ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *AJA XENA-LHe* at our website: *Click HERE*

Whitepaper Author:
Thad Huston, Product Manager, Windows Desktop Products—AJA Video Systems



DVCProHD Editing with KONA and XENA

1. Introduction

a. Scope

This Document is meant to describe various ways to use the DVCProHD codecs provided in AJA's XENA software, and AJA's Mac Plug-ins for Adobe. It will describe capture, editing, sharing, rendering and exporting of DVCProHD files, and projects in the context of use in both online and offline workflow in Adobe Premiere Pro on Windows and Mac.

b. AJA's New DVCProHD Codec Support

On Windows: With the version 3.5 release of XENA software, AJA now includes a DVCProHD codec for capture and editing with the XENA card. This codec was licensed by AJA from the codec professionals at Main Concept. The inclusion of this codec serves to add compressed workflow features to a product that, until now, was primarily for uncompressed work.

On Mac: Shortly following the release of the XENA 3.5 software on windows, AJA will release AJA Mac Plug-Ins for Adobe. These plug-ins, along with the KONA drivers, will allow the use of KONA cards in Premiere Pro, After Effects, and Photoshop. These plug-ins are Mac versions of the XENA plug-ins. In their first release, a Main Concept codec will not be included with the Mac Plug-ins for Adobe. DVCProHD functionality described below in the Mac Plug-ins for Adobe will require the presence of the Quicktime DVCProHD Codec which is included in Final Cut Pro.

2. DVCProHD Pro's and Con's

a. File Sizes

The most attractive feature in DVCProHD encoding is file size. While the files are not as small as DV, HDV, and most other flavors of MPEG encoding, the sizes are typically manageable often on a single hard disk, or at worst on a 2 disk RAID 0. This allows for users to manipulate HD footage, without breaking the bank on sizable, fast, complex storage system. DVCProHD boasts data rates generally under 17 MB/s (60 GB/h). Meanwhile, uncompressed HD will start around 110 MB/s (400 GB/h) and can balloon past 250 MB/s (900 GB/h). The potential cost savings here are obvious.

b. Encoding/Decoding Difficulty

Because the compression ratios are typically lower for DVCProHD than for MPEG or many other high compression codecs, it means that encoding and decoding is relatively less difficult. This allows for the use of a software codec such as the MainConcept codec to be used for real-time HD capture, at fairly high quality, on a standard workstation with 2 to 4 cores. This is not possible in most cases with other compression schemes such as HDV, Flash, XDcam, AVCHD, without additional specialized hardware. This again helps to keep costs down for the end user.

c. Bit Depth

DVCProHD is always 8-bit. This helps again to ensure low bitrates, small files, and ease of use with inexpensive storage systems. However, it leaves the end user with less than perfect color data, which could create challenges for users looking for the cleanest keying or effects they can possibly get.

d. Color Sampling

DVCProHD is always YUV 4:2:2. In most cases this is considered superior to the sampling used in DV and HDV. While this is adequate for many users, the most critical effects artists, colorists, and film editors will prefer RGB 4:4:4 and may consider 4:2:2 sampling to be inferior. Again, the trade-off realized is in a lower data rate, ultimately reducing data throughput needs, especially for the disk system.

Copyright ©2008 AJA Video Systems, Inc

AJA VIDEO SYSTEMS
WWW.AJA.COM
530.274.2048
800.251.4224 US

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

e. Raster Sizes

DVCProHD works in non-standard raster sizes, with non-square pixels, to create the same 16:9 picture aspect as full raster HD, without storing as much data. This once again helps to keep the data rates and encoding difficulty down, however the sacrifice is in real resolution. In some cases this will be an acceptable trade off, and in some it will not. Specifically this can cause issues for effects and keying work. In place of standard 1920x1080, DVCProHD encodes 1280x1080 or 1440x1080 depending on the frame rate. In place of 1280x720, DVCProHD encoding down samples to 960x720.

f. AJA's Choice of DVCProHD over other codecs

Every codec has its share of advantages and disadvantages. MPEG formats are hard to encode, uncompressed formats are large to store, some proprietary codecs are not cross-platform and are sometimes less widely useable. AJA chose DVCProHD for inclusion with XENA's current uncompressed abilities because of its combination of small file sizes, encoding ease, general industry acceptance, and relative quality.

3. DVCProHD Support on Windows with XENA

a. DVCProHD Projects with XENA

The XENA installer includes Adobe Premiere Pro project presets specifically for use with DVCProHD compressed files. These project presets have raster sizes that match the non-standard resolutions and pixel aspect ratios of DVCProHD. Use of these project presets is highly recommended for any situation when the bulk of the assets will be DVCProHD. For Example, if the end user has 1080i HDCam tapes, and wishes to capture to DVCProHD to avoid the need for large storage systems, they would choose the AJA XENA preset in Premiere Pro called "HD_DVCProHD_1080i@29.97fps." This preset will create a project that defaults to DVCProHD capture settings, DVCProHD preview rendering, and DVCProHD sized editing timelines.

