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Avid, Sony and Adobe Training for Television

ACKNOWLEDGEMENTS

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FINDING YOUR WAY

This document is meant to be used as a reference or research tool for developing your own workflow using Sony XDCAM and Avid® editing systems. As such, some people will read it all the way through, others might use it as a reference for a single aspect of their workflow. Separate training courses for Editors and Producers repackage this information for better, more targeted training.

The information presented here is intended for experienced Avid users. While the procedures described here are not difficult, they do require knowledge of Avid systems, processes and procedures.

The capabilities of Sony products and Avid software are always changing. This document was written and the procedures tested on **Avid Media Composer® 3.0** using Sony products such as the PDW-F75 XDCAM deck. There is already talk of changes and updates in the products of both manufacturers. This document will need to be updated at intervals to reflect these advances as they reach the market.

Paul Sampson
November 2008

INTRODUCTION

THE PURPOSE OF THIS PAPER

XDCAM is one of several file-based solutions for video production. It comes in many flavors, and offers many new features and possibilities in Broadcast and Post Production. This short paper is an introduction to XDCAM workflow with Avid editing systems.

We must recognize that there is not one, single workflow to suit everyone. This paper aims to tell you about XDCAM, Avid, Proxies, FAM, Long GOP and more, so that ultimately, you can make your own decision about how to use XDCAM with Avid editing systems.

USING XDCAM IS *JUST LIKE* EDITING ON TAPE

It's possible to use XDCAM in the old familiar way. Assuming you have the correct equipment, you can use XDCAM as if it were a standard tape deck, recording video and audio from the deck in a traditional manner. The video is recorded in the Avid system using a standard Avid codec. In this case, there is very little new stuff to learn. Even so you will receive a big benefit from XDCAM- cueing is instant. This allows Batch Capture with no cueing time – which is really fast!

This approach of treating XDCAM essentially as if it were tape does not however give you access to many of the file-based benefits which XDCAM offers.

USING XDCAM IS *NOTHING* LIKE EDITING ON TAPE

The special features we are referring to include what is called **F**ile **A**ccess **M**ode (FAM), **Network access** to files and **proxy** video which is automatically recorded on the XDCAM discs. These features provide us with an opportunity for different ways of working. These new methods can offer improved workflow to save time and make editing more efficient and enjoyable. Finally, when working with XDCAM you may also use Sony's Screening and Logging software offline, before the edit.
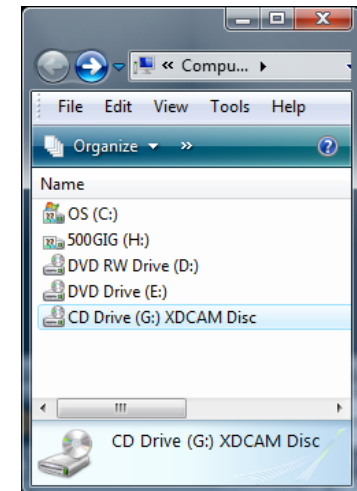
THINGS YOU NEED TO KNOW

XDCAM is not really a single solution. It is a family of cameras and players designed to record on optical disk or solid-state memory. The unique feature is that the recordings are not done on a linear medium as they are on tape, but that they are stored as individual files recorded on the disk or memory card.

FAM stands for **F**ile **A**ccess **M**ode. This refers to the ability of the XDCAM recordings on a camera/deck/XDCAM player to be accessed as files by a computer connected using a FireWire cable or over Ethernet. While we all know how video tape works, in File Access Mode the recordings are ingested quite differently. The XDCAM camera/deck/player appears as a hard drive on the host computer. The recordings are now randomly accessible by the editor as individual files, instead of being ingested as video recorded on a linear medium like tape. Sony provides software for screening and logging these files in FAM mode.

NETWORK ACCESS is possible with some of the Sony machines and an optional Sony Ethernet network card. This allows an XDCAM player to be located centrally, and shared over a network by multiple producers and editors. When used this way, the machine appears on the network as a target for (FTP) file transfers. This makes Network access ideal for a server-based environment. For a standalone system, Network access does not allow you to directly ingest video or even to "Play" or "Record," but with the proper software it allows media transfers to occur in the background while you edit.

*An XDCAM device connected using file access mode (**FAM**) appears as an optical disc on your computer – as shown here for drive G:*

PROXY video is supplied automatically on the XDCAM recordings. These are low resolution copies of what's recorded on the disk. These copies are very small in size. They can quickly be downloaded to a computer where they can be used for the first or off-line cut of the video. The final product can then be conformed using the high-resolution files. Proxy video is also small enough that it could be placed on many corporate networks for production browsing. The Sony PDZ-1 software is designed to screen and annotate proxy video on your desktop.

LONG GOP refers to a method of recording that does not record every frame in its entirety. Long GOP records a frame, then for the next several frames (group of pictures- GOP) it only records the difference between frames. While this is a simplification, it does indicate that Long GOP recording is harder to edit

because most frames are not complete, and must be reconstructed at the edit point from adjacent frames. This makes editing Long GOP a bit more challenging.

THE PRODISC

Your XDCAM camera or deck records on a disk Sony calls a ProDisc. It currently comes in two sizes – 23 Gigabyte and 50 Gigabyte. How much can be stored on these discs depends on the format you record at. If you record using Sony's common 35 Megabit HD codec, these two discs will hold 60 and 150 minutes of material respectively.

YOUR RECORDING IS A FILE

Every time a recording is made in the XDCAM world, a new file is created. By default these files are named using the format "`C0001.MXF`" where the number increments with each new recording. It is possible to change the 'base name' in the camera at the time of recording so the file names can make more sense- for example have all the files start with "Factory" and then increment, so you have "`FACTORY0001.MXF`". When you ingest the material to an Avid system as a file it may come in with these cryptic names. A better solution is to use the Sony screening software – PDZ-1 – to rename the recordings (clips) either individually or as a Batch operation. You can also rename them after import in the Avid editing system itself.

For each file recorded on the disc, such as "C0001.MXF", a second file named "`C0001S01.MXF`" is also recorded. This is a lower quality copy of the recording made automatically by the camera or the deck as it records high quality video. It is called a *Proxy* file. These files are for screening, logging and performing 'offline' edits. The high resolution files are on the disc in a directory labeled "`CLIP`", while the low resolution files (proxies) are in a directory labeled "`SUB`".

The Sony ProDisc comes in two sizes – 23GB single sided, and 50GB double sided

YOUR RECORDED FILE IS LONG-GOP

If the original recording is long GOP of any kind, we must 'rebuild the GOP structure' on playback. With Avid's newer hardware – Avid Mojo® DX and Avid Nitris® DX – this GOP rebuilding is in real time as you playback the timeline. They can playback XDCAM without any transcoding.

Avid Adrenaline™-based systems cannot playback XDCAM without first transcoding it into Avid's native Avid DNxHD® format. If you are editing using Adrenaline hardware you will find that all appears OK when editing in DRAFT (green/yellow) or BEST PERFORMANCE (yellow) quality modes. On this equipment, when you try to do a Digital Cut or select FULL QUALITY (green/green), you will see BLACK on the HD output of your Avid editing system when you try and play XDCAM HD video. This is normal, and indicates that transcoding is required. Avid Mojo (Classic) products do not provide an HD video output at all.

SONY SOFTWARE TOOLS TO PREPARE FOR THE EDIT

You can bring the recorded XDCAM ProDisc directly into the edit suite of course, but someone may want to screen it before the edit. This can be done in the usual manner using an XDCAM screening deck. Sony also offers some small, inexpensive disc players which allow you to look at the discs on your desktop (PC only) computer. The following software works with your XDCAM player to allow desktop screening as well as annotation and logging of the disc contents.

This software is cryptically named and comes on a disc from Sony with the purchase of their XDCAM products. It may also be downloaded from the internet free of charge. Go to http://pro.sony.com and select SUPPORT, and then SOFTWARE AND PARTS.

Sony PDZ-1

This software allows the screening and manipulation of proxy (low resolution) copies of the video. The proxies are downloaded to a desktop computer to free up the original disc. At the desktop the producer can screen files, rename files, 'edit' files together into an edit list and more.

Sony PDZ-1 Direct

This is exactly the same software as above, except it works directly with the files on the disc. You can do all the same things as with PDZ-1 but without requiring drive space to download proxies to your Hard Drive first. This also means of course you can't do anything with this version unless you have the original disc!

Both PDZ-1 and PDZ-1 Direct are installed together when you run the Sony PDZ-1 installer.
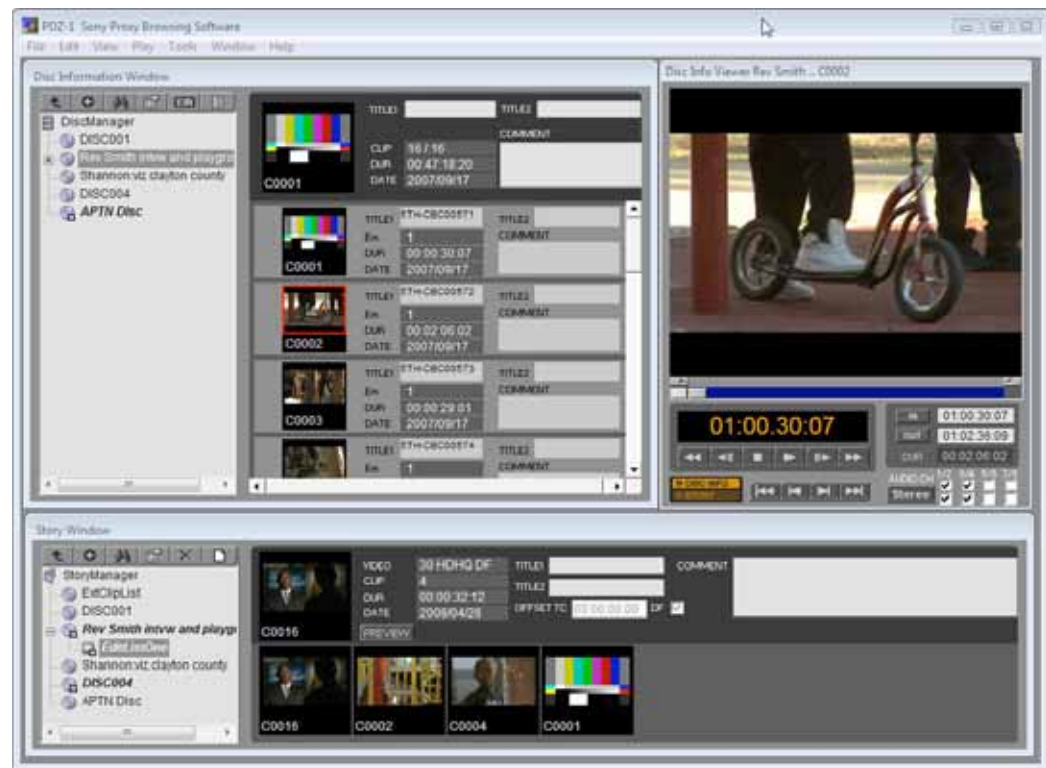
Sony PDZ-VX10 Software

This also goes by the name "**Sony XDCAM Viewer**". This is a simple file player which can be used to directly screen Low *and* High Resolution Sony MXF files. This makes it useful for quick screening to evaluate quality, audio levels and such. The software also lets you look at Metadata for a recording.

