

Electronic Pixels and Pics: A User's Glossary

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THE KEY TO maintaining a successful lab in the next five years is going to hinge upon a lab manager's ability to understand and adapt to new electronic processes. These innovations are designed for more efficient lab operation, but the lab manager must understand and speak the language that comes along with these systems in order to perform properly.

In the past, photo labs only needed to understand basic photographic language in order to interpret how to operate the latest lab equipment. With the advent of new electronic processes, lab personnel must start over and learn computer jargon. The following photo-computer glossary will help you to better understand the marriage of photography and computers.

PIXEL

A pixel is the smallest unit of measurement on the computer screen. These pixels should be considered the "grain" of the computer screen image and can be manipulated the same way that grain in film can be changed and improved. Just as film manufacturers improve the grain structure of their films, computer manufacturers improve the pixel quality of their monitors. Photographs captured and displayed on a screen are represented by rows and columns of pixels. For example, a 640 row \times 480 column computer screen would take 307,200 pixels to display an image.

Just as film is made up of three color layers, the computer colors are comprised of three color pixels. On a color slide for example, red would be represented by density in the magenta and yellow layers and no density in the cyan layer. On the computer screen the same red would be represented by a red pixel at full intensity, and the green and blue pixels at minimum intensity. Information in the form of computer bytes controls each of these pixels and their intensity.

BYTE

A byte is a unit of computer measurement that can be represented by a single character on the screen. Each byte is made up of smaller units that consist of electronic charges on the chips in the computer and are called bits. These unique combinations of charged on, or

charged off, bits in the computer make each byte different. Groups of bytes can be described in kilobytes (1000), megabytes (1,000,000) and gigabytes (1,000,000,000). These units of measurement are used to tell the user how much space a program needs to operate, or how much room a data file needs on the computer storage device.

DISK STORAGE

Some type of storage device is necessary to store the information you input into the computer and save it for later use. A number of devices exist, the most common being the floppy disk. These disks come in 5.25 (pronounced five and a quarter), and 3.5 (pronounced three and a half). They can be compared to a record as they are divided into circular tracks for data storage. Some of the 5.25 disks can store 360KB of information (360,000 bytes) while others can store 1.2MB (1,200,000 bytes). Some 3.5 disks can store 700KB while others store 1.44MB.

When you need to store more information than a floppy disk will hold, or need to access the information faster, then a hard disk is the answer. This eliminates the need to insert and remove a floppy, as the hard disk is a permanent fixture in your computer. These hard drives come in all sizes of memory storage from 20MB on up.

RAM

Information to run the computer and computer programs are stored

in micro-chips called RAM (Random Access Memory). When the computer is turned on, computer bytes of information are loaded into the chips from your storage device. This operating information stays in the chip and can be altered using the keyboard, a mouse, or drawing tablet.

COMPUTER GRAPHICS

These are as the name implies—computer generated graphics. These graphic slides can be created with your computer and a variety of business graphics software programs. These visuals are used mainly for lectures and presentations. Once these images are designed, they can be output to laserprints, overheads or to a film recorder.

FILM RECORDER

Basically a film recorder is a color printer that prints images on photographic film. An extremely high resolution black and white monitor is encased in a black box with a camera and lens attached to one end. A color image in the computer is broken down into red, green and blue parts and is sent one color at a time. When the red information is sent, a color filter is rotated in front of the camera lens. After this exposure is made, the green image is shot through a green filter followed by the blue image through a blue filter, and then the film advances to the next frame. The resulting film is a full-color computer-designed image.

Originally film recorders were used

for making business graphics slides. With the advent of flatbed and film scanners, labs can now scan in photographs, negatives and slides, and re-output them to the film of your choice. For example, you can scan in a Kodak Ektar color negative and make a Fuji Velvia slide. The film recorder/ scanner combination can be used to make black and white negatives, internegatives, slides, and standard color negatives.

SERVICE BUREAUS

A service bureau is a photo lab that specializes in servicing the computer graphic specialist. Most service bureaus can scan slides or prints into any format you desire. They can also provide images from the software disks that you have designed. Service bureaus provide fast turnaround, as the final images are usually sent via an overnight courier service. Although the cost of imaging is relatively high, it definitely outweighs the cost of setting up a full-service imaging lab.

VECTOR vs. RASTER IMAGES

Images created in the vector format are similar to connect-the-dots pictures. Objects are created using the location of dots to tell the outline of the object. For example, a rectangle might be described by starting at point (0,0) and connecting the points (0,100), (100,100), (100,0) and then back to (0,0). A final command would indicate that the entire center of the object be red. The data required to represent this picture could be less than 500 bytes. This format is mainly used for images originally created on the computer.

A raster image comprises information about each pixel that appears on the CRT screen of the film recorder. These images are very similar to the dot pattern on your TV set. Because these files contain information about each pixel, the files are usually very large (50K to 72MB). The same red rectangle discussed earlier could have over one megabyte of information if it were converted to a raster file.

