

Avoid the Graphic Traffic Jam

A basic guide to computer graphic file formats

By John Lotze

There are plenty of computer graphic formats. Some are good for some things, some for others. Here's a basic rundown of some common formats, what they're good for, and what they're not good for.

JPEG (or .jpg)

Best format for photos on the Web, and for compressing files for e-mail.

TIFF (tagged image file format - .tif)

Best format for printing of high quality photos

GIF (.gif)

Good for logos and clip art on the Web

EPS (encapsulated postscript - .eps)

Best format for vector graphics. Also good for high quality photos for printing in some situations (ie. duotones)

BMP (windows bitmap - .bmp)

Avoid this format for anything but personal use or photocopying in-house.

WMF (windows metafile - .wmf)

Avoid this format for anything but personal use or photocopying in-house.

Web Friendly Formats

JPEG – use for photographs and complex multicolored graphics

GIF – Use for logos and clip art that uses a limited number of colors

Printing-Friendly Formats

TIF – Best format for most photographs

EPS – Good format for photographs. Also the best interchangeable and scalable format for vector images.

Color Models (RGB vs. CMYK)

There are two main models, or modes, of color you can use in computer image files:

RGB — Red, Green, Blue

These are the basic colors computer monitors use to create all other colors. Use this color model for Web sites and any other images that will be displayed primarily on computer screens.

CMYK — Cyan, Magenta, Yellow and Black

These are the four inks printers use to produce full color images. Make your graphics CMYK whenever you want a printer to print them in full color. For best results with color photos, have a professional do a high quality scan and color correction with specialized equipment.

Vector Versus Raster Images

A vector image is defined by curves, lines and fills. The computer reads the curves and lines and fills as mathematical formulas, which means that the files can be very small. Also, you can enlarge vector graphics without degrading the quality. Freehand, Illustrator (.ai) and some graphics from Corel are vector files. EPS is a common interchangeable format for saving vector files.

A raster image is composed of dots. The computer keeps track of each dot and what color or shade of gray the dot is. The higher the quality of the image, the more dots. That's why these files can get large. Digital photos are raster images. If you try to enlarge these images too much, the dots get bigger and the image starts to look grainy and pixelated. Not good. Common raster image formats include JPEG, GIF, TIF, and sometimes EPS.

DPI - Dots Per Inch (sometimes also called PPI - pixels per inch)

In general, the higher the dpi of an image, the higher the quality it will be. For photos and graphics for use on the Web, scan at 72 dpi. For photos that will be printed, scan at a dpi that is 1.5 to 2 times the line screen at which they will be printed (see below for more on line screen). Most high quality images are scanned at 300 dpi or more, allowing them to be printed at 150 to 175 line screen..

Logos and other "line art" images that are pure black and white with no shades of gray or colors, should be scanned at the same dpi at which they will be output. For the Web, that's 72 dpi. For high quality printing, it can be as high as 2,400 dpi or higher. It sounds like a lot, but the files don't get extremely large, because they don't have to carry information about the color or shade of gray of each dot.

So what is line screen anyway?

When you look at an original photograph you're looking at a continuous tone image. The colors are solid and blend continuously into one another to form an image. But in order to print that photograph, those colors have to be output as a screen—a bunch of dots arranged in a certain order. In darker areas of the photograph the dots will be clustered densely together, and in lighter areas they'll be farther apart.

If you look closely at the dots in a print of a photograph, you'll see that they are arranged into lines. Line screen simply refers to the number of lines of these dots per inch. The higher the line screen, the higher the quality of the printed image. Newspapers usually print images at about 85 line screen. Most magazines are printed at 133 or 150 line screen. High quality magazines such as National Geographic or Communication Arts routinely print at 200 line screen or above. T-shirt silk screeners, on the other hand, only need a 33 line screen!

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