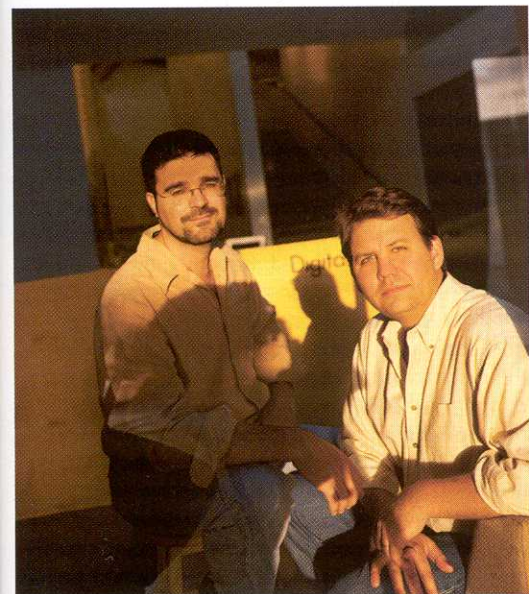


DIGITAL HQ

THE DIGITAL FUSION LAB IN LOS ANGELES MAY WELL BE WHAT THE FUTURE OF COMMERCIAL PHOTOGRAPHY LOOKS LIKE. BY JEFFREY ELBIES

Top: Milstein (left) and Moeller. Bottom: The Digital Fusion office in Culver City.



laborative effort involving not just the photographer but an entire team of technicians and retouchers who work closely with him or her to achieve a final product. "The model for commercial photography, as we see it," says Moeller, "is the movie industry." The photographer essentially becomes the auteur, working with a team of talented specialists to create the image he envisioned—a team that Digital Fusion has assembled. "It's no accident that we created this business plan in Los Angeles, in the home of the film industry," says Moeller.

Whether photographers want a future like this may already be irrelevant. Technology now makes it possible, which of course means that clients—especially the big advertisers and film studios that spend hundreds of thousands of dollars to hire top photographers to shoot their campaigns, movie posters, and celebrity portraits—will demand that work be done digitally. The lures are both speed of image delivery and creative control. Already some high-priced publicists are demanding that photographers shoot their celebrity clients digitally so that they can do instant edits.

"That's going to become the norm with all kinds of photo clients," says Moeller. For Moeller and

Milstein, the challenge has been how to take pro photographers who have built careers around their knowledge of film into this new digital world.

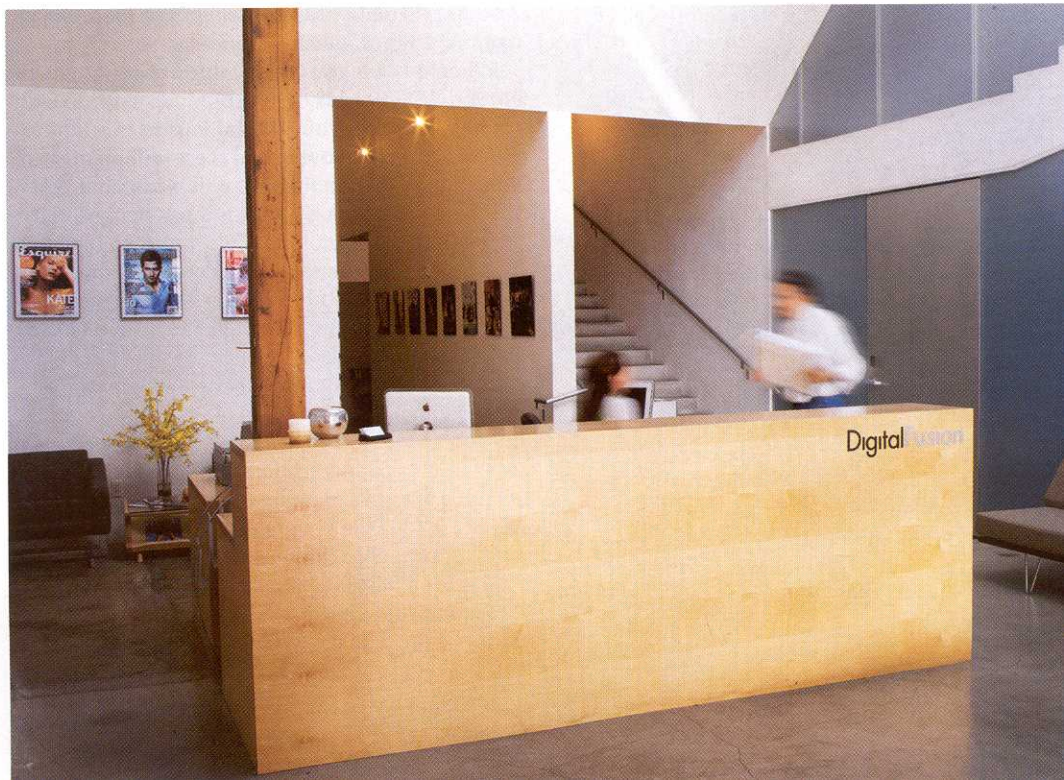
The concept they came up with—Moeller refers to it in digital jargon as a "complete solution"—is a service that goes well beyond the hybrid film-and-digital retouching and printing that most labs do. The Digital Fusion model of the future starts with digital capture and ends with long-term storage of vast amounts of data that photographers can access at any time. "Basically, we wanted to mimic the work flow that pros have been using already," says Milstein.

