

## Introduction



### Scan Your Garden

Scanning living flowers and botanical specimens with Patri Feher Betcha can't believe your flatbed scanner is a camera with a macro lens!

[Rongorong@aol.com](mailto:Rongorong@aol.com)

<http://www.blackrosegallery.com>

<http://www.scannography.com>

BLOG:

<http://blog.scannography.info/>

Wikipedia entry:

<http://en.wikipedia.org/wiki/Scanography>

### Preparing for "Scan Your Garden"

#### **Before you buy a scanner: what to look for...**

The type of scanner you'll want to use:

One that employs a **CCD array** as the capture device. CIS, for contact image sensor, devices are not good for scanner photography! CCD ([charge coupled device](#)), are similar to digital camera sensors.

Most scanographers use Epson "photo" scanner models in the Perfection or XL Expression series. The Microtek ArtixScan M1 has also shown superior DOF (depth-of-field) results.

The price of an appropriate standard scanner ranges from under 100.00 to 500.00; the large format models start at 2,500.00.

With standard scanners the increase in cost is attributed mostly to the hardware features and add-ons, for example a larger transparency holder which you may not ever use.

### **Other technical considerations...**

**The dynamic range** (Dmax value) of Epson models varies from 3.6 and 3.8 to 4.0 (4.0 is the highest for a flatbed scanner.) This concerns the scanning of negatives and slides more than 3-dimensional scanning. Dmax value is important for shadow and highlight detail.

Manufacturers that do not report their dynamic range don't because it is far below the Epson standard or the capture device is a CIS (Contact Image Sensor).

**Bit depth.** All of the newer Perfection/Expression models allow for 48-bit color depth. 24-bit includes *plenty* of colors for the average artist. Unless you are producing museum quality prints on state-of-the-art printers, 24-bits should suffice. Simply stated, bit depth concerns color- specifically more tonal values to each color. There is a limit to how many different colors the human eye can differentiate and how many colors and their values a printer can print!

To understand bit-depth and dynamic range [read this](#).

**The Resolution factor.** Resolution determines the maximum PRINT SIZE of your scan. *More pixels or higher resolution does NOT make a higher quality print with more colors or better detail. It just makes a BIGGER PRINT.*

**Optical resolution vs. "interpolation"** "Life-size" capture requires "only" 300 dpi. When you want to enlarge the image, increase the dpi. *But don't increase it past the maximum optical resolution.* The maximum varies from a mere 800 dpi to well over 1200 dpi. When you need an oversize print it's better to use resizing software, for example, Genuine Fractals, rather than rely on the Photoshop resizing- looks more like interpolation. (Psssst! The trick to PS resizing is to increase in 25% increments, rather than one big one rescale!) Simply stated "interpolation", imagine cropping the empty space around a tiny object so that it appears to fill the entire frame. Technically, interpolation (or PS upsizer) tries to add more pixels by guessing the color they are likely to be based on the surrounding color pixels.

**DPI and PPI...** "dpi" (dots per inch) refers to the printed image on paper while "ppi" (pixels per inch) refers to the number of pixels in your monitor's

display image. Always remember: a print image requires three times more pixels than a monitor display (or web) image. An inkjet printer uses multiple sprays of ink for just one dot.

**The monitor image...** imagine a stained glass window or transparency lit from behind. The bright, crisp colors that you see on your monitor may appear dull and lower in contrast when printed. A printed image will never look as dazzling and crisp when printed, especially on matte paper. It is a technical and artistic challenge to recreate those vivid shades on paper.

**Black and White (monochrome) prints...** monochrome images printed with an ordinary inkjet/giclee process just don't compare with photographic "silver" printmaking accomplished in the darkroom. In fact they can't even come close. If your intent is to recreate the long, delicate tonal values in the tradition of platinum or silver prints you will need to use a special process like that of [Joanne Urban](#). A special process is necessary to produce B/W prints, called piezography. Essentially, the color inks in the printer are replaced with an array of black inks. [Cone Editions](#)

### **Set up the scanning studio and test your devices**

As soon as you get the scanner into the studio set it up and test it using 3-dimensional material to be certain it is functioning properly and communicating with your computer. Be certain to UNLOCK the all of the scanner's locks (there can be more than one).

Use the manufacturers software only- do not use third-party software, for example Silverfast or the OS software!

Follow the installation directions to a T because if you connect the USB at the wrong point in the installation it will not communicate properly.

*Reset the (Epson) software from the default mode to the "Professional" mode (the manual mode).*

If your computer doesn't recognize the device or the model doesn't display in the image editing (Photoshop) "import" menu call the manufacturers tech support. If this issue cannot be resolved by reinstallation the scanner may be defective and needs to be returned.

If there is a problem with the capturing software, go online and download the latest driver. Uninstall the previous driver and reinstall the update. If this does not resolve the problem, call the manufacturers tech support. When this issue can't be resolved you'll need to return the scanner.