8 BIT COLOR vs. 24 BIT COLOR

Computer programs that bring photographs into the computer using 8 bit color can only display a maximum of 256 colors. The 256 colors are derived from the fact that if you look at all the unique combinations of 8 bits of information

charged on, or charged off, there can only be that many colors. If you assign 24 bits of information to each color, the result is over 17 million colors. If you want to retain all the colors of a photo when you bring it into the computer, you should be using a scanner and software program

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that will handle 24 bit color.

FLATBED SCANNER

If you want to bring your black and white or color prints into your computer system, you can use a flatbed scanner. Flatbed scanners

look and work very much like copy machines. You place the original copy on the machine and a long row of light sensors inside the scanner scans across the photo and transmits it to the computer. Special photographic software then adjusts the contrast and color balance, retouches it, and saves the image to a raster file.

This file can then be transmitted

to a film recorder, thermal printer, or laser printer. With a flatbed scanner you can combine photos, add text, retouch damaged photos, restore old photos and create new high-quality thermal photos.

FILM SCANNER

A film scanner operates very much like the flatbed scanner but looks more like a slide projector. A slide or negative is inserted into a slot in the front of the device and is scanned into the computer in the same manner as the flatbed scanner. Using special photographic software that comes with the scanner, you can change color negatives into positive images, adjust color balance and exposure, change the gamma and retouch damaged slides and negatives.

VIDEO CAPTURE BOARD

Once this board is installed into the computer, a video camera can be attached via a cable and transmit images from the camera into the computer. These captured images can be modified and printed out to a computer color printer and/or a film recorder. These images can also be reduced in size and combined with computer graphics created with computer software. Both motion and still video can be captured and used in a variety of outputs from the computer.

THERMAL COLOR PRINTER

This electronic printer is quite new to photo labs and promises to be a great help in the electronic lab. Prints, negatives and slides that are scanned into the computer can be corrected for color balance and exposure and then printed on a special thermal paper. This process takes 4-5 minutes, making it very competitive with the RA-4 process. This printer requires no darkroom, no chemistry, and no enlarger, fits on a desk, and makes an ideal candidate for creating quality prints.

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much like a slide duplicator except that it has a video camera in the place of a duping camera. The negative or slide is placed on the base under the camera and a positive image is displayed on a TV monitor—handy for lab personnel or customers viewing an image and trying to visualize what a final print is going to look like.

CD PICTURE DISK

The amount of computer data (bytes) required to capture most of the image quality in a color negative or slide can approach 20 megabytes of space on a hard disk. Most computers today have less than 100 megabytes of space, which would only hold 5 pictures. Kodak's new CD scheduled for release in 1992 will hold 100 photographs in storage at 18 megabytes each for a total of 1.8 gigabytes of data. When Kodak sets up these new systems in many of the one-hour labs, customers will be able to bring in their film, have it processed and scanned onto a CD disk. The customer can take the disk home, play the pictures back on a Photo CD player, and view them on a TV or import them into a computer system.

Learning More About Photo Computer Terminology

One of the best ways to learn more about this hybrid of photography and computers is to check out classes offered by your local colleges. Occasionally, you will see specialized classes in digital photography, electronic photography, or other titles that tell you these are more than basic computer classes. If you feel you need to learn more about the basics of the computer, you can find dozens of classes at local computer stores, colleges, and high schools. Keep reading our articles, as we will keep you informed as to what's happening in this computer-driven photo world.

Sue and Jack Drafa operate a full-service commercial photo lab just outside Portland, Oregon. Services include audio visual productions, computer graphics and stock photography. They are contributing editors to Petersen's Photographic, and specialize in photo lab procedures.

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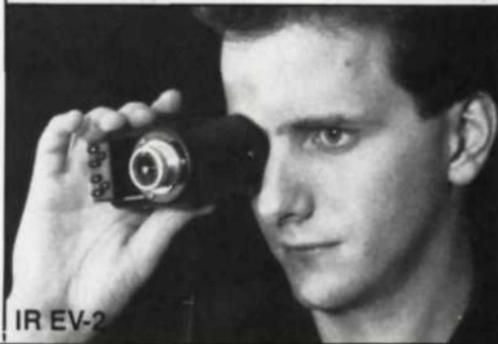
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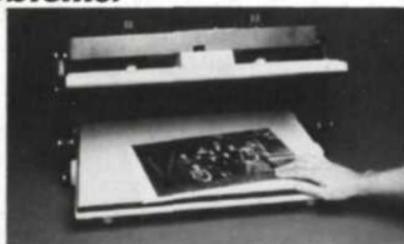


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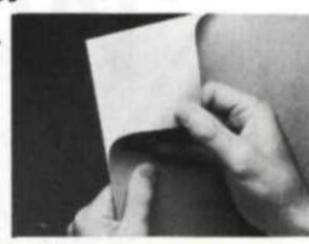


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