

GRAPHIC EXCHANGE

DIGITAL CONTENT CREATION FOR PRINT, VIDEO & THE WEB

In Concert

QuarkXPress and OS X Classic
Bitmaps and page layouts
PDF workflow and Quark trapping
Pro SLR cameras and megapixels
Desktop video and broadcast TV

Bitmap images Embedded or linked?

Without QuarkXPress, does it even matter?

by Lidka Schuch

One of the most confusing questions in desktop page layout revolves around whether bitmap images should be embedded or linked. What makes this subject even more perplexing is that commonly used applications include hidden booby traps that can cause images to be embedded unintentionally.

Since the answer to this conundrum depends on the type of output and the combination of software being used, let's first describe embedding and what this means in a specific workflow.

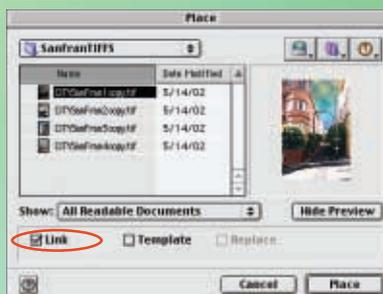
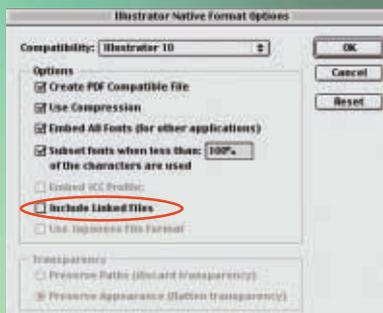
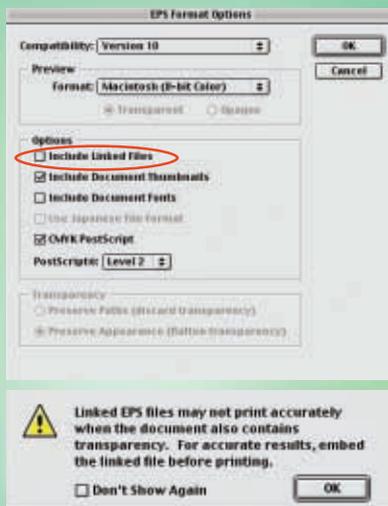
HOW BITMAPS CAN BE EMBEDDED

In essence, embedding a bitmap image means that all its informa-

tion is included with the page, and the bitmap is rewritten into the language of the page layout application. This means that the file size of the application document increases by the size of the embedded bitmap, making it big and clunky.

Once an image has been embedded, it's difficult to isolate it from the layout, so it is imperative to start with the correct resolution and color mode. As well, if an image is embedded by rasterizing, its resolution and color mode can be altered, resulting in color and/or detail degradation.

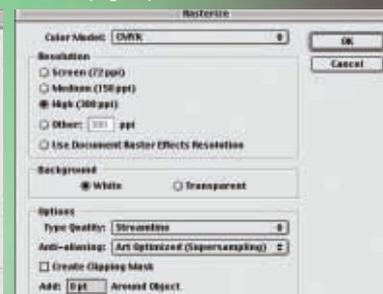
The only place where bitmap images can be embedded is in a vector page layout program such as QuarkXPress, Adobe Illustra-



ADOBE ILLUSTRATOR offers a multitude of ways to intentionally (or unintentionally) embed an image, and there isn't a word of explanation about what works and what doesn't in the on-line help. An image can be embedded in Illustrator by:

- not checking the Link checkbox right in the Place dialog window
- using the Embed command from the Links palette flyout menu
- using the Rasterize command from the Object pull-down menu (the resolution and the color mode of the original image may change, which will result in color degradation and loss of clarity)
- checking the Include Images box in the Save As EPS and Save As Native Illustrator dialog windows

To add to this, Illustrator offers no easy way to extract embedded images from the page layout.



tor, Adobe InDesign, Adobe PageMaker, Macromedia FreeHand and CorelDRAW. It *cannot* be done the other way around.

One advantage to embedding images is that they don't have to be collected or packaged separately with the job—in theory. But in practice, and regardless of whether final output is PostScript or PDF, applications don't all speak exactly the same language. And QuarkXPress, the most popular format for page layout, is the prime example. For example, if a photo is embedded into an Illustrator file and the whole file is saved as EPS and placed into a QuarkXPress page, a PostScript output error will usually occur.

Back in the days when hard drives were small and slow, Aldus PageMaker's embedded graphics were one of the biggest problems with which service bureaus had to contend. In fact, when Quark's programmers figured out a better way to import images by linking them, this contributed heavily to PageMaker's loss of the page layout market.

When an image is linked to a layout, its low resolution preview is displayed; but when the document is sent to print, the image information is sourced from the original file. Of course, all external images have to be found, which is why application utilities that copy all images and graphics into a specified folder (such as "Collect for Output" in QuarkXPress or "Package" in InDesign) are so handy to use. And in the newest versions of these programs, even fonts are included.

