.

   ▶ (Option) Right-click, and select "Mount to drive" from the menu.

   ⬚ *Selecting this option will override the current drive mapping option settings for the selected workspace. For more information on drive letter assignments, see "Configuring Workspace Drive Letter Assignments" on page 83.*

   The Client Manager mounts the selected workspace on your client and the Online icon for the mounted workspace changes to green. The Workspaces list displays the drive the workspace is mounted to. If you use letterless drive mappings, the Workspaces list displays "UNC path" next to the Online icon.

3. (Option) If you want the selected workspace remounted the next time you log in, do one of the following:

   ▶ Click (enable) in the Auto column for the mounted workspace.

   ▶ Right-click, and select "Enable auto mount."

   The next time you log in to your client system, the Client Manager automatically mounts the selected workspace.

To mount multiple Avid workspaces on your system:

1. Open the Client Manager.

   The Workspaces list opens. The Online field displays a green ball for workspaces that are already mounted. You can filter the Workspaces list by Workspace name.

2. Do one of the following:

   ▶ Select multiple non-contiguous workspaces with Control+click.

   ▶ Select a range of contiguous workspaces by clicking on the first workspace row in the range, then Shift+clicking on the last.

   ▶ Select all workspaces by right-clicking in the Workspaces list and selecting "Select all".

   ▶ Select all workspaces by pressing Control+A.

3. Right-click, and select Mount.

The Client Manager mounts the selected workspaces on your client and the Online icons for the mounted workspaces change to green. The Workspaces list displays the drives the workspaces are mounted to. If you use letterless drive mappings, the Workspaces list displays "UNC path" next to the Online icons.

4. (Option) If you want the selected workspaces remounted the next time you log in, right-click, and select "Enable auto mount".

The next time you log in to your client system, the Client Manager will automatically mount the selected workspaces.

To unmount an Avid workspace on your system:

1. Make sure your Avid application is not running.

2. Open the Client Manager.

The Workspaces list opens. The Online field displays a green ball for workspaces that are already mounted. You can filter the Workspaces list by Workspace name.

3. Do one of the following:

  ▶ Click the green icon in the Workspaces list to unmount the selected workspace.

  ▶ Click to select a workspace, then right-click, and select Unmount.

The Client Manager unmounts the workspace from your client, and the green icon is removed from the Online field for this workspace.

To unmount multiple Avid workspaces on your system:

1. Make sure your Avid application is not running.

2. Open the Client Manager.

The Workspaces list opens. The Online field displays a green ball for workspaces that are already mounted. You can filter the Workspaces list by Workspace name.

3. Do one of the following:

  ▶ Select multiple non-contiguous workspaces with Control+click.

  ▶ Select a range of contiguous workspaces by clicking on the first workspace row in the range, then Shift+clicking on the last.

  ▶ Select all workspaces by right-clicking in the Workspaces list and selecting "Select all".

  ▶ Select all workspaces by pressing Control+A.

4. Right-click, and select Unmount.

The Client Manager unmounts the workspaces from your client, and the green icons are removed from the Online field for those workspaces.

Configuring Workspace Drive Letter Assignments

The Client Manager allows you to configure the drive letter used when mounting Avid workspaces. This allows you to prevent workspaces from being assigned drive letters you want reserved for other uses.

📑 *The Client Manager skips fixed drives and drive letters that are already in use.*

If your system requires using Universal Naming Convention (UNC) paths for all mounted workspaces rather than drive letters, you can use Client Manager to set this as the default mapping for workspaces.

To configure the drive letter for mounting workspaces:

1. Open the Client Manager.

   The Client Manager opens.

2. Select a workspace from the Workspace list.

3. Right-click the selected workspace, and select "Mount to drive" from the menu.

   The Mount To dialog box opens.
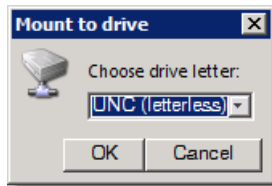
4. Click the Choose drive letter menu, and select the drive letter you want to use for mounting workspaces.

Option	Description
UNC (Letterless)	Uses a Universal Naming Convention (UNC) path for the mounted workspace instead of a drive letter.
Any drive	Mounts the workspace to the next available drive letter, working backward from drive Z:
Specific drive	Mounts the workspace to the selected available drive letter.

5. Click OK.

Section 3: Avid DS

9 **Section 3: Avid DS**

9 Setting up Storage and Media for Projects on Avid DS

Since file-based media can be large, it requires high bandwidth and fast disk access. You must ensure that you have storage that is large and fast enough for high throughput so that you can play your sequence in realtime. (Typically, 2K data takes up over 1 TB per hour of footage.)

The Avid DS Support Center web site provides a complete list of storages supported for high-res media, and indicates which types of storage provide realtime capability.

If you need to transfer or share projects and media for offline-to-online production between Avid systems, you can set up shared storage with Avid Media Composer. MXF sequences offlined on an HD-capable Avid Media Composer can be previewed directly in Avid DS using the real-time proxy resolution (film proxy mode).

Before you begin working on your projects, you must plan out your storage solutions carefully so that you can share media between Avid applications—see "Sharing Media" in the Avid DS Help.

Checklist: Configuring Avid DS on Avid Shared Storage

Each Avid DS workstation connected to Avid shared storage (Unity or ISIS) requires its own workspace. This workspace is then added to the storage configuration in each Avid DS workstation. For more information on configuring the workspaces and setting permissions on the Avid shared storage, refer to the corresponding shared storage documentation.

A different configuration is required if you are working within an Avid Interplay environment—refer to the Avid Editing on Interplay Workflow Guide.

Step	Refer to
❑ Determine the best configuration for your workgroup.	"Planning your Storage Locations" in the Help for Avid DS.

	Step	Refer to
❑	Install all Avid DS client workstations. ⚠ **Do not install any Avid DS software components (such as the indexing services) directly on Avid shared storage.**	"Installing your Avid DS Environment" in the Help for Avid DS.
❑	Install the client software for Avid Unity or ISIS on each Avid DS workstation that is connected to Avid shared storage.	Avid shared storage documentation.
❑	Install the latest updates for the Avid shared storage software (if any). Follow the online instructions to install this software update, then reboot your workstation.	Avid Download Center www.avid.com/support/downloadcenter/index.asp
❑	On the Avid shared storage, create a video workspace and an audio workspace for each Avid DS workstation (the RP workstation does not need a workspace). Create a workspace for the video storage - *server_name**workspace_name*\\video Create a workspace for the audio storage - *server_name**workspace_name*\\audio	Avid shared storage documentation.
❑	If you need to share media with other Avid editing systems (Media Composer, Symphony), create additional workspaces where they can place media that will be shared with Avid DS (audio and video can be stored in the same folder). 📄 *These folders should only contain media that needs to be conformed and used by Avid DS, as there is no need to index all the offline media on an Avid editing system.*	
	When using Avid shared storage, you must ensure that an ISIS or Unity account is created to match each account name that is in the Avid DS workgroup. If the Avid DS user name is not in the ISIS/Unity System Director accounts list, then media access will be problematic on the Avid workspaces. The storage spaces will either not work properly, or the Avid DS clients will not be able to get real-time playback on the storage. To share MXF media, create the workspace using the following convention: *server_name**workspace_name*\\Avid MediaFiles\\MXF\\	Avid shared storage documentation.

Step	Refer to
To share OMFI media, create the workspace using the following convention: *server_name**workspace_name*\OMFI MediaFiles\VideoStorage *server_name**workspace_name*\OMFI MediaFiles\AudioStorage Make sure to use the correct syntax: • Include a space between OMFI and MediaFiles • Don't include a space for MediaFiles, VideoStorage, and AudioStorage • Use the correct uppercase and lowercase letters.	
❑ Use the Administration Tool to assign the permissions on each workspace. If some workstations need to share media, you can assign permissions for these workstations on the appropriate workspaces. (You should also give the RP workstations permission to each workspace).	Avid shared storage documentation.
❑ Set up the Avid Connection Manager on each Avid DS workstation to auto-launch. The Connection Manager should always be left active on the Avid DS workstations. This utility will automatically map letters (or UNC paths in recent releases) and authenticate the specific user accounts listed in the Avid shared storage engine.	
❑ Each client workstation needs to mount the required workspaces.	"Mounting and Unmounting Workspaces" on page 80.
❑ In Avid DS, use the Storage Configuration tool to add a shared storage connection to your local indexing service. **Important**: Do NOT use a drive letter or mapped drive letter, instead browse the network to the Avid shared storage server, using only a UNC path to access your media folder on the Avid storage.	"Configuring your Storage Locations" on page 92.
❑ Place your media in the designated workspaces.	"Placing File-based Media on the Storage Device" on page 90.

Placing File-based Media on the Storage Device

High-resolution digital footage that comes either from digital video cameras, film scanning processes or CGI applications (e.g. R3D, ARI, DPX, TIF), should be placed onto a fast, high-capacity storage device connected to your workstation. This allows you to link to these source files and still get real-time playback in Avid DS.

If this media is being shared with other Avid systems, you can place these master files on a shared storage, and link to it.

For a list of storages that support real-time playback, refer to the Avid DS Support Center. You can also place your media on a shared storage and link to it, but you may not get real-time playback unless you process the media.

If you are working with different types of high-resolution media (e.g. R3D, ARI, DPX, TIF), make sure that they are each placed in different folders.

▶ *For local storage.* Place your high-resolution files in an appropriate folder under the \VideoStorage or \MediaStorage folder on the storage device. For example,

workstation_name\VideoStorage\DPX\Casino\...

Or alternatively, create a specific DPX folder outside of the VideoStorage folder and add this location in your Avid DS Media Storage Configuration tool as a Read-only storage. This option allows you to quickly add or remove this file-based storage without affecting media content from the VideoStorage folder.

▶ *For shared storage.* Place the high-resolution files on a workspace on the Avid shared storage. For example,

\\Server_name*workspace_name*\Avid MediaFiles\DPX\Casino\...

If you are conforming with MXF media, then see "Sharing MXF Media" on page 53.

Sharing MXF Media

MXF (Material Exchange Format) is an industry-standard container format that encapsulates media and production metadata into a single file. MXF is also a common file format for direct media interchange among Avid applications, as well as with third-party MXF-compliant products. MXF supports both standard-definition and high-definition formats.

Avid DS can share HD projects and Avid DNxHD media with Media Composer HD-capable systems. The MXF files need to be placed in a specific folder so that Avid DS users can relink to them in a conform workflow.

> *For a list of shared DNxHD resolutions—see "Avid DNxHD Compressions" in the Help for Avid DS.*

If you are reading or writing MXF media for use only by Avid DS:

▶ Create a MXF folder on your storage device using the Windows Explorer:

workstation_name\Avid MediaFiles\MXF

If you are sharing media with other Avid editing systems on an Avid shared storage:

▶ Create the following shared storage workspace for MXF files that you are reading from other systems:

*Server_name**workspace_name*\Avid MediaFiles\MXF

> *These folders should only contain media that needs to be conformed and used by Avid DS, as there is no need to index all the offline media on an Avid editing system.*

▶ Create the following shared storage workspace for MXF files that Avid DS is creating for use by other systems:

*Server_name**DS_workspace_name*\Avid MediaFiles\MXF

Make sure to use the correct syntax:

- Include a space between Avid and MediaFiles
- Don't include a space for MediaFiles
- Use the correct uppercase and lowercase letters.

Installing and Configuring the ARRI Plug-in

Download the plug-in from the ARRI web site, and install it on your Avid DS workstation.

To enable grouping of the ARRI file type in Avid DS:

1. Start Avid DS.
2. Select File > User Preferences.
3. Select the Avid Explorer tab.
4. In the File Grouping, Available list, select ARI, and click the Add button to move it to the Selected list.
5. Click OK.

Configuring your Storage Locations

Once all the workstations in your Avid DS workgroup have been set up and installed with the necessary software, you need to specify your storage areas so that they can be viewed or shared by other clients in the workgroup. This configuration of storage areas is done through the Media Storage Configuration tool in Avid DS. All storage areas are configured within your workstation's media indexing service.

Opening the Media Storage Configuration Tool outside Avid DS

Before you begin working on any projects, you must set up your storage. The Media Storage Configuration tool can be accessed inside or outside Avid DS.

To open the media storage configuration tool outside Avid DS:

1. Double-click on the Avid DS Support Console icon on your desktop.

   The support console and all the various tools are displayed.

2. Click UMMDTest.

3. Select File > Open Service.

   A dialog box displays for you to enter the name of the workstation whose storage you want to configure. If you are already on this workstation then leave the machine name blank and click OK.

   If you need to configure the storage for another workstation that is attached to this one in a workgroup, then enter the name of that workstation.

Warning: There is no security when configuring another workstation's storage in this way. Therefore, make sure that no one else is using that workstation or they will automatically be disconnected when you log in.

4. Select File > Configure.

   The Media Storage Configuration dialog box displays any storage on the media indexing services that may have been configured for your workstation.

Defining your Storage Areas within the Media Indexing Service

You must define all storage areas that you need to access inside a configuration called a media indexing service. The Avid DS media indexer uses this service to scan all storages configured within, and indexes the media for quick and efficient access.

You cannot leave the Avid DS local media indexing service list empty, otherwise Avid DS will report missing audio or video storages every time you start the application. Add all required storages and name them clearly.

To define your storage areas in the media indexing service:

1. If you have Avid DS running, select Data Management > Configure Storages.

   The Media Storage Configuration dialog box displays the media indexing services that have been configured for your workstation.

   Your workstation's media indexing service
   is indicated by the computer name
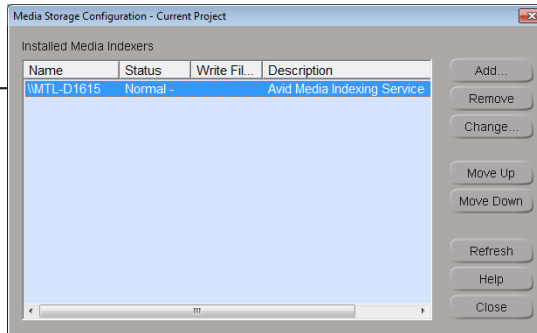
2. Select your workstation's media indexing service, and click the Change button.

   The Media Indexing Service dialog box displays.
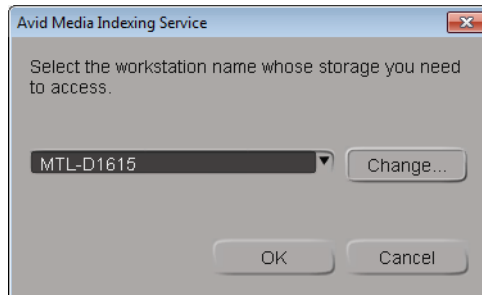
3. Leave the workstation name as it is and click the Change button.

   The list of storage areas that have already been defined in this indexing service displays. Each storage area is uniquely identified by the workstation name and folder where the media resides.

Avid DS shared
storage name

Actual path to storage
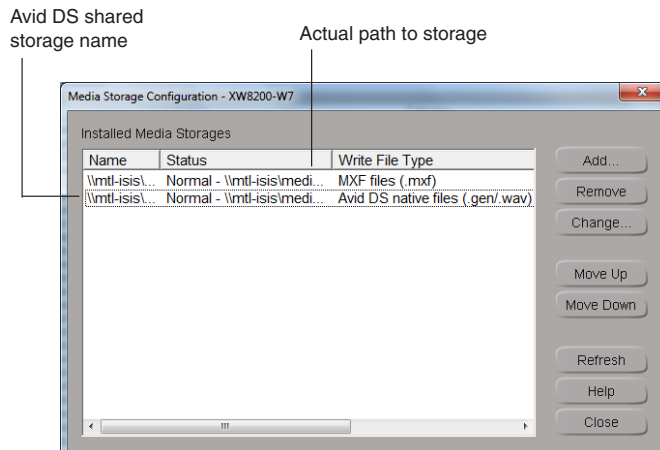
4. To change the existing configuration, select a storage entry in the list, and click Change. Skip to Step 8.

5. To add a new *storage*, click the Add button.

6. In the Available Storage Types dialog box, select Avid Media Storage and click OK.
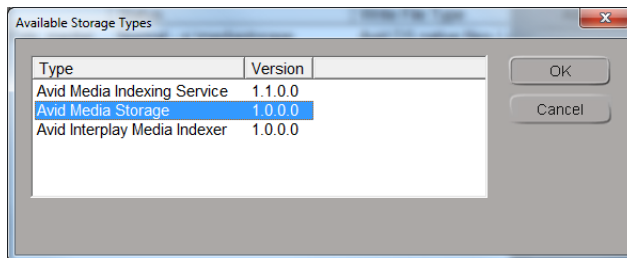
7. Enter the full Windows path name (*workstation_name**folder_name*) where the storage area is located, or use the browse (...) button to find it. For example, \\DSStorage4\Video.

   If you are connecting to a folder on an Avid shared storage, then click the browse (...) button and locate the Avid shared storage workspace folder. For example, *Server_name**workspace**folder_name*.
   Do NOT use a drive letter.
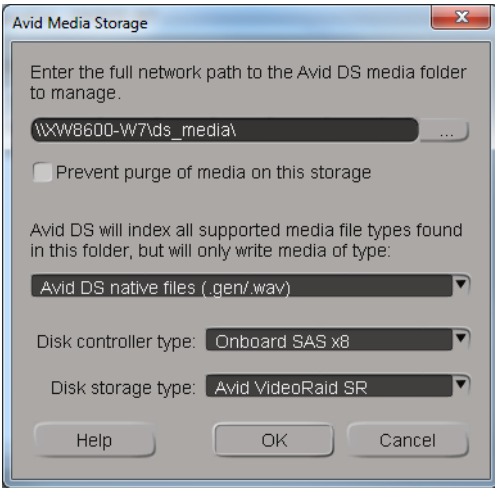
8. If this storage is for sharing MXF media with another Avid editing system such as Media Composer, then select **Prevent purge of media on this storage**. This automatically makes the storage "read-only".

