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Settings for the Panasonic HVX200 for transfer to 35mm

General remarks:

The Panasonic HVX200 is often mentioned together with the HDV cameras which have been released recently as it falls roughly into the same price and user segment as the small “prosumer” HDV cameras. Still the HVX200 does not record in a HDV codec. It is a multi format camera which can record in several SD formats and in Panasonics HD format DVCPro100.

The second attribute which discriminates it from the HDV family is that it records onto P2 cards and not onto tapes. There is a tape drive in the camera but it is solely for DV recording.

Consequently the users of this camera will have to fit the production and post production process to the workflows which this camera dictates.

Recording time with P2 cards:

There are two slots for P2 cards. Today one card can take up to 16 GB. One GB equals to about 1 min of DVCPro 100 or 2 min of DVCPro 50 or 4 min of DV. The capacity of P2 cards is constantly increased with every new generation coming to the market.

Models:

There are two available models fitting the PAL and NTSC markets:

The 50 Hz model for PAL countries (Europe, some Central/South America) 25p/50i.

The 60Hz model for NTSC countries (USA, Japan, some Central/South America) 24p/60i

We used the Euro model in our test.

Resolution:

From what I could find out the facts are the following:

The actual chip of the HVX200 camera can record 950x540 pixels only. This is below HD resolution. With the help of a spatial offset technology called “Advanced Progressive Technology” a true progressive image of a resolution of actually 1440x810 can be captured. This lies somewhere between 1280x720 and 1920x1080. All image sizes the camera offers as output are derived from that resolution.

Recording frequency:

60Hz, US model:

Important: There is a difference between the frame rate captured by the camera chip and the frame rate actually recorded to tape. Most video systems still capture onto magnetic tape. When varying frame rates and progressive scan became possible in capturing, technicians had the following problem: Tapes are limited to one frame rate for recording.

Also DVCpro 100 was originally recorded onto tape by the Varicam system. Therefore a recording mode needed to be chosen, into which all capturing formats could be transformed and then regained for post without losing quality.

Example:

The DV format. Originally thought to record an image with 60 half frames (SD 60i). Panasonic made the first DV camera which was able to capture 24 full images per second (true 24p), the DVX100. Now, how do I record 24 full images onto a tape which has recording tracks for 60i? One possibility is the classic 2:3 pulldown which is also used to telecine 35mm film onto 60i video. The problem is that you can prove by going step by step through this process that the image quality will suffer if you do 24p to 60i to 24p (back to 24p for post production on a 24p timeline) with the 2:3 pulldown. This problem was solved by the new 2:3:3:2 pulldown. With this pulldown the way from capturing true 24p to recording onto a 60i tape and back to a 24p timeline in post does not harm the image quality. This mode was called the advanced mode.

Back to the DVCpro 100: Panasonic decided for it's DVCpro 100 format to record at 60p for the US model and the Euro model at 50p, meaning 60 (50) full progressive frames per second. I will talk about the US version in the following explanations only. Even if recording onto P2 cards does not have the problem of the tapes, Panasonic stuck to their workflow they worked out for the Varicam, probably to keep the recorded footage compatible. Therefore the US model of the HVX200 has a p and a pA (A for Advanced, 2:3:3:2) mode reflecting the DVX100 issue.

Still there is an additional option which is grace to P2 recording media: The pN mode (N for Native). The pN mode records actual 24p and does not go via 60p. This helps to save space on the P2 card.

Important: To profit from the advantages of either the pA or the pN mode, the post production platform used must be able to ingest the footage according to their technical requirements. Else you do more damage than good.

50Hz European model:

A direct comparison of material recorded in 720/25p with the same shots in 1080/50i showed a slightly better sharpness of the 1080i material.

Conclusion:

* From what the technical facts tell us and the test we did with the European model the 1080/50i (Europe) 1080pA (US) mode does deliver the best quality.

* 720pN should be chosen if the substantially increased recording time per card is needed. The loss of sharpness is small.

* Again: To profit from the advantages of either the pA or the pN mode, the post production platform used must be able to ingest the footage according to their technical requirements. Else you do more damage than good.

* Recording 1080p and 720p probably give a similar result. Both workflows do not maintain the max. quality because of processes taking place inside the camera.

Recommendations for transfer to 35mm film (tested at 1280x720/25p):

Detail Level: -2 to 0
V Detail Level: -2 to 2
Detail Corning: 0
Master Ped: +2
Gamma: HD norm
Knee: mid
Skin Tone Dtl.: off
Shutter speed: 1/50s

The change of the setting of Detail Corning does not alter the image too much, neither in a positive nor a negative way.

Panasonics HVX200 camera is not as strong under **low light conditions** as other video cameras are. Using the gain might be no problem for TV purposes, but the increased video noise is much better visible after blowup to 35mm. So using gain should be avoided whenever possible.

Image quality:

The HVX200 can't compete with HDCam or Varicam quality but it does generally outdo HDV, DV or DVCam. When used correctly the results can be very good for the camera's price.

HVX200 vs. HDV:

The general image quality is better and less "videoish" than the heavily compressed HDV formats. Due to the true progressive mode, motion reproduction is better than what the interlaced HDV formats deliver.

The image is noisier than Sony's Z1 for instance, but it shows less compression distortions. There is no absolute judgment possible on which system is better if all aspects are taken into account. It depends on the type of project and your personal preferences.

Color reproduction:

The color compression is not as strong as in HDV.

Using a setting of Chroma = +3 (standard setting) looked fine.

General remarks:

After all please keep in mind that shooting in HD demands additional care and experience compared to shooting in SD specially in what concerns lighting.

The production/post production workflow for the P2 cards is new and not settled yet. This can make workflows seem more cumbersome than with established formats. As the hardware and software for tape free post production improves, the processes get easier and clearer. Tape free recording is a forward-looking technology, it will sooner or later be a standard. If P2 cards are going to be major recording media in this field is another question.

The HVX200 and Final Cut Pro:

It used to be necessary to make the MXF files ready for editing in Final Cut Pro, by a software like "P2 log" by Imagine Products which we used in our test.

www.imagineproducts.com/P2log.htm

In the latest versions of FCP MXF file import is no problem there is no additional software required.

Delivery formats for transfer to 35mm:

Delivery formats for a finished project or a test for transfer to 35mm are:

- * Play out on DVCPRO HD tape or uprez and play out HDCam tape.
- * Series of image files (TIFF, TGA, DPX, CIN, BMP)
- * Never play out onto a HDV tape!

Testing is always recommended!

With every new camera model or format some time and experience is required to become aware of all advantages, disadvantages and possible pitfalls. Only a test transfer to 35mm can give you full insight in what you can expect.

Different transfer systems have very different properties. Our recommendations for settings are limited to our systems.

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