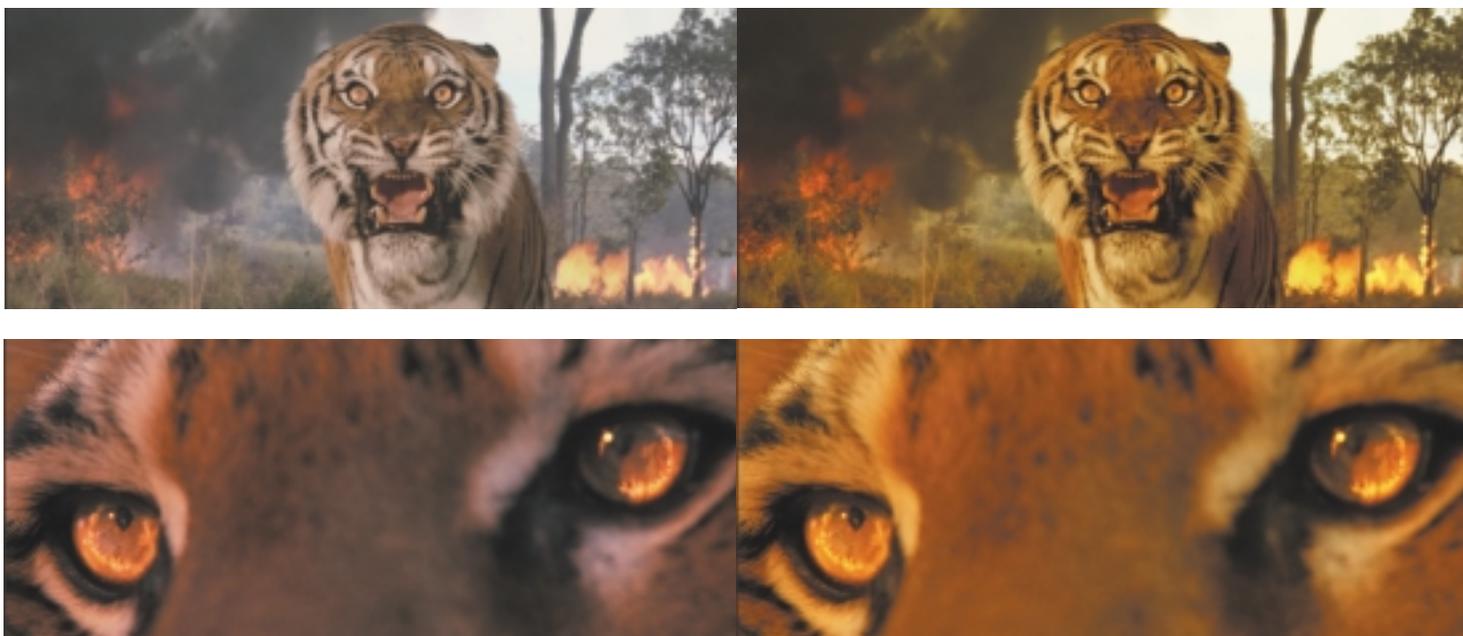


# Reflections: *Two Brothers*

Jean-Marie Dreujou, AFC and colorist Yvan Lucas detail the digital intermediate on *Two Brothers*.

by Benjamin B



Music is playing softly in a big, darkened room. Seated in the penumbra, three men watch a tiger roar silently on an 8-foot screen. Colorist Yvan Lucas clicks a computer mouse and the image freezes. "A little cold?" asks director of photography Jean-Marie Dreujou, AFC. "I'll add a couple points of yellow," Lucas answers. He clicks the keyboard twice and the image warms up.

"Looks better," comments colorist Bruno Patin, who is sitting nearby.

Inside a digital-intermediate (DI) suite at Éclair Laboratories outside Paris, Dreujou is timing the high-definition video/35mm hybrid *Two Brothers* (see *AC* July '04) with Lucas, assisted by Patin. Lucas is using Discreet's Lustre to grade the digital image and a Barco DLP 50 projector to display it large-scale. Later, the graded digital file will be

transferred to an intermediate film stock using an Arrilaser film recorder.

