

**Piezography<sup>®</sup> BW icc**  
*Black & White printmaking system*

DIMA 2004  
 DIGITAL PRINTER SHOOT-OUT  
**Winner**

Best Black & White



## Digital In Black And White

*Ink Jet Printing Problems And Solutions*

**by David B. Brooks**  
**December 2001**

The output device for most digital darkrooms has become the photo-realistic ink jet printer. The printers that are designed to produce high quality photographic image reproduction are primarily color printers. They can be used for a wider range of applications, including printing text in pure black and white, and provide a good quality result. However, if used to print a black and white (gray scale in computer terms) image when the printer driver is set on black ink only (gray scale), the range of print densities produced is usually not comparable to that produced when a color photograph is made with the printer. The reason is that ink jet printers are CMYK type printers, and, in the case of most photo-realistic models, use six instead of the four standard colors of garden-variety ink jets.



A black ink only print from a gray scale image file is then limited to just the number of ink drops which can be applied from the black ink, approximately by 1/6 of those available to make a full color print. The result is a print that lacks the tonal range, smoothness, and depth of tones of a color image made with the same printer. However, as printer resolution has increased, combined with the use of smaller jet sizes (now down to four picoliters) the number of jets in a print head for each color including black has been increased. This new advantage, of course, functions only when the printer's top resolution setting is selected. And, in the case of the latest 2880dpi Epson printers, this highest setting can only be used when printing Glossy or Premium Glossy photo paper. This will satisfy many practical needs for black and white photographic prints. But for the photographer who has done fine black and white printing in a traditional darkroom, as well as anyone who wants to emulate the photographic tradition of fine black and white prints exemplified by the likes of Ansel Adams, and who has used high quality fine arts printing papers, there is no ready, automatic, click and print black and white solution.

### Using Color Inks To Make B&W Ink Jet Prints

Simple logic suggests that if printing with just the black ink alone does not produce the same image qualities as are produced in color image printing, why not use all of the ink colors to print a gray scale image file to make a black and white print? Most printer drivers support this by just setting the print command to color when printing a gray scale image. Unfortunately, even though the printer driver sends commands to the printer to lay down equal amounts of each color of ink to produce a range of neutral grays, there is enough variation in these mass produced machines that the amounts of each color of ink are not "exactly" applied to the paper. The result is not an entirely neutral range of gray tones in the print but a tint of either magenta or cyan, neither of which is a very attractive tone for a fine black and white print.



**Prints made with the Cone Editions Piezography BW inks and software, even on moderate cost ink jet matte photo paper, exhibit a full range of tones with excellent shadow and highlight detail. The Piezography BW system used with the Epson 1160 printer and its small ink droplet size produces the finest definition of detail and image sharpness that can be made in a black and white print with a modest cost 13" wide ink jet printer.**

### **Independent Brand All Black Ink Sets**

For the serious black and white photographer the most obvious solution to obtaining full tone range photographic prints with a color ink jet printer would be to replace the color inks with black ink. Ink manufacturers independent of the printer companies agree with this concept and offer ink sets for a number of printers, including many of the Epson models as well as some of the Canon BubbleJet printers.

I used the term "serious" because the use of all-black ink sets involves thoroughly cleaning the print head with special "cleaning" cartridges before the new black inks are used, which involves some expense and time. So, it is really only practical, convenient, and economical if you dedicate a printer to black ink only use. In other words, switching a printer back and forth between color inks and all-black inks is not a satisfactory solution. The cleaning process has very stringent demands. You must thoroughly remove any trace of the old ink from the print head. From the information I have, and one sad personal experience ruining a printer, any mixing of one type of ink with another raises the possibility of coagulation that could result in permanent clogging of the print head jets. The all-black inks include a standard full strength black and the color cartridge replacement includes varying dilutions of black (grays). This assures the standard printer driver set on color will apply ink densities that will result in an appropriate range of tones in the final print.

### **Piezography BW By Cone Editions Press**

For the really serious black and white digital photographer, Cone Editions press offers Piezography BW, a complete software and materials solution designed for select Epson printers to produce archival pigment ink black and white prints of the highest quality. The Cone Editions Piezography BW kits include the necessary ink sets, cleaning cartridges, and software to produce prints using ICQ profiles for a wide range of popular fine art

and photo ink jet papers. The software is an Adobe Photoshop Export plug-in which takes over control of some of the key functions of the Epson print driver and allows tight, repeatable quality control of the output, including adjustment of both image gamma and ink dot density to control print mid-tone lightness/ darkness and the amount of ink applied. Currently Piezography kits are available to provide black and white fine art quality printing with the Epson 760, 800, 850, 860, 1160, 1200, 1520, and 3000 printers. The cost of the initial kits range from \$335 for most of the consumer line of Epson printers to \$550 for the professional 3000 model. Additional ink sets (both grays and black) are \$80 a pair for all of the consumer Epson printers.