Their newest innovation is a portable digital shooting system called Digital Fusion Pro. The lab has designed and built carts loaded with everything from cameras to hard drives that can be rented by photographers for shoots in studios or at remote locations. The carts come equipped with Hasselblad H1 SLRs and lenses and Imacon 22-megapixel digital backs, as well as multiple customized computers, monitors (the studio model has a 20-inch monitor), and enough battery power to run everything for eight to ten

To gauge where photographic technology is at the moment and the threshold on which the craft of image making stands, it is useful to visit the Digital Fusion lab in Culver City, California. Located in a futuristic office building in an industrial area only about 20 minutes from Hollywood, the lab was launched in 1999 by two University of Southern California Film School graduates, Jon Moeller and Hugh Milstein. Moeller had spent a dozen years working in the movie industry, and Milstein, a self-confessed "lab rat," had earned a reputation as one of the top film processors and retouchers working for photographers such as Art Streiber, James White, and Mark Liddell. They began the business out of a garage in Venice Beach, servicing pros who needed their film work digitized. But even then, in the ancient digital days of five years ago, they had a dream of a future that would completely transform the craft and business of photography.

"We were just waiting for the technology to catch up with our ideas," says Moeller.

Now, says Milstein, the technology, and commercial photography's future, has arrived. It is a filmless future in which images are captured, processed, manipulated, and distributed digitally, and the creative act of photography becomes a col-





1 DIGITAL CAPTURE

So far, most pro photographers have been working in a hybrid world combining film with digital processing and printing. But the newest service offered by Digital Fusion aims to make the work flow all-digital, starting with capture. The centerpiece of the lab's new service is called a "Fuse Box" (above). The cart is a rolling workstation that comes complete with multiple computers and a swing-out monitor, Hasselblad H1 SLRs and lenses, and Imacon 22-megapixel digital backs. The cart has batteries to power all the equipment for up to ten hours. When a photographer

rents a cart (for about \$2,500 a day) he or she also gets a Digital Fusion technician to connect and work all the gear. "The idea is to make working digitally as worry-free as possible for a photographer," says Milstein. "Our system means you have a dedicated digital technician running the back end of the cart during the shoot." That includes managing image files as they are saved redundantly to several locations at once. The lab offers two cart sizes: a studio-production version with a 20-inch monitor and a location-production version with a smaller monitor.

hours. "I've been on shoots where the power goes out, which can be a disaster, especially if you're working digitally," says Moeller. (For more information, go to digitalfusion.net.)

When a photographer rents the cart (rates run around \$2,500 a day), it also comes with a dedicated technician from Digital Fusion to run it. "We basically guarantee that there will be no fowl-ups, that all this equipment will work, that there will be enough redundancy in the system so that if one piece of equipment fails, there's a backup," says Milstein. When the shutter snaps, images are written to several locations at once, including portable hard drives that Digital Fusion has had specially designed.

The drives, about three inches wide and five inches long, have an ample 60-gigabyte capacity, but more important, they are protected by a lightweight aluminum housing designed to resist shock and to dissipate heat, as well as a custom interior mounting system that allows the drive to "float" in three dimensions. (Moeller says they will resist a 5,000 G shock rating at .5 milliseconds. Basically, it means the drives will survive a two-foot drop onto concrete.) The idea was to

give photographers used to working with film a familiar concept—hence the name the lab has chosen for the drives, HardFilm. "This drive, in effect, becomes your film cassette," says Moeller.

RAW files go back to the lab, where they are color corrected and processed. The photographer gets his pictures the next day in a package that includes digital contact sheets and the original processed digital files delivered on DVD or HardFilm. The contacts are also posted on an Internet site for 14 days. The work is archived for one year at the Digital Fusion lab. The photographer can make selects, have them retouched, and have RGB files converted to CMYK for proofing or have prints made. The lab matches its three Epson Stylus Pro inkjet printers—the 9000, the 10000, and the 9600, all with custom output profiles—to specific media, and also uses the Fujifilm Pictography 4000 printer for smaller proofing jobs.

