Fiery X12/XP12

COLOR GUIDE

for DocuColor 12

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Introduction

Welcome to the *Color Guide*. This manual introduces you to the concepts and issues associated with printing to the Fiery X12/XP12 Color Server™. It outlines key workflow scenarios, provides information on calibration and color profiles, and contains application notes that explain how to print to the Fiery X12/XP12 Color Server from popular Microsoft Windows and Apple Mac OS applications.

This manual is one book in a set of documentation that also includes manuals for users and system administrators. All the other manuals should be available at your site—refer to them for a complete description of your Fiery X12/XP12 Color Server.

NOTE: The term "Fiery®" is used in this manual to refer to the Fiery X12 or Fiery XP12 Color Server. The Fiery supports the DocuColor 12 color copier; the term "copier" is used in this manual to refer to this supported device. The term "ColorWise®" is used to refer to ColorWise 2, the current version of the Fiery's built-in color management system.

XP12 This icon specifies information, features, or procedures that apply only to the Fiery XP12.

About this manual

This manual is organized to supply you with key information about managing the color output of your Fiery. Chapter 1 discusses the Fiery's print options and how to get the best color results, and Chapter 2 describes several effective workflows. ColorWise Pro Tools™ are discussed in the next two chapters. Chapter 3 covers Calibrator™ and other methods used to calibrate the copier, and Chapter 4 takes you through the features of Profile Manager™, used to manage color profiles on the Fiery, and Color Editor™, which lets you customize simulation and output profiles. Succeeding chapters offer tips for printing from business and graphics applications. Finally, the appendixes offer information about color theory and color management.

Words in bold, for example, **output profile**, are terms that appear in the glossary. The bibliography at the end of this manual provides sources for further investigation of color printing issues.

NOTE: Starting on this page, color terms and concepts such as “RGB data,” “color space,” “spot color,” “gamut,” and “source profile” are used throughout this manual. If you are new to desktop color or if any terms are unfamiliar, be sure to read Appendixes A and B or check the glossary.

Key features of ColorWise

ColorWise is the second-generation **color management system** (CMS) built into the Fiery and designed to provide both casual and expert users the best color output for a variety of purposes. The ColorWise default settings were specifically selected to provide great out-of-box color from many applications and Windows and Mac OS platforms. This means that casual users can get good quality output without knowing about or changing any color settings on the Fiery.

To get consistent color, you should be sure the Fiery is calibrated on a regular basis. ColorWise Pro Tools include a simple-to-use calibrator, which allows you to calibrate using either the scanner that comes with the copier or an optional densitometer (see Chapter 3).

There are a number of features you can use to modify printing results. Depending on your particular needs, you can:

- Set the behavior of CMYK printing to emulate DIC, Euroscale, and SWOP offset press standards
- Match PANTONE colors for the best match when printed using four-color press conditions or when printed using presses with extra, custom plates

- Select a **color rendering dictionary** (CRD), also called a rendering style, for RGB printing. CRDs allow for rich, saturated printing of presentation graphics; smooth, accurate printing of photographs; and relative or absolute colorimetric rendering for specialized needs
- Define the source of incoming RGB color data for better screen matching and provide for better color conversion of RGB data with no source information
- Define whether RGB data is converted into the full gamut of the copier or whether it is first converted into the gamut of another device, such as a press standard. This feature is very helpful for making one device behave like another. It is also useful for evaluating the appearance of the RGB file under different printing conditions without having to reprocess the RGB data each time

ColorWise offers an open color architecture, letting users customize the Fiery to meet new printing needs as they arise. ColorWise supports ICC profiles, which are industry standard color profiles that define the color behavior of a device. By downloading ICC profiles to the Fiery, it can simulate a custom press (or another copier) as well as accurately print colors from a particular monitor or a particular scanner. In addition, you can create customized ICC profiles for the copier.

ColorWise also lets you use any Status T densitometer by importing data in a standard file format (see Appendix C). In this case, it is important to note that the quality of the instrument used determines the quality of the calibration.

Chapter 1: Fiery Color Management

The first part of this chapter describes the options available from the ColorWise color management system and explains how you can customize the color settings for your particular needs. It provides descriptions of the preset default settings of ColorWise and covers additional options for users who need to customize ColorWise.

Beginning on page 1-13 is a detailed explanation of what a PostScript Level 2 or PostScript 3 printer driver does, as well as information on the capabilities of various printer drivers and instructions for setting color options with the PostScript drivers for Windows NT 4.0, Windows 95/98, and Mac OS.

NOTE: Most of the color management features described in this chapter are available only with the PostScript driver, not with the PCL driver.

Managing color on the Fiery

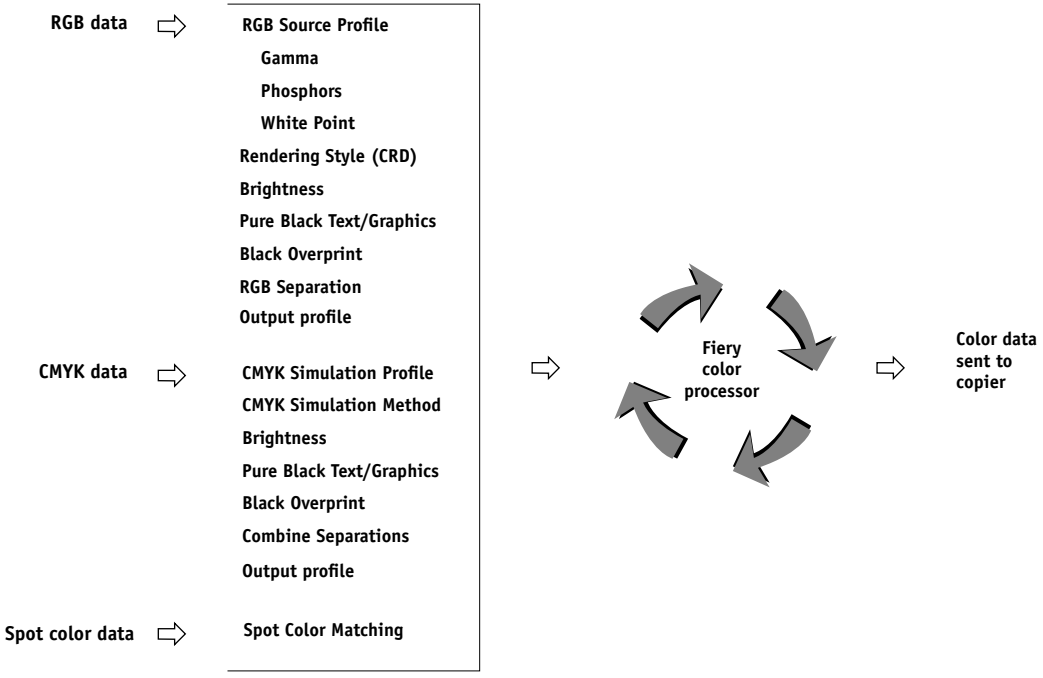
There are three ways to modify the Fiery's printing behavior:

- You can select ColorWise options for an individual print job using menus that appear from the printer driver.
- You can select most ColorWise options as server defaults from Fiery Setup or from the Control Panel, as described in the *Configuration Guide*. These defaults will apply to all subsequent print jobs unless you override them.
- You can select some ColorWise options, particularly default **ICC profile** settings and calibration options, from ColorWise Pro Tools. These options include default Simulation Profile (see page 1-8), Simulation Method (see page 1-9), Appear in Driver as (see page 4-8), default Source Profile (see page 1-6), RGB Separation (see page 1-7), and associated calibration set (see page 3-3).

Applications can generate color data for the Fiery in many different **color spaces**. The most common type of color data produced from office applications is RGB, while prepress applications generally produce CMYK data. Desktop applications can also generate spot colors such as PANTONE colors. To complicate matters, a single page may contain a mix of RGB, CMYK, and spot colors. The Fiery lets users control the printing of these mixed-color documents with features that apply specifically to RGB, CMYK, or spot color data.

Fiery color management generates CMYK data to be sent to the copier; additional processing may then be performed before printing begins.

The diagram below illustrates the print options in the Fiery color management process that affect color data conversions. You access these print options when you send a print job to the Fiery. Most of these options and settings are described in subsequent sections of this chapter.



RGB Source Profile is the only color option that applies strictly to RGB color data. The other options that affect RGB color also affect the more rarely used Lab, XYZ, and other calibrated color spaces.

NOTE: For users who are familiar with PostScript 3.0 color, RGB Source Profile affects all CIEBasedABC color spaces (if the source space is RGB). Also, if you send CMYK data to the Fiery in CIEBasedDEFG format, for example, by choosing PostScript Color Management in Adobe Photoshop, the Fiery's Rendering Style selection—which normally affects only RGB data—will also affect this CMYK data.

Settings for the following options can be specified via print options when you send a job to the Fiery. Some can also be set as defaults by the administrator during Fiery Setup. Settings specified via print options override the defaults.

Fiery color print option:	What it does:
Brightness 85% Lightest to 115% Darkest	Performs a color adjustment on all **color channels** to make the printed output lighter or darker. (This feature is available with the PostScript driver only.)
Rendering Style Photographic/Presentation/Relative Colorimetric/Absolute Colorimetric (Default set at Setup)	Applies a Fiery color rendering style (CRD) to RGB data (see page 1-5), or to any incoming data with a PostScript **source color space** definition, including CMYK. (This feature is available with the PostScript driver only.)
RGB Source Profile EFIRGB/sRGB (PC)/Apple Standard/Other/ Source 1-10/None (Default set at Setup or with ColorWise Pro Tools)	Applies an RGB source space definition to RGB data (see page 1-6). If you choose the Other setting, you can specify particular settings for gamma, phosphors, and white point. See the corresponding options in this table. This option, along with Gamma, Phosphors, and White Point, are the only ColorWise options that affect *only* DeviceRGB or calibrated RGB color spaces. (This feature is available with the PostScript driver only.)
(Other) Gamma 1.0/1.2/1.4/1.6/1.8/2.0/2.2/2.4/2.6/2.8/3.0	Applies the specified **gamma** value to the RGB source space definition (see page 1-6). To use this print option, you must choose Other as the RGB Source setting. (This feature is available with the PostScript driver only.)
(Other) Phosphors Hitachi EBU/Hitachi-Ikegami/NTSC/ Radius Pivot/SMPTE/Trinitron	Applies the specified **phosphor** (monitor type) information to the RGB source space definition (see page 1-6). To use this print option, you must choose Other as the RGB Source setting. (This feature is available with the PostScript driver only.)
(Other) White Point 5000 K (D50)/5500 K/6500 K (D65)/ 7500 K/9300 K	Applies the specified **white point** value to the RGB source color space definition (see page 1-6). To use this print option, you must choose Other as the RGB Source setting. (This feature is available with the PostScript driver only.)
RGB Separation Output/Simulation	Determines which CMYK color space your original RGB data will be separated into—CMYK for the copier (Output) or CMYK for a specified simulation (Simulation) (see page 1-7). It is important to note that when RGB Separation is set to Simulation, RGB colors are affected by CMYK Simulation Profile and CMYK Simulation Method. (This feature is available with the PostScript driver only.)

Fiery color print option:	What it does:
CMYK Simulation Profile SWOP-Coated/DIC/Euroscale/Simulation 1-10/Match Copy/None (Default set at Setup or in ColorWise Pro Tools)	Adjusts CMYK color data to simulate an offset press standard or a custom color **gamut** defined at your site. The Match Copy setting bypasses Fiery calibration to match a copy made from the copier glass. Choosing None bypasses simulation (see page 1-8). **NOTE:** Some of the Simulation settings have slightly different names depending on the model of copier. (This feature is available with the PostScript driver only.)
CMYK Simulation Method Quick/Full (Default set at Setup or in ColorWise Pro Tools)	Quick simulation applies one-dimensional transfer curves that adjust output density only. Full simulation applies colorimetric transformations that adjust hue as well as output density (see page 1-9). (This feature is available with the PostScript driver only.)
Output Profile Default output profile/Output 1-10 (Default set at Setup or in ColorWise Pro Tools)	The Output Profile is applied to all data in the print job (see page 1-9). User-defined output profiles can be downloaded to the Fiery with ColorWise Pro Tools (see Chapter 4). (This feature is available with the PostScript driver only.)
Pure Black Text/Graphics On/Off (Default set at Setup)	The On setting optimizes the quality of black text and line art output (see page 1-10). (This feature is available with the PostScript driver only.)
Black Overprint On/Off (Default set at Setup)	The On setting overprints black text placed on colored backgrounds; it automatically activates the Pure Black Text/Graphics option (see page 1-11). (This feature is available with the PostScript driver only.)
Spot Color Matching On/Off (Default set at Setup or with ColorWise Pro Tools)	The On setting enables Fiery matching of PANTONE colors; Off instructs the Fiery to match color output to a Pantone-specified CMYK combination (see page 1-12). (This feature is available with the PostScript driver only.)

Detailed explanations of how these and other settings affect your print jobs are provided in subsequent sections of this chapter.

Rendering styles

The Rendering Style option specifies a CRD for color conversions. You can modify the Rendering Style option to control the appearance of images, such as prints from office applications or RGB photographs from Photoshop. The Fiery lets you select from the four rendering styles currently found in industry standard ICC profiles.

Fiery rendering style:	Best used for:	Equivalent ICC rendering style:
Photographic—Typically results in less saturated output than presentation rendering when printing out-of-gamut colors. It preserves tonal relationships in images.	Photographs, including scans and images from stock photography CDs.	**Image**, **Contrast**, and **Perceptual**
Presentation—Creates saturated colors but does not match printed colors precisely to displayed colors. In-gamut colors such as flesh tones are rendered well, similar to the Photographic rendering style.	Artwork and graphs in presentations. In many cases it can be used for mixed pages that contain both presentation graphics and photographs.	**Saturation**, **Graphics**
Relative Colorimetric—Provides white-point transformation between the source and destination white points. For example, the bluish gray of a monitor will map to neutral gray. You may prefer this style to avoid visible borders when *not* printing full-bleed.	Advanced use when color matching is important but you prefer white colors in the document to print as paper white. It may also be used with PostScript color management to affect CMYK data for simulation purposes.	**Same**
Absolute Colorimetric—Provides *no* white point transformation between the source and destination white points. For example, the bluish gray of a monitor will map to a bluish gray.	Situations when exact colors are needed and visible borders are not distracting. It may also be used with PostScript color management to affect CMYK data for simulation purposes.	**Same**

NOTE: This feature is not available with the PCL driver.

RGB Source Profile

The RGB **Source Profile** setting allows you to define the characteristics of the RGB data in your document so that the appropriate color conversion can occur on the Fiery. Commonly used monitor color spaces are available from the driver and from the ColorWise Pro Tools Profile Manager. In addition, for special needs you can use ColorWise Pro Tools to download custom monitor or scanner profiles.

When you specify a setting other than None for the RGB Source Profile, the Fiery overrides source color space definitions or profiles that other color management systems may have specified. For example, if you specified a ColorSync System Profile on your Mac OS computer, the RGB Source Profile setting overrides it. In cases where you *do not* want this setting to override another specified source color space, choose the None setting.

When you specify a setting other than None for the RGB Source Profile—since the color space definitions are overridden—the prints from the Fiery will be consistent across platforms. Below are the Fiery's RGB Source Profile options.

- **EFIRGB** specifies an EFI-defined color space recommended for users who have no detailed information about their RGB data.
- **sRGB (PC)** specifies the industry standard definition for a generic Windows PC monitor.
- **Apple Standard** specifies the definition of all standard Mac OS computer monitors.
- **Other** allows you to specify custom RGB source settings. If you choose Other as the RGB Source setting, you can choose settings for the Gamma, Phosphors, and White Point options.
- **Sources 1-10** specify the definitions you download as RGB source profiles. (For more information about downloading RGB source profiles, see Chapter 4.)
- **None** instructs the Fiery to allow the RGB sources you defined elsewhere, such as in the application, to be used. When you set RGB Source to None, the appearance of colors will *not* be independent of the file type. For example, RGB EPS files will look different from RGB TIFF files.

With RGB Source set to None, PostScript RGB data that contains a source color space definition is converted using the CRD specified by the Rendering Style option (see page 1-5). NonPostScript RGB data and PostScript RGB data that does not contain a source color space definition is converted using a general **undercolor removal** conversion method.

NOTE: This feature is not available with the PCL driver.

RGB Separation

The RGB Separation option determines how RGB colors (as well as Lab and XYZ colors) are converted to CMYK. The name of this option is meant to be descriptive, since the option defines the color spaces that will be used by the Fiery to "separate" the RGB data into CMYK values.

The two choices available for this option determine whether RGB data is converted into the full gamut of the copier (**Output**) or whether it is first converted into the gamut of another digital printer or a press standard (**Simulation**). This feature is helpful for making one device behave like another for RGB data. For example, if a high-quality ICC profile is available for another print device, the copier can simulate the behavior of that device.

RGB Separation is also useful for prepress applications. For example, it lets you experiment with the appearance of an RGB scan under different press printing conditions without having to convert the RGB data to CMYK data for each printing condition. When the desired printing condition is found, you can then convert the file to CMYK, if desired, using the same CMYK simulation profile that was used during the experimentation.

NOTE: The RGB Separation print option should be used in conjunction with the Output Profile or CMYK Simulation Profile print options.

- **Output** converts all RGB colors into the CMYK color space of your copier (when the Output Profile option is set to Printer's default), or a customized CMYK color space for your copier (when the Output Profile option is set to Output 1-10).
- **Simulation** converts all RGB colors into the CMYK color space for a specified simulation (make sure to select the desired simulation with the CMYK Simulation Profile print option).

NOTE: This feature is not available with the PCL driver.

CMYK Simulation Profile

The CMYK Simulation Profile print option allows you to print press proofs or simulations. This setting specifies the offset press standard or other color printing device that you want to simulate. This option affects CMYK data only.

The CMYK Simulation Profile setting you should specify depends on the press standard for which the CMYK data was separated.

- For images that were separated using a custom separation (such as a separation produced with an ICC profile), choose the corresponding profile on the Fiery with the CMYK Simulation Profile setting.
- For images that were separated for **SWOP**, choose SWOP as the CMYK Simulation Profile setting.

NOTE: To properly simulate a printed image that was separated through the use of an ICC profile, the same profile must be present on the Fiery. For more information about downloading ICC profiles to the Fiery, see "Downloading profiles" on page 4-5.

- The Match Copy setting bypasses Fiery calibration to simulate the color of a copy produced by the copier. Use this setting when you print images scanned with the Fiery Scan plug-in set to Match Copy.

NOTE: This feature is not available with the PCL driver.

CMYK Simulation Method

The CMYK Simulation Method setting specifies the quality of simulation to perform.

- **Quick** applies one-dimensional transfer curves that adjust output density only.
- **Full** provides a more complete and accurate simulation by applying colorimetric transformations that adjust hue as well as output density. The Full Simulation option also maintains the integrity of the black channel by adjusting it independently. This is especially important for images separated using an optimized black generation (UCR/GCR) setting either from a scan or from within an application such as Photoshop.

NOTE: This feature is not available with the PCL driver.

Output Profile

The output profile is applied to all data in the print job, so make sure the selected profile is right for your job. The default output profile consists of both a profile for your copier, describing its color characteristics, and a calibration target that describes the expected behavior of the copier.

In certain cases you may wish to customize the default output profile using the ColorWise Pro Tools Color Editor to achieve particular color effects (see page 4-13). If so, the new customized output profile is applied to all data in the print job. Changing only the output profile does not affect its associated calibration target (since the target is based on a copier model). If you wish, you can edit D-Max values of the calibration target separately (see page 4-7).

You can also use the ColorWise Pro Tools Profile Manager to download your own output profile to the Fiery (see page 4-5). Downloaded output profiles are at first associated with the default calibration target. As mentioned above, you can edit calibration target D-Max values separately.

NOTE: This feature is not available with the PCL driver.

Pure Black Text/Graphics

The Pure Black Text/Graphics option affects the printout for black text and vector graphics on a page. Under most circumstances it is preferable to leave this option set to the On position. When Pure Black Text/Graphics is on, black colors generated by applications are printed using 100 percent black-only toner (for example, RGB = 0, 0, 0; CMYK = 0%, 0%, 0%, 100%; or K = 100%). This means the black text and line art will not exhibit halftone artifacts and will not be misregistered, since there is only one toner used. In addition, this setting eliminates **blasting**. This option is automatically set to On when the Black Overprint option is set to On.

For some jobs it is preferable to turn this option Off, for example, if the page includes gradient fills that use black. The table below describes the behavior of the Pure Black Text/Graphics option with black data defined in different color spaces.

NOTE: The Pure Black Text/Graphics option can be used only when printing composites, not when printing separations.

Input black color:	Pure Black Text/Graphics:	
	On	Off
RGB	Prints 100% black	With the default profile, prints a rich black using all toners.
CMYK		Prints only with black toner, because CMYK simulations preserve the black channel. The actual amount of toner used depends on the current simulation and the calibration state of the copier.
Spot		Prints only with black toner, because spot color simulations preserve the black channel. The actual amount of toner used depends on the current simulation and the calibration state of the copier.

NOTE: PostScript applications, such as QuarkXPress, may convert elements defined as RGB = 0, 0, 0 to four-color CMYK black before sending the job to the Fiery. These elements are not affected by the Pure Black Text/Graphics option. See the application notes for details. Also, black text and line art defined as RGB = 0, 0, 0 in office

applications (such as Microsoft Word) are converted to single-color black (CMYK = 0%, 0%, 0%, 100%) by the Microsoft PostScript Level 2 driver for Windows NT 4.0. To print this single-color black at the maximum toner density of the copier, set the Pure Black Text/Graphics option to On.

NOTE: This feature is not available with the PCL driver.

Black Overprint

The Black Overprint option lets you specify whether or not black text, defined as RGB = 0, 0, 0, or as CMYK = 0%, 0%, 0%, 100%, overprints colored backgrounds.

- **On**—Black text overprints colored backgrounds, eliminating white gaps and reducing halo affects or misregistration of colors. Setting Black Overprint to On automatically activates the Pure Black Text/Graphics option.
- **Off**—Black text knocks out colored backgrounds.

NOTE: PostScript applications may perform their own black overprint conversions before sending the print job to the Fiery.

One example of how you might use this setting is with a page that contains some black text on a light blue background. The background blue color is CMYK = 40%, 30%, 0%, 0% and the black text is CMYK = 0%, 0%, 0%, 100%.

- With Black Overprint On, the final text portions of the page are overprinted, or combined with the underlying colors. This results in CMYK = 40%, 30%, 0%, 100% for the color used for the text. There is no transition in the cyan and magenta toners, and the quality of the output is improved since it will not show **artifacts** near the edges of the text. The option also works with text defined in the RGB color space, that is RGB = 0, 0, 0.
- With Black Overprint Off, the border of the text is on an edge that has cyan and magenta toners on one side (outside the text) and black toner on the other side (inside the text). On many devices, this transition causes visible artifacts because of the practical limitations of the copier.

NOTE: This feature is not available with the PCL driver.

Spot Color Matching

The Spot Color Matching option provides automatic matching of PANTONE colors with their best CMYK equivalents.

- **On**—The Fiery uses its built-in table to generate the closest CMYK matches of PANTONE colors your copier can produce. (New tables are generated when you add new output profiles.)
- **Off**—The Fiery uses the CMYK equivalents defined by your application to print PANTONE colors.

For jobs that include PANTONE spot colors, set Spot Color Matching to On unless you are printing press simulations. In that case, set Spot Color Matching to Off and choose the appropriate CMYK Simulation setting (see page 1-8).

NOTE: You can use the Spot Color Matching option only when printing composites, not when printing separations.

Spot Color Matching and the PANTONE Coated Color Reference

The PANTONE Coated Color Reference (described on page 5-7) prints differently depending on the Spot Color Matching setting.

- **On**—The Fiery uses its built-in table to generate the best matches of the PANTONE colors that your copier can produce. The PANTONE number is printed below each swatch.
- **Off**—The Fiery prints swatches using the CMYK values recommended by Pantone (and used by applications that provide PANTONE color libraries). The CMYK values used to generate the color, as well as the PANTONE number of the color, are printed below each swatch. These CMYK values are printed through the selected CMYK Simulation and Output Profile settings.

NOTE: This feature is not available with the PCL driver.

PostScript Printer Drivers and Print Options

This section describes the role of the printer driver and explains how to use Windows and Mac OS printer drivers for Fiery printing.

NOTE: The term "PostScript" by itself is used to refer to Adobe PostScript Level 2 or later. For more information on the PCL drivers for this copier, see the *Printing Guide*.

What a PostScript printer driver does

To take full advantage of the features of the Fiery, your print jobs must be sent as PostScript data. Since most applications cannot generate PostScript data directly, it is the function of a printer driver to interpret instructions from the application and convert them to PostScript data.

A PostScript printer driver also allows you to select print options specific to your copier. To do this, the printer driver must be matched with a **PostScript printer description file (PPD)** for your Fiery. The PPD contains information about the particular features supported by the Fiery and the copier. The PPD can be thought of as the lines of PostScript code in the file that are device-specific. When you print a job, the printer driver lets you choose among features by displaying print options.

A few PostScript applications can send PostScript data directly to the copier and present print options within the application interface. Even these applications, however, require that you use a PostScript printer driver.

