
Printing Transparency

Two of the most important figures in the desktop publishing revolution—Tim Gill (founder of Quark, Inc.) and John Warnock (co-founder of Adobe, Inc.)—each had a blind spot that led to a tragedy of unparalleled proportions. Well, maybe not quite that strong (they both retired quite happily in recent years). But the blind spots did have interesting results that caused their companies difficulties.

Tim Gill didn't believe that HTML was worth much attention, and Quark suffered by being late to supporting the Web. John Warnock didn't believe transparency was important and so it took PostScript 20 years to support it. Everyone knows that vector transparency is important to designers, but because PostScript couldn't print it, programs couldn't support it.

But wait, you say, some programs have had transparency features for many years! Photoshop supported transparency because it only had to worry about pixels, not vector artwork. The transparency features of every other program (including Illustrator, FreeHand, and so on) worked by faking the effects at print time, “flattening” the transparent objects into a form that PostScript could handle.

In recent years, transparency has finally made its way into PostScript 3 by way of the PDF 1.4 specification (PostScript 3, version 3015 or later, to be precise). RIPs that support PDF 1.4 directly can print transparency without any chicanery. Unfortunately, as we write this, the vast majority of RIPs—especially RIPs suited for high-resolution imagesetters and platesetters—support only PostScript Level 2. So most of the time programs like Illustrator and InDesign are still forced to flatten files that include drop shadows, feathering, or any other cool transparency effects.

The Flattener

Adobe’s technology for turning transparent objects into a form suitable for older RIPs is called “the flattener.” (David is pleased to have finally found a word that more or less rhymes with his last name.) The flattener works by breaking up transparent objects into smaller non-transparent objects. It has three basic methods to do this. (Note that the flattener works the same in Illustrator 10, Acrobat 5, and InDesign 2.)

- ◆ **Divide and conquer.** If you have a 50-percent transparent magenta square partially over a cyan square, the flattener splits this into three objects: where the two overlapped it creates a rectangle made of cyan and magenta; where they didn’t overlap, it makes two L-shaped objects, one cyan the other magenta.
- ◆ **Clip it up.** Let’s say you have a 20-percent transparent picture partially overlapping that cyan square (or vice versa, a partially-transparent cyan square overlapping a picture). The flattener splits the picture into two (or more) pieces by drawing invisible frames (clipping paths) and putting pieces of the picture into them. The part of the picture that is inside the square gets cyan added to it to finish the effect.
- ◆ **Rasterize.** When all else fails, and InDesign realizes that it’ll take too long to use the previous two methods (too long to flatten means the file will probably also take way too long to print), it punts and just turns the whole thing into a bitmapped picture (converting vectors into bitmaps is called rasterizing).

Again, all of this is done behind the scenes and only at print time (or when you export the file as an EPS or an Acrobat 4 PDF file, both of which also use the flattener). In most cases, you’d never know that InDesign was doing any of this if we hadn’t told you, because the results are extremely clean. In some cases, primarily when InDesign ends up rasterizing part of your page, you may find the results only fine, okay, or (rarely) unacceptable.

Transparency Tricks Okay, here comes our “with power comes responsibility” talk. Transparency is all about accepting compromise, and if you can’t deal with compromise then you might consider avoiding transparency altogether. The first compromise is time versus quality: The better quality, the more time your files will take to print (or export). The next compromise is that if you want to play with transparency (or your clients want to, and you’ve agreed to print their documents), you need to pay attention to how your document is created and be prepared to proof the final results carefully.

Here’s a few things you should pay attention to when messing with transparency.

- ◆ Transparency comes in all sorts of forms. If you use the Drop Shadow or Feather feature, you’re introducing transparency. So does importing a native Photoshop, Illustrator, or PDF document which includes any transparent object. If the page icon in the Pages palette has a checkerboard in it, you can bet that the flattener will kick in.
- ◆ If you’re going to use transparent objects in Adobe Illustrator (including transparent brushes, most filters, drop shadows, and so on), make sure you’re using version 9.02 or later (you should probably just use version 10 or later). Also, we suggest saving files in the native .ai format, the Acrobat 5 PDF format, or use .eps compatible with Illustrator 9 or 10 (not earlier versions). This way InDesign handles flattening at print time instead of you worrying about Illustrator getting it right.
- ◆ If you’re importing Illustrator documents that include images and use transparency effects, it’s probably a good idea to embed the images in the Illustrator file itself rather than relying on linking to the file on disk.
- ◆ Set the Transparency Blend Space (in the Edit menu) to CMYK rather than RGB, and—if you’ve turned on color management—use Convert to Profile to convert the document working space to your final output space.
- ◆ Spot colors offer a number of opportunities for problems, especially the flattener converting spot colors to process colors (or worse, converting part of an object to process color and leaving the rest of the object a spot color). Fortunately, this typically only happens when you use fancy transparency modes (like Color, Saturation, Difference, and so on) or when you have spot color gradients involved with transparency.

