

The SAGATUG

INTERFACE

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The San Gabriel Valley Technology User's Group. The Club for TRSDOS and MS-DOS

The Power of Small - Small is Beautiful

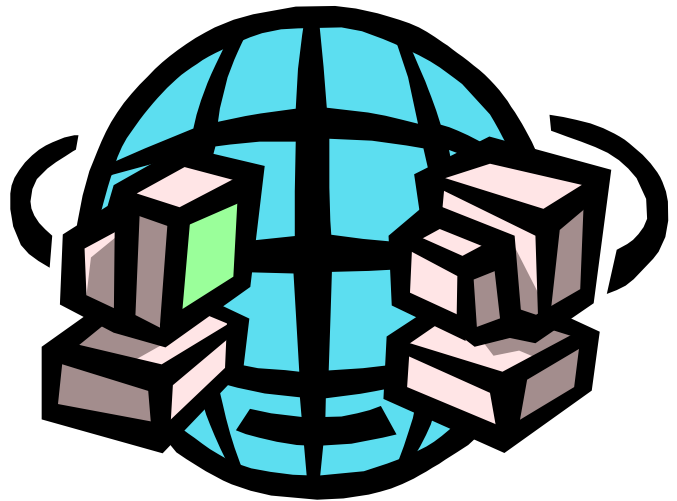
By Guenter Schott,

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The above headline may appear to you as “strange”, but I want to emphasize an important ingredient of good communications when you transmit images as a file attachment over the Internet.

Yes, there is an unwritten protocol that calls for courtesy in this process and of what happens when you, for instance, send a family photograph to a friend or family member with the help of an E-mail client.

Most of us don't have the luxury of a fast DSL phone line. And that is the problem when you transmit an image from point A to point B. You probably have only a 56K modem connection and so does the other person you communicate with on the other end of the Internet data transmission highway.



So, what are we really talking about? Two simple words are the explanation: File size. Why is that so important, you might want to know? Well, let's first describe what a modem is and what it actually does. It's an acronym for modulator-demodulator. A modem is a device or program that enables a computer to transmit data over telephone lines. Computer information is stored digitally, whereas information transmitted over telephone lines is transmitted in the form of analog waves. A modem converts between these two forms. The next thing you have to understand is bandwidth. It's the amount of data that can be transmitted in a fixed amount of time. For digital devices (your computer), the bandwidth is usually expressed in bits per second (bps) or bytes per second. For analog devices, the bandwidth is expressed in cycles per second, or Hertz (Hz).

Memory Jogger...



See you at the next SAGATUG meeting this Friday, November 8, 2002 from 7 to 10 p.m. at the Arcadia Park Senior Citizen's Center, 405 S. Santa Anita Ave. (See page four for directions and more upcoming events.)

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Power of Small

A bottleneck in transmission of data through the circuits of a computer's microprocessor or over a TCP/IP (abbreviation for Transmission Control Protocol/Internet Protocol) network is the key point in this discussion. The delay typically occurs when a system's bandwidth cannot support the amount of information being relayed at the speed it is being processed. TCP/IP connections were originally designed to transmit only text files, and the proliferation of bandwidth-intensive transmissions such as high-resolution graphics has caused bottlenecks in the process; therefore, the data moves more slowly across networks. TCP/IP, the

suite of communications protocols used to connect hosts on the Internet, uses several protocols, the two main ones being TCP and IP.

All communications between devices require that the devices agree on the format of the data. The set of rules defining a format is called a protocol. At the very least, a communications protocol must define the following: Rate of transmission (in baud or bps).

Whether transmission is to be synchronous (occurring at regular intervals) or asynchronous (most communication between computers and devices is asynchronous — it can occur at any time and at irregular intervals).

Whether data is to be transmitted in half-duplex (refers to the transmission of data in just one direction at a time). For example, a walkie-talkie is a half-duplex device because only one party can talk at a time. Or in full-duplex mode (refers to the transmission of data in two directions simultaneously). For example, a telephone is a full-duplex device because both parties can talk at once.

In addition to the standard protocols, there are a number of protocols that complement these standards by adding additional functions such as file transfer capability, error detection and recovery, and data compression.

All of the above now leads us to the core information I want to address, and that is the all-important

data compression. Data compression is particularly useful in communications because it enables devices to transmit the same amount of data in fewer bits. There are a variety of data compression techniques, but only a few have been standardized. The CCITT (abbreviation of Comité Consultatif International Téléphonique et Télégraphique, an organization that sets international communications standards. CCITT, now known as ITU — the parent organization) has defined many important standards for data communications, including the V.90 compression standard for full-duplex modems sending and receiving data across phone lines at up to 56,600 bps. In addition, there are file compression formats, such as ARC and ZIP.

OK, now that we have covered all the fundamentals, we can talk about some of the file formats when images and graphics are to be transmitted



over the wires and cables of the communications industry. First of all, keep in mind that — just like the rendering of images on Web sites — the viewer will get irritated if it takes too long to hold your attention. E-mail is certainly no exception. Have you ever downloaded your messages from your ISP (Internet Service Provider) server and seen the blue progression bar draw at a snail's pace? It makes you furious when, after perhaps 20 minutes, you have 4 messages on your computer and one came with a file attachment (your brother-in-law's birthday party picture) that alone took 19 minutes of the entire download process?