So if embedded images are more of a headache than a help, why are software developers now reviving this practice? And why is Adobe in particular fond of providing so many little checkboxes and commands that can often result in unintentional embedding?

There are several explanations for this resurgence in the use of embedded images. The tremendous growth of web publishing is probably the first and foremost; electronic publishing to a website

is now an established addition to content creation workflows. A dramatic increase in the processing speeds of desktop computers has also encouraged the trend. And the addition of new tools and special effects such as transparency and warping in vector-based page layout applications now tempt designers and artists to ignore the old rules like never before.

But don't forget that most of these new features work only with embedded images in RGB—and there's a reason for this.

EMBEDDING IS NO PROBLEM IN WEB WORKFLOWS

Let's look at the workflow for electronic publications. Whether you use Photoshop, ImageReady, Illustrator, Acrobat, Fireworks, Dreamweaver, BBEdit or FrontPage to create electronic publications, the page that you create or export or save for the web is a very simple document. Web pages are normally very small in size, with low resolution bitmaps compressed whenever possible, and all flattened into one layer of information.

Color monitors display RGB (24-bits per pixel or 8-bits per channel), so files for the web are saved in RGB or Indexed (8 or fewer bits/pixel, maximum 256 colors) color mode. Even in a vector environment where animations and websites are created using Flash or LiveMotion, bitmaps are compressed as much as possible to minimize file sizes, and pages are ultimately exported or published as flattened RGB files. The final electronic publication is a compressed version of a "work in progress" file, and 24-bit color is its maximum final output.

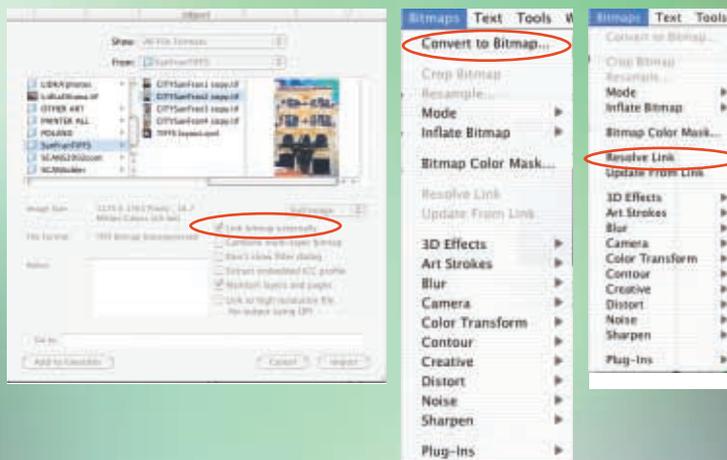
All of which is to say that if an electronic publication looks good on a monitor and loads quickly, this is the end of the workflow. Web pages and electronic publications rarely need to be printed, so embedding bitmaps in this kind of workflow is not a problem.

TIP: how to extract an embedded image

1. From Adobe Illustrator: a) Copy the image and paste it into a new document. Save as an Illustrator file. Open the file in Photoshop and resave it as an independent TIFF or EPS, or b) Export as TIFF or Photoshop file.

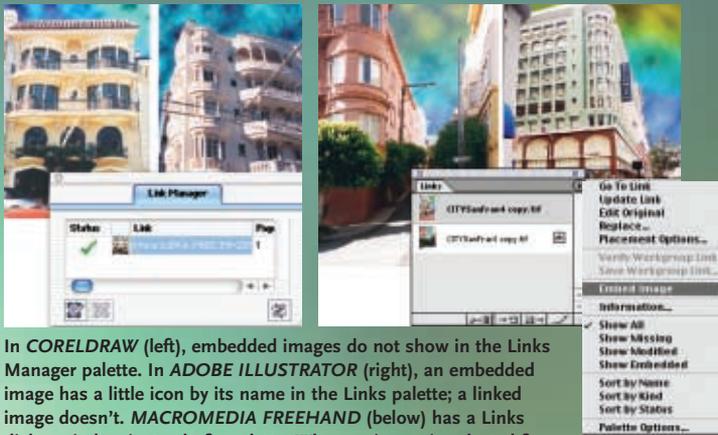
2. From Macromedia FreeHand: Select the image and click the Extract button in the Links dialog box. This brings up the Save As dialog window so that the image may be saved as an independent bitmap file.

