

Workflow Guide for the SONY CineAlta® F5, F55 & F65 RAW - SRFile – 4KXAVC/HDXAVC – HD4:2:2 MPEG2 50Mbps



F5



F55



F65

This workflow guide is intended as an introduction to the different workflow options offered by the SONY CineAlta 4K Super 35mm family of digital motion picture camera systems. We will be making revisions to this document, as each workflow naturally evolves over time, and so will the feature set of each camera system.

All of these cameras are capable of acquiring the highest quality images in a variety of different file formats. To enhance and simplify the workflow SONY has partnered with many 3rd party Alliance Partners. The contribution from these partners cannot be underestimated.

There is now excellent support from all the major solution providers for Dailies, Editorial and Grading applications. There are currently more than 30 Format Supporters for both the SRMASTER® and XAVC™ formats.

SRMASTER Format Supporters

XAVC Format Supporters

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Basic Workflows:

The basic workflow for CineAlta cameras can be broken down into different sections.

- a. On-Set Look Management - creating in-camera 'looks' during pre-production or on-set
- b. Data transfer and backup - offloading data from cards, performing checksum and archiving
- c. Dailies – transcoding camera original files to multiple deliverable file formats (ProRes, DNxHD, QT, H.264, etc....)
- d. Editorial
 - Native files – using camera original files for edit process
 - Transcoded files – using dailies generated files for edit process
- e. Grading
 - Native files – grading final images from camera original files for highest quality
 - Transcoded files – grading transcoded files e.g. HD final delivery from RAW acquisition

Data transfer and backup:

The first process after shooting content with any digital camera is to offload and backup the data. Sony provides multiple solutions for doing this quickly and efficiently.

F65 data transfers:

The F65 camera offers two methods for offloading the recorded data.

1.SR-PC4

The SR-PC4 provides the highest data transfer rates for SRMemory cards. It can achieve up to 320MB/s transfers while concurrently generating checksum data. Transfer speeds this high require use of 10GbE ethernet connection. Interface to the SR-PC4 is via built-in GUI using standard internet browser or with the new SRUtility application.

The SR-PC4 also supports real-time playback of files directly from the SRMemory card with HD-SDI monitoring.



2.SR-D1

The SR-D1 supports both eSATA and USB3 interfaces. Operation is very easy and transfer speeds up to 200MB/s can be achieved.

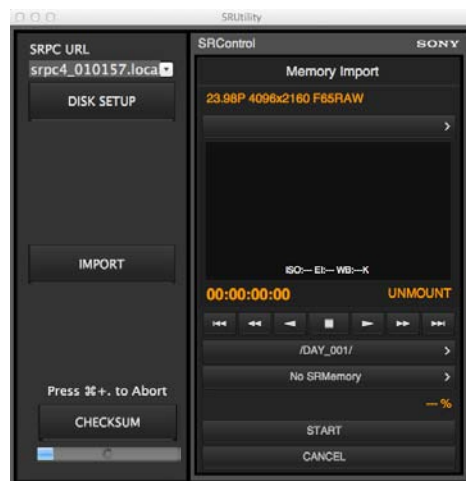


SRUtility application for SR-PC4:

This is a newly designed application to interface to the SR-PC4. It has been designed to have a user friendly interface and to be very easy to configure and operate.

Key features of this application are:

- Easy configuration for NFS (MAC OS) or CIFS (WINDOWS OS)
- Auto selection of All Files on card
- Auto Checksum capability
- File transfer logging
- Shortcut keys
- Provides direct access to same operation screens as the standard SR-PC4 GUI interface
 - Viewer, Import, Setup, Format & Diagnosis



F5 & F55 data transfers:

The F5 & F55 cameras offer two methods for offloading the recorded data.

The card reader used depends on the media used for the recording, SxS (XAVC, SRFile, MPEG2 50) or AXS (F5RAW or F55RAW)

1.SBAC-US20

The SBAC-US20 is used for transferring files from SxS® cards. It utilizes USB3 interface for high speed transfers up to 170MB/s.



