The Lowdown on Hi-Fi Color

By Steven W. Frye   April 1, 2005

Is it time to take another look at Hi-Fi printing? Hi-Fi is any printing technology that delivers a higher-quality product than the normal four-color process. This is usually done with custom ink applications of five, six, seven or even eight-color Hi-Fi ink sets that deliver a wider range of colors than the standard CYMK process. Hi-Fi breaks the color barrier and achieves far superior brightness levels.

Ten years ago it was touted as the next great innovation in high-quality printing. The flexography market has done well with it for the packaging industry, but it somewhat fizzled in the publishing industry. However, a devoted group of book publishers have kept it alive and use it with great success.

The best-known and most widely used commercial Hi-Fi system is Pantone's Hexachrome—a six-color process that includes a custom ink set, design capabilities, separations, proofing and Pantone Color Guides. The ink set has enhanced versions of black, cyan, yellow and magenta with added fluorescence that makes them brighter. It also uses a vivid orange and green that greatly expands the printable color saturation and range.

While Hexachrome uses only six colors, it provides more flexibility and a broader color gamut than other Hi-Fi models utilizing seven or even eight colors due to the purity of the Hexachrome primary inks. Ninety percent of the solid Pantone Matching System (PMS) colors can be simulated with Hexachrome. That is almost double the number that can be achieved with conventional four-color process printing.

Who Uses Hi-Fi?
Hi-Fi printing is used by book publishers who want extremely vibrant color. It has been very successful with children's books and cookbooks. Janet Hill, design manager at elementary educational publisher Pearson Scott Foresman, has been using Hexachrome for six years, and combines it with foil stamping and embossing on covers.

Designs no longer need to be compromised by limitations inherent in four-color printing. An advantage of the enhanced color gamut is that it can better achieve what is displayed on a high-quality computer. While designers long for a better monitor-print match, adapting to a new color spectrum can be intimidating. "We have to teach our artists not to be afraid of it," says Hill. They have to learn how to read color in a different way.

The learning curve of Hi-Fi color can be daunting. "Separating images into five or more color channels is not what system print professionals are accustomed to, let alone graphic designers," says Dan Reid, senior trainer for Renaissance Photographic Imaging in Tucson, Ariz., an authorized consultant for Pantone's Hexachrome print process.

Hexachrome Basics
A Hexachrome digital file consists of six separations with the following separation names:
Hexachrome Cyan
Hexachrome Magenta
Hexachrome Yellow
Hexachrome Black
Hexachrome Orange
Hexachrome Green

Because Pantone Hexachrome is a distinctly unique color space, Hexachrome files must be created using ICC profiles. In late 2004, Pantone Inc. released ColorSuite for Hexachrome 2.5, which supports Adobe Creative Suite for creating Hexachrome colors. ColorSuite provides the separation software and color-reference guides essential to working in the Hexachrome process. ColorSuite comes with Pantone HexWare and two color–guide sets.

Pantone HexWare 2.5.1 is a software plug-in that allows users to easily convert files into Hexachrome color space. It allows users to create and edit color palettes, perform color corrections, and view soft-proof output in Hexachrome. Two plug-ins included in the HexWare set are HexVector and HexImage.

Pantone HexVector 2.5 is an Adobe Illustrator 9.x plug-in used to convert vector graphics and line art to Hexachrome, and can apply Hexachrome colors to any vector illustration. With the three essential Pantone Hexachrome Libraries provided, you can specify colors from the large color palette of Pantone Hexachrome colors. In addition, HexVector lets you save your design as a pre-separated EPS file, colorize graphics using Hexachrome colors, access more than 2,000 Pantone Hexachrome colors on coated stock, create your own Hexachrome colors and more.

Don Hutcheson, consultant and color-management instructor at the Graphic Arts Technical Foundation notes, "Adobe Photoshop still does not support n-color (Hi-Fi) ICC profiles." That is probably why Pantone created HexImage 2.5, an Adobe Photoshop 6.x plug-in for Hexachrome DCS 2.0 files. It has color-correction and soft-proofing capabilities for bit-mapped images and converts raster images into six-color Hexachrome separated DCS 2.0 files. However, Hutcheson points out, "It is a basic program that is meant for designers, not heavy users. True color professionals may find it weak in its functionality."

Hutcheson says he hopes the next Adobe release will include this function, but adds, "The number of inquiries about Hi-Fi is so low at Adobe, I'm surprised they address it at all."

Hi-Fi on Press
Art files require conversion from RGB or CMYK to the Hexachrome process. Hill sends CMYK files to the printer for conversion to Hexachrome. She says she finds the process easy, as the printer does all of the work.

But adjustments to color are almost always necessary, as the color is distorted from the original four-color image. "Most of our adjustments are toning the color back down," says Hill. When asked about flesh tones, Hill says she avoids them as they invariably turn out looking unnatural.

Reid recommends sending RGB for conversion instead. A CMYK file is already limited to that process and misses out on the real benefit of Hexachrome.

Hexachrome reproduces continuous-tones, which are ideal for images with brilliant color, soft pastels and especially skin tones. An original Hexachrome separation produces clearer and brighter flesh tones than its four-color cousin.

Hutcheson points out, "Another possible reason for 'enhanced' color is that printers tend to run to higher-density levels." Hexachrome inks are purer and require lower densities. "Printers also have to be trained to work with a new color mentality," he adds.