- ◆ The flattener must work with high-resolution images on disk, which means that DCS files and an OPI workflow—both of which rely on importing low-resolution images that get swapped out with high-resolution later—are out. (Of course, if you have DCS or OPI images that are not involved with transparency then you can still use them.) Adobe’s documentation says that EPS duotones are also a no-no, but we haven’t run into any problems with them.
- ◆ It’s better not to mix overprint settings (like Overprint Stroke or Overprint Fill in the Attributes palette) with transparency. For example, if you’re using transparency anyway, then consider using the Multiply blend mode rather than turning on Overprint Fill.
- ◆ Most PostScript RIPs can handle the flattener tricks just fine, but we have encountered some RIPs that cause problems. For example, because Scitex (now part of Creo) RIPs rely on separating continuous tone imagery from linework (vector) images, you can get some very bad results, especially where text interacts with transparent objects. Creo says they’re working on a fix for this, but be extra careful when perusing your output if you (or your output provider) are using this sort of RIP.
- ◆ In fact, it would behoove you to always look over your final output carefully. Look for spot colors that were converted to process, overprinting instructions that were ignored, vector objects that were rasterized in unpleasant ways, unintentionally rasterized type, and text or strokes that became heavier.

Flattener Styles

As we said earlier, flattening is a matter of compromise. Fortunately, you have a say in the matter, by selecting among various flattener styles. Each flattener style is a collection of flattening choices, such as how hard should InDesign try before giving up and rasterizing the artwork.

InDesign ships with three predefined flattener styles: Low Resolution, Medium Resolution, and High Resolution. You can mentally replace the word “resolution” with “quality.” You should typically use Low or Medium when printing to a desktop laser printer and High when printing to an imagesetter or platesetter (see “Applying Flattener Styles,” below).

Occasionally we find a need to create our own flattener style. For example, if you’re doing a lot of proofs on a black-and-white desktop laser printer, you could probably get away with making a “Very

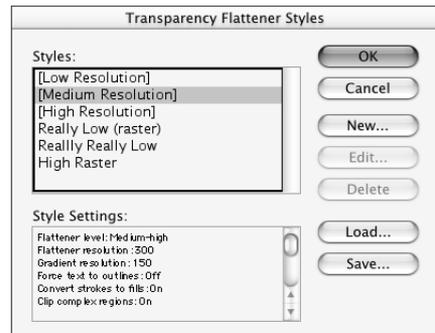
Low” style, which may print faster than Low Resolution with “good enough” quality. Or, if you’re getting unacceptably slow printing, PostScript errors, or poor quality on an imagesetter with the High Resolution style, you might want to create a custom style that works better for you.

To make a custom flattener style, select Transparency Flattener Styles from the Edit menu (see Figure 11-9). While you cannot edit the default styles, you can base a new one on a default style by selecting the style then clicking the New button, which opens the Transparency Flattener Style dialog box. Beyond the name of the style (pick whatever you want), there are six controls here.

Raster/Vector Balance. The Raster/Vector Balance slider is a graphic representation of the quality/speed compromise. Push the slider all the way to the left and InDesign rasterizes everything on the page (we can’t think of any good reason to do this). Push the slider all the

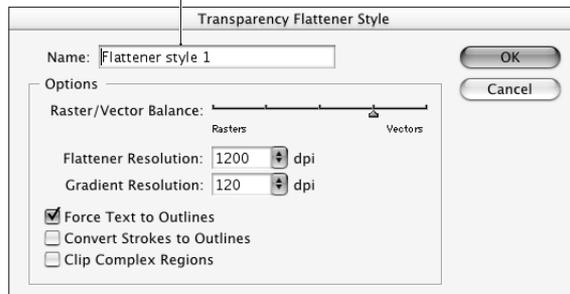
FIGURE 11-9
Creating a
Flattener Style

To define a flattener style,
select Transparency
Flattener Styles from
the Edit menu.



To base a new style on an existing style,
select a style and click the New button.

Enter a name for the flattener style. (Something more
descriptive than this one would be good.)



way to the right and InDesign tries its best to maintain every vector in the document, even if that means taking a long time to flatten and a long time to print. As left-leaning as we tend to be, we always prefer pushing this to the far right when printing on imagesetters. However, on a complex page, this creates so many clipping paths that your file might not print at all. In that case, you'd need to take it down a notch. On desktop PostScript printers, we'd set this even lower.

Flattener Resolution. When InDesign ends up rasterizing a vector object, it looks to the Flattener Resolution setting in order to find the appropriate resolution. The Low Resolution flattener style uses a flattener resolution of 288 ppi (pixels per inch), which will look very slightly jagged on a desktop laser printer. The High Resolution flattener style uses 1200 ppi. If you were printing on newsprint, you could easily get away with creating a flattener style that used 800 ppi. If you're printing on glossy stock for an coffee table book, you could probably raise this to 1600 ppi.