2.AXS-CR1

The AXS-CR1 is used for transferring files from AXS cards. It utilizes USB3 interface for high speed transfers up to 200MB/s.



On-Set Look Management:

This is a rapidly growing segment of the workflow. It allows the intended look achieved on-set to be passed through Dailies and onto the final Grading process. The most common way to pass this data from on-set to the post pipeline is using ASC CDL values.

Note: ASC CDL is the American Society of Cinematographers Color Decision List. It is comprised of 10 numbers that reflect how the image color was changed. It consists of values for Slope (R, G, B), Offset (R, G, B), Power (R, G, B) and Saturation.

For CineAlta cameras, utilizing the SLog2/S-Gamut output provides greatest dynamic range and wider color gamut than that of 35mm film. ASC CDL data captured on-set can then be repurposed for generating Dailies deliverables and in final Grading.

On-Set Look Management support for CineAlta cameras



Blackmagicdesign
FUJIFILM
colorfront
PANDORA
FilmLight
POMFORT *fn*

*Blackmagic DaVinci Resolve V10, HDLink Pro
Colorfront On set Live
FilmLight Truelight, FLIP
Fujifilm CC Box
Pandora Pluto
Pomfort Livegrade*

Dailies:

Dailies is a very important component of almost all workflows these days. The majority of projects record the audio separate from the camera. Of course it is possible to use the CineAlta camera recorded audio as it is very high quality. Historically audio is recorded separately and must be synced in the Dailies process when generating deliverables.

ASC CDL values from On-Set Look Management can also be utilized for Dailies creation, or a new ASC CDL can be generated and applied by the Dailies application.

Any deliverable required by the production can be generated from the files recorded by the CineAlta cameras.

Dailies solutions that support Dailies generation with CineAlta cameras



ASSIMILATE
Blackmagicdesign
FilmLight
codex
colorfront
MVI FILM
YoYotta

*Assimilate Scratch Lab
Blackmagic DaVinci Resolve
Codex Vault
Colorfront OSD, ExD
FilmLight Baselight Transfer
MTI Film Control Dailies, Cortex
Yo Yotta YoYo*

Editorial:

Of course editorial is an essential part of the workflow. The file formats generated by CineAlta cameras provide Productions with different options for editing.

1. Native editing
2. Transcoded editing

Native editing:

Many of the NLE platforms can natively handle these files. Productions that want to operate like this can skip Dailies Generation and go straight to editorial.

NLE's that natively support HD & 4K XAVC

The image shows four logos: the Adobe logo (a red 'A' with a white triangle), the Apple FCP-X logo (a clapperboard with a rainbow spectrum), the Avid Media Composer logo (three purple triangles), and the Sony Vegas Pro 12 logo (a blue play button on a black box).


*Adobe Premiere
Apple FCP-X
Avid Media Composer, Symphony
Sony Vegas Pro 12*

NLE's that natively support SRFile

The image shows three logos: the Apple FCP-X logo (a clapperboard with a rainbow spectrum), the Avid Media Composer logo (three purple triangles), and the Sony Vegas Pro 12 logo (a blue play button on a black box).

*Apple FCP-X
Avid Media Composer, Symphony
Sony Vegas Pro 12*

NLE's that natively support RAW

The image shows two logos: the Adobe logo (a red 'A' with a white triangle) and the Avid Media Composer logo (three purple triangles).

*Adobe Premiere
Avid Media Composer, Symphony*

Transcoded editing:

In the Dailies process it is very common to generate DNxHD or ProRes files for the off-line editing process. All NLE's can edit with these files so the process is no different to editing with any transcoded file.

At the end of the editing process it is typical to generate an AAF or XML file for relinking to the camera original files for final grading.

AAF or XML?

So what exactly is the AAF or XML that is generated by the NLE system?


















AAF (Advanced Authoring Format) and XML are both multimedia file formats that allow exchange of digital media and metadata between platforms, systems, and applications. The selection of AAF or XML depends on the editing system being used.