9. Select the media type that you will store in this folder:

📖 *If there are different media types in your storage, you must add a storage configuration for each different type (e.g. generic audio, generic video, MXF audio, MXF video, etc.)*

For this storage folder	Select this option(s)
Video media imported or generated media by Avid DS (read/write).	generic media
Media that is going to be read-only, but not overwritten. e.g. OMFI media that will be used by other Avid editing systems.	None
For MXF media: Folders that contain MXF media must be defined separately within your media indexing service.	

📖 *You need to set up MXF folders for Avid DS and any other Avid editing systems—see "Sharing MXF Media" in the Avid DS Help.*

MXF (purgeable)	MXF files (.mxf)

For this storage folder	Select this option(s)
MXF (non-purgeable)	• MXF files (.mxf) • Prevent purge of media on this storage

10. From the Disk Controller Type list, select the card that is installed in your workstation.

11. From the Disk Storage Type list, select the storage type that you are using.

    The disk options set the appropriate bandwidth for Avid DS to use when transferring data to the storage. Choose the appropriate options for your storage device to obtain the best performance for real-time effects.

📖 *If your storage device does not appear in the list, it may be because it was installed after Avid DS was installed. If it is an Avid-certified device, restart Avid DS so that the software detects the device and displays it in the list.*

12. Click OK to return to the Media Storage Configuration list..
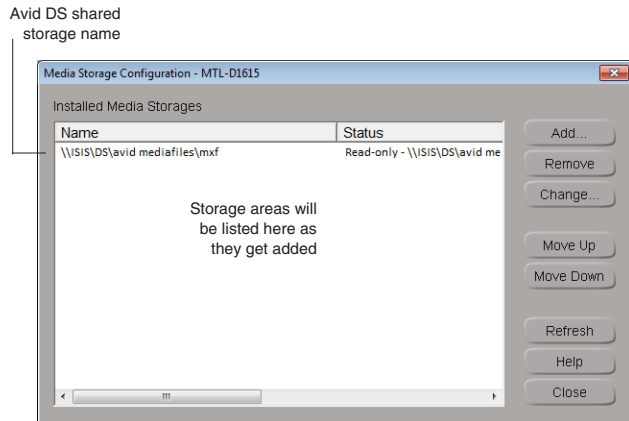
13. Continue to add storage areas for all folders to which you need access.

    If there are different media types in your storage, you must add a storage configuration for each different type (e.g. generic audio, generic video, MXF audio, MXF video, etc.)

14. Storages are accessed and indexed in the order in which they are listed. Use the Move Up or Move Down buttons to change the order of priority.

Avid DS shared
storage name
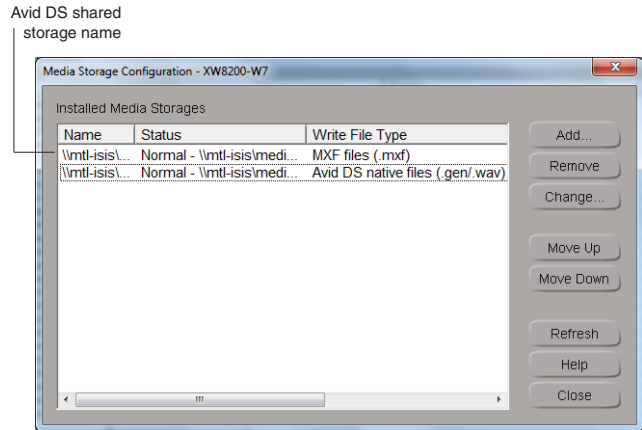
15. Click Close and then OK to return to the Media Storage Configuration - Workstation dialog box.

16. Click the Close button to save the configuration for the media indexing service.

📖 *By default, the media indexer sets any new storage areas to automatically have full read/write access by any user on the network. To restrict access to your media, you can change the share permissions through Windows.*

The first time that you configure your storage, the media indexer will need to index the media on your storage device. This may take a while depending on the amount of media on your storage.

17. Once your storages have been indexed, you should stop and restart the media indexer—see "Stopping and Starting your Avid Indexing Services" in the Avid DS Help. This step allows the creation of the media table content (server.umd file) which helps speed up the media validation process after a system restart, and brings the media online more quickly.

Accessing Storage on another Workstation

A media indexing service is defined for every Avid DS workstation in the workgroup. To access media on another workstation, you need to add that workstation's media indexing service to your own storage configuration. (It is more efficient to connect to the media indexing service on that workstation rather than directly to its storage area.)

📖 *When you import a sequence or clip from another project, Avid DS creates a connection to the media even if it resides on another workstation. If the storage where this media resides is not already configured on your workstation, Avid DS will automatically add a media indexing service for that storage in your own workstation's storage configuration.*

The Avid DS media indexing service can also index media on other Avid editing systems (Media Composer, Symphony). This media typically resides on a shared workspace. This workspace should only contain media that needs to be conformed and used by Avid DS, as it is extremely time-consuming to index all the offline media on an Avid editing system.

If your Avid editing systems are within an Interplay environment, you need to connect to the Interplay media indexing service instead. The Avid Interplay media indexers manage the media more efficiently for Media Composer and Symphony workspaces on shared storage—see "Workgroup with Shared Storage in an Avid Interplay Environment" in the Avid DS help.

To access a media indexing service on another workstation:

1. Select Data Management > Configure Storages.

   The Media Storage Configuration - Current Project dialog box is displayed with a list of existing services.

Your workstation's media indexing service
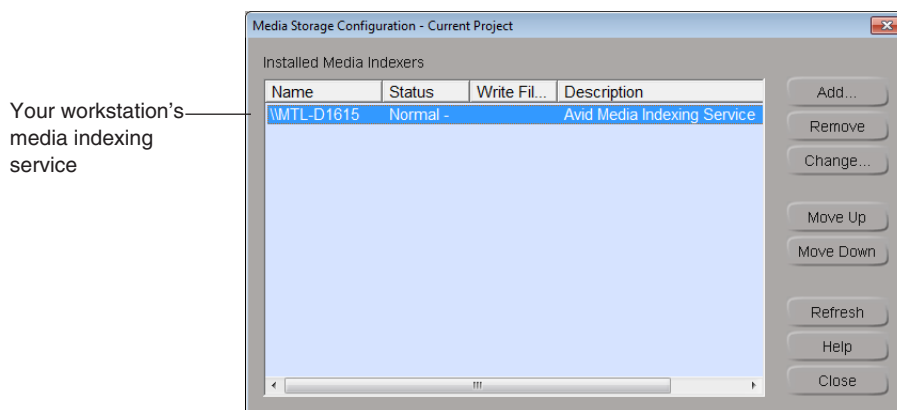
2. To add a new *service*, click the Add button.

   The Available Storage Types dialog box is displayed.
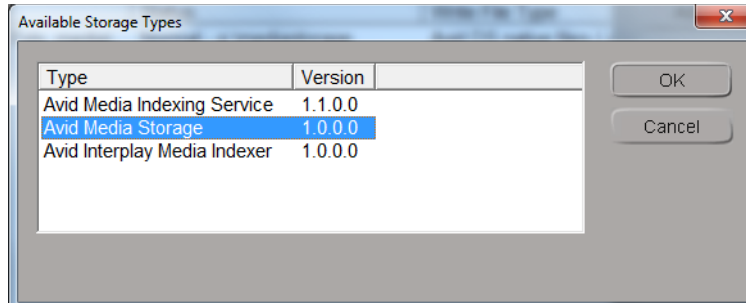
3. Select Avid Media Indexing Service and click OK.

   Avid DS scans the network for all workstations in your workgroup that are running media indexing services.
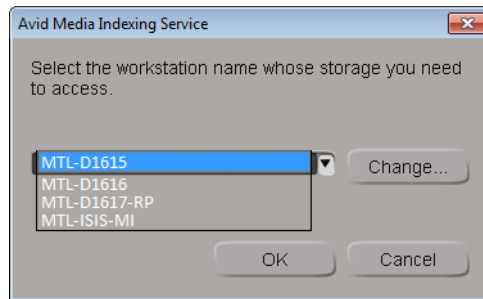
4. Select the workstation whose media indexing service you need to access, and click Change.

5. Click Close to accept this configuration.

   The other workstation's service configuration is now added to your storage configuration.

Your workstation's media indexing service

Other workstation's media indexing service

6. Click the Close button to exit the Media Storage Configuration - Current Project dialog box.

To remove a media indexing service:

1. In the Media Storage Configuration - Current Project dialog box, select the service that you want to delete.

2. Click the Remove button.

    The indexing service is no longer defined for the current project.
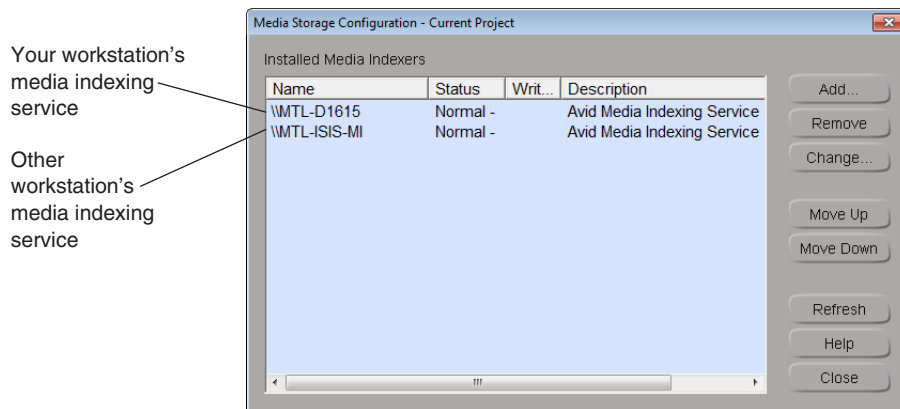
3. Click the Close button.

Accessing Storage on Workstations in an Avid Interplay Environment

A media indexing service is defined for every workstation in an Interplay workgroup. The media indexing service includes all storage folders that the workstation needs to access. To access media created by other Avid editing systems within an Interplay environment, you need to connect to that system's local Interplay media indexing service, or to the media indexing service for a group of Avid editing systems known as a High Availability Group (HAG).

To access an Interplay media indexing service:

1. Select Data Management > Configure Storages.

    The Media Storage Configuration - Current Project dialog box is displayed with a list of existing services.

Your workstation's media indexing service
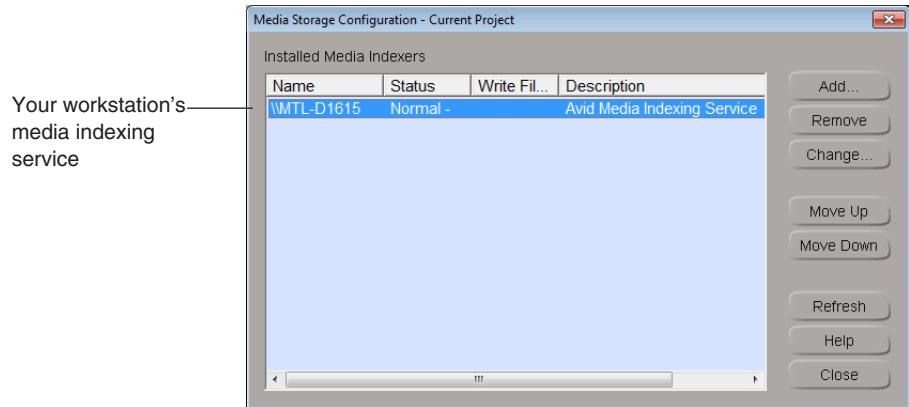
2. To add a new *service*, click the Add button.

   The Available Storage Types dialog box is displayed.
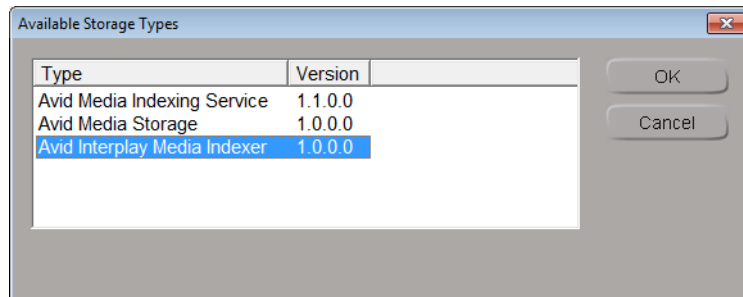
3. Select Avid Interplay Media Indexer and click OK.

   A dialog opens for you to enter information about the Interplay media indexer to which you need to connect.
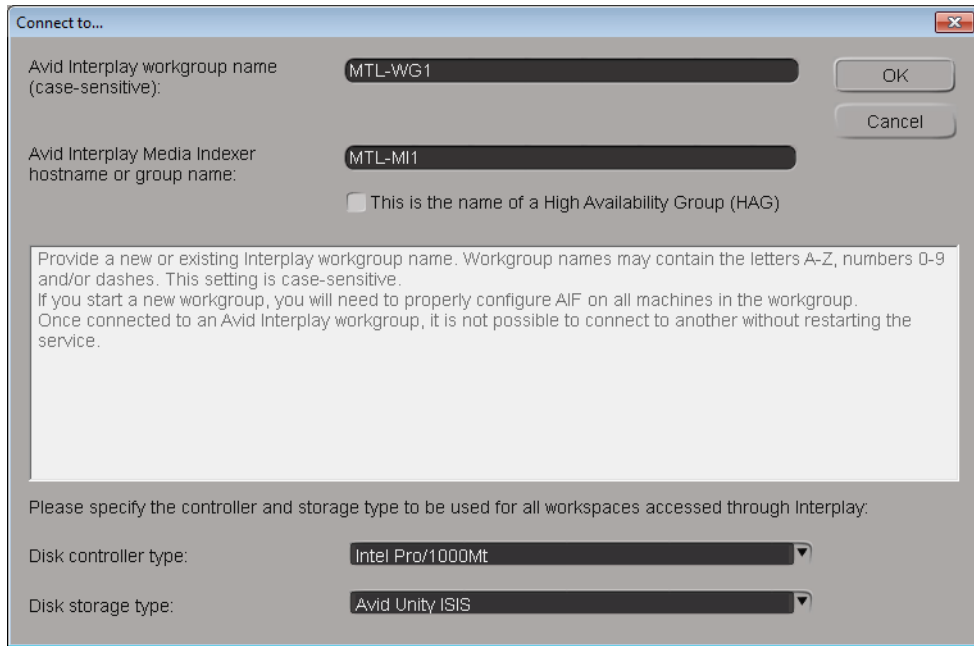
4. Enter the name of the Avid Interplay workgroup where the media is located.

5. Enter the name of the Avid editing system whose local indexing service you need to access,

   or

   the name of the HAG where the shared indexing service is located, and select the This is the name of a High Availability Group (HAG) option.

6. Set the Disk Controller Type and Disk Storage Type.

7. Click Close to accept this configuration.

   The Interplay media indexing service is now added to your storage configuration.

8. Click the Close button to exit the Media Storage Configuration - Current Project dialog box.

To remove a media indexing service:

1. In the Media Storage Configuration - Current Project dialog box, select the service that you want to delete.

2. Click the Remove button.

   The indexing service is no longer defined for the current project.

3. Click the Close button.

Stopping and Starting your Avid Indexing Services

All media and project information, that is indexed on your workstation or in the Avid DS workgroup, is kept in the system memory. This information is only saved to a file (server.ummd for the Avid Media Indexer) when your system is shut down and the media and project indexing service is stopped.

Therefore, it is good practice to stop and start your services at the end of the day so that the indexing information is written to a permanent file. The media indexer needs to be stopped on each Avid DS workstation.

To stop/start the indexing services:

1. Close the Avid DS application.
2. Click the Windows Start button, and select Control Panel.
3. Double-click Administrative Tools.
4. Double-click Computer Management.
5. Select Services and Applications > Services.
6. In the list on the right, right-click on Avid Media Indexer and select Stop*.

Stopping these services may take some time and even exceed the Windows allocated time. If this happens, you will get a notification from Windows that the service could not be stopped. Ignore this warning and click OK, then wait for the service to stop completely.

DO NOT SHUT DOWN OR RESTART the system until the service is fully stopped or you will corrupt the table being saved. While saving, the services status appears as Stopping. Refresh the window until the Status indicates that the service is indeed fully stopped.

7. After the service has been stopped, right-click on it again, and select Start.
8. Once the services are started, close all open windows.

9 **Setting up Storage and Media for Projects on Avid DS**

10 Editing High-Res Projects in Avid DS

As there are a number of different ways to work with high-resolution projects, it is recommended that you first read "Avid File-Based Workflows" on page 15 and follow the workflow that best meets your project requirements. You should also read the material in "Color Management in Avid DS" on page 147 to better understand how and where the "look" files (LUTs) are applied.

Depending on your system configuration, many high-resolution formats are playable in real time—for a specific list of these formats, see the Avid DS support web at www.avid.com. When editing high-resolution projects where real-time playback is not achievable, you can use the proxy mode to apply effects and view the results in either HD 4:2:2 or HD 4:4:4.

Opening an HD or Film Project in Avid DS

Avid DS can work with HD and 2K/4K files, including a large number of sequence formats for various film resolutions and aspect ratios.

To set your project settings accurately when you open a project in Avid DS, you must gather the following information from either the film-scanning facility, the camera operator, or the production director:

- The original film format of your media (e.g. 1080, RED, Full Aperture, DPX, Cineon).

- The quality at which your film master was scanned or transferred. The most popular is the 10-bit format and the most frequently used resolution is 2K.

- The frame rate (fps) at which your film master was scanned or transferred. When conforming sequences in Avid DS, make sure you create a project with the same frame rate that was used for the offline.

- The format required for final delivery.

- A corresponding LUT for your footage. This will be required when you import your media into Avid DS.

To create a film-based project:

1. In the Open Project dialog box that displays when you start Avid DS, click the New Project button.

   The New Project dialog box displays. You can click the Help button at any time to get a full description of all the parameters in this dialog box.