Dreujou's cinematography credits include *Last Trading Post in India*, *The Children of the Marais*, *Little Chinese Seamstress* and *The Man on the Train*. He has been nominated twice for France's Cesar, for *The Whims of a River* in 1996 and *Girl on a Bridge* (which was graded by Lucas). *Two Brothers* was his first



**Opposite:** The shot of the tiger in the HD wide shot was intercut with the 35mm close-up. Both shots contain virtual fire elements. The raw images are shown on the left, and the digitally graded images are on the right. This page, top left: A Buddhist woman prays in a shot involving different grading windows for the patches of blue sky and orange interior. These shots, as well as the tiger images, were taken directly from the Lustre proxies.

HD project; he has since photographed two more.

Lucas is a pioneering color timer with 40 features to his credit, including *Delicatessen*, *City of Lost Children* and *Seven* (all shot by Darius Khondji, ASC, AFC), as well as *Amélie* (shot by Bruno Delbonnel, AFC).

About 50 films made in France last year, roughly one quarter of the national output, made use of the DI process, and Éclair has established itself as a leader in the field. *Two Brothers* presented some unique challenges in that it was shot mostly in HD; 35mm was used for about 15 percent of the picture.

Philippe Soeiro, creative director at Éclair, explains that the post-production workflow for *Two*

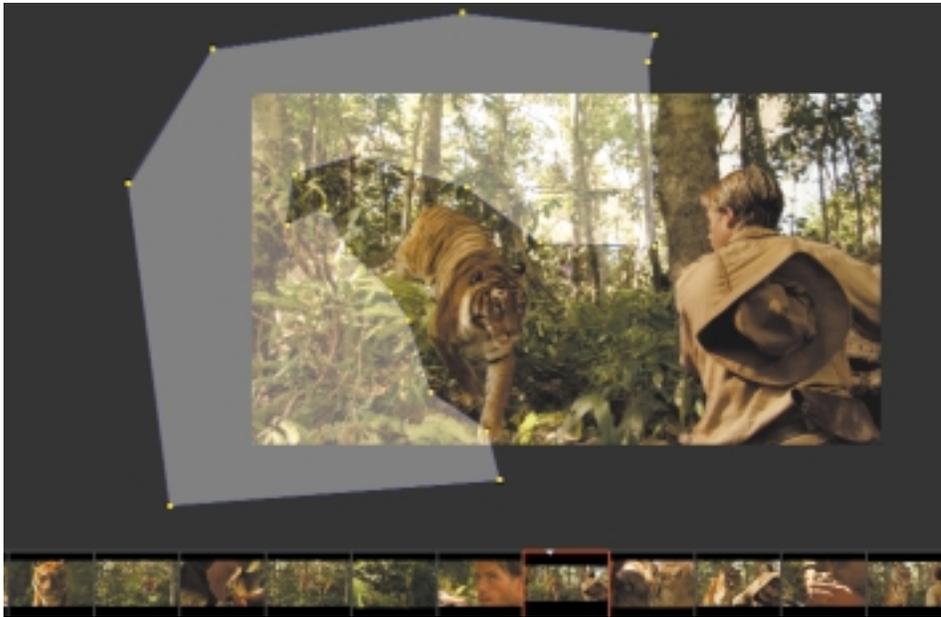
*Brothers* was designed to treat the project “as if it were shot entirely on film.” First, all of the 35mm and HD footage was transferred to a Discreet Smoke workstation. The HDCam image was converted from its native YUV video format to RGB, the computer standard.

Digital-effects supervisor Frederic Moreau notes that *Two Brothers* has almost 550 visual-effects shots, many combining HD, 35mm and computer-generated (CG) elements. To create uniformity between HD and film, the 35mm images were scaled down to the HD size of 1920x1080 pixels and then transferred to the HD depth of 8 bits per color. In addition, grain was removed from some of the film footage. Moreau explains that the

effects sequences were composited and “pre-graded” before they were transferred to the Lustre for final grading.

Before use in the Lustre, all of the HD images were transferred from linear to 10-bit log format. Soeiro notes that this colorspace conversion was “one of the delicate steps” in the post process, and that the conversion look-up table (LUT) was fine-tuned to allow for more detail in the dark areas. He explains that the log format enables the cinematographer and colorist to work using film-style “printer points” when grading on the Lustre, whereas the linear format does not. Dreujou cautions that perhaps because of the conversions, the raw Lustre HD footage needed work before it resem-

# Reflections: *Two Brothers*



bled the images he had seen on the hi-def monitor during production.