3. From CorelDRAW: Select the embedded bitmap and Export as TIFF or EPS.

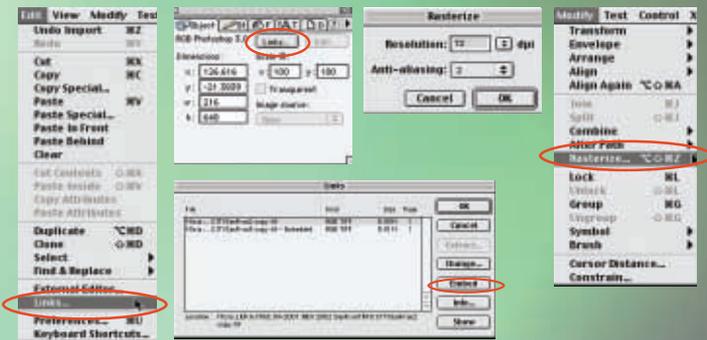


CORELDRAW has a few ways to embed a bitmap image. A bitmap can be embedded by:

- not checking the Link Image Externally check box in the Import dialog window
- choosing the Resolve Link command from the Bitmaps pull-down menu
- choosing the Convert to Bitmap command from the Bitmaps pull-down menu (and unlike the Rasterize command in Adobe Illustrator and Macromedia FreeHand — and far less confusing — this command can only be used when a vector object is selected)



In **CORELDRAW** (left), embedded images do not show in the Links Manager palette. In **ADOBE ILLUSTRATOR** (right), an embedded image has a little icon by its name in the Links palette; a linked image doesn't. **MACROMEDIA FREEHAND** (below) has a Links dialog window instead of a palette. When an image is selected from the list displayed, the information at the bottom of the window indicates whether it is embedded or linked.



An image may be embedded in **MACROMEDIA FREEHAND** by selecting it and either choosing the Links command from the Edit pulldown menu or clicking the Links button on the Object palette and then clicking the Embed button in the resulting dialog window. An image can also be embedded by rasterizing it.

TIP: going to press with embedded images

Here are a few guidelines for embedding images in print documents

1. Embed images only into the final page layout, and don't embed if the final layout file format is undetermined. Images embedded in draw or page layout programs and then saved as EPS do not always output properly from QuarkXPress.
2. Ensure that embedded images have the correct resolution and color mode.
3. Saving pages as Quark or InDesign EPS files also embeds bitmap images into the page layout. Placing these EPS files back into a page layout works best within the same software vendor environment, e.g. a Quark EPS in a QuarkXPress page will rip, but an InDesign EPS in Quark may not.
4. If you embed bitmaps, work in one software environment, such as Adobe, Corel or Macromedia. For example, the latest versions of Adobe programs handle embedding well, provided that the file is ripped on a PostScript 3 RIP. But never assume—ask your prepress service or printer if this is correct for their setup.
5. If your publication is small (like a book-mark, one-page flyer or postcard), the risk of running into a problem with embedded images is much less, but check with your printer to make sure this is going to work in their workflow.
6. Never embed duotone EPS images. Duotones get separated into the color mode of the document (RGB or CMYK) and will not print as spot colors (and disregard Adobe's convoluted warnings when you link a duotone image—this will only lead to problems).

DIFFERENT RULES FOR PRINT

Publications going to press require bitmaps with a much higher resolution than those in electronic documents, so the file sizes are much bigger as well. More important, final files from QuarkXPress or InDesign are not simplified and compressed for export (Quark files are not even flattened); these documents are sent for output with bitmaps and vectors placed or imported into the page layout.

With print, the workflow doesn't stop at the monitor—these pages have to be ripped to film or plates, where all continuous curves and straight lines and all anchor points from vector images are translated into square (or lately squarish) laser spots. And the grids of pixels for bitmap images are translated into round or oval halftone dots built from the same square laser spots (think about how many calculations are required when a PostScript RIP processes 5.8 million dots (2400 x 2400) in every square inch of a 2400 dpi printout!).

In addition, the size of a CMYK bitmap image is larger than RGB. Four inks are used for process color printing, which means that there are now 32 bits of information per pixel. To appreciate the complexity of high end print production, just imagine a simple circle with four anchor points. This basic shape will generate sixteen pages of PostScript code!

There are other factors which may complicate the algorithms, ranging from the user's application software (and version) and the PostScript software running at the RIP to the number of pages and pictures in the publication and the complexity of the vector graphics. And now, more than ever, output may be wrong if transparency is applied incorrectly to these graphics.

Despite the fact that (unlike Adobe or Corel) Quark offers no draw or paint applications to complete the design workflow, QuarkXPress is still the most commonly used professional page layout program in the world. But when images from other programs are embedded into a Quark document, the file will probably not rip.

In general, don't embed a bitmap into a vector-based page if it will eventually be placed in a QuarkXPress final page layout. Even if you stick to one vendor's software environment, remember that scrolling, screen redraw, and saving and opening a file slows down as the file size increases, and large files take longer to rip—or even worse, may not rip at all. So apply common sense, and communicate with your output service first. And even if an application lets you do it, never embed duotones.

Lidka Schuch is president of Toronto-based Studio L (www.studio-l.com), a design studio and training facility offering customized courses in high end desktop graphics for graphic arts professionals.