2. Enter a Project Name.

3. Keep the default project Location as this is where all your Avid DS projects reside.

4. There are a number of film resolutions and apertures for HD or film that you can choose from.

   Select the specific film Format at which your material was acquired. The menu options are as follows—*Media Format > Resolution > Frame rate*.

   For example:

   FILM > RED > 2:1 (2K) > 23.97 frames/s

   HD RGB 4:4:4 > 1080i > 59.94 fields/s

   If you are going to output your project at a different resolution then what it was originally shot at, then you can set the project with the new output format. Note however, that if your media format is not the same as your sequence format, your media will not be playable in realtime in Avid DS until you process your sequence.

There are some third-party applications available on the Internet that can read the properties of high-resolution files (i.e. DPX, R3D, TIF) to give you the exact frame dimensions.

5. When you select the format, the frame details are set automatically.

   Verify that the Frame Size is showing the correct dimensions. If not, you will need to choose another Format.
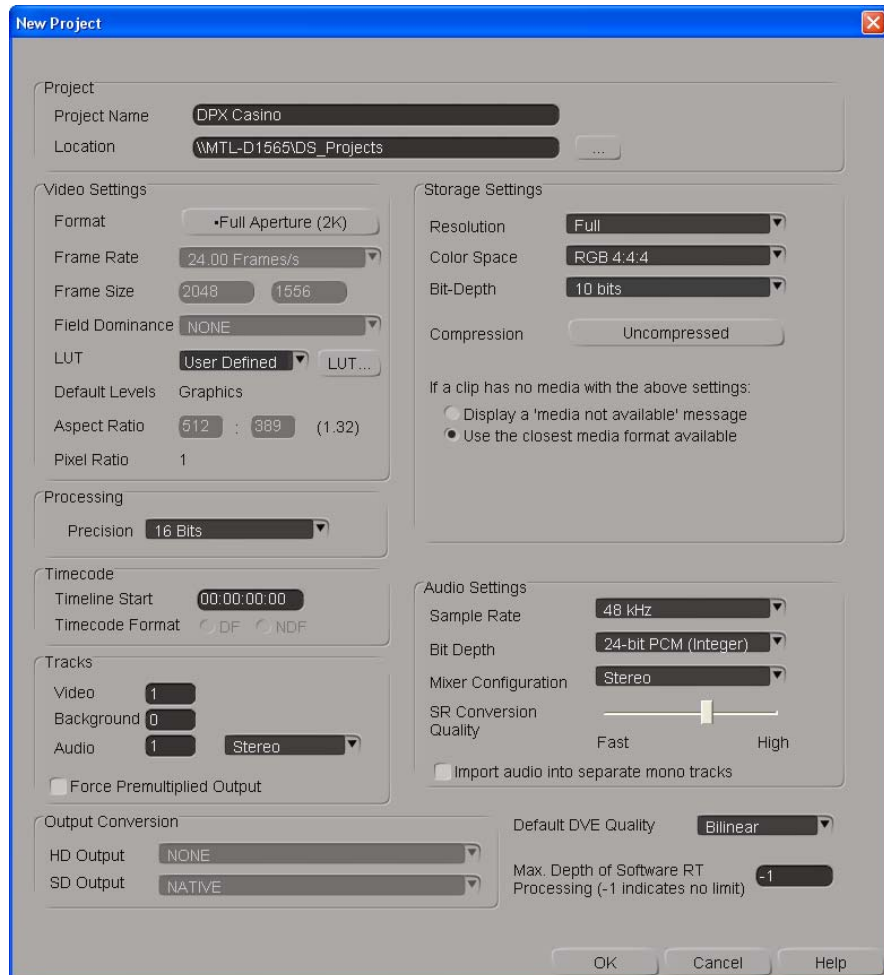
6. Select the LUT depending on the delivery format of this sequence.

For example, if the material you are editing and finishing is for HD Television, then the Sequence LUT will be ITU 601/709.

If you are working with media from only one source and been provided a specific LUT file for this media, you can import it now—see "Importing External LUTs" on page 158.

If you will be using media from different sources, then we recommend that you select the LUT that is most appropriate for the final output.

7. For the Storage Settings:

▶ Set the Resolution for capturing/linking video media to Full.

▶ Set the Color Space to RGB 4:4:4.

📖 *Work in 4:4:4 color space whenever possible. If you need to deliver your final master in 4:2:2, the sequence can be downconverted at time of output.*

> ▸ Set the Bit Depth to 10-bits. This is typically the format at which film is scanned.

8. Select Use the closest media available, to allow Avid DS to display media of mixed resolutions and frame rates in your sequence.

9. Set the Processing Precision to a bit-depth that will give you the best quality for your processed effects. To preserve the quality of the bit-depth of 10-bit material, choose 16-bits. For more information on bit depth, see "Bit Depth" in the Avid DS Help.

   If you selected the ITU 601/709 LUT, then select the 32 Bits float option for Processing. This ensures that the LUT can be reversed transparently so that you can view your media without your LUT if necessary.

⚠️ **Although Avid DS can support higher bit depths during processing, the caches may be stored at a lower bit depth depending on your resolution and color space settings. Note that, using a higher precision bit depth generates smoother effects during processing, and still produces better quality output for lower bit depth outputs. Optionally, you could set the Precision bit depth to the same setting as the Storage bit-depth. Then, if you want to process a specific effect at a higher-quality bit depth, you can change the Precision bit depth within the Processing dialog box, or in the Options property page of the effect.**

10. For the Audio Settings, set the Sample Rate and Bit Depth at which you will output your audio media.

11. Leave the conversion settings at default.

12. Click OK to save project preferences.

    Avid DS displays the timeline where you can now begin working on a sequence.

    A project folder is created under the location specified earlier. This is where all your sequences will reside.

Linking to High-Resolution Files

By creating links to media files, you can work with media files without having to capture them to your local storage. These files, called *linked clips*, can reside on any connected storage location until you're ready to output your sequence.

Some projects may require you to work with images at varying resolutions (sizes). When you capture these files, you must convert the material to the working resolution of the current sequence. By linking to the material instead, you can keep the material at its original

resolution regardless of the sequence's frame size. Once you have completed your edits, you can process the linked material, which creates a cache file of the image area that is visible in the viewer.

Linking clips is also useful when more than one person needs access to the same file. You can capture the file as a linked clip, drop it into your sequence, and continue to use it as a reference while another person continues to work on the source media file. Changes made to the original file automatically appear in the linked clip, both in the Avid Explorer and on the timeline. You can also use the Copy-Link function to make a copy of the original media and then link to it—see "Copying and Linking Media" in the Help for Avid DS.

> *If another person tries to modify a file that is linked to a clip in an open project, they will not be able to save that file due to a sharing violation. You must close the project that contains the linked clip for them to be able to save the original file.*

Once you are ready to output the sequence, simply process the clip on the timeline. If you process the material, a cache file is created. Once a cache is created, Avid DS no longer refers to the source media file, but uses this cache file during playback. Any further changes to the source file do not appear in the linked clip on the timeline. Like any other cache however, the cache for the linked clip can be purged, which relinks the clip to the source file.

> *If the original file is removed from its location, you will receive a "Media not available" message when you playback the portion of the sequence that uses that clip.*

- If you are conforming a sequence—see "Conforming with Media from Alternate Sources" on page 134.
- If you are building a new sequence in Avid DS—see "Creating Linked Clips" on page 109.

Creating Linked Clips

When you link to media on your storage, linked clips will appear in the Avid Explorer similar to master clips. Since no actual media has been captured, their file type icons will be underlined in red.

Depending on the type of media you are linking to, your system hardware, or the storage where your media resides, some linked clips do not require processing and can be played back in real time (such as .gen, .omfi, .mxf, .dpx, or .cin files). If you cannot view your media in realtime when they are placed on the timeline, you will need to process. Processing the clips will create media caches on your storage which will be used instead of the original linked media.

If the Media Not Found message appears in the viewer when using linked clips, it is possible that the file has been moved or that Avid DS has lost the connection to the linked file. To re-establish the link, see "Relinking a Clip" in the Help for Avid DS.

To create a linked clip:

1. In the Avid Explorer, open a bin and select the file (s) you want to capture as linked clips. To select a series of files, click the first file, hold down the Shift key, and click the last file. To select multiple files, hold down the Ctrl key and click each file name.

If you select a sequential list of still files of the same type (such as all .DPX or all .TIF), you will be asked if you want to combine the files into one master clip or capture individual clips. Working with one master clip makes editing much easier.

2. Right-click a file and select Capture Settings.

   The Capture Settings dialog box opens.

3. Select the settings that apply to the files that you want to capture. See "Capturing Material from File" in the Help for Avid DS.

Since linked files are brought into Avid DS at their original resolutions, there is no need to convert them to the current sequence's resolution. As a result, the Media Conversion modes are not applicable when the Link option is selected.

4. Close the Capture Settings dialog box.

5. Right-click the selected files and select Link.

   An Import dialog box opens and the first file (first frame of the transfer) is displayed in the viewer. For more information on the options in this dialog box, click Help.

6. Optional. If you are working with film-based material, make sure you select the appropriate LUT for your footage. By default, Avid DS selects an appropriate LUT for the file type you are working with. However, if you have a LUT that was provided together with your footage, then you should use this LUT instead.

7. Click Ok to begin the import.

   As the material is linked, clips appear in the selected bin. The clip icons are underlined in red to indicate that they are linked clips. Although no media has actually been captured, when they are placed on the timeline, the media will still be referenced.

You can view additional information about the linked clip by right-clicking on the clip, and selecting Clip properties. On the Format Specific tab, click the File Info button.

Aligning your DPX Files

If Avid DS gives you a message that your DPX files cannot be read, it may be due to misaligned sectors in the DPX files. This can easily be realigned using the FixDPX utility.

To align your DPX files:

1. If the sequence using the DPX files is currently open, exit Avid DS, or switch to another project.

2. Click the Start button and select Programs > Avid Products > Avid DS > Tools > FixDPX.

3. In the FixDPX dialog, click the File... button to browse for a specific file that you want to fix.

   If you want to fix several files, then click the Folder... button to select the folder name.

4. Click Fix it! to begin.

   The FixDPX utility will display a summary of the files that were or were not fixed.

5. Click Done to exit.

Capturing High Resolution Media from Tape

HDCAM-SR is commonly used for HDTV television production. However, HD resolutions are now also used more and more for film work, especially in 4:4:4 RGB color space. The 4:4:4 refers to an encoding technique that holds onto all of the image's red, green, and blue color data for superior color fidelity, unlike the traditional 4:2:2 YUV mode, which discards half of the color data. Although this method does not support resolutions as high as film-scanned DPX files (2K, 4K), HDCAM-SR does allow for fairly high quality resolution (upto 1920 x 1080 HD), and with the latest digital film cameras, material can also be shot directly in RGB 4:4:4. Also, Telecines now perform high-quality transfer directly to HD in real-time, which is much faster and economical than a typical film scanner.

To ensure the highest quality of the master tape, transfer your film reel to HD format in 4:4:4, which offers the best uncompressed color quality currently available on video. The film should also be transferred as 16:9 so that the conform process will not only be frame-accurate, but also pixel-accurate in the sense that the effects will match the same aspect ratio (titles, shapes, etc.).

When working in HD, you can capture all the media and edit directly in Avid DS—see .

Alternatively, you can do your offline editing in Avid Media Composer, and conform and finish your project in Avid DS. For this workflow, see "Conforming HD Video Sequences" in the Help for Avid DS.

Logging and Capturing Clips from Tape

When capturing from tape you have the choice of capturing media as you preview the tape, or logging the in and out points to create empty master clips that can be captured at a later time.

To log and capture clips from a tape:

1. Do one of the following:

Option	Do this
From the NLE toolbar just above the timeline	Click the Media IO button and select Capture Tool.
From the main menu	Select View > Single-Instance Views > Capture Tool.

2. Configure the external device, specify the capture quality, and other perform other tasks listed in "Preparing to Capture Material" in the Help for Avid DS.

3. Click the Tape button.

4. Click the Log/Capture mode button. It toggles between the following modes:

Button Mode	To	Do this
	Capture clips	Set the Capture mode and specify the exact in-points and out-points. When you click the Capture button, the deck will roll and the capture the media between the selected in and out-points.
	Log clips	Set the Log mode and specify the exact in-points and out-points. When you click the Capture button, an empty master clip will be logged in your bin.

5. From the Deck list, select a deck preset.

6. (Optional) Set a custom Preroll for the deck.

   This setting temporarily overrides the setting in the deck template but does not change it.

7. Click the Check button.

If the communication between the external device and your system is operating properly, nothing happens. If there is a problem, a message box appears, stating the possible cause of the problem.

You can verify that the external device is operating within normal parameters by checking the five items in the External Device Status area, located beneath the transport controls. See "Transport Controls" in the Help for Avid DS.

8. From the source name list, select the tape's name.

   If the tape is new, click the New Tape button and enter a name for the tape. The tape name is added to the Tape Library.

⚠️ **It is very important to assign a unique name to every tape because Avid DS uses it to identify the captured media.**

9. In the Clip Name text box, enter a name to prefix all captured clips.

10. From the Target list, select a location to hold the clips.

Option	Description
Project Root	Creates master clips in the folder with the project name (the project folder).
Main Explorer Location	Creates master clips in a bin you selected in the Avid Explorer.
Auto-Source	Creates master clips in a folder with the same name as the tape name.

The most recently activated bin within the project root becomes the capture target. An icon in the title bar marks a bin as the Capture Target.

📖 *You cannot create master clips outside the current project. Avid DS checks the path to make sure the folder is within the project folder.*

11. If you are working with logarithmic media (such as film-based material), you will need to select a LUT in order to linearize your media for Avid DS. The LUT is used to preserve the color data of the material when it is captured into Avid DS.

    Typically, you need to apply a LUT that corresponds to the camera that shot the footage.

    If you do not have details on which camera was used, then the sequence LUT (selected when you opened your project/sequence), will be used by default.

12. To select a different LUT when capturing your media, select User Defined LUT from the LUT drop-down list.

13. Click the LUT button.

    The RGB LUT dialog box opens. For descriptions of the parameters in this dialog box, click the help button.

14. Select or customize the LUT by doing one of the following:

To	Do this
Choose a predefined LUT.	Select the appropriate LUT from the drop-down list. For HD RGB 4:4:4 sequences, you can use the ITU 601/709 LUT.
Choose a standard camera LUT or create a custom LUT.	Select From File from the LUT Creation drop-down list, and click the Create LUT button. Browse to the **/DS_v10.x/Luts/Lut presets** folder and select the appropriate camera LUT—see "Industry LUT Presets Available in Avid DS" on page 149.

15. Click OK to save your settings and close the RGB LUT dialog box.

16. Click the Timeline/Deck Control button to set it to operate the Deck controls. It toggles between Timeline and Deck mode.

17. Click the Video button to capture the video channel of the material.

18. Click the Audio button to capture one or more audio channels of the material.

19. To record additional material before the in-point and after the out-point, type the appropriate number of frames in the Heads and Tails text boxes.

20. Use the transport controls to play or shuttle the tape to the point where you want to start the capture and click the Mark In button.

    The timecode of the in-point you selected is displayed in the In timecode box.
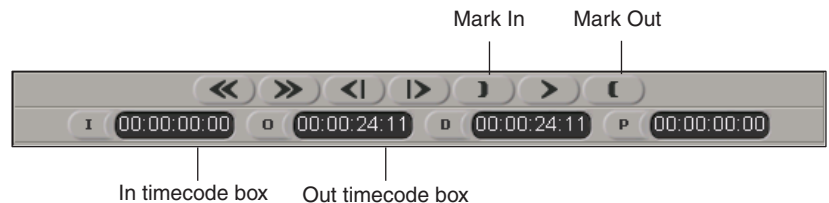
21. Play or shuttle the tape to advance to the point where you want to end the capture and click the Mark Out button.

    The out-point is displayed in the Out timecode box. The Duration timecode box displays the length of material to be captured.

📄 *Tip: If you already know the in and out timecodes, you can type them directly in the In or Out timecode boxes. You can also enter a value for the duration and Avid DS will calculate the out-point.*

You can use the numeric keypad to enter in-points and out-points. Begin typing the timecode and an entry box is displayed. When you finish typing, press the I key to set an in-point or the O key to set an out-point. Or type a duration and press the D key. To go to a particular location on the tape, type the timecode and press Enter.

22. You can add locators with comments while capturing. See "Adding Locators While Capturing" in the Help for Avid DS.

23. Click the Start/Stop Capture button.

    As the material is logged, or logged and captured, clips appear in the Avid Explorer according to the in and out points that you specified.
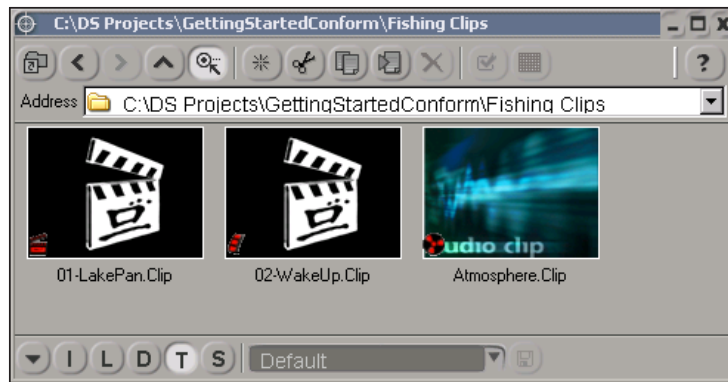
In the Thumbnails view of a bin, video and audio clips without media are displayed with red icons.

In the Details view of a bin, video and audio clips without media are preceded by a red icon.
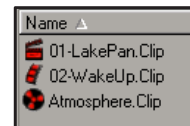
Logged video clips appear with an image of the Avid DS clapboard icon, since they do not have any media. Both video and audio clip icons are also red to show that no media has been captured. You can later capture these clips in one batch directly from the Avid Explorer.

