About DVCPRO HD

DVCPRO HD is a high definition addition to the DV/DVCPRO format family, making it simple to adapt your existing DV- and FireWire-based editing workflow to HD video. DVCPRO HD is an enhanced version of DVCPRO and DVCPRO50. DVCPRO50 is backwards-compatible with standard DVCPRO and DVCPRO50.

DVCPRO HD, also known as DVCPRO100 is a high-definition video format that can be thought of as four DV codecs that work in parallel. Video data rate depends on frame rate and can be as low as 40 Mbit/s for 24 frame/s mode and as high as 100 Mbit/s for 50/60 frame/s modes. Like DVCPRO50, DVCPRO HD employs 4:2:2 color sampling.DVCPRO HD increases the data rate to 100MBps, which is why it is sometimes called DVCPRO100. DVCPRO HD cassettes are identified by a red lid.

DVCPRO HD Formats Supported by Final Cut Pro

Final Cut Pro natively supports the following DVCPRO HD formats.DVCPRO HD uses smaller raster size than broadcast high definition television: 960x720 pixels for 720p, 1280x1080 for 1080/59.94i and 1440x1080 for 1080/50i.

59.94 fps–Based Formats

The following table shows the 59.94 fps–based DVCPRO HD formats supported by Final Cut Pro.

Format	Final Cut Pro Easy Setup	Sequence dimensions and frame rate	Scanning method
1080i60	DVCPRO HD - 1080i60	1280 x 1080, 29.97 fps	Interlaced
1080p30	DVCPRO HD - 1080p30	1280 x 1080, 29.97 fps	Progressive
1080pA24	DVCPRO HD - 1080pA24	1280 x 1080, 23.98 fps	Progressive
720p60	DVCPRO HD - 720p60	960 x 720, 59.94 fps	Progressive
720p30	DVCPRO HD - 720p30	960 x 720, 29.97 fps	Progressive
720p24	DVCPRO HD - 720p24	960 x 720, 23.98 fps	Progressive

50 fps–Based Formats

The following table shows the 50 fps–based DVCPRO HD formats supported by Final Cut Pro.

Format	Final Cut Pro Easy Setup	Sequence dimensions and frame rate	Scanning method
1080i50	DVCPRO HD - 1080i50	1440 x 1080, 25 fps	Interlaced
1080p25	DVCPRO HD - 1080p25	1440 x 1080, 25 fps	Progressive
720p50	DVCPRO HD - 720p50	960 x 720, 50 fps	Progressive

720p25	DVCPRO HD - 720p25	960 x 720, 25 fps	Progressive

DVCPRO HD Frame Rates

DVCPRO HD supports frame rates compatible with both NTSC and PAL frame rates, although most camcorders are designed to work with one or the other. For example, the Panasonic AG-HVX200 camcorder records 1080i60 or 720p60 DVCPRO HD, and the Panasonic AG-HVX200E camcorder (designed for PAL regions) records 1080i50 or 720p50 DVCPRO HD. 1080i footage is described by its field rate (60i or 50i), whereas 720p footage is described by its frame rate (60p or 50p).

Additional formats, such as 24p, can be achieved using pull-down (1080i) or duplicated frames (720p). Variable frame rates for slow- and fast-motion effects are also possible in the 720p format.

Note: 1080i60 and 720p60 DVCPRO HD actually operate at 59.94 fps, not 60 fps. See Setting System Frequency on a Panasonic Varicam Camcorder for an exception to this rule.

1080pA24 DVCPRO HD

1080pA24 DVCPRO HD is recorded using the 1080i60 format with advanced pull-down (2:3:3:2). This is the same method employed by the Panasonic AG-DVX100 camcorder.

Note: You can also record the 1080p24 DVCPRO HD format using traditional 2:3:2:3 pull-down. Cinema Tools can remove this kind of pull-down, but Final Cut Pro cannot. Don't use this format unless you have a special reason for doing sso. If you want to work with 1080p24 footage, the 1080pA24 format is much easier to use.

720p60 DVCPRO HD

The 720p60 DVCPRO HD format supports 60, 30, and 24 fps recording. When you choose a frame rate lower than 60 fps, the camera CCD captures images at the lower rate but the recording rate stays fixed at 60 fps.

For example, if you record the 720p30 format, the camera CCD produces 30 unique images per second, but each frame is recorded on tape twice. These duplicate frames are digitally flagged during recording and must be removed during or after capture.

Capturing DVCPRO HD

Used frames   Deleted frames

720p60

DVCPRO HD tape (59.94 fps)

Captured in Final Cut Pro (59.94 fps)

720p30

DVCPRO HD tape (59.94 fps)

Captured in Final Cut Pro (29.97 fps)

720p24

DVCPRO HD tape (59.94 fps)

Captured in Final Cut Pro (23.98 fps)

Most capture presets for 720p DVCPRO HD enable the Remove Advanced Pulldown and/or Duplicate Frames During Capture From FireWire Sources option to remove redundant frames during capture. For information about modifying capture presets, see "Capture Settings and Presets" in the *Final Cut Pro 7 User Manual*.

When this checkbox is selected, your captured media files are smaller and ready to edit at the proper frame rate.

Note: The 720p60 Easy Setup does not enable this option because no duplicate frames are recorded at 60 fps.s

For more information, see Stage 3: Logging and Capturing Your DVCPRO HD Footage in Working with DVCPRO HD in Final Cut Pro.

720p50 DVCPRO HD

The 720p50 DVCPRO HD format supports 50 and 25 fps recording. When you record at 25 fps, the camera CCD captures images at the lower rate but the recording rate stays fixed at 50 fps.

