



Desktop Publishing

Scanning Tips

To answer the question of how much scanning resolution requires that we consider several factors:

- The size of the original image or artwork.
- The intended final reproduction size.
- The resolution of the printer that the page will be printed on.
- The kind of artwork: gray scale or line art?



Scanning Resolution

How much do we need? When scanning images, it is important that we use enough resolution, but not too much. If we scan with too little resolution, we end up with inadequate sharpness or visible “jaggies.” Too much and the file sizes are too big which slows down display, importing and printing, and unnecessarily occupies disk space, memory and other computer resources.

Kinds of Artwork

There are three basic kinds of scanned artwork: color, gray scale and line art. Line art is represented as pixels that are either on or off, i.e., black or white. Gray scale is represented as pixels that may be any shade of gray. Color images can be thought of as three gray

scale pictures – one each for the red, green and blue components. Most gray scale scanners can recognize 256 shades of gray, while others are limited to only 64, or even 16 or fewer shades. For the purposes of determining optimum scanning resolution, use the same formula for both color and gray scale images, but use a different formula for line art.

□ For Color or Gray Scale pictures, use the following formula for optimum resolution:

scan resolution = (reproduction width ÷ original width) x (halftone frequency x 2)

□ For Line Art use this formula to calculate the optimum scanning resolution:

scan resolution = (reproduction width ÷ original width) x printer resolution

Gray Scale and Color

Gray scale and color images are printed by creating halftone dots of varying sizes. The size of each halftone dot is determined by the shade of gray (or color) being reproduced. When reproducing halftone pictures, the dots in a dark area of the picture are large, while the dots in a light area are smaller. So, in order to determine the size of each halftone dot, the printer will average gray values of one or more pixels in the gray scale picture. To determine the proper resolution for gray scale scanning we first need to determine how many halftone dots per inch we will be using. The number of halftone dots per inch is known as the *frequency* of the halftone. This is usually dependent on the type and resolution of printer, the method of reproduction, and the type of paper printed on. Once we know the halftone “frequency” we will use, it is possible to calculate the optimum scanning resolution.

Line Art

In general, line art is more susceptible to visible “jaggies” than gray scale. This is because the halftone screens used for the reproduction of gray scale images tends to mask these low resolution “jaggies” somewhat. For this reason, it is usually necessary to scan line art at higher resolutions than that needed for gray scale or color pictures.