If you detect a thin red or green line(s) running down the length of the image, or any abnormal "Newton's Rings" (a lot of lines over the entire page). The scanner is defective and must be returned.

Check the glass platen- be certain it doesn't have scratches or a "haze" that seems to float below the glass or a smudge that you can't polish clean. It's a good idea to make a few test captures and zoom in to pixel level to check for these defects (red/green lines and imperfections on the platen). Sometimes they are not visible until you looking for them at actual pixel (100%) size.

Don't struggle with an old or inferior scanner! A new scanner perfectly suited for entry level 3-D scanning can be bought for less than 100.00. As you gain experience or outgrow your entry-level software or hardware you can consider upgrading your studio devices.

#### **WARNING!**

Do your scans of 3-D objects have a "mottled" milky white-gray background and very blurry petals or leaves? Only the petals or leaves right on the glass are sharp? Even with the top left open the background is still a blotchy gray? If you are experiencing these symptoms you probably don't realize that you're using a scanner with a CIS sensor and not a CCD array. For best results, use this scanner only for documents and not scanography. You will never capture a black background and an adequate depth-of-field. Of course you can limit yourself to capturing flat leaves and specimens with the top squashing them flat- but that's not what *this* class is about.

#### **I strongly urge my class participants to start printing captures immediately!**

Often participants are reluctant to "waste" paper and ink on images they feel are not good enough to print. There is a lot more to be gained by making a few proof-prints (even on a home inkjet printer) than lost to a packet of paper and a couple of black ink tank refills! I had that attitude way back when and let me tell you: it was a BIG mistake! So learn from my ignorance, friends...don't worry about making gallery quality art at this point (unless you are already a photographer at that level of competency).

#### **My opinion about inkjet printers**

A good (and not very expensive) entry level printer is a Canon Pixma. While not technically "archival" the prints are good enough for proofing and the Canon printers are nowhere nearly as frustrating to use as the Epson R series. I do not recommend any low-end Epson printer for the hobbyist or the novice! They are

just way too problematic and need servicing after only a few months of photo printing.

When you have exhibition printing to do- but a high-end printer is not in your budget, take your digital files to a service bureau that prints for professional photographers. There are only about a million of them to be found online, vying for your business. And, psssst! "Photographic" process printing (dye layers) is less expensive than "giclee" printing (pigment squirted on paper or canvas). Click on the resource link on my web gallery

<http://www.blackrosegallery.com/linksandresources.html>

## **Hardware and software shopping list...**

### **PC or Mac computer**

### **Scanner**

### **Photo editing software (strongly suggested)**

### **Optional:**

### **Inkjet printer (at least an entry level one for "proof" printing)**

### **Fresh set of inkjet tanks**

(you will go through twice as much black, so buy more black)

### **Heavy weight "photo" print paper**

Although you don't need "state of the art" hardware and the latest, greatest software versions to learn scanography, certain features will make your scanning studio workflow more enjoyable.

Specifically you'll need a computer- PC or Mac, a standard (letter size scanning area) CCD array scanner (preferably an Epson Perfection series) and an image editor- Photoshop, Photoshop Elements or Paintshop Pro are the three most common. If you have never used image editing software, install Adobe Photoshop Elements 2.0 This is an older program but it the most simple to use- and much less complicated than the newer versions or standard Photoshop.

"Scan Your Garden" assumes that you are already quite familiar with Photoshop, Photoshop Elements, Paintshop Pro, Painter or some other "advanced" image editing/creative software. In my tutorials I assume that you have a fundamental knowledge. This tutorial doesn't include the teaching of PS or image editing in general.

As I've already mentioned "Scan Your Garden" encourages all participants to begin printing their scanned images. However, I'm only covering very basic inkjet printing issues for "proof printing". Fine Art printmaking is an art in itself and beyond the scope of this tutorial. But you will need this skill in the very near future!

If you are having any scanner installation or software issues prior to the start of classes, email me immediately at: [Rongorong@aol.com](mailto:Rongorong@aol.com) so we can get these problems resolved before we start.

Please download the .pdf file "Directory of Scanner Photography" at <http://www.blackrosegallery.com/>

Take a look at the diversity of artists utilizing this medium:

## **Field Trip**

**[Mark Mcaffee Brown](#)**

**[Portia Munson](#)**

**[Joanne Urban](#)**

**[Harold Feinstein](#)** (note his famous shell and flower series)

**[Ellen Hoverkamp](#)**

**[Christa Kreeger Bowden](#)**

**[Carol Rollick](#)**

**[Sandi Hutchins](#)** (pay particular attention to her shadow boxes)

**[Patrick Beilman](#)**

**[Jeff Mihalyo](#)**

**[Algis Kemezys](#)**

**[Elena Kropaneva](#)**

This is just a handful of inspirational artists. Explore as many photoartists listed in the directory as you can, perhaps one day you'll be one of them!





**Using a flat bed scanner as if it is a camera to record three dimensional objects d' art, live botanical specimens and preserved natural specimens...or any object that fits on the platen!**

**Before you buy...**

### **The Scanning Device**

Arrangements of objects can be "captured" or "photographed" using a scanner intended to digitize photographic prints, negatives or transparencies. The recording device is a CCD array (*charge coupled device*, same as in a digital camera). Most photoartists in the USA prefer Epson Perfection or Expression models. Only a device with a CCD array is suitable for capturing 3-dimensional objects with the lid removed. Scanners employing a CIS device (*contact image sensor*) are not suitable for "lid removed" life-like scanography. Expect to test a scanner to determine if the result is compatible with your creative intent, so pay attention to the store or manufacturer's return policy! Keep all the purchase documentation, the original packaging and be certain to return the scanner within the 30 day period (or whatever their policy states). Some stores make returns for a full refund difficult. If their policy doesn't allow returns except for replacing damaged equipment or store credit- shop elsewhere! Note: I've bought quite a few damaged "refurb" scanners from the Epson clearance center.

When a less technically fine, "deconstructed" image is preferred there may be a distinct advantage to using a device intended to copy office documents rather than photographic images.

Scanners designed to scan photographic prints, negatives or transparencys are referred to as a "photo" scanner. Scanners designed to input office documents (mostly black and white printed material) and to be used like a traditional "Xerox" copier are referred to as "scanners" or "home office scanners". The difference is that the printing device employs an ink jet printer as opposed to a laser printer.

### **Ink jet printer or laser copier**

*An ink jet printer is designed to print photographic images.* It squirts dots of a liquid dye (cheap) or a pigment (more expensive) to create millions of colors that look much like like a traditional photograph.

*A laser printer is designed to reproduce printed matter.* The type can be a color or black. The type area is magnetized and a black or color toner "sticks" to that area only.

A laser printer delivers typed copy much more sharply than an ink jet printer. Cartoons and graphics (areas of solid color) are also reproduced sharper and brighter, however "continuous tone" photographic images are rendered much better by an ink jet printer. But type, especially tiny print, is not as crisp and solid. Since there have been many improvements in this area the average viewer may not see a bothersome difference. Photographs made on a laser printer appear with higher contrast with less shadow and highlight detail. Again, to the average viewer, this difference may not be noticeable.



A distinct advantage for artists is that luxurious, traditional mould-made artist papers, toothy watercolor paper, transparent, metallic and colored paper; fabric canvas, fluid lengths of fabric, glossy or textured photographic papers and often heavy weight board, as well as cheap copy paper can be used for printing. The same paper can be run through the printer multiple times. Laser paper is boring and has to be smooth.

### What do you mean by "archival" and "giclee"?

Ink jet printing of the highest, "archival" quality is often referred to as "giclee" printing. (Say *GEE-clay*...it's French for "too squirt".) Cheap ink jet printers can produce a very fine photographic image, however the image is not regarded as "archival". Prints created with dye inks are not as "permanent" as prints made using pigment based ink. To qualify as "archival" the image must be produced by pigments squirted on a processed artist paper or photographic paper. That print may be further treated with chemicals that prevent fading from light and exposure to air. Note: traditionally, a "giclee" refers to a *canvas reproduction* of an original painting (oil, acrylic, mixed media and such) that simulates the original. Today, the giclee process is used by digital painters and photographers that have abandoned their easels and darkrooms and create works of art on demand. The distinct advantage to the artist is art that can be produced in any dimension on any surface to meet their patron's fancy. Essentially, the cheapest ink jet printer and the most sophisticated archival printer are spraying a lot of miniscule dots of color on a surface.

### Pigment vs Dye

A dye is a man-made color from chemical process. A pigment however is made from natural substances from the earth. Generally speaking, pigments outlast dyes. Dyes are brighter and less expensive to produce. Dye or pigment- the longevity of an image is affected by the material it is printed on, then the light and atmosphere it is displayed in. Prints should be professionally framed using archival materials, behind (but not touching) *artificial* glass (because real glass is a substance that is not a solid sheet) with a sealed-back frame. No print should be handled with ungloved hands. The oils from fingers will cause deterioration over time.

### "Photographic" Prints

Photographic "snapshots" are a totally different process from ink or pigment attached to the surface of a substrate (paper or fabric). Traditional color photographs are created from layers of dye embedded in the substrate. Traditionally B/W prints were made with silver salt coated on a substrate, but now they are often produced with dye too. The process involves exposure to a controlled lightsource, hence the term "darkroom". Traditional color printing is often much less expensive than giclee printing and is more practical to use for proofs. "Archival" dye prints or "Cibachrome" prints increase the cost. Overall, this type of traditional printing is more practical and less costly than a highend giclee.