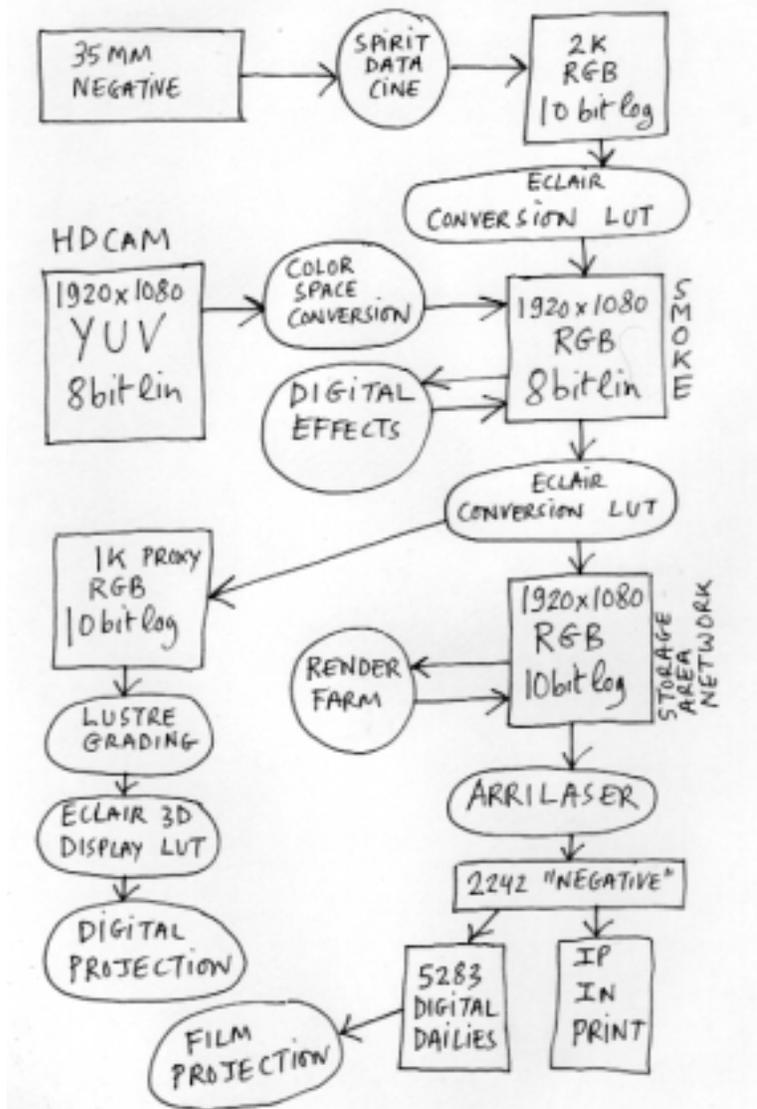
Both Dreujou and Lucas were delighted to work with the same yellow, cyan and magenta points that are used in photochemical color timing. “My origins are in photochemistry,” notes Lucas. “I came to digital because I wanted to follow the evolution of the technology, but my heart still beats for photochemical treatments. I hope one day to combine digital and photochemical techniques to create a new look.”

*Two Brothers*’ final graded image file was transferred from the Lustre to the Arrilaser, where it was recorded onto Eastman 2242 intermediate film. The Arrilaser output six 15- to 20-minute reels that served as a “negative” for a traditional photochemical process that involved contact printing to an interpositive (IP) and internegative (IN), all on 2242. The release prints were then made on Kodak Vision 2383.

Soeiro explains that *Two Brothers* was graded using Lustre “proxy” images that had lower resolution than but identical color values to the HD originals. These smaller proxy images were sized to match the 1280-pixel width of the “1K” Barco DLP 50 projector. The proxy images were manipulated in real time on the Lustre, while the original HD images were conformed offline by a “render farm.”

