

Current Capabilities of the nanoFlash, as of July 12, 2009

Recording and Playback

1. Recording and Playback of clips.

The nanoFlash records seamlessly from one CompactFlash card to the next.

We call each recording, from when the recording starts to when it ends, one "Clip".
We break long "Clips", seamlessly and automatically, into multiple "Sub-Clips".

The sub-clips (files) are recorded in FAT32 format for compatibility with both Mac's and PC's.

When the maximum size of one sub-clip is reached, the current sub-clip is closed, and another sub-clip is opened seamlessly. A menu option allows you to customize the "maximum size" that you wish to use. This allows you to indirectly specify the length of each sub-clip.

There is no loss of audio or video during this process.

Playback is seamless from one sub-clip to the next, even if the next sub-clip is on another CompactFlash Card.

While the nanoFlash holds two CompactFlash cards simultaneously, the files are written to only one card at a time.

There is no need to have more than one card in the nanoFlash for recording, unless one wants to increase the maximum recording time, as when one card becomes full, the next card is used automatically.

The nanoFlash will create native Quicktime files, or native MXF files, selectable via a menu option.

Final Cut Pro version 6.0.5 or later, with all of the latest updates, is required to work with the Quicktime files.

Recent versions of Sony Vegas 8.0c and above, Edius, and Avid support our native MXF files.

If the original files are recorded in Quicktime, we provide a free utility to convert them to native MXF files.

Quicktime allows one to take the files recorded onto a Compact Flash card to a Mac computer with Final Cut Pro (Version 6.0.5 or higher) and immediately start editing.

Likewise, our MXF files may be edited with other popular Non-Linear Editors (NLE's).

Alternatively, one can transfer the files to a computer and then immediately re-use the card.

The Lexar Firewire 800 CompactFlash or the SanDisk Extreme Firewire 800/400 card readers may be used to quickly transfer the clips to another storage device, such as a computer or laptop. If one has an ExpressCard 34 slot, then a very high speed Sonnet CompactFlash card reader is available for around \$100 US.

The transfer occurs up to approximately 6x real-time for 50 Mbps clips, or up to approximately 3x for 100 Mbps clips, or even faster with the ExpressCard 34 card reader.

But, this depends on your computer setup / speed / disk type (IDE, Firewire 400 / Firewire 800 / SATA I/II) / disk speed / CompactFlash card reader type / etc.

If time is critical, one can play or edit the clips directly off the CompactFlash card when using one of the

CompactFlash card readers.

We also recommend the Nexto DI storage device, as this is a very effective way to store the contents of multiple CompactFlash cards. This also isolates the CompactFlash card from the Mac Leopard operating system, which has caused serious problems with Transcend cards on an intermittent basis.

2. Playback.

After each recording, the Play key may be used to play back the last clip.

During playback, one can press the Left Arrow or Right Arrow to navigate to other clips/sub-clips. One can quickly jump from one sub-clip to another.

Or, one can select the desired clip via the menu, based on clip name or timecode.

A Flash XDR may be used to playback nanoFlash clips and vice-versa.

3. Saving of Current Menu Settings.

Appropriate current menu settings are saved in non-volatile memory.

The settings remain active through power down and power up and the changing of the battery or interruption of the power supply.

4. Naming of Clips.

Each Clip is given a “nanoFlash/Camera” unit number, a Clip Number, and a Sub-Clip number.

The Clip Number is a three-digit, sequentially assigned number. This number is remembered through power down and power up cycles.

This allows the clips from multiple CompactFlash cards, or even multiple nanoFlashes, to be loaded into a folder with all of the clips automatically sorted into a useful order.

Then, in many NLE's, one can select a group of clips, then drag and drop to a timeline, and all of the clips will appear, in order, on the timeline.

Video

5. Video Modes Supported.

Bit Rate Compression Audio Format Subsampling Raster

160 Mbps Long-GOP CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
140 Mbps Long-GOP CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
100 Mbps Long-GOP CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
050 Mbps Long-GOP CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
035 Mbps Long-GOP CBR PCM 24-Bit 48K 4:2:0 1920 x 1080 / 1280 x 720p

220 Mbps Intraframe (I-Frame Only) CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
160 Mbps Intraframe (I-Frame Only) CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
140 Mbps Intraframe (I-Frame Only) CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p
100 Mbps Intraframe (I-Frame Only) CBR PCM 24-Bit 48K 4:2:2 1920 x 1080 / 1280 x 720p

Note that the CompactFlash card brand / speed in use may restrict the bit-rates available. Also, our Pre-Record Buffer option restricts the maximum bit-rate to 160 Mbps.