But the biggest benefit is for publishers who use multiple PMS spot colors in their print jobs. Printing presses configured for Hexachrome enable jobs with multiple spot colors to run under one ink configuration, allowing more jobs to be printed each day, without necessitating press wash-ups between jobs.

Help with Color Management
Hexachrome does require a higher level of color management. You may opt to hire a consultant, however it is your color separator and/or printer that would use a consultant's services for training, and they, in turn, would help you.

Printers have to be certified by Pantone to use their system, and they must submit a test form to Pantone to get licensed. Ink manufacturers also need to meet strict standards to achieve Hexachrome certification.

Although Hexachrome has been used on sheetfed presses since 1995 for projects ranging from packaging to posters, is Hi-Fi printing an option for web offset? The Graphic Arts Center in San Francisco is said to be the first to use it for high-volume web offset printing. They faced a challenge familiar to many web printers: How do you accurately match colors to products with one pass without incurring the cost of multiple spot colors?

For high-quality and multiple-color projects, they still use a Hi-Fi process. However, Ken Clark, marketing director at the Graphic Arts Center, says that while they still offer it, they really don't sell too much of it.
Peacock Colors, Inc. in Butler, Wis., "stopped making the Hexachrome ink sets years ago because it was unprofitable," says Cliff Bloom, the company's president. "We had [fewer] and [fewer] customers to sell to." As a matter of fact, Bloom questions the future of all sheetfed offset printing, "In the future I cannot see sheetfed presses competing economically with the new digital technology."

Several companies that heavily touted Hi-Fi printing just five years ago are no longer in business. Who knows if Hi-Fi helped lead to their demise, but far fewer printers have embraced it than what was expected during its heyday 10 years ago.

Hi-Fi printing is more expensive than the conventional four-color process. It's more difficult and expensive for the printer to produce, as extra plates and special inks are needed. There is an innate cost involved when testing any radically new technology.

But, for a printer who prints a lot of spot colors, setting up for Hexachrome can actually be less expensive. The six-color configuration minimizes makereadies and wash-ups saving time, materials and labor.

Who Is Offering It?
So where do you find a printer that offers Hi-Fi printing? Good question. It may be harder than you think. Hutcheson agrees, "Hi-Fi printers are scarce, and the market for Hi-Fi printing remains small." Pantone lists only two certified printers on its Web site, and both are packaging printers.

Hutcheson wasn't surprised, "Hexachrome just isn't on their radar as it used to be because of low customer interest."

Your peers, always a trusted source, may be the best resource for finding printers. Also, several Hi-Fi printers can be found exhibiting at the annual BookTech Conference and Expo in New York, held March 7-9.

A Solid Niche Among Vibrant-Color Seekers
Hexachrome printing hasn't lived up to its early expectations, but still has etched out a solid niche. Vibrant, and I mean vibrant color is a desire of all designers.

If you haven't discovered the benefits of Hi-Fi printing, then it is time for a little education. Thinking in six colors can be a challenge to any designer, but once it clicks, a whole new world of color opens up to you and your books.

As Reid says, "Multicolor printing is not for the timid."
And Hutcheson points out, "Workflow is the key. Once it becomes easy, more and more designers will use it."

It appears the resources and tools have matured. They've stayed in sync with the newest versions of Adobe's ColorSuite, and it is very possible for you to start producing vibrant (and did I say vibrant?) high-quality color … right now.

Check out these companies for more on commercial Hi-Fi programs.

Pantone Inc. ColorSuite for Hexachrome 2.5
Supports Adobe Creative Suite for creating Hexachrome colors. ColorSuite provides the separation software and color reference guides essential to working in the large gamut, six–color Hexachrome process. It comes with Pantone HexWare, two color–guide sets (solid in Hexachrome guide coated and solid to process guide coated), Hexachrome test form and Hexachrome test form CD.

Pantone also has introduced Pantone x-ref, a free, Web-based cross-referencing utility that allows users to quickly match colors between Pantone Color Systems. Matching Pantone colors across different mediums can be difficult since each system is based on a different color formulation; x-ref enables users to identify colors in the Pantone Matching System, Pantone Plastics Color, or Pantone. It is available free of charge to members of myPantone, the company's free information portal. www.Pantone.com

Opaltone Seven Color Process
A fully integrated reproduction system with a complete support infrastructure that includes multicolor separation software, editing/graphic assembly software, conventional/stochastic screening, digital/analog proofing, and a standard seven-color process (C, M, Y, K, R, G, B) ink set. Opaltone's RGB separation algorithm is deployed via Photoshop.

GretagMacBeth ProfilerMaker 5.0
Professional-level color-management software and the Eye-One spectrophotometer. ProfileMaker is now available in versions for both professional photographers and prepress and publishing markets. This

update uses reference data and measurement data to calculate ICC profiles (including version ICC4) for a broad range of input and output devices, including CRT and flat panel displays, printers and presses, and digital cameras. The on-screen preview of reference and measurement data makes it easy to confirm that you've chosen the right data set. Supports Eye-One, X-Rite and other professional spectrophotometers.

MonacoPROFILER

Designed for service bureaus, newspapers, large-print vendors, fine-art reproduction studios, high-end commercial photographers and print shops requiring support for up to eight-color presses. Version 4.7 offers the industry's most comprehensive ICC profiling capabilities for all of your devices—monitors, scanners, digital cameras and printers. Available in two versions, Gold and Platinum, it is the Platinum edition that adds Multi-color, Hexachrome and Digital Camera Target support.

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