PDZ-VX10 also adds some capabilities to Windows itself that you will find useful. It adds Thumbnail display of the first frame of the recording, and Tool Tips for Sony MXF files. You can look at a directory of Sony MXF files in thumbnail mode and see the first frame of each recording. If you hold your mouse over a Sony MXF file it will present a 'tool tip' with useful text information – including timecodes.

XDCAM Proxy Viewer

This is a simple player to allow screening of proxy files only. Its functionality is replaced by the PDZ-VX10 Proxy Viewer, described above.

Software Summary

This table presents a summary of the software just described. The software is available from Sony.com or in some cases on a disc that came with your XDCAM equipment.

PRODUCT	ROLE	DETAILS
PDZ-1	Screening, Logging, Creating Edit Lists	Screen and rename your shots, attach comments, create shotlists among other functions. Perform utility functions such as copy proxies to your computer, make backups of XDCAM ProDisks, copy media between ProDiscs and Hard Drives
PDZ-1 Direct	Screening, Logging, Creating Edit Lists	As above, except many functions are performed using the XDCAM ProDisc, not copies of the Proxy media on your hard drive. If you have a LOT of discs it may not be practical to copy proxies from all of them to your computer.
PDZ-VX10 XDCAM Browser	Screening High and Low Res	Screen your recorded XDCAM video from a hard drive, or an original disk. Low Resolution (Proxy) and High Resolution Video can be screened. Shotlists made with the PDZ-1 Software can also be screened.
PROXY Browser	Screen Proxies only	Screen Sony Proxy (low resolution) files only.

PDZ-1 allows the addition of "Essence Markers", shown as the four thumbnails at the bottom. Click on an Essence Marker to cue to that frame, or export them as locators to the Avid editing system.

There is a separate Sony Browser for XDCAM **EX** media not shown in this table.

WORKFLOW

WORKFLOW EXAMPLES

NEWS: At a small TV station XDCAM is in use for local production in a configuration made up of a group of standalone Avid systems. Each suite has an XDCAM player, and the disc content is treated as and ingested as video.

NEWS: At a medium sized TV station an Avid Interplay® server is in use. Recorded XDCAM discs are delivered to a central Ingest area where each disc is ingested fully. Ingest is slightly faster than real time, and as soon as ingest begins Producers can start screening using their Interplay Assist screening workstations, and editors can begin editing at their NewsCutter® editing systems.

NEWS: A National Broadcaster has a large Avid Interplay system to support many edit suites. As the XDCAM discs come back, they are placed into an Ethernet-connected deck which is accessible through an IT network. Using third party software, any edit suite can access the deck and begin transferring the files to the server as a background task, allowing them to continue editing their item without having to wait for the transfer to complete.

DOCUMENTARY: A field crew is in Abu Dhabi shooting for a documentary. The Executive Producer in Vancouver is not on the shoot, but wants to keep up with the progress. Each morning he goes to an FTP site where the dailies (previous day's recordings) have been sent back as low-resolution proxy files by the production crew. He finds one GB (!) of files, which is an hour's shooting from the previous day. He screens these using the Sony PDZ-1 software.

resolution video. Editing begins!

SPORTS: At a major sporting event 5 cameras are deployed to cover the action throughout the day. As the XDCAM discs come back they are first ingested to an Ethernet-attached hard drive (NAS) as proxy video. Connected to this NAS are three laptops running Sony PDZ-1 screening software. The producers screen and make Edit Lists of the plays and clips they want to use in their items. Meanwhile, since the discs are now free, they have gone to the Ingest area ahead of the edit where the high-resolution video is being ingested. Later, when the Producers go to the edit suite the Editor imports their edit list and relinks it to online high-

editing or output at high quality.

SERIES TV: A game show involves a competition covered by 9 cameras. For the season, they shoot 180 hours of footage over a week. They don't want to delay editing for 180 hours until all this is ingested to an Avid system (4.5 weeks of one suite ingesting at 40 hours of material a week!). Instead, they ingest all the footage as Proxy video in a very short period of time, and begin editing almost immediately. While they are editing the Proxy video, an assistant with a laptop and an XDCAM player ingests the same video at high resolution. Any time after the high resolution is ingested the editors can RELINK to the high resolution media and continue

We are about to discuss XDCAM workflows in detail. This diagram shows the most common approaches, and provides a roadmap for the discussion which follows.

POST WITH VIDEO – Video-Based Workflow needs no further discussion. The XDCAM deck is connected and configured as a regular tape machine, and the edit proceeds as usual. The problem with this workflow is it assumes the presence of a video-capable XDCAM deck. There are some XDCAM decks and players which do NOT have an SDI or a suitable video output at all. They happen to be the cheaper ones!

INGEST   EDIT   CONFORM   TRANSCODE (non-Avid DX Systems)   **OUTPUT**

SONY 23GB Professional Disc
XDCam Field Recording

SDI Video
FILES High Rez — SD / HD
FILES Low Rez (Proxy) — SD / HD

© 2008 XDCAM@paul-sampson.ca
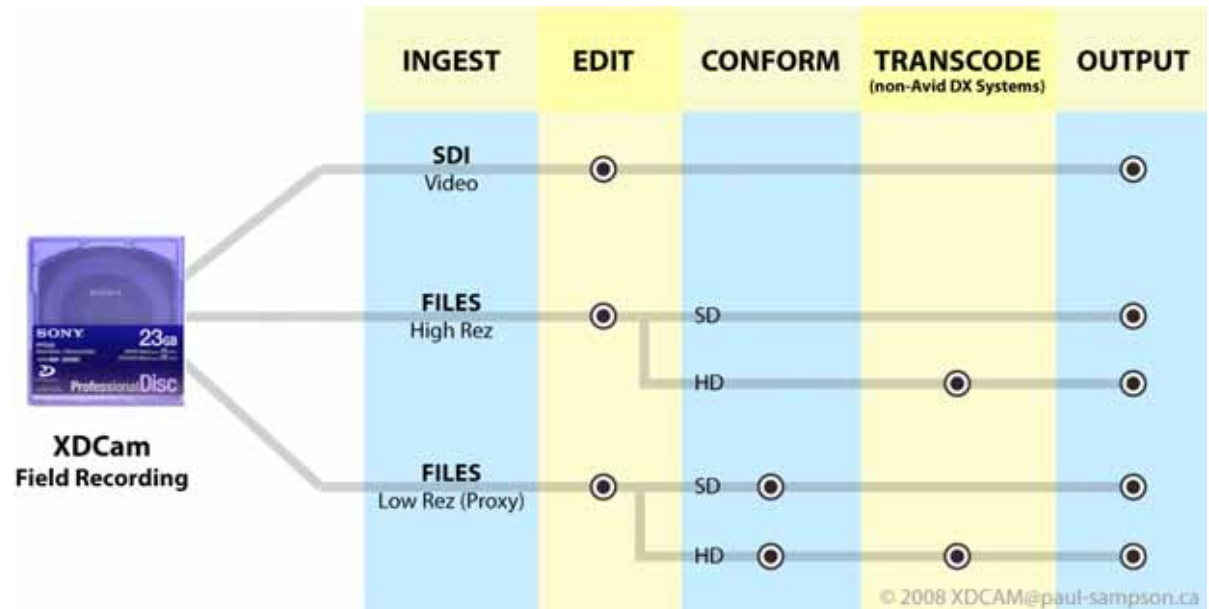
POST WITH FILES - HIGH RES Workflow.

This assumes you transfer the XDCAM files via FireWire/USB/Network to your Avid system and edit the high resolution media. This can be done with a lower cost XDCAM device such as the PDW-U1. If your media is Long GOP (as when editing XDCAM HD) the issue with the file-based workflow is simply how to work with that Long GOP media which needs to have the GOP structure rebuilt before you can output your final, edited program. There are several ways to prepare the final XDCAM HD Long GOP edit for output:

- For video copies, play back your final edit in real time using an Avid Mojo DX or Avid Nitris DX-based system
- Output an XDCAM file back to an XDCAM disc
- On Avid Adrenaline™-based systems or for AirSpeed® transfers, transcode all your raw footage *before* the edit
- On Avid Adrenaline-based systems or for AirSpeed transfers, transcode only your final sequence *after* the edit

Of course, if you are editing in SD, this is not Long GOP and nothing special needs to be done for output.

POST WITH FILES - LOW RESOLUTION (PROXY) Workflow

This approach has you bringing in the small proxies for an offline edit. You may decide to do this because the proxies are all that are available (sent in from a remote site. for example), or you need to edit with a lot of hours of footage and a real-time ingest of all that footage is not practical given your timeframe.

Proxies import FAST (as quickly as 4 minutes for an hour's footage) and you can be editing quickly. What are the penalties? Proxy audio is low quality (8 kHz sampling) and many people dislike editing with it. Also, when you are done editing with Proxies you need to do a high-resolution conform.

Conforming XDCAM low-resolution proxies to high resolution can be done three ways:

- Batch *Capture* from the original discs as video
- Batch *Import* the sequence to capture only the *parts* of each file required for your timeline. Whether this works as expected or not depends on where the proxies came from, as will be discussed. You will want to read this part carefully!
- Import all the high-resolution media and perform a RELINK of your sequence

Sony PDW-U1 is a USB connected FAM only device. It has no video or network connectivity – but is comparatively low in cost.