Your Fiery user software includes Adobe PostScript printer drivers for Windows 95/98, Windows NT 4.0, and Mac OS computers. These are the recommended printer drivers for printing to the Fiery. (See *Getting Started* for information on installing printer drivers.)

It is recommended that you set the print options initially in Fiery Setup (see the *Configuration Guide*). This provides you with a default configuration that is appropriate for most Fiery print jobs.

Adobe PostScript printer driver for Windows 95/98 and Windows NT 4.0

The printer driver options described in this section can be accessed by clicking Start\Settings\Printers, right-clicking the appropriate PPD name, and selecting Properties (Windows 95/98) or Document Defaults (Windows NT 4.0) from the pop-up menu. These settings are also accessible from the Print Setup or Page Setup dialog boxes of most applications.

For Window 95/98, the Fiery driver interface enables you to save combinations of settings that you can later access. Additionally, you can choose different settings for individual jobs from the applications you use.

The printer driver writes a PostScript file containing the instructions generated by your application and the Fiery print options you selected. The printer driver sends the PostScript file to the Fiery. The Fiery then performs PostScript processing and color conversions and sends raster color data to the print device.

NOTE: The following illustrations and instructions do not apply to all applications. Many applications, such as PageMaker, Photoshop, Illustrator, QuarkXPress, and CorelDRAW, have other color management options in addition to those presented in the printer driver. For information on specific applications, see Chapters 6 through 9.

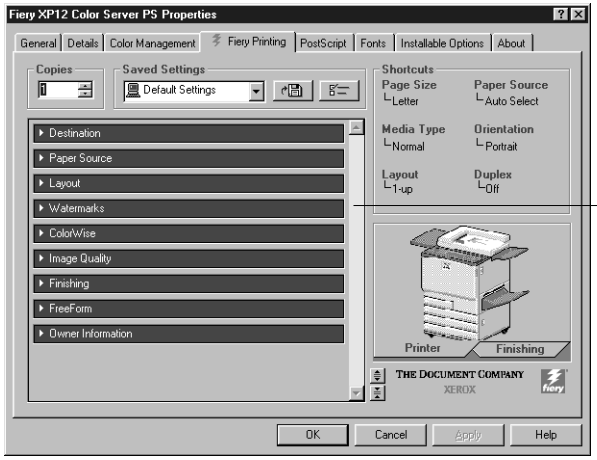
Setting color management print options for Windows 95/98 and Windows NT 4.0

This section explains how to set Fiery color print options with the Adobe PostScript printer driver version 4.3.x for Windows 95/98 and version 5.1 for Windows NT, PostScript 3 printer drivers that can take full advantage of the color features of the Fiery. Before you proceed, make sure you have completed the following procedures described in *Getting Started*:

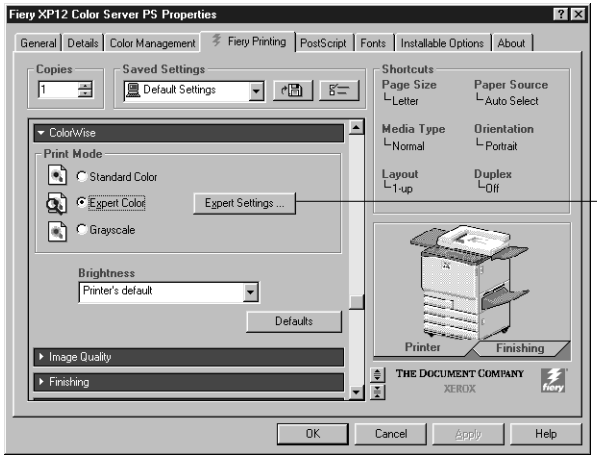
- Install the Adobe PostScript Printer Driver version 4.3.x (Windows 95/98) or 5.1 (Windows NT) and the Fiery PPD
- Set up the Fiery for printing

To set print options, open the PPD, as described on page 1-14. Under the Fiery Printing tab, click the ColorWise menu to select settings for the print options described on page 1-3. (For most users, the default settings provide the right level of color control.)

NOTE: The interface shown here is Windows 98; however, the interface is basically the same for Windows 95 and Windows NT 4.0.

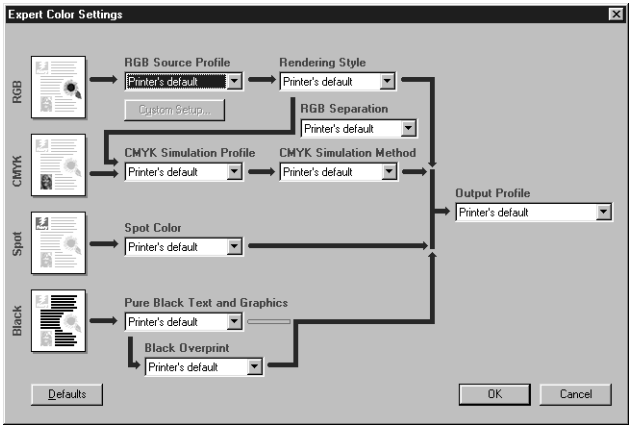


Click the ColorWise menu

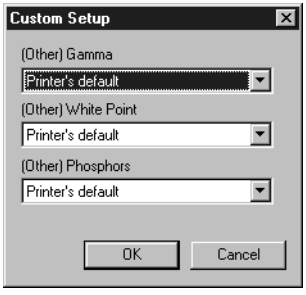


Click the Expert Settings button to access additional ColorWise options

Click on the Expert Settings button on the ColorWise window (above). This brings up the Expert Color Settings flowchart window (below), which displays additional color settings for the Fiery. Each option includes a pop-up menu from which you can select settings for your specific job.



Selecting Other for RGB Source Profile brings up the following window for specifying custom RGB source settings (see page 1-6).



Adobe PostScript printer driver for Mac OS

This section explains how to set color management print options with the AdobePS 8.6 printer driver for Mac OS, a PostScript 3 driver that takes full advantage of the color features of the Fiery and lets you save a set of print option settings.

Before you continue, make sure you have completed the following:

- Install the AdobePS printer driver and the Fiery PPD, as described in *Getting Started*.
- Select the Fiery in the Chooser and set it up with the Fiery PPD.

NOTE: The following illustrations and instructions do not apply to all applications. Many applications, such as PageMaker, Photoshop, Illustrator, QuarkXPress, and CorelDRAW, have other color management options in addition to those presented in the printer driver. For information on specific applications, see Chapters 6 through 9.

Setting color management print options

You choose print options from the various panes of the AdobePS driver dialog box. To access the initial AdobePS dialog box, choose Print from your application's File menu.

NOTE: The word "pane" is used to describe the different pages that appear in the driver's dialog box when you make selections from the pull-down menu at the top left. Each pane presents a particular set of print options.

The AdobePS driver includes the following Color Matching options.

- **Color/Grayscale**—When this setting is used to print to the Fiery, ColorWise provides all color conversions on the Fiery. Typically, you should use this option when printing to the Fiery.
- **PostScript Color Matching**—Intended for use with PostScript devices such as the Fiery. It provides for color conversion *on the Fiery* using a color rendering dictionary resident on the copier (that is, a Fiery CRD) or a color rendering dictionary that is downloaded with the print job.

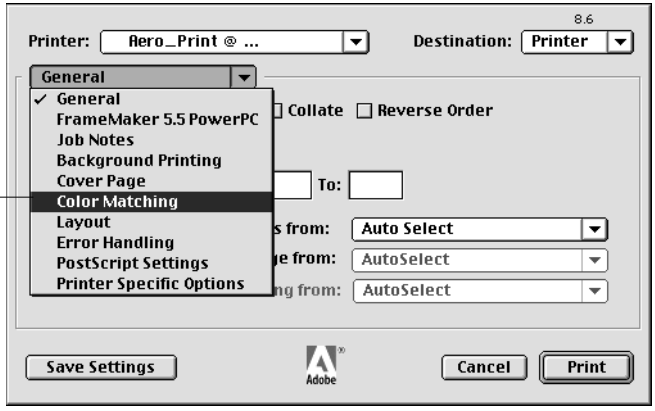
NOTE: If you use the PostScript Color Matching option, the driver may, depending on the application you are using, attach a CMYK source definition to the CMYK data in your document. In such a case, the CMYK data in your document is reseparated using a Fiery CRD. The destination color space for the CRD is determined by the RGB Separation print option. By setting RGB Separation to Simulation, CMYK data is

printed according to all specified CMYK Simulation Profile and CMYK Simulation Method settings. By setting RGB Separation to Output, CMYK data is converted to the selected output profile's CMYK color space.

- **ColorSync Color Matching**—Provides for color conversion *on the host computer*. This option can be used with PostScript devices such as the Fiery, but it is intended for use with PostScript Level 1 devices. If you use this option, be sure to specify the Fiery's ICC profile as the Printer Profile. ColorSync Color Matching is not a suggested color matching method because it does not work in conjunction with all applications and requires that you disable features of ColorWise on the Fiery.

Setting Fiery color management options

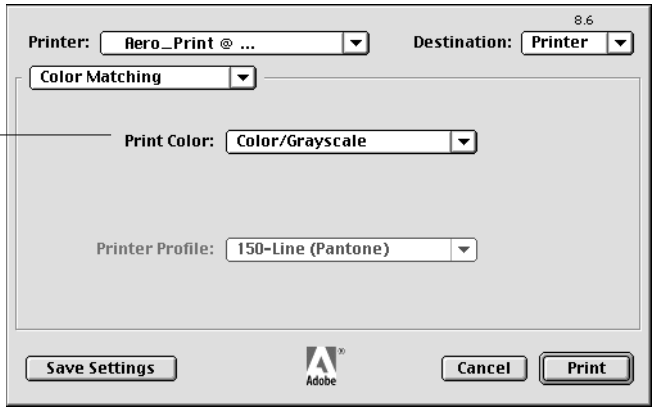
In the AdobePS Print dialog box, choose Color Matching from the pull-down menu.



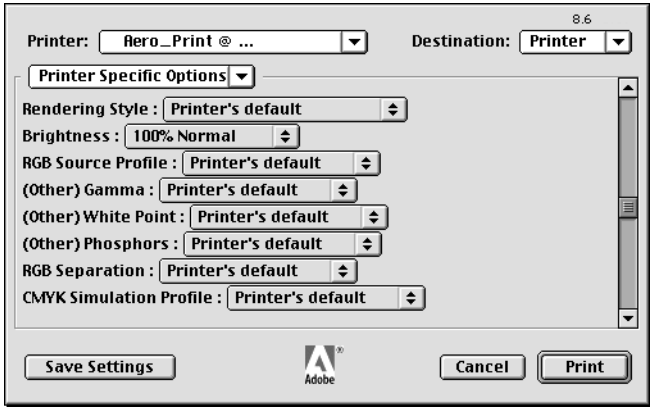
Choose Color Matching from the pull-down menu

In the Color Matching pane, choose Color/Grayscale from the Print Color pop-up menu.

Choose Color/Grayscale



In the Printer Specific Options pane, choose settings for the print options described on page 1-3.



If these settings are ones you use regularly, click Save Settings to save them for subsequent jobs.

Chapter 2: Simple and Advanced Workflows

This chapter discusses color management workflows used in short-run color printing as well as color proofing on the Fiery. It also gives examples of color management in specific desktop applications and the interaction between those applications and ColorWise color management.

NOTE: See Chapter 1 for information on the differences in color management support between the PostScript driver and the PCL driver.

Workflow concepts

The term "**workflow**" is used to describe the path a job follows from its creation in a desktop application to final printed output. It is helpful to think of the following categories when describing workflows:

- Short-run printing versus color proofing for eventual output on an offset press
- RGB, CMYK, and PANTONE color systems
- Desktop color management within an application versus color management on the Fiery, along with the notion that different versions of desktop applications handle color management differently. So it is important to pay close attention to the version of a particular application when considering the workflows in this chapter.

Short-run printing versus color proofing

Short-run color printing refers to those jobs for which the Fiery is the final print device. Printing jobs to the Fiery in preparation for printing on an offset press is referred to as color proofing. Both types of Fiery print jobs use RGB, CMYK, and PANTONE colors.

- For short-run jobs, bright, saturated colors are often desirable. These are achieved by using the full range of colors available, referred to as the full gamut of copier, or more simply copier CMYK. See "Advanced Workflows" on page 2-9 for short-run printing examples.
- Offset jobs proofed on the Fiery require the printed colors to match those from another set of CMYK printing conditions. Colors that are specified for an offset press require CMYK simulation that is optimized for proofing on the copier. See Advanced Workflows on page 2-9 for color proofing examples that simulate the gamut of another digital printer or press standard.

RGB, CMYK, and PANTONE colors

Colors can be defined in several different color models, the most common being RGB, CMYK, and the PANTONE color matching system. Each model requires a different color conversion at the Fiery. These different color conversion workflows are explained below.

- RGB source profiles and color rendering dictionaries are used to map RGB colors through a device-independent color space to a destination space, either the full copier gamut in a short-run printing workflow or CMYK simulation in a color proofing workflow.
- CMYK colors are device-dependent. In a proofing scenario, colors specified in prepress applications are adjusted so the gamut of the Fiery copier can simulate that of the press. In a short-run printing workflow, specifying CMYK colors according to the calibrated copier output eliminates the need for simulation during printing.
- PANTONE spot colors are special inks manufactured to run on an offset printing press. Spot colors can be simulated using CMYK copier toners or process color inks. Two basic workflows exist for printing PANTONE colors to the Fiery:

  Spot Color Matching On instructs the Fiery to match the output of the copier to the PANTONE spot color.

  Spot Color Matching Off instructs the Fiery to match the copier output to a Pantone-specified process simulation. This CMYK combination is then printed with the CMYK Simulation setting you choose, such as SWOP or Custom, and CMYK Simulation Method set to Full.

Desktop versus Fiery color management

A desktop color management system uses ICC profiles to convert colors from one device gamut to the next (see Appendix B). The color data is converted when it is passed from one application to another or when the job is sent to the copier, so the processing occurs on *your computer* as opposed to the Fiery.

One advantage of using ColorWise color management over desktop color management is that your computer is spared the added processing chores; delaying color conversions until the color data reaches the Fiery frees up your computer so you can continue working, and color conversions on the Fiery are in most cases much faster than similar conversions on a host computer.

Managing most or all of your color on the Fiery can also eliminate the potential for undesirable color management-related conflicts, such as iterative color conversions and inconsistent color. The Fiery applies global corrections to specific groups of RGB, CMYK, and PANTONE colors to avoid such conflicts.

Finally, by sending RGB files instead of larger CMYK files from applications to the Fiery, network traffic is minimized and jobs are generally printed more quickly.

ColorWise uses ICC profiles to convert colors to the copier gamut or to simulate other devices such as an offset printing press. ColorWise manages color conversions for all users printing to the Fiery from Windows and Mac OS computers. It lets users follow a simple workflow with minimal intervention using robust default settings, while giving advanced users the control and precision they need.

The Fiery can intelligently manage the printed appearance of RGB, CMYK, and PANTONE colors. You can let the Fiery manage color for most short-run color printing jobs without adjusting any settings.

Simple workflows

Every time you print a document containing colors that were not chosen for your specific copier, those colors need to be converted, which requires color management. Colors can be defined or modified at any stage in the workflow. Since ColorWise is compatible with most other color management systems, you can use the workflow most familiar to you.

This section provides examples of color workflows that should meet the needs of most Fiery users. For information on specific desktop applications, see Chapters 6 through 9.

Select your colors wisely

For the colors you see on your monitor to match those on your printed output, they must go through color management, including precise calibration of your monitor and copier. If you are not equipped or inclined to maintain accurate monitor color management, you may opt for an easier approach. First, determine which is more important for you—printed colors or monitor displayed colors.

If displayed colors are more important, trust your eyes and your monitor. Visually select colors on your monitor, but be aware that colors will be optimized only for your monitor. When the document is opened on other monitors, the colors may look different. And even though printed colors may not match those displayed on your monitor, they will still print on the Fiery with good results.

If printed colors are your priority, choose colors from printed samples. By using these sample colors, your printed output will remain consistent regardless of how the colors appear on different monitors. Print the palette of available colors from business applications and then select colors from the printed samples. The Fiery comes with color reference files on the user software CD (see page 5-2). You can also print the color charts from the Control Panel and select colors by numbers or by name from the printed samples. Advanced applications let you define colors in the easier-to-control PANTONE and CMYK color spaces. See Chapter 5 for more advice on color selection.

No matter which workflow most closely matches your own, you should calibrate your copier regularly (see Chapter 3).

Select a short workflow

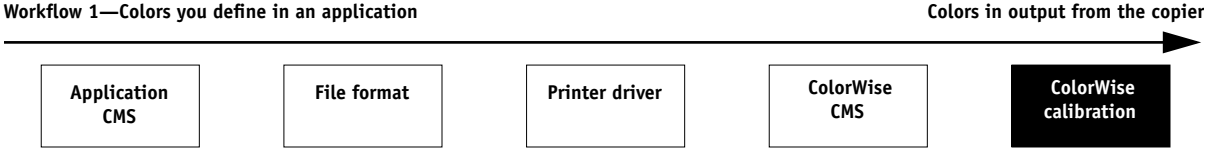
Every time colors are converted, performance and color accuracy are affected. Therefore, a workflow with fewer steps minimizes the risk of error.

Workflow 1 using ColorWise calibration—minimal workflow

A minimal color workflow requires that you calibrate the copier. Select from printed colors as described above, and set the CMYK Simulation option to None, since simulation is not needed when colors are already defined using CMYK values optimized for your calibrated copier.

NOTE: CMYK Simulation set to None is also useful when you want to prepare an output profile of your calibrated copier or when you use less efficient color management from the desktop (such as ColorSync or ICM).

In this workflow, colors are modified only at the calibration stage. This is indicated by the black box in the diagram below.



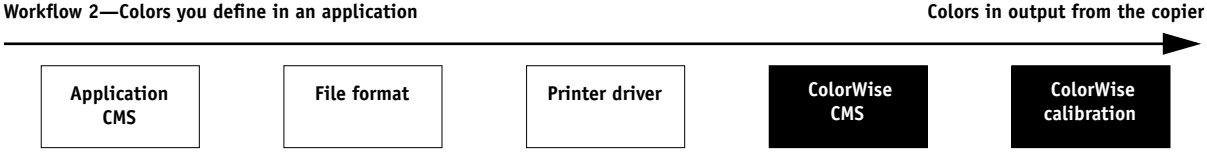
While this workflow lends some control over the color quality produced by the copier, you should consider additional ColorWise color management, as described in the next section.

Workflow 2 using ColorWise color management—standard workflow

Fiery servers are highly optimized for the specific copier they drive, and ColorWise addresses many issues unique to your copier, including screens, individual toner response, interactions among toners, natural smoothness of blends, and the capability to render PANTONE and custom colors. The Fiery distinguishes text and graphic from image elements, so the black channel information is preserved while parameters used for CMYK color separations are maintained.

Conventional color management systems typically address only color conversions, and they occupy your computer's processor. When you use ColorWise, jobs leave your computer faster to be processed more quickly on the Fiery.

The recommended standard color workflow (indicated by the black boxes in the diagram below) uses ColorWise calibration and color management.



The Fiery comes into play near the end of the color workflow. To ensure that the colors you have selected reach the Fiery and ColorWise in a usable form, you should bypass any color management from applications and printer drivers. (Keep in mind, however, that color management from applications and printer drivers is fully supported by ColorWise (see "Advanced workflows" on page 2-9).

You must print with the CMYK Simulation print option set to match the CMYK color space in your application when you selected the colors. Any CMYK Simulation setting (except Match Copy) applies calibration, so the response of the copier will appear to be stable.

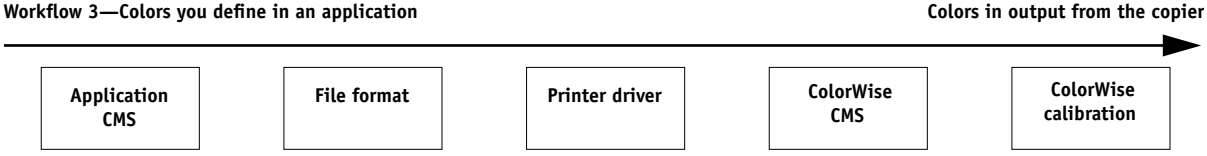
The recommended values for CMYK Simulation are SWOP in America, Euroscale in Europe, and DIC in Japan—choices that respect the color standard for each region. If colors have been selected specifically for your calibrated copier, set CMYK Simulation to None.

See the table on page 1-3 for the list and descriptions of ColorWise print options affecting CMYK, RGB, PANTONE, and other colors.

Workflow 3 bypassing ColorWise—*not* recommended

Bypassing ColorWise color management, while an option, is not a recommended workflow. When you bypass ColorWise, you must choose colors using only CMYK formulas designed specifically for your copier, and you must print with the CMYK Simulation option set to Match Copy. The Fiery still prints pages using your PostScript files, and drives the copier and its accessories, but it does not perform CMYK color transformation, nor does it consider the calibration of the copier. Calibration is needed in order to get consistent output, since the color response from your copier varies significantly depending on wear, heat, humidity, and service.

The diagram below indicates that no modifications are made to colors in this workflow.



Turn off color management in your application

Generally, when printing to the Fiery, it is best to disable color management in the application to ensure that the Fiery receives color data properly and prints it accurately.

Save your files using color-safe settings

There are several additional steps you can take to ensure color accuracy.

- When saving EPS files, do not include PostScript Color Management information. This minimizes the risk conflicting data and multiple color conversions. PostScript Color Management causes your CMYK and RGB colors to be interpreted by the Fiery as though they were supplied in the Lab color space and, as a result, to be processed by CRDs rather than your simulation settings.
- Include ICC color information in files. ColorWise will not conflict with this information, and such data can be useful to identify the specific color space used by your files.

- Do not include halftone and transfer functions.
- Turn off color management in the printer driver.

  On Windows machines, if the printer driver offers Image Color Matching options, select Printer Image Color Matching.

  On Mac OS computers, you should set the printer driver to include *no* color management commands at print time (see page 1-17).

Advanced workflows

The following sections present advanced color management workflow examples for three short-run printing and three color proofing situations. Each workflow example consists of a brief description, steps for creating and manipulating the files, a list of the ColorWise settings used in the example, and a table that summarizes the workflow.

NOTE: These examples use specific software packages to represent image-editing, illustration, page-layout, and business/office applications; they are Adobe Photoshop, Adobe Illustrator, QuarkXPress, and Microsoft PowerPoint, respectively.

Short-run printing examples

The following examples illustrate short-run printing on the Fiery.

Photoshop RGB workflow

This short-run workflow of printing an RGB image from Photoshop is one of the simplest Fiery color workflows. In it, RGB data is sent from the application, through the printer driver, to the Fiery, and the RGB-to-CMYK conversion takes place on the Fiery using a CRD rather than in the application. Use the settings illustrated in this workflow for printing photographs and artwork.

This document could be created as follows:

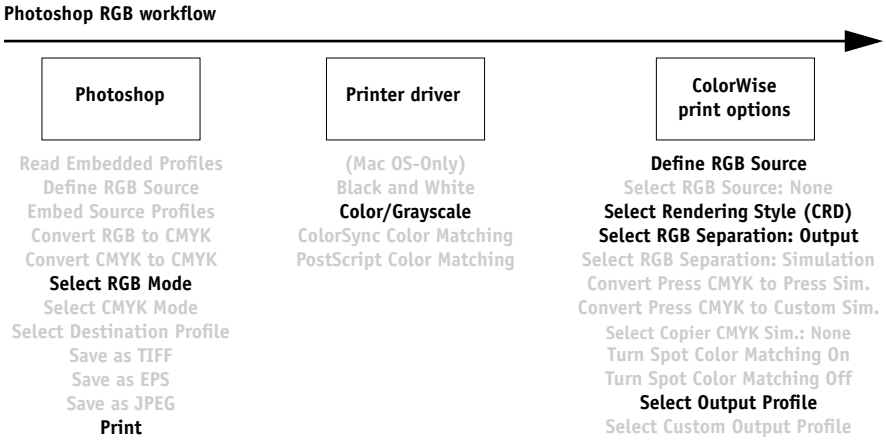
- Create an RGB image in Photoshop.
- Print the file directly to the Fiery.

  See Chapter 7 for recommended print settings from Photoshop.
- Use ColorWise to convert the RGB image to copier CMYK, or the full gamut of copier.

The ColorWise settings used in this example are:

- RGB Source Profile set to EFIRGB or another RGB source definition
- Rendering Style set to Photographic
- RGB Separation set to Output

The diagram below indicates the steps for this particular workflow in black.



Photoshop RGB with Illustrator and QuarkXPress CMYK and PANTONE colors

This workflow involves short-run printing of a complex page layout with images saved in Photoshop, illustrations created in Illustrator, and PANTONE spot colors. A Photoshop image is saved in an RGB color space using the EPS file format. Illustrator artwork contains objects defined as CMYK and as PANTONE spot colors selected from printed output, and they are saved using the Illustrator EPS file format. After all of these individual objects are imported into QuarkXPress, additional design elements in QuarkXPress are colored using CMYK process colors or PANTONE spot colors. Use the settings illustrated in this workflow for printing brochures, newsletters, and other layouts.

NOTE: Anytime CMYK colors are placed in a document, they should be selected from printed output (see page 2-4).