The flattener resolution also acts as an “upper boundary” when imported bitmapped images are involved with transparency. For example, let's say you import a 300 ppi image, put transparent text over it, and then print using the Low Resolution flattener style. InDesign resamples the image down to 288 ppi. However, if you use the High Resolution flattener style, InDesign will not upsample the image to 1200 (that would be crazy).

Gradient Resolution. Sometimes objects get rasterized no matter what happens—for instance, soft drop shadows or feather effects. The gradient resolution determines the appropriate resolution for these sorts of raster effects. The Gradient Resolution setting in the Low Resolution flattener style defaults to 144 ppi, even though you typically don't need more than 100 ppi on any desktop printer. You generally don't need more than 200 ppi for high-resolution output. (After all, you need resolution to capture detail in an image, and these “images” have no detail).

InDesign may upsample your bitmapped images if they're involved with a transparent areas of the page and they're lower resolution than the Gradient Resolution setting. For example, if you import a 72 ppi image (like a JPEG saved from a Web site) and change its transparency setting, the flattener upsamples the image to the gradient resolution. Unfortunately, if you import a 200 ppi TIFF image (which is very reasonable for most printed artwork today), set its transparency, and print it using the High Resolution flattener style, InDesign also upsamples it to 300 ppi—causing slower print-

ing and possibly image degradation. (InDesign uses “nearest neighbor” interpolation, which results in a pretty clunky images.)

Force Text to Outlines. When text gets involved with transparency (either it is transparent or something transparent is on top of it), the type almost always gets turned into paths which act as clipping paths. This slows down printing a bit, and sometimes that text appears heavier than the equivalent characters that aren’t converted to outlines, especially on lower-resolution printers. If, for example, you had an image that was partially transparent on top of half a column of text, the text under the image might appear like it was very slightly more bold than the rest of the text. One answer would be to create a flattener style in which the Force Text to Outlines option was turned on and apply that to this particular spread (we discuss applying flattener styles below). This way, all the text on that spread gets converted to outlines. The page prints even slower, but is more consistent. This is rarely a problem when imagesetting or platesetting, however, so we usually just ignore this feature.

Convert Strokes to Outlines. The problem with type “heavying up” is also an issue around thin lines. The flattener converts lines that are involved with transparency effects into very thin boxes. These boxes may appear thicker, however, than equal lines that don’t have any transparency effects. Turning this feature on ensures that InDesign converts all the lines in the document, making them more visually equal. Again, this is rarely an issue on high-resolution printers.

Clip Complex Regions. When InDesign does resort to rasterizing vectors, it usually does so in rectangular areas, called “atomic regions” (sort of like the smallest regions the flattener deals with). The problem with this lies along the line between a rasterized area and an area drawn with vectors—in many cases, the step from raster to vector is visually obvious (sometimes called “stitching”), which sort of ruins the whole point. When you turn on the Clip Complex Regions checkbox, however, InDesign works extra hard to keep the transitions between raster and vector occur only along the edges of objects. The result is a better-looking page that is more complex and prints more slowly (or not at all). Ah, compromises.

Applying Flattener Styles

After reading all of this, don’t you wish you had a PDF 1.4-aware PostScript 3 device that can print transparency effects without flattening? Until you have one, however, you’d better know about how to apply these flattener styles.

You can set the flattener style to either the whole document (the “default style”) or specific page spreads (a “local style”). To apply a default style at print time, choose it from the Transparency Flattener Style pop-up menu in the Advanced tab of the Print dialog box. You can also set the default style in the Advanced tabs of the Export as PDF and Export as EPS dialog boxes, as well as the Export as SVG dialog box (if you click More Options).

To apply a local flattener style, select one or more page spreads in the Pages palette and select from among the choices in the Spread Flattening menu in the Pages palette menu: Default, None (Ignore Transparency), or Custom. If you choose None, InDesign prints this spread without any transparency effects. You might use this as a troubleshooting technique if your page isn’t printing properly: if you turn off transparency for the spread and it then prints, then it’s likely a transparency-related print issue.

Choosing Custom opens the Transparency Flattener Style dialog box. We assume there’s a good reason that there’s no way to select one of the flattener styles you’ve already built, but we can’t imagine what that reason would be. Perhaps Adobe just wants to give you something to look forward to in future versions of the program.

If you (or some nefarious client) has applied flattener styles to spreads and at print time you want to override them all with the default style, you can turn on the Ignore Spread Overrides checkbox in the Print dialog box.

Preparing an InDesign File for Imagesetting

We’ve listened long and carefully to the grievances of imagesetting service bureau customers and operators. We’ve heard about how this designer is suing that service bureau for messing up a job, and we’ve heard imagesetter operators talking about how stupid their clients are and how they have to make changes to the files of most of the jobs that come in. We’ve listened long enough, and we have only one thing to say: Cut it out! All of you!

There’s no reason that this relationship has to be an adversarial one. We don’t mean to sound harsh. We just think that we can all cooperate, to everyone’s benefit.

Designers: You have to learn the technical chops if you want to play. That’s just the way it is. The technical challenges are no greater than those you mastered when you learned how to use a waxer, an X-Acto knife, or a copy camera.