INGEST

XDCAM can be edited in a manner similar to tape, assuming you have an appropriate deck available. It can also be handled strictly as files, in which case they can be ingested into the Avid via FireWire/USB or File transfer (FTP) over Ethernet. The table below summarizes your Ingest options.

USE A VIDEO PLAYER	Sony sells several XDCAM decks with video out, and serial (9 pin) cable remote control. These can be connected to an Avid system and used the same way as any other tape deck. As a bonus, there is essentially no cueing time when ingesting. With HD format media, serial control of the deck is not officially supported. Despite this, serial control of High Definition decks does work if you select either the HDW-1800 or the HDWM-2000 deck control template that is present.
USE FIREWIRE/ USB FILE TRANSFER	The ProDisc will appear on your desktop as a Removable Disc Drive, the same as a CD or DVD. The Avid system can – and should – work with a ProDisc directly. Avid has special XDCAM support to: • Import high and low resolution video • Conform (via Batch Import) high resolution files after an low resolution offline • Relink to high resolution media after a low resolution offline edit • Write the edited show back to the XDCAM disc You can also do some file manipulation, such as make backups, at the desktop level. The free Sony PDZ-1 Software will allow screening and some file manipulation, such as renaming files.

USE ETHERNET   This allows you to access your ProDisc recordings via FTP (File Transfer Protocol).

For stand alone systems without any special software or configuration, *files must be transferred to a local drive before they can be screened or ingested-* you cannot normally ingest directly over Ethernet. When locally connected by Ethernet your deck is essentially a data source, not a video device.

In this typically non-server environment, an Ethernet connection simply means the machine can be accessed and shared by multiple users over a standard Ethernet network. The Sony PDZ-1 software also works, and in fact does quite a bit more with your disc when connected via Ethernet.

In a server environment or even stand alone with special configuration and software, having an Ethernet-connected deck with the proper hardware and software can allow for background transfers of media to your storage. It is possible to be editing while media is transferring over Ethernet either to networked or local storage.

SONY XDCAM DECKS

Deck information is readily available on the Sony XDCAM micro-site (`http://sony.com/xdcam`). For your convenience some general information is extracted here to give an idea of the scope of available XDCAM ingest machines. This information changes frequently – please check the web site for accuracy! The asterisks indicate relative cost – which at the moment ranges from $3,000 US to $21,000 US for a single machine, list price.

PDW-1500

★★★

Video: SDI, Composite
Access: FireWire, RS422, Ethernet
(Non-HD)

PDWHD-1500

★★★★

HD compatible single and dual layer discs

PDW-F30

★★

Video: Y/Pb/Pr (HD), RGB, SD analog composite
Access: FireWire, RS-232, RS422, Ethernet
HD compatible, single layer disc only

PDW-F75

***

Video: Composite, Component HD, HD-SDI
Access: FireWire, RS422, RS232, Ethernet
(HD compatible, single and dual layer discs)

PDW-D1

DISCONTINUED

*

Video: none
Access: FireWire
(SD only, single layer discs only)

PDW-U1

*

Video: none
Access: USB
(HD compatible, dual and single layer discs)

AVID IMPORT SETTINGS

Before we start a file based ingest we must answer some basic questions about how you want the Avid system to handle your XDCAM discs. This is done by filling out the IMPORT settings for XDCAM. You will find this dialogue box in your settings.

Look for the IMPORT settings, and select the last tab, labeled XDCAM.
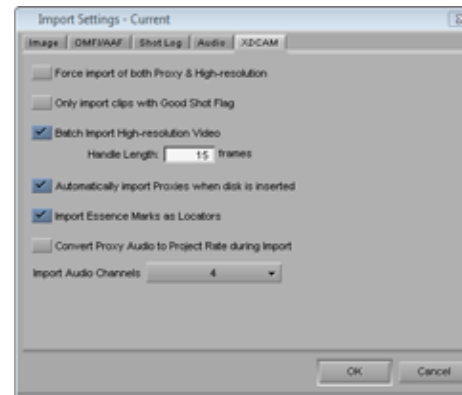
When you use the menu item `FILE > IMPORT`, (and only then) this allows you to import two copies of the media you select at once – both the High Resolution and the Low Resolution Proxy. This would be very unusual, so this option will in most cases be UNCHECKED.

At the camera, a marker (Sony Essence Mark) may be placed on a recording to indicate it is a "good shot." When checked this will only import shots on the ProDisc which contain that marker. Generally, leave unchecked so all shots will be imported.

When you batch import you need a way to indicate your desire to import the low resolution (Proxy) video or the high resolution video. When you perform a batch import, you will import the PROXY video only, unless you CHECK this option which will then import the high resolution video also. For a batch import of partial clips, notice you also choose the Handle length here.

Automatically import Proxies when disk is inserted

When the Avid program is running, it watches for new discs which mount on the desktop. If it finds one that it identifies as an XDCAM disc, this option CHECKED will tell it to automatically import the proxies, without you needing to ask it to. If you decline and decide to do it later, you can use the menu item `FILE > IMPORT XDCAM PROXY` at any time. Unless you are strictly working in low resolution, leave this UNCHECKED.

☑ Import Essence Marks as Locators

An XDCAM camera can place markers within the recordings. Markers (Sony Essence Marks) indicate START of recording or a designated GOOD SHOT for example. This option allows you to have these Sony Essence Marks translated into Avid Locators on the clip so the editor can see them. Using the Sony PDZ-1 software you can create your own Essence Markers to transfer information between programs.

Convert Proxy Audio to Project Rate during Import

Proxy audio is 8kHz. This option will convert the audio on import to the sample rate of your project. The intention is that you would (rarely) leave this CHECKED so all your audio is at the Project's sample rate and audio processing works more efficiently. This is a small gain considering the danger- normally leave it UNCHECKED to avoid accidently confusing upconverted low-quality audio in your final program with high-quality audio.

Import Audio Channels 4 ▼

Choose the number of audio tracks to import. This defaults to 8, which is too many. Current XDCAM field cameras only record 4 channels. Some studio decks (PDWHD-1500) do support 8 channels, but make sure you need them before you ingest them to avoid wasting storage and creating Clip tracks which are useless.

INGEST HIGH RESOLUTION FOR EDITING

Capture as Video:

You may decide to work with XDCAM as if it were coming from a tape deck - that is possible and quite common. You control the deck via Serial control, and take the Video into Avid Mojo/Adrenaline or Avid Mojo DX/Nitris DX hardware. The Capture proceeds as with any other tape deck, except that shot cueing is instant. Remember that since most Sony HD Decks are not officially supported by Avid, you will should select the either the HDW-1800 or the HDWM-2000 machine template to get reliable serial control.

Ingesting from a File:

If you decide to import your footage as high resolution files you can expect something like a 1.5 times faster than real time import of the files using Sony's latest equipment. This process can be used with an XDCAM disc connected to your Avid system in File Access Mode (FAM), or may be used with files stored on any local or network drive. If importing from a hard drive, some Avid features will not work as described. For example, importing of Proxy and High Resolution media at the same time only works on a true XDCAM disc. More importantly, Conforming with Batch Import will only work 'properly' if the low resolution proxies were initially acquired from a properly mounted XDCAM disc- not from copies stored on a hard drive..

When ingesting high resolution video from a file, your resolution settings in Media Creation, and other dialogue boxes is ignored. Sony XDCAM is always automatically imported at its native resolution.

There are four ways to initiate a high resolution import of XDCAM into Avid:

- Drag and Drop. Select one or more MXF files from the XDCAM disc's "CLIP" folder, and drag and drop them into a bin. Be sure you do not drag the similarly named files ending in ".XML"- they are data, not media files

- Use Menu Item FILE > IMPORT and select desired files from the ProDisc "CLIP" folder. You must enter a disc label at the bottom of the Import dialogue before you can do the import.

- If the clip exists in the Avid, but the media is Offline, you can Batch Import using the menu item CLIP > BATCH IMPORT. The Avid system will attempt to re-import the media from its original location.

- If you have used Proxies from a properly mounted XDCAM disc you can batch import the sequence in high resolution as described later in this paper.

*Full XDCAM support on the Avid editing system will only be available if the video is imported as files from a **FAM** mounted XDCAM disc.*

Importing files copied to a hard drive, for example, can result in problems doing efficient batch

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INGEST PROXY VIDEO FOR EDITING

XDCAM HD files are large (relative to Proxy files at least), use up a lot more drive space and take a relatively long time to import. Also, you also can't usually send (FTP) high resolution files from a jobsite so the editor can get started before you return with the disc. These are just two reasons you might find yourself editing using low resolution (Proxy) video. There are three ways to import Proxy video into your Avid:

- *Import ALL Proxy files from mounted XDCAM Disc:* Select the menu item `FILE > IMPORT XDCAM Proxy`. A dialogue appears to allow you to identify the disc, and then all the proxies on that disc are brought into the bin. Only media on a mounted XDCAM disc will be seen, and Hi Res media cannot be imported this way.

- *Import SOME proxies from a mounted XDCAM disc:* Use the menu item `FILE > IMPORT`, and select the files in the "SUB" folder on the XDCAM that you wish to bring in. There are no ".XML" files here to worry about. Be sure to enter the DISC LABEL at the bottom of the Import dialogue.

- *Import Proxy files from **local** or **network** hard drive:* Use the menu item `FILE > IMPORT`, and select the files in the "`SUB`" folder on the XDCAM drive. You may also use Windows Explorer to drag and drop the proxy files from the `SUB` directory on the XDCAM disc. You will not have the option of entering a disc label if it is not an XDCAM disc, so you would be wise to immediately modify the disc label to match the disc the proxies came from. This can be done in the `CLIP > MODIFY` menu of the Avid.

  WARNING: If your workflow involves importing Proxy files from a local drive or a network drive (not from a properly mounted XDCAM disc) you might run into difficulties later. Importing from anything other than a properly mounted XDCAM disc results in Batch Import working ineffectively – it will batch import all source files at full length and will not be able to find the high resolution files on its own! This is generally not a good workflow option – in fact it is a "Show Stopper" when it comes to your workflow.

WHAT MAKES AN XDCAM DISC?

