# CMYK:
Still an Enigma for Imagers?

Jack and Sue Drafahl
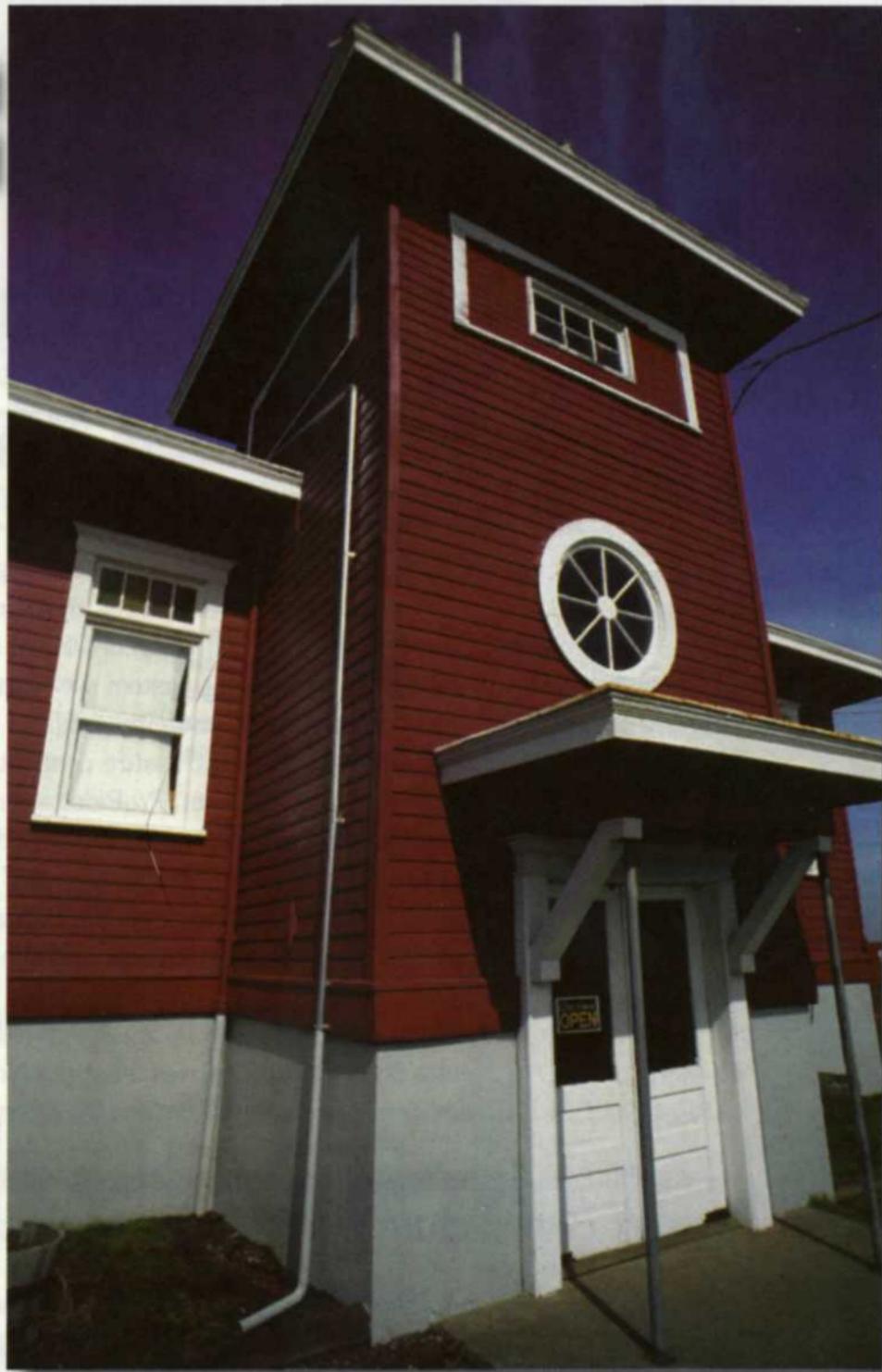
An issue that really seems to remain a challenge in our industry is a four letter acronym—CMYK. Most of the contact photographers and lab owners used to have with CMYK was in color printing and slide duplication, where C(cyan), M(magenta), and Y(yellow) are used as filters to color balance images. The only other contact with CMYK was when photographers had work run through offset print shops. Then digital printing came along.
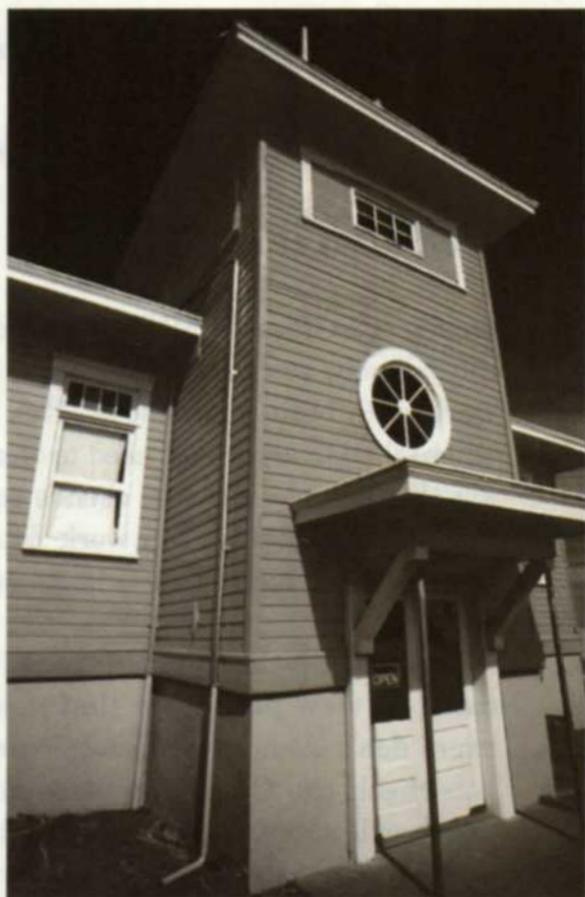
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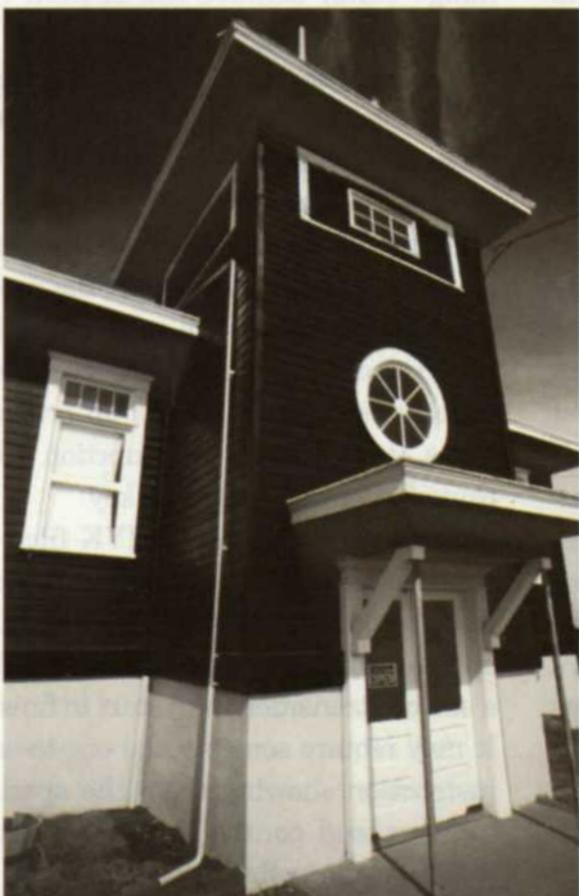