The metadata captured during the editing process enables re-linking between off-line files, camera original files or transcoded on-line files. This is a very powerful feature and is used in the vast majority of projects. It is also commonly known as 'roundtripping'.

Grading:

The grading process is typically the final step in a project. This is where final color corrections are applied. All the major grading applications support CineAlta camera files. To maintain the highest quality it is recommended to use the camera master files for this process.

Manufacturers that can grade files from CineAlta cameras are:

| Grading applications that support HD & 4K XAVC | Grading applications that support SRFile | Grading applications that support RAW |
|--|--|--|
|    |        |        |
| <i>Assimilate Scratch Blackmagic DaVinci Resolve FilmLight Baselight</i> | <i>Assimilate Scratch Autodesk Flame Blackmagic DaVinci Resolve Digital Vision Nucoda DVS Clipster FilmLight Baselight Quantel Pablo</i> | <i>Assimilate Scratch Autodesk Flame Blackmagic DaVinci Resolve Digital Vision Nucoda DVS Clipster FilmLight Baselight Quantel Pablo</i> |

WHY IS GRADING NECESSARY WITH RAW or LOG BASED CAMERA ACQUISITION?

For many years cameras burnt-in the look when capturing images. They were painted to achieve the desired look. This was OK when the dynamic range of cameras was noticeably more limited than it is today. These days CineAlta cameras can capture images with a latitude of 14 stops. To do this Sony CineAlta cameras employ Linear RAW and SLog2 (XAVC, SRFile, MPEG2) formats to capture the entire range of the signal without any clipping or crushing.

Linear RAW or SLog2 encoded images require grading to produce the desired final results. The benefit is that everything in the image has been captured. It also permits easier manipulation of the images to produce amazing final results.

With the PMW-F5 and PMW-F55 not only are Linear RAW and SLog2 formats supported. They can also be adjusted during pre-production to match multiple cameras. This is perfect for multi-cam productions like sitcoms or dramas. Producing excellent results that enable fast turnaround for post-production, even at 4K resolutions.

MEET THE NEWEST MEMBER OF THE SONY 4K/2K RAW CAMERA FAMILY:

NEX-FS700 + HXR-IFR5 + AXS-R5



NEX-FS700

HXR-IFR5 AXS-R5

The NEX-FS700 is now enhanced with migration path to support 4K RAW acquisition.

HXR-IFR5 interface unit scheduled to ship in June 2013 will allow Super Slow Motion NEX-FS700 camcorder to capture stunning 4K/2K RAW cinematic content in combination with the Sony AXS-R5 RAW recorder.

In addition to realizing the full potential of the FS700's imager, the ability to record RAW affords tremendous workflow flexibility in post production.

RAW data can be archived for repurposing at a later date, can be used in an off line or on line workflow, and offers the flexibility of debayering to any format or codec of choice.

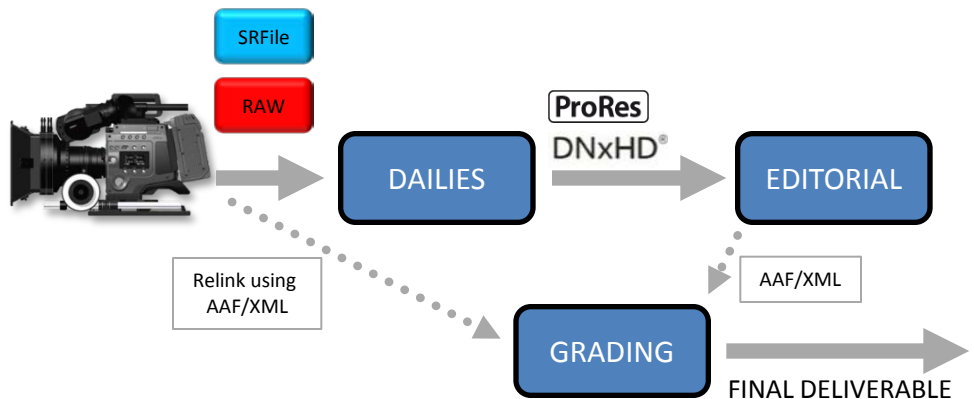
The NEX-FS700 camcorder features a state-of-the-art 4K Super 35 "Exmor®" CMOS sensor (total 11.6 million pixels). With an optional firmware upgrade (available June 2013), the NEX-FS700 will output 4K bit-stream data over 3G-SDI. The HXR-IFR5 interface unit has a 3G-SDI input and will transfer the 4K/2K RAW data for recording onto Sony's AXS Memory Card technology.