A disc is seen as an XDCAM disc if it has the required. xml files in the root directory of the disc, as well as all the folders holding media and data. This means any drive, or even a DVD, can be seen as a properly mounted XDCAM disc if you place all the required files in the root directory.

EDITING

XDCAM editing proceeds as a normal edit session. There is a separate paper in this series on Editing in HD which contains information specific to editing with Avid DNxHD media. It also has a lot of general information about editing in HD which applies to XDCAM. Keep the following points in mind when editing XDCAM in HD:

- When editing with HD footage on an Avid Adrenaline-based system (with Avid DNxcel™ card), you must edit in DRAFT mode (green/yellow) in order to see XDCAM HD output on an HD monitor.

- If you do not have an HD Video I/O box (Avid Mojo DX, Avid Nitris DX, Avid Adrenaline with Avid DNxcel card) you can still monitor your edit on an external SD monitor with any IO box by switching your project to SD mode (FORMAT tab in your settings window) while you edit.

- If editing in HD with Adrenaline-based systems, you will need to transcode the final sequence to Avid DNxHD before you will be able to do a Digital Cut.

- In any Avid Interplay environment, XDCAM HD material being Sent To Playback must be transcoded because current AirSpeeds can't yet play back XDCAM natively.

- XDCAM SD 25Mb is actually Sony DV format. This, as well as the XDCAM IMX formats may be edited and output with no special procedures.

SPECIAL SYMPHONY NITRIS EDITING CONSIDERATIONS

Due to the design of the Symphony™ Nitris hardware (not to be confused with the Nitris DX hardware), playback of XDCAM media on an Avid Symphony Nitris editing system causes dropped frames. To allow for full performance playback, you should transcode the XDCAM media into Avid DNxHD media to play the video on your Avid Symphony system. Use the following workflow to play XDCAM media on your Symphony editor.

To play XDCAM media on an Avid Symphony system:

- Import your XDCAM media

- Transcode the XDCAM media into Avid DNxHD media

- Edit your media.

- Perform your output as you normally would.

CONFORMING XDCAM PROXY VIDEO

If you have edited using Proxies, you will want to Conform to full resolution at some point, replacing the proxy video and audio with high resolution media from the original discs. There are two different methods to choose from:

- **Batch Import method**: If you brought the proxies in from an XDCAM disc, you can use this method. The Avid editing system finds the High Resolution files on the original XDCAM discs on its own, and then only imports the media required for your completed sequence.

  WARNING: *If you did not get your proxies from a properly mounted XDCAM disc* (for example, if the proxies came from an FTP site, or were imported from a sub directory of a hard drive), batch importing will not work as expected. In these cases, when batch importing you would need to *manually* locate on the local or network drive every individual shot you wish to re-capture in High Resolution. The Avid system has never seen the high res files, and in this case will not have access to some XDCAM information from the XDCAM disc which could help it find them. It will need you to help it find each file. A second concern is that you will also be importing the entire original recording, not just the part of it you need for your sequence.

  In reality, this is a big and error prone process, best avoided if you can. If you want to Batch Import, ingest the proxies off the original XDCAM disc to avoid these problems - or fake an XDCAM disk when you import the Proxies, as described on the following pages.

- **Relink method**: This method is useful if you have a lot of media to ingest, or a lot of editing to do with a short turnaround. In the latter case, you import proxies quickly and while you are editing, the high resolution can be ingested. After the edit, you would use the Relink command to relink to the High Resolution media (on a stand alone system) or use Dynamic Relink to relink to the High Resolution media (Avid Interplay system). As an example, in a news operation 30 minutes of proxies can be imported in possibly 3 minutes and editing can begin. While the edit proceeds the High Resolution media is imported faster than real time. When the Proxy edit is complete it is relinked to the now online, High Resolution media.

This method also avoids the issues mentioned in the warning above. It does, however mean you are importing a lot more High Resolution media as you need to take in full length files even if you only need a small portion of that file.

CONFORMING: BATCH IMPORT METHOD

This process requires that you acquired your proxies originally from an XDCAM disc- not via duplicates on a hard drive, or via a network or FTP transfer. If your proxies did not come from a properly mounted XDCAM disc then attempting to batch import the final sequence will present two major hurdles:

- The Avid system will not be able to find the high resolution files wherever they are, and you will need to navigate to each and every file individually to re-import it at high resolution.
- Each file will be imported at its full length, not just the portion of the file required by the sequence.

As stated several times, these issues will not be present if the proxies were originally acquired form an XDCAM disc. If you have this disc (or can simulate it, as described in the next section) proceed as follows:

- Import the proxies from the XDCAM disc into a bin. Consider adding PROXIES to the bin name
- Edit your item
- Create a new bin
- Place a copy of the Sequence in the new bin. Consider adding HIGH RES to the name of the bin.
- Ensure your XDCAM Import settings are set to "Batch Import High Resolution Video"
- Select the sequence and choose the menu item CLIP > BATCH IMPORT
- Insert the XDCAM discs when asked, and allow the media to be imported.

At this stage the process is different for an SD project compared to an HD project.

In an **SD** environment, you may need to render effects and titles to do a digital cut, and possibly Transcode the timeline if you plan to send the final sequence to a playback AirSpeed. (Each AirSpeed plays back only a single format, and as always you must ensure your timeline is the correct format.)

On the other hand, if you are producing an **HD** product, the hardware you are using becomes a factor.

- `Required on Adrenaline HD systems –` Transcode the sequence to Avid DNxHD for output to tape

Always try to batch import proxies from a properly identified XDCAM disc.

This is a disc with all the required folders and .xml files at the root of the disc.

- `Required on Adrenaline HD systems` – Render all effects and titles.
- `Required on all systems` – For AirSpeed playback, transcode all HD to Avid DNxHD as AirSpeeds do not currently play native XDCAM HD.

Batch Import "Time" Consideration

At the moment batch import may take longer than you expect. If you are Batch Importing from small (around 2 minute or less) files, batch import proceeds at a useable clip. If you have longer files (around 20 minutes or longer) batch import slows down considerable with these clips. In a specific scenario, a 3 minute item with 30 shots from longer clips has taken me 15 minutes to batch import- 5 times longer than real time.

This has been described to me as a temporary issue related to the way Metadata from XDCAM files is read during Import. Avid is aware of this slowdown during Batch Import, and it is expected to be addressed with a future release.

***Simulating* an XDCAM disc**

If your proxies are sent from another location, or downloaded over a network, you might still like to use a low res workflow and then successfully and efficiently res up from XDCAM discs. We can do this by fooling the editing system into thinking we are taking the proxies off the original XDCAM disc. This requires you not only have the proxies, but also the ".XML" files which are in the main directory (root) of the XDCAM disc. Consider the following method for 'faking' an XDCAM disc so you will be able to import proxies from an alternate location and still do a proper Conform later using XDCAM discs and Batch Import:

- Copy the proxies in their "SUB" folder to a local hard drive
- Copy the XML files found in the main directory (root level, see image at the right) of the XDCAM disc. Place these in the same folder as the "SUB" directory, but not within the SUB folder!
- Ask the shooter if they named (labeled) the XDCAM disc, and if so note the Disc Label
- If small enough, burn these files to a DVD, or copy them to the 'root' of any hard drive on your system. You might consider reserving a small partition on a drive on your system for this purpose.
- Select FILE > IMPORT XDCAM PROXIES and import the proxies from this disc. Enter the Disc Label – you will of course need the correct disc label to do the res up.

Edit with the proxies as normal. When done, use the original XDCAM discs and BATCH IMPORT the sequence to perform a normal XDCAM Conform.

REZZING UP: RELINKING METHOD

This approach might make sense in situations where you have a lot of raw material and must begin editing quickly. If you edit proxies without the original XDCAM disc, you can still do a proxy edit and conform the HD using this RELINK approach. This involves editing with proxies, while the original, full length files are being ingested. When the edit is done, the High Res is online and you just relink.

Note that Avid software (ftpClipList) and third party software (MOG Solutions, NLTek) are available to allow background transfers of media while you are editing- both for standalone systems and Shared Storage systems. These generally require an Ethernet-connected XDCAM deck, and Avid Transfer software as well as the third party software.

- Import proxies as described previously
- If they do not come from a mounted XDCAM disc, change the Disc Label to match the disc. Use the CLIP > MODIFY command to do this.
- Edit the sequence
- Import the files at High Resolution
- Place a copy of the sequence in a new bin
- *Standalone:* Select the sequence and choose the menu item `CLIP > RELINK`. Choose to relink "non-master clips' (sequences) to highest quality available.
- *Avid Interplay:* Use Dynamic Relink to relink to the high resolution media

CAUTION: When relinking, be sure the FORMAT tab is set to the format of the video you wish to relink to. For example, when editing with proxies you might be in an SD project to work more quickly and see a signal on an SD monitor. Switch the Format tab back to HD before doing a relink or the system will be trying to relink to SD media, and of course your efforts will fail!

Duplicate Clip Names

Your clip names may be duplicated in the sequence. If you used several discs you might have several "C0001S01" clips. The relink will be able to tell which C0001 file matches which disc. In short you need not worry - it all works out with duplicate names from multiple ProDiscs. If the duplicate names in the timeline bother you, you can of course rename the clips in the bin and these new names will then appear in the sequence instead.
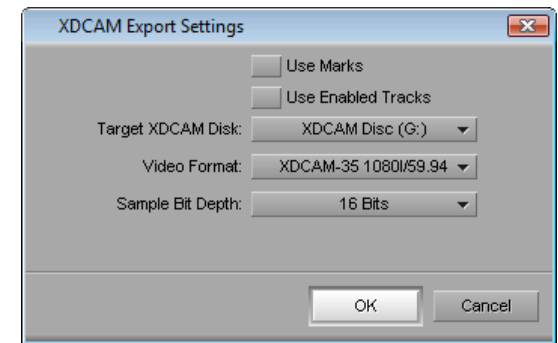
OUTPUT

SENDING BACK TO XDCAM

Your completed SD or HD program may be file transferred back to an XDCAM disc. The output is done directly to the XDCAM ProDisc- you do not need free drive space on a local hard disc to hold a copy of the full sequence.

Output to XDCAM it is very easy to do.

