

# Focus on Imaging

August 2001

## Piezography Black and White: Digital Fine Art Printing Ron Eggers

*Black and white processing and printing has transitioned from a standard service most commercial labs were offering to a specialty service that's become more expensive than color processing and printing. Many labs have eliminated black and white services altogether.*



MOST FINE ART photographers have always done their own black and white work. They would justify (or rationalize) sending out their color work, if they shot color, because it was difficult to maintain the temperatures and chemical solutions at the tolerances required for color. But their desire to maintain creative control usually won out over the aggravations of handling their own darkroom work when it came to black and white printing.

Darkroom work used to be a tedious process that took considerable time and a certain amount of skill. However, new ways of digitally working with black and white are prompting both labs and photographers to experiment.

There are various ways of working with black and white digitally. The easiest is to use color printers and consumables to generate monochrome prints. Photo-realistic inkjet printers are able to generate black and white prints from the factory-installed ink sets. But, while the results are fine for record shots, they aren't acceptable for fine art photography or other serious applications.

Some printer manufacturers offer ink sets that do a better job with black and white than inks from competing companies. The results, however, are still not ideal.

In order for a digitally generated print to compete with a darkroom print, it has to be able to reproduce all the subtleties that are inherent in black and white. Until recently, that hasn't been possible. With ConeTech's Piezography BW black and white printing system, it is possible. In fact, in some respects, the results are better than what can be produced in a darkroom.

### The ConeTech System

The Piezography black and white printing system produces continuous-tone prints that have a greater dynamic range than traditional darkroom prints. The process is capable of rendering subtleties in tone that hasn't been possible before, conventionally or digitally.

ConeTech, a division of Cone Editions Press, was founded by Jon Cone. Basically, the piezography system uses the special formulations of black ink that replace the black and color cartridges in certain Epson printers. While it is available for both four- and six- ink well models, it's most effective with units that use the six ink sets.



But this black and white printing process is about more than simply providing a different ink set. Sophisticated printer drivers and advanced soft proofing capabilities ensure that grayscale images are reproduced accurately. "The resulting digital prints have the look of custom prints generated in the



Mexican Wild Pig Skull,  
2001PhaseOne Digital Capture  
600 dpiPiezography™ BW Pro24  
print on ConeTech Orwell paper  
using the Epson 7000

darkroom,” Cone says.

Cone has a long background in this field. He first started working on fine art digital printing in 1993. Working closely with Iris Graphics, he was one of the early adapters of the company’s printers for custom display output. Many of the Iris installations around the country used the technology he developed. “As a developing partner with Iris, I was responsible for fine art systems from 1993 to 1997,” he explains. “During that time I developed three different sets of inks and software for those printers.”

Output on optimized Iris systems was excellent. They were the first inkjets to be used to generate digital fine art prints. However, because of their high price and frequent technical support requirements, the Iris market didn’t hold great potential.

With the proliferation of relatively inexpensive inkjet printers, first for the professional market and then for the consumer market, Cone saw a mass-market opportunity. “The potential was there for thousands of the less expensive inkjets to be printing in black and white,” Cone says.

“There are two broad-based market segments that we serve. The first consists of photographers, including serious amateurs, prosumers, (in other words, the business market), and professionals. The other is the lab/service bureau market. We’re trying to provide scaleable, and affordable, solutions ranging from casual photographers to serious fine art photographers to professional labs and service bureaus.”

The first Piezography system was developed for the Epson 3000 wide format printer. Since then, product lines have been developed to meet the needs of the two market segments.

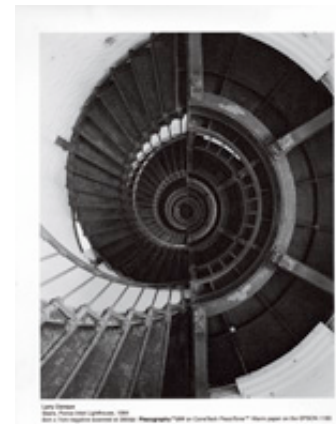
The Piezography BW Pro24 system converts the Epson Stylus Pro 7000 and the Pro 7500 to black and white fine art printers. The Pro24 contains both 8-bit and 16-bit per channel hextone engines for the highest quality printing and compatibility with the widest range of digital cameras and scanners. Using proprietary ICC profiles, which optimize the tonal response according to the paper selected, Piezo black and white prints exceed darkroom-generated prints in tonal range and quality.

The Piezography BW6 system is available for the Epson Stylus Pro 1200. There are also Piezography BW products available for several different Epson desktop consumer units, including the 760, 800, 850, 860, 980 and 1160. Black and white systems for other Epson units are being developed. “We’re just coming up with a system for the Epson 1280, which is the microchip printer, and the 980,” says Cone.