The 4K RAW format output by the NEX-FS700 camcorder is 4096 x 2160 pixel resolution and the available frame rates are 23.98p, 25p, 29.97p, 50p and 59.94p. High frame rate continuous recording up to 240fps is also possible in 2KRAW.

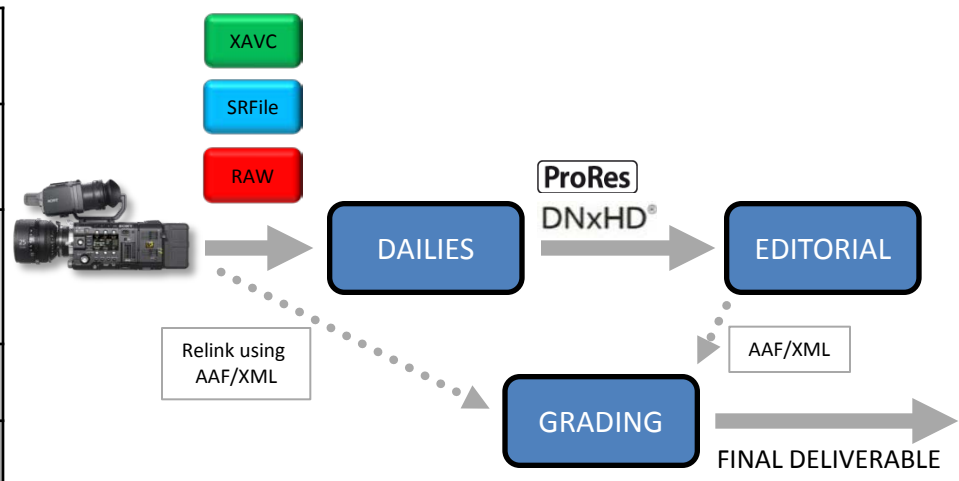
After recording the 4K/2K RAW data onto the AXS Memory Card, the workflow will be the same as PMW-F5 and PMW-F55 when using the AXS-R5 for RAW recording. This gives users the unique opportunity to combine camera solutions in production for multi-camera scenarios with the advantage of a unified 4K RAW workflow.

WORKFLOW EXAMPLES:

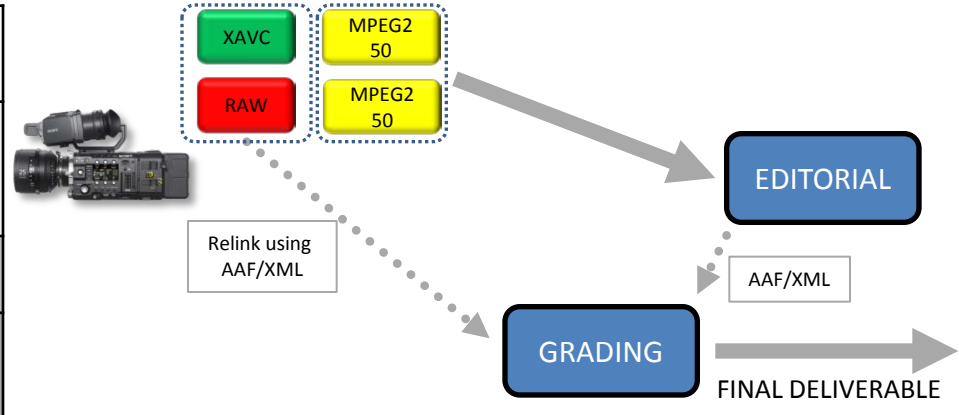
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|---|
| <h1>F65</h1> |
| Format: F65 RAW or SRFile |
| Dailies : • Sync audio • Transcode to ProRes or DNxHD |
| Editorial: • ProRes or DNxHD |
| Grading: • F65 camera original • RAW or SRFile |