While capturing you can add locators that will be linked to a specific timecode.

If Avid DS is unable to capture the material on the first attempt, it will try again. If it fails again, Avid DS will attempt the capture a third time with an additional preroll of five seconds. If the capture fails again, an error message is displayed with a possible explanation for the problem.

If you encounter problems capturing material from tape, you should deactivate the viewer using the Viewer button in the status bar and try capturing again. When capturing full resolution HD material at 29.97 and 30 frames per second, the viewer is automatically deactivated.

If any frames are skipped during the capture, the capture stops, and an error message is displayed. Clips are created for the material that was captured up to the point at which frames were dropped.

If Avid DS detects any problems during capture, the Capture Error Log is displayed. The Capture Error Log dialog box displays the clip that could not be captured, including tape source name, in-point, and out-point. It also gives you a brief description of the type of error that occurred.

a. To save this log as an .html file, click the Save As button.

b. In the Save As dialog box, navigate to an appropriate folder, type a name for the log and click the Save button.

The log is saved as an .html file and can be viewed in any HTML browser.

Avid DS stops a capture session if it detects any timecode breaks on the source tape. It creates a master clip from the in-point to the timecode break. The capture session may stop a frame or two after the actual timecode break. If this happens, you may have to cut or trim some of the unusable frames from your clip.

To resume capture, enter new in and out-points in the In/Out timecode boxes and click the Start/Stop Capture button.

If there is insufficient material for the deck to preroll before capturing, you will not be able to capture the material. In this case, use the Live capture option to capture the material.

Capturing Film Footage from File

You can capture digital film types such as DPX and R3D files.

If the series of digital files were provided by a film scanning facility, use the accompanying LUT file that was applied during the transfer as the Masterclip LUT.

When capturing this media, you will need to use the LUT from the digital film camera or one that was provided to you from the film transfer facility. This LUT known as the Masterclip LUT, needs to be imported when you set the capture settings. If you do not have a masterclip LUT, the sequence LUT that you selected when you opened your project/sequence will be used by default.

To capture film-based media from file:

1. Right-click the file(s) that want to capture and select Capture Settings.

2. Set the appropriate options—see "Video Capture Settings" in the Help for Avid DS.

3. Right-click the file(s) and select Capture.

   The dialog box that opens depends on the type of file that you are capturing.

   - DPX files—see "DPX Import Dialog Box" in the Help for Avid DS.

   - R3D files—see "RED Import Dialog Box"in the Help for Avid DS.

4. Set your masterclip LUT by doing one of the following:

To import a LUT that was provided with your media	See "Importing External LUTs" on page 158.
To use a industry-standard LUT provided by Avid DS	Select the appropriate LUT from the drop-down list. For DPX, you can use the ITU 601/709 LUT. For R3D, you can use the RED LOG LUT.
Choose a standard camera LUT or create a custom LUT.	Select From File from the LUT Creation drop-down list, and click the Create LUT button. Browse to the **/DS_v10.x/Luts/Lut presets** folder and select the appropriate camera LUT—see .

5. Click OK.

   As the material is captured, the clips appear in the target bin.

Viewing High-Resolution Sequences

Avid DS allows you to playback SD and HD sequences in realtime in the Avid DS viewer or on an external monitor. When working with sequences that are higher than HD resolution, your system may not have sufficient bandwidth to output to an external monitor. In such a case, you have two options:

- Use the Realtime Proxy mode: Avid DS converts the sequence format to a lower-sized HD resolution that still provides excellent visual quality for editing and previewing your sequence in a video monitor. For more details, see "Film Proxy Mode" on page 120.

- Use the Graphics-link mode: You can redirect your output through the graphics card to a second computer monitor. Even with high-resolution 2K sequences, Avid DS is capable of 10-bit 4:4:4 RGB color-managed display on either a computer monitor, or an external monitor—see "Using Avid DS Graphics-Link with an External Monitor" on page 118.

Only NVIDIA graphics cards with sufficient memory support this mode. For details on which cards are supported, see the Avid DS support website at www.avid.com.

Using Avid DS Graphics-Link with an External Monitor

If your Avid DS system is equiped with an appropriate NVIDIA graphics cards (refer to the Avid DS Support Center) you will be given the option to play back high-resolution sequences (HD or higher) on an external monitor. Using the GPU processor and the second output of the graphics card, Avid DS is capable of 10-bit 4:4:4 RGB color-managed display on either a computer monitor, or an external monitor such as DreamColor, Cine-tal or Barco.

To use the graphics card for output, you need to use Avid DS Graphics-Link (This application is available via an icon on your desktop). Avid DS Dual-Link and Avid DS Graphics-Link cannot be run at the same time. To change between these different modes, Avid DS must be closed and re-opened in the desired mode of operation.

To use the Avid DS Graphics-Link option:

1. Save your sequence and close Avid DS Dual-Link.

2. Open Avid DS (Graphics-Link) from the desktop.

While using Avid DS in the Graphics-Link (GL) mode, the dual-link card will still be used for audio playback, but all forms of capture will be disabled (even if the capture tool is available).

When viewing images on the external monitor, the sequence format is always maintained, regardless of the size of the connected monitor. Therefore, if the resolution of your monitor is smaller than the sequence resolution, the output will be reformatted in real time to fit the monitor's aspect ratio. For SD formats, the picture will not be upscaled and will display in the center of the screen.

The output settings can be changed via the Sequence Preferences dialog with the choice of None (Centers the image), 1080p padding (pad around the sides), or 1080p CenterCrop (do a center crop).

If your workstation has the supported hardware, sufficient memory and processing power, you may be able to view your high-resolution sequences in realtime.

You can also analyse the pixels in your image using the waveform monitor and histogram options on the secondary monitor view using the GL mode.

To display the waveform monitor or histogram on the secondary monitor:

1. Move your mouse over to the secondary monitor view and click on it.

   This viewer is now in focus and you can use the following keys on the main area of the keyboard:

To	Press
Enable/disable the waveform monitor	S
Show RGB value of each pixel	X (for row) C (for column)
When viewing colors in the waveform monitor, use the mouse to point and click on the area of the image that you want to analyse. The coordinates of the pixel and the RGB values will be displayed in the bottom left corner [x, y, R, G, B].	
Enable/disable the Histogram	H
View a histogram of individual Red, Green or Blue channel	R, G or B
When viewing colors in the histogram, the black and white level limits are set according to the sequence format. These are indicated by the two vertical lines on the left and right of your screen. The minimum and maximum range values are also indicated next to these lines.	
Change color of the lines in the histogram display	[or]
Lighten or darken the lines in the waveform monitor/histogram display	+ or -

2. To return the focus to your Avid DS Viewer on the primary monitor, move your mouse over to the viewer and click on it.

Real-Time Playback for High-Res Media

Linked files will be real-time for DPX and R3D formats if:

*   The resolution of the high-res files are supported for realtime playback on your system configuration—see the Avid DS support website at www.avid.com.

*   The high-res files are on your local videostorage that is large and fast enough to support high throughput.

*   The format of the high-res files exactly match the format of the current sequence.

*   The current sequence storage bit-depth is set to 10.

*   *For DPX*. The data in the DPX files are correctly aligned. This should almost always be the case. If not, the FixDPX utility can fix any misaligned data DPX files—see "Aligning your DPX Files" on page 111.

Film Proxy Mode

When editing high-resolution sequences (higher than HD), you have a choice of displaying and processing either in full resolution or real-time proxy resolution. The proxy is a lower-sized HD resolution that provides excellent visual quality for editing and previewing your sequence in a video monitor.

With proxy resolution, the correct aspect ratio is preserved in the Avid DS viewer as well as in the external HD monitor. Even an SD monitor can be used when working with 23.97, 29.97 and 25-fps sequences. In addition, color space is automatically taken into account by Avid DS to make the use of these proxies as transparent as possible.

When working in full resolution, the results of the processing can only be seen in the Avid DS viewer, as the external monitor is disabled. If your system has a graphics card that supports high-resolution formats, you can redirect your output to the external monitor—see "Using Avid DS Graphics-Link with an External Monitor" on page 118.

To work more quickly and efficiently, you can apply effects in the lower, real-time proxy resolution. In this mode, real-time effects do not need to be processed. If any effects do require processing, the resulting caches are also generated in real-time proxy resolution to save disk space.

If any effects were previously processed in full resolution, then Avid DS will use these caches instead of the proxy 4:2:2 caches.

When you are ready to output your final sequence, you can switch back to full resolution to process your effects. Processing in full resolution has the advantage of highly accurate processing using 4:4:4 RGB values.

When working in film proxy mode, note the following:

• You can work in either RGB 4:4:4 or YUV 4:2:2 color space. If you are applying effects that modify color, and you are outputting to RGB 4:4:4, then set the Color Space to 4:4:4.

• Proxy modes are determined by the type of sequence in which you are working. For example, when working with R3D files, the RGB 4:4:4 film proxy mode is used.

• You cannot enable viewer LUTs in YUV 4:2:2. However, you can use the LUTs effects on the Timeline as an effect. Do note that if you are using it to make color modifications, it is a good idea to work in a 4:4:4 proxy mode for an accurate color display.

• When in a shared collaborative environment using an AvidUnity/Avid ISIS, the Avid DNxHD proxies can easily be shared between Avid Media Composer HD and Avid DS systems. Avid DNxHD compression ratios are also available to you when you use proxy mode. For a description of these ratios—see "Avid DNxHD Compressions" in the Help for the Media Composer family.

Enabling Film Proxy Mode

Real-time proxy mode is only available on an Avid DS workstation that has the appropriate hardware. Otherwise, you can work in Full resolution which still gives you real-time playback of your media in the viewer, but not the external monitor.

To set your sequence preferences to work in proxy mode:

1. Select File > Sequence Preferences.

2. Set the Resolution to Real-time Proxy so that you can edit and add effects in real-time.

3. On Avid DS workstation, you can change the Compression to one of the Avid DNxHD compression formats.

   This will save you space on your storage device while you are editing your sequence.

4. Set Downconversion of HD/SD output to the appropriate setting so that you can feed your output to an external monitor and view the results.

   In the Avid DS viewer, the real-time proxy mode compensates for change in aspect ratio. For the external monitor output, you have the flexibility to either see a cropped version of the frames, or a centered and padded version. Internally, Avid DS still holds the entire frame.

5. Click OK to set the preferences.

Editing and Applying Effects in Film Proxy Mode

To work more quickly and efficiently, you can apply effects in the lower, real-time proxy resolution without having to process real-time effects do not need to be processed. If any effects do require processing, the resulting caches are also generated in real-time proxy resolution to save disk space. If any effects were previously processed in full resolution before the switch to the proxy mode, Avid DS will use these caches.

When you are ready to output your final sequence, you can switch back to full resolution to process your effects.

To edit and apply effects in proxy mode:

1. Load your sequence or clips onto the timeline.

If you cannot get realtime playback for your media, you can process your timeline. This generates media on your local storage based on the format of your sequence.

2. Perform the necessary edits, color correction, and addition of effects to your sequence.

   While applying effects such as Keyers or creating mattes, toggle between Proxy and full resolution modes by clicking the button with the green dot above the viewer.

3. If are applying a LUTs effect on the Timeline—see .

4. Switch back to full resolution mode and process the effects—see "Processing Effects" in the Help for Avid DS.

5. When ready to output, see .

Outputting Film Sequences

Avid DS supports output mastering of film-based projects to any of the original transfer formats.

You can output the film sequence to tape or to a digital file format such as Cineon or DPX. The delivery depends on how the output will be displayed. For example, for HD TV broadcast, you should output the final sequence to tape.

By default, the Sequence LUT is used when outputting to tape or to file. This ensures that the color information used when editing and applying effects in your sequence remains the same during output.

Ouputting to Multiple Formats

Outputting your sequence to multiple formats is known as *Universal Mastering*. If you are working in an HD sequence, you can easily deliver the same sequence to multiple formats such as film or NTSC formats. In the case of a film output, it is possible to output a final series of film-resolution images (2-4 K) for a film recorder.

To deliver to multiple formats:

1. Save the sequence after you are finished editing and applying special effects.

2. Create a new sequence making sure that you are using the same frame rate as the sequence you just saved.

3. In Avid DS, select the sequence and drag it on the timeline.

4. Output the sequence using the applicable settings.

Outputting DPX Files

In the case of a film output, it is possible to output a final series of DPX images for film recorder compatibility. All color information from the sequence LUT is also encoded within the DPX files.

To output a sequence to DPX or Cineon files:

1. Select View > Single-Instance Views > Output Tool.

2. Select the material to output. You can choose the entire timeline or specific in/out timecodes.

3. Click the To File button.

4. For File Type, select the file format which you want to export (DPX or Cineon).

   The DPX Export dialog box opens.

5. For the LUT, Avid DS will use the Sequence LUT that was set when the sequence was created. You may change this if necessary.

6. If you want to save a timecode on each frame in the file, select Export Timecode, and set the appropriate timecode start time.
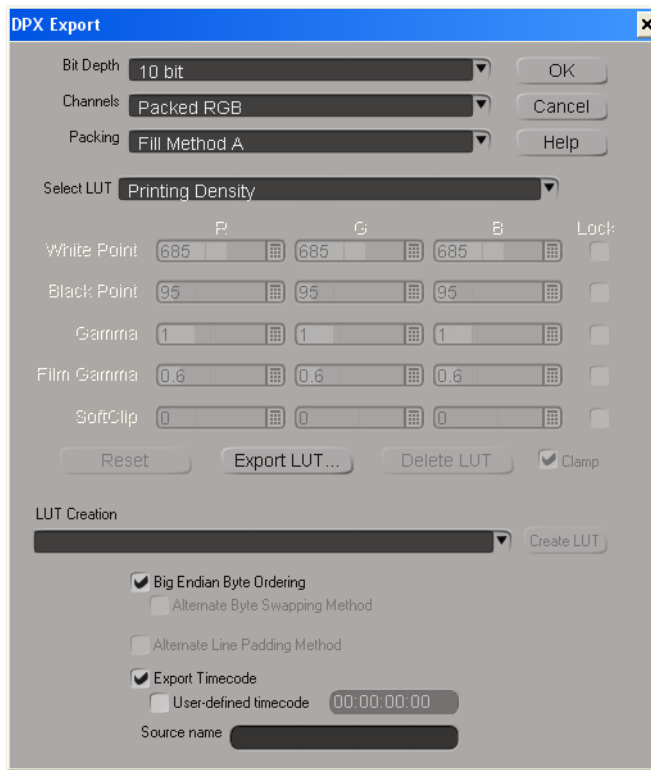
7. Click OK to save the settings.

8. In the Output Tool window, keep the Output Resolution at the defaults.

9. For the Output Options, select the appropriate Codec (if applicable).

10. Select the Preserve Alpha option if the sequence includes an alpha channel that you want to keep in the output file.

   This is useful if you plan to reuse the matte information in future compositing or graphics projects. However, not all file formats support alpha channels.

11. To resize your file, select Use Advanced Settings.

   Click the Help button for more information on the parameters in this dialog.

12. Click the Output button to begin the export.

13. Select a folder in which to save your material, enter a name for the file, and click Save.

   The material is processed, if necessary, exported to file, and placed in the selected folder.

14. Close the Output Tool dialog box.

Outputting to Tape

When you output to tape, the image size must match the resolution set in your Sequence Preferences.

To output to tape:

1. Do one of the following:

   ▶ From the NLE Tools toolbar above the timeline, click the Media IO button and select Output Tool.

   ▶ Select View > Single-Instance Views > Output Tool.

   The Output Tool opens.
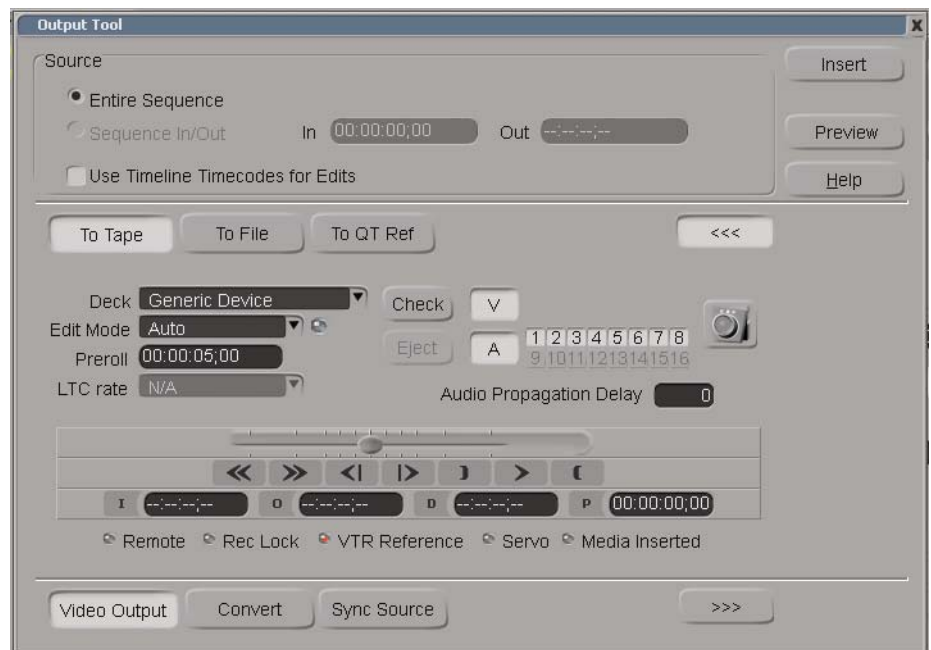
For information about options in the Output Tool, click Help.

2. Configure the external device and perform other necessary pre-output tasks. See "Preparing for Output" in the Help for Avid DS.

3. Click the To Tape button.

4. Select the Deck.

   The device that is currently active will display in the Deck list. You can select a another device preset from the list.

5. Click the Check button.

   If the link between the external device and your system is operating properly, nothing occurs. If there is a problem, a message box appears, stating the possible cause of the problem.

