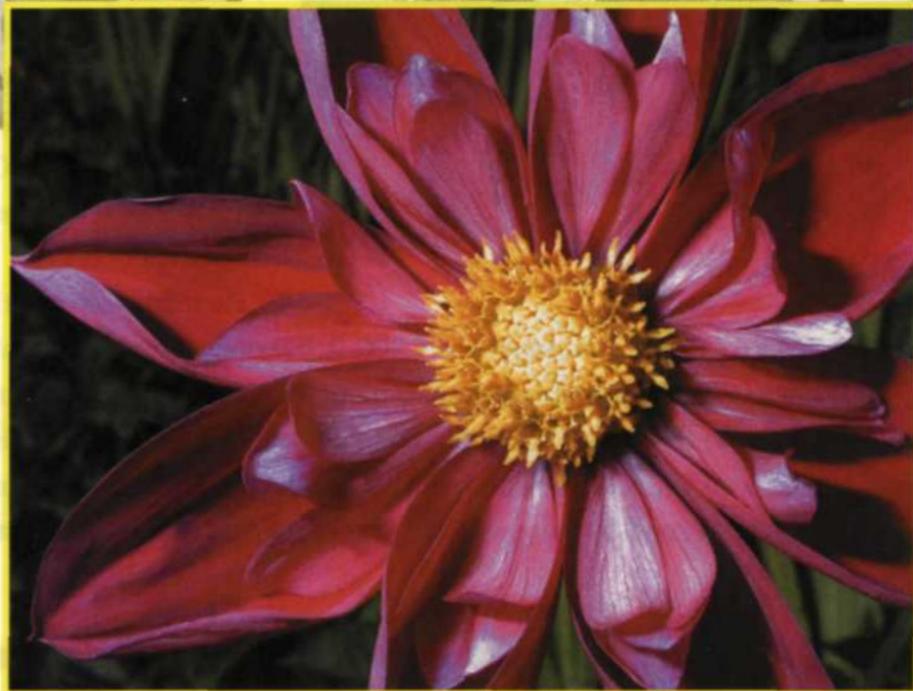


DIGITAL DIRECTIONS



Megapixel



*Above: This 35mm format (Nikon 990) does not use all the pixel sensors, so the megapixel count for this file is less.
Right: This TV format (Nikon 990) does not use all the pixel sensors, so the megapixel count for this file is less.*

Megapixel Madness—the first symptoms appear when you initially touch a digital camera. Your condition gradually deteriorates until you are delirious with pixel fever. Sadly, there is no cure. Once you are infected, you will have the obsession forever. The digital camera manufacturers are sure happy about that!

Jack and Sue Drafahl

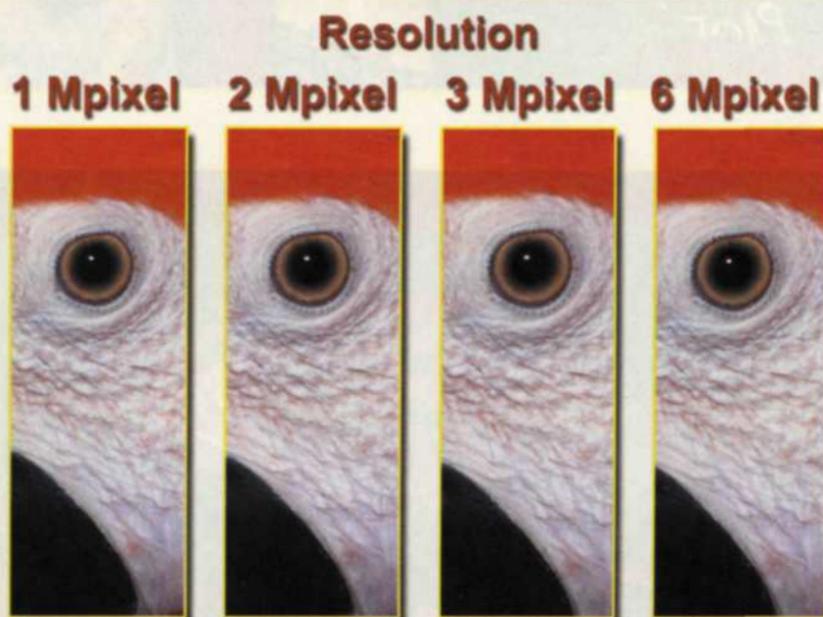
DIGITAL CAMERAS now come in just about every shape, size and combination of features. Photo lab owners and their customers are confused by this landslide of new digital terminology, especially the concept of megapixels being digital film. The more informed a photo lab can be regarding this new technology, the better they can advise their new digital customers.