720pN DVCPRO HD Native Frame Rate Recording

Camcorders such as the Panasonic AG-HVX200 allow you to record 720p footage onto P2 cards without duplicating frames. Because the footage is recorded at the intended frame rate, this method is called *native frame rate recording* and is often indicated by the letter *N*. For example, 720p60 camcorders can record 720pN30 and 720pN24 formats. 720p50 camcorders can record the 720pN25 format. For details about how to best ingest these formats, see Panasonic P2

Camcorder Compatibility.

720p DVCPRO HD Variable Frame Rate Recording

Some 720p DVCPRO HD camcorders allow you to create slow- and fast-motion effects by recording at variable frame rates.

720p60 camcorders can record frame rates between 4 and 60 fps.

720p50 camcorders can record frame rates between 4 and 50 fps.

For example, you can create slow motion with the Panasonic Varicam camcorder by setting an intended playback frame rate of 24 fps and then recording at 60 fps. When 60 fps footage is played at 24 fps, slow-motion effects are created. For more information, see Using the DVCPRO HD Frame Rate Converter.

Setting System Frequency on a Panasonic Varicam Camcorder

The Panasonic Varicam camcorder can record at the standard NTSC-compatible rate of 59.94 fps or at exactly 60 fps. Final Cut Pro only supports DVCPRO HD video transfer via FireWire at 59.94 fps (or one of its variants, such as 29.97 or 23.98 fps). If you want to capture DVCPRO HD footage via FireWire, make sure you record your footage with the system frequency of your camcorder set to 59.94, not 60. For more information, see the documentation included with the Panasonic Varicam camcorder.

Choosing 720p60 DVCPRO HD Timecode Display Options

It is important that you choose the correct timecode display option for 720p60 DVCPRO HD media. Even though the timecode track of 720p60 DVCPRO HD QuickTime media files is always running at 60 fps, you can choose whether the timecode fields in Final Cut Pro display 60 or 30 fps timecode.

When editing 720p60 video, you can choose from two time display options:*HH:MM:SS:FF:* The timecode counts 60 frames per second, from :00 to :59.

60 @ 30: Displays 59.94 and 60 fps video using 30 fps timecode. One timecode number is used for every two video frames, and an asterisk is displayed on every other frame. This timecode display matches the display on DVCPRO HD decks and is useful when you are referring to log notes or EDLs generated with 30 fps timecode.

Frames	60 @ 30 fps	60 fps
	01:50:20:28	01:50:20:56
	01:50:20:28*	01:50:20:57
	01:50:20:29	01:50:20:58
	01:50:20:29*	01:50:20:59
	01:50:21:00	01:50:21:00
	01:50:21:00*	01:50:21:01

When editing 720p30 or 720p24 video, you can choose to display clip time instead of source time. The clip time option displays timecode at the media file frame rate, not the media file timecode track rate.

The DVCPRO HD Codec Fits Smoothly into Your Current Environment

DVCPRO HD codec recording and playback are standard on the P2 HD Series. The DVCPRO HD format, which stands at the apex of DVCPRO migration, uses 4:2:2 sampling to retain color information and an intra-frame compression system just like that of AVC-Intra, supporting high-end video production with chromakey composition and high-precision editing. DVCPRO HD is widely used by broadcasting stations and production companies around the world. Because P2 files are recorded with the same codec as the DVCPRO family, degradation-free conversion between tape and file is possible using an IEEE 1394 digital interface. This lets the P2 cam fit smoothly into a tape-based production environment and also allows the use of DVCPRO HD materials in a P2-file-based broadcasting system. HD (SD) SDI and analog interfaces are also provided for added flexibility.

New AVC-Intra 100/AVC-Intra 50 Codec

AVC-Intra is a new codec that further advances HD production. It complies with the MPEG-4 AVC/H. 264 international standard based on advanced motion-image compression technology, and offers both superb image quality and high compression. It uses an intra-frame compression system to bring important advantages to professional editing.

Applicable products

	AJ-HPX3700	Standard
	AJ-HPX2700	Standard
Camera Recorder	AJ-HPX3100	Standard
	AJ-HPX2000/HPX2100	Option
	AG-HPX370 series	Standard

	AG-HPX250*1	Standard
	AG-HPG20	Standard
Recorder	AG-HPD24*2	Standard
	AJ-HPM200	Standard
	AJ-HPD2500*3	Standard

The Avid Quicktime Codecs LE 1.2.0 installer will install the following codecs in the Windows System32 folder for system wide use:

- AvidAV1xCodec.qtx: Avid 1:1x codec (Uncompressed MXF 8-bit)

- AvidAVd1Codec.qtx: Avid DV 100 codec (MXF)

- AvidAVdnCodec.qtx: Avid DNxHD codec (MXF)

- AvidAVdvCodec.qtx: Avid DV codec(DV 25 and DV 50, OMF and MXF)

- AvidAVpkCodec.qtx: Avid Packed codec (Uncompressed MXF 10-bit)

- AvidQTAVJICodec.qtx: Avid Meridien Compressed codec (OMF 8-bit)

- AvidQTAVUICodec.qtx: Avid Meridien Uncompressed codec (OMF 8-bit)

http://en.wikipedia.org/wiki/DV#DVCPRO

http://documentation.apple.com/en/finalcutpro/professionalformatsandworkflows/index.html#chapter=3%26section=1

http://www.panasonic.com/business/provideo/dvcpro-hd-camcorder.asp

http://www.free-codecs.com/download/Avid_Quicktime_Codecs.htm