DIGITAL DIRECTIONS

Electronic Image Storage

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WHEN YOU FIRST start working with electronic images, storage will probably not seem like a big concern. You will soon change your tune, however, after creating a few large images which take mega-pixels and giga-bytes. All of a sudden your 600 megabyte hard drive seems very small. You are now faced with a new problem. Do you throw away your client's image files once the final output is delivered or do you find a reasonable way to store them?

Unfortunately, there is no simple solution. Each lab's storage solution will depend on the volume of images, size of each image, budget for storage, and how long you need to store the images.

In the traditional photo lab, image storage is pretty simple. Most current images are in a job envelope circulating around the lab, filed in a cabinet for short-term storage, or filed in an archival cabinet for long-term storage of client's work.

Electronic image storage is very similar in concept, but the hardware looks different. The first level of electronic image storage is for active images in progress in the lab. These files are usually stored on the main hard disk, or a second hard disk assigned for image storage. The advantage of using one hard disk is that it costs less per megabyte and allows high speed direct access from the same drive. The disadvantage is that if the drive crashes, you not only lose data, but also lose all your installed programs.

Keep in mind that when working with large files, you are constantly writing and deleting large amounts of disk space. This is fine as long as the operating programs are well compressed at the front of the drive, but if the programs become

fragmented when you upgrade your operating programs, gaps will appear between programs. When you come back to write a large image file, the computer will break it up into pieces and fit it into the holes between the programs. If an error occurs in writing, you will lose the image file and possibly several operating programs as well.

We feel the better solution is to have a 200-500 megabyte hard disk for programs and a 500 to 1 gigabyte drive for image file storage. If you have enough space on your operating drive, you should set aside a permanent space for temporary files. This means that anytime the operating system needs to store memory on the hard disk, it will always store it in the same place, and not try to fit it into any gaps.

Once the job is completed, the image can then be transferred to a secondary level storage system. This storage media can be in the form of a backup tape, magnetic cartridge, or optical cartridge. The backup tape is generally used to back up whole drives, directories, or groups of files. The advantage in this system is that storage is very cheap per megabyte and the size of the tape is very small. The disadvantage is that access time is longer than cartridge devices, and the life span of the images on tape is shorter.

The magnetic cartridge, like SyQuest or PLI, has a much faster access time than tape but not as fast as the main

hard drive itself. Magnetic car-tridges usually hold less data than the hard disk or tape back-up, so most us-ers have sever-al cartridges for transferring tem-porary image files. Since these are removable hard disks, they are popular for transferring files to printers for offset output. The optical car-tridge looks very much like the magnetic cartridge, but through the use of a laser it has the ability to hold large amounts of data. Its access time is usually longer than a magnetic cartridge because of its design, but its ability to hold vast data may compensate for the speed loss. Both the magnetic and optical cartridge are the best ways to move large images from one computer system to the next.

Eventually you will come to a point where both your active and temporary storage systems are full. You then have the choice of deleting old inactive files, adding more temporary storage, or add-ing an archival storage system. Worm drives (Write Once Read Many) and CD Writers store large amounts of image data for at least 20 years without any data loss.

Both systems write the data once, and that data cannot be changed once writ-ten. The CD Writer usually holds 600-700 megabytes of un-compressed image data, while the Worm drive can record thousands of megabytes of data. The data from the Worm drive is usually read back into the computer system via the same drive. Images written with the CD Writer can be read from it ,or even inexpensive CD ROM drives. Both types of drives are slow in image retrieval speed, but compensate by the vast data they can store.

Another consideration for image stor-age is image compression. Many of the

file formats today, such as Targa, TIFF, PIC and BMP, offer special image compression techniques that can reduce the size of the file to as much as 25% of the original size. This means that four times as many images can be stored in the same space. If you are storing a lot of images and space is critical, a special image format call JPEG (Joint Photographic Electronic Group) can reduce the file to 10% of the original size, but with some loss of data

Most recently a new compression format called CMP from Leadview Systems can reduce the image to 20% of its original size with no loss of data. This means that you could store 200 megabytes of compressed image data on a 44 megabyte SyQuest cartridge. If you had 10 cartridges, you would have the ability to temporarily store 2 gigabytes of data. If you use the same compression scheme on a CD Writer, you could store between 3-4 gigabytes of image data on one CD-ROM disk at about $10 per gigabyte.

Once you have decided on the storage system for your image files, you will need a way to easily locate a specific file that is intermixed with megabytes of other files. File managers help, but they only give file name, size and time the file was made. In most cases that is not adequate. An easy solution is to add a picture file manager to the main computer system.

When the picture manager is installed for the first time, it will go through the selected hard disks and directories, and create small thumbnail pictures of each file. This process is lengthy the first time, so plan accordingly! Once the picture library is completed, you can add new images on a daily basis.

These picture managers are very handy for deleting unwanted pictures. If you have three file names, Gizmo 1, Gizmo 2 and Gizmo 3, you might have to guess which images each contains. But with a Manager, you would merely look at the thumbnail sketch and select, and delete it. These picture programs can also convert files and print directly to printers and film recorders.

If you're not totally confused yet, let's add one more thought on image storage.

It is often common practice to upgrade computer equipment and sell the old to offset the cost of the new. Always make sure that you are backwards compatible on image files and retrieval. If your new system cannot retrieve your old files, you will probably have to keep one of the old systems in your lab to retrieve those images. An alternate approach would be to transfer all the old images to the newly installed system.

Before you decide which storage system you want to have in your lab, ask yourself a few questions: How fast can it read or write? How much data can it store? Is it expandable? What is the life span of the data? How much does it cost per megabyte? How easy is it to use? When you have looked at all the systems and answered these questions, you will be ready to set up an effective storage system in your electronic lab.

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