   You can also verify that the external device is operating within normal parameters by checking the five items in the External Device Status area, located beneath the transport controls. A green or red light beside each item displays its status. Items that are grayed out are inactive.

6. Select the Edit Mode, either Auto (Insert) or Assemble.

   This setting temporarily overrides the setting in the deck template but does not change it. For more information about Edit Mode, see "Configuring the External Device for Output" in the Help for Avid DS.

7. (Optional) Set a custom preroll for the deck.

   This setting also temporarily overrides the setting in the deck template but does not change it.

8. Make sure the Timeline/Deck button is set to Deck.

9. Click the track buttons (V, A1, A2, and so on) for the video and audio tracks you want to output.

10. If you are experiencing any frame delays in audio when you output your sequence to tape, enter the number of frames in the Audio Propagation Delay text box.

11. If you need to output your sequence to a lower resolution format than the current sequence setting, click the Convert button.

    Select the required output formats. The options that are available depend on the current video format. For a list of the available formats, see "Downconverted Output Formats and Sync Sources" in the Help for Avid DS.

12. If you have not selected the Use Timeline Timecodes for Edits option, specify the position on the tape where you want the program to start recording. Use the transport controls to locate the position or type a timecode in the I (In) field. See "Selecting an Area to Output" in the Help for Avid DS.

If you are insert editing your material, your tape must be properly striped with timecode before attempting to output your material.

13. (Optional) Click the Preview button to view your sequence before outputting to tape.

14. Click the Insert button. If you set the Edit mode to Assemble, then click the Assemble button.

    The selected media in your sequence is output to tape.

Linking Back to MXF Media on the Avid Offline Editing System

You can share MXF master clips captured or generated on Avid DS with other Avid editing systems. For HD media, you can share MXF DNxHD media only with other Avid systems that support it. To make this media available for use by Avid offline editing systems, you need to set up your storage areas accordingly.

To share MXF master clips created on Avid DS, follow this basic workflow:

1. Make sure any storage devices or Avid Unity workspaces are configured correctly.

2. On the Avid DS system:

   a. Create a project. In the New Sequence dialog box, select the proper capture settings: MXF storages (one for audio and one for video), desired compression, and so on. MXF storage can be shared (in an Avid Unity environment) or local (and later transferred).

   If you are going to capture audio from a multi-stream file, make sure to select the option "Import audio into separate audio tracks" in the New Sequence dialog box.

   b. Capture and edit the media.

   c. Export an AAF file—see "Outputting a Sequence to Avid Media Composer" in the Help for Avid DS.

3. If your media is not on a shared Unity storage, you will need to transfer media to the Avid editing system. Do one of the following:

   - If you are transferring media over a network, copy the MXF audio storage and the MXF video storage to the local drive.

   - If you are transferring media on a removable drive, connect the drive.

4. On the Avid editing system, open a project with a matching frame rate.

5. Import one or more AAF files.

   The Avid editing system creates a master clip for each AAF file.

6. Select the new master clips and select Clip > Relink.

   The Relink dialog box opens.

7. Deselect the option Relink only to media from the current project, accept the other defaults, and click OK.

   The master clips are relinked with the MXF media.

You can use the Media Tool to create master clips, but this method does not always work, for example, when a clip from Avid DS includes alpha.

Media Composer Macintosh systems, and other Macintosh-based Avid editors, cannot use MXF media created by Avid DS, due to a 31-character file name limit. This situation occurs when an Avid DS system creates a storage on a Unity volume to share with other Avid editing systems. This problem does not affect Windows systems.

11 Conforming AFEs and EDLs

Conforming is the re-creation of the offline project on an online editing system. Avid editing products are designed so you can easily move projects and media from one system to another and preserve your edits and effects. In a typical offline-to-online workflow, you create a program on an Avid offline editing system—choosing the footage, making edits, adding effects—and then transfer your project to another Avid system to continue with the final editing and finishing process. Projects can also be conformed to and from Avid systems and other 3rd-party editing systems.

You can transfer your projects with or without media. If you intend to use the same media for offline and online editing, you can access the media in several ways—such as sharing media on Avid shared storage, or transferring removable drives from one system to another. After the project is conformed, the clips and sequences automatically link to the media, and you can continue with the final finishing. If you are not sharing media, then you simply need to recapture the media in Avid DS.

Finishing involves the actual tasks to be performed when you have the media in its final resolution. Finishing is typically done on an online editing system such as Avid DS. These jobs might involve compositing, making color corrections, and applying effects before outputting the final master.

Conforming with AAF/AFE Files

Avid DS cannot directly open projects from Media Composer or other Avid editing applications. To transfer bins, clips, or sequences to Avid DS, you must use an intermediate file format such as Advanced File Exchange (AFE) or Advanced Authoring Format (AAF). You need the AAF or AFE file for the online session.

AAF files can have only a single sequence, while AFE files can contain more than one bin or sequence. You can use either format when transferring media outputs from Media Composer to Avid DS.

Importing AFE/AAF Files

You can import an AFE or AAF file from an Avid editing system such as Avid Media Composer.

📖 *AFE (Avid File Exchange), is the preferred method of conforming sequences created on other Avid editing systems as it offers the highest level of conform capability.*

To import an AFE file:

1. Open a new project in Avid DS in the format in which you intend to output your final sequence. Make sure the frame rate matches the project you are conforming from the offline system.

2. You have a few options for importing your projects and media:

Option	Action
If clips were linked via AMA on Media Composer and you would like to relink to the same clips	Make sure that you have access to the folders where the project files (AFE, EDL, ALE) and media are located on the Media Composer system.
If you are transferring the AFE and/or media to the Avid DS system	Copy the AFE and other project files that you may require (e.g. EDL, ALE,) to the local project folder that was established when you created your project in Avid DS. e.g. C:\DS Projects\DS v.x\Casino\... If you are not sharing the same media folder that was used by the offline system, then you must copy your media to a storage area that is managed by Avid DS. During the import process, you will be able to redirect Avid DS to this storage area.

3. In Avid DS, navigate to the folder where you placed the offline project files, and double-click the AFE.

AFE file ———
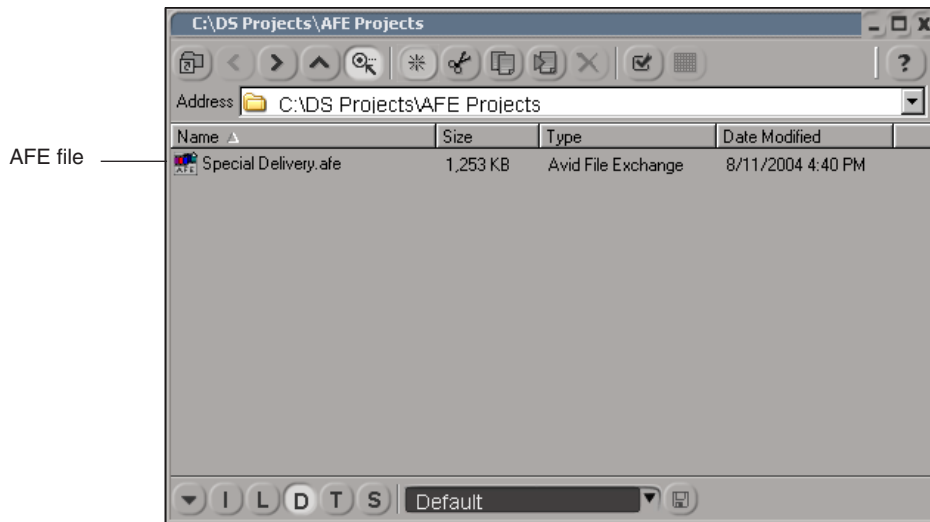
The bins used in the offline will display in the lower area of the screen.
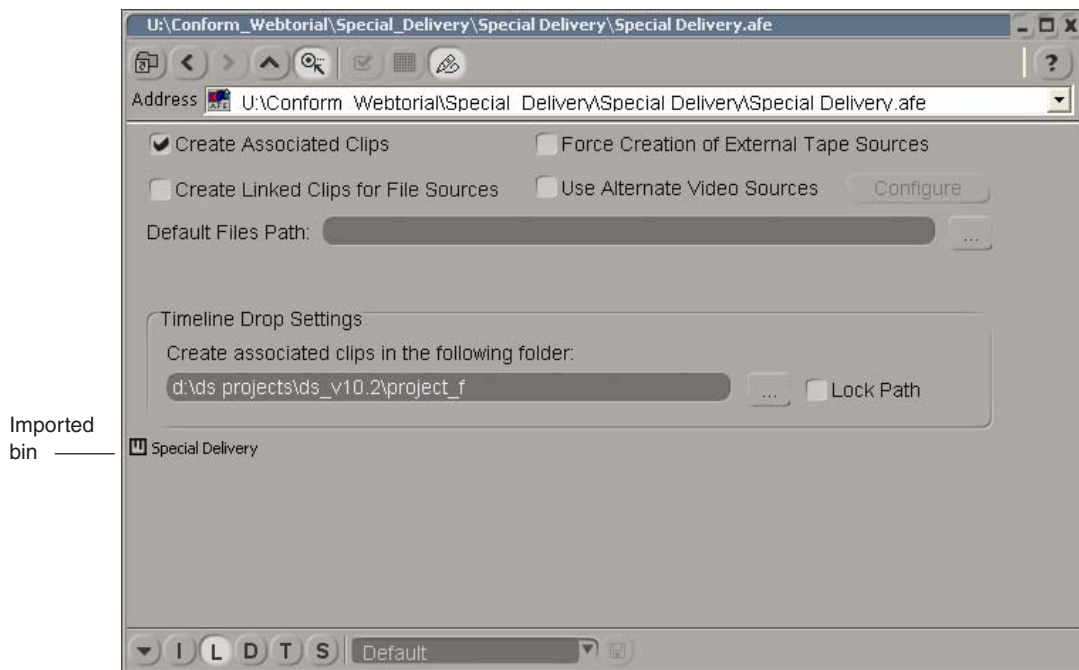
Imported
bin ———

4. To recreate the master clips in Avid DS, you should always select "Create Associated Clips", and select the folder where you want to place the master clips using "Create associated clips in the following folder" option.

This creates master clips in the Avid Explorer so that you always have the masters in case any clips from the timeline are deleted. You do not need to select this option if you already created master clips and you want to avoid creating a duplicate set. (Duplicate clips are numbered sequentially beginning with 001.)

Select Lock Path to keep the same folder for any new master clips. Deselect this option if you want to create subfolders that match the names of the imported bins. This allows you to keep the original structure for your bins and clips as it was in Media Composer.

5. To continue with the conform process, follow the procedure below that best describes the media that you intend to use.

If your sequence contains several types of media, you will have to conform it once per type of media, and replace them manually on the final sequence.

Conform Scenario	Go to
Conform with the same media that was originally linked via AMA on Media Composer/Symphony (R3D, MXF)	"Conforming with Media Originally Linked via AMA on the Offline Editing System" on page 132
Conform with media from alternate sources (i.e. original files such as R3D, DPX, ARRI)	"Conforming with Media from Alternate Sources" on page 134
Conform with media captured/generated by the offline editing system (MXF)	"Conforming with Media Already Captured/Generated by the Offline System" on page 138

Conforming with Media Originally Linked via AMA on the Offline Editing System

If you used AMA to link to your RED or QuickTime media during the offline editing session, these links will be preserved when you export the AFE of the sequence. If you are using a shared storage area, simply make sure that Avid DS has access to this media. If you have transferred media from the Media Composer system to a different location so that it can be accessed by Avid DS, you must enter the new path in Default Files Path.

To link to the same media used via AMA:

1. Make sure that you have loaded your AFE into Avid DS as described in "Importing AFE/AAF Files" on page 129.

2. Double-click an imported bin to display its contents.
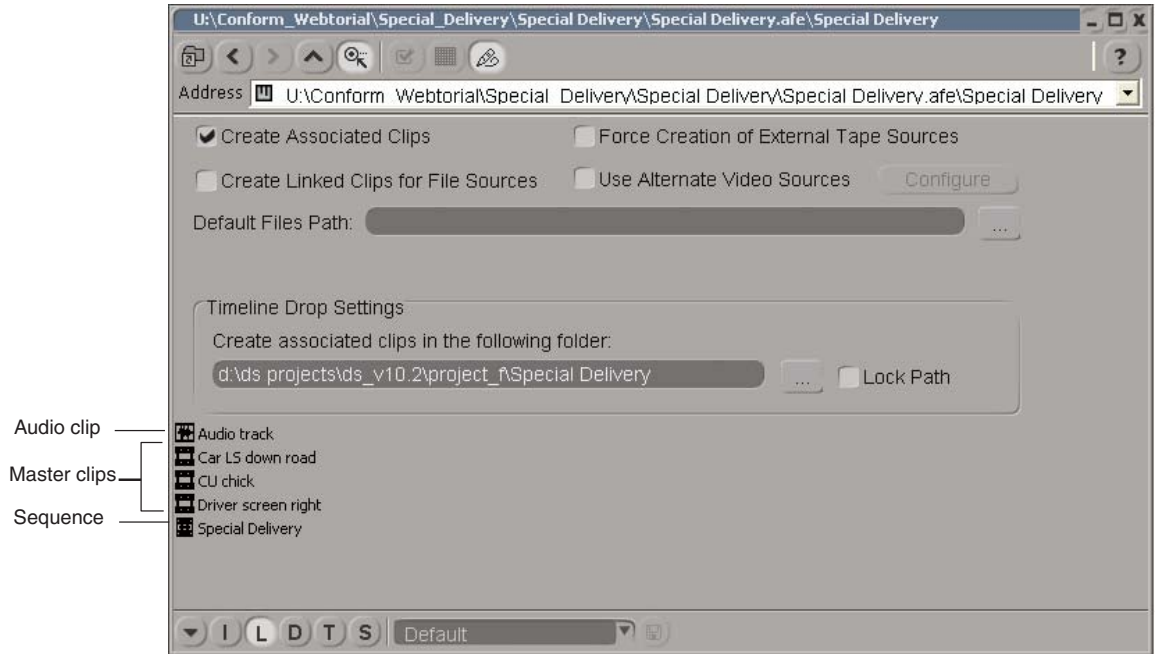
The contents can include master clips, subclips, and sequences. For a description of Avid editing system icons, see "AAF/AFE List" in the Help.

The columns displayed in the bin view can show all the metadata within the AFE file (select **D**etails view). You can show or hide selected columns, as described in "Customizing the Details and Script Views" in the Help.

3. To recreate the master clips in Avid DS, you should always select "Create Associated Clips", and select the folder where you want to place the master clips using "Create associated clips in the following folder" option.

   This creates master clips in the Avid Explorer so that you always have the masters in case any clips from the timeline are deleted. You do not need to select this option if you already created master clips and you want to avoid creating a duplicate set. (Duplicate clips are numbered sequentially beginning with 001.)

   Select Lock Path to keep the same folder for any new master clips. Do not select this option if you want to create subfolders that match the names of the imported bins. This allows you to keep the original structure for your bins and clips as it was in Media Composer.

4. Select Create Linked Clips for File Sources.

   By default, these linked clips will be created in a folder with the same name as the bin that was opened.

5. Do NOT select Force Creation of External Tape Sources and Use Alternate Video Sources.

6. *If you are linking to a storage shared by the Media Composer system*, Avid DS will use the same path specified in the AFE/AAF.

    If you have transferred media from the Media Composer system to a location where it can be accessed by Avid DS, you must enter the new path in Default Files Path.

    Avid DS will use this path instead of the location specified in the AFE/AAF.

7. Select a sequence from the bin in the AFE view, and drop it onto the timeline.

    The conform begins and a progress bar displays during the process.

    The clips and associated media will display in the timeline. In the Avid Explorer, the folder for your master clips will show these clips with a red underline to indicated that they are linked.

    If any errors were detected during the conform process, a message box displays a summary of the information contained in the AAF/AFE Conform Log and asks if you want to view the log.

8. All clips should automatically relink to the source media.

    To confirm this, go to the project folder, and open the bin where the clips were created.

    Any clips without media will have a red underline. To find the missing media, see "Relinking Missing Clips" on page 140.

Conforming with Media from Alternate Sources

If the offline editing was done with proxy resolutions (MXF) of media and you want to link to or recapture the original high-res DPX, Cineon, ARRI, or QuickTime media for finishing in Avid DS, you can simply point the conformed sequences to an alternate media source.

The clips must have timecode/edgecode and tape name information that matches with the same information found in the alternate sources scanned by Avid DS.

To link to alternate media sources:

1. Make sure that you have loaded your AFE/AAF into Avid DS as described in "Importing AFE/AAF Files" on page 129.

2. Double-click an imported bin to display its contents.
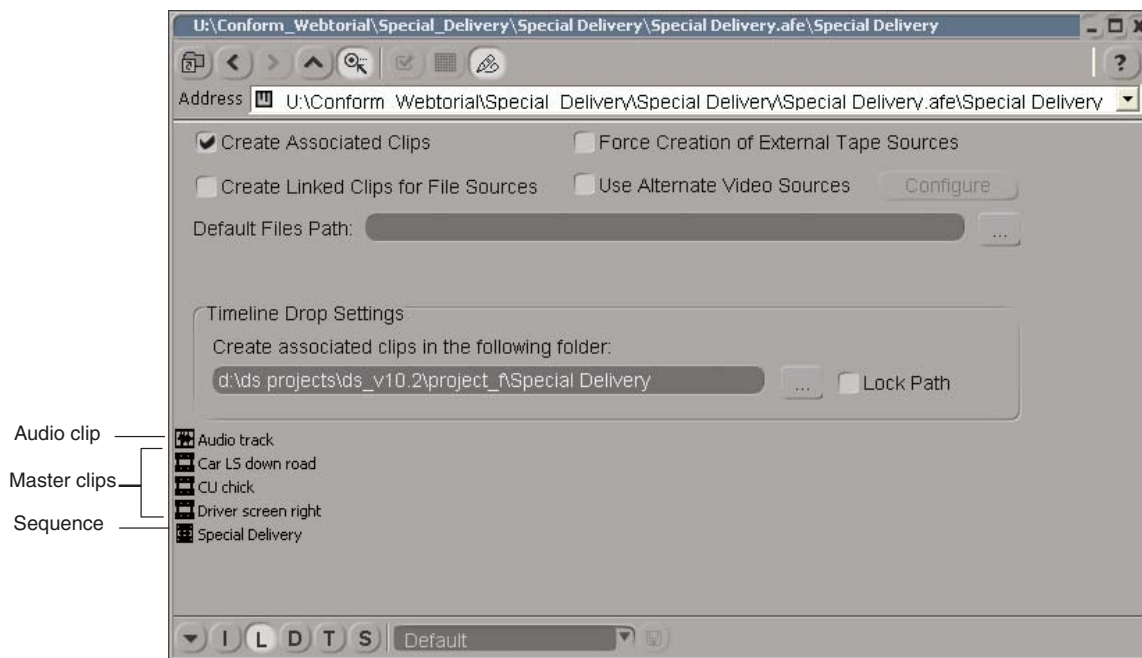
The contents can include master clips, subclips, and sequences. For a description of Avid editing system icons, see "AAF/AFE List" in the Help.

