Converting to
COLOR

IEEE Software takes the plunge into
desktop color and discovers it's not that simple
✍✍ By Galen Gruman

S o you want to join the desktop color revolution. Current microcomputer technology makes it possible, although producing four-color publications is not a simple task. At IEEE *Software,* we recently explored this technology and found that there are both pros and cons. Yes, you can produce high-quality color work from a PC or Macintosh; but, no, it is generally not as easy as traditional methods.

Although we had planned to experiment with desktop color in 1991, we had not planned to do it as quickly as we did. We got into the technology the worst way possible: on deadline. We wanted to use a television test pattern for our March cover, but we could not get a realistic look from traditional media; our design director, Dirk Hagner, could not achieve the desired TV curve, ghosting, and luminescence with traditional ink and airbrush approaches. We were panicked because we shipped in two weeks.

Both Dirk and I had just obtained copies of Core1 Draw Version 2.0, which added features such as envelope editing and extrusion that might let us achieve the TV effects, although neither had actually used the new features. Still, we proposed using the new software to managing editor Angela Burgess, who gave us the okay despite the huge risks in trying a new technology on deadline, since it seemed to be our only option.

Dirk quickly learned how to use the new features and realized we could do what was needed. As a result, he scanned in several black-and-white test patterns as TIFF files and then mixed details from several test patterns to create a new test pattern in the iPhoto photo editor from U-Lead Systems. He also used the program's unique ability to convert among black-and-white, gray-scale, and color images to colorize two copies of the test pattern: one in dark gray and the other

(to be used as a ghosting shadow) in a light gray with a magenta cast. After importing the colorized pattern into Core1 Draw, he used the envelope and extrude features to give the patterns the bowed TV-screen look.

Now he was in familiar territory. He used Core1 Draw's unique feature of making a bitmap's background transparent so he could superprint the test pattern over the ghost pattern and then superprint both test patterns over the bluish TV screen. (Most programs fill bitmaps with white, which means you can only knock out a bitmap, not superprint it.) Dirk used Core1 Draw's radial fill feature to have the screen color go from sky blue to pale blue. This gave the TV screen a more three-dimensional look and the appearance of a bright light source at the center.

The only thing he couldn't do was include the magazine logo, since that was created in Aldus FreeHand on the Mac. Although FreeHand exports EPS files that most desktop-publish-

March 1991 cover.
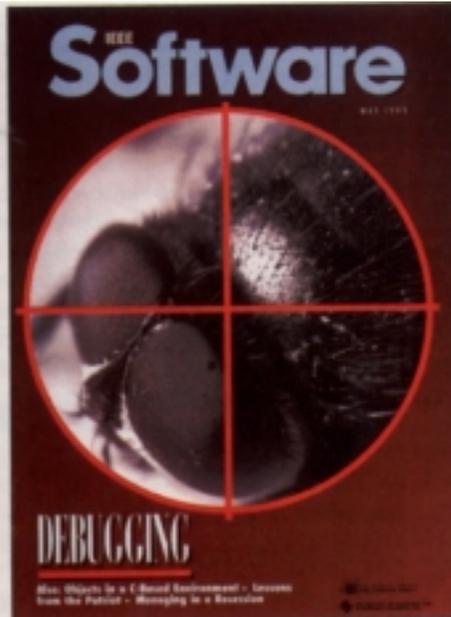
May 1991 cover.

The screen shot (at right) of the Corel Draw version of the March 1991 *IEEE Software* cover (above left) was taken on a super-VGA monitor at the superhigh resolution of 768x1,028 pixels (standard VGA of 480x640 cannot show true colors). In designing the cover, standard resolution was used because it was easier to read text at that resolution (the text is bigger). For color proofing, superhigh resolution was used. The Windows 3.0 built-in screen capture was used, and the file was pasted into Corel Draw where the color separations were completed before transferring to a PC disk.

The May 1991 cover (above right) also used a computer-generated cover, since it was a companion to the March issue.

ing programs can read (both Mac and PC), most graphics programs cannot edit FreeHand's version of EPS files. (They can **edit** the Adobe Illustrator version instead.) So we had to have the printer strip these in traditionally. Later, we redrew our logos in Corel Draw.

