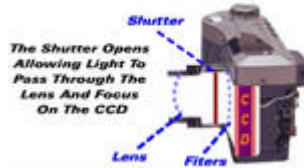


Capturing the Picture



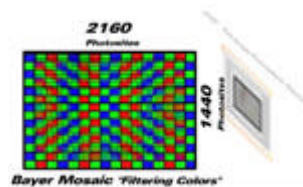
1 Composing Your Picture

In order to take a picture with any camera-traditional or digital-you need a subject and a light source. The light source distributes rays of light onto the subject and the camera records those reflected light patterns to capture the picture. You can use an available light source or rely on the built-in flash. With digital cameras, you have the option of using an optical viewfinder or the color LCD display to compose the shot. Once you have framed your subject and are ready to take your photo, press the shutter button.



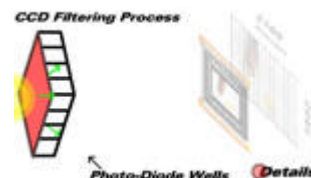
Shutter Button

The shutter button actually does two things for you. When pressed halfway it sets the focus position and exposure level, when fully pressed it takes the final picture. As you fully press the shutter button the mechanical shutter opens. The reflected light passes through the lens and filters and is focused on the CCD image sensor "Charge Coupled



Device." 3 Capturing The Picture

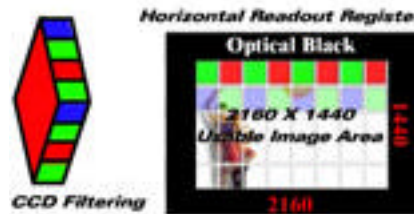
The DC4800 camera uses a color area array, CCD image sensor with 3.3 million tiny cells or photosites that are arranged in a special checkerboard, known as the Bayer Mosaic. The outer photosites are opaque in order to provide a black reference, and are cropped out of the final 3.1 megapixel image. This Bayer Mosaic uses fifty percent green filtered cells which create a visually sharp image. The CCD collects light from the scene



and converts it to an electrical charge.

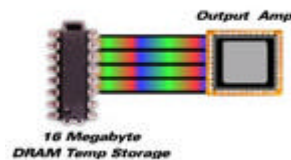
4 Capturing Colors

Each of the Photosites is covered with a single color filter-red, green or blue-allowing each cell to "see" only one color. This color information is then transmitted to a light-sensitive photodiode, which absorbs the reflected light, and generates electrons that are collected in the potential well of each photodiode.



1 Reading Out The Analog Photo

At the end of the exposure time, the mechanical shutter is closed. The color information (in the form of electrical voltage) moves, one row at a time, from the photodiode wells to



a horizontal register. 2 Converting To Digital

Now that we have our analog photo stored it is time to amplify the electrical data and convert it to a digital format. The Voltage is then amplified and converted to a digital image data signal using separate integrated circuits. 3 Viewing The Picture



The 10-bit mosaic RGB sequence or raw image is stored on DRAM. The processor creates a "thumbnail" image which is viewable on the color liquid crystal display (LCD). A backlight illuminates the LCD panel through a polarizing screen. If you don't care for the picture, you can push a button to immediately erase it from temporary storage. If you choose to save it, the photo is then processed, compressed, and stored on the Picture Card.

This scene illustrates the next steps in refining the raw digital information to achieve the highest quality digital picture.

1 Adding Full Color

The camera then takes the raw 10-bit mosaic-like image signal and performs a series of sophisticated calculations to produce high quality color pictures. The first step is a process known as De-Mosaicing. During this phase, the single red, green and blue colors created by the Mosaic pattern are digitally processed to create the missing color values, producing a full-color digital picture.



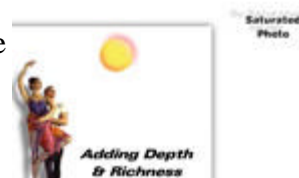
2 Color Correcting For Lighting

In the next step, the automatic white balancing on the DC4800 camera analyzes the scene and adjusts the red and blue signals to match the green signal strength in the white and neutral areas of your picture. This is important because indoor and outdoor lights operate at different color temperatures and often add a red, or yellow cast to your picture. White balancing gives your picture a more natural, overall coloring, similar to how your eyes adapt to indoor and outdoor light.



3 Adding Depth And Richness

The image is not perfect yet because the color CCD doesn't quite "see" colors the same way your eyes do. Therefore, the camera takes the digital image through a process that enhances and saturates the colors, giving you true rich color photos.



4 Emphasizing The Fine Details

Passing through the lens and the anti-aliasing filter inside the camera may cause a slight softening of the image, so the next step is to sharpen the image electronically. A two-dimensional digital filter analyzes the image to locate and enhance edge details.



This section leads you through the last steps taken before you can start using and sharing your pictures.

1 Compressing Your Picture Files

The size of a 3.1 megapixel, bit mapped image is over 9 megabytes. To stretch the capacity of your Picture Card, The JPEG compression standard is used. This decreases the file size to an average of 850KB. During image compression, the image processor selectively filters the image to produce a smaller image file with minimal impact on picture quality.



2 Creating The Finished Image File

The JPEG compressed image file is combined with a thumbnail image for quick previewing and detailed capture information known as Metadata. Then, the image is saved to the removable Picture Card. These pictures subsequently can be transferred to a computer, television or other device for viewing, editing, sharing and archiving.



3 Reviewing The Process

If you'd like to view the whole digital capture process again and see how each of these four steps fits together along the Path to Digital, [click here!](#)