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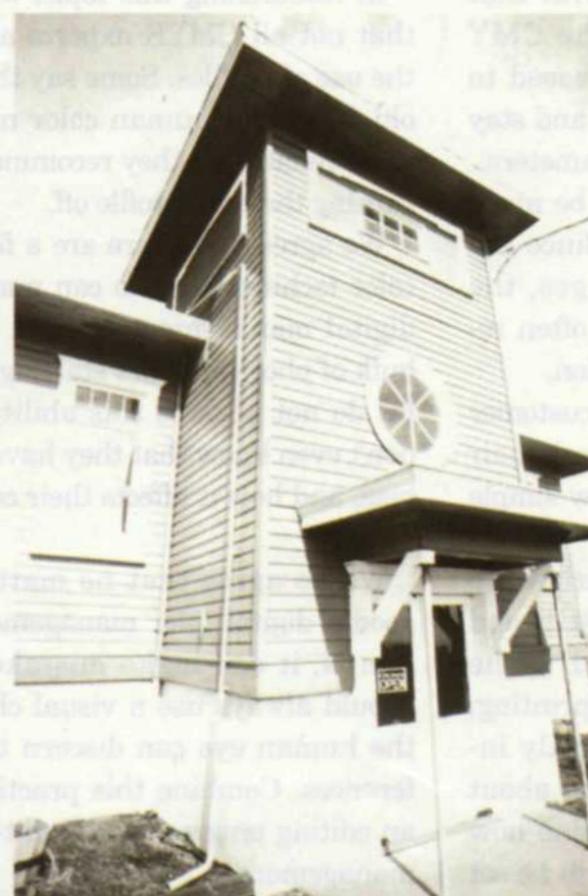
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MOST MISUNDERSTANDINGS about CMYK occur because of insufficient communication between the photographer and the photo lab or offset print house. Everyone has an opinion about how to handle CMYK digital files. As a result, many files have to be redone and tempers flare. It probably would be easier for the photo lab and offset printer to scan and create the CMYK files, but many photographers want to prepare the materials themselves. So, the battle continues.