Dirk followed similar techniques to create an interior four-color art page.

Getting negatives

Then came the hard part: having the negatives printed. It's not as easy as you might think, especially since we were using a PC-based graphics program, and most service bureaus are Mac-based. In fact, we were told by more than one service bureau that there was no way a PC could drive an

imagesetter. Not true, but it gives some indication of how Mac-oriented service bureaus are.

The first problem we had was figuring out what kinds of files to provide the service bureau Dirk uses. (Dirk is an independent contractor who lives 30 miles away, so he tends to use his own set of vendors.) Corel Draw pro-

vides several options, and the Microsoft Windows 3.0 environment it runs under also has its own output-to-PostScript option.

Then we realized that the resulting files wouldn't fit on our floppy disks. Our situation was complicated by the equipment our company owned: Our PC-to-Mac transfer station could read only low-density disks. In color publishing, nothing is low-density. Even the high-density 1.2MB, 5.25inch PC disks were too small. Some files fit on the high-density 1.4MB, 3.5-inch PC disks, which Macs can also read via the Apple File Exchange program. But our PCs didn't have 3.5-inch disks.

Finally, we resorted to a time-consuming process: using the PKZip data-compression program (available on bulletin boards and as packaged software) to make our files small enough to fit on our disks; uncompressing the files on the transfer station's hard disk; sending these huge files to a Mac via the Lap Link program; and compressing them again to fit on a Mac disk, which we then gave to the service bureau, which had to uncompress them again. We couldn't use the compressed files from the PC on the Mac because the compression formats were different.

Then the bad news: The first service bureau couldn't get the files to print. We never did figure out why. The bureau was new to desktop-publishing technology and didn't really know how to output files-especially those created on PCs. We knew something was wrong when the bureau staff kept trying to import our files into applications like Aldus PageMaker and manipulating them from there, rather than downloading the files we provided directly to the imagesetter. We had similar problems with another service bureau.

Finally, we went to a service bureau (Design Type of Long Beach, California) more experienced with publishing technology. Although a Mac shop, the people there were more savvy about file transfer and desktop-publishing technology and quickly realized that the files we provided needed no special handling-something that seems to go against the grain in Mac-based printing, where it

seems you always use a utility to fine-tune files. We found that the Windows-created EPS files worked the best: They printed both on our PC-driven laser printer and on the service bureau's Mac-driven imagesetter.

Later, we found two shareware programs that solved the compression-incompatibility problem, saving us a lot of time in the Lap Link step. Unzip lets Macs uncompress PC-created PKZip files, and Unsit lets PCs uncompress Mac-created Stuff-It files.

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(Both are available on electronic bulletin boards; we got ours from the desktop-publishing round table on the Genie service.) We also began using my home machine, which has both 3.5- and 5.25~inch drives, as a transfer station so we could put our files onto a 3.5-inch disk the Mac could read, saving the time it took to transfer the compressed files via Lap Link.

(File size had been a problem for us earlier, when we began producing our table of contents via QuarkXPress. We had scanned in several color marble patterns for use in the TOC, and the resulting files were about 8MB each! When placed in our TOC and separated via XPress, the file for each negative took 3-4MB. Even with data compression, we could not fit the files on Mac 2MB disks, so we ended up using a backup program, Fastback, to copy the files to multiple disks. Our printer charged us a $50 "aggravation fee" to copy these backed-up files to their hard disk; the whole job took several hours. Our solution has been to color-separate the marble traditionally and have it stripped in manually to the negatives we supply for the

rest of the TOC. This stripping of supplied traditional seps into computer-generated negs costs the same as doing everything on-line but saves us several hours of work.)

But our problems were not over. The radial fills in our cover meant that it took six hours to print the negatives at magazine-level quality (150 lpi at 2,540 dpi). When you are charged by the minute for output time, this cost can easily surpass that of traditional color separations. And a service bureau can't afford to do such work under a "one price fits all" policy.