- Ensure your XDCAM device is setup for the format you want to save your timeline in, or the transfer will fail. For example, if you want to export a PAL timeline it must be sent to a PAL disc.
- Ensure the XDCAM device is setup for the same number of audio tracks that you want to export. If you are doing a 5.1 audio mix, the XDCAM deck cannot be set to a more limited 4 channel mode!
- Select your sequence in the bin
- Choose the menu item OUTPUT > EXPORT TO DEVICE > XDCAM
- Fill in the simple dialogue shown here and press OK

Your sequence will show up as a high resolution clip inside the XDCAM disc "CLIP" folder, and also as a low resolution clip inside the "SUB" folder.

There are three caveats for outputting XDCAM back to a disc:

- This process outputs only a set of Stereo or dual Mono audio tracks- direct out does not work. Your program will be mixed down in Stereo or Mono, depending on the Audio Output settings of your project. If you are in Direct Out for audio, an error message will appear and the transfer will fail.
- An HD recorded ProDisc will only accept HD content. Similarly, an SD recorded ProDisc will only accept SD content. You can export XDCAM HD of different bitrates to the same disc. For example, XDCAM HD 35Mb can share a disk with XDCAM HD 50Mb. In other words, frame sizes and frame rates must match on the disc.

- The Sequence name is not transferred to the XDCAM device. A new, default name (such as `C0001`) is used for the recording.

- When sending back to a ProDisc, the Sequence timecode is lost, and the new clip on the XDCAM disc has timecode which matches the setting of the TC Generator on the deck itself. Two examples: TCGen set to `EXTERNAL` with no input, the clip Timecode will be 00:00:00:00 and will not update; if the TC Gen is set to `INTERNAL`, `REGEN` the Timecode on the new clip will pick up where the Timecode of the last clip on the disc ended.

DIGITAL CUT TO HD TAPE

An SD output to tape of XDCAM SD proceeds as normal. There are no special steps for SD output.

If your timeline is made from XDCAM HD, then how you output to tape depends on your hardware. On the newer Avid Mojo DX and Nitris DX hardware direct realtime output of an XDCAM sequence is possible. With older Avid Adrenaline hardware we need to transcode the sequence into Avid DNxHD to perform a Digital Cut.

For **Adrenaline** output of XDCAM HD the simple steps are:

- Copy the sequence and place it in a new bin. Not technically required, but it keeps the XDCAM media separate from the Avid DNxHD media.
- Select the sequence, and choose the menu item `BIN > CONSOLIDATE/TRANSCODE`.
- Choose the `TRANSCODE` option, and fill out the rest of the dialogue. The target resolutions change when you switch the `FORMAT` tab between SD and HD. If you don't see the resolution you want, try switching the format in the `FORMAT` tab of the Project window.
- Press `OK`.

Any XDCAM media will be transcoded to Avid DNxHD. Only enough media to play your sequence (plus handles, if any) will be generated. If there are already some shots using Avid DNxHD, they will not be copied again. On Adrenaline, you will now render the effects and Titles and then be ready for output.

RECAPTURING MEDIA

Re-Ingesting Low Res Proxies

If you have lost your proxies you may import them all again using `FILE > IMPORT XDCAM PROXIES`.

If you wish to re-import just some of your proxies select the clips in the bin and choose `CLIP > BATCH IMPORT`. Make sure you set your XDCAM `IMPORT` settings to *NOT* import the high res. Specifically, go to your settings, select the Import settings and choose the XDCAM Import tab. Make sure the option "Batch Import High Resolution Video" is off. This will ensure your batch import only brings in the low resolution media.

Re-capturing Low Res Proxies as High Res Media

Select the clips and choose `CLIP > BATCH IMPORT`. In this case, go to your settings for IMPORT (as described above) and ensure "Batch Import High Resolution Video" is checked.

Re-Ingesting High Res Media

Select the high resolution clip missing its media, and choose `CLIP > BATCH IMPORT`. The clip will be re-imported from the original XDCAM disc at high resolution. The XDCAM "Batch Import High Resolution Video" checkmark in the `IMPORT` setting has no effect in this case- if you batch import a high res clip, it will batch import the high res.

WORKING WITH ETHERNET-CONNECTED DECKS

Some Sony decks, with the optional network card, allow you to set them up in a central location and then access them via an Ethernet network. This is particularly useful in an Avid Unity™ or Avid Interplay server environment, where the system can then perform transfers between the deck and the server over Ethernet. This makes use of Transfer Manager (Avid Unity) or Interplay Transfer (Avid Interplay) products from Avid.

On a *standalone* system, network connectivity is not so much for editing as it is for managing ProDisc media. From a directly connected editing client (without Transfer Manager or Interplay Transfer) you can't ingest or output *directly* to an Ethernet-connected deck. You can however easily perform media copies and transfers.

If you install Transfer Manager or Interplay Transfer on the standalone editing system, then there is other software to perform background media transfers to local storage (only) on your standalone system. On a shared storage system, Transfer Manager/Interplay Transfer allow background transfers into shared storage directly from the Ethernet-connected XDCAM device.

Since an Ethernet-connected deck is accessed as if it is an FTP file server, any commercial FTP software can be set up to access the deck.

IMPORTING CLIP LISTS FROM SONY PDZ-1 SOFTWARE

The Sony PDZ-1 software will allow you to make a 'Clip List" or what might be better called a "selects list" for each individual disc. These selects lists can be imported into an Avid system where they appear as a group of clips or as a timeline, depending on the process you use. The Clip List is sometimes considered to be a rough cut timeline, and may also be played within PDZ-1 logging software and the Sony XDCAM Viewer. If you wish to 'edit' using shots from multiple discs you need to know how to create a PDZ-1 "Extended Clip List."

These select lists can be written back to the XDCAM disc, and may also be exported in a number of formats to any location on your computer. From within the Sony PDZ-1 software you can export:

- BVE-9100 EDL
- Sony EDL
- ALE (Avid Log Exchange)
- Windows ASF movie
- AAF (Advanced Authoring Format) file

USING AN EDL/ALE EXPORT FROM PDZ-1

The BVE-9100 EDL and the Avid ALE will import into an Avid system and fill the bin with *clips*- not a sequence. These clips come with a TAPE NAME, and can be batch *captured* as video in realtime from a connected XDCAM disc player. You will need a video out from this player, and serial control over it. This appears to be necessary because the EDL/ALE formats do not carry enough disc identification information to work with the files on the XDCAM disc directly.

USING A WINDOWS ASF MOVIE EXPORT FROM SONY PDZ-1

This option will compress and output media as a Windows Movie. This is a small, low quality movie suitable for review and approval.

USING AN AAF EXPORT FROM SONY PDZ-1

After making your Clip List in the Sony PDZ-1 software you can export it as an AAF (Advanced Authoring Format) file. When imported, your Clip List will appear as a timeline within the Avid system which is linked to the XDCAM files on the XDCAM disc. You can then Batch Import of Relink (as discussed previously) to the XDCAM media. It is also possible to have the AAF file contain the media it needs within itself.

The option is under the TOOLS menu.   There are three options available from within PDZ-1 software for AAF Export:

- **AAF data only**: This exports an AAF file without any media – just data. When you import it you see a sequence and the *full length* reference clips for that sequence in the bin.

   You will use option when you intend to relink to media which is already on your system, if you plan to perform a video-based Batch Capture, or if you want to Batch Import the video for the sequence.

- **AAF data and partial files:** This exports the AAF file with just the media needed to play back the sequence. When the AAF file is created, you can also assign *Handles* to the media. Import the AAF sequence, as a separate step import the MXF media files, then use the RELINK.

- **AAF and full files**: This exports the AAF file, and also the media as separate, full length files. Even if the producer using PDZ-1 only used one second from a file in their Clip List, the entire media file will be exported with the AAF file – presumably to allow the editor total flexibility in a re-edit.

   Import the AAF sequence as a separate step import the MXF media files, then RELINK.

USING SONY XDCAM EX MEDIA

The Sony XDCAM EX cameras share the XDCAM name with the professional broadcast line, but were designed by a different team at Sony. This is one reason they use a different file format. The camera original files are MPEG 2 wrapped as .mp4. Because of this you cannot use these files directly with an Avid editing system. Instead, you screen and export the files you want to use with Sony software, and these saved copies are Avid-compatible.

There are two ways to make your XDCAM EX media Avid compatible.

- Method 1 directly copies your media from the SxS cards into the Avid media folder and creates an AAF file for you to import which has clips for each piece of media. This is a single step, and faster than method 2 – but if you lose your Avid media you can't do this again and relink a sequence to this newly imported media. If you are going to do this, backup your Avid media after importing the XDCAM EX!

- Method 2 involves transferring your media from the SxS cards to an intermediate location, then importing these files into the Avid. This takes longer (which is relative – it works out to be about realtime), but you can do this again with your SxS media and relink to it.

Why the difference in the relink ability? Each method transfers the SxS media from the cards in a different format. Method 1 creates an AAF file and directly deposits "OPAtom" files in your media file folder. OPAtom means the Video and Audio are separate files. Method 2 transfers your media off the SxS cards as an OP1a file, which is a single file with video and audio inside it. There are differences in Metadata transferred with each approach, and thus differences in what options you have with each approach.

XDCAM EX SXS TRANSFER TO AVID: METHOD 1

This process creates "OPAtom" files which cannot be re-imported and relinked to your sequence at a later date. This process is quite fast and very simple.

- Download and install the Sony Clip Browser 2 Software for XDCAM EX (available from Sony.com)
- Screen and select the XDCAM EX clips you want to use
- Highlight the clips you want in the Sony Clip Browser
- Export the Media Files directly to your `Avid MediaFiles/MXF/1` folder, and the AAF file with your new clips to a folder of your choice.