The columns displayed in the bin view can show all the metadata within the AFE file (select **D**etails view). You can show or hide selected columns, as described in "Customizing the Details and Script Views" in the Help.

3. Select Create Linked Clips for File Sources and Use Alternate Video Sources.

4. Click Configure.

The Choose Alternate Video Sources dialog opens so that you can select the high-resolution files to which you want to link.

5. In the Choose Alternate Video Sources dialog, select Quick browse.

6. Click Select Root Folder and browse to the folder where the original media is located.

7. Select the folder that needs to be scanned and click Select.

Click Select again if Windows prompts you with subfolders. You do not need to select a subfolder as all folders under the folder you select will also be scanned.
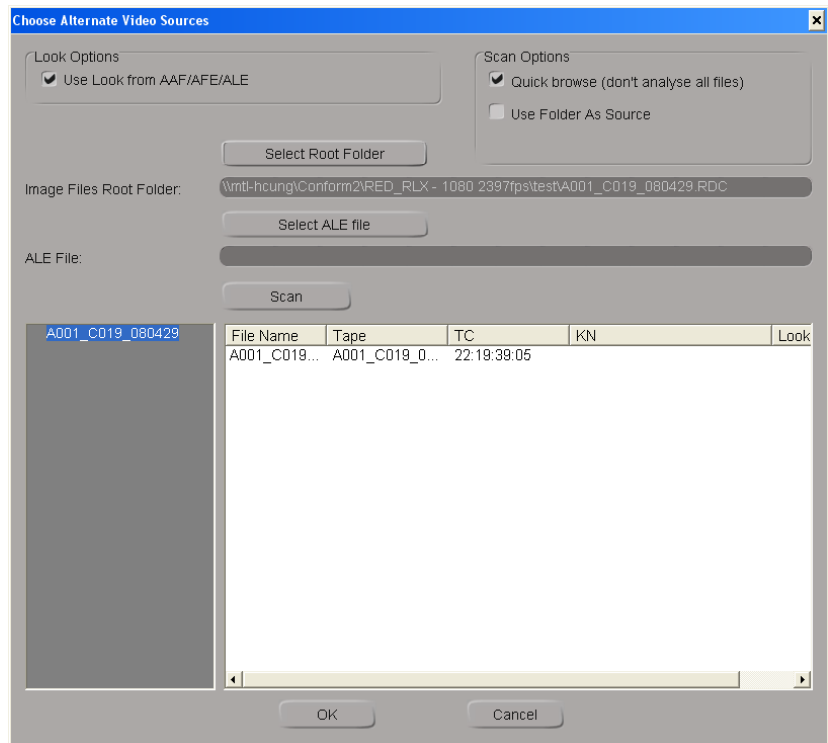
8. (Optional) If you want to use an ALE to make the relationship between the corresponding AFE/AAF/EDL timecode/KeyKode edits, click the option for Select ALE File, and browse to the folder where the ALE file is located.

9. (Optional) If you are using media that has an associated "look" or LUT file holding additional color information (e.g. .RLX, .RSX, .RMD), then select the Look options: Use Look from AAF/AFE/ALE.

Media type	File Location
DPX/Cineon	All associated LUTs must be placed in the LUT folder under your project folder. The AFE contains the name for the LUT associated to each DPX file.
RED	If a look file (RLX/RSX/RMD) is associated with a clip in the AFE/AAF, it will be used as the primary source of settings. (The name of the look file does not have to match the name of the R3D file.)

Media type	File Location
	For RSX or RMD files. If the name matches the source, then place it in the same folder as the R3D files. They will be used when you begin the scan. If both RMD and RSX files of the same name are present, then the RMD file will be given preference.
	For RLX files. Place them in the RLX folder under your project folder.
ARRI	XML files are located in the LUT or XML folder in the path where Avid DS is installed. (This folder was created when the ARRI plug-in was installed.)

10. Click Scan.

    The folder is scanned, collecting the metadata that it contains, to display the timecode and/or KeyKode associated to each file referenced in the EDL/AFE/AAF.

    When you scan your files, Avid DS retrieves the metadata in the files (i.e. timecode, KeyKode, tapename) and does the following:

If...	Then...
The DPX files contain the tape source information (i.e. tape name and timecode)	A direct association is made between the file's timecode/tapename, and the edited sequence's timecodes/tapenames.
The DPX files only contain timecodes	An association is made with the file's timecodes, and the folder in which the file is located is used as the "tape name".
The DPX files only contain film source info (i.e. KeyKode), or you want the KeyKode rather than the timecode	In this case, you must also specify an ALE file to allow Avid DS to create the association between the scanned file's KeyKode, and the edited sequence's timecodes/tapenames. (The ALE can come from the film house, MetaFuze or Avid Media Composer).

A User Settings dialog box opens and the first scanned file is displayed in the viewer. The settings you choose here will be applied to all sequential files imported. These settings can be overidden by For more information on the options in this dialog box, click Help.

11. Click OK to close the Import dialog box.

    The list of files found will be displayed.

12. Click OK to close the Choose Alternate Video Sources dialog box.

Avid DS can only conform media of one type at a time. If you have selected a root folder than contains more than one type of media, you will be prompted to select the media type. The following are the choice of files that you can conform:

Media Type	Description
R3D (RSX/Metadata)	Parameters in the R3D file may be overidden if different values are found in a corresponding RMD/RSX file. The RMD/RSX file is only used if it has the same name as the R3D file. If both an RMD and an RSX file exist, then preference is given to the RMD file. (RSX uses Color Science 1, and RMD uses Color Science 2)
	If you prefer to use your own Custom settings, then you can set specific parameters that you want to override for any previously applied settings.
	Finally, you can link to a LUT file to override specific parameters that have already been set in the above process.
R3D (Custom)	Conform RED media using settings of your choice. In this case, a RED property editor will display to allow you to choose the color values.
ARI	Conform ARRI media.
DPX	Conform DPX files.

13. Select a sequence from the bin in the AFE view, and drop it onto the timeline.

The conform begins and a progress bar displays during the process.

The clips will display in the timeline and will link to the associated media.

If any errors were detected during the conform process, a message box displays a summary of the information contained in the AAF/AFE Conform Log and asks if you want to view the log. If you have clips with missing media, see "Relinking Missing Clips" on page 140.

Conforming with Media Already Captured/Generated by the Offline System

If you want to use the MXF media that was already captured or generated on the offline editing system, make sure that Avid DS has access to this media—see "Sharing MXF Media" in the Help.

To link to existing media from the offline system:

1. Make sure that you have loaded your AFE/AAF into Avid DS as described in "Importing AFE/AAF Files" on page 129.

2. Double-click an imported bin to display its contents.

The contents can include master clips, subclips, and sequences. For a description of Avid editing system icons, see "AAF/AFE List" in the Help.

The columns displayed in the bin view can show all the metadata within the AFE file (select **D**etails view). You can show or hide selected columns, as described in "Customizing the Details and Script Views" in the Help.

3. Only select Create Associated Clips , and use the "Create associated clips in the following folder" option to specify the folder where you want to place the master clips.

4. Do NOT select any other options.

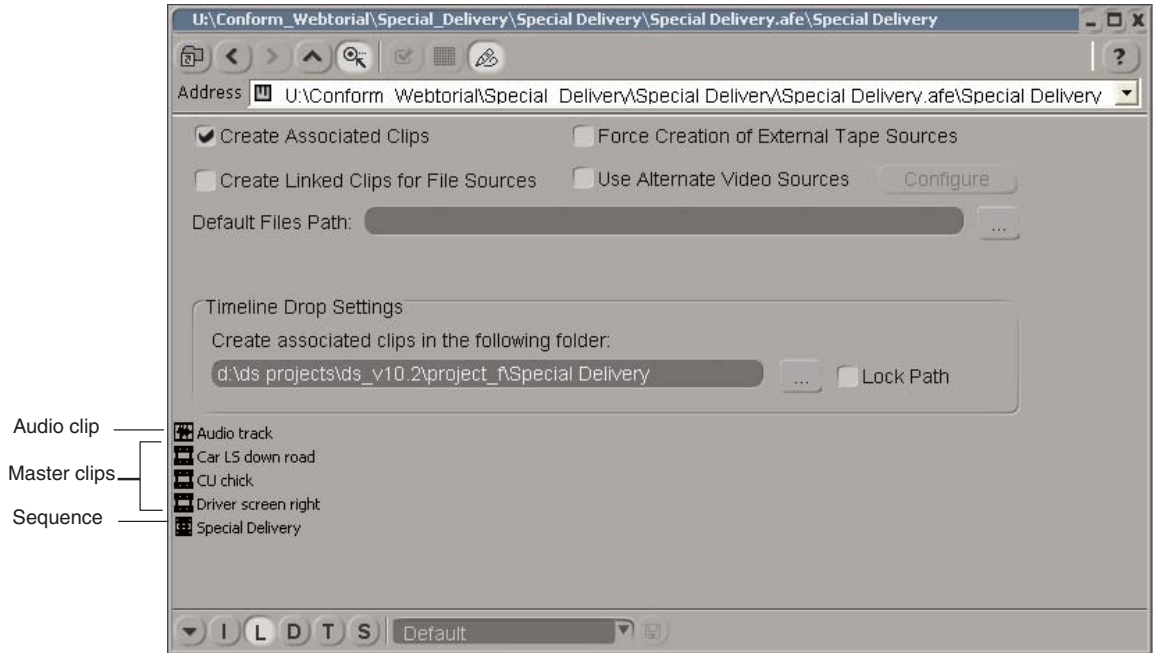5. Select a sequence from the bin in the AFE view, and drop it onto the timeline.

The conform begins and a progress bar displays during the process. Avid DS automatically scans your configured storage areas for the MXF media.

The clips and associated media will display in the timeline. In the Avid Explorer, the folder that was selected for the associated master clips will contain the master clips.

If you are working with MXF media from an Avid editing application, with resolution that does not match your current Avid DS sequence compression, select the "Use the Closest Media Available" option in the Sequence Preferences dialog box.

If any errors were detected during the conform process, a message box displays a summary of the information contained in the AAF/AFE Conform Log and asks if you want to view the log. If you have clips with missing media, see "Relinking Missing Clips" on page 140.

Relinking Missing Clips

When importing an AFE sequence from Media Composer that has links to media (either AMA-linked or MXF), you can relink to, or recapture from that same media when you conform the sequence in Avid DS. If you are not able to relink to this media, the Capture/Link list can help you find your media.

The Capture/Link list allows you to quickly see the state of linked files (missing or available) and help re-establish the links to missing files. Each time you manually relink to a clip, any other missing files found in that relative path will also have the link re-established.

For example, if you have these two missing files in the list:

- ClipA => d:\media\old\bar\A.mov
- ClipB => d:\media\old\set\folder\B.mxf

If you make a manual fix of the path, ClipA now points to: *d:\media\this\new\folder*\bar\A.mov.

Avid DS will look for B.mxf in *d:\media\this\new\folder*\set\folder\ and automatically fix the path for ClipB if the file can be found. This can be really helpful for fixing links to newly-created linked clips after a conform.

To search for clips with missing media:

1. Make sure that the Capture/Link list feature is enabled in Avid DS.

   Select File > User Preferences.

2. From the Data Management tab, select the Use Capture/Link List option, and click OK.

3. Navigate to the project folder where your master clips were created, right-click on any clip in that folder, and select Relink.

   The Capture/Link List displays the status of all clips in that folder.

   Clips that have missing media will be displayed in red. Clips that have partially missing media will be displayed in yellow.
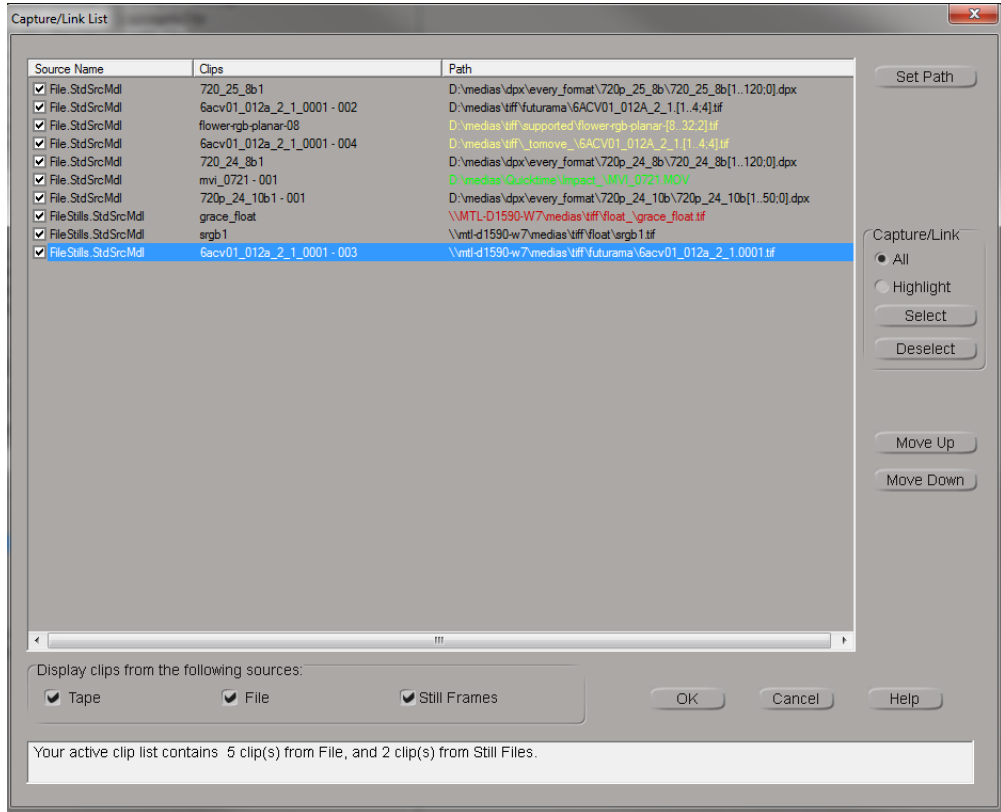
4. Ctrl-click to select all the clips whose paths need to be fixed.

   The selected clips will be highlighted in bright blue.

> *If you have many clips that reside in the same folder, then only one clip in that path needs to be selected. Avid DS will automatically look for other clips in that folder (or in the same relative path), and automatically fix the path if the files can be found.*

5. Click the Set Path button.

6. Navigate to the folder where the media is now located and select one of the missing files. The source media file must have the same name and duration in order for the path to be established.

7. Click Ok.

   All clips that are found during this operation will be displayed in green.

8. Before you begin the relink or recapture process, you can filter the list of files, or change the priority of clips by moving them up or down in the list—see Capture/Link List.

9. Select the clips that you want to relink or recapture by selecting the checkbox next to the source name.

10. Click Ok to begin the capture or relink process.

Real-Time Playback for High-Res Media

Linked files will be real-time for DPX and R3D formats if:

• The resolution of the high-res files are supported for realtime playback on your system configuration—see the Avid DS support website at www.avid.com.

• The high-res files are on your local videostorage that is large and fast enough to support high throughput.

• The format of the high-res files exactly match the format of the current sequence.

• The current sequence storage bit-depth is set to 10 and uses the RGB 4:4:4 color space.

• *For DPX*. The data in the DPX files are correctly aligned. This should almost always be the case. If not, the FixDPX utility can fix any misaligned data DPX files—see "Aligning your DPX Files" in the Avid DS help.

Conforming an EDL File

An edit decision list (EDL) is a detailed list of the edits contained in a sequence, including all the timecode and supported effects information required to re-create the sequence on an online editing system. Avid DS accommodates EDLs from many different systems.

When conforming your EDL, you have the choice of logging events in the Avid Explorer, recreating the list of events on the timeline, or both. Once you log the events, you can capture the media from either the Avid Explorer or the timeline. For more information, see "Batch Capturing" in the Help.

Before conforming your EDL, check if there are any layers to be composited. Offline editors often create multiple EDLs since the EDL format does not support more than one video track.

During the conform process, you can set up the appropriate heads and tails values for each clip. This is important if you need additional material at the beginning and end of each clip to do minor changes during the final stage of the edit. You can also configure the audio channel patching for each tape.

If the proofing session is successful, you can then remove the video track you added and continue to add effects and finishing touches to the original sequence.

To conform an EDL file:

1. Open a new project in Avid DS in the format in which you intend to output your final sequence.

2. From your offline editing system, take the EDL and other project files that you may require for the sequence that you are conforming, and copy them to the local project folder that was established when you created your project in Avid DS.

   e.g. C:\DS Projects\DS v.x\Casino\...

3. In Avid DS, select View > Single-instance Views > EDL.

4. Load an edit list in the EDL view.

   The selected EDL is displayed in the EDL view. The EDL view lets you import an EDL file produced on any external system, and capture material based on the edits in that EDL. For more information about the EDL view, click the Help button.