When film photographers go digital, surprising things can happen, as Moeller and Milstein have discovered. Recently, they "rolled out" their digital cart on a shoot with Hollywood celebrity portraitist James White. "We told him, 'Just snap a few shots with the digital unit, and do the rest on film if you like,'" says Milstein. "He ended up shooting one roll of film and about five hundred digital frames."

High-end digital capture on such a scale does not come without complications, however. Each of the frames White shot was about 63MB, meaning that the Digital Fusion lab had one heck of a lot of data to process in a short time. Moeller and Milstein have brought in another USC alum, John Supra, to create custom software that batch-processes images and speeds the entire work flow.

The other issue raised by having large amounts of digital data on hand—archiving all those images—was equally important. "At one time, we thought we would have to buy about a terabyte of storage

2 DIGITAL STORAGE

While searching for the best way to store and transport image files, Milstein and Moeller found that a relatively old technology worked best. "Hard drives are a great medium on which to store images, but we thought, 'Why should they be buried inside a

computer that is hard to move or easily damaged if it's dropped?'" says Moeller. The Digital Fusion solution is a cassette-size hard drive that can be easily transported from a photo studio or remote location to the lab itself. "In our system, these drives kind of take the place of film," says Milstein. Thus the drives' name: HardFilm. With a 60-gigabyte capacity, the drives, which are specially made for Digital Fusion, are protected by an aluminum housing and designed to resist shock and dissipate heat.





a year to keep up with demand," explains Milstein. "Now that photographers are starting to shoot digitally, and we are storing entire takes, we're looking at adding a terabyte of storage a month."

The lab stores work from a shoot on its Apple Xserve RAID server hardware for one year at no extra charge; after that, photographers will be able to decide whether to pay extra to keep all or part of the work on the system. "They'll still have the files in their own studio as well, as prints and on HardFilm," notes Moeller, "so it's their choice." If the photographer keeps images in long-term storage on the Digital Fusion server, the lab promises to migrate the files to whatever

storage media become available in the future—a potentially important issue if today's CDs and DVDs become obsolete or prove to provide less-than-archival security.

Will Digital Fusion's scheme turn out to be the way photographers work from now on? If so, it's because their model is based, ironically, on a reverence that Moeller and Milstein have for old-fashioned film. "Film is an amazing medium, and if you're going to replace it, you're going to have to use something that is pretty amazing too," says Milstein. Something that is portable, secure, archivable, accessible—and also tactile and physical. "There's a psychological thing about digital files," says Moeller. "The image doesn't really exist until you make it exist; it doesn't seem as real as it might if it were on film. Digital feels so free—you shoot 800 frames, no problem. In a way, digital has degraded the concept of the product the photographer produces. Our plan is to treat digital files as valuably as traditional labs treat film—to create the images, materialize them, and protect them." ■

3 IMAGE PROCESSING

After a shoot, images are transferred via HardFilm back to the Digital Fusion lab in Culver City, California, where files are color corrected and processed. "But when a pro shoots a big job, he or she may be coming back with 400 or more image files, and each file is 50 to 60 megabytes," says Milstein. "That's a big load of processing, and of course the photographer wants the work ready the next day, just as he would if he dropped off film at a lab." Custom software allows Digital Fusion technicians to batch-process and get them back

to photographers quickly. The images are delivered in a package that includes digital contact sheets and the original processed image files on DVD or HardFilm. The images are also posted on the Internet for 14 days and automatically archived for 12 months at the Digital Fusion lab. The photographer can make selects, have them retouched, have RGB files converted to CMYK for proofing, or have prints made. "The goal for us was to create a work flow that closely approximated the work flow that pros already have with film," says Moeller.

4 OUTPUT AND PRINTING

The lab makes prints on three Epson Stylus Pro inkjet printers—the 9000, 10000, and 9600—to specific media. There is also a Fujifilm Pictography 4000 printer

for smaller jobs. "We pick the printer and the inks based on the clients' needs, whether they want a wide color gamut, special paper, or 200-year longevity," says Milstein.



5 ARCHIVING

Photographers get all their images from a shoot delivered back to them as prints and HardFilm, and they are stored for 12 months on the Digital Fusion server. After that, the photographer can pay for longer-term storage. The lab has an Apple Xserve RAID server and is expecting to add a terabyte of storage a month. And if a photographer chooses to store his images at Digital Fusion, the lab promises to migrate the files to whatever future storage media might become available in the future.