This document could be created as follows:

- Create an RGB image in Photoshop and save it as an EPS.
- Create a graphic in Illustrator using CMYK and PANTONE colors and save as Illustrator EPS.
- Use CMYK colors and a PANTONE color in a QuarkXPress document.
- Import the Illustrator EPS into QuarkXPress and place the Photoshop EPS image.
- Print the QuarkXPress document to the Fiery.
- Use ColorWise to convert the RGB image to copier CMYK, to adjust the process colors for short-run printing, and to match the PANTONE spot colors using the full copier gamut.

The ColorWise settings used in this example are:

- RGB Source Profile set to EFIRGB or another RGB source definition
- Rendering Style set to Photographic
- RGB Separation set to Output
- CMYK Simulation None
- Spot Color Matching set to On

The diagram below indicates the steps for this particular workflow in black.

Photoshop RGB workflow with Illustrator, QuarkXPress CMYK, and PANTONE colors

Photoshop	Illustrator	QuarkXPress	Printer driver	ColorWise print options
Read Embedded Profiles	Read Embedded Profile	Read Embedded Profile	(Mac OS-Only)	**Define RGB Source**
Define RGB Source	Define RGB Colors	Define RGB Colors	Black and White	Select RGB Source: None
Embed Source Profiles	**Define CMYK Colors**	**Define CMYK Colors**	**Color/Grayscale**	**Select Rendering Style (CRD)**
Convert RGB to CMYK	**Define PANTONE Colors**	**Define PANTONE Colors**	ColorSync Color Matching	**Select RGB Separation: Output**
Convert CMYK to CMYK	Convert RGB to CMYK	Convert RGB to CMYK	PostScript Color Matching	Select RGB Separation: Simulation
Select RGB Mode	Convert PANTONE to CMYK	Convert CMYK to CMYK		Convert Press CMYK to Press Sim.
Select CMYK Mode	Embed Source Profile	Convert PANTONE to CMYK		Convert Press CMYK to Custom Sim.
Select Destination Profile	Select Destination Profile	Embed Source Profile		**Select Copier CMYK Simulation: None**
Save as TIFF	Export as TIFF	Select Destination Profile		**Turn Spot Color Matching On**
Save as EPS	**Save as EPS**	Export as TIFF		Turn Spot Color Matching Off
Save as JPEG	Print	Save as EPS		**Select Output Profile**
Print		**Print**		Select Custom Output Profile

Photoshop RGB with Illustrator CMYK and PANTONE and PowerPoint RGB

This workflow involves short-run printing of a complex presentation document with images saved in Photoshop, illustrations created in Illustrator, and PANTONE spot colors. All elements are imported into PowerPoint for output.

This document could be created as follows:

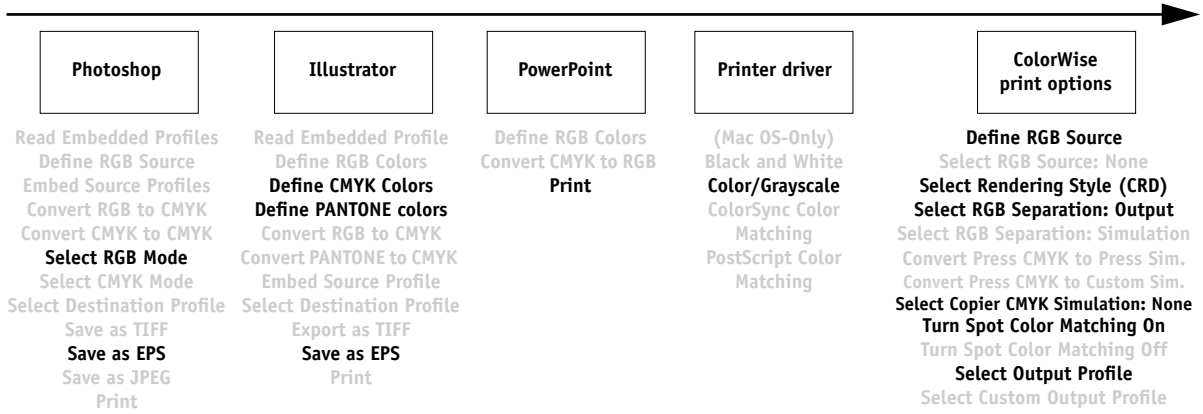
- Create an RGB image in Photoshop and save it as Photoshop EPS.
- Create a graphic in Illustrator using CMYK colors and a PANTONE spot color and save as Illustrator EPS.
- Create a presentation in PowerPoint using RGB colors.
- Import the Illustrator EPS graphic into the PowerPoint presentation and place the Photoshop EPS image.
- Print the PowerPoint document to the Fiery.
- Use ColorWise to convert the PowerPoint RGB colors and Photoshop RGB image to copier CMYK, to adjust the process colors for more saturated short-run printing, and to match the PANTONE spot colors using the full copier gamut.

The ColorWise settings used in this example are:

- RGB Source Profile set to EFIRGB or another RGB source definition
- Rendering Style set to Presentation
- RGB Separation set to Output
- CMYK Simulation NONE
- Spot Color Matching set to On

The diagram below indicates the steps for this particular workflow in black.

Photoshop RGB and Illustrator CMYK and PANTONE in PowerPoint RGB workflow



Color proofing examples

The following examples illustrate methods for simulating the output from another printing system, such as an offset press. Each of the proofing examples uses an ICC profile to describe the destination color space. While some examples use simulation profiles built in to the Fiery, others use ColorWise Pro Tools (see Chapter 4) to download custom ICC output profiles to the Fiery for use as simulation profiles.

Photoshop 5.x RGB-to-CMYK conversion using a custom ICC profile

This workflow is useful for prepress environments that have integrated ICC color management and have profiles for the presses they use. In this example, an image in Photoshop 5.x is converted from RGB to CMYK using Photoshop's ICC color conversion features in the CMYK Setup option. (For more information on CMYK Setup, see your Photoshop 5.x documentation.) Using the Simulation settings available in ColorWise, the CMYK image is printed to the Fiery, and the output is made to appear as if it were printed on an offset press.

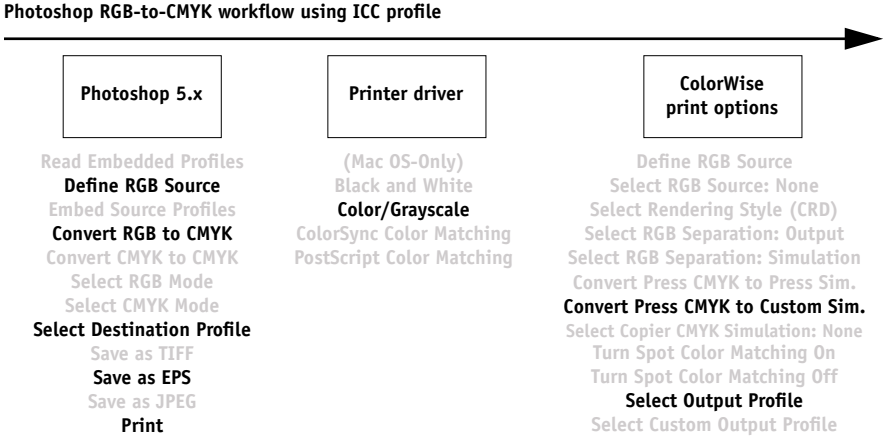
This document could be created as follows:

- In Photoshop 5.x, set CMYK Model in CMYK Setup to ICC.
- In the Profile menu, select an ICC profile for the desired offset press. Click OK.
- Open an RGB image. From the Image pull-down menu select Mode>CMYK Color.
- Save the image in any file format.
- Print directly to the Fiery.
- Use ColorWise Pro Tools to select a simulation profile or download a custom ICC profile to the Fiery for use as a CMYK Simulation Profile.

The ColorWise settings used in this example are:

- CMYK Simulation Profile set to the desired press standard or to the corresponding custom simulation (Simulation 1-10) if you downloaded your profile with ColorWise Pro Tools
- CMYK Simulation Method set to Full

The diagram below indicates the steps for this particular workflow in black.



Photoshop 5.x Built-in RGB-to-CMYK workflow

This workflow is useful for prepress environments that have *not* integrated ICC color management and do not have profiles for the presses they use. In this example, an image is converted from RGB to CMYK using Photoshop 5.x's Built-in color conversion features in the CMYK Setup option. (For more information on CMYK Setup, see your Photoshop 5.x documentation.) Using the Simulation settings available in ColorWise, the CMYK image is printed to the Fiery, and the output is made to appear as if it were printed on an offset press.

This document could be created as follows:

- Select the Built-in radio button from CMYK Setup in Photoshop 5.x Color Settings.
- Adjust the Ink Options and Separation Options to match your offset press.
- Select the Tables radio button in CMYK Setup and click Save.

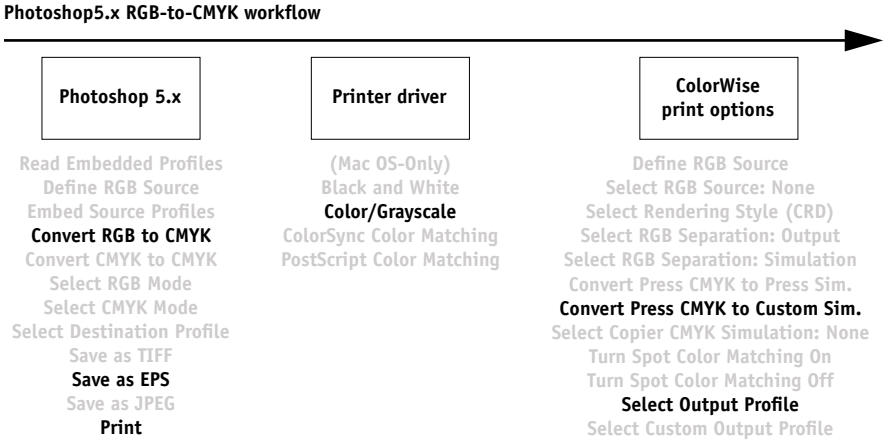
  This saves your settings as a CMYK ICC profile that you will later download to the Fiery as a custom simulation profile.
- Click on the Built-in radio button in CMYK Setup again and click OK.
- Launch ColorWise Pro Tools and download your new CMYK ICC profile to the Fiery as a custom Simulation profile.

  For the Appear in Driver as option in Profile Settings, select Simulation-1. (For more information on downloading profiles, see page 4-5.)
- Open an RGB image in Photoshop 5.x. From the Image menu, select Mode >CMYK Color. Save the image as Photoshop EPS.
- Print the image directly to the Fiery and choose Simulation-1 as the CMYK Simulation Profile setting.

The ColorWise settings used in this example are:

- CMYK Simulation Profile set to Simulation-1
- CMYK Simulation Method set to Full

The diagram below indicates the steps for this particular workflow in black.



Photoshop RGB and QuarkXPress CMYK

This workflow exemplifies the use of the RGB Separation feature of ColorWise. An RGB image, originally saved in Photoshop, is printed to the Fiery from QuarkXPress. To simulate how the RGB image would print on an offset press, the RGB Separation feature of ColorWise is set to Simulation. This workflow—useful for proofing brochures, newsletters, and other layouts—lets you maintain consistency by using the source RGB file for multiple purposes.

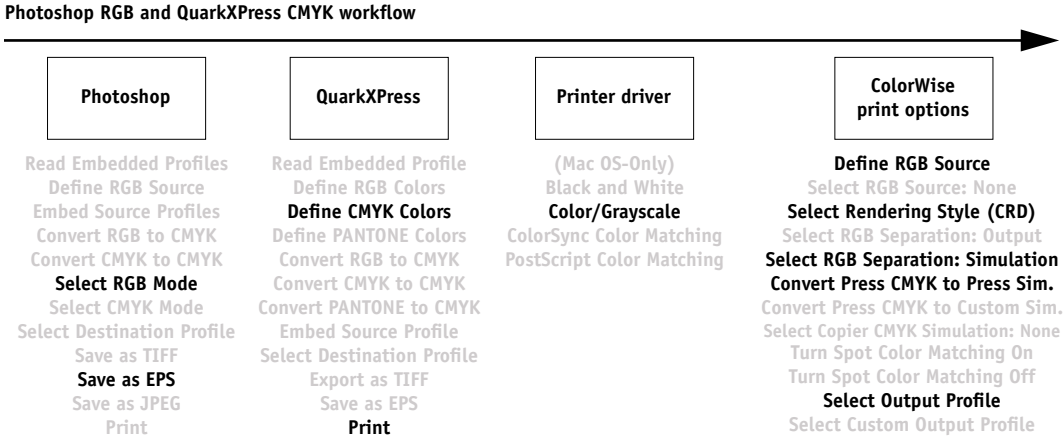
This document could be created as follows:

- Create an RGB image in Photoshop and save it as Photoshop EPS.
- Place the EPS image in a QuarkXPress document.
- Create several process-colored page elements alongside the image and print.
- Use ColorWise to convert the RGB image to simulated press CMYK and to adjust the process colors for proofing to the copier.

The ColorWise settings used in this example are:

- RGB Source Profile set to EFIRGB or another RGB source definition
- Rendering Style set to Photographic
- RGB Separation set to Simulation
- CMYK Simulation Profile set to SWOP
- CMYK Simulation Method set to Full

The diagram below indicates the steps for this particular workflow in black.



Chapter 3: Color Calibration

Calibrating the Fiery ensures consistent, reliable color output. You can calibrate the Fiery with ColorWise Pro Tools using an X-Rite DTP32 automatic scanning densitometer (available as an option). By connecting the densitometer to the serial port on your computer, you can quickly measure color patches and download measurements to the Fiery. You can also obtain measurements from the copier's built-in scanner and calibrate using AutoCal2 which does not require the use of a densitometer and can be run from ColorWise Pro Tools or from the Control Panel.

NOTE: See Chapter 1 for information on the differences in color management support between the PostScript driver and the PCL driver.

This chapter explains how **calibration** works and provides instructions for all calibration procedures. Calibrating with ColorWise Pro Tools is described on page 3-9; calibrating from the Fiery Control Panel with AutoCal2 is described on page 3-15.

For information on advanced calibration and simulation features available with ColorWise Pro Tools, such as editing profiles and creating custom profiles, see Chapter 4. A format for inputting color measurements from other densitometers is described in Appendix C.

The procedures described in Chapters 3 and 4 are fundamentally the same for Windows 95/98, Windows NT 4.0, and Mac OS computers, including those running Command WorkStation software. The main differences are the interface cable and the port used to connect to the densitometer.

NOTE: The term *computer* is used to refer to any computer running ColorWise Pro Tools.

Introduction

Calibration generates curves that adjust for the difference between the actual toner densities (measurements) and the response expected by the output profile.

- Measurements represent the actual color behavior of the copier.
- Calibration sets are sets of measurements.

- A calibration target that describes the expected behavior of the copier is contained in each output profile.

Once you have calibrated the Fiery with ColorWise Pro Tools or with AutoCal2 from the Fiery Control Panel, a calibration set is stored on the Fiery. This calibration set will be used when it is associated with an output profile. Every output profile has an associated calibration set. If you have not specified one, the calibration set associated with the default output profile is used.

NOTE: Changing calibration has the potential to affect *all* jobs for *all* users, so you may want to limit the number of people authorized to perform calibration. An Administrator password can be set from the Fiery Control Panel or in Setup from the Command WorkStation to control access to calibration.

Understanding calibration

Although most users' needs are met by the default calibration set, the Fiery allows you to choose a calibration set to customize calibration for specialized jobs.

Calibration allows you to:

- Maximize the color reproduction capabilities of the Fiery
- Ensure consistent color quality over time
- Produce consistent output across Fiery servers that are connected to the same print engine
- Achieve better color matches when reproducing spot colors such as PANTONE colors or other named color systems
- Optimize the Fiery for using ColorWise rendering styles (CRDs) and CMYK simulations, and for using ICC profiles

How calibration works

Success in obtaining satisfactory print quality from a color server such as a Fiery connected to a copier depends on many factors. Among the most important are establishing and maintaining optimal toner densities. Density is a measure of the light absorbed by a surface. By carefully regulating toner densities, you can obtain consistent printed color.

Even with a calibrated system, toner density is affected by service settings, humidity, and temperature; it also tends to drift over time. Regular measurement detects day-to-day variations in densities, and calibration corrects for them.

Calibration works by creating calibration curves on the Fiery that compensate for the difference between actual (measured) and desired (target) density values.

Calibration curves are the graphic equivalent of transfer functions, which are mathematical descriptions of changes that will be made to the data you start with. Transfer functions are often graphed as input or output curves.

The Fiery generates calibration curves after comparing measured values to the final target values for each of the four toner colors. The target values are based on the output profile specified.

Measurements

Measurement files contain numerical values that correspond to the toner density produced by the copier when it prints solid cyan, magenta, yellow, and black, and graduated tints of those colors.

To create a measurement file, first print a page of color patches from ColorWise Pro Tools or from the Control Panel to the copier. Then measure the patches using either an X-Rite DTP32 densitometer connected to a computer on the network or the copier's scanner. The new measurements are automatically downloaded to the Fiery.

Output profiles and calibration sets

Output profiles and calibration sets define desired calibration results. One or more output profiles and one or more calibration sets are provided with the Fiery. When you calibrate the Fiery, you can select the calibration set that corresponds to the typical printing jobs at your site. This same calibration set can be associated with one or more output profiles. (For more information on output profiles, see page 1-9.)

Scheduling calibration

In general, you should calibrate the Fiery at least once a day, depending on the volume of print jobs. If it is very important to maintain consistent color, or if the copier is subject to wide fluctuations in temperature or humidity, calibrate every few hours. To get the best performance, calibrate whenever there is a noticeable change in print quality.

If you need to split a print job into two or more batches to be printed at different times, it is especially important to calibrate before printing each batch. You should also calibrate the Fiery after copier maintenance. However, because the copier may be less stable immediately after maintenance, wait until you have printed approximately 50 pages before you calibrate.

NOTE: Since printed output from the copier is very sensitive to changes in temperature and humidity, the copier should *not* be installed near a window or in direct sunlight, near a heater or air conditioner. Paper is sensitive to climate changes as well. It should be stored in a cool, dry, stable environment, and reams should remain sealed until they are needed.

Print color reference pages, such as the Color Charts (from the Control Panel or from the Command WorkStation) and the color reference pages included with the user software (see *Getting Started*). All of these pages include fully saturated color patches and pale tints of cyan, magenta, yellow, and black. Images with skin tones offer a very good basis for comparison. You can save and compare pages you printed at different times. If there is a noticeable change in appearance, you should calibrate the Fiery.

If the solid density patches (100% cyan, magenta, yellow, or black) look less saturated with time, show the pages to your copier service technician to find out whether adjusting the copier can improve output.

Checking calibration status

You can check whether the Fiery is calibrated, which calibration set and output profile were used, and when the copier was last calibrated:

- Print a Configuration page or Test Page from the Control Panel or the Command WorkStation.
- When you select a calibration set in Calibrator, the last calibration and the user who performed it are displayed.

Using a densitometer

ColorWise Pro Tools are designed to work with the X-Rite DTP32 reflection densitometer where color measurements are entered automatically.

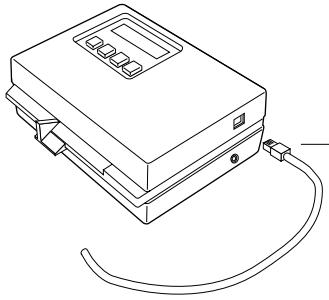
NOTE: Measurements from other densitometers can be input using a simple ASCII file format (see page C-1).

Setting up the densitometer

Before you calibrate the Fiery, you need to connect, configure, and calibrate the densitometer to prepare for measuring the printed patches (see "Calibrating the densitometer" on page 3-8). For additional information about setting up and using the densitometer, see the documentation included with it.

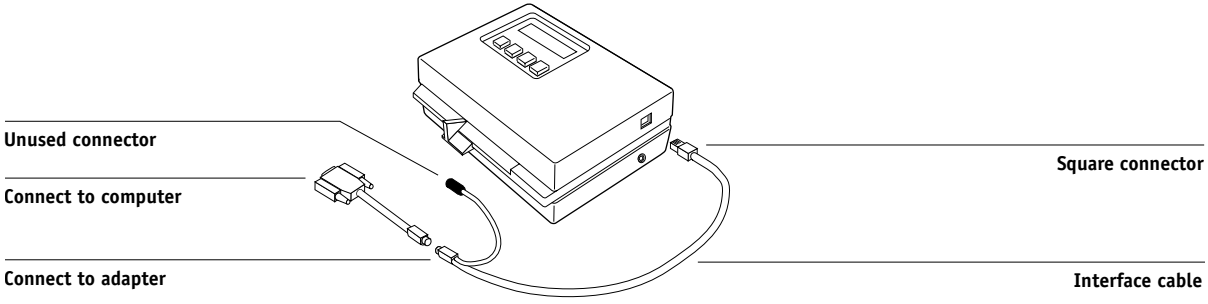
TO CONNECT THE X-RITE DTP32 TO THE COMPUTER:

1. **Turn off the computer.**
2. **Plug the square end of the interface cable (looks like a modular phone plug) into the I/O port on the side of the X-Rite DTP32.**

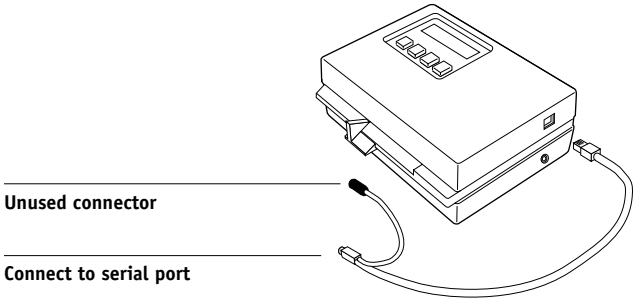


3. **Attach the connector to the computer.**

   For a Windows computer, insert the 8-pin mini-DIN end of the interface cable into the 9-pin DB9 Connector cable adapter. Insert the 9-pin end into the COM1 or COM2 port on the computer and tighten the screws. If the available port on your computer is 25-pin, you must use the 8-pin-to-25-pin adapter.



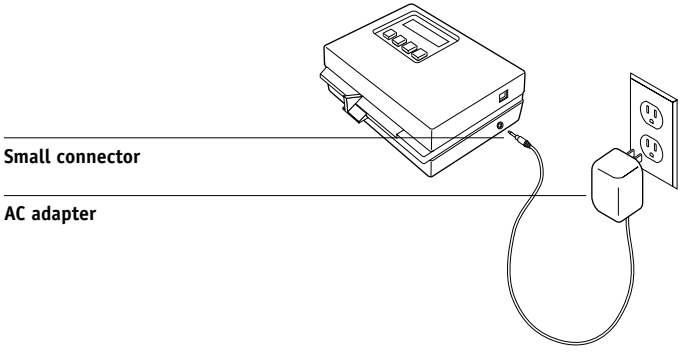
For a Mac OS computer, connect the 8-pin mini-DIN plug directly into the serial port of the computer.



NOTE: For Macintosh computers with a USB port (for example, an iMac) you need an adapter to connect the DTP32 to your computer. See the X-Rite, Inc. web site (www.x-rite.com) for information on supported adapters.

4. **Use the AC adapter to provide power.**

   Plug the small connector on the adapter cable into the side of the X-Rite DTP32 and plug the adapter into a wall outlet.



5. **Turn on the computer.**

6. **Calibrate the densitometer (see below).**

7. **Use ColorWise Pro Tools to calibrate the Fiery (see page 3-9).**

Calibrating the densitometer

You will need the black-and-white X-Rite Auto-Cal Strip included with the densitometer. Calibrating the densitometer does not require ColorWise Pro Tools.

TO CALIBRATE THE X-RITE DTP32:

1. **Connect the densitometer to the computer and supply power (see page 3-5).**
2. **From the Main Menu on the X-Rite DTP32 display, press the p1 key once to reach p2.**
3. **Press the cal key.**

   Calibrating motor speed is displayed, followed by the words INSERT CAL STRIP.
4. **Insert the arrow end of the X-Rite Auto-Cal Strip into the 35mm slot on the front of the X-Rite DTP32 until it stops or the roller starts pulling the strip.**

   Reading appears momentarily, followed by the density values and CALIBRATION OK. The densitometer automatically returns to the MAIN MENU.

   If UNRECOGNIZABLE STRIP appears, repeat the process or try cleaning the strip (see the X-Rite DTP32 Operating Manual).
5. **Start ColorWise Pro Tools and proceed to calibrate the Fiery (see the next section).**

   Recalibrate the densitometer at least once per month. For critical color, calibrate the densitometer every time you calibrate the Fiery. The densitometer may also warn periodically that it requires calibration.

Calibrating with ColorWise Pro Tools

Using the densitometer or AutoCal2, you can quickly measure color patches and download these measurements to the Fiery using ColorWise Pro Tools Calibrator.

NOTE: Multiple users can be connected to one server with ColorWise Pro Tools, but only one user at a time can use Calibrator. An error message appears if you try to calibrate when another user is already using ColorWise Pro Tools to calibrate.

ColorWise Pro Tools for Windows and Mac OS computers are fundamentally the same; differences are noted in this chapter. The windows and dialog boxes you see illustrated are the Windows version.

NOTE: Changing the calibration has the potential to affect *all* jobs for *all* users, so you may want to limit the number of people authorized to perform calibration. An Administrator password can be set from the Fiery Control Panel to control access to calibration.