Conform EDL   Record in-point

```
Ev#    Source   Mode   Tran   Dur   Source In    Source Out   Record In     Record Out
TITLE: Master timeline
*DS type=header major=1 minor=0
*DS type=header frame-rate=24 fcm=non-drop-frame
*DS type=header sort-order=none [same as file] note-placement=below
* Track 'V1' is in EDL 'RogerVA12_multiedit_V1.edl', with time span of [00:00:00:00,00:00:...
0002   ROGER    A1     C            01:00:25:00  01:00:26:16  00:00:00:00   00:00:01:16
0003   ROGER    A2     C            01:00:25:00  01:00:26:16  00:00:00:00   00:00:01:16
0004   ROGER    A1     C            01:00:25:00  01:00:26:16  00:00:01:16   00:00:03:08
0005   ROGER    A2     C            01:00:25:00  01:00:26:16  00:00:01:16   00:00:03:08
0006   ROGER    A2     C            01:00:25:00  01:00:26:16  00:00:03:08   00:00:05:00
0007   ROGER    A1     C            01:00:25:00  01:00:26:16  00:00:03:08   00:00:05:00
0008   ROGER    A1     C            01:00:25:00  01:00:26:16  00:00:05:00   00:00:06:16
0009   ROGER    A2     C            01:00:25:00  01:00:26:16  00:00:05:00   00:00:06:16
```

If you selected the wrong file type, you are prompted to convert the file to the appropriate type.

5. From the EDL view, click the Conform EDL button.

   The EDL Conform dialog box opens.

📖 *You can capture all events in the edit list, or Ctrl+click separate events for the source material you want to capture.*

6. If you want to log clips, select the folder for the clips you create. The folder path text box lists the default folder. Click the browse (...) button to select a new folder.

7. Select one of the following options:

Option	Description
Create Logs	Creates a log of events in the selected folder.
Create Timeline Clips	Recreates the events on the timeline.
Create Both	Create both a log of events in the selected folder and a sequence based on the EDL events.

8. Select the Overwrite Video Track option to overwrite clips on the timeline at the same timecodes. If you deselect this option, clips are added to new video tracks.
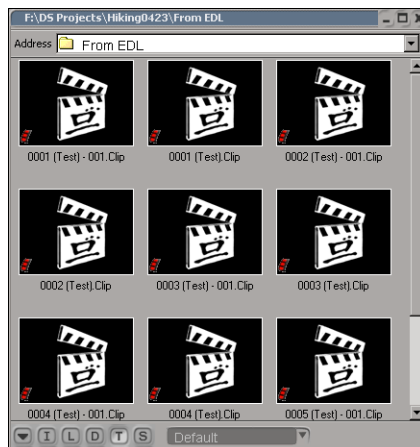
9. To add material before the In point and after the Out point of all tape sources, type the appropriate number of frames in the Heads and Tails text boxes.

10. If you need to reconfigure the audio tracks, select a name from the Tape Name list and then click the audio channel routing matrix to assign the incoming audio tracks to an audio channel.

Audio channel routing matrix
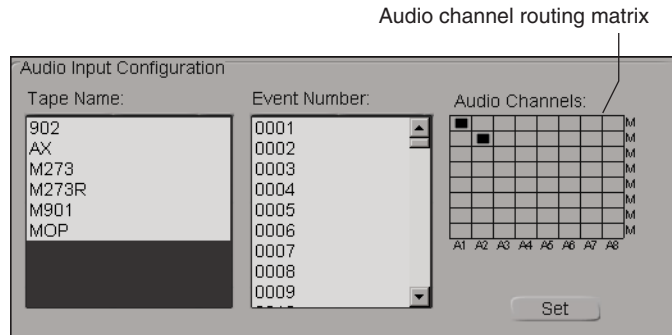
You can assign each tape name to separate audio channels, or you can Ctrl+click multiple tape names and assign them to the same audio channel.

11. Click Set after each audio track assignment to save the settings.

12. Click Conform to begin conforming the EDL.

If Avid DS cannot find the media associated to these clips, it recreates the events on the timeline as empty clips and creates master clips in the selected folder for each event. When you open the folder in a bin, the clip icons appear red since they have no available media. You can then recapture the media for these clips.

📑 *Audio events in the edit list do not support stereo clips. When the conform creates a stereo clip (two streams) on the timeline, it splits the clip onto two mono tracks with one stream on each track.*

13. If your digital master is in DPX, QuickTime, R3D, or ARI file format, select Use Alternate Video Sources and click Configure.

14. Click the Conform button.

   The log/linked clips are created on the timeline.
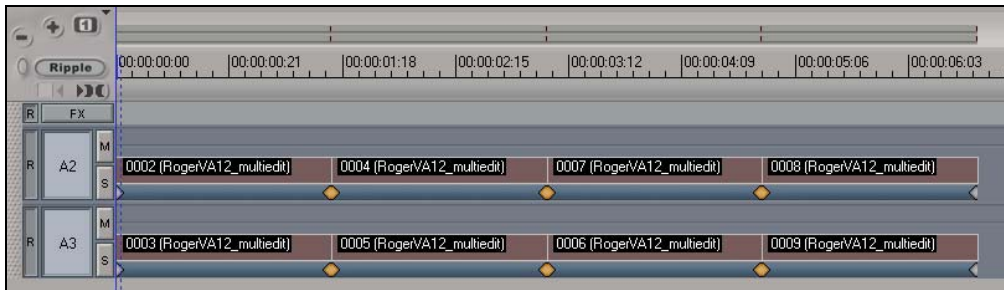
📑 *Audio is ignored when conforming DPX files. You will need to import the audio separately.*

12 Color Management in Avid DS

When high-resolution files are transferred through the Telecine process to tape or scanned to DPX files, the storage of color data can be compromised. Furthermore, the different types of monitors used in post-production sites when editing and finishing clips can display inconsistent color data or information.

Proper color management requires that the monitors are calibrated to give editors and artists a uniform view of the footage being used. Color management in Avid DS ensures that the color information from acquisition (capture) to delivery (output) is accurate, consistent, and undistorted. Additionally, it helps guarantee that the colors of the output, even when footage is acquired from different sources, is standardized across all display devices such as CRT and LCD monitors or projectors. This guarantee is accomplished with the use of Lookup Tables (LUTs).

Before you begin using LUTs in Avid DS, do the following:

- Profile all monitors being used at the site to get the existing color data being displayed, and then calibrate the monitors according to the site's workflow. This preliminary practice ensures consistent color display on all monitors.

- Clearly understand the type of final output that the client wants as this determines the LUT file that will be applied. For example, the client may want the final output to be broadcast on television, projected in the cinema, or both.

Lookup Tables (LUTs)

A LUT is a file that contains a conversion table used to map an input color value to an output color value.

In Avid DS, LUTs are used for the following reasons:

- To ensure a standardized color output value across different devices such as computer monitors, broadcast monitors, and film projectors.

- To offer flexibility in editing and post-production when working with media from different sources or shot with different cameras.

- To convert logarithmic media files to linear format prior to editing and applying effects.

- To determine how the color data of the final image will be displayed.

- For creative or artistic purposes to obtain a particular "look and feel" to a scene.

Avid DS supports two different types of LUT formats:

- 1D LUT: A 1-dimensional lookup table maps each input channel value to an output channel value on a per-channel basis (independently for each channel R, G, and B). LUT formats from Apple, Autodesk, Avid, and Nucoda are supported.

- 3D LUT: A 3-dimensional lookup table maps any given color value (R,G,B) to an output color value (R, G, B). Mistika, Thomson Luther, Kodak KDM, Iridias formats are supported.

Since high-resolution media can originate from a traditional film reel or from more recent technology such as a digital camera, there are a number of ways to preserve the color values in this media. There are three common acquisition methods:

Film Transferred to HD Tape

After the initial chemical development stage of the original color negative, footage originating from traditional film cameras can be transferred through Telecine onto a tape in HD format. The media from film has a LUT file that is determined by the color management and calibration process during the transfer process from film to tape.

Example: Footage for television is shot and transferred to a tape in HD RGB 4:4:4 format. The LUT is delivered with the footage.

Film Scanned to High-Resolution Files

Film-reel footage from a camera is scanned at a film-scanning facility to a series of logarithmic-based files. The facility delivers a series of file-based media such as DPX with an accompanying LUT that was used for color calibration and the calculation of how the film scanner interpreted the film stock's density and color data.

Example: Footage is sent to a film-scanning facility from which a series of DPX or Cineon files are produced. These files are then packaged and sent to the post-production site for editorial and special effects work. The LUT is delivered together with the series of files.

High-Resolution Files from a Digital Camera

Digital footage comes directly from the digital camera in a series of linear-based files. This media has a corresponding LUT. For example, R3D files from a RED ONE camera will have their own LUT.

Example: Footage is shot using the RED camera and stored as compressed linear-based native R3D files. An RLX file, generated at the time of acquisition, can also be loaded to provide additional color information of the new footage. (This RLX file can be imported at the same time you import the RED media.)
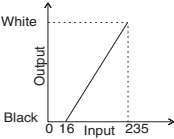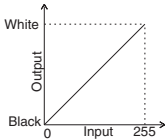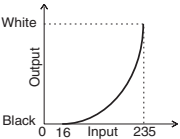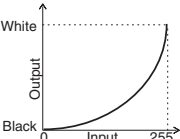
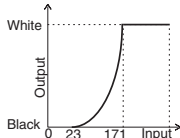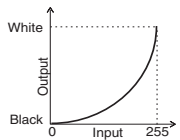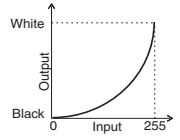## Industry LUT Presets Available in Avid DS

Avid DS provides a list of industry LUT presets that you can use when starting a new sequence or capturing media. These are available when you set the LUT option from the New Project dialog box. You can also customize these presets and save them for future use.

Refer to the following table for the default values of the Black and White points and the Gamma. For example, if you start a new sequence in 8-bit and you select ITU 601/709, color values of 16 are mapped to black in Avid DS.

If you need to use the full color range, regardless of the standard black and white levels, you can disable the clamp option so that Avid DS preserves the full pixel range ("SuperBlack" and "SuperWhite") throughout the process. You can create an unclamped version for any of your custom-made LUTs simply by deselecting the Clamp option in the LUT editor. Once the LUT is created, it will be available in the list of LUTs for all the new sequences that you create.

LUT Presets	Description	Default Black point (8-bit/10-bit)	Default White point (8bit/10bit)	Default Gamma	
Linear	Creates a linear curve letting you adjust the black and white points only. The gamma value is always 1 and cannot be adjusted.	0/0	255/1023	1	
Linear Video	Creates a linear curve letting you adjust the black and white points only which by default are set to the standard video levels.	16/64	235/940	1	

LUT Presets	Description	Default Black point (8-bit/10-bit)	Default White point (8bit/10bit)	Default Gamma	
ITU 601/709	Used with both SD and HD workflows. SD uses 601 values, while HD uses 709 values.	16/64	235/940	2.2	
DCI Gamma	Similar to ITU 601/709, it creates a straight gamma 2.6 but without a linear breakpoint or linear segment. Used for the DCI workflow.	0/0	255/1023	2.6	
Printing Density	Used mostly with Cineon or DPX files that derive from the film scanning process. 🗎 *This LUT automatically clamps the high white values. If you prefer to use the unclamped version, refer to the "Custom or Camera LUT Presets" on page 151.*	23/95	171/685	1.66	
sRGB	The gamma is similar to ITU 601/709. Used mostly when working with standard and CRT monitors, for example to create movies for the web.	0/0	255/1023	2.2	
Legacy Graphics	Creates a linear curve letting you adjust the black and white points as well the black and white gain values.	0/0	255/1023	2.2	

Custom or Camera LUT Presets

Avid DS also provides custom LUTs that are optimized to work with specific industry cameras such as the RED, Viper, and Panavision cameras. For example, the REDLOG LUT has been optimized for the RED Camera sensor and is the best choice for preserving most of the color data in the R3D file during capture in Avid DS. These custom/camera LUTs are found in the **/DS_v10.x/Luts/Lut presets** folder and can be used if one has not been provided with your footage.

The following table describes the custom/camera LUTs that are available in Avid DS:

Custom LUT	Description
Viper	Normalizes images shot using the Thomson Viper Camera. This LUT is used only when the camera is in RGB 4:4:4 filmstream mode.
	Note that this LUT linearizes the logarithmic color data from the Viper Camera without affecting the white balance. Use the color correction effect to balance the white color value in the image.
RED LOG	Provided by the Red One Camera. R3D files are already in a linear-based format, however this LUT optimizes the visual quality of color data when a 16-bit image is stored in 10-bit.
Printing Density unclamp	The Printing Density LUT is provided with the film print stock. It is used mostly with Cineon or DPX files that derive from the film scanning process.
	The Printing Density Unclamp is the unclamped version and is used so the LUT can be reversed transparently. Note that you can create an unclamped version for any of your custom-made LUTs simply by deselecting the Clamp option.
PDLog985	Uses the Printing Density Linear to Logarithmic function with the black point at 95 and the white point at 985.
	It can be used for Cineon or DPX files that are derived from the film scanning process.
	Because this LUT has a wide dynamic range, set the Processing Precision option to 32-bit float when creating a new project or sequence.
Panalog	Provided by the Panavision Camera. It is used to convert a 14-bit image to a 10-bit log file.
	Similar to the PDLog985 LUT, the Panalog LUT has a wide dynamic range so set the Processing Precision option to 32-bit float when creating a new project or sequence.

External Monitoring LUT Presets

If you are using an external broadcast monitor that accepts LUTs, you can upload external monitor presets from the **/DS_v10.x/Luts/External Monitoring Luts** folder. These LUTS should be applied if you want to view the image with its true color settings. This LUT converts linear back to log for viewing purposes.

The following table describes the external monitor LUTs available in Avid DS:

External Monitor LUT	Description
Viper2ITU709_viewer	Converts Viper output colors (in the Viper LUT file) to ITU709 on the external monitor.
RedLog2ITU709_viewer	Converts RedLog output colors (in the RedLog LUT file) to ITU709 on the external monitor.
PDLog9852ITU709	Converts PDLog985 output colors (in the PDLog985 LUT file) to ITU709 on the external monitor.
PD2ITU709_viewer	Converts Printing Density output colors (in the Printing Density LUT file) to ITU709 on the external monitor.
Panalog2ITU709_viewer	Converts Panalog output colors (in the Panalog LUT file) to ITU709 on the external monitor.

The Avid DS Color Management Pipeline

It is important to understand the color management pipeline in Avid DS, and where and when you need to apply LUTs. The following section provides an overview of the process.

As shown in the diagram, there are different stages in the workflow where a LUT can be set. For the most part, Avid DS applies an appropriate LUT, however you do have the flexibility to change the default LUT when you create a new sequence, at capture, during the editing stage, and at output.
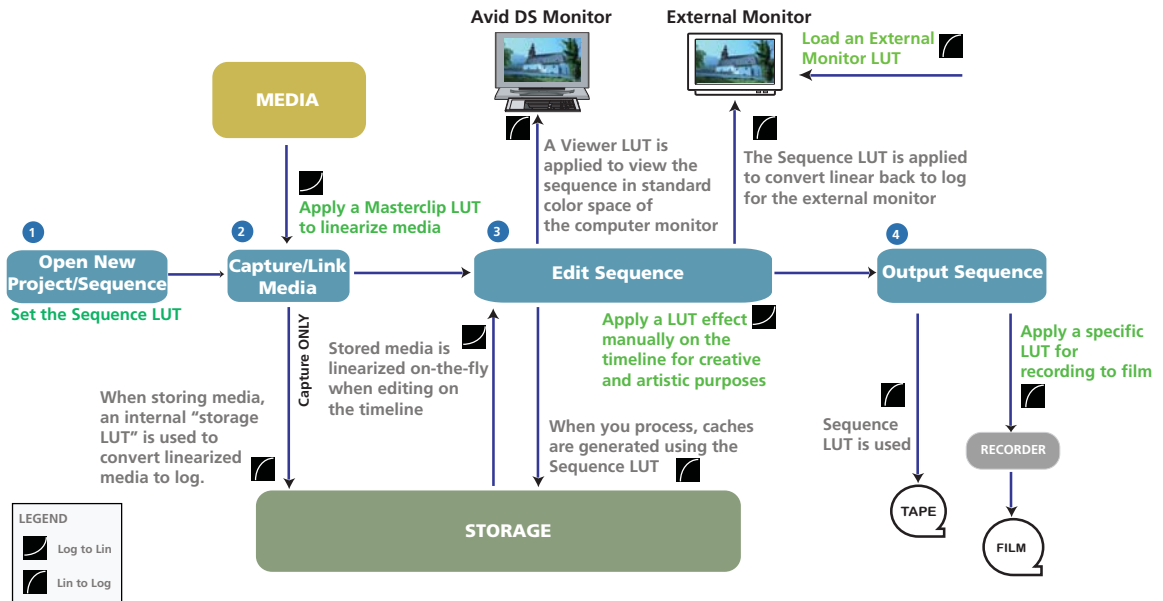
Step 1: Open a New Project/Sequence

Before you start a project, you should know the delivery format of the final output. Besides the obvious settings, such as the video format, you also need to be aware of the color model and color space at which you will output your sequence. Avid DS uses different color management if your work in YCbCr 4:2:2 versus RGB 4:4:4. You cannot switch between YCC and RGB because the color models are not the same. You can, however, edit in 4:4:4 color space, and view and output to 4:2:2 by setting the proper hardware conversion in the Output tool—see "Film Proxy Mode" on page 120.

The delivery settings are important in determining the LUT that you will set when you start a project. In Avid DS, these settings are in the Sequence LUT. For example, if the material you are editing and finishing is for HD television, then the Sequence LUT should be ITU 601-709. If you are delivering for film projection, then you can use the Printing Density LUTs (clamped or unclamped versions).