You will require the Sony "XDCAM EX Clip Browsing Software" version 2, This software is useful for many different tasks as listed here:

- View your XDCAM EX files
- Make copies of your files
- Move your files
- Delete your files
- Perform format conversion for AVID and other systems
- View and edit clip metadata
- Perform keyword searches to find clips
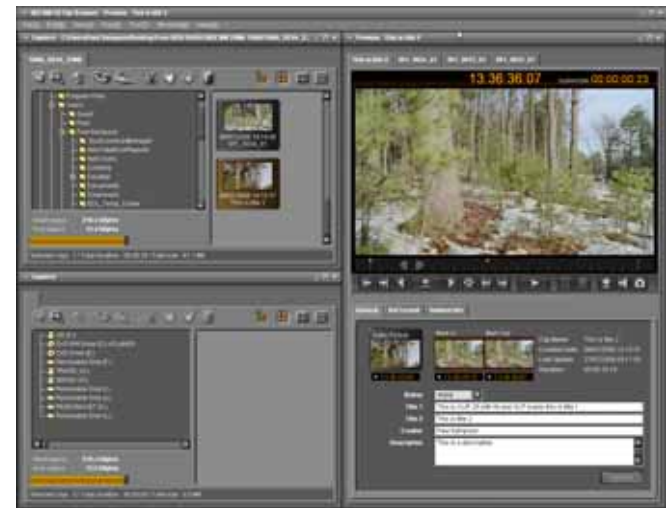
To perform a transfer from your XDCAM EX SxS card (or copy of the card contents) follow these steps:

- **FIND YOUR CLIPS**: In the Sony Browser 2 Software, use the tabbed browser to navigate to your drive and directory which contains the media
- **SELECT YOUR CLIPS**: You can screen, review metadata and evaluate your clips. Select the clips you wish to transfer to your Avid editing system
- **IDENTIFY YOUR AvidMediafiles FOLDER**: You are about to make MXF copies of your files, and need to choose a location to send them to. One of the advances of this Browser version 2 is that you can select any folder, including your AvidMediaFiles folder, as a target for the newly formatted files. From the menu items at the top of the browser select `TOOLS > OPTIONS > CONVERSIONS`
- **IDENTIFY AN AAF FOLDER**: While you may have copies of your media files, you need to be able to easily find them on your Avid system. You can do this from within your Avid system by importing the AAF (Advanced Authoring Format) file that the Browser software creates. This will populate your bin with Clips which access the Media Files you have copied. You will be asked for your AAF file folder when you actually choose Export.
- **INITIATE THE EXPORT OF YOUR FILES**. Choose the menu item `FILE > EXPORT > AVID AAF(V)` and fill in the dialogue box which appears. The directory you are being asked to select is the directory for the previously mentioned AAF file. Remember the media files are going to be located in the directory you choose in the tools menu, also mentioned above.
- **IMPORT THE AAF FILE**: Within the Avid system, make a bin and import the AAF file just created. Your bin will fill with clips to match the media you copied to your AvidMediaFIles folder..

The metadata fields for *Description* and the *Creator* text, if any have been added, will come with the clip into the Avid. The Creator metadata comes in the Journalist column, and the Description comment comes in the Description column of the Avid. No other metadata safely makes the journey from Sony to Avid using this route.

XDCAM EX SXS TRANSFER TO AVID: METHOD 2

This method creates "OP1a" files which can be re-imported and relinked to a sequence in your timeline. It takes a bit longer, but is more flexible. From within the Sony Clip Browser software:

- Screen and select the XDCAM EX clips you want to use
- Highlight the clips you want in the Sony Clip Browser
- Select the menu item FILE > EXPORT > MXF for NLEs and export the files to an temporary location
- On the Avid choose FILE > IMPORT and import these files

XDCAM EX - IMPLICATIONS FOR BATCH IMPORTING

Notice the XDCAM EX media is imported into the Avid system with no mention of a Disc Label. This means the Avid system sees it just as it would a QuickTime movie or a graphic. Because of this, when you attempt to do a Batch Import from a sequence it will import the entire original clip, not just the portion of the clip needed by the sequence. This may not be a big issue since there are no proxy clips, and rezzing up will not be a regular part of any XDCAM EX workflow.

APPENDIX A: Editing in XDCAM HD

First, some quick notes:

- For Adrenaline output through the Avid DNxcel card at high quality the final show must be transcoded (rendered) to Avid DNxHD resolution
- If you don't have the actual XDCAM disc, it is still possible to navigate to any directory and import low res media – but now you can't easily rez up. You will need to navigate to each high resolution file individually, and it will import at its original full length.
- You can navigate to any directory and import the High Res, and you should be fine with it unless you need to do a batch import, in which case each individual file must be imported at its full length!
- For an XDCAM low resolution recording the low resolution media is SD. The high resolution media is HD. Work in an HD project with an HD timeline so you can link the HD media to this timeline when it becomes available. The format of a timeline is set at the time it is created, but if needed it can be changed with the MODIFY command in the CLIP menu.
- XDCAM media can only be imported at its native resolution. Selecting, for example, DNxHD as the import resolution has no effect.
- When performing an OUTPUT > EXPORT TO DEVICE > XDCAM the final timecode on the disc will begin at 00:00:00:00. The Sequence timecode does not transfer over.
- An XDCAM timeline output as an XDCAM Export (using OUTPUT > OUTPUT TO DEVICE > XDCAM) will only have a single stereo pair of audio tracks.

Can I rename a Proxy clip in the bin?

Yes. This does not limit the Avid editing system's ability to find and re-import the clip.

CHOOSING AN XDCAM HD PROJECT IN MEDIA COMPOSER V3.0

HDTV 1080 native frame sizes are 1080 pixels high by 1920 pixels wide. This is not the size of the frame recorded by XDCAM.

As part of its approach to compressing the signal, XDCAM resamples the 1920 pixels in each line and records only 1440 pixels instead. This is sometimes called a "Thin Raster." If you could look at the picture directly off tape it would looked squished. You never see the squished image because all the Deck outputs resample back to 1920 pixels per line.

With Media Composer version 3, and other newer Avid products, you can indicate that the majority of media you are editing with has a native size of 1080 x 1440. This allows the Avid system to set itself up for processing that frame size, and work more efficiently with that media fame size.

When making a new project, you have a new selection labeled "Raster Type." Choose the type of media your project will mainly consist of to get the best performance.
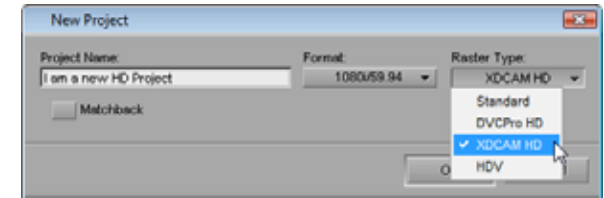
WHAT DOES THE FORMAT TAB DO?

When editing in an HD project, you may need to capture some SD media from tape, or vice versa. The FORMAT tab in the Project window allows you to switch the Project type so that you may work in SD or HD mode without needing to make a new project of the required type.

The drop down menu here switches your inputs (capture) and outputs (digital cut) between SD and HD. It switches your Avid computer monitors between 4:3 to 16:9, and changes the list of available resolutions in various dialogue boxes between SD resolutions and HD resolutions. This includes changing the resolutions in Capture and Transcode dialogues.

Finally, when performing a RELINK with XDCAM, the setting of this tab determines if you will relink to SD (Proxy) or HD media.
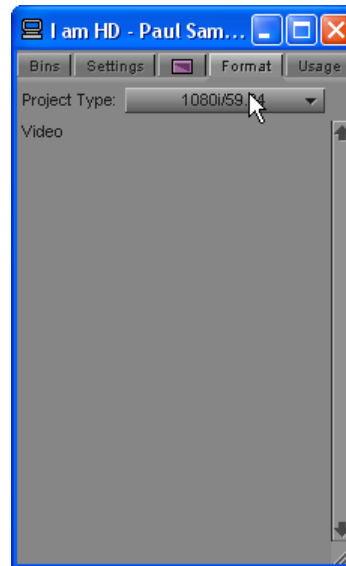
DO I HAVE MIXED HD/SD MATERIAL IN MY TIMELINE?

How do you know your sequence has mixed (SD/HD, Proxy/High Resolution) media that needs your attention? On an Avid Adrenaline-based system you need to know so you can transcode the low resolution media, and even on a Nitris DX system you may need to know so you can check and correct Aspect Ratio issues. Here are some ways to tell if you have mixed media in a timeline:

- In the timeline, use the fast menu `Clip Color` > `SD/HD` option to identify media which does not match the current project setting as chosen in the FORMAT tab.
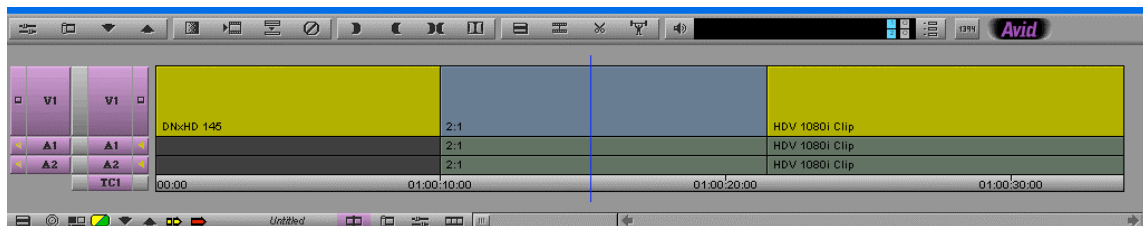
**Project Format set to SD (30i) and HD clips are highlighted**
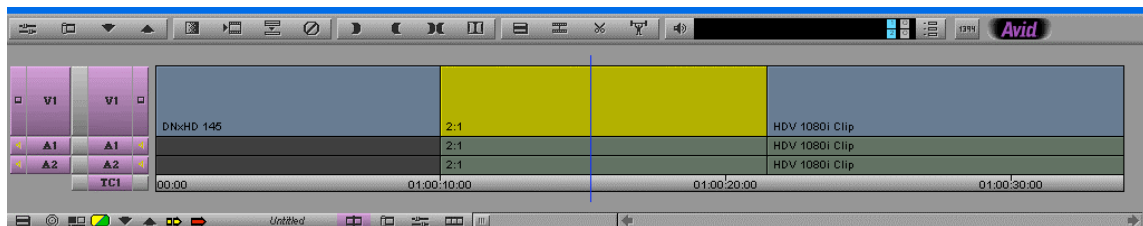

Project Format set to HD (1080i) and SD clips are highlighted

- *Adrenaline only*: In Full Resolution (GREEN) playback mode, an SD segment plays as black on an external HD monitor when played back in an HD project. An unrendered effect also plays as black if you are in full quality playback mode.