TO CALIBRATE THE COPIER USING CALIBRATOR:

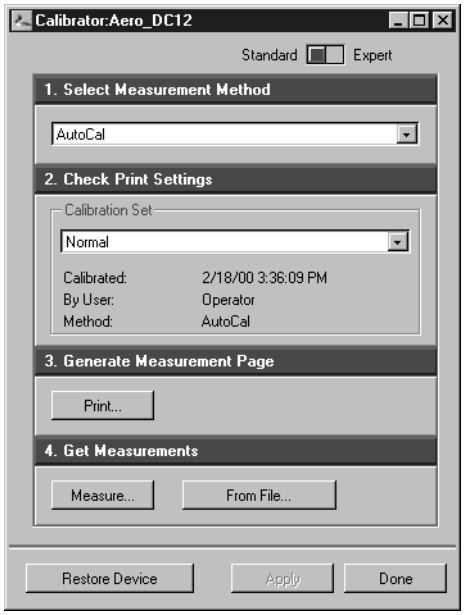
1. **Launch ColorWise Pro Tools and connect to the Fiery.**

For instructions on configuring the connection to the Fiery, see *Getting Started*.

2. **Click Calibrator.**

3. **Select a measurement method.**

   AutoCal2 and X-Rite DTP32 should appear as the measurement methods. This information is provided to Calibrator by the Fiery. If neither option appears, make sure you are connected to the Fiery.



4. **Under Check Print Settings, choose the desired calibration set.**

   Choose the appropriate calibration set for the type of media you will use most often.

   NOTE: For this calibration to take effect, the calibration set must be associated with one or more output profiles. The default calibration set is already associated with the default output profile, so there is no need to make any new associations.

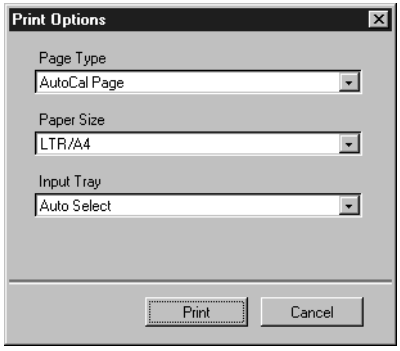
5. **Under Generate Measurement Page, click Print.**

6. **In the Print Options dialog box that appears, choose the page type, paper size, and input tray to use for the measurement page and click Print.**

   For AutoCal2, the Page Type pop-up menu states AutoCal Page. For the densitometer method, select either 34 or 21 Sorted Patches.

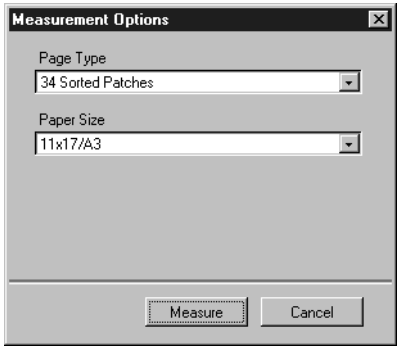
In the Paper Size pop-up menu, specify the paper size for the measurement page: For AutoCal, LTR/A4 appears in this menu. For densitometer, the menu will automatically select LTR/A4 for 21 Sorted Patches or 11x17/A3 for 34 Sorted Patches.

In the Input Tray pop-up menu, specify the paper source.



7. **Under Get Measurements, click Measure.**

   If you chose the densitometer method, select the Page Type and Paper Size options you selected for the measurements page, and click Measure.



8. **Follow the directions for either AutoCal2 or densitometer measurement based on your selection of measurement method.**

9. **When you are notified that the measurements were read successfully, click OK, and then click Apply to implement the new calibration set.**

TO RESTORE DEFAULT CALIBRATION MEASUREMENTS:

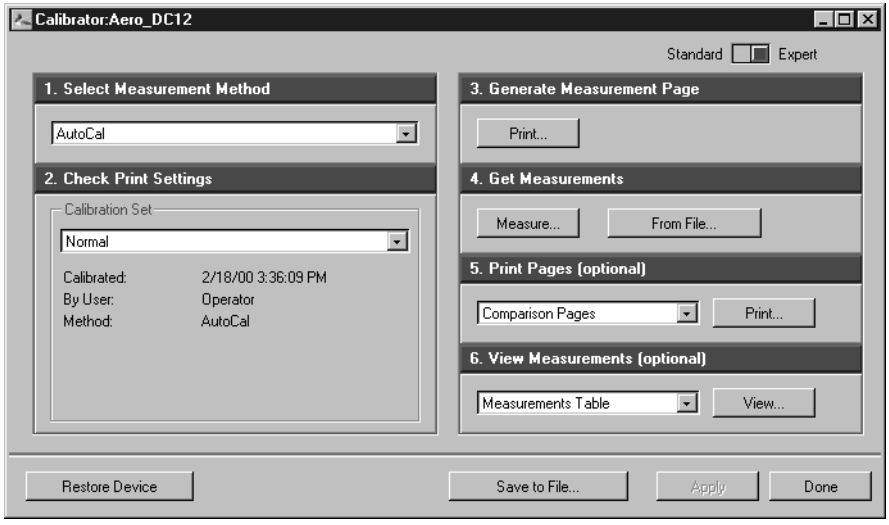
1. **Launch ColorWise Pro Tools and click Calibrator.**
2. **Click Restore Device.**

3. **Click OK to restore the preset default calibration set.**

   NOTE: Restore device applies only to the currently selected calibration set.

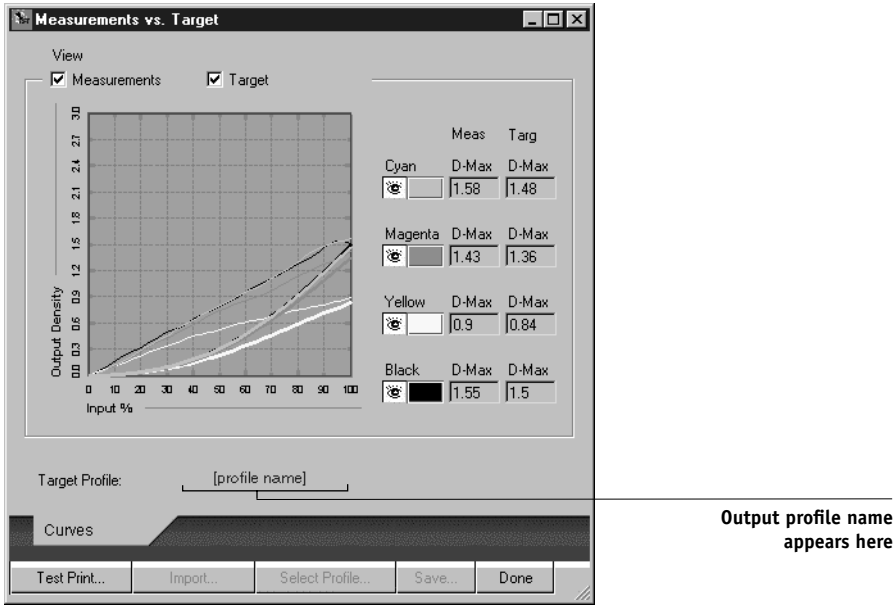
Expert Mode

Expert Mode offers two additional options: Print Pages and View Measurements.



With the Print Pages option, you can print a calibration Comparison Page showing the results of the new measurements with any profile associated with the currently selected calibration set. You can also create a custom comparison page and save it as a PostScript or an Encapsulated PostScript (EPS) file called CALIB.PS. Then print the file to the Hold Queue of the Fiery from your application or download it to the Hold Queue with Fiery Downloader. An additional way to create the CALIB.PS file is to rename any job in the Hold Queue using Command WorkStation.

With the View Measurements option, you can view the current set of measurements as a table or as a graph that shows both the measurements and the target curves (shown below).



When more than one profile use the same target, an additional menu called Plot Against appears at the top right of the window above. It lists all output profiles that use that same calibration set. Selecting an output profile from this menu displays the target curves associated with that profile. If each output profile contains a unique calibration target, when you switch profiles, the curves displayed also change.

Calibrating from the Control Panel using AutoCal2

You can calibrate the Fiery from the Control Panel using AutoCal2, which calibrates the Fiery using the copier's built-in scanner as a densitometer. If an Administrator password has been set, you will need it for calibration.

For instructions on using the Fiery Control Panel, see the *Configuration Guide*.

For troubleshooting during the AutoCal2 procedure, see the *Job Management Guide*.

NOTE: To calibrate using AutoCal2, you will need the Kodak Gray Scale strip included in the customer media pack that came with your Fiery.

TO ACCESS AND USE AUTOCAL2:

1. **At the Idle screen, press the Menu button to enter the Functions menu.**
2. **Choose Calibration, and choose Set Up Calibration.**

   If a password is set on the Fiery, enter it and press OK.
3. **For Calibration Mode, select Standard or Expert.**

   Expert Mode adds the option to print a Comparison Page (see page 3-13).
4. **For Tray, choose the paper source for the patch page and press OK.**

   Select LTR/A4 from the Fiery Control Panel.
5. **Choose Calibrate.**
6. **Select the calibration set.**

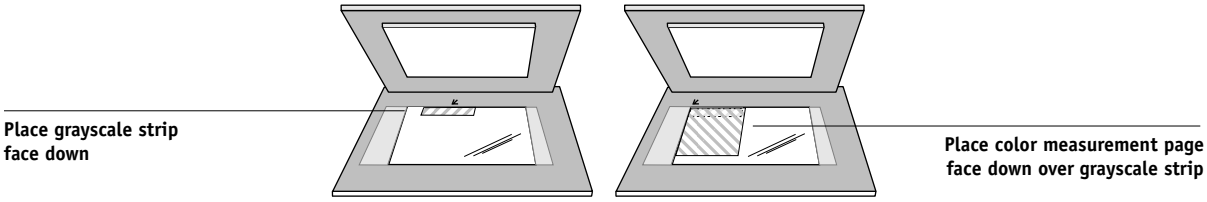
   You can choose from the list of all calibration sets on the Fiery. This screen appears only if more than one calibration set is available.
7. **When prompted, select Yes to print the measurement page.**

   This page is comprised of swatches of color that will be measured by the copier and then compared to the target color values. After the page is printed, the Measure Page screen is displayed.

8. **Select Yes in the Measure Page screen.**

9. **When prompted on the Control Panel, place the Kodak Gray Scale strip face down along the top of the copier glass.**

   Place the strip so that it will be centered along the top edge of the AutoCal page.



10. **Place the color measurement page face-down over the grayscale strip.**

    Place the page at the upper left-hand corner of the copier glass. Slide the grayscale strip to the top center of the color measurement page. Make sure the patches on the grayscale strip do not overlap the color patches.

11. **Close the platen glass cover, being careful not to move the grayscale strip and color measurement page.**

12. **Click OK.**

    Status messages display the progress of scanning and calculating measurements.

13. **When prompted to Print Comparison Page (Expert Mode only), select Yes to print a preview of the selected calibration.**

    Select from a list of output profiles that use the same calibration set and press OK. This option appears only in Expert Mode calibration.

14. **When prompted to overwrite calibration, select Yes.**

15. **Select Yes to confirm.**

    Status messages display progress information. When calibration is complete, the LCD screen returns to the Functions menu.

Chapter 4: ColorWise Pro Tools

ColorWise Pro Tools are color management applications that give you flexible control of color printing. There are three tools:

- Calibrator (see Chapter 3)
- XP12 Color Editor
- Profile Manager

ColorWise Pro Tools for Windows and Mac OS computers are fundamentally the same; differences are noted in this chapter. The windows and dialog boxes illustrated are the Windows version. For information on installing and configuring a connection to ColorWise Pro Tools, see *Getting Started*.

NOTE: See Chapter 1: for information on the differences in color management support between the PostScript driver and the PCL driver.

Profile Manager

Profile Manager allows you to manage and edit ICC profiles. In the case of the Fiery, these profiles are divided into RGB Source, Simulation, and Output profiles.

- **RGB Source** contains all monitor profiles resident on the Fiery. RGB Source profiles are used to define the source color space for RGB colors processed by the Fiery.
- **Simulation** contains printer profiles used to simulate another device on the Fiery.
- **Output** contains copier profiles that describe the attached copier. For more information on output profiles, see page 1-9.

NOTE: Changing the Fiery default profiles affects *all* jobs for *all* users, so you might want to limit the number of people authorized to use ColorWise Pro Tools by setting an Administrator password.

Several profiles are provided with the Fiery, and you can create additional ones as needed by modifying the existing ones. You can also download profiles from any workstation to the Fiery. The profiles provided are:

RGB Source:

- **sRGB (PC)**—source color space for a generic Windows computer monitor
- **Apple Standard**—standard source color space for Mac OS computer monitors with older versions of ColorSync
- **EFIRGB**—preset default setting for a Fiery

Simulation:

- **SWOP-Coated**—the United States press standard
- **Euroscale**—the European press standard
- **DIC**—the Japanese press standard

Output:

- **Fiery DocuColor 12**—profile that describes the copier
- **Fiery DocuColor 12 HiGCR** —profile that describes the copier, but with a higher level of black generation than the preset default profile (should be used if gray balance is of a higher priority than print quality)
- **Fiery DocuColor 12 Max PPM K**—profile that describes the copier but ensures that equal levels of red, green, and blue will be printed as black-only at 50 pages per minute. Use this profile if you are printing documents that contain both color and black-and-white pages and you want to make sure that the copier prints at the highest speed for each type of page.

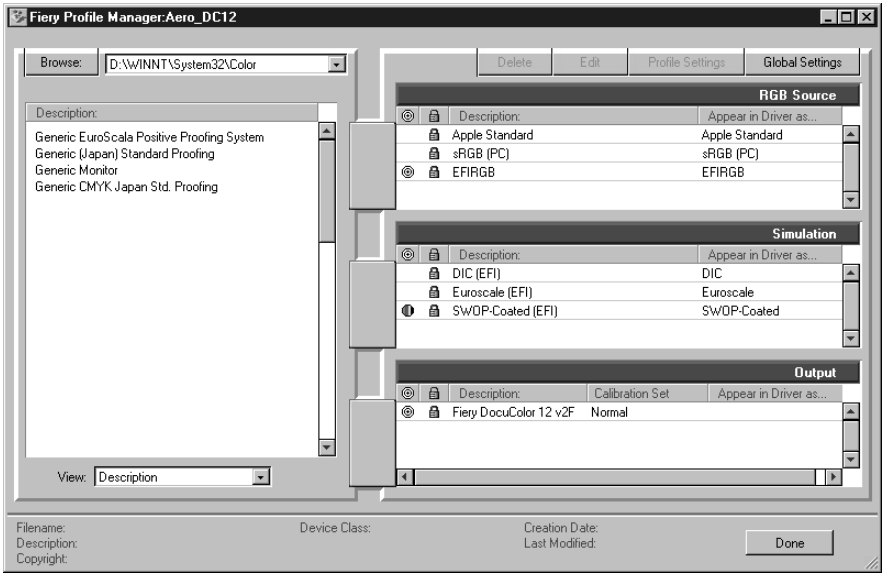
NOTE: Fiery DocuColor 12 is built into the Fiery; Fiery DocuColor 12 HiGCR and Fiery DocuColor 12 Max PPM K can be found on the User CD in the ICM folder (Windows) or ColorSync folder (Mac OS).

Setting the default profiles

The default profiles are applied to all print jobs sent to the Fiery, unless you override them using print options. Therefore, the defaults should be the most commonly used profiles.

TO SPECIFY A DEFAULT PROFILE:

1. **Launch ColorWise Pro Tools and click Profile Manager.**



The left side of the screen lists the ICC profiles in the default directory of your computer. The right side lists each of the three types of profiles on the Fiery.

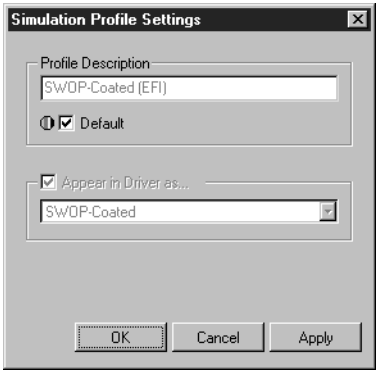
The lock icon (🔒) to the left of a profile name indicates that the profiles cannot be deleted and can be edited only if it is saved under a new name. Only Simulation and Output profiles can be edited.

A small icon to the left of a profile name indicates the default profile for each category (RGB Source, Simulation, and Output). If you designate a different profile as the default, the icon appears next to your designated profile. The icon indicating the default RGB Source and Output profiles looks like a target (◎). The icon indicating

the default Simulation profile changes in appearance depending on whether the RGB Separation setting in the Global Settings dialog box is set to Simulation ( ) or Output ( ).

2. **Select the profile you want as the default for a profile type, and click Profile Settings.**

3. **In the Profile Settings dialog box, click Default and click Apply.**



4. **Click OK.**

5. **In the main Profile Manager window, the target icon appears next to the new default profile you specified. Repeat steps 2 through 4 for each type of profile.**

If no default is set for RGB Source, then the RGB Source print option is set to None. If no default profile is set for Simulation, then the CMYK Simulation print option is set to None. For more information on print options, see Chapter 1.

For Output there is always a default profile. You can change the Output default by selecting a preset profile you want as the default and clicking Profile Settings. Or you can create a new default under a new name by selecting a preset profile and specifying your choice of the calibration set in the Use Calibration Set pop-up menu and a new name in the Profile Description menu.

Downloading profiles

The Fiery comes with default profiles. It is possible to download additional profiles from any computer connected to the Fiery.

TO DOWNLOAD A PROFILE:

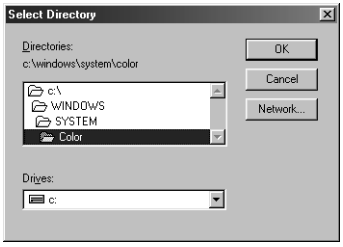
1. **Launch ColorWise Pro Tools and click the Profile Manager.**

   The left side of the main Profile Manager windows lists the ICC profiles in the default directory of your workstation.

   For Windows 95/98, the default directory is \Windows\System\Color.
   For Windows NT 4.0, the default directory is \Winnt\System32\Color.
   For Mac OS, the default directory is System Folder:Preferences:ColorSync™ Profiles for ColorSync 2.0, and System Folder:ColorSync™ Profiles if you have ColorSync 2.5 or later.

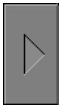
2. **If the desired profile does not appear, click Browse to go to a different directory.**

   Browse to the directory containing the profile you want to download and click OK.



3. **When the profile you wish to download appears in the list in the main Profile Manager window, select it.**

   If the profile is compatible with the Fiery, a green arrow indicates that the profile is available for download. Only output device profiles are downloadable to Simulation and Output. Only input device profiles are downloadable to RGB Source.



   NOTE: On Windows computers, the profiles must have an extension of .icc or .icm to be listed. On Mac OS computers, the profiles must have a file type of profile.

   All ICC profiles in the selected directory on your computer are displayed in the list in the main Profile Manager window. However, because a profile is listed does not necessarily mean it can be downloaded to the Fiery.

   Simulation profiles should be only profiles of devices for which you want the Fiery to match in terms of color output characteristics. Output profiles should be only profiles of the device to which your Fiery is connected. Although CMYK printer profiles can be downloaded as Simulation or Output, consider how they will be used. If you want the Fiery prints to look like another printer, download that profile as a Simulation. If you have a custom profile of the copier your Fiery is connected to, download that profile as an Output profile.

4. **Click the arrow to download the profile and click OK when the download is complete.**

   The new profile now appears on the list of profiles on the right side of the Profile Manager main window.

   This profile must be associated with one of the predefined names (Source-1 through 10 for RGB Source, Simulation-1 through 10 for Simulation, or Output-1 through 10 for Output) or set as the default before it can be used. See “Defining profiles” on page 4-8.

   NOTE: When an output profile is downloaded, it inherits the calibration target of the current default output profile.

XP12 Editing profiles

The profiles on the Fiery can be customized to meet your specific needs and the characteristics of your copier using Color Editor either directly or through Profile Manager. See "Color Editor" on page 4-13 for more information on how to edit profiles.

Managing profiles

With Profile Manager, you can back up profiles and delete profiles. You should always back up profiles before updating Fiery software to ensure that no custom profiles are lost.

NOTE: You can back up and delete only those profiles that appear in the main Profile manager window *without* the lock icon next to them. Locked profiles cannot be deleted, but most can be backed up.

TO BACK UP PROFILES:

1. **Launch ColorWise Pro Tools and click Profile Manager.**
2. **Select the profile on the Fiery to upload.**

   The arrow in the middle of the Profile Manager window turns green and points to the left, indicating the profile is available for upload.
3. **Click the green arrow, choose a name and location for the profile, and click Save.**

   The name will be the filename of the profile, but the profile description will be the original one or the one you entered in the Profile Settings dialog box.

   NOTE: When saving the profile on a Windows computer, be sure to include the extension .icm. If the extension is not included, additional dialog boxes appear.
4. **Click OK when you are notified that the profile was successfully uploaded.**

Delete profiles to make sure no one uses the wrong profile and to free up disk space on the Fiery (although profiles are small and don't take up much space).

TO DELETE PROFILES FROM THE FIERY HARD DISK:

1. **Launch ColorWise Pro Tools and click Profile Manager.**
2. **Select the profile you wish to delete and click Delete.**

   A Warning dialog box asks you to confirm deletion.

   NOTE: You cannot delete preset profiles, profiles that are currently set as default, or profiles that are linked to any of the predefined custom names, for example Simulation-1.

3. **Click Yes to delete the profile.**

   If you want to delete a profile that is currently set as the default or associated with a custom name, click Profile Settings and uncheck the default option.

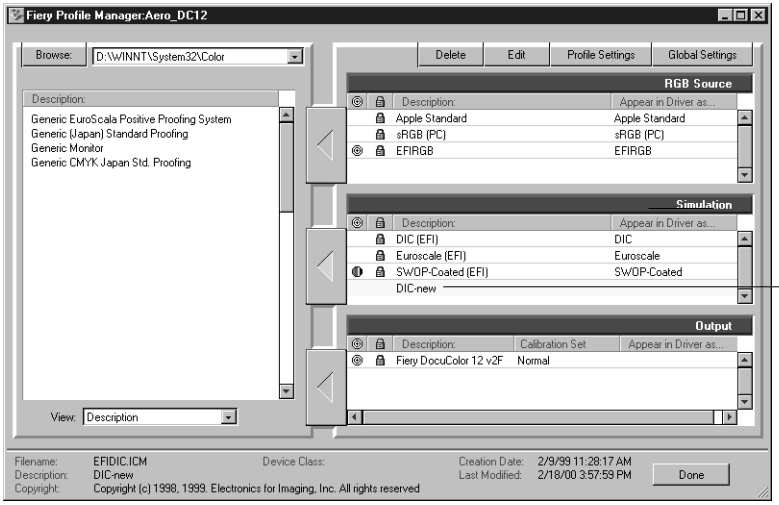
Defining profiles

Before you can apply any downloaded or edited profile to a print job, that profile must be linked to one of the predefined custom names, or you can set the profile as the default for all print jobs (see setting default profiles, page 4-3). There are 10 names available for custom profiles— Source-1 through 10 for RGB Source, Simulation-1 through 10 for Simulation, or Output-1 through 10 for Output.

NOTE: A custom simulation profile is used to illustrate this procedure. The same steps apply for defining custom or downloaded output profiles.

TO DEFINE A PROFILE:

1. **Launch ColorWise Pro Tools and click Profile Manager.**



For the purposes of this example, assume DIC-new is a custom simulation profile created with Color Editor. As you can see, DIC-new has no information under the heading “Appear in Driver as.”

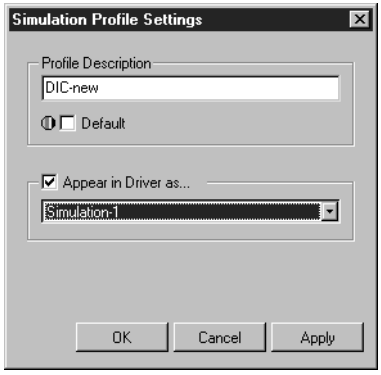
2. **Select DIC-new in the Simulation list, and click Profile Settings or double-click DIC-new.**

3. **Select the “Appear in Driver as” checkbox, choose one of the predefined custom simulation names (Simulation-1 through Simulation-10) from the pop-up menu, and then click Apply.**

   Make sure to choose a name that is not already linked with another simulation. If you try to define two profiles with the same name, you will get an error message.

   For an output profile, the predefined custom names would be Output-1 through Output-10.

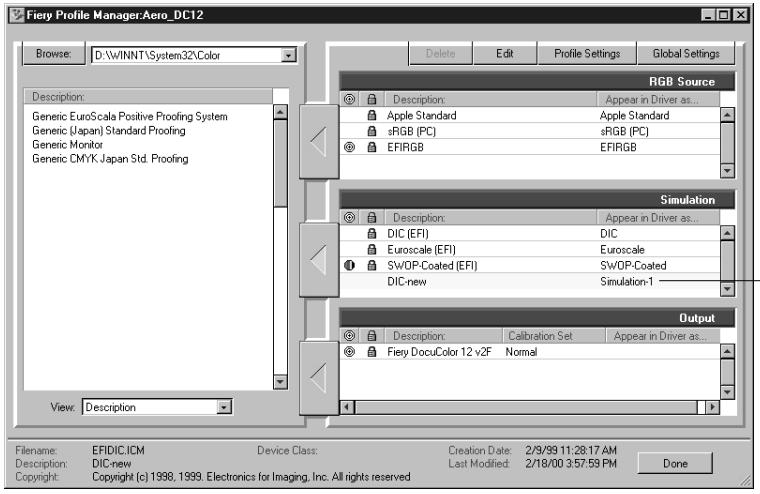
NOTE: While you cannot delete a preset profile, you can use a preset profile's name for your edited profile when you select the "Appear in Driver as" option. This replaces the preset profile with your own profile.



