DIGITAL PRODUCTION
CHALLENGE II

2009 Technical Focuses

Technical Focus 1 — The decision tree.

A primordial question for the producer is understanding through which channels he can distribute his film and so, in which format he must deliver his copies. The answer to this question — often multiple, that is: film copies, numeric copies, tv and dvd copies — depends on the workflows or diverse ways available to her/him to produce the film.

Technical Focus 2 — The different workflows.

The digital workflow has been differentiated into categories according to data output rather than camera and postproduction equipment. Effectively, only classification and comparison of data remains relevant in relation to ergonomy and cost, independant of the constant technical evolution. In 2009, the workflows considered were:

1. under 50Mbps = camera Sony XDcam EX & Panasonic P2 HVX 200

2. between 50 Mbps & 400 Mbps = Panasonic HVX 500

3. RED

4. with a film camera

5. over 400 Mbps = overview Sony F23 & F35 and Arri D21

The case studies have been chosen to illustrate and make concrete these workflows with particular importance given to solutions 1 to 4, these being the most current.

Technical Focus 3 — Data management.

The management of memory cards and hard discs that replace the tape of certain cameras. Transfers, safe-guards, people and time dedicated to these, extra assistants on set or in the production office, necessary infra-structure and logistics...

Technical Focus 4 — Compression.

Or the importance of this notion as regards the final result...

Technical Focus 5 — Delivery/Copies/DCP.

Film, numeric, master copies and other DVD that need working out, according to the diverse channels of distribution. It is the final step of the production chain from which one needs to ascertain the production method and the workflow, going back up the workflow chain, along the "decision tree".

Technical Focus 6 — The sensors and the Bayer filter.

Cameras like the XDCam, the P2 and the F23 and F35 have the advantage of sensors and electronics which allow immediate viewing of the image shot. Cameras like the Red or Arri have a sensor which produces an image requiring reprocessing afterwards to obtain the final image — a sort of "developing in an electronic laboratory". Advantages and inconvenience of both methods. The consequences in terms of cost, ergonomy and functionality on the set.

Red One — Specificities.

RED ONE RESOLUTION: The RED ONE Camera (Build — Version 21 — January 2010) uses a Bayer Filter pattern (Two Green photosites for one Red and one Blue) in front of the photosites which delivers technically 4K data at the end. But, because a Bayer-pattern sensor must use color information from at least four adjacent photosites do derive a single RGB value it's obvious that the effective resolution is less than 4K. Depending on the De-Bayer process we can obtain 2,5 K to 3K maximum. For these reasons when switching the camera from 4K to 2K you will dramatically lower the sharpness because you're looking at an area half the size comparable to Super 16 mm. After having done the De-Bayering process you can decide to downsize it in 2K but it's never recommended to do it before that step.

RED ONE MONITORING: There are two main De-Bayer process which create an RGB image. The first one is designed for the monitoring and because of the low price, the image quality is far away from the second one deilvered by the final process in post. So it's quite impossible to have any judgment on the on the final result of RED ONE image on set at the difference of the Arri, Sony or Panasonic digital cameras. Except making a render of a single picture frame through a computer you have only a control of the framing on set with this camera.

RED ONE CAMERA WORKFLOW: Because of the proprietary system developed by RED CAMERAS, the Red one uses a non standard Space color system (REDSPACE) which is not easy to handle during post. In France, e.g. for twelve different postproduction houses you will find twelve different De-Bayering down-rez, and data handling processes meaning twelve different images at the end.

Because of the JPEG 2000 codec based algorithm and the 10:1 compression ratio, (Version 21 with Redcode 36 – Jan 2010) the're a lot of strong compromises in terms of dynamic range (only 5 stops) and subtleties in the range of tones.

The way you back up the footage on set, the way you handle this non linear process all along the workflow is a key point. "When, where, by whom" are paramount with this camera

Technical Focus 7 — Camera ergonomy.

Some of the questions to ask oneself before choosing the shooting equipment: weight of camera and batteries, data management, safeguard of data...

Technical Focus 8 — Dailies control/ Security checks.

Organization of viewing and checking of daily rushes, often neglected on shoots due to tight schedules. Sorting of rushes and pre-editing during shoot.

Technical Focus 9 — Archiving and catalogue management.

Since their arrival on the market, numeric supports have never guaranteed much durability. The tapes deterio-rate, the systems change and become obsolete. To this day, the most reliable support for numeric conservation is the system of LTO tapes, the 35mm copy remaining one of the best archival aids!

There is still no satisfactory answer as to which numeric support and in which format a production company should transfer its archives when aiming at long term conservation, nor as what to do with a collection of su-per 16 and 35 mm negatives, Beta masters, DigiBeta and other HDcam...