- In the server environment (WG4 or WG5 – Interplay) the sequence is PINK in the bin if it contains mixed resolutions.
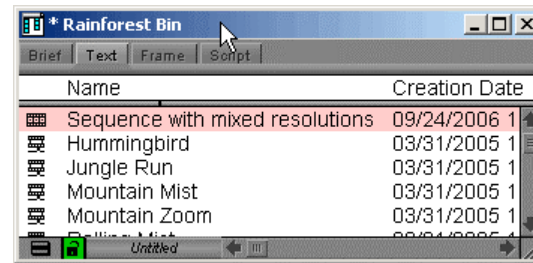
Bin containing a mixed resolution sequence

- In the Timeline 'hamburger' (Fast) menu choose CLIP TEXT > RESOLUTION to display on every clip in the timeline its resolution.

- Place the sequence in an empty bin and choose from the menu's BIN > SET BIN DISPLAY. From this dialogue activate the check mark beside SHOW REFERENCE CLIPS. The bin will display the original clip for every shot in the sequence. These *Reference Clips* will behave as normal clips in the bin – you can load, play, sort and otherwise manipulate them. Look at the Video column to determine the resolution of each, individual clip in the Sequence

- Select the sequence then choose Relink (Clip > Relink) and relink to a specific resolution. All other media goes offline. While this may not seem too useful, the procedure is used to quickly allow you to Batch Import or Batch capture the mismatched (now missing) media
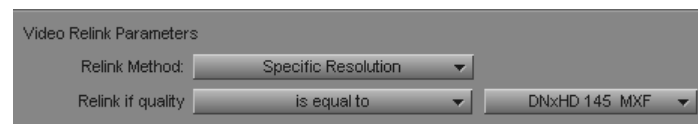
Portion of the Relink Dialogue

REFORMATTING 4:3 ASPECT RATIO TO 16:9

If a 4:3 SD shot is played back on a 16:9 HD timeline, it will be stretched to fill the frame. Normal 4:3 video will be distorted. We can remove this distortion using one of the effects mentioned below.

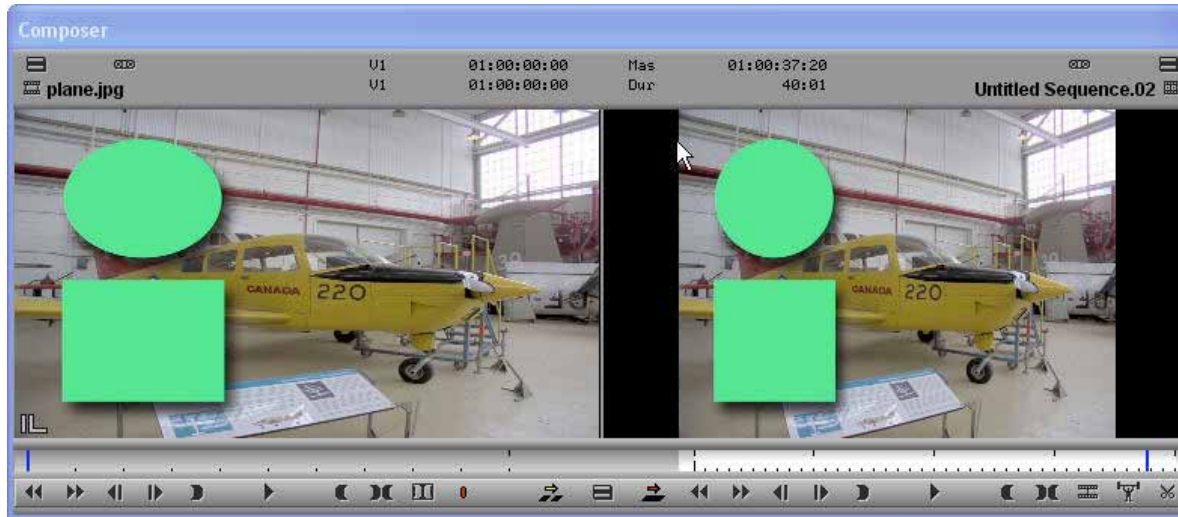**Original, correct 4:3 image in an
NTSC (30i) Project**

**Same shot displayed (and distorted) in
a 16:9 format (1080i) Project**

We can correct this distortion with:

- Picture in Picture effect
- A REFORMAT category "4:3 Sidebar" effect
- A REFORMAT category Pan and Scan effect

SIMPLE STRETCH FOR ASPECT RATIO CORRECTION

(left) Original distorted image in player,   (right) corrected (Pillar Boxed) image in recorder

To remove the stretch from an upconverted 4:3 SD shot and create a Pillar Boxed look:

- Correct the *WIDTH* by applying a Picture in Picture and then set the width to 75% exactly. This results in the black "Pillars" being visible. What you do to cover the black bars that result in this "pillar box" approach is a production decision.

- From the REFORMAT effects category, apply the "4:3 Sidebar" effect to do the same width adjustment automatically

- Correct the *HEIGHT* by applying a Picture and Picture and adjusting the height to 133% exactly. This enlarges the image more than a width adjustment, and cuts off the top and bottom of the frame. There are no black "Pillars" to worry about, but the image has been enlarged more than with the previous two methods.

PAN AND SCAN FOR ASPECT RATIO CORRECTION

Pan and Scan is a strategy for avoiding the black bars around the 4:3 frame by blowing it up and panning and tilting within the enlarged frame. This of course cuts off some of the picture at both the top and the bottom of the frame. It also suffers from the problem of blowing up an SD picture which has already been substantially enlarged. If does nonetheless provide a solution for eliminating the black bars when correcting Aspect Ratio.

In the Reformat category you will find an effect called the Pan and Scan. You will simply drag and drop this onto the shot to be reformatted. Then we enter effects mode and set up the options.

Original distorted 4:3 image in player   **Pan and scan used to blow the image up, but also to 'tilt' up to include the part of the frame we want to present to the audience. As a result, the bottom of the frame is cut off.**

To use the Pan and Scan effect:

1   Apply the Effect   In the REFORMAT category, select Pan and Scan. Drag and drop onto the segment to be reformatted.

2   Enter Effects Mode

3   Set the ASPECT RATIO's

Use the Fast Menus at the top of the Effect Editor window. The SOURCE is the aspect ratio of the SD footage: set to 4:3.

The TARGET is the aspect ratio of the HD Project: set to 16:9 Anamorphic.
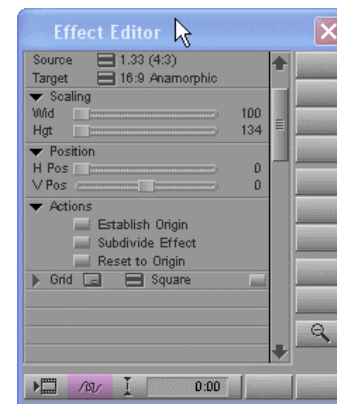
4   Look at the picture

Most effects show you the results of the effect in the record monitor as you manipulate it. *Pan and Scan does not.*

With this effect, you need to see the entire frame so that you can select the portion of it you want to blow up. What you see then is the entire frame, with a white outline box indicating the portion which will be in the final output.
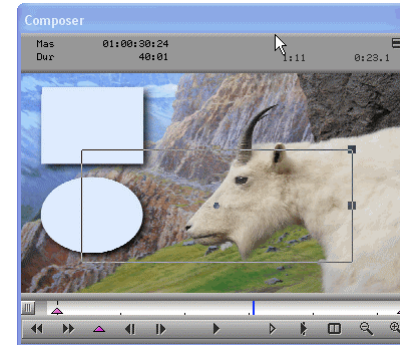
5   Adjust the Scaling

This is where you determine how much the picture is blown up. By default, the scaling is set to width:100 and Height:134. This default scaling cuts off the top and bottom of the frame but preserves its full width.

You can increase the scaling if you wish to zoom in even more. Use the sliders in the Effects palette, or drag the handles provided in the record monitor.

These zooms can of course be keyframed, but remember you are enlarging a limited number of pixels as you do this!


6   Adjust the Position

Since you are zooming in on the frame, you must select which portion of the frame you wish to zoom in to.

With the default scaling values, simply drag the white box on your picture up or down to choose which part of the frame to keep visible.

If you have zoomed in enough that you might need to pan left or right, hold SHIFT as you drag the white wireframe left and right.
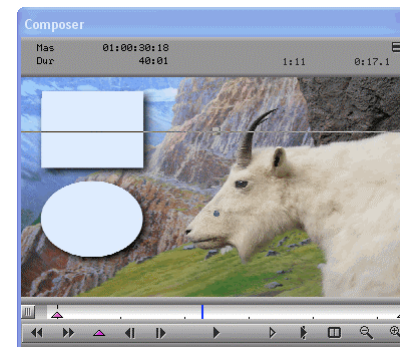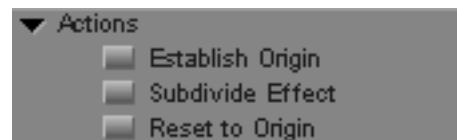
7   Preview the result

Press PLAY in Effect mode, or leave effect mode and play to see the final on-screen result.
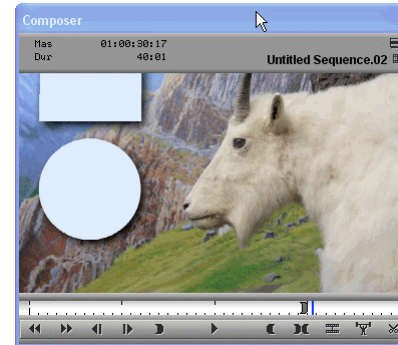
More Pan and Scan Options

There are three other options we will look at in the Effects editor. These are the *Origin* and the *Split* buttons for this effect.

The ORIGIN

This allows you to set a default size and position for the bounding box in this effect. The origin can be set (memorized) and recalled on a segment by segment basis. The intention is that if you are keyframing within a segment, you can return to a predefined (default) framing within that segment with a single click.

There are two origin buttons, and while they look like check boxes they are conventional buttons. Click as follows to operate the Origin commands:

Establish Origin To memorize the current size and position as the default for the Pan and Scan bounding box- for this segment only!

Reset to Origin To recall the default origin for this segment

SPLITTING the Pan and Scan effect

If you edit an entire sequence of 4:3 upconverted shots into a timeline, you may want to simplify things by using a single Pan and Scan on an upper, empty track to apply a default setting, then SPLIT the effect into separate Pan and Scan segments so you can then customize each shot as (and if) required.