When you choose Profile Settings for an output profile, the Use Calibration Set option also appears. You must calibrate the Fiery with this calibration set before this option has any effect. If you have never measured for this calibration set, default measurements will be used. For more information about calibration sets, see page 3-2.

In Profile Settings you can also change profile descriptions for all non-locked profiles.

4. **Click OK.**



DIC-new will appear in driver as Simulation-1

Simulation-1 now appears under the “Appear in Driver as” column for DIC-new. Choosing Simulation-1 from the CMYK Simulation option of the printer driver applies the DIC-new simulation to the print job.

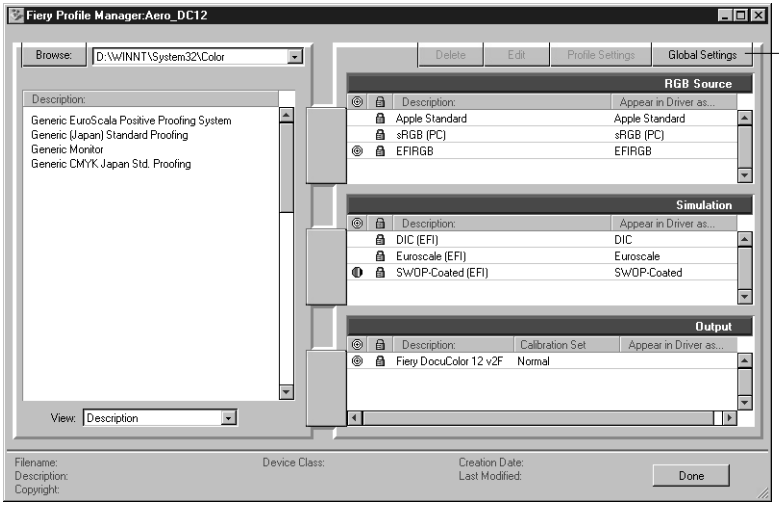
If you do not define a custom simulation profile, your job will print with CMYK Simulation Profile set to None. If you do not define a custom RGB Source or Output profile, the default profile is used.

Changing global settings

Use the Global Settings button to open a dialog box where you can set the default simulation method and the profile used for RGB Separation. You can also access information on how all the profiles are applied to color data in a job.

TO CHANGE THE GLOBAL SETTINGS:

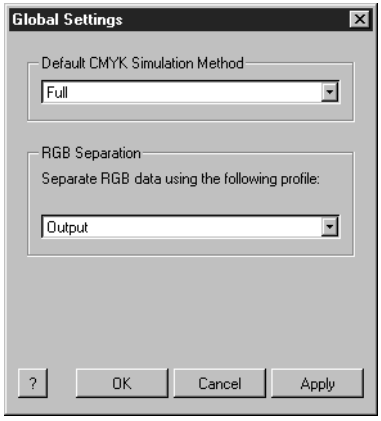
1. **Launch ColorWise Pro Tools and click Profile Manager.**
2. **Click Global Settings at the top right corner.**



Click Global Settings

3. **Choose Full or Quick for the Default CMYK Simulation Method.**

   See Chapter 1 for details on print options.

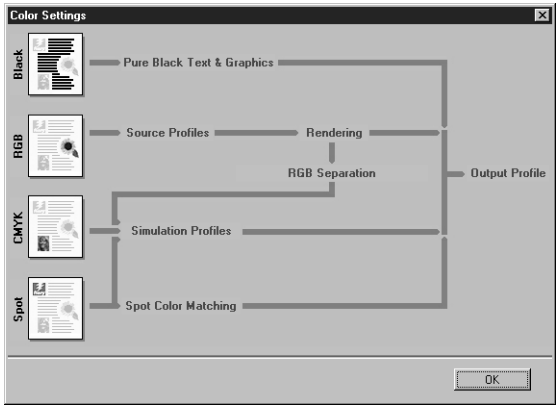


4. **Choose Simulation or Output for RGB Separation.**

   See Chapter 1 for details on print options. Although the RGB Separation feature is primarily intended for RGB, it can also apply to data in the Lab color space or data that uses PostScript Color Management.

5. **To see a diagram of how color settings affect print jobs, click the question mark (?) button at the bottom left.**

   The diagram is illustrative and does not include selectable options. Click OK to close.



6. **Click Apply to apply any changes you have made. Click OK to close the window.**

XP12 Color Editor

Color Editor is used to customize simulation and output profiles and can be accessed either directly by clicking its icon in the ColorWise Pro Tools main window, or indirectly through the Profile Manager.

Editing Profiles

Color Editor allows you to create custom profiles by editing existing simulation or output profiles and saving the changes as a new profile. With Color Editor, you can fine-tune a profile on your Fiery to meet your exact specifications.

NOTE: You cannot edit source profiles; only simulation and output profiles can be customized.

Color Editor has two Edit Modes for editing output profiles.

- **Custom**—Use Custom to edit output profiles and save customized versions of them.
- **% Density**—Use % Density to view the calibration target, which is one component of the output profile. You cannot make changes to the calibration target in this window, but you can import a new target (see page 3-2).

Color Editor also has three Edit Modes for editing simulations.

- **Master**—Use Master mode to create custom *master* simulation that affects all print jobs to which it is applied, unless a linked simulation exists for the selected combination of simulation profile, simulation method and output profile.
- **Quick** or **Full**—Use Quick or Full mode to create custom *linked* simulations. Linked simulations affect the print job only if the corresponding simulation profile, simulation method, and output profile are selected. If you choose an output profile and simulation method for which you have created a custom linked simulation, that simulation is applied automatically to the job. If you choose a simulation method or output profile for which there is no custom linked simulation, then the master simulation is automatically applied.

Quick applies one-dimensional transfer curves that adjust output density only, while Full provides a more complete and accurate simulation by applying colorimetric transformations that adjust hue as well as output density (see page 1-9).

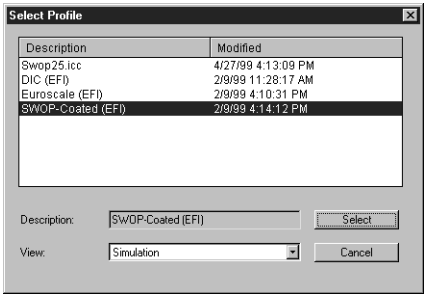
NOTE: If you made edits to a master simulation after you created a linked simulation, the edits are not applied to the linked simulation.

TO EDIT A SIMULATION PROFILE IN MASTER MODE OR AN OUTPUT PROFILE IN CUSTOM MODE:

1. **Launch ColorWise Pro Tools and click Color Editor.**

2. **Choose Simulation or Output from the View pop-up menu.**

   Simulation lists the simulation profiles resident on the Fiery, and Output lists the output profiles resident on the Fiery.

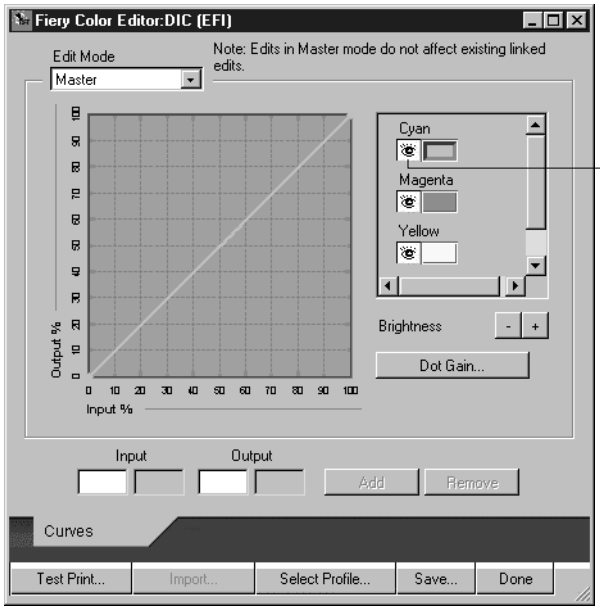


3. **Choose a profile to edit and click Select.**

   NOTE: You can also open the Profile Manager, select a profile, and click Edit.

4. **For a simulation profile, choose Master from the Edit Mode menu. For an output profile, choose Custom from the Edit Mode menu.**

   (See page 4-19 for instructions for using Quick or Full mode.)



The eye icons indicate cyan, magenta, and yellow are visible and can be edited

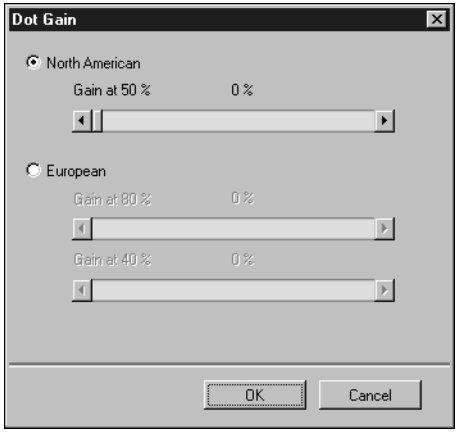
You can use this dialog box to view or edit profiles. The graph allows you to view and manipulate color output values.

NOTE: When editing an output profile in Custom mode, the Import button at the bottom of the Color Editor window lets you import a calibration target file (.trg) created on another Fiery using the previous version of ColorWise. The current version of ColorWise does not allow you to save a target separately; rather, it saves the target in conjunction with an output profile.

5. **Select the colors you want to edit by turning colors off and on.**

   The box with the eye icon to the left of each color indicates whether that color is visible on the graph and will be affected by changes to the curves, brightness, and dot gain controls. You can view and edit all four colors (cyan, magenta, yellow, and black) at once or any combination thereof. Working with only one or two colors at a time helps you fine-tune your adjustments. To turn off a color, click its eye icon. In the example below, cyan and magenta are visible and can be edited.

6. **Click Dot Gain to adjust the dot gain value for simulating press output.**



   You can choose either the North American or European standard. Then use the sliders to select the desired Dot Gain:

   - The range of values for North American at 50% input are from 0% to 50% gain on output.
   - The range of values for European at 40% input are from 0% to 59% gain on output; the range of values for European at 80% input are from 0% to 20% gain on output.

If you use Dot Gain values, you should apply the settings first so that the curves are deflected from their straight-line positions. Then make edits to the new curves. When you adjust Dot Gain values, all existing points on the curve are removed. A warning dialog box gives you the chance to cancel Dot Gain settings before they are applied.

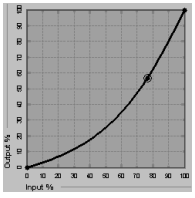
7. **Use the plus and minus buttons to adjust brightness.**

   Changes to the brightness are reflected in the curve(s).

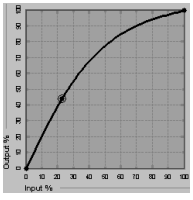
8. **You can adjust the curves directly by clicking and dragging points on the curve or by entering numbers into the input and output boxes.**

   The graph maps the input percentage to the output percentage. (These percentages refer to the size of the CMYK halftone dots.) The curve you selected appears, and points along the curve are marked so you can adjust them.

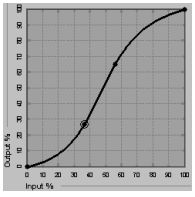
A curve with this shape makes a color appear lighter by reducing density in the midtones.



A curve with this shape makes a color appear darker by adding density in the midtones.



A curve with this shape increases contrast.



NOTE: You should adjust points in this way only *after* you have entered the Dot Gain and Brightness values.

For greater precision, you can key in percentages in the Input and Output boxes or use the arrow keys on the keyboard to adjust the curve. To use the arrow keys, you must first click on the curve to establish an anchor point that serves as a reference.

9. **For an output profile, you can set maximum densities of the C, M, Y, and K channels.**

   You can enter the maximum densities, called D-Max values, of individual colors for profiles that support density settings. D-Max settings are not available when editing Simulation profiles in Master mode.

10. **When you are finished, click Save and enter a name for the new profile.**

    The new custom profile is saved to the Fiery with the new name. If you edit one of the press standard targets (for example, SWOP-Coated, DIC, or Euroscale), you may want to include the original name as part of the new target name, for example, DIC-new, to help you remember the source of the new target.

    NOTE: Preset default profiles are locked and *must* be saved with a new name.

    Custom profiles must be linked to one of the 10 predefined custom profile names (Simulation-1 through 10 for simulation or Output-1 through 10 for output) in order to be accessible from the printer driver. You can create as many custom profiles as you want, but a maximum of 10 are available from the printer driver at any one time. See "Defining profiles" on page 4-8 for information on linking custom profiles to the predefined custom profile names.

    NOTE: If you set a custom profile as the default, you can access it from the printer driver *without* linking it to one of the predefined custom names. Simply select "Printer's default" from the printer driver.

TO EDIT A SIMULATION IN QUICK OR FULL MODE:

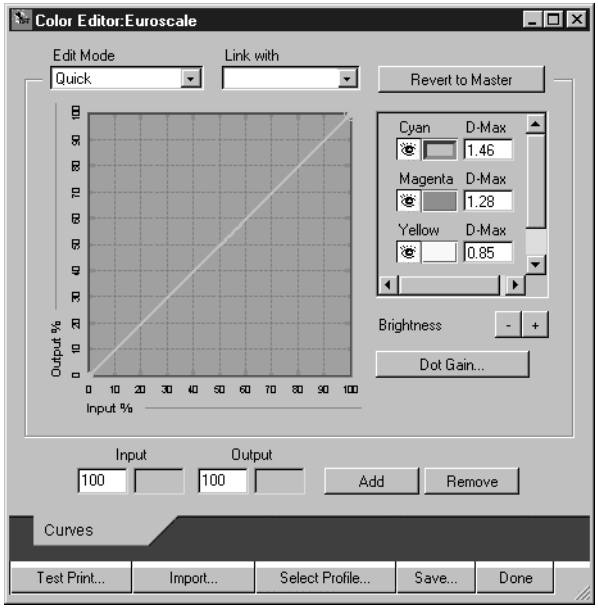
1. **Launch ColorWise Pro Tools and click the Color Editor.**

2. **Choose Simulation from the View pop-up menu, choose the simulation profile to edit, and click Select.**

   NOTE: You can also open the Profile Manager, select a simulation profile, and click Edit.

3. **Choose Quick or Full from the Edit Mode menu, and choose an output profile with which your edited simulation will be linked from the Link with menu.**

   The edited simulation will be linked with the output profile you select from the "Link with" menu.



NOTE: When editing a simulation profile in Quick mode, the Import button at the bottom of the Color Editor window lets you import a custom Quick Simulation created on another Fiery using the previous version of ColorWise. The current version of ColorWise does not allow you to save custom Quick or Full Simulations independently; rather, they are saved as components of the same profile.

4. **Edit and save the simulation as described in the procedure (steps 5 through 10) starting on page 4-16.**

   For this new simulation to be automatically applied to a print job, the CMYK Simulation, Simulation Method, and Output Profile settings must be the same as those used when you edited the profile. If the Simulation Method is different or a different output profile is selected, then the Master simulation is applied.

   NOTE: A Simulation Profile can have a custom Master and one or more custom links—up to two links (Quick and Full) for each output profile on the system.

Undoing simulation edits

You can undo the changes you made to simulations (master and linked) in a number of ways:

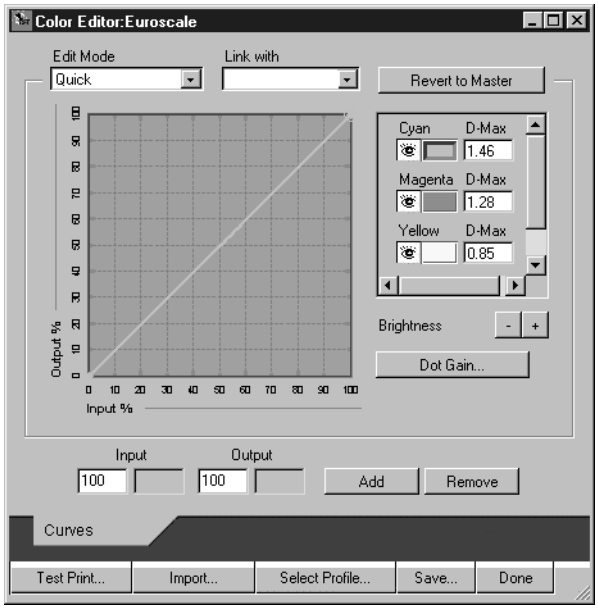
- If you have not yet saved your edits, click Done on the Color Editor menu bar, and don't save the changes.
- If you saved your edits under a new simulation name and want to delete all edits (in Master, Quick, and Full modes) to the simulation, see page 4-8.
- If you saved your edits under a new simulation name and want to undo the edits to one or more linked simulation, use the following procedure.

TO UNDO EDITS MADE TO A CUSTOM LINKED SIMULATION:

1. **Launch ColorWise Pro Tools and click either Color Editor or Profile Manager.**

2. **Choose Simulation from the View pop-up menu, choose the simulation for which you wish to undo edits, and click Select (Color Editor) or Edit (Profile Manager).**

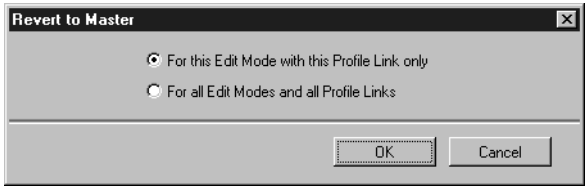
3. **Choose Quick or Full from the Edit Mode menu and choose the output profile with which your unwanted edits are linked from the Link with menu.**



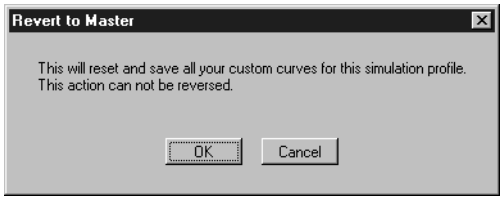
4. **Click Revert to Master.**

NOTE: Revert to Master makes the curves for one or more linked simulations match the last saved master simulation. If you have edited and saved changes to a master simulation, your linked simulations will revert to the changed master, *not* the original.

5. **Indicate whether you want to revert the currently selected linked simulation only, or revert all links of this simulation profile, and click OK.**



6. **If you choose "For all Edit Modes and all Profile Links," a warning dialog box appears. Click OK.**



The curves for the linked simulation(s) now match the last saved master simulation exactly.

Checking edited profiles

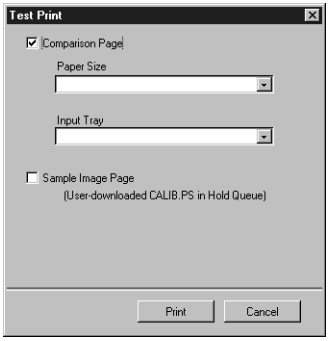
You can view a printed sample of a profile before you save it to the Fiery. You can print a:

- Comparison Page provided with ColorWise Pro Tools, which shows a comparison of images and colored patches with and without edits.
- User defined CALIB.PS in the Hold Queue.

  You can create a custom comparison page and save it as a PostScript or an Encapsulated PostScript (EPS) file called CALIB.PS and then print the file to the Hold Queue of the Fiery from your application or download it to the Hold Queue with Fiery Downloader (see page 3-13).

TO CHECK A PROFILE:

1. **Click Test Print from the Color Editor window.**



2. **Select a page to print, specify the paper size and input tray (Comparison Page only), and click Print.**

   For Comparison Page, specify the paper size (LTR/A4 or 11x17/A3) in the Paper Size pop-up menu. In the Input Tray pop-up menu, specify the paper source.

   NOTE: If you print the measurement page from the Manual Feed Tray, make sure to select “MF set at copier” in the Input Tray pop-up menu. Load the appropriate paper in the Manual Feed tray and then select the correct paper size from the copier touch panel display.

Chapter 5: Working with Color in Applications

This chapter provides guidelines for defining colors in your documents to produce the results you want. The following topics are covered:

- Factors affecting how you work with color
- Choosing colors in applications that rely on GDI or QuickDraw to communicate data to the printer driver, such as presentation applications and word processing programs
- Choosing colors in applications that have the ability to write their own PostScript, such as some page-layout programs, illustration programs, and pixel-editing applications

NOTE: See Chapter 1 for information on the differences in color management support between the PostScript driver and the PCL driver.

Working with color

The two main factors that influence how you work with color in the creation of documents are the application you use and the final print device. Applications vary in the methods they provide for choosing colors and in the way they transmit color data to the print device.

- **Office applications** such as presentation software, spreadsheets, and word processing programs use the RGB color model. They typically transmit only RGB data to the print device.
- **Illustration applications** use both the RGB and CMYK color models but typically transmit only CMYK data to the print device.
- **Pixel-editing applications** use both the RGB and CMYK color models. They also transmit both RGB and CMYK data to the print device.

The type of printing you plan for the document—short-run color printing on the Fiery versus color printing for eventual printing on an offset press—determines the way you define colors as well as the print option settings you choose.

- For short-run color printing on the Fiery, use any type of application and define colors in either RGB or CMYK. If your application supports it, you can also choose colors from the PANTONE color library. Placed images may be limited to the RGB color space. Choose the appropriate settings for print options affecting color output (see page 1-1).
- For color proofing, use an application that writes its own PostScript and define colors in RGB, CMYK, or choose colors from the application's PANTONE color library. Placed images can also be defined in RGB or CMYK. Choose the appropriate settings for print options affecting color output (see page 1-1).

NOTE: The Fiery allows you to use RGB or CMYK data when printing proofs for an offset press run. However, sending data to an **imagesetter** most often requires CMYK data.

Color reference pages

Fiery user software includes several types of color reference pages that let you see the range of colors that can be printed on your copier. For predictable color, use the color reference pages when defining the colors in your document.

- RGB Color Reference—a Microsoft Word file and a Microsoft PowerPoint file that let you view the colors available in the standard palettes of office applications and see how those colors print on the Fiery (see page 5-4).
- CMYK Color Reference—an 11-page downloadable PostScript file of CMYK color patches (see page 5-6).
- PANTONE Coated Color Reference—a 19-page downloadable PostScript file of color patches showing CMYK equivalents of PANTONE Coated colors. This file prints differently depending on the setting of the Spot Color Matching option (see page 5-7).

In addition, you can print RGB, CMY, and PANTONE color charts from the Fiery Control Panel.

Office applications

When using the PostScript printer driver, copiers such as the Fiery must receive PostScript instructions to print an image or a document. Many applications do not create these PostScript instructions by themselves, and instead rely on the printer driver to create them. Included in this category are most word processors, spreadsheets, and presentation packages. These applications use Windows **Graphics Device Interface (GDI)** to display and print when running under Windows and Apple **QuickDraw** to display and print when running on Mac OS computers. We refer to these GDI and QuickDraw applications as "**office applications**."

All office applications handle color similarly, using the same RGB color model used for the color monitor display. Most office applications allow you to choose colors from a palette of preselected colors; some allow you to add new colors to the palette using a color picker. Although some applications allow you to specify color using the CMY, HSL, and HSV color models, these applications always send RGB color data to the Fiery. (An exception to this is a CMYK EPS file placed in the document, which is sent as CMYK data.)

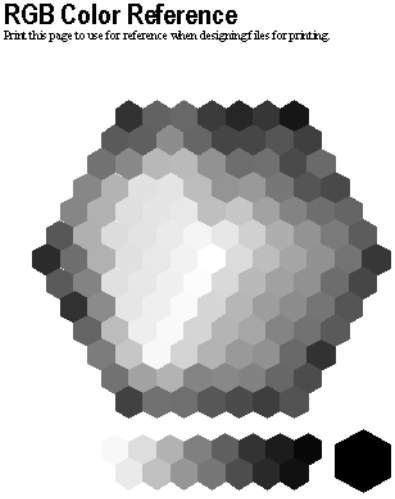
When working with color in office applications, keep in mind that:

- The range of colors that can be displayed in RGB on your monitor is much larger than the range of colors that can be printed on your copier. When you print the document, out-of-gamut RGB colors are mapped to colors your copier can produce.
- These applications send only RGB data to the Fiery. You control the rendering style of the color conversion with your selection of a CRD.

  Each CRD uses a different color rendering style, and therefore has a different way of mapping unprintable colors to the color gamut of your copier. Fiery color rendering styles are described on page 1-5.

Choosing colors in office applications

Two RGB color reference pages, a Microsoft Word file and a Microsoft PowerPoint file, are provided with your Fiery user software. Print these files using different CRDs to see how the colors appear when printed to the Fiery. For best results, print the color reference page using the same print options you plan to use for your final document. Select the colors you want to use from the printed version of the RGB color reference page and then use those colors in your document.



RGB Color Reference (Microsoft PowerPoint)

PostScript applications

Most applications used for illustration, pixel editing, and page layout can create the PostScript information they send to PostScript copier or save in PostScript files. Illustrator, Photoshop, PageMaker, QuarkXPress, and FreeHand are all PostScript applications.