A digital image is comprised of pixels, which is short for picture element. Megapixels suggests that each picture has one million pixels of resolution. This is where things get a bit confusing and it all becomes a can of worms. The quality of digital cameras is primarily dependent on the size of the CCD (Charge Coupled Device) and how that data translates to an image file. Although each chip has a specific resolution based on its size, not all cameras use the chip in the

same manner. Because film is based on the 35mm format, many digital cameras want to closely simulate this format. In order to accomplish this, they end up cropping the image that the chip records, and lowering its resolution. Many of the newer digital cameras give you the option of using the cropped 35mm format or the full chip usage that closely simulates television format.

Another reason for confusion on image resolution from the CCD chip is that many digital cameras do some firmware enhancements to the data recorded on the CCD chip. This enables them to come up with a higher resolution. Some cameras will interpolate, pixel shift, or extrapolate data. Whatever terminology or technology they use, these methods take the captured data and insert new data between the pixel values, thus increasing the resolution.

Madness



A 6 megapixel image of Opie the Scarlet Parrot used to test film and digital cameras.

The key to understanding resolution when buying a megapixel camera is to look at the specifications of the physical size of the chip and just how many actual megapixels it will hold. Even when the values are identical from one digital camera to the next, you can still find variations. The difference in image quality can be due to manufacturing quality control, the method that the data is handled by the image processor and camera lens quality.

In digital's infancy stages, a field of experts decided that the file size for the photo CD should approximate the resolution of film. Their extensive calculations indicated an 18 megabyte file size is necessary to allow a digital picture to give film a run for its money. Since file size is three times the megapixel designation, an 18 megabyte file size has the equivalence of 6

megapixels. Most digital cameras today have about 3 megapixels. There are some 6 megapixel cameras available today, but they boast a hefty price tag. As technology improves and prices drop, 6 megapixels will become the norm.

Another factor in this megapixel madness is the variety of methods for storing images within the camera. You can find CompactFlash, SmartMedia, Memory Sticks and even Micro drives.

The two most popular are the CompactFlash and SmartMedia. Both use non-volatile memory, which means that they do not need a power source to keep the data safe when the storage device is not in the camera. The SmartMedia uses a control in the camera that allows it to be compact and less expensive. The CompactFlash has its own controller within the card, so as cameras evolve these

cards will probably have fewer compatibility issues than the SmartMedia.

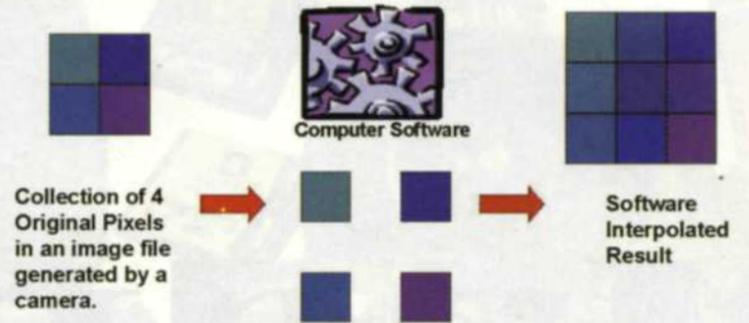
Whichever card you decide to use, you must balance the quantity of images to desired image quality. Since you bought a digital camera with several megapixels, your best results are when you image at the camera's highest resolution. The problem is that this results in the largest image files and you can't store very many files on your digital film.

