For practical reasons, creating ICC profiles requires making some assumptions about the true behavior of the device that's being profiled. Tweaking the color that results from such a profile requires good software.

Fine-tuning your ICC profiles

To truly profile the behavior of an RGB output device such as a printer, you'd need to measure 16.7 million color patches. Besides its being a totally unreasonable task, it would probably make the resulting profile larger than many image files. Therefore, ICC profiling software samples far fewer color patches, then makes a number of assumptions to complete the profile.

In general, good software packages sample 300 to 1,200 patches, and can then build well-behaved printer profiles. Occasionally, you'll want to make minor tweaks or improvements in the color that results from such a profile, and this requires using good profile editing software. It's important to remember that editing profiles is *not* a fix for poorly built profiles.

ICC printer profiles relies on two tables to control color; one affects the onscreen soft proof, and one affects the conversion, the numerical color values that are sent to the printer. Even the best profiling packages sometimes yield results that make it necessary to edit one of the profile tables to get more accurate results. A printer profile might produce excellent output, but poor soft proofs that don't accurately reflect the prints when viewed properly under a light box. *Never* alter a display to match a print. The correct solution is to edit the ICC profiler table that affects the appearance of images onscreen.

Sometimes the printer profile is off. To detect such problems, test print a representative group of diverse images. Perhaps there's too much yellow in the reds. Like Photoshop, a good profile editor will allow you to selectively color correct the reds alone. In fact, most profile editors prompt you to open an image and use it as a guide to editing the profile.

Unlike Photoshop, using an editor will not affect the numerical colors values in the image file; instead, it uses the image as a visual guide, and the alterations take place in the ICC profile.

One of the most powerful profile editors I've used is **Kodak ColorFlow Custom Color Tools v3.1.** This Photoshop plug-in allows me to edit profiles with the Photoshop tools I know so well. First, I select Custom Color Profile Edit from the import menu, which brings up the dialog you see in *Figure 1.*

Then I select the profile I wish to edit, as well as an image to display as a reference,
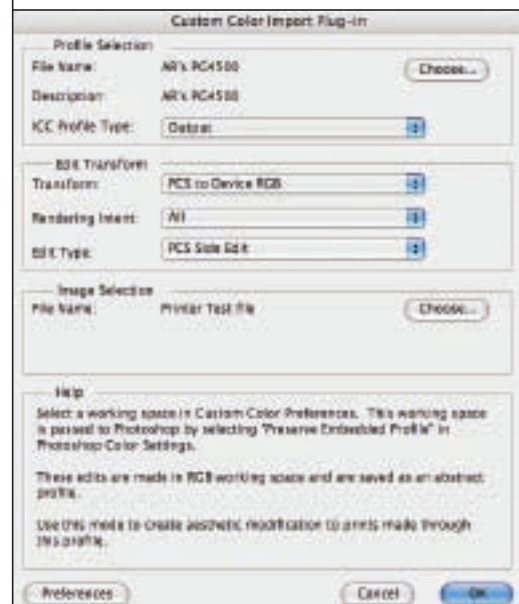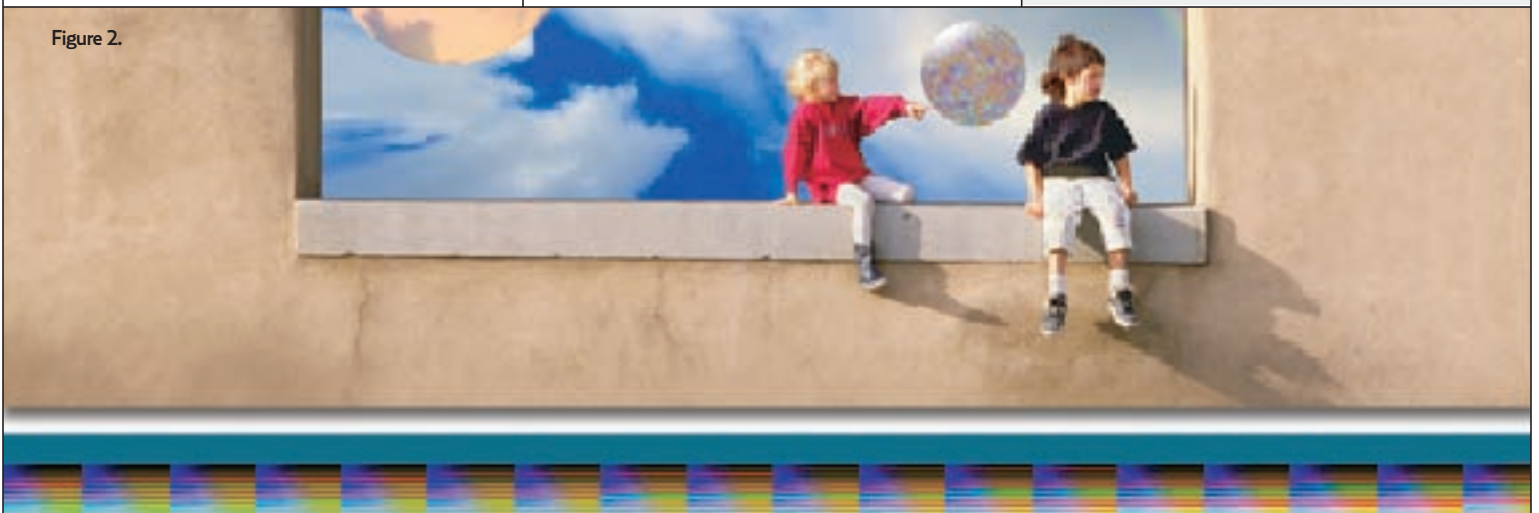
Figure 1

Figure 2.

the one that the ColorFlow tools will use to reflect the edits in the ICC profile. When the image opens, the software adds a vast number of colored pixels in a strip across the bottom of the document (*Figure 2*). Kodak calls this strip of tiny color patches a *Tracer*, and it's a Kodak-patented technology.

All my edits are applied to these patches and used to create a new edited profile. I work in Photoshop adjustment layers to apply each edit to the profile. The adjustment layers can then be used as individual *edit lists*, allowing me to make as many edits to the profile as necessary.

When I've finished editing the image, I simply select the Custom Color Profile Export menu item, which calls up a standard save dialog where I can save the edited profile name and location. I test the profile by printing a sample; if

further edits are needed, I simply call up the appropriate adjustment layer, tweak the edit, build a new profile, and output another test print.

Because ColorFlow Custom Color Tools uses multiple adjustment layers for edits, it affords precise control for minute edits. The other major benefit of ColorFlow Custom Color Tools is that I can independently edit either the preview or the output table, and edit one or all of the rendering intents. ColorFlow Custom Color can edit input, monitor, and output profiles, so it's quite flexible. I use it mostly to edit output profiles for printers.

I do want to point out that profile editing isn't a process every user needs to rush out and try. But when the time comes when your custom ICC profile isn't fulfilling it's potential, it's good to have a reliable

profile editor on hand. There are other profile editors on the market, some with powerful tools and capabilities not found in the Kodak's. But I rarely need to make radical modifications, and ColorFlow Custom Color Tools generally fulfills my needs. My software is a prerelease version; the release of the market version is pending. Keep an eye out on this product's pricing and availability at www.kpgraphics.com. ■

* It's *important* to remember that *editing profiles* is *not* a fix for poorly built profiles.