PostScript applications work with color in many different ways. Most allow you to choose process colors (by entering percentages for cyan, magenta, yellow, and black), as well as **named colors** from a custom color system such as PANTONE. When you print composites, these applications send process-color equivalents for named **spot colors** to the copier. In some applications, you can also choose colors using the RGB, HSB, HSL, or other color models.

Generally, PostScript applications send color information to the Fiery as CMYK data. An exception to this is an RGB image placed in the document, which is sent directly to the Fiery (unless you specify special color management settings in the application). In addition, some PostScript applications that allow you to define colors in RGB or other color models can also send data to the Fiery in those color spaces.

Color controls in PostScript applications are typically designed for printing on an offset press, and some adjustments are required for printing to the Fiery. Displayed versions of colors you choose in these applications may not match Fiery output exactly, and named colors may not print accurately on the Fiery, since these colors typically require custom inks.

Choosing colors in PostScript applications

With PostScript applications, you can create colors using any of the color models supported by the application. All PostScript applications support CMYK; some also support RGB and other color models based on monitor display values. PostScript applications also allow you to choose named colors using one or more color libraries, such as PANTONE (see page 5-7).

You should use swatch color matching to ensure predictable color printing results with the Fiery or to match your Fiery color output to colors produced by other print devices.

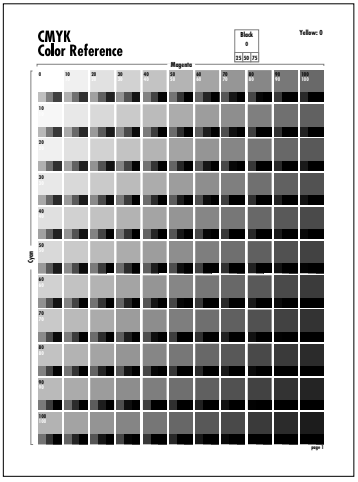
Swatch color matching

Fiery user software includes several color reference pages (see page 5-2). By choosing colors from these reference pages, you can be sure of obtaining the same color from your copier. For best results, calibrate the Fiery before printing the reference pages.

NOTE: Swatch color matching does not match *monitor* colors to printed colors. For this you must use a color management system and calibrate your monitor.

Using the CMYK Color Reference

The CMYK Color Reference included with your Fiery user software lets you see how various cyan, magenta, yellow, and black combinations look when printed on your copier.



To print the CMYK Color Reference, download the file to the Fiery. The printed pages display groups of color patches in graduated combinations of yellow, magenta, and cyan, and smaller patches that include 25%, 50%, and 75% black. Refer to these pages to pick colors and specify process color values in your application. For the location of the file on the User Software CD, see *Getting Started*.

PANTONE Coated Color Reference

The PANTONE Coated Color Reference included with your Fiery user software can help ensure predictable results with colors chosen from the PANTONE color library.

The information printed by the PANTONE Coated Color Reference depends on the setting of the Spot Color Matching setting.

- **On**—Prints swatches of the closest equivalents of PANTONE colors your copier can produce. The equivalent PANTONE color name is printed below each swatch.
- **Off**—Prints swatches of the CMYK equivalents of PANTONE colors as defined by Pantone. (These are the same CMYK values defined in applications that include PANTONE libraries.) The CMYK values used to produce the color, as well as the PANTONE color number, are printed below each swatch.

To print the PANTONE Coated Color Reference, download the file to the Fiery. (For the location of the file on the User Software CD, see *Getting Started*.) If the default Spot Color Matching setting on the Fiery is not the setting you want to use for printing the PANTONE colors, download the file to the Hold queue. Then use Command WorkStation to override the Spot Color Matching setting.

Default output profile

The default output profile consists of both a profile for your copier, describing its color characteristics, and a calibration target that describes the expected behavior of the copier. For more information on output profiles, see page 1-9.

In certain cases you may wish to customize the default output profile to achieve particular color effects (see page 4-13). If so, the new customized output profile is applied to all data in the print job. You can also use ColorWise Pro Tools to download your own output profile to the Fiery (see page 4-5). Downloaded output profiles are at first associated with the default calibration target.

CMYK simulation

If you are using the Fiery to print proofs for an offset press job or to simulate another print device, choose the appropriate CMYK Simulation Profile and CMYK Simulation Method print option settings (see page 1-8).

Chapter 6: Office Applications

This chapter provides instructions for printing color documents from GDI and QuickDraw applications such as presentation, spreadsheet, and word processing software. You can use these instructions with the Microsoft Office 97 and Microsoft Office 95 suite of applications.

Working with office applications

Before printing from these applications, make sure the appropriate printer driver and the Fiery PPD are installed on your computer as described in *Getting Started*. The Fiery ColorWise color management system provides complete color management for jobs printed from office applications.

Defining colors

Office applications use the RGB color model. For instructions on defining colors, see "Choosing colors in office applications" on page 5-4.

The only way to use CMYK or PANTONE colors is to define them in EPS files with an illustration or page layout application, and then place these files into MS Office documents. Colors in EPS files are preserved until they reach the Fiery (assuming no PostScript Color Management information was included).

MS Office applications lack finesse when displaying EPS files, so use these files only when RGB colors are not practical in your specific workflow. EPS files are also useful when using large or complex images that need to be printed at full resolution or cannot fit some MS Office configurations with limited memory.

Working with imported files

Although your application may allow you to import a variety of file formats, EPS files are recommended for all raster images you want to import; some applications have printing problems when using file formats such as TIFF and PICT.

NOTE: You may have to perform a "custom install" of your Office application if you are not able to import EPS elements.

Although there are no color management options within Office applications, color conversions do occur when you import images or page elements that were not defined in RGB. To avoid such conversions with imported files, use the EPS file format for artwork that is to be imported into Office applications.

All RGB images placed in a document are affected by RGB Source and Rendering Style settings.

Tip for advanced users

If you place multiple RGB images, mixed non-photographic and photographic, a single CRD may not be suitable for all the images. In this case you may want the photographic images to bypass the CRD altogether. To accomplish this, save the image in CMYK mode with a pixel-editing application such as Photoshop and perform color correction on it. Then save it as an EPS file and import it into the document.

Selecting options when printing

There are few differences among office applications with regard to Fiery printing. The instructions in this chapter apply to all office applications. Use the instructions in Chapter 1 to specify print options and color management settings. To specify these options, you must use a PostScript Level 2 (or later) printer driver, such as an Adobe PostScript Printer Driver.

Because office applications send RGB data to the Fiery, your choices of RGB Source and Rendering Style settings are important. Be sure to specify the appropriate CRD for the color effect you want (see “Rendering styles” on page 1-5).

Output profiles

All color data in the job is affected by the output profile on the Fiery. This profile may be the one designed for your copier and shipped with the Fiery, or it may be a custom profile created at your site (see page 1-9). If necessary, print the Test Page to see which profile is currently resident on the Fiery.

Chapter 7: Adobe Photoshop

This chapter covers features of Adobe Photoshop versions 4.x and 5.x for Windows and Mac OS. The illustrations show only Mac OS dialog boxes, but the information and instructions apply equally to the Windows version of Photoshop.

Photoshop 5.x

Because Photoshop 5.x uses a sophisticated color management system, there are several setup steps you should take before you begin working. These steps include:

- Calibrating your monitor
- Adjusting Photoshop 5.x color settings
- Setting ColorSync defaults (Mac OS only)

For information on monitor calibration and color setup in Photoshop (version 5.02 or later) open the Adobe Color Management Assistant by choosing Color Management from the Photoshop Help menu. (See your Adobe Photoshop 5.x documentation or Adobe's Technical Guidelines for Photoshop on the internet at www.adobe.com.)

Photoshop 5.x color settings

Photoshop 5.x has a control panel and three setup dialog boxes that control how color is managed when you open and save RGB and CMYK images. You should calibrate your monitor using the Adobe Gamma control panel, and specify settings in Photoshop's Profile Setup, RGB Setup, and CMYK Setup dialog boxes before you begin working with images in Photoshop.

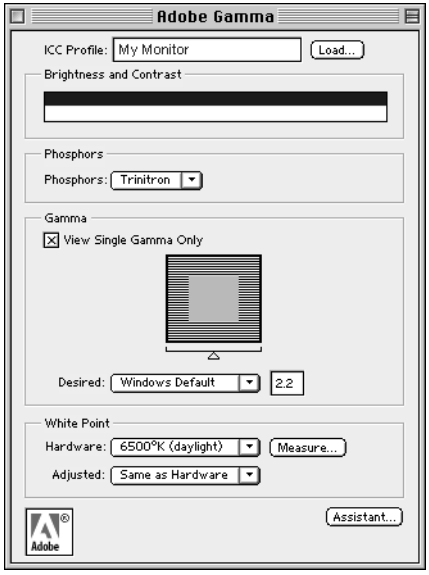
NOTE: The Adobe Gamma control panel performs similar functions on both Windows and Mac OS computers.

Adobe Gamma control panel

You can use the Adobe Gamma control panel to create and customize ICC profiles for your monitor. Photoshop properly displays images on your monitor by compensating between your chosen working space (see the following section on RGB Setup) and the description of your monitor defined by its profile. If you do not create a profile in the Adobe Gamma control panel that corresponds to your monitor, you may encounter poor monitor-to-print matching.

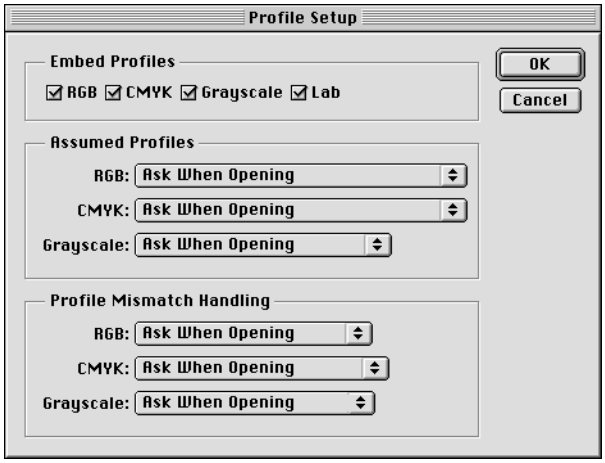
NOTE: If a profile for your particular monitor is not available, use the Adobe Gamma control panel's setup Assistant (or Wizard on Windows) to customize an available profile that *at least* has the same type of phosphors as your monitor.

- Display the Adobe Gamma control panel by double-clicking its icon in either the Windows or Mac OS Control Panel. If you have not yet selected your monitor's profile or wish to customize your current profile, click the Assistant (Wizard on Windows) button.



Profile Setup

From the Photoshop 5.x File menu, choose Color Settings>Profile Setup.



In the Embed Profiles area, check all boxes to embed the appropriate ICC profile when saving a file. By embedding a profile during the saving process, Photoshop can link a color space (working space) definition with that file for future use. When you open an image that already contains a profile, Photoshop can alert you as to which color space the file was saved in. Be aware that you should avoid conversions between color spaces as much as possible (each conversion results in loss of color information).

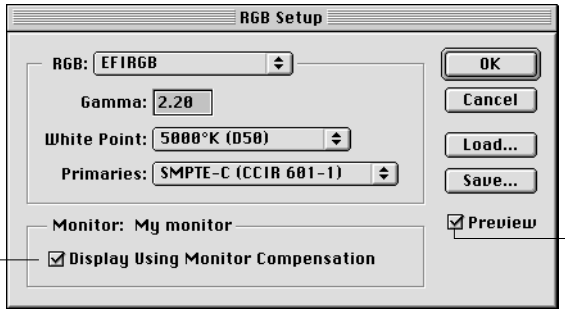
In the Assumed Profiles area, choose Ask When Opening from the RGB and CMYK menus. When you open files that do not contain an ICC profile, you have the choice to convert the file to your current Photoshop working space setting or leave the file unconverted—the preferred choice, but make sure the current Photoshop working space setting matches the intended color space of the image.

In the Profile Mismatch Handling area, choose Ask When Opening from the RGB and CMYK menus. When you open a file that contains an ICC profile that does not match your current Photoshop working space setting, you have the choice to convert from the embedded profile or not. If you want to preserve the color integrity of the source image, do not convert. When you open the image, immediately go to RGB or CMYK Setup to specify the working space for the image. If your working space is set to your output device, you may want to convert.

RGB Setup

Photoshop 5.x allows you to simultaneously use two RGB spaces, one for the monitor and one for the Photoshop RGB working space. The monitor RGB space setting does not affect the image data in the file; it affects only the way the image is displayed on the monitor. Even if an RGB image has been prepared with different monitor settings, it is still correctly displayed on your monitor, without changes to the original values in the file.

From the Photoshop 5.x File menu, choose Color Settings>RGB Setup.



From the RGB menu, choose your current Photoshop RGB color space, which should reflect the color space of most RGB files you will be opening. If you create new RGB files or if you want to standardize your RGB files, you should choose EFIRGB.

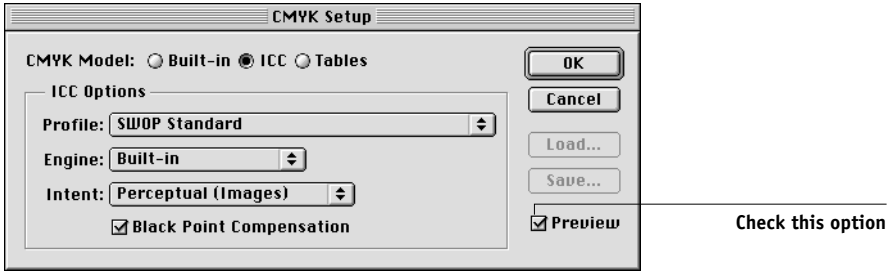
Click Load if the file is not visible in the RGB pop-up menu. You can load the Calibrated RGB setup file, EFIRGB ICC ColorSync file, or the EFIRGB.ICM file. All describe the same RGB space and automatically set the Gamma, White Point, and Primaries. You may consider sRGB if you usually view images on a generic PC monitor, or if you rely on a Windows operating system to manage color on your monitor. If you choose sRGB as a working space, make sure to print with the Fiery RGB Source option set to sRGB.

NOTE: EFIRGB is set as the default RGB Source color space on the Fiery. No matter what RGB space you select, make sure it is available on the Fiery. For more information on downloading RGB Source profiles to the Fiery, see Chapter 4.

The Monitor area shows the currently selected profile in the Adobe Gamma control panel. Turn on both the Display Using Monitor Compensation and Preview options.

CMYK Setup

From the Photoshop 5.x File menu, choose Color Settings>CMYK Setup.



Turn on the Preview option. For CMYK Model, select ICC. Previous versions of Photoshop used Photoshop Separation Tables, and you can load them for Photoshop 5.x. However, you will get better results using ICC profiles and the built-in color management system.

In the ICC Options area, choose from the Profile, Engine, and Intent menus.

- For Profile, choose your final output copier ICC profile. Prepress users should choose an ICC describing their target press, such as SWOP. Office users should choose the ICC profile describing the copier connected to the Fiery. In this case, you should avoid converting RGB to CMYK in Photoshop. Instead, leave images in RGB and allow the Fiery to convert them to CMYK.

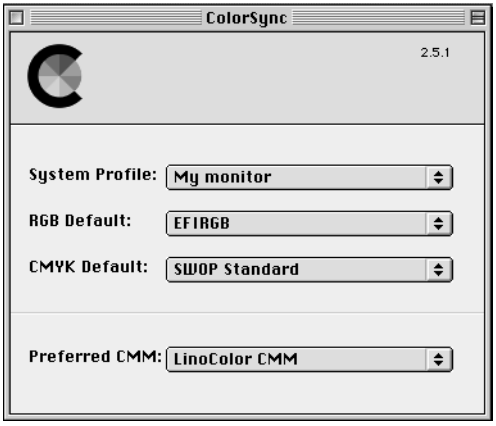
NOTE: With the RGB Separation feature of the Fiery, you can preview (print) your conversions from RGB to any simulated CMYK space by downloading the desired target profile to the Fiery. For more information about downloading profiles, see Chapter 4.

- From the Engine menu, choose Built-in so that the Photoshop engine will be used.
- From the Intent menu, choose Perceptual (Images), which is appropriate for photographs normally edited in Photoshop. The Intent setting is used only when you convert between color spaces.

It is often better to turn on the Black Point Compensation option. With many ICC profiles, this check box has no effect. However, when it does, it has a dramatic effect on the dark areas of your image. If you want this effect, leave Black Point Compensation on; if not, turn it off.

ColorSync defaults

You should have ColorSync 2.5.x or later installed on your Mac OS computer. The ICC profiles used by ColorSync are saved in System Folder:ColorSync Profiles. From the Apple menu, choose Control Panel>ColorSync.



Use the following settings:

- **System Profile**—choose the customized ICC profile for your monitor. You need to set up the Adobe Gamma profile to ensure that your monitor's profile is already present (Mac OS only).
- **RGB default**—choose the same RGB working color space that you set in Photoshop 5.x.

NOTE: The System Profile is the same one used in your monitor calibration and in your Monitors and Sounds control panel.

- **CMYK default**—choose the same CMYK color space that you set in Photoshop 5.x.
- **Preferred CMM**—choose LinoColor CMM (both ColorSync 2.0 and Microsoft ICM 2.0 are based on this color management module).

Defining colors

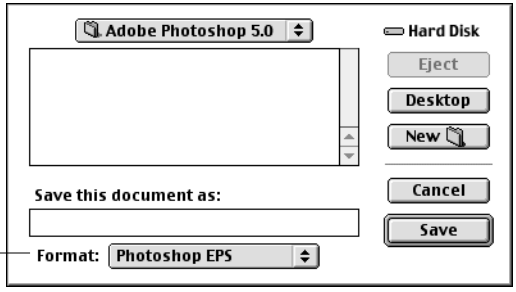
You can choose colors in Photoshop with various color models including HSB, CIE Lab, RGB, and CMYK. You can also choose named colors from the PANTONE Coated color library. For best results, use the color definition methods described in Chapter 5.

Saving files for importing into other documents

Before saving a file, perform any rotating, cropping, and resizing needed. This speeds processing when printing from the application in which the image is placed.

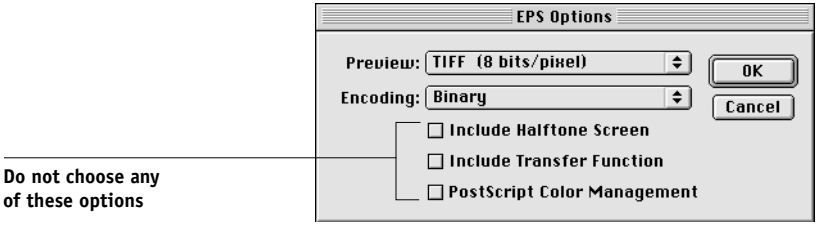
It is recommended that you use EPS or TIFF file formats to save RGB images that will be imported into other documents and printed to the Fiery. You can import EPS and TIFF files into virtually all page layout applications.

NOTE: Although TIFF files display better when imported into other applications, their color and resolution characteristics may be altered by the application into which they were imported. EPS files are left untouched.



Choose Photoshop EPS or TIFF

In the EPS Options dialog box, choose binary encoding and do *not* check PostScript Color Management (see the following section for more information on PostScript Color Management). Do *not* include transfer functions or halftone screens. A TIFF preview is compatible with both Windows and Mac OS computers.



NOTE: If you choose **JPEG** encoding, keep a backup of the original image saved with binary encoding until you have seen the printed results of the JPEG file. Occasionally the compression used for JPEG encoding produces unwanted artifacts. If you see unexpected results in the printed output of a JPEG file, revert to a binary version instead.

If you experience problems printing the document in which you place the image, substitute an ASCII version of the same image, and print the document again. Binary encoding is much more compact than ASCII encoding but occasionally causes printing problems with some system configurations.

Tips for advanced users

Use the following information to implement alternate, more complex, color workflows with Photoshop.

Saving EPS Documents with PostScript Color Management

Turning on the PostScript Color Management option when saving either a CMYK or RGB EPS file prompts Photoshop to embed PostScript color information—which is independent of ICC profiles—in the resulting document. This information is intended for PostScript devices like the Fiery.

Printing RGB EPS Files Saved with PostScript color management

When you print an RGB EPS file (that contains an embedded profile) to the Fiery, the working space information from the embedded RGB profile can be used as an RGB source definition for Fiery CRDs. To use the embedded profile's source color space information with Fiery CRDs, choose None as the Fiery RGB Source when you print. This holds true when you print directly from Photoshop, or when the same RGB EPS file is imported into another application for output.

To *override* an EPS document's embedded profile using an RGB Source definition made available by the Fiery, choose anything except None as the Fiery RGB Source Profile.

Printing CMYK EPS files saved with PostScript color management

If you decide to turn on Photoshop's PostScript Color Management option when you save a CMYK EPS image, Photoshop embeds PostScript color information that defines the CMYK source color space of the image. When you print a CMYK EPS file that contains PostScript color information to the Fiery, CRDs are used instead of ColorWise CMYK Simulation and Simulation Method settings. Make sure to choose the appropriate setting for the Rendering Style option.

Selecting options when printing

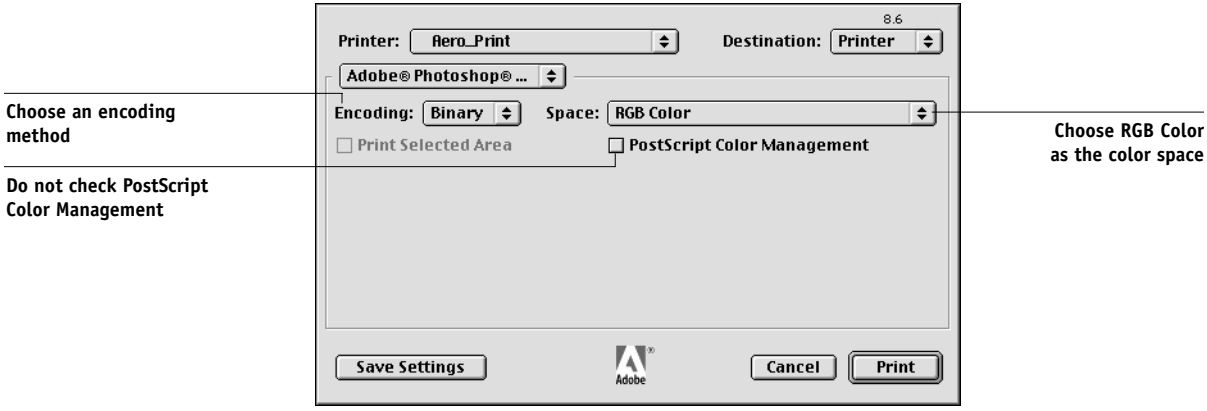
You can print RGB or CMYK images from Photoshop.

- When you print an RGB image, you can choose whether the conversion to CMYK is performed by the Fiery (using a CRD), by PostScript (using PostScript Color Management), or by Photoshop's built-in color management engine (by choosing an Output profile from the Space menu).
- When you print a CMYK image, you can print composites or **color separations**.

NOTE: You cannot use the Combine Separations feature of the Fiery to recombine separations printed from Photoshop.

Printing RGB images

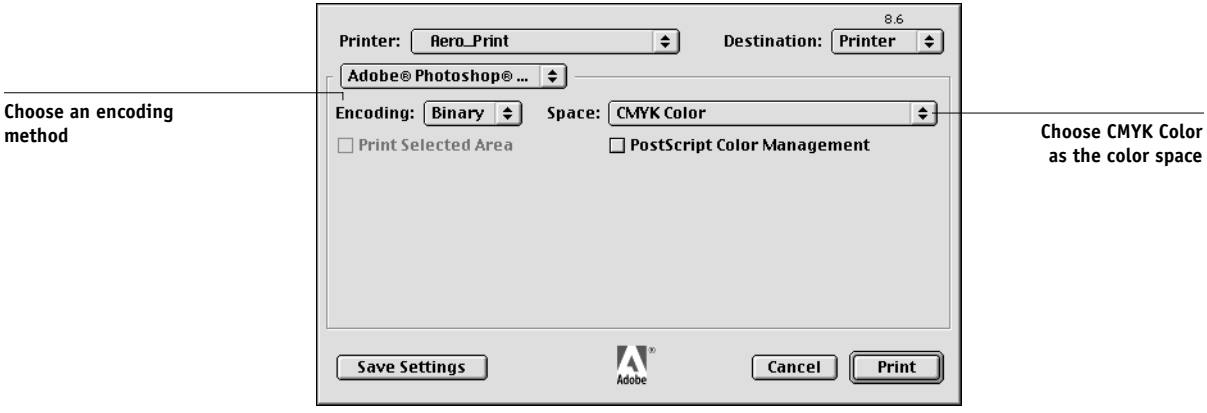
Use the following instructions to print RGB images.



Choose RGB Color from the Space pop-up menu. Any other setting causes Photoshop to convert image data to that color space before sending it to the Fiery. With the AdobePS 8.6 printer driver for Mac OS, these options appear in the Adobe Photoshop pane of the Print dialog box.

Printing CMYK images

Use the following instructions to print CMYK images.



Choose CMYK Color from the Space pop-up menu. Any other setting causes Photoshop to convert image data to that color space before sending it to the Fiery. (With the AdobePS 8.6 printer driver for Mac OS, these options appear in the Adobe Photoshop pane of the Print dialog box.)