The nanoFlash is able to detect the brand / speed of some CompactFlash cards, but not others. Recommended cards can be detected at this time. If you are using a non-recommended card, it is appropriate for you to run tests to see that the card does record and play properly, in the modes and bit-rates you have selected.

6. Video Formats Supported.

1080i60 / 59.94 / 50

1080p30 / 29.97 / 25 / 24 / 23.98 (23.976)

1080psf30 / 29.97 / 25 / 24 / 23.98 (23.976) (psf = Progressive Segmented Frame)

720p60 / 59.94 / 50

Please note that we support "True 60" and "True 24".

7. Long-GOP Mode or Intraframe (I-Frame Only).

Files are recorded in either Long-GOP mode or Intraframe (I-Frame Only), selectable via a menu option.

8. Recording Quality Options.

35 / 50 / 100 / 140 / 160 / 220 Megabits per second modes are available.

Speeds up to including 140 Mbps can be recorded using 133x write-speed cards, but please use the specific cards that we have qualified.

Speeds 160 Mbps and higher require faster CompactFlash cards.

Our 100 Mbps Long-GOP mode has been shown to be visually indistinguishable from a live, uncompressed feed and this mode can be recorded on 133x write-speed cards that we have qualified.

140 and 160 Mbps Long-GOP modes are available for your use, but we recommend 100 Mbps Long-GOP for most applications, as this has been proven to be the "Sweet Spot".

High bit-rate Intraframe (I-Frame Only) modes are also of very high quality.

We recommend that you select the best option for your application, based on tests that you have run, prior to your production.

Please test the mode, recording quality, etc. with the NLE that you will be using for post.

Audio

9. Audio Recording.

- All recording is done in the 24-bit word format.
- Typically, audio is recorded from the audio embedded in the HD-SDI or HDMI signal.
 - .. In this mode, audio signals are first fed into your camera, and your camera provides phantom power, if needed to your microphones.
- For external audio, one external 3.5 mm, 1/8" audio input is provided.
 - ...This can be configured for mic or consumer line levels.

...This input works very nicely with many cameras' line level outputs
... and mixer "tape outputs" via a simple audio cable.

- Two unbalanced mic level inputs, with up to 44 db gain, and consumer line level inputs
- Future: One unbalanced mic level input, however no phantom power provided (3.5mm plug).
... This is supported by the nanoFlash hardware; we just do not have this option
... in our firmware at this time.
- Audio Level Meters
- The Headphone output can be used for monitoring while recording or playback.
(At this time there is some latency in the headphone output.)
- The Headphone output can also be configured to output consumer line level.
- Two Channels of embedded HD-SDI Audio can be recorded.
... Future: Eight Channels of embedded HD-SDI Audio is planned.

10. Audio and Timecode Embedding.

The two external audio channels are automatically embedded into the HD-SDI and HDMI outputs.

External timecode is also automatically embedded into the HD-SDI outputs.

The HDMI spec does not support timecode.

Timecode

11. Timecode.

Timecode embedded in the HD-SDI signal, or external timecode can be selected.

The current timecode value is prominently shown on the display.

The selected timecode source, external timecode or embedded timecode, is recorded with the audio and video.

The HD-SDI output will have the selected timecode automatically embedded in the output signal.

Compact Flash

12. CompactFlash Card Support.

We currently recommend the SanDisk Extreme III, SanDisk Extreme IV, Delkin UDMA, and Lexar 300x UDMA CompactFlash Cards.

We also work with the Kingston Elite Pro 32 GB cards, but we currently do not recommend their purchase. Those with Kingston cards may continue to use them. There has been a bad batch of Kingston cards. We cannot recommend the Kingston cards at this time due to the chance of receiving a bad card. If the Kingston card passes our "Format", then it is ok to use.

Those with Transcend cards may continue to use them, but we recommend that Transcend cards not be inserted into any card reader attached to a Macintosh, for the safety of your card and your data.

Other cards will be qualified in the future, including 64 GB cards as they become available.