By default, the LUT set for the project is used for all sequences within that project. However, you can change the LUT for individual sequences within the project.

When you are editing in Avid DS, the Sequence LUT is used for the following:

- Encoding the color information that is displayed on the external monitor.
- Generating caches when applying and processing effects in the sequence.
- Outputting to tape.

For more information, see "Opening an HD or Film Project in Avid DS" on page 105.

Step 2: Capture/Link Media

Any media that is captured, must be converted to a linear representation so that it can be used in Avid DS. When capturing media, you need to know how your media originated so that you can use the appropriate LUT when capturing or linking to that media. The LUT that accompanies the footage is known as the Masterclip LUT in Avid DS. It defines the mapping of the logarithmic values representing each pixel's color values to a linear color space value.

If you have been given a LUT with your media, then it needs to be applied when you capture or link to the media so that the original color data of the captured material is preserved. When using media from different cameras or sources, make sure that you are using the correct LUT with the correct media during capture.

Although RGB 4:4:4 media is linearized at capture time, it is still stored as logarithmic-based data. An internal storage LUT, controlled by Avid DS, is used to convert the linear-based media to logarithmic-based media for storage.

Step 3: Edit the Sequence

When editing the sequence, there are three places where you can apply a LUT:

- On the Avid DS viewer
- On an external broadcasting monitor
- On the timeline as an effect

The Avid DS Viewer and the Viewer LUT

When editing a sequence, you need to keep in mind that Avid DS works in linear color space. Most computer monitors expect sRGB gamma which is why a Viewer LUT is required to convert linear images to the viewer gamma settings. As a result, you may not be seeing the colors intended for final delivery and you will need to apply a LUT on the Avid DS viewer. By default, sRGB is used, however, you can change the Viewer LUT according to your monitor characteristics.

📖 *The Viewer LUT does not affect or encode the final output. The Sequence LUT will still be used at output.*

For more information, see "Industry LUT Presets Available in Avid DS" on page 149 and "Enabling a LUT to the Avid DS Viewer" on page 160.

The External Broadcast Monitor LUT

Most post-production sites use an external broadcast monitor to view the final output. External monitors have their own LUTs to convert images coming from Avid DS into the color space of the external monitor. This LUT converts linear back to log for viewing purposes. It is applied on the external monitor only and not processed by the Avid DS system.

Avid DS provides external monitor LUT presets that you can load on your external monitor using a USB key or a similar hardware device. (Consult your external monitor's documentation for procedures for uploading LUTs.) These LUTS can be found in the **/DS_v10.x/Luts/External Monitoring Luts** folder. For descriptions of these LUTs, see "External Monitoring LUT Presets" on page 151.

The LUT Effect

If you are an Avid DS colorist and prefer to color correct on logarithmic-based media, the color management process in Avid DS provides this flexibility by letting you apply the LUT effect from the image effects library.

Typically, when a LUT is applied during capture, logarithmic media from a camera or file is linearized. This is because compositing, titling, and the application of effects in Avid DS requires that the media be linear.

If you want to work in logarithmic space, when color correcting for example, you can manually apply a LUT effect to convert to logarithmic and then back to linear to complete the editorial. However, you can convert the clips back to apply special effects, or for color correction work. For more information, see "Applying a LUT Effect" on page 160.

Step 4: Output the Sequence

You can output the finished sequence to tape or digital files such as DPX or Cineon. By default, Avid DS uses the Sequence LUT that you set when you started the sequence for the following reasons:

- The sequence has been using this LUT to encode the media and generate caches when working on the timeline.
- The Sequence LUT ensures that the stored color information is correct and properly displayed on an external monitor or film projector.

When outputting to tape, the Sequence LUT is automatically used. When outputting to file, you can apply any LUT. For more information, see "Outputting Film Sequences" on page 122.

You can also apply a 3D LUT when you are outputting to Cineon and DPX files.

13 Using Lookup Tables

A Lookup Table (LUT) is used to map input color values to output color values. A full description of LUTs and how they are used in the Avid DS color management pipeline is provided in "Color Management in Avid DS" on page 147.

Customizing LUTs

When you start a new sequence, it is recommended that you customize LUT files only when you need to change the Black and White points, the Gamma, and the Black and White gain values of the media. It is crucial that you understand these properties and their relationship to each other.

Example: If you are using the ITU 601/709 LUT, Avid DS maps the color values of 64 in 10-bit to black. If you want to use a color value of 67 as black, then you can nudge the value to 67 to make sure that black is properly represented.

Note the following:

- By default, R, G, and B values are locked.
- For a Linear LUT, you can adjust only the White Point and the Black Point. For a Log LUT, you can also adjust Gamma, Film Gamma, and Softclip.

To customize a LUT:

1. In the Video Settings section of the New Sequence Dialog box, select User Defined for the LUT option.
2. Click the LUT button.

   The RGB LUT dialog box displays.
3. From the LUT Creation drop-down list, select the appropriate conversion format.
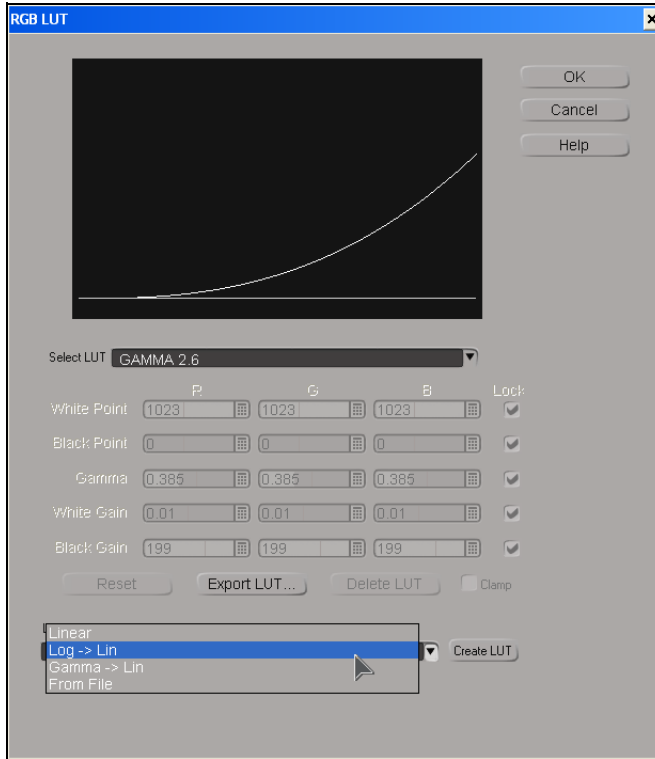
4. Click the Create LUT button.

    A new LUT is created and is displayed in the Select LUT list. It is symbolized by the asterisk until the page is closed at which point they get saved and the asterisk no longer displays.

5. Edit the values as necessary.

    For descriptions of the parameters in this dialog box, see "RGB LUT" in the Help for Avid DS.

6. Click OK to save the settings.

    The LUT is listed in the LUT drop down list in the Video Settings box.

7. Proceed to set up the new project or sequence.

Importing External LUTs

You can import a LUT file that has been supplied for use specifically with the media you are working with in Avid DS. A LUT file can be provided by the camera operator, the director of photography, the film scanning facility, or even a colorist.

📄 *When importing R3D files, you can load an RLX file that is generated at the time of aquisition to provide additional color information of the footage.*

To select an external LUT file:

1. Depending on whether you are starting a new project or capturing a file, do one of the following:

If you are…	Do this
Opening a new project or sequence	In the Video Settings section, select User Defined for the LUT option. Click the LUT button
Capturing a file	From the LUT Creation drop-down list, select From File. Click the Create LUT button.

2. Navigate to the location of the LUT file.

3. Select the file and click OK.

   The LUT file is displayed in Select LUT list. The asterisk indicates that it is a new file and will disappear after the dialog box is closed.

Saving and Exporting a LUT File

You can save and export the LUT file that you have applied during your work. This LUT file can be saved or sent to another editor or colorist who is working on the same footage.

To export a LUT:

1. Make sure you are either in the New Project or the New Sequence dialog box.

2. In the Video Settings section, select User Defined for the LUT option.

3. Click the LUT button.

4. In the RGB LUT window, click Export LUT.

5. Navigate to the location where you want to save the LUT.

6. Enter a name for the file and click Save.

   Two files are saved: The *.lut file, which is used for the Log to Lin conversion and the *_inv.lut, which is the inverse LUT that can be used for the Lin to Log conversion.

Enabling a LUT to the Avid DS Viewer

If you are using an external broadcast monitor to view the final output of your sequence, it will display colors that are determined by the Sequence LUT, the LUT file that was set when you started the sequence. You can apply a LUT on the Avid DS viewer for viewing purposes. For example, if the Sequence LUT is Printing Density, the image on the Avid DS viewer may look dull with little or no contrast. You can apply a LUT to view the clips in the color space used by the monitor (sRGB or ITU-601/709).

If you are unsure of which LUT to use, it is recommended that you use the sRGB LUT as this is the color space that is used by the Avid DS viewers and monitors. You can also use the ITU-601/709 as its values are close to sRGB. If you are working in a 4:4:4 sequence, the sRGB LUT is enabled by default.

The viewer LUT does not encode or affect the final output.

To apply a viewer LUT:

1. Make sure that the position indicator is placed on the correct clip on the timeline, right-click the viewer and select Viewer Properties.

2. Right-click the viewer and select Viewer Properties.

   The Viewer Properties property editor displays.

3. In the Display tab, click the Viewer LUT button.

   The RGB LUT dialog box displays.

4. Select the LUT that you want to use to view the clip.

To disable the viewer LUT:

1. Make sure that the position indicator is placed on the correct clip on the timeline, right-click the viewer and select Viewer Properties.

2. Right-click the viewer and select Viewer Properties.

   The Viewer Properties property editor displays.

3. Select Disable Viewer LUT.

Applying a LUT Effect

The LUT and 3D LUT effects are available from the Avid DS Image Effects Library.You can apply these effects for artistic purposes in order to achieve a certain look and feel to a scene. The 3D LUT is specifically applied to simulate film emulsion properties.

They can be applied to clips, tracks, or the timeline.

| To apply the effect to	Refer to
Clip	"Applying Effects to Clips" in the Help for Avid DS.
Track	"Applying Effests to Tracks" in the Help for Avid DS.
Timeline	"Applying Effects to the Timeline Effect Track" in the Help for Avid DS.

To select a 3D LUT Effect:

1. In the Avid Explorer, navigate to the Image Effects folder and locate the LUT Effect.

2. Drag the effect to the clip, track, or the Effects tree which you want to apply the effect.

   The effect is applied and the Luts Effects property editor opens.

3. Click the Lin2Log tab and click Enable the selection of the LUT.

4. From the Select LUT drop-down list, select the appropriate LUT that will be used to feed the 3D LUT with the correct log data.

   It is recommended that you select the same LUT that you used when capturing media.

5. Optional: Select Show Input Histogram to view the change in the histogram when the 3D LUT is imported and loaded.

6. Click the 3D LUT property page.
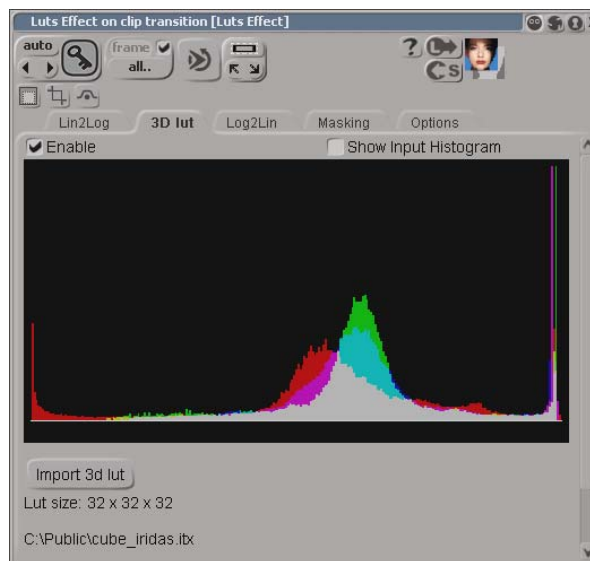
7. Select Enable.

8. Click the Import 3D LUT button.

9. Navigate to the location of the 3D LUT and click Open to load the table.

   The table is loaded and the histogram will change accordingly. You can select and deselect the Show Input Histogram option to view the difference.

10. Go to the Log2Lin tab and select Enable.

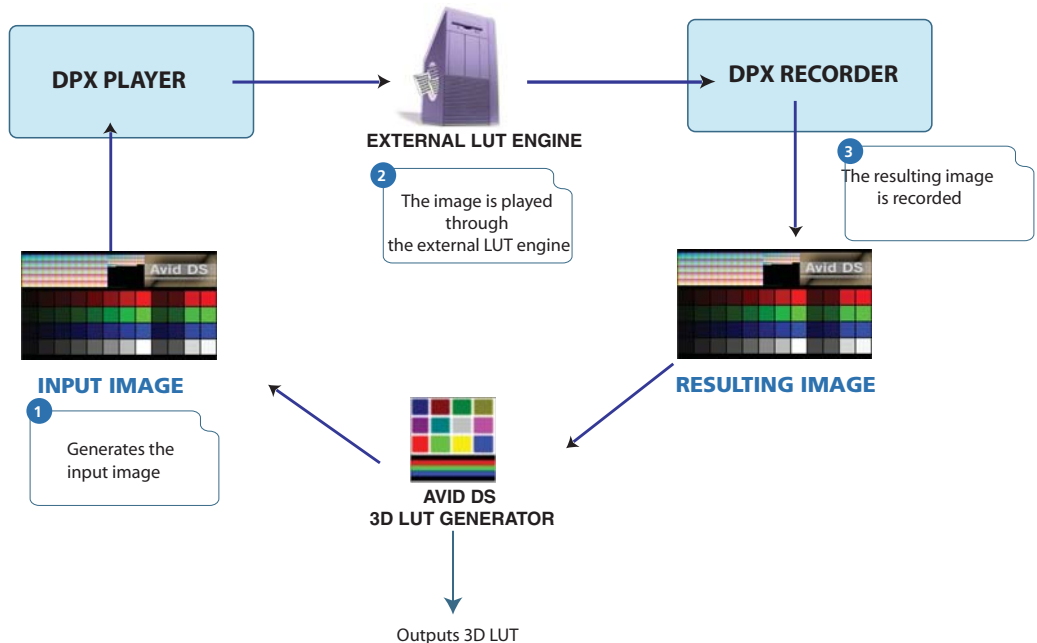11. From the Select LUT drop-down list, select the output LUT.

Generating 3D LUTs

The Avid DS 3D LUT Generator is a tool that lets you easily generate a 3D LUT based on the color differences between the original image and the newly-created image generated from a color grading system or an external LUT engine.

Using a Color Grading System
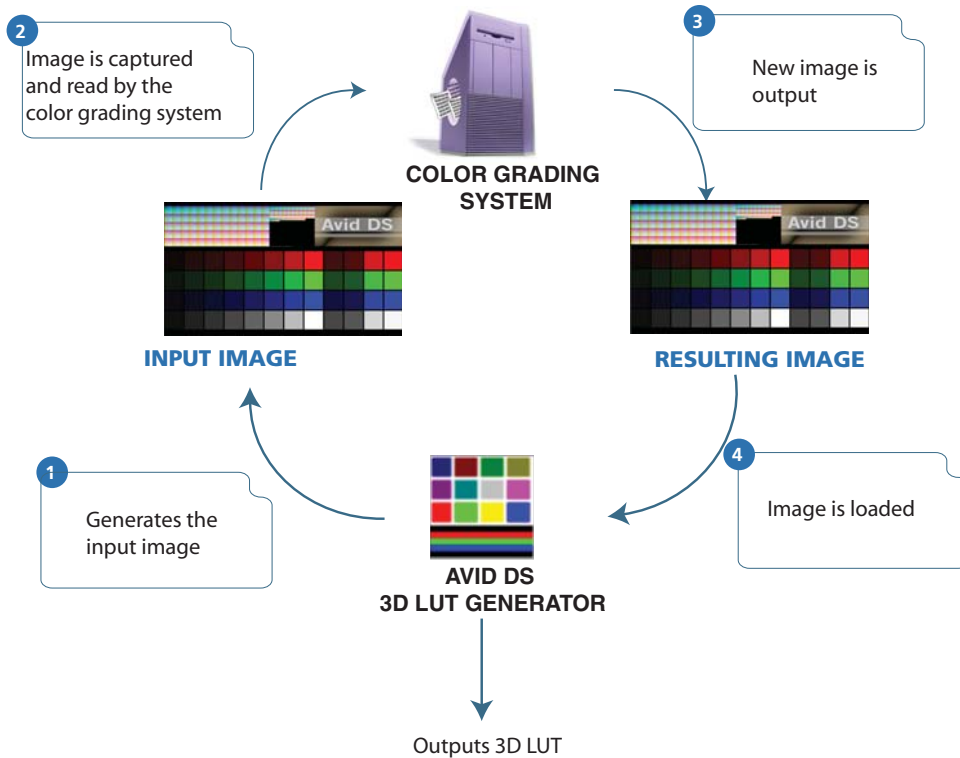
Using an External LUT Engine

To generate and load a 3D LUT:

1. Go to Start > All Programs > Avid > Avid DS v10.x > Tools > Avid DS 3D LUT Generator.

2. Click the Generate Image button and navigate to a location to save the image.

3. Select the type of image.

   It is recommended that you use the .dpx format. Avoid using lossy compression formats such as .jpg.

4. Send the image for processing by an external grading system or LUT engine.

   Once it's processed, it can be imported.

5. Launch the Avid DS 3D LUT Generator.

6. Click the Resulting Image button.

7. Select the Size of the LUT.

   Note that a larger LUT size effect will take a much longer time to process on the Avid DS Timeline, but the results will be more precise.

8. Click the Create 3D LUT button and select a format.

9. Click OK.

You can now view a comparison between the input and resulting image using the newly created 3D LUT.