NOTE: If you choose JPEG encoding, keep a backup of the original image saved with binary encoding until you have seen the printed results of the JPEG file. Occasionally the compression used for JPEG encoding produces unwanted artifacts. If you see unexpected results in the printed output of a JPEG file, use a binary version instead.

Printing tips for advanced users

Use the following information to implement alternate, more complex, color workflows with Photoshop.

Printing RGB images with Photoshop PostScript color management

If you select an RGB color space and decide to use PostScript Color Management from the printer driver, Photoshop sends RGB data to the Fiery along with PostScript color information defining the source color space of the image, or the color space of the profile chosen in the Space menu. Because this profile is included, a Fiery CRD is used to perform color conversions to CMYK.

NOTE: The included RGB source color space information is overridden by the Fiery RGB Source option unless it is set to None.

For fastest print times, choose JPEG encoding, but check printed output carefully for unwanted artifacts that can appear as a result of JPEG compression. If you see unexpected results in the printed output, print the job again using Binary or ASCII encoding.

Choose other print options you want to use (see Chapter 1).

Printing CMYK images with Photoshop PostScript color management

If you decide to turn on PostScript Color Management when printing a CMYK image, Photoshop sends CMYK data to the Fiery along with PostScript color information defining the source color space of the image, or the color space of the profile chosen in the Space menu. Because this profile is included, a Fiery CRD is used. (Make sure to choose the appropriate CRD setting.)

The destination color space for the CRDs is determined by the RGB Separation print option. By setting RGB Separation to Simulation, CMYK image is printed according to all specified CMYK Simulation Profile and CMYK Simulation Method settings. By setting RGB Separation to Output, CMYK image is converted to the selected Output profile's CMYK color space.

Choose other print options (see Chapter 1). The Spot Color Matching setting has no effect because Photoshop converts PANTONE colors to CMYK values when you work in CMYK mode.

- If the image was separated for an offset press standard, apply the corresponding CMYK Simulation setting. For example, if the image is separated for SWOP, choose SWOP as the CMYK Simulation setting.
- If Photoshop is configured for a custom separation using ICC profiles, select the corresponding profile from the CMYK Simulation print option for the Fiery.

NOTE: The above custom simulation setting requires that the same profile used for separation in Photoshop also resides on the Fiery. For more information on downloading CMYK Simulation profiles to the Fiery with ColorWise Pro Tools, see page 4-5.

Photoshop 4.0

A special feature of Photoshop allows you to save RGB EPS (PostScript) images that include independent source color space information. This feature is sometimes referred to as "PostScript Level 2 tagging" or "RGB tagging."

You define the source color space to apply to RGB EPS images by specifying a Monitor Setup in Photoshop. However, this Photoshop-specific source color space definition is overridden by the RGB Source print option setting located in the Print dialog box under Printer Specific Options, unless you set the latter to Off (see page 1-6).

Defining colors

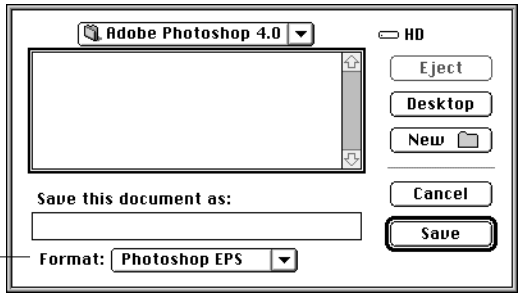
You can choose colors in Photoshop with various color models including HSB, CIE Lab, RGB, and CMYK. You can also choose named colors from the PANTONE color library in Photoshop. For best results, use the color definition methods described in Chapter 5.

Saving files for importing into other documents

Before saving an RGB EPS file, check the Photoshop Monitor Setup. This setting defines the RGB source color space information that will be included in the RGB EPS image. You can override this source color space with the RGB Source setting in the Print dialog box under Printer Specific Options (see page 1-6).

Before saving a file, perform any rotating, cropping, and resizing needed. This speeds processing when printing from the application in which the image is placed.

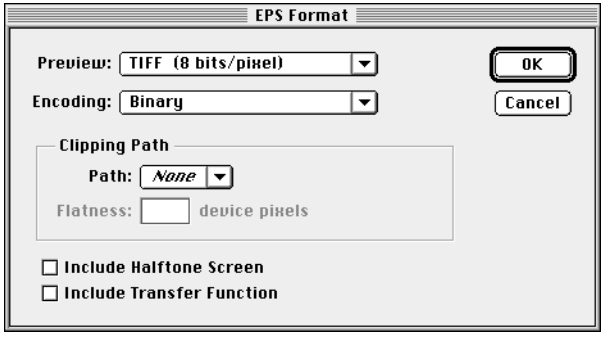
It is recommended that you use the EPS or TIFF file formats to save RGB images that will be imported into other documents and printed to the Fiery. EPS and TIFF files can be imported into virtually all page layout applications.



Choose Photoshop EPS or TIFF

In the EPS Format dialog box, choose binary encoding and do *not* include transfer functions or halftone screens. A TIFF preview is compatible with both Mac OS and Windows computers.

NOTE: If you experience problems printing the document in which you place the image, substitute an ASCII-encoded version of the same image, and print the document again. Binary encoding is much more compact than ASCII encoding but occasionally causes printing problems with some system configurations.



NOTE: If you choose JPEG encoding, keep a backup of the original image saved with binary encoding until you have seen the printed results of the JPEG-encoded file. Although not often, at times the compression used for JPEG encoding may produce unwanted artifacts in the file. If you see unexpected results in the printed output of a JPEG-encoded file, use a binary-encoded version instead.

Selecting options when printing

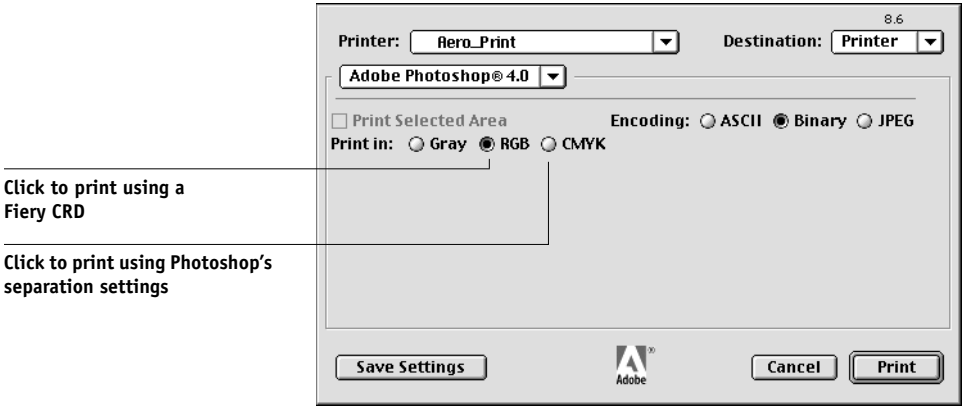
You can print RGB or CMYK images from Photoshop.

- When you print RGB images, you can choose whether the conversion to CMYK data is performed by the Fiery (using a CRD) or by Photoshop (using Photoshop's separation settings).
- When you print CMYK images, you can print composites or **color separations**.

NOTE: You can not use the Combine Separations feature of the Fiery to re-combine separations printed from Photoshop.

Printing RGB images

Use the following instructions to print RGB images.



Choose whether to print in RGB or CMYK. (With the AdobePS 8.6 printer driver for Mac OS, these options appear in the Adobe Photoshop pane of the Print dialog box.)

- If you select **Print in RGB**, Photoshop sends RGB data to the Fiery and a CRD is used to perform color conversion. Choose the appropriate print option settings for RGB data (see Chapter 1).
- If you select **Print in CMYK**, Photoshop performs a color conversion and sends CMYK data to the Fiery. With this setting, RGB Source, Rendering Style, and Spot Color Matching settings have no effect.

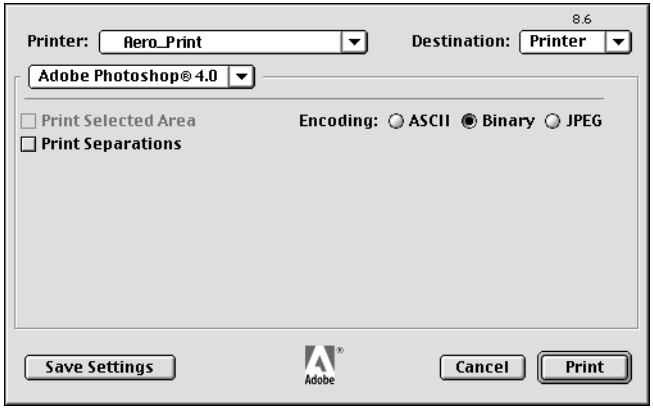
For printing in CMYK, consider these Photoshop separation settings:

- If Photoshop is configured for separating to an offset press standard, apply the corresponding CMYK Simulation setting. For example, if Photoshop is configured for separating to SWOP, choose SWOP as the CMYK setting.
- If Photoshop is configured for a custom separation (not a press standard), choose None as the CMYK Simulation setting, or choose the corresponding custom simulation profile on the Fiery if one has been downloaded with the Profile Manager. For more information on the Profile Manager and ColorWise Pro Tools, see Chapter 4.

NOTE: If you choose JPEG encoding, keep a backup of the original image saved with binary encoding until you have seen the printed results of the JPEG-encoded file. Although not often, at times the compression used for JPEG encoding may produce unwanted artifacts in the file. If you see unexpected results in the printed output of a JPEG-encoded file, use a binary-encoded version instead.

Printing CMYK images

Use the following instructions to print CMYK images.



Choose an encoding method. (With the AdobePS 8.6 printer driver for Mac OS, these options appear in the Adobe Photoshop pane of the Print dialog box.) For fastest print times, select JPEG encoding. You should, however, check the printed output carefully

for unwanted artifacts that can appear as a result of JPEG compression. If you see unexpected results in the printed output when printing with JPEG encoding, print the job again using binary encoding.

Choose other print options (see Chapter 1). RGB Source and Rendering Style settings have no effect on CMYK images. The Spot Color Matching setting is also irrelevant because Photoshop converts PANTONE colors to CMYK values when you work in CMYK mode.

- If the image was separated for an offset press standard, apply the corresponding CMYK Simulation setting. For example, if the image is separated for SWOP, choose SWOP as the CMYK Simulation setting.
- If the image was separated using a custom separation (not a press standard), choose None as the CMYK Simulation setting, or choose the corresponding custom simulation profile on the Fiery if one has been downloaded with the Profile Manager. For more information on the Profile Manager and ColorWise Pro Tools, see Chapter 4.

Chapter 8: Page Layout Applications

This chapter provides instructions for printing color documents from Adobe PageMaker 6.5, QuarkXPress 4.02, and QuarkXPress 3.32.

Before printing from these applications, make sure the appropriate printer driver and the Fiery PPD are installed on your computer as described in *Getting Started*.

Working with page layout applications

The following sections apply to all page layout applications.

Defining colors

Page layout applications generally use the CMYK color model. Some allow you to define colors with other color models and may be able to send that data to the Fiery in those other color models. Generally, however, CRDs (which affect only RGB data) do not affect colors defined in page layout applications. For predictable results with CMYK colors, use the CMYK Color Reference when defining colors in page layout applications. See "Choosing colors in PostScript applications" on page 5-5.

NOTE: If the application allows you to define colors in RGB, you should determine whether it converts the RGB data to CMYK before sending it to the Fiery. If it does, this will determine which Fiery print options affect your job. For example, if the application converts RGB black (defined in the document as R0%, G0%, B0%) to four-color CMYK black when it sends the job to the Fiery, the Pure Black Text/ Graphics option will have no effect when you print the job.

You can also choose named colors from the PANTONE color library. See "PANTONE Coated Color Reference" on page 5-7.

Importing images

EPS and TIFF are the recommended formats for images imported into page layout documents. Support for importing other file formats may be provided by individual applications.

All RGB images placed in a document are affected by the RGB Source and Rendering Style settings. The Fiery color management system applies the specified RGB Source setting to all RGB data and then uses the specified Rendering Style (CRD) to perform a color conversion. An exception to this occurs if you assign ICC profiles to RGB images using the application's color management tools (see "Tips for advanced users" below). In this case, the application performs the color conversion of the image and sends CMYK data to the Fiery.

NOTE: To take advantage of RGB Source and Rendering Style settings for images imported into QuarkXPress 4.02, either save images in the EPS format, or use Quark's PrintRGB XTension, which outputs RGB TIFF image files without converting them to CMYK.

Tips for advanced users

If you place multiple RGB images, some non-photographic and some photographic, a single CRD may not be suitable for all the images. In this case you may want the photographic images to bypass the CRD altogether. To accomplish this, separate the image to CMYK data with a pixel-editing application such as Photoshop and perform color correction on it. Then save it as an EPS or TIFF file and import it into the document.

Or you can save the RGB image in TIFF format and assign it an ICC profile and rendering intent when you import it into the document, if your application supports this feature.

CMYK simulation

You can specify a CMYK Simulation and a CMYK simulation method for the job with the CMYK Simulation Profile and CMYK Simulation Method print options (see page 1-8). The CMYK Simulation setting affects all CMYK color data sent by the page layout application. It can also affect RGB data if RGB Separation is set to Simulation.

- If the document contains CMYK images that were separated for an offset press standard, apply the corresponding CMYK Simulation setting. For example, for images separated for SWOP, choose SWOP as the CMYK Simulation setting.

  If you print separations to the Fiery and choose use the Combine Separations feature in conjunction with Full Simulation, the result may not match that of the same page printed as composite.

- If the document contains CMYK images that were separated according to the color characteristics of a custom ICC profile (not a press standard profile), choose the corresponding profile as the CMYK Simulation Profile print option on the Fiery.

NOTE: To achieve the workflow described above, the profile used for the separation of CMYK images in the document should also reside on the Fiery. For more information on downloading CMYK Simulation profiles to the Fiery with ColorWise Pro Tools, see Chapter 4.

Adobe PageMaker 6.5 for Mac OS and Windows

The Mac OS and Windows versions of PageMaker 6.5 are essentially the same. The illustrations in this section show only the Windows version, except where differences exist between the two versions.

Windows version requirement

For the Windows version of PageMaker 6.5, make sure a copy of the Fiery PPD file is in both of the following folders:

- PM65\RSRC\USENGLSH\PPD4
- Windows\System

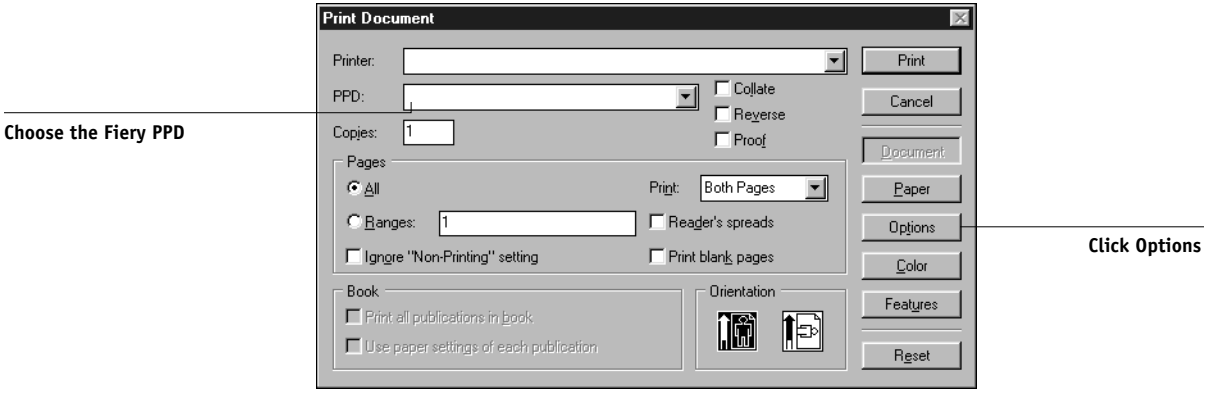
Importing images

All RGB images placed in a document are affected by your RGB Source and Rendering Style settings. For best results with placed images, use the instructions in "Importing images" on page 8-2 and "CMYK simulation" on page 8-3.

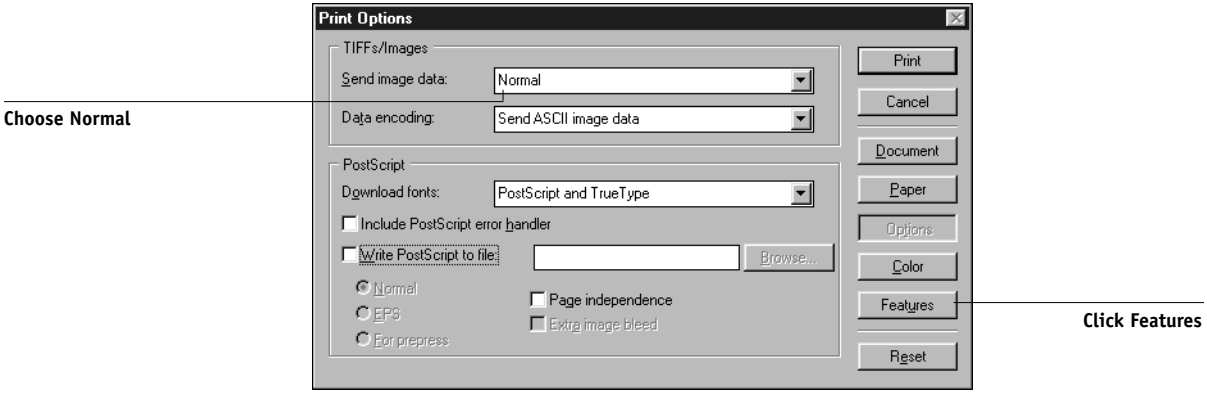
NOTE: You should choose whether you want to use ColorWise color management or the CMS options built into PageMaker. It is important that you do not use both systems for the same print job. If you do not wish to use PageMaker 6.5's color management features, choose File>Preferences>General, then click the CMS Setup button and choose Off from the Color Management pop-up menu. Then click OK. (Color management can be disabled for a specific bitmapped image by selecting the image and choosing Element>Image>CMS Source, then choosing None from the This Item Uses pop-up menu.)

Selecting options when printing

All print settings are specified from the various Print dialog boxes in PageMaker 6.5. The printer driver interface described in Chapter 1 is not used.

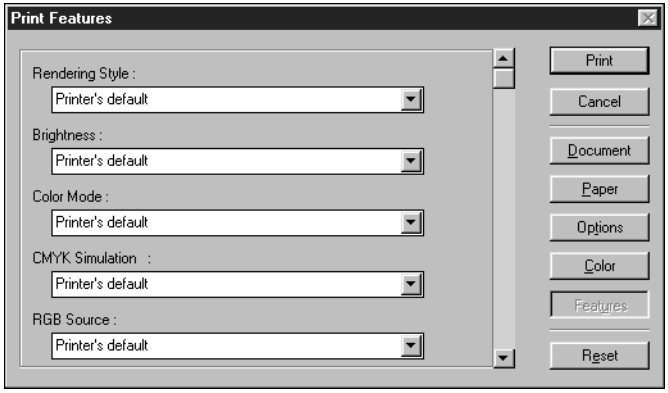


In the Print Document dialog box, choose the Fiery PPD from the PPD menu.



In the Print Options dialog box, choose Normal (not the Optimized Subsampling default) from the “Send image data” menu to ensure that TIFF images print at their full resolution.

If a document contains RGB placed images or colors defined in RGB that will not be separated to process colors, choose RGB Source and Rendering Style settings in the Print Features dialog box. If the document contains PANTONE colors, choose the appropriate Spot Color Matching setting.



When you click Print from any of the PageMaker 6.5 dialog boxes, the job is sent to the Fiery. You do not see the printer driver dialog boxes described in Chapter 1.

Optional Color Management from PageMaker

If you have additional color management requirements not offered by ColorWise, such as managing color on non-Fiery devices, you may want to consider using the color management features offered by PageMaker. For more information, see your PageMaker documentation.

QuarkXPress 4.02 for Mac OS and Windows

If you have additional color management requirements not offered by ColorWise, you may want to consider using features offered by the Quark CMS XTension for QuarkXPress 4.02. These features allow advanced users to control RGB to CMYK color conversions. If you plan to use these features, make sure the Quark CMS XTension is installed before starting QuarkXPress. If it is not, use the Quark XTensions Manager to install it. Refer to your QuarkXPress documentation for instructions.

NOTE: Quark CMS converts RGB TIFF, JPEG, and PICT images to CMYK before sending color data to the Fiery. RGB Source and Rendering Style settings have no effect on this data unless you use Quark's PrintRGB XTension, which outputs RGB TIFF image files without converting them to CMYK.

Importing images

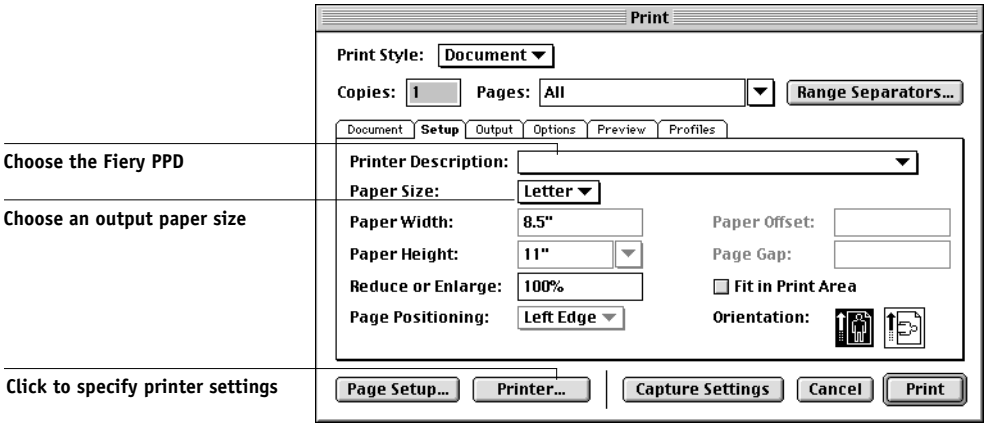
With the exception of RGB images that are saved in EPS format or that use Quark's PrintRGB XTension, QuarkXPress 4.02 converts all RGB data into CMYK, even when the Quark CMS XTension is disabled.

Only RGB images saved in EPS format are affected by RGB Source and Rendering Style settings. For best results with placed images, use the instructions in "Importing images" on page 8-2 and "CMYK simulation" on page 8-3.

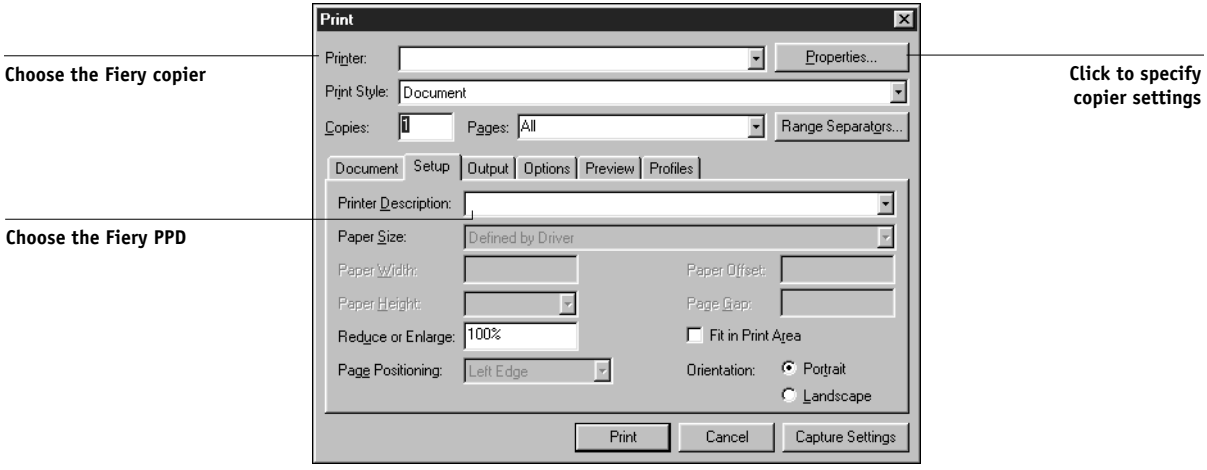
Selecting options when printing

Choose the Fiery PPD from the Printer Description menu in the Print dialog box.

Mac OS



Windows



If the document contains PANTONE colors, choose the appropriate Spot Color Matching setting. For instructions on specifying print options, see Chapter 1.

Optional Color Management from QuarkXPress

If you have additional color management requirements not offered by ColorWise, such as managing color on non-Fiery devices, you may want to consider using the color management features offered by QuarkXPress. For more information, see your QuarkXPress documentation.

QuarkXPress 3.32 for Mac OS and Windows

Before starting QuarkXPress 3.32, make sure the EfiColor XTension is *not* loaded in the XTensions folder. EFICOLOR profiles are not currently provided with Fiery products. Without the correct EFICOLOR profile, the EfiColor XTension cannot perform color conversions on placed images.

Windows version requirement

For the Windows version of QuarkXPress, make sure a copy of the Fiery PPD file is in the \XPRESS\PDF folder.