The nanoFlash only accepts Type I (Type 1) cards. Type II cards are thicker. We could modify the nanoFlash to accept Type II cards, but we are worried about cards being inserted improperly and thus damaging the contacts. We avoid this, at this time, by limiting the opening to accept Type 1 (the most common type) only.

The nanoFlash is designed to accept larger capacity cards, such as 64 or 128 GB cards when they become available. However, we will need to qualify the new cards to ensure that they will work well with the nanoFlash.

13. CompactFlash Card Monitoring.

- A Bar Graph for each Compact Flash card is provided to show percent used and percent space remaining.
- The total remaining record time, across both cards, is also displayed digitally.
- Each CompactFlash card slot has an LED status light.

14. CompactFlash Card Formatting.

Two 32 Gigabyte CompactFlash cards can be fully formatted, in the nanoFlash, in under 10 seconds.

Record Trigger Options

15. Record on Incrementing Timecode.

The nanoFlash can be set to start recording when incrementing timecode is detected. When the timecode stops incrementing, recording will stop.

Due to the inherent complexities of Record-Run timecode in certain cameras, you may find that using the wired remote control that we now offer better fits your type of recording.

For example, some cameras will not increment timecode unless they have a tape or other memory in the camera, and then they stop incrementing timecode if the internal media becomes full.

If you are recording long events, triggering with the record button on the nanoFlash or via a remote control may fit your needs better.

16. Remote Start/Stop.

The nanoFlash provides a 10-pin Hirose connection for remote start / stop with a tally (recording) light, timecode input and RS-232/RS-485 connections. Please note that the Flash XDR remote control uses a 4-Pin Hirose connector and thus is not compatible with the nanoFlash.

Please note that RS-232 and RS-485 will be supported in a future firmware release.

We are working to support an external GPS device for use with the nanoFlash. The GPS device itself will be available at extra cost and there may be an extra cost for the GPS software/firmware.

17. Record Trigger Options.

Recording can be trigger via any one of the three separate options.

- a. Incrementing time code (via the timecode embedded in the HD-SDI signal only)
- b. Record Button (on the nanoFlash)
- c. Remote Control

d. None – Recording is locked out allowing for playback only.

Other Features

18. SD-SDI Support.

The nanoFlash has limited support for recording SD-SDI at this time.

Playback of SD-SDI is not yet supported from within the nanoFlash itself.

19. Internally Generated Timecode.

The nanoFlash is capable of generating timecode internally.

Jam-sync of timecode is not currently supported.

20. Pre-Record Buffer.

The nanoFlash, as a menu option, can be set to keep the last 4.5 seconds of video in a cache memory. When a recording starts, then these 4.5 seconds of video and audio will be placed at the start of the recording.

When Pre-Record Buffer is enabled, 160 Mbps is the maximum bit-rate supported.

21. Internal Temperature Display

The internal temperature of the nanoFlash is displayed in the LCD.

We provide this so that you can monitor the internal temperature of the nanoFlash when you are using it under extreme weather conditions. Under normal conditions, there is no reason to be concerned with the internal temperature.

The nanoFlash consumes 5.6 watts in recording, or when in pre-record buffer mode, and 4.9 watts in playback, or 0.2 watts in standby (when no signal is present on the HD-SDI input and you have selected HD-SDI as your input. The nanoFlash can not enter standby when HDMI is selected as the input.

22. Simultaneous Output.

The input to the nanoFlash may be either HD-SDI or HDMI, selected via a menu option.

Both HD-SDI and HDMI outputs are live, regardless of which input is selected.

This allows the nanoFlash to be used as a HD-SDI to HDMI converter and vice-versa.

Also, this allows HDMI monitors to be used on-set, or off-set for reviewing footage.

23. Battery Level Monitoring

We have added Battery Level Monitoring to the nanoFlash. The battery voltage is displayed on the LCD.

In the future, we will add support for detecting critical battery levels, which vary depending on the battery chemistry in use.

24. Quicktime to MXF Converter

We provide a free, Quicktime to MXF Converter. This works with files created by the Flash XDR or nanoFlash only, and works on the Mac only.

This allows one to record in Quicktime mode, then, using a Mac, create MXF versions for Avid, Sony Vegas, Edius, etc. Please note that this is not a transcode, no quality is lost in this process.

25. Future Features

Hot Swapping of the CompactFlash cards, over and under-cranking, and other features will be added in future releases.