DIs would not be possible if the projected digital images did not accurately represent the final result on film. Soeiro credits the 3-D Display LUTs that Éclair developed in-house for enabling great precision in mimicking the way the image will look on positive film stock. Whereas a “normal” (2-D) LUT transforms individual red, green or blue values from one colorspace to the other, a 3-D LUT establishes correspondences between actual colors defined by triads of red, green and blue. Notes Soeiro, “With this method, you can decide, for example, that the

Above: The Discreet Lustre allows for “Power Windows” defined by polygons. These windows can move during the shot. The polygon shown here (also taken from the Lustre proxies) has been lightened for illustration purposes. Right: A flow chart of the hybrid DI process at Éclair, showing the different image formats used.



oranges in the digital color space should be displaced more toward the red of the film color space, without displacing the other colors nearby. This kind of thing is impossible in 2-D LUTs, where each red, green or blue component is treated separately. Only 3-D LUTs enable you to make two colorspace coincide perceptually."

"What's pleasant about the digital projector," observes Dreujou, "is that it's on a big scale, so you can more accurately adjust the volumes in the image. What's unpleasant is that the image quality is soft because it lacks definition." Although the digital-proxy projection was remarkably close to 35mm, Dreujou

**"If the cinematographer isn't there to make that change in post ... the image won't be what he or she wanted."**

— Jean-Marie Dreujou, AFC

noticed some subtle differences in contrast and saturation. "We found we had to augment the contrast and saturation slightly in the digital image in order to get the desired result in film," says the cinematographer. "Also, we ended up with something slightly too blue in digital projection to get what we wanted in film projection." He adds that the film projection also revealed more detail in the blacks than the digital one did.

The time it takes to get film out of an Arrilaser marks a key difference between digital and traditional grading. At 1.5 to 2.5 seconds per frame, it takes 12-15 hours to

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# Reflections: *Two Brothers*

A day interior is shown along with the Lustre color menu.



record a 20-minute reel of film with the Arrilaser, whereas a traditional film reprint is done in real time. Because many film projects are competing for valuable Arrilaser time, Éclair has instituted the practice of “digital dailies,” two- to three-minute rolls of selected excerpts. These serve as a regular check of the film output of the grading process and are short enough so that it is practical to produce them every couple of days.

Dreujou notes that although digital dailies can alert filmmakers to potential problems, they can be downright frustrating. “You don’t have time to really get into a sequence,” he says. “It’s a way to check that everything is okay, but it goes too fast. Also, you’re often selecting the problem scenes because you want to check them, so most of what you see needs work. After a while, it can get pretty depressing.” After days of effort on *Two Brothers*, Dreujou remembers the moment when he finally saw an entire 20-minute reel output to film. “Seeing

Reel 2 in its entirety was happiness! All of a sudden, I could breathe more freely. You don’t really see things until you get an entire reel, and then you can really enter into the film. However, you have to be sure of what you’ve done before you send a reel off to be recorded on film. You don’t want to have to re-record the entire reel!”

Adds Lucas, “In digital grading, you tend to work reel by reel, so you stay on one reel for a long time. When I finally see the entire film, I may want to tweak the reels so they match — one might be greener than another because we did it two weeks later, for example, so I may adjust the end of one reel and the beginning of another.” Lucas often does these final adjustments directly on 35mm with 35mm color timing.

In photochemical color timing, there are three controls, one each for the amount of red, green and blue light that will shine through the negative and onto the positive print. Changing all three printer lights together adjusts the

density or brightness of the image. One look at the dozen buttons and complex menus of the Lustre makes it clear that there is more at work here than just three printer lights. “The tool has completely changed,” agrees Lucas, “but the way of working is the same because I can work on a machine that has the same color points and density points as with film. Now, however, there is a new parameter: contrast. I work at removing undesired variations in contrast between shots. Another big difference is that we can now work with zones inside the image, but inside each zone, we work the same way we do with film.”

Lucas defines the zones with roughly sketched polygon or oval “windows” and then varies the color, brightness or contrast values inside the window. These windows (also known as mattes) can be programmed to move within a shot, follow an actor, or, in this case, follow a tiger across the frame. Lucas notes that the control of saturation is another feature that distinguishes

digital grading from film grading; although there are ways to desaturate the image photochemically, such as ENR, these are complicated processes.