| |
|---|
| F5/F55 |
| Format: F5/F55 RAW or SRFile or XAVC |
| Dailies : • Sync audio • Transcode to ProRes or DNxHD |
| Editorial: • ProRes or DNxHD |
| Grading: • F5/F55 camera original • RAW or SRFile |



| |
|---|
| F5/F55 |
| Format: Combo Record F5/F55 RAW or XAVC & MPEG2 50 (proxy) |
| Editorial: • ProRes or DNxHD |
| Grading: • F5/F55 camera original • RAW or SRFile |



DMPC – DIGITAL MOTION PICTURE CENTER

Website <http://www.sony.com/DMPC>



Mission Statement

We believe the production community needs a place to come together, share experiences and stay current with the latest digital technology. With the creation of the Digital Motion Picture Center, located right on the Sony Pictures Lot at Stage 7, Sony has made a long term commitment to strengthening their ties to the film community.

The DMPC is your one stop learning destination for:




- Camera and lens testing/training
- Dailies, Editorial and DI workflow optimization
- Partnering with 3rd Party Solutions
- 4K content viewing
- And so much more!

The DMPC offers weekly hands-on training on Sony's full range of Super 35mm cameras---especially the groundbreaking F65 CineAlta digital motion picture camera and the new F5/F55 4K digital cameras. Here, on one stage, filmmakers can shoot 4K pictures, process them through a 4K workflow and view the results on a 4K projector! In addition to our product line, the DMPC features a wide range of 3rd party workflow solutions that support our technology. You can freely test any workflow at your discretion. Your input and experiences are critical to Sony as we develop the right tools to advance the state of art in digital production.

SONY software to support CineAlta cameras:

To support our CineAlta cameras there are a selection of applications, plug-ins and utilities available.

<http://www.sonycreativesoftware.com/download/updates>

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|-------------------------|---|---|
| Content Browser | XAVC and MPEG2 50 <i>Content Browser is an all-in-one clip management application that can be used with the latest portfolio of Sony camcorders and decks. Content Browser integrates XDCAM Browser (XDCAM) and Content Management Utility (NXCAM) into a single application.</i> |  |
| SR Viewer SRV-10 | SRFile <i>Viewing application software for SRFile (MPEG-4 SStP) files. Incorporates SRSUM checksum mode.</i> |  |
| RAW Viewer | F5RAW, F55RAW & F65RAW <i>RAW Viewer is a dedicated application for viewing and basic color grading of Sony RAW files shot by CineAlta F65/F55/F5 camera with the optional RAW recorder. Transcode to DPX, OpenEXR formats. Decode resolutions up to 8K with F65RAW files.</i> |  |
| PDZK-LT2 | XAVC/XDCAM plug-in for FCP X <i>Camera Import Plug-in provides support for XAVC and XDCAM / XDCAM EX files shot on Sony SxS card, allowing viewing and editing capability in Final Cut Pro X.</i> | |
| PDZK-MA2 | XAVC/XDCAM plug-in for AVID <i>AMA plug-in provides support for XAVC and XDCAM / XDCAM EX files in Avid Media Composer, Symphony and NewsCutter products, allowing viewing and editing capability.</i> | |
| SRPA-10 | SRFile plug-in for AVID <i>AMA plug-in provides support of SRFile Lite, SQ & HQ modes. Ability to Export timeline sequence as SRFile (SStP) MXF. Link to AMA Volume support for SRFile (SStP) file structure.</i> | |
| SRPM-10 | SRFile plug-in for FCP 7/X <i>This plug-in needs to be installed for both Apple Final Cut Pro 7 and Final Cut Pro X.</i> | |
| PLAD-RW1 | RAW plug-in for ADOBE <i>This plug-in adds support for Sony RAW MXF files in Adobe Premiere Pro CS6 products, allowing viewing and editing capabilities.</i> | |
| PLAV-RW1 | RAW plug-in for AVID <i>This AMA plug-in provides support for Sony RAW MXF files in Avid Media Composer and Symphony products, allowing viewing and editing capability.</i> | |
| SR-D1 Utility | Device driver and utility application <i>This device driver and utility application enable you to mount an SRMemory Drive (SR-D1) as a memory card drive in both Windows and Mac operating systems.</i> | |
| AXS-CR1 Utility | Utility application <i>This software utility includes several functions for use with the AXS Memory Card Reader (AXS-CR1) including: Displaying the status of an AXS-CR1 drive and AXS Memory Card. Fully formatting an AXS Memory Card. Saving AXS-R5 firmware data onto an AXS Memory Card (for firmware update). Retrieving log data from an AXS Memory Card. Updating the Firmware of AXS Memory Card.</i> | |