The bottom line is that technology has handed us some pretty incredible new photo tools, but it seems that life just got more complicated in the process. More and more photographers are getting into digital, scanning their own images, performing image manipulation and creating complex composite images. To complicate matters even more, there are dozens of new file formats, several professional editing programs, and tons of new digital equipment.

So, why even bother with CMYK colorspace? RGB works well, so why not just use it? The fact is RGB is primarily used in electronic devices that use additive colors of red, green, and blue light to create a full color image.

Film recorders, for example, use a red, green, and blue filter to add these colors to the film in a hard-mounted camera. Some of the lower-end inkjet printers also use RGB and translate the colors into CMYK ink. The problem occurs when you absolutely need to transfer RGB to CMYK for large format digital printing or offset printing.

The subtractive colors of CMYK are translated to inks for larger format digital printers or color separations for offset printing. These colors are called subtractive because as you mix them together, the amount of light reflecting off the final print is subtracted. The more you add, the less color of light is reflected.

…there are a few good color technicians who can match any digital management system…

X-Rite Color DTP92

The problem of converting RGB to CMYK is complex. It is not as simple as just pushing a button. The red channel will resemble the cyan, the green the magenta and yellow the blue. The problem occurs with that leftover black channel. The CMY channels have to be suppressed to make room for the black ink and stay within the offset printing parameters.

A compensation must also be made for dot gain on the press. Since the RGB files have longer ranges, the blending of colors to CMYK often results in banding or posterization.

The key is to educate your customer base on how to better control their CMYK files, so here are a few simple tips.

Most of the labs and magazines we work with ask us for both RGB and CMYK for each file we send. If the image is destined for offset printing, then the print house is directly involved in the communication about the file format. They determine how both RGB and CMYK files will be set up to simplify the conversion.

We use the action function of Photoshop 5, so that when we are ready to prepare a CD of images we simply press one key and both the

RGB and CMYK files are made automatically. Profile your system

It is not uncommon in a lab to see work stations that vary in monitor brand, scanner type, and editing programs. It is really tough trying to move images between work stations and maintain consistency. Thankfully there are colorspace profiles that come with many of these devices to help keep images consistent between systems. If you and your clients use this profiler, then you will know exactly how the files were made. This information is invaluable whenever changes to the files are necessary.

In researching this topic, we found that not all CMYK experts agree on the use of profiles. Some say that good old fashioned human color match is more reliable, so they recommend just turning the color profile off.

We agree that there are a few good color technicians who can match any digital management system, but the bulk of photographers starting in digital do not possess this ability. Most don't even know that they have a color bias, and how it affects their color balancing.

We do agree that no matter how good a digital color management system is, it can make mistakes. You should always use a visual check, as the human eye can discern tiny differences. Combine this practice with an editing program with built-in color management

Adobe Photoshop 5 has a really nice function for balancing the gamma of your monitor, and setting up a profile to transfer information from one computer to the next. In the preferences

section of RGB and CMYK setup, you can tell your system how you want to work with both colorspaces. This is where the lab and client need to work together to make sure the client's values are ones the lab can work with. Use the CMYK preview and gamut warning

Photoshop 5 has two functions located in view pull down that most users don't even know about. When you check the CMYK preview, the image will appear as it would in the CMYK colorspace, even thought you are editing in RGB. The CMYK preview is very handy and can help a new image editor achieve the desired results from the lab.

A second function can be used to turn on the gamut warning to highlight those areas that will not fit smoothly in the CMYK color space. It is helpful in locating those problem areas, but can often force you to overcorrect the problems. Many times the problem is in non-critical areas, and fixing them too much has adverse effects on critical areas. Be sure to use this function with caution. Communication is key

Since working with CMYK files is different for each type of output device, close communication between clients and the lab is absolutely necessary for a smooth transition from start to finish. It may require some special one-to-one instruction showing them the special buttons and controls, but the time spent may be well worth it.

If you do accept customer prepared CMYK files, you will probably need to have a questionnaire that would narrow down the scope of how the file was created. You might ask:

- What type of digital device was used to create the file?
- Was it made via a scanner or digital camera?
- What software was used to edit the image?
- If you have a color management system, was the color profiler used?

Even when all the questions have been answered, you may have to run a couple of test images to match up the systems. Unless you work together to match the system, you know the photo lab will be caught in the middle. The photographer will say, "It looked really good on my monitor. Why didn't it come out the same on the print from your lab?"

If you have an employee who has a special feel for working with CMYK, give him/her time to research and keep up to date with industry changes. You need at least one employee who is totally CMYK savvy.

Once a system is set up, keep running checks to ensure that it has not gone astray thanks to some unnoticed system change. Work with the manufacturers of your CMYK output devices, and learn everything you can about how they work. If you can profile your digital systems with hardware and software sensitometry devices, they generally work better than a visual matching system.

The conversion of RGB to CMYK has been a source of frustration in our business for years. We thought that researching information for this article would help clear up some ques-

tions. After sorting through reams of conflicting information, we were just about ready to give up. Then we discovered a couple of informational goldmines that saved the day.

The first is the X-Rite web site where you will find dozens of CMYK links, a variety of color management equipment, and a downloadable PDF file called "The Color Guide and Glossary." The second is a RGB to CMYK bible called *Professional Photoshop 5* by Dan Margulis. Both offer some good points of view and great directions to follow.

Jack and Sue Drafahl are digital imaging experts and professional photographers based near Portland, Ore.