Image compression helps reduce file size and increases the number of images that you can store on a card. The key is to find the right combination and compromise of resolution and compression.

Our tests on different digital cameras show that the best balance between quality and quantity is to use the highest image resolution and the default compression, which is somewhere in the middle.



Resolution Increase by Software Interpolation

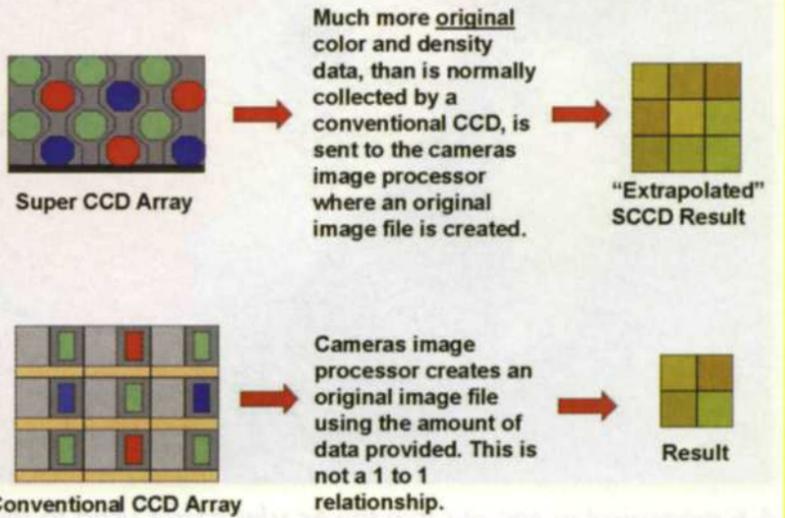


Collection of 4 Original Pixels in an image file generated by a camera.

A 100% increase in size: Software moves them apart and calculates what color pixels should be placed between the originals.



Resolution Increase by Super CCD Data Extrapolation



Top Above:
Fuji FinePixPro
image shot at the
6 megapixel level.
Near Above:
Kodak DC660
image shot at the
6 megapixel level.
Near right:
Agfa 1680 image
shot at 1 megapixel.
Far Right:
Nikon D1 at
3 megapixels.



Once you have your images stored on digital film, you need to get them into your computer. When digital cameras first came out, most used a direct connection to the computer for downloading. Now we have many types of digital film card readers on the market. You can get readers dedicated to one type of card, or a reader that can accept two or three types of storage cards. Most connect through the USB port, but there are a few that use firewire, standard serial port, or even printer ports.

The best part is that readers are simple to use. When your card is full, insert it into the card reader and they will come up on your computer screen. Drag the files from your megapixel image card to one of your computer's main data drives, and then delete the images on the card. You now have a clean slate and are ready for more digital action.

Although perception of quality is in the eye of the beholder, there will come a time when a client wants you to produce a large print from a too-low resolution file.

There is now hope for these customers, with a special software compression program called Altmira Fractal Print Pro. This program takes digital files and converts them to a new type of fractal printing format.

Once the file is reloaded, you can increase the image resolution to the larger print size, and the pixelation evident with a low megapixel image is no longer visible. It sounded almost too good to be believable, so we compared samples.

We were very impressed with the quality of the images, but you need to be aware that the higher resolution images require additional time for viewing and printing.

As a photolab owner, you need to have a good working knowledge of digital cameras, image resolution and compression to interface with your existing lab services. Your clients are relying on you and your expertise for answers to their digital questions. We suggest making some samples printed from various megapixel resolutions, and various compression levels to help illustrate your point. Be prepared, because this megapixel madness is highly contagious!

Jack and Sue Drafahl are freelance writers and professional photographers based outside Portland, Ore.

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