In some cases, full raster project presets may be required. For example, in a case where most assets would be full 1920x1080, but some 1280x1080 DVCProHD footage needs to be incorporated, a standard, non-DVCProHD specific project at 1920x1080 might be selected. In this case the capture defaults and preview rendering defaults will be full raster uncompressed. But the non-standard raster DVCProHD files should play from the timeline just fine.

b. XENA P2 Support

P2 MXF files are also supported, with no capture, rendering, or re-wrapping required. These files may be simply imported into the desired projects either directly from a P2 card, or after being transferred from a P2 card to the local system. They will work the same way captured DVCProHD Quicktime files do. They can be used in XENA DVCProHD projects, or in full raster uncompressed projects as described above in part 3.a.

c. XENA capture

There are two different applications through which the end user can capture DVCProHD compressed files, from HD-SDI or analog sources, using the XENA card in Windows. These are AJA's Machina, and Adobe Premiere Pro CS3. Instructions on capturing with these applications can be found in the PDF manual which is installed with the XENA installer. All normal capture instructions apply except for the following:

- "File Type" must be Quicktime
- "Video Subtype" must be DVCProHD
- "Primary Video Format" should be set to the real HD raster size.

For example, if capturing from a 1920x1080 source, that same raster should be selected in the "Primary Video Format" control in the capture settings. The encoder will automatically scale the video down to the appropriate DVCProHD resolution. When using XENA DVCProHD project presets, these settings should already be preset for the end user.

Once capture is completed a Quicktime file will exist on the specified hard disk. If capturing in Adobe Premiere Pro, the Quicktime file will automatically be imported into the current Premiere project bin.

d. Compressed Online Editing with XENA

Use of DVCProHD for online editing is quite straightforward, and as simple as standard compressed or DV editing. The relatively good quality of DVCProHD, combined with the ease of use and price/performance of Panasonic P2 cameras, makes online editing with the codec a popular way to get good HD results, on a limited budget.

For example: An editor might have 2 hours of 1920x1080i 29.97 HDCam tapes, along with 2 hours of P2 assets, and need to deliver a 25 minute HDCam finished master, along with an NTSC Digibeta master and a DVD. This editor has a moderate workstation with two dual-core XEON processors on it, with one SATA system disk, and one 500 GB scratch/media disk. By capturing the HDCam footage with the DVCProHD codec using XENA, and moving the P2 footage directly to the local system the editor easily gets all 4 hours of HD footage onto his single scratch disk with half the disk still empty, and the capability to read that footage off the disk in real-time for playback and editing.

Once the editor has captured and imported all his assets, editing with real-time playback of the DVCProHD assets occurs using the combination of native Premiere Pro effects, transitions, and tools, along with the included real-time AJA effects. The editor may select DVCProHD as their "Video Rendering" setting in the project preferences as well. This ensures that the files created when non-RT segments of the timeline are rendered, are also DVCProHD compressed and can be easily read off the storage system.

Finally, the editor may use all the normal export features from Premiere Pro along with additional features added by the XENA hardware and software to finish his deliverables. In this case, the editor would export the finished timeline to HDCam tape using the XENA device control and the XENA SDI outputs. Subsequently, the editor would use the XENA down-conversion feature (see XENA Manual for further description) to export the same timeline to his Digibeta deck in NTSC. Finally, the user can export the timeline to widescreen DVD or another file type using the normal encoding tools included in Premiere Pro.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

So, to summarize the steps:

- Capture almost anything to DVCProHD using XENA
- Edit using normal XENA and Premiere Pro toolset
- Directly export to multiple format deliverables
- Deliver finished content

e. Compressed Offline Editing with XENA

Compressed Offline Editing is also facilitated by using the DVCProHD codec with XENA. The fundamentals are the same as the online workflow described above. However in this scenario the editor uses the codec to do offline editing on a less expensive computer system, with the intention of finishing later using full-raster uncompressed HD.

In the example "d" from section 3 above, virtually the entire workflow remains the same except that before exporting the deliverables, the editor exports an EDL from his DVCProHD Project (1280x1080), then re-imports it into a full-raster (1920x1080) uncompressed project, and re-captures his HDCam assets to uncompressed files using a larger, faster, storage system. This allows for full-raster and higher bit-depth finishing, color grading, and effects work but only requires the final edited scenes to be recaptured in uncompressed format, rather than the entire set of assets. It also allows the online edit to occur in a completely different editing system if necessary. Once final finishing is done on uncompressed assets, delivery options remain the same.

Note: When capturing assets with pulldown removal, timecode of files will be incorrect and therefore re-capture of files may not work. This workflow described should be used in the case that every frame on the tape is captured.