Here is the explanation: The image file was way too large and should have been compressed or put

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into a JPEG (Joint Photographic Experts Group) appearance. He had a real nice photograph and probably digitized it by passing it through an optical scanner. A scanner works by digitizing an image — dividing it into a grid of boxes and representing each box with either a zero or a one, depending on whether the box is filled in. (For color and gray scaling, the same principle applies, but each box is then represented by up to 24 bits.) The resulting matrix of bits, called a bit map, can then be stored in a file, displayed on a screen, manipulated by programs, or sent to someone else by E-mail.

A photo scanner is a type of optical scanner designed especially for scanning photographs. Photo scanners are smaller than general-purpose scanners but offer high resolution. A typical photo scanner is a sheet-fed scanner that can scan 3x5-inch or 4x6-inch photographs at 300 dpi or higher resolution. Some high-end photo scanners can also scan negatives and slides.

As for E-mailing photos, you must avoid creating images on your scanner that are megabyte monsters. The two important points to always keep in mind are size (dimensions) and resolution (dpi). Normally, there is no good reason to scan anything higher than 72 or 96 dpi for anything that's going to be viewed on a computer monitor.

You have to “optimize” photos or graphics and find the right balance between file compression and quality. Most professional graphics programs are able to do this effectively. A good jpg cruncher is available at <http://spinwave.com/crunchers.html>.

Had uncle Joe used his newly acquired digital camera (a camera that captures and stores still images as digital data instead of on photographic film) instead and then sent the image to his relative, the outcome would have been considerably different.

Now a word about the most universal file formats. It appears to be a somewhat confusing area and when it comes to the question of which one is best for your purpose, I would first look at one of the

following and keep the explanation handy. Graphics file formats are file formats designed specifically for representing graphical images.

TIFF is the acronym for Tagged Image File Format, one of the most widely supported file formats for storing bit-mapped images on personal computers. Other popular formats are BMP and PCX. TIFF graphics can be any resolution, and they can be black and white, gray-scaled, or color. Files in TIFF format often end with a .tif extension.

JPEG (Joint Photographic Experts Group) is a lossy compression technique for color images. Although it can reduce files sizes to about 5% of their normal size, some detail is lost in the compression. Lossy compression technologies attempt to eliminate redundant or unnecessary information. Most video compression technologies, such as MPEG, use a lossy technique.

GIF (pronounced jiff or giff) stands for Graphics Interchange Format, a bit-mapped graphics file format used by the World Wide Web, ompuServe and many BBSs. GIF supports color and various resolutions. It also includes data compression, making it especially effective for scanned photos.

The Golden Rule: No screenful of data should take longer than 25 seconds to load. That is not only true on the Internet but can also be applied to sending graphic images by E-mail. Assume 1K per second at 28.8 bps, and that will allow you 25K of data.

You can write Guenter at schott@tfb.com



**Next SAGATUG Meeting
Time and Place:**

7 to 10 p.m., Friday, November 8, 2002

Arcadia Park Senior Citizen's Center, 405 South Santa Anita Avenue, Arcadia.

(In the park just south of Huntington Drive)

Meetings are on the second Friday of every month

Club Officers and Board Members:

President	Art Molz, art1sam@juno.com
Vice President	Royal Brown
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INTERFACE Editor	Bob Allen, boballen99@earthlink.net
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Members at Large	Roy T. Beck, roybeck@ix.netcom.com
Webmaster, SAGATUG.org	John Calhoun, johnpc@sagatug.org

Upcoming Events:

Manhattan Beach, last Saturday, monthly, TRW Swap Meet, Admission Free.

Santa Ana, last Sunday of each odd month, ACP, 1310 E. Edinger, Admission Free.

Pomona Swap Meet 3rd Saturday, monthly, at Cal Poly Pomona, 3801 W. Temple Ave., Admission Free

Pomona Fairplex, November 16 & 17, 2002 (Sat. & Sun.) bldgs. 6 & 7at LA Fair grounds, Gate 14, Admission \$7, plus parking.

Burbank, November 2 & 3, 2002 (Sat. & Sun.), Hilton Burbank Airport & Convention Center, 2500 Hollywood Way, Burbank, CA 91505. 10 a.m. to 5 p. m. \$5 admission

Costa Mesa, November 23 & 24, 2002 (Sat. & Sun.) bldg. 10, 2002 (Sat. & Sun.), Orange County Fair and Exposition Center, 88 Fair Drive, Costa Mesa, CA 92626, 10:00 a.m. to 5:00 p.m., \$5 admission

Santa Monica, November 30 & December 1, 2002, Santa Monica Civic Auditorium, 1855 Main Street, Santa Monica, CA 90401

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Deadline for the Newsletter

The deadline for the INTERFACE is the last Saturday of the month.

Republication:

Articles may be republished if credit is given to the author and the San Gabriel Valley Technology User's Group.

Please visit the new SAGATUG website at www.sagatug.org There you will find photos of the meeting site maps to the meeting, articles from other sources and an archive of the *SAGATUG Interface*.

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