- Create a new video track on which to place the effects.
- Use add edits to isolate the portion of this new track on which you want to place the Pan and Scan effect
- Apply Pan and Scan Effect
- Apply your default Pan and Scan settings
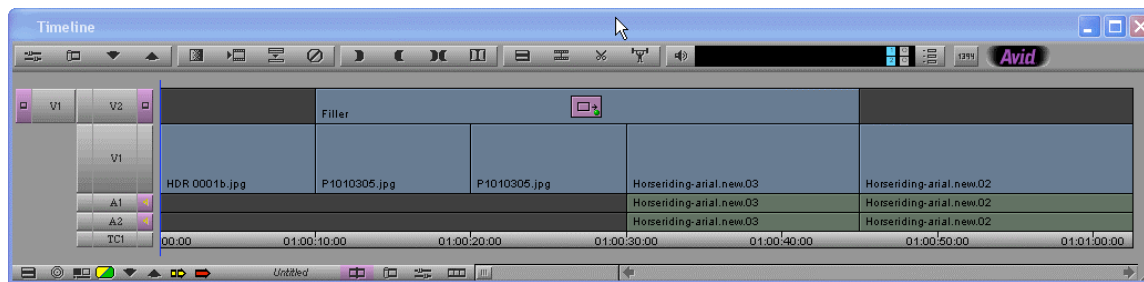
Timeline with initial Pan and Scan effect covering multiple shots

- Turn on the Video tracks that contain the video segments you want to split the Pan and Scan effect by
- Click the SPLIT button in the Pan and Scan effect
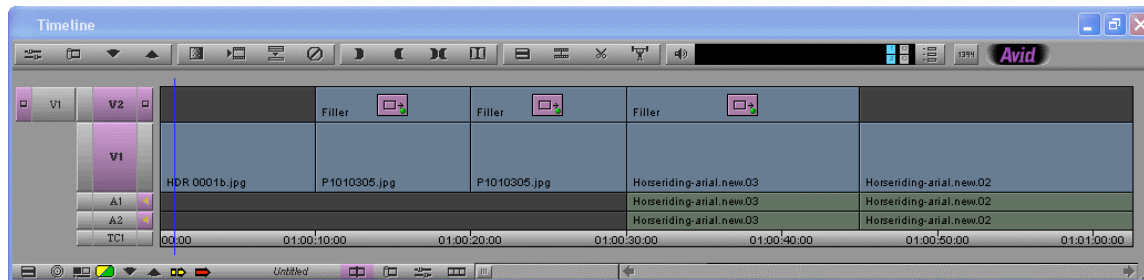
Timeline after SPLIT button has split the effect to match the cuts in the active video layers

- Apply any customization to the now separate segments which need adjustment from the default

While you could do the same thing by applying a separate Pan and Scan effect to each shot, this lets you apply a default to many shots at once, and only need to modify those which deviate from the default.

If you have transition effects, apply the Pan and Scan effect to the segments directly, not the track above, so the Pan and Scan adjustment is taken into consideration during the transition

DISPLAYING 4:3 SAFE REFERENCE INSIDE A 16:9 FRAME

 This button will turn ON a safe action and safe area grid appropriate to the format of the program. The grid can be modified to display, among other things, a 4:3 safe area indicator for your HD program. Proceed as follows:

- From your Settings, select *GRID*.

- On the first tab (shown here) choose "4:3 inside 16:9 monitor" from the top selector.

    This will add the 4:3 reticule as shown on the image below.
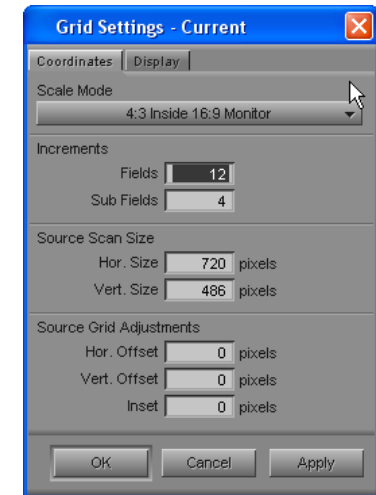
The default grid shows safe action (outer box) and safe title (inner box) for the 16:9 program.

Switching on the "4:3 safe inside the 16:9" monitor results in this display, showing what part of the frame will be visible on a 4:3 TV if the downconvert is done by cutting off the excess image on each side of the frame.

If you hold ALT as you click on the GRID button, the grid appears as a series of dashes instead of a solid line.

APPENDIX B: CONNECTING AN XDCAM DECK

CONNECTING A DECK FOR HD VIDEO INPUT TO AVID

If your XDCAM deck has a video output, you may connect it as if it were a regular tape machine.

CABLES

- **RS422 Serial Control:** Connect a serial cable (and serial 422 –RS232 converter) between the XDCAM and the Betacam. Setup the Avid system to use this serial control, and of course when the time comes you will need to place the Deck into REMOTE.
- **Video**: This cable between the deck and the Avid system of course carries the video and the audio.

MENUS

On the Sony deck, check these two Menu items to ensure control is granted to your Avid:

- `MENU > SETUP MENU > INTERFACE SELECT > REMOTE I/F > 9P/232`
- `MENU > SETUP MENU > INTERFACE SELECT > iLINK MODE > AV/C`

Your XDCAM deck should now respond to the Avid system as a normal tape machine – except that cueing to a timecode is instant!

CONNECTING A DECK VIA FAM TO AVID

File Access Mode (FAM) may be used with decks and cameras. This procedure makes the ProDisc appear as an optical disk on your desktop, and file transfers may be performed. You need to adjust some menu settings on the XDCAM deck.

- Install the FAM driver on your PC computer, if you have not already done so. It is supplied with XDCAM products, and also comes as part of the downloadable Sony PDZ-1 software
- On the Sony deck, check this Menu item to ensure control is granted to your Avid:
  `MENU > SETUP MENU > INTERFACE SELECT > iLINK MODE > FAM (PC REMOTE)`
- Ensure the all disc operations are stopped, and the Menus are not in use on the deck.
- Connect the required iLINK (FireWire) Cable: This cable makes the FAM connection between the deck and the computer. Your deck should appear in My Computer as a CD/DVD drive automatically

CONNECTING A DECK VIA ETHERNET TO A COMPUTER

Connecting a deck to an Ethernet network requires just a little networking experience. If you know what an IP address is and how to use the Menus on a Sony deck then that is probably enough.

If you use the Ethernet connection between a deck and a computer, you will have access to many FTP features in the PDZ-1 software. For a producer screening with PDZ-1, an FTP (Ethernet) connection is more than enough. A simple menu command will import proxies to the local hard drive via Ethernet. You cannot directly screen or import off a Network connected deck. You must transfer the files to a locally accessible (lettered) hard drive to use them.

For an Editor wanting to import to an Avid, they must download the files from an Ethernet connected deck to a local drive first. Remember in this case to copy the ENTIRE disc, including the XML files at the root. You will need all these files for them to be treated as if they came off an actual XDCAM disc. As you recall, this is necessary if you plan to do an efficient Batch Import.

Making an Ethernet Connection to Deck

The PDW decks are network appliances. They can be connected to an Ethernet network and accessed via FTP commands using any commercial FTP software. They can also be accessed using Sony PDZ-1 software over a network. Note the Proxy browser and the PDZ-VX10 (high resolution file viewer) cannot access the decks over the network – they require a drive letter to be available for the drive the file is on. Use FAM (File Access Mode) with these programs, or copy the files to a local drive

Following are recommended settings from Sony (many are the defaults) If you are familiar with network setup, you will of course change these at your pleasure.

Before you begin:

Do not be connected in FAM mode – disconnect and turn OFF FAM mode before you begin.

Check the decks Network Menu settings. These are the defaults, but please note they can become reset to other values and should be checked:

DHCP:	Disabled
Deck IP:	192.168.1.10,
Connecting computer Static IP:	192.168.1.100
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0
Link Speed:	AUTO
Duplex:	AUTO
Jumbo Frame:	OFF

- Run a network cable between the deck and the client computer. A crossover cable is not required for connection – any network cable may be used to directly connect between the deck and the computer.
- Set the PDW front "Remote" switch to the NETWORK position
- Place a disc in the machine – there can be no connection without a disc
- The disc in the deck should not be in use – not playing, recording, viewing thumbnails, deleting or formatting, for example.

After you are connected

Normally, you will start the PDZ-1 software and interact with the deck through this software. You may establish a traditional FTP connection and interact with the deck through FTP commands and commercial software.

To test the connection, you may:

- PING 192.168.1.10 to see if there is a network connection. This will establish the cables and the menu items on the PDW are correct.
- FTP 192.168.1.10 to see if you can establish an FTP connection. For all FTP connections, the user name is *admin*, password is machine model name, such as *pdw-f75*.

APPENDIX C: CONTENTS OF AN XDCAM DISC

root		INDEX.xml	Contains an index of the disc contents. Since Video and Audio files are actually separate on the disc, this is a list of what Video and Audio go together. You could look in this file to see how many audio tracsk were recorded.
		ALIAS.xml	When you rename a clip or a clip list you don't actually change the name of the file here on the ProDisc. Instead, this file contains the lookup tables for user assigned names for clips and Clip Lists.
		DISCMETA.xml	Contains information about the disc properties, including the discs unique ID and the date the disc was initialized. Not really useful to humans
		MEDIAPRO.xml	This contains an entry for each file, listing its video format, duration, aspect ratio, "Universal Media ID" UMID, audio format and name of the Proxy file. Some of this information may be useful – for example to identify the aspect ratio or frame rate of a recording.
	Clip DIRECTORY	C0001.mxf	A recording
		C0001M01.xml	Metadata about the similarly named recording
		C0002.mxf	
		C0002.M01.xml	
	Edit DIRECTORY	E0001E01.SMI	A Clip List
		E0001M01.xml	Metadata for the similarly named Clip List
		E0001E02.SMI	
		E0001M02.xml	
	Sub DIRECTORY	C0001S01.mxf	Low resolution (SD) proxy video file. There are no associated XML files in this directory
		C0002S01.mxf	
	General DIRECTORY	A user directory in which you can place files of your choosing. You might place images, scripts, schedules and the like here so they travel with the disc.	

For suggested updates or to offer advice feel free to contact:

Paul Sampson
Avid, Adobe and Sony Training for Television
xdcam@paul-sampson.ca
114 Donlea Drive, Toronto, Ontario, Canada, M4G 2M5