Each Piezography system comes with new multi-monochromatic ink sets, replenishable inkwells and the software drivers required to optimize output. The drivers disable the Epson printer firmware and replace it with a sophisticated proprietary software-broadband-microwave, which increases the printer’s apparent resolution three-fold. The higher resolution reduces, in fact almost eliminates, the dot patterns that are inherent in digital prints, even when examined under magnification.

The 8-bit engine is capable of producing 256 addressable gray values per ink channel, which is 50 percent more total gray levels than the Iris Graphics 3047 G printer. The Pro 24 automatically senses 16-bit grayscale images and switches to a 16-bit rendering pipeline that produces 1024 addressable gray values per each of the six ink channels. An 8-bit image looks virtually continuous tone. A 16-bit image looks even better.

Chicago-based Kevin Anderson, who produces fine art black and white display and portfolio prints for various photographers, was one of the early adapters of the ConeTech system. He started out with a black and white print system on a 3000. He’s added a number of other printers since that first installation, including two 1160s and a 1200.



Larry DanqueStairs, Ponce Inlet  
Lighthouse, 19846cm x 7cm  
negative scanned at 360dpi  
Piezography™ on ConeTech  
PiezoTone™ Warm paper on the  
Epson 1160

Setting the individual systems up didn't take all that long. "I was able to get a relatively good print in a couple of hours," Anderson says. But getting an optimized print took somewhat longer. "To be able to get what I wanted, from the point of view of tone placement, to get the tonal scale I was looking for, took some experimentation."

For him, success came once he correctly matched the papers with the ink set that he was using. "The papers can make a tremendous difference." According to Anderson, one of the limitations of the ConeTech system is that printing on glossy is still a problem. "Jon is working with several paper manufacturers to try to resolve that problem," he says.

Anderson has been printing in the darkroom for more than 25 years, but darkroom work is all behind him now. "I've shifted completely to digital. The stuff we're coming up with is just so stunning that it's hard to think about ever going back to the darkroom."



Printed on Epson glossy paper

There are some misconceptions about the piezography ink sets. While there are four or six wells as part of each ink set, the inks aren't different shades of black and gray. Rather, they are different dilutions of carbon black pigment inks, which have been formulated to print with absolute sharpness and without the bleeding that's sometimes associated with pigmented inks.

Cone is in the process of introducing additional ink sets to further refine digital black and white output. "We're coming up with another ink set for selenium toning," he says. He's also developing ink sets for what he calls "digital platinum" printing. "The technology will simulate the chemistry behind split toning."

Cone had developed the process for the Iris, which has just four inks. He's now working on the process for some Epson models. "Straight silver photography appeals to some photographers, platinum printing to others."

Depending upon which printer is installed and which printing system is selected, it's possible for a photographer to experiment with digital printing for just a few hundred dollars. A lab or service bureau can install a profitable black and white print system for \$5,000 or \$6,000, which includes hardware, software and consumables.

"That's extremely affordable for most labs," Cone says, adding that some labs are reluctant to install his system because they don't think that a system as affordable as his can come up with the quality output they require. Once they see the results though, they're generally hooked.



Printed on PhotoBryte Kanvas Art Paper.

New England landscape photographer George DeWolfe was the first beta tester for the ConeTech system. He first started playing with it in early 1999, with an Epson 3000. He now has 12 different Epson printers generating fine art prints of his work, four of which are dedicated to black and white output. He has the Piezography on the 860, the 1160, the 3000 and the 7000. That gives him both small format and wide-format black and white printing capabilities.

He's very satisfied with the results. "They're much better than anything that can be printed in the darkroom. The quality is higher....the control you have is infinitely greater. It's better by a factor of ten, at least," DeWolfe says, adding that when the control that digital imaging provides is combined with the carbon based inks, it's possible to output prints that just couldn't be generated in the darkroom.

The other thing that impressed DeWolfe is the support. Getting that first system up and running was an involved process. "The problems that can be encountered are really too multi-faceted to even talk about," he says. But DeWolfe is happy with the tech support. "Tech support was really, really good. I got 100 percent from Jon and his staff. They addressed all the issues."

Nationally known wedding and fine art photographer Robert Hughes is using an Epson 3000 to generate his black and white prints. He was the fifth or sixth person to install a ConeTech system. Like Anderson,

Hughes has totally abandoned the darkroom. "I'm totally digital now. I just can't see why anyone would want to continue working in the darkroom."

For more information about the piezography system contact: Jon Cone at (802) 439-5751; email [jon@con-conditions.com](mailto:jon@con-conditions.com).

***Ron Eggers is a contributing editor with FOCUS ON IMAGING (formerly Photo Lab Management) and with NewsWatch News Feature Service.***

---