ADDITIONAL TERMINOLOGY:

SLog2

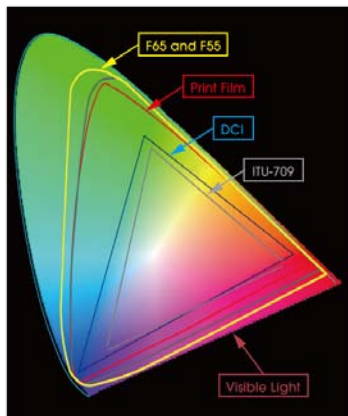
The original Slog gamma curve was created for the F35 and F3 cameras. It was designed to capture the full latitude of these cameras (approx 12 stops). With the latest F5, F55, F65 cameras being capable of capturing 14 stops it was necessary to revise this curve. The result is SLog2 which can handle the extended dynamic range now available.

S-Gamut

S-Gamut is the native color space for CineAlta cameras. The F65 and F55 also share the same CFA (color filter array). The benefit of S-Gamut over other cameras is that it is the widest color gamut currently available for any digital motion camera. In fact it is even larger than print film.

Sony has just released a selection of 3D LUTs (look up tables) to our Alliance Partners. These 3D LUTs will simplify grading from S-Gamut to Rec709 for projects that have a requirement for Rec709 Finishing.

These 3D LUTs will be available for customers to download as well.



ACES

This is the Academy Color Encoding System. CineAlta cameras have been designed to produce beautiful results when processed in an ACES pipeline. The benefit of S-Gamut becomes very apparent as the transform into ACES color space works beautifully. The results from using CineAlta cameras and ACES are simply amazing. There are some major Hollywood movies being released this year that have used ACES for color management. ACES plus CineAlta S-Gamut cameras is the perfect combination for the highest quality color rendition.

AVID DNxHD

Developed by AVID and stands for "Digital Nonlinear Extensible High Definition". It is a lossy HD video codec that was designed to reduce storage and bandwidth requirements. It is an implementation of the SMPTE VC-3 standard.

APPLE ProRes

ProRes is a family of intermediate codecs designed for post production use. It is a lossy codec that supports resolutions from SDTV up to 4K.

CHECKSUM

This is a critical aspect of file based workflows. It is vitally important that all the data recorded on the memory card is transferred and backed-up. Equally important is generation of checksum data when transferring the files. This checksum data can be used to confirm that the files were transferred correctly. The most common checksum algorithm for video files is MD5.

LUT (1D or 3D)

A 'Look Up Table' is a transform used to process an image. They are typically available as 1D or 3D tables. A 1D LUT is useful to manipulate the tone curve of an image. A 3D LUT can be used to change the color space of an image. Simply put, a 1D LUT will convert an input data value to a different output data value. Whereas a 3D LUT will convert an input color to a different output color.