The two tiger images shown on page 78 exemplify the hybrid nature of *Two Brothers*. The wider shot was filmed in HD, while the close-up was filmed in 35mm. Both shots contain virtual CGI elements: in the wide shot, some of the flames and smoke are virtual, and so is the circle of flames seen in the eyes in the close-up. Lucas explains, "Here, as elsewhere, we accentuated the color of the tiger's fur. We added saturation overall and yellowed the image significantly, but kept the greens of the vegetation. This could have been done in classical timing because we

**"I think a lot about the timing during the shoot. Usually, I want to reproduce what I have created on the set."**

— Jean-Marie Dreuju, AFC

didn't use windows.

"In the day interior shown here," he continues, "we redid the backlight. I brightened the shot and used a window to darken the people and the walls. For the image of the Buddhist woman praying, we added density and saturation to an image that was shot during the day to create more of a dusk feeling. In the interior, we used windows to brighten some shadows and warm up her face and the area behind the bamboo. We used windows in about



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# Reflections: *Two Brothers*

From left: Cinematographer Jean-Marie Dreujou, AFC, colorist Yvan Lucas and colorist Bruno Patin sit at the Lustre control panel in a DI suite at Éclair Laboratory outside Paris.



one-third of the shots, including many effects shots. We typically used them to boost the green of the jungle and the color of the tiger's fur — we had to match the color of 30 different tigers! We also used windows to bring down the HD skies.”

The greater capabilities of

digital grading have made postproduction a more protracted process, and many cinematographers are concerned that productions are not allowing for a lengthy digital timing when they make deals with directors of photography. Dreujou observes that photochemical grading takes

roughly one week, during which the cinematographer attends projections, gives notes to the color timer, and only comes back to see the next print. Digitally grading *Two Brothers* took almost two months of Dreujou's time; the ability to stay on one shot and grade any area of the frame means that the dialogue between cinematographer and timer is much more detailed than it has to be in traditional timing. “If you truly want to leave your signature on the film, you have to organize your schedule so you can be available — even if it means turning down other films,” he says.

Digital grading is changing the nature of cinematography by creating a kind of “virtual cinematography,” whereby the cinematographer can use software in post to create virtual filters, flags or T-stop changes. “Because of these tools, I will sometimes live with certain problems

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during shooting because I know I will be able to fix them in post," says Dreujou. "Say, for example, that the walls are too bright. It may be complicated to set up a bunch of flags, and it will take time to adjust them. I now know that I will be able to darken the walls very easily in post, so I may not take a half-hour to solve the problem on the set. However, if the cinematographer isn't there to make that change in post, it won't get done, and then the image won't be what he or she wanted. In general, it's dangerous to not be present during post."

Dreujou adds that a cinematographer needs to have clear objectives in order to avoid getting lost in the endless possibilities of digital grading. "If you don't go in with firm intentions, your image can end up all over the place. Now that I have more experience, I think a lot about the timing during the shoot.

Usually, I want to reproduce what I have created on the set."

Dreujou confesses that he now relies on virtual grad filters instead of putting the real thing in front of his lens. "I used to use a lot of grads, but now I use hardly any. It's complicated to move a grad during a shot, but it's very simple in post. I still use 85s and colored filters because I don't want to deliver a neutral image. In some cases, it might be easier to not use filters during the shoot, but I'm deeply attached to the notion of giving an intention to the image on set. Time is precious in production, but as cinematographers, we've been asked to put a story in images, and we must do that from the very beginning until the very end." ■

## TECHNICAL INFORMATION

**Format:** 2.40:1 extraction from Super 35 and HD

**HD capture:** Sony HDW-F900 and HDW-F950, Digital Primos

**Film capture:** Arri 435, Primo lenses

**Original elements:** HDC videotape and 35mm Kodak and Fuji negatives

**Effects image format:** 1920 x 1080 pixels, RGB, 8bit linear

**Grading image format:** 1920 x 1080 pixels, RGB, 10bit log

**Tools used:** Phillips Spirit DataCine, Discreet Smoke, Flame & Inferno, Discreet Lustre, Éclair 3D Display LUT, Barco DLP 50 projector, Arrilaser Film Recorder

**Intermediate Film:** Eastman Kodak 2242

**Printed on:** Kodak Vision 2383



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