So, to summarize the steps:

- Capture almost anything to DVCProHD using XENA
- Edit offline using normal XENA and Premiere Pro toolset
- Export EDL From DVCProHD project
- Import EDL to full raster project in selected online editing application
- Re-capture edited scenes in uncompressed format
- Directly export project using export features of chosen application
- Deliver finshed content

f. Mixed Media

One of the most powerful features of the XENA plug-ins for Premiere Pro is its ability to import and edit multiple media types, and play them all in real-time from the same timeline. For example, an editor with 1440x1080i 29.97 HDV or XDCam assets, and 1280x1080i 29.97 DVCProHD assets, can open a standard uncompressed 1920x1080 XENA project, and cut both files on the same timeline. In this case, virtually any 1080 file, of the file types supported by XENA can be edited on the same timeline.

g. AJA's hardware Scaling Support

Most AJA hardware has built in hardware-based scaling support that allows for DVCProHD resolution up-sampling and down-sampling to be done in real-time, with very high quality. This hardware based scaling is done during capture and during playback or output from the editing timeline. The XENA LH/LHe and the XENA 2K/2Ke both have this support built in. The XENA HS does not.

h. Codec Requirements

It is worth noting that the DVCProHD support included with XENA requires the presence of the XENA card, and works only in the applications where the card is being utilized. Quicktime files captured with XENA can be used in other applications, and even on other platforms, but they require the presence of a third party DVCProHD Quicktime codec such as the one included in Final Cut Pro, or the stand alone Quicktime decoder sold by Calibrated Software (www.calibratedsoftware.com).

4. DVCProHD Support on Mac with KONA

a. KONA with AJA's Mac Plug-ins for Adobe

AJA's Mac Plug-ins for Adobe are almost identical in function to the XENA Plug-ins on Windows. Functionality and workflow described in section 3 above will all apply, except for these noted exceptions:

- In the initial release of AJA Mac Plug-ins for Adobe, a DVCProHD codec will NOT be present. In this case, the presence of Final Cut Pro is required, as it provides a Quicktime DVCProHD codec that can be used by KONA inside Premiere Pro.
- AJA Machina is not available on Mac. This means that all DVCProHD Quicktime capture must be performed either in Final Cut Pro, or in Premiere Pro with AJA's Premiere Pro capture plug-in.

b. Tips for KONA users in Adobe Premiere Pro

KONA users, who are accustomed to using the KONA control panel, should take note that the Adobe Premiere Pro plug-ins do NOT use the Control Panel. This means that changing card outputs, inputs, and conversions is all controlled using the integrated AJA plug-ins inside Adobe Premiere Pro. For instructions, please refer to the AJA Mac Plug-ins for Adobe manual, which is installed with the plug-ins.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

c. KONA with DVCProHD in Final Cut Pro

Final Cut Pro, and the other Final Cut Studio applications, offer native support for the DVCProHD codec. Specific DVCProHD Easy Setups for Final Cut Pro are provided by AJA as part of the KONA software driver installation. Whether DVCProHD media is captured via a KONA card, via FireWire from a VTR or camera, or via file transfer from a solid state P2 device within Final Cut Pro, AJA offers realtime playback and editorial of the DVCProHD material. Material captured to the DVCProHD codec using version 3.5 XENA software on the Windows OS can be used within Final Cut Pro as well.

5. Cross-Platform Workflow with XENA, KONA, and DVCProHD

a. Single System Cross-Platform

These new features of XENA allow for a completely cross platform workflow with XENA and KONA. Using Bootcamp, with XENA drivers in Windows, and KONA drivers along with Final Cut Pro in MacOS, files can be captured, played and edited on either platform, using Machina, Premiere Pro, and Final Cut Pro. For example, a user who has both an After Effects license for Windows and a Final Cut Pro license, and use both applications on the same system, with Bootcamp. With an AJA XENA or KONA card present, a DVCProHD QuickTime file can be captured, used on both platforms, and in either application.

b. Collaborative Cross-Platform

Additionally, the features described in 5.a. above can easily be applied to a multi system/multi editor workplace. For example, suppose two editors are collaborating on the same project. One is a Mac user who knows FCP, and the other is a PC user who is more experienced with Adobe Premiere Pro. When these editors have their AJA XENA/KONA cards installed, files can be logged and/or captured by either of them, and at any stage, they can be passed, along with an EDL to the other editor, for input to the project.

c. AJA XENA/KONA Cross-Platform use

It is worth mentioning that both XENA and KONA cards be used on either platform. Effectively, the hardware is identical (i.e. XENA 2Ke is the same as KONA 3). The term XENA effectively brands AJA's Windows software, and KONA brands the Mac software. So an AJA card, purchased as a XENA, can be installed in a Mac. When the KONA drivers are installed with this card, it effectively becomes a KONA. This is true of a KONA card in a Windows based system as well. Installation of the XENA drivers with that card, make it a XENA even if it was purchased as KONA.

.

Copyright © 2008, AJA Video Systems, Inc. All Rights Reserved

WWW.AJA.COM
530.274.2048
800.251.4224 US

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP