A Basic Guide to Going Digital

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Navigating the Forks and Potholes on the Road to Digital

With all the attention given digital photography these days, many photographers either feel a bit left out or overwhelmed by the phenomenon. While some photographers have found their Digital Oz, others have serious questions about whether and/or how to pursue it. Join us for a practical overview of the issue before you strike out down your Yellow Brick Road.

The Good, the Bad, and the Ugly

While the benefits of digital photography are widely touted, digital evangelists are not always forthcoming about disadvantages and the necessary learning curves. For example, many commercial photographers who shoot a lot of catalog images were first to employ digital photography because their art director clients loved the instant feedback and digital saved everybody substantial sums in film, processing, and scanning. Photographers with big catalog clients found the benefits of going digital far outweighed the steep costs.

Though the cost advantages are not as clear-cut for portrait and wedding photographers, the competitive advantages are seductive. Imagine being able to display and print wedding and reception images during the event. This would allow many who would normally not have the opportunity to see and buy 5 x7 or 8x10 prints on the spot. Or, how about presenting a model portfolio in minutes instead of days, thus creating the on-the-spot opportunity to add poses and sell more prints?

Those who have made the plunge successfully report that fast turnaround services can bring new clients and "instant proofing" can dramatically increased their sales. However, if not financed correctly, the cost can be deadly to your business; a digital system for use with your medium-format camera can range from $15,000 to $35,000.

Medium-format backs

For professional photographers using medium-format equipment a digital system typically begins with a digital back/magazine installed in place of a conventional film back on your camera. Inside this digital back is an electronic sensor that records an image much like film, in this case using millions of small receptors commonly referred to as pixels, or picture elements. Generally speaking, the higher the number of pixels, the higher the resolution of your final image consequently producing a better enlargement.

Image sensors may be square or rectangular, something you need to fully consider before you incorporate this technology into your business since your images take on the shape of the sensor. For example, while MegaVision's S-2 digital back is available for use with 645, 6x6, and 6x7cm cameras, it uses a square sensor that produces a square image. Therefore, if you need or prefer a rectangle you should use the more recent S-3 digital back with its rectangular sensor.

Sensors in digital cameras are identified as being either a CCD (Charge Coupled Device) or CMOS (Complementary Metal Oxide Semiconductor). For the professional photographer it matters little in understanding the

Camera	Highest CCD Resolution	Lens Mount	Approx. Street Price
Canon EOS D30	2,160 X 1,440 pixels	Canon EOS	$3,000
Fujifilm FinePix S1 Pro	3,040 x 2,016 pixels	Nikon	$3,200
Nikon D1	2,012 x 1,324 pixels	Nikon	$3,500
Kodak DCS 620x	1,728 x 1,152 pixels	Nikon	$6,500
Kodak DCS 660	3,040 x 2,008 pixels	Nikon	$14,000

technical difference between the two. What is important to know is that while CCDs are the most common now, the lower cost of manufacturing CMOS sensors will make them more common in pro cameras in the future.

A term that is more important to familiarize yourself with is "megapixel," which is simply another way of saying one million pixels. When you read manufacturers' literature, they almost always note image size in horizontal and vertical dimensions, i.e., 1,800x1,200. Multiply the two and you have the total number of pixels on the sensor: in our example, 2,160,000 pixels, or 2.16 megapixels.

To produce high quality prints from digital images, you need to understand how digital print quality (on an inkjet, dye-sublimation, or thermal printer) is related to the size of the digital sensor in your camera or back. For example, the top-of-the-line Kodak 8650R thermal printer has a maximum print resolution of 300 pixels-per-inch. Therefore, if you plan to produce an 8 x 10 print, a simple rule of thumb to maximize image quality for this size print would be 2,400x3,000 pixels (8 inches x 300 =2400; 10 inches x 300 = 3000), or a total of 7.2 million pixels. A 5x7 print of equal quality would require only 1,500x2,100, or 3.15 million pixels. You can use a similar formula for inkjet or dye-sub printers as well, but bear in mind the files created will be very large and increase the amount of time you will need to manipulate, adjust, and print them.

To keep things simple, one rule-of-thumb is that each added megapixel provides one increase in print size. For example, a 1.5 megapixel camera will provide good 4 x 6 prints, but for a 5x7 print you should really consider a 2+ megapixel camera, for 8x10 prints a 3+ megapixel camera, and so on.

As with any rule, keep in mind there are always exceptions. Newer cameras often produce larger image files that in turn yield better quality prints even though they may use the same size CCD as a previous model. Imaging software may also be an exception to the rule. Programs such as Genuine Fractals, an Adobe PhotoShop plug-in, allows you to produce high-quality enlargements from lower resolution (fewer pixels) files. As with all things digital, these solutions have their supporters and detractors.

What Do You Need?

If you start looking around you will find that companies such as Better Light, Leaf, MegaVision, PhaseOne, Sinar, and other digital back manufacturers can be divided into two categories: single-shot backs (starting at about $15,000) or multi-shot backs (as high as $30,000). Most of these manufacturers use a Philips 6-megapixel

CCD (2,000x3,000 pixels). While Kodak has taken orders on backs with its new 16-megapixel CCD, it is not yet available on the market. Applying the rule-of-thumb, digital files from the single-shot 6-megapixel chips produce near-perfect prints as large as 20x24. Single-shot backs capture the image by "looking" or scanning it once, something that is referred to as a pass. These are ideal for people or portrait photography. Multi-shot or three-shot backs yield higher resolution but require multiple passes—one pass each for red, green and blue—making them best suited for still-life studio shots.

Rarely mentioned in product literature, digital backs require electric power and are usually tethered to a personal computer or other recording device. While this is not a problem when using a digital system in a studio, it does prove challenging for on-location assignments. Currently, the only portable solution is MegaVision's BatPac, a small battery-operated hard disk that stores your digital images. When you want to view or print them, you still need to transfer the images to a personal computer and then use an image editing program like Photoshop to adjust them for your needs.

Digital SLRs

For those who work primarily on location and prefer to operate sans tether, a digital 35mm-style SLR such as a Fujifilm FinePix S1 Pro, Canon EOS D30, Nikon D1 or one of the Kodak DCS series may be what you are looking for. These professional level cameras store the images they capture on memory cards or small removable hard drives. Generally, these SLRs cost between $3,000 and $7,000, though certain models go for much more.

Generally speaking, sensor resolution is lower in these SLRs (typically, 3-megapixels), which is, in essence, the trade-off you make to gain added portability. This past year, two new 35mm-size digital SLRs were introduced—the Fujifilm FinePix S1 Pro and Canon EOS D30—offering tremendous value at street prices around $3,000. These models yield high digital resolution and use Nikon, Canon, or compatible interchangeable lenses; the Fujifilm FinePix S1 Pro uses Nikkor mount and Canon its own. Those photographers who have a substantial investment in these types of lenses can help offset their initial investment.

Olympus also has done very well in the past few months with a 4-megapixel SLR, the Camedia E-10, at $2,000, though its Olympus 9-36mm f/2.0-2.4 ED Glass aspherical zoom lens is not interchangeable.

So-called "prosumer" digital cameras, such as the Nikon Coolpix 990, Canon PowerShot G1, and Fujifilm FinePix 4700 zoom, sell for between $850 and $1,000. While they will produce images of similar resolution (with approx. 3-megapixel chips), they are basically point-and-shoot cameras. You lose exposure controls and have no interchangeable lenses.

Lens Effect

One note to all the new digital camera systems rarely mentioned in the marketing literature is the change in effective focal length of your lens. Why? Because image sensors are typically smaller in dimension than the film size they replace. So, in effect, your lenses take on a longer focal length than when they are used with conventional film-based cameras. Focal length factors vary depending on manufacturer and will generally increase when you use the same back on a larger format camera. For instance, you may have a factor of 1.5 with a 6x4.5cm camera, making a 50mm lens effectively perform like a 75mm lens. A 6x7cm camera that has a factor of 2.2 would make that 50mm lens a 110mm focal length.

The digital SLRs also have focal length factors that need to be considered. In the case of the Canon EOS D30, its factor of 1.6 makes a standard 50mm lens perform like an 80mm lens, and your favorite 28-105mm zoom becomes a 45–170mm lens.

Should I wait?

New photographic technology may transform your business into a very successful one, but you must go into the project with a business plan that ensures a sustainable payback.

Before you plunk down a major investment in this rapidly changing technology, knowing what you gain or lose is key. It's not an easy choice, but hopefully this article has enlightened you on some of the factors you need to understand as you venture into the future of digital photography. ■