Cone Editions founder Jon Cone provided a kit for me to test, but I had to acquire a compatible Epson printer on my own. Having a substantial interest in black and white printing, being an "old-timer" with 75-80 percent of my archives black and white negatives, I decided this was as good a time as any to equip myself with an

appropriate printer. Colleagues as well as the staff at Cone Editions suggested an Epson Stylus Color 1160 as the best affordable choice in a 13" wide printer. The reasons given were that a four-color printer is better adapted to all-black ink printing, and the 1160 model, among 13" wide printers, uses the latest Epson technology utilizing a four picoliter ink droplet size which will achieve the sharpest detail and smoothest tone gradations. The very week I made the decision to buy this printer, Epson discontinued it. However, I was able to buy the last one in stock at my local office supply store. If anyone else is interested, refurbished units of the 1160 model are available from The Epson Store as well as other select outlets.

Getting started with the Epson 1160 was the same as if I were going to use it for color printing with Epson inks, installing the hardware and software following the Epson guide. Then after making a couple of test prints to confirm it functioned properly, I removed the ink cartridges and replaced them with the cleaning cartridges from the Piezography kit and performed a thorough flushing of the print head. I then installed the Piezography software Photoshop plug-in and the Piezography BW ink cartridges.

I then printed a number of images from the selection of about 40 fresh scans of medium and large format negatives, from which I selected all the images for test printing for this article. A package of letter-size papers stocked and sold by the Cone Editions web outlet, [www.inkjetmall.com](http://www.inkjetmall.com) was used, as well as the Hahnemuhle Photo Matte I have come to value, and Concorde Rag included with the Cone Editions samples, plus the new Schoellershammer Velvet. The Schoellershammer Velvet and Hahnemuhle Photo Matte do not have ICQ profiles provided with the Piezography BW software, but by selecting a couple of "standard" profiles for papers with similar attributes and then making minor adjustments to the gamma and dot density sliders, I was able to obtain very comparable quality results to the profiled papers I test printed.

My first impression from these print results is that the Piezography BW printing solution is very adept at handling both all kinds of image characteristics as well as a wide range of papers from moderate cost photo ink jet papers to premium fine arts papers. I was particularly pleased with the results obtained with the new Schoellershammer Velvet. It provided equal, if not better overall print image appearance compared to my previous favorite but pricier Concorde Rag, which I found sometimes limiting because it is a very warm-toned paper.

### **B&W Digital Printing Conclusions And Recommendations**

Black and white printing for the digital photographer is both possible and practical. It can yield image qualities at least comparable to traditional expectations. In some instances, contemporary consumer ink jet printers offer an even greater potential than traditional, plus deliver it with convenience and reasonable cost of both hardware and materials. Choosing the best option demands making a realistic assessment of need and determining how much black and white printing you would actually do. If it is only an occasional need and does not demand archival print life, existing consumer color ink jet printers, even including the more business oriented four-color printers, may be used. Once a small investment in time and a little paper and ink for tests is made, quite good quality black and white prints can be produced reliably on demand.

As with color images made with all dye-based ink jet printers, monochrome prints are subject to color shifts caused by differential ink fading if accepted display conditions and preparations are not observed. For those photographers who have or are considering the archival Epson Stylus Photo 2000P, the same approach produces either warm neutral or sepia tone prints of black and white images with excellent quality, given that the shifts in different lighting conditions are anticipated.

My conclusion is that a major involvement in black and white imaging is best served by a printer that is dedicated to black and white only. This is quite cost effective and yields a more efficient workflow, assuring a more consistent and controllable level of print image quality. Whether to simply convert an older color printer like the Epson Stylus Photo 1200 to the use of all-black inks or to acquire a four-color printer, as I did, and invest in Piezography, I think will depend on your commitment and concern about your work. It will also give you the ability to use a greater selection of printing papers. With 3/4 of my image collection black and white, and a history of interest in quality black and white printing, the decision to favor Piezography BW is an easy one for me.

**Piezography BW Update:** After using the Epson Stylus Color 1160 and the Cone Editions Piezography BW software and inks for several weeks and quite a few more prints after finishing my report, the result of that additional experience needs to be related. Although the prints produced continued to be very rewarding and were even improving in quality as I gained experience, not using the system regularly combined with changing the ink cartridges apparently introduced some air bubbles into the 1160's print head. This caused the clogging of some of the jets. After obtaining more information on print head nozzle clogging from the Cone Editions web site I attempted to clear the problem, but with no luck. I then got a new set of cleaning cartridges, and finally restored the performance of the Epson Stylus Color 1160.

The one solution that was offered by the very supportive staff at Cone Editions was to add the continuous flow bulk ink supply kit to my printer, which eliminates introducing any air into the print head when cartridges are changed, the probable cause of the clogging. This kit would be another \$150 for the hardware, plus even more for an initial ink supply. However, the per-print ink cost would be reduced over using cartridges, which are expensive and don't produce many prints. So, my original recommendation that the Cone Editions Piezography BW is a choice only serious black and white printers should make is now even more qualified, as I would not recommend planning to use the system based on any method except using a continuous flow bulk ink supply. The ink cartridges do not assure reliable performance, and are not cost effective.

Copyright © 2001 by PRIMEDIA Enthusiast Group.

We welcome your comments in our [Feedback Forum](#)

[Home](#) | [News](#) | [Products](#) | [Support](#) | [Dealers](#) | [Media](#) | [Studios](#)

Copyright © 2003 Cone Editions Press, Ltd. All rights reserved