We also realized that our image was being cropped, so there was no trim space. We couldn't figure out why, since we had provided a generous two picas of bleed. It took us days to realize that our programs were cropping off anything that bled off the page (which was the size of our trim). So away went our crop. We learned later that all desktop-publishing programs, both Mac and PC, do this: FreeHand, Core1 Draw, Xerox Ventura Publisher, Aldus PageMaker, and QuarkXPress.

We had to change our page size to tabloid, which meant outputting to larger negatives, which costs more money. We also discovered that our service bureau had set the imagesetter to automatically rotate negatives, which saves materials. This is fine for letter-sized material, since the ll-inch length when rotated still fits in the imagesetter's 12-inch width. But when our tabloid files were rotated, the tops and bottoms of the 17-inch-long rotated files were cut off. The bureau had to disable that feature (which they had forgotten was set).

Worse, we could not get the interior art page to print-the page was so complex because of the special effects we had applied to the bitmaps that the imagesetter ran out of memory trying to process it. We had to resort to outputting two sets of negatives-one for the bitmaps alone and one for the background, which had to be super-printed on the bitmaps (remember, FreeHand automatically knocks out bitmaps). This meant a complex stripping job.

Because we were in danger of slipping schedule, we had our printer-

not the savvy service bureau-output these negatives, and we used Free-Hand to output the page because the printer was familiar enough with it to do the separations for us, which meant we could send one file on one disk rather than four negatives compressed into four disks.

That was a mistake. The printer inadvertently and unknowingly changed our color specs on the FreeHand file. We noticed it in the color proof and asked for a correction, but the printer looked at the (incorrect) file and saw that what was printed matched the new, incorrect specs. So the printer printed the page without calling us to say there was a discrepancy between what we said our file specs were and what the specs were at their end. We lost almost all our magenta as a result. We have learned never to send source files to a vendor unless we had a long working relationship and strong trust with the company. Our printer is too new at desktop publishing to warrant that level of trust.

Our next issue (May) also used a computer-generated cover, since it was a companion issue to the previous issue and so we wanted a similar look on the cover. The process was smoother, since we knew what to watch out for. But we still spent hours dealing with file transfer. In July, we went back to traditional techniques, having Dirk draw an illustration that we then had separated the usual way. We did supply the type electronically to be output to paper and then shot and stripped in as four-color. This cover took almost no effort at all.

Lessons learned

Our experience taught us a great deal:
- Work on test files the first few times, never on deadline material.
- Be careful in choosing a service bureau. There are many opportunities to make mistakes because so many programs are involved in creating your final output. You really have to know how they all work individually and how they affect each other. This is especially true when you mix Macs and PCs, which we do because there are some things that our magazine needs that Macs can do that PCs can't, and vice versa.

- Use data cartridges instead of floppies. Cartridges hold up to 60MB of data-more than some hard disks-and are transportable. Of course, make sure your service bureau has the same type of cartridge you do.
- If you use PCs, look for a service bureau with PCs connected to Macs or with imagesetters connected to both. That way, no matter what you use, you're covered.
- Don't send source files to others. Send printer files only.

Color publishing is possible on PCs and Macs, but it is not easier or less expensive than traditional methods. You may save on stripping costs, but you'll spend more on output time and file transfer. Initially, expect to spend more when using desktop color technology because of the price you'll pay for the inevitable mistakes. It seems to even out once you've survived the learning curve. Frankly, the value in color systems comes when you are producing art that must be created on a computer because of its nature. Unless you use very high-end systems like Scitex for color image scanning and output, let the images you use determine the set of tools you pick to create and produce them.

Would we do it again? I would. In fact, I used the streamlined process we eventually developed to produce the negatives for the screen shot that accompanies this story. But the managing editor has been very firm: "Never again!" The magazine's staff is too small and resources too few to rely on this complicated process when traditional methods work more easily. If we had a dedicated art department and technical guru on board, she would be more amenable to using this technology regularly. But we don't.

In the end, you have to decide how to spend your resources. Desktop color is possible, but it is not as simple as you might expect. ✍

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