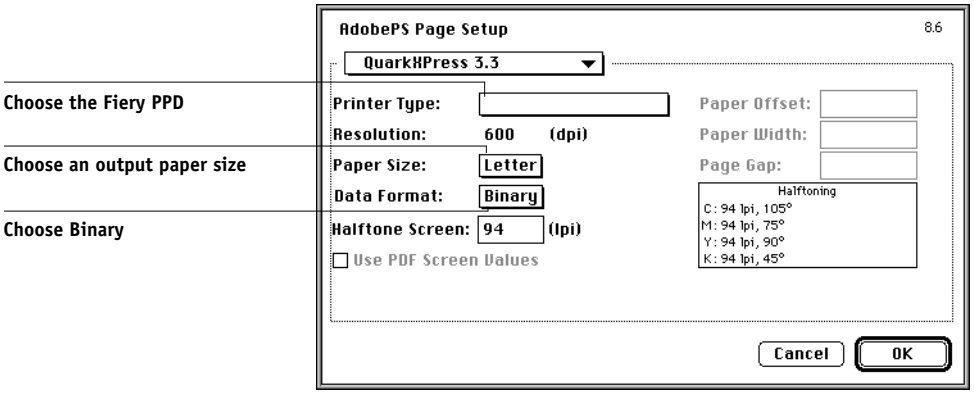
Importing images

All RGB images placed in a document are affected by your RGB Source and Rendering Style settings. For best results with placed images, use the instructions in “Importing images” on page 8-2 and “CMYK simulation” on page 8-3.

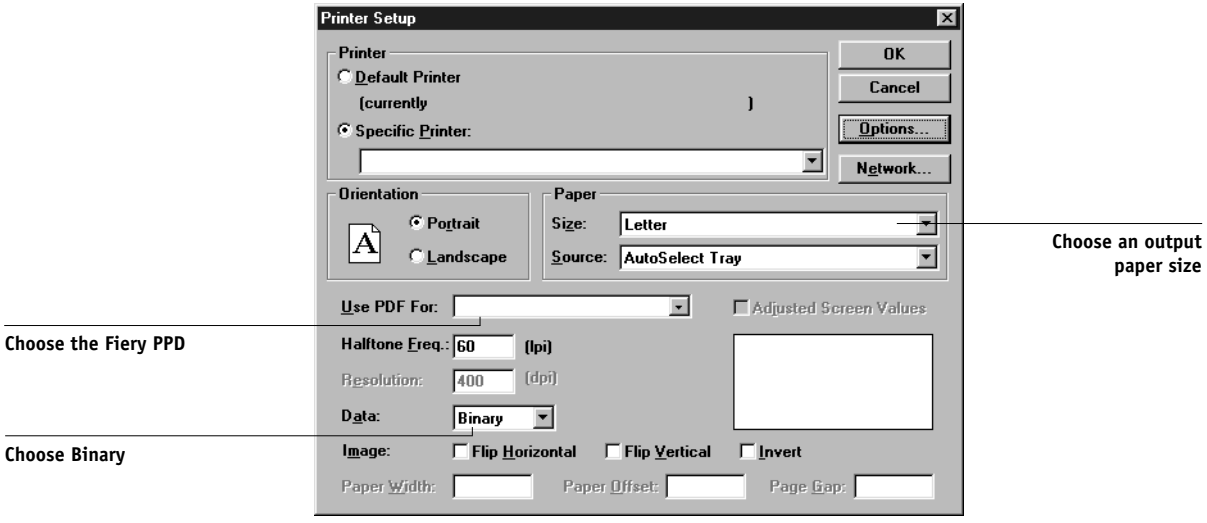
Selecting options when printing

You must select the Fiery PPD from the Printer Type menu in the Page Setup (Mac OS) or Printer Setup (Windows) dialog box.

Mac OS version



Windows version



If a document contains RGB placed images or RGB colors that QuarkXPress will print without converting to CMYK, choose RGB Source and Rendering Style settings. If the document contains PANTONE colors, choose the appropriate Spot Color Matching setting. For instructions on specifying print options, see Chapter 1.

Chapter 9: Illustration Applications

This chapter provides instructions for using Adobe Illustrator for Windows and Mac OS, Macromedia FreeHand for Windows and Mac OS, and CorelDRAW for Windows and Mac OS.

Before printing from these applications, make sure the appropriate PostScript printer driver and the Fiery PPD are installed on your computer as described in *Getting Started*.

Working with illustration applications

You can print directly from an illustration application or use it to create and save files that will be imported into a page layout document. To print from an illustration application, use the printer driver and the print settings recommended in Chapter 1.

NOTE: These application notes provide instructions for printing composites only. For instructions on printing color separations, refer to the documentation for your application.

As a general rule, use the EPS file format when saving files with an illustration application.

Defining colors

All illustration applications use the CMYK color model. While some also allow you to define colors using other color models, they all send CMYK data to the Fiery. Consequently, the RGB Source and Rendering Style settings in the PPD do not affect all colors printed from illustration applications. For predictable results with CMYK colors, use the CMYK Color Reference pages when defining colors (see "Choosing colors in PostScript applications" on page 5-5).

NOTE: If you define colors in RGB and print directly from the application, the application converts the RGB data to CMYK before sending it to the Fiery. This conversion by the application will determine which Fiery print options affect your job. For example, if the application converts RGB black (defined in your document as R0%, G0%, B0%) to four-color CMYK black when it sends the job to the Fiery, the Pure Black Text/Graphics option in the PPD will have no effect when you print the job.

You can also choose named colors from the PANTONE color library. See “PANTONE Coated Color Reference” on page 5-7.

Importing images

In general, all images placed into illustration application documents should be in EPS format.

All RGB images placed in a document are affected by the RGB Source and Rendering Style settings in the PPD. The Fiery color management system applies the specified RGB Source setting to all RGB data and then uses the specified Rendering Style (CRD) to perform a color conversion to CMYK. An exception to this occurs if you assign ICC profiles to RGB images using the application’s color management tools (see “Tips for advanced users”). In this case, the application performs the color conversion of the image and sends CMYK data to the Fiery.

Tips for advanced users

If you place multiple RGB images, some non-photographic and some photographic, a single CRD may not be suitable for all the images. In this case you may want the photographic images to bypass the CRD altogether. To accomplish this, separate the image to CMYK data with a pixel-editing application such as Photoshop and perform color correction on it. Then save it as an EPS or TIFF file and import it into the document. Or you can save the RGB image in TIFF format and assign it an ICC profile and rendering intent when you import it into the document (see the individual application notes in this chapter).

CMYK simulation

You can specify a press simulation target and a press simulation method for the job with print options (see Chapters 1). The CMYK Simulation setting affects all CMYK color data sent by the illustration application.

- If the document contains CMYK images that were separated for an offset press standard, apply the corresponding CMYK Simulation setting. For example, for images separated for SWOP, choose SWOP-Coated as the CMYK Simulation setting.
- If the document contains CMYK images that were separated according to the color characteristics of a custom ICC profile (not a press standard profile), select the corresponding profile from the CMYK Simulation Profile print option on the Fiery.

NOTE: The workflow described above requires that the profile used for the separation of CMYK images in the document also resides on the Fiery. For more information on downloading CMYK Simulation profiles to the Fiery with ColorWise Pro Tools, see Chapter 4.

Adobe Illustrator 8.x for Windows and Mac OS

The Windows and Mac OS versions of Illustrator 8.x are essentially the same. The illustrations in this section show only the Windows version, except in instances where differences exist between the two versions.

NOTE: If you are using ColorWise color management, disable Illustrator's color management by removing the Color Conversion and Color Conversion Utilities files from the Adobe Illustrator>Plug-ins>Extensions folder.

Defining colors

Any colors defined in Illustrator are sent to the printer in CMYK—even those defined using other color models. For best results, use the color definition methods described on “Choosing colors in PostScript applications” on page 5-5.

Importing images

All RGB images placed in a document are affected by the RGB Source and Rendering Style settings you select in the PPD. For best results with placed images, use the instructions in “Importing images” on page 9-2 and “CMYK simulation” on page 9-2.

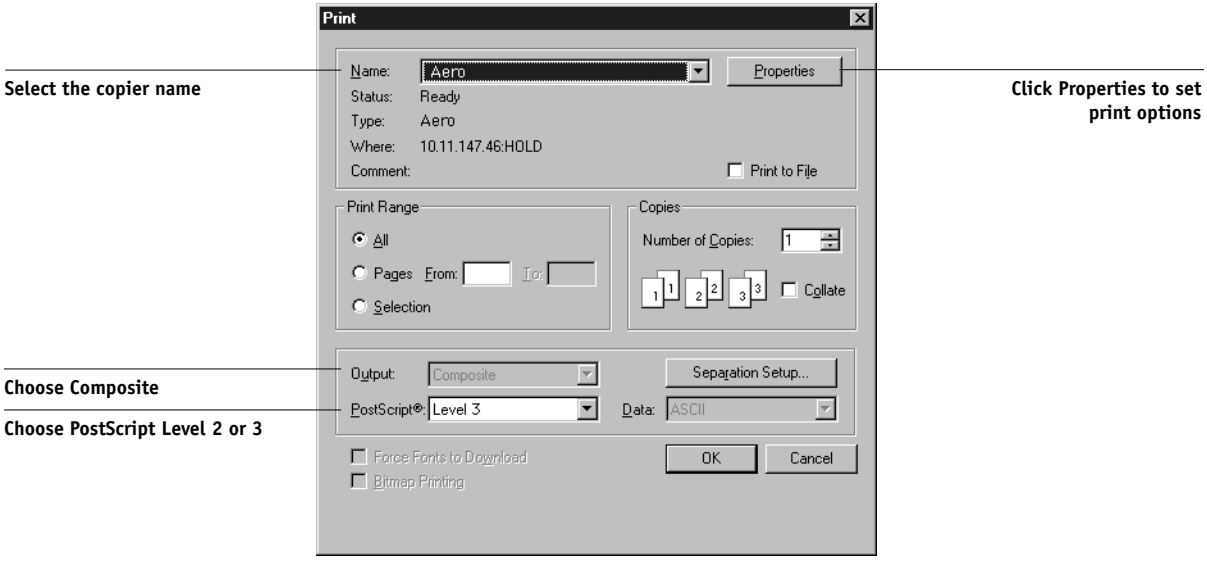
Optional Color Management in Illustrator

If you have additional color management requirements not offered by ColorWise, such as managing color on non-Fiery devices, you may want to consider using the color management features offered by Illustrator. For more information, see your Illustrator documentation.

Selecting options when printing

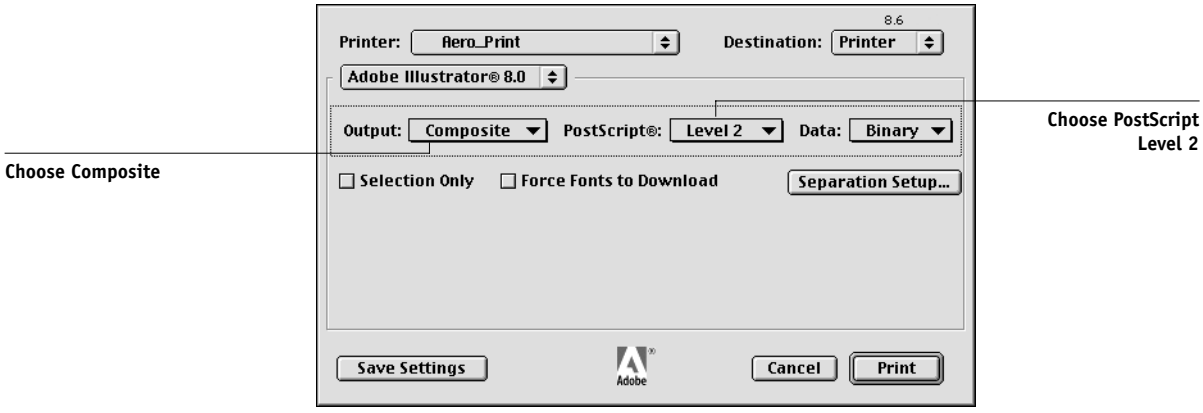
For the Windows version of Illustrator, select the appropriate copier from the Name pop-up menu and select PostScript Level 2 or 3.

Windows



For the Mac OS version of Illustrator, choose Composite output and PostScript Level 2.

Mac OS



If a document contains placed RGB images, click on the Properties button (Windows) or select Printer Specific Options from the pop-up menu (Mac OS) and choose RGB Source and Rendering Style settings for the Fiery. With the exception of placed RGB images, these settings have no effect on colors printed with Illustrator 8.x. If the document contains named PANTONE named colors, choose the appropriate Spot Color Matching setting.

For instructions on setting print options, see Chapter 1.

Saving files for importing into other documents

When saving files in Illustrator 8.x for importing into other types of documents, use the EPS file format. Illustrator can save color information in both RGB and CMYK. The Fiery's RGB Source and Rendering Style settings effect color output of RGB artwork saved in Illustrator EPS and imported into other kinds of documents (even when both RGB and CMYK artwork exists in the same file). In the case of Illustrator files imported into Photoshop, however, vector data from the Illustrator file is rasterized into bitmaps in Photoshop, and the final color space of the bitmap data is determined by the color mode you set in Photoshop.

Macromedia FreeHand 8.x for Windows and Mac OS

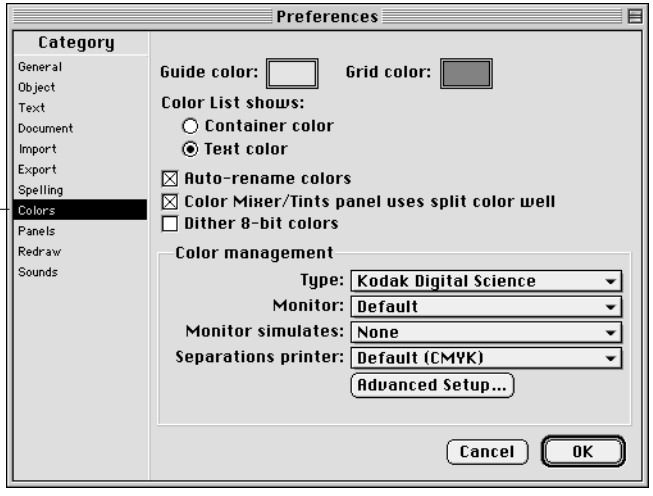
The information in this section applies to both the Windows and Mac OS versions of FreeHand 8.x. Only Mac OS dialog boxes are shown, but the information and instructions are identical for the Windows version of FreeHand.

NOTE: If you are using ColorWise color management, you should turn off FreeHand 8.x color management features by choosing None from the Colors>Color Management>Type pop-up menu.

Defining colors

Any colors defined in FreeHand are sent to the copier in CMYK—even those defined using other color models. For best results, use the color definition methods described on "Choosing colors in PostScript applications" on page 5-5.

You can control the conversion of RGB colors defined in FreeHand by specifying settings in the Preferences dialog box under the Colors category, or by clicking the Color Management button in the FreeHand pop-up menu on the Print dialog box.



Click Colors to access the color management settings

Importing images

A number of file types can be imported into FreeHand 8.x, but once imported, all are treated as either EPS images, TIFF images, or editable paths. For details, see your FreeHand documentation.

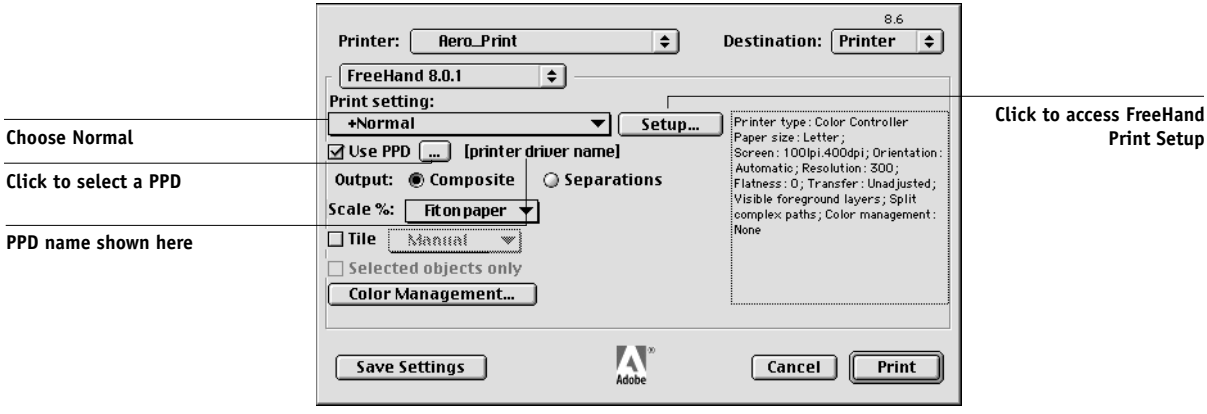
When you import an EPS image into your document, FreeHand inserts a link to the image rather than embedding the original file, resulting in a smaller file size. If the image is a CMYK EPS file, the colors print just as they would from the originating application.

NOTE: Before placing a CMYK EPS file, be sure the file was saved with Desktop Color Separation (DCS) set to *off*. If the file was saved with DCS on, FreeHand prints composites of the image at the low resolution used for screen viewing.

All RGB images placed in a document are affected by your RGB Source and Rendering Style settings in the PPD. For best results with placed images, use the instructions in "Importing images" on page 9-2 and "CMYK simulation" on page 9-2.

Selecting options when printing from FreeHand

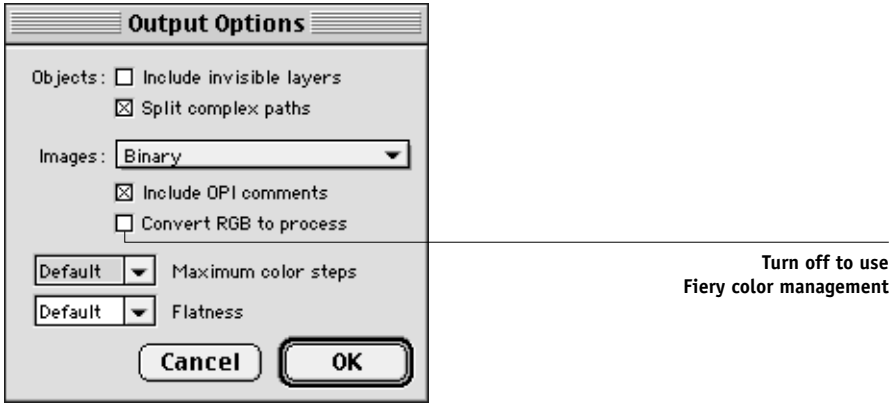
When printing, refer to the following illustrations to select options.



In the Print dialog box, make sure the Use PPD option is turned on. From the Print setting menu, choose Normal.

- If the Use PPD option is on, a plus sign (+) appears in front of the word "Normal."
- If the PPD name for your Fiery is not displayed next to the PPD button, click the button marked "…" and choose the appropriate PPD from the menu that appears.

To use Fiery color management features, turn off the “Convert RGB to process” checkbox in the File>Output Options dialog box. If this option is turned on, FreeHand’s color management settings are used to convert RGB colors and RGB TIFF, PICT, and JPEG images to CMYK.



If a document contains placed RGB images, choose RGB Source and Rendering Style settings in the PPD. With the exception of placed RGB images, these settings have no effect on colors printed with FreeHand. If the document contains PANTONE named colors, choose the appropriate Spot Color Matching setting in the PPD.

Refer to your FreeHand documentation for information about other FreeHand print options.

Saving files for importing into other documents

When saving files in FreeHand 8.x for importing into other types of documents, use the EPS file format. FreeHand saves all color information in CMYK. The RGB Source and Rendering Style print options have no effect on the color output of RGB artwork saved in FreeHand 8.x and imported into other kinds of documents. In the case of FreeHand files imported into Photoshop, however, vector data from the FreeHand file is rasterized into bitmaps in Photoshop, and the final color space of the bitmap data is determined by the color mode you set in Photoshop.

Optional Color Management in FreeHand

If you have additional color management requirements not offered by ColorWise, such as managing color on non-Fiery devices, you may want to consider using the color management features offered by FreeHand. For more information, see your FreeHand documentation.

CorelDRAW for Windows and Mac OS

Defining colors

Any colors defined in CorelDRAW 9.x for Windows or CorelDRAW 8.x for Mac OS are sent to the copier in CMYK—even those defined using other color models. For the best results, use the color definition methods described in "Choosing colors in PostScript applications" on page 5-5.

You can control the conversion of RGB colors defined in CorelDRAW by specifying settings in the Color Management dialog boxes. On Windows machines, the Color Management dialog boxes are located in Tools>Color Management. On Mac OS computers, the Color Management functions are located under Edit>Preferences>Global.

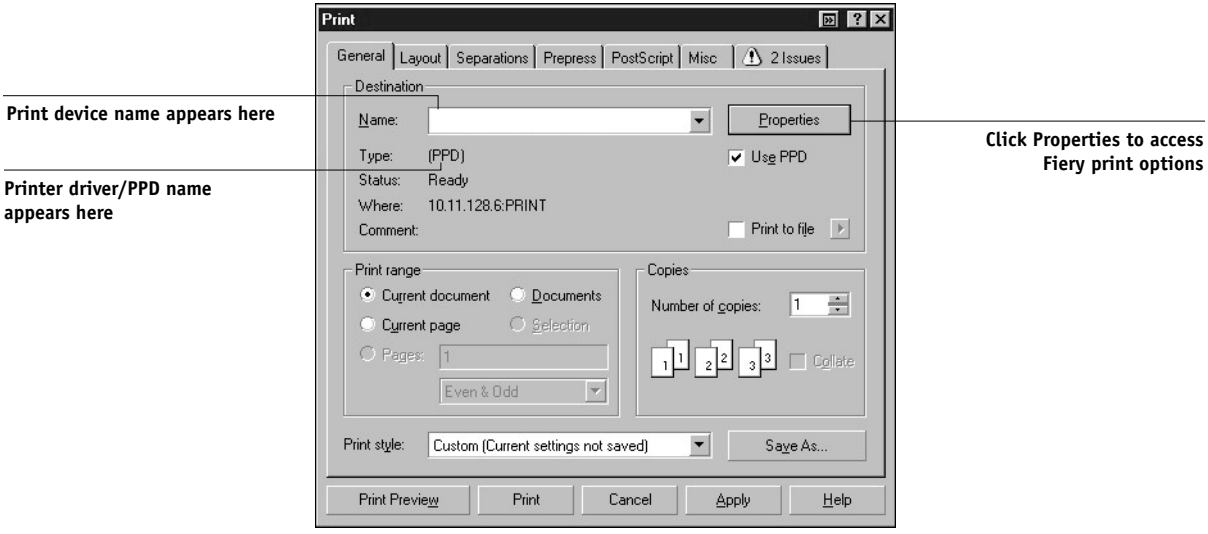
NOTE: If you do not wish to use color management in CorelDraw, do not check options under Color Management and Color Management/General, and select None from the Composite Printer pop-up menu under Color Management/Profiles.

Importing images

All RGB images placed in a document are affected by your RGB Source and Rendering Style settings in the PPD. For best results with placed images, use the instructions in "Importing images" on page 9-2 and "CMYK simulation" on page 9-2.

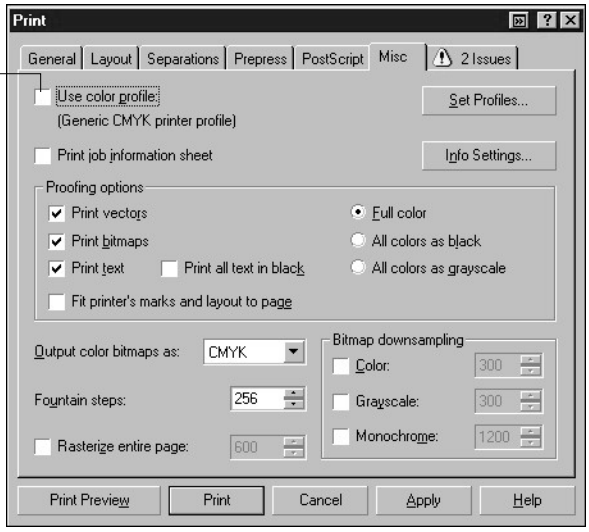
Selecting options when printing

On Windows computers, in the Print dialog box under the General tab, make sure the correct copier and PPD are selected and check the Use PPD box. Click Properties to specify Fiery print options.



On Mac OS computers, click on the Printer button in the General Print dialog box to select the copier and print options.

To use Fiery color management, make sure the “Use color profile” option in the Misc tab of the Print dialog box is *not* on. If this option is turned on, CorelDRAW color management settings are used to convert RGB colors and images to CMYK.



To use Fiery color management, do not check this box

If a document contains placed RGB images, choose RGB Source and Rendering Style settings for your copier. With the exception of placed RGB images, these settings have no effect on colors printed with CorelDRAW. If the document contains PANTONE named colors, choose the appropriate Spot Color Matching setting.

Saving files for importing into other documents

When saving files in CorelDRAW for importing into other types of documents, use the EPS file format. CorelDRAW saves all color information in CMYK, so RGB Source and Rendering Style print options have no effect on color output of artwork saved with CorelDRAW and imported into other kinds of documents. In the case of CorelDRAW files imported into Photoshop, however, vector data from the CorelDRAW file is rasterized into bitmaps in Photoshop, and the final color space of the bitmap data is determined by the color mode you set in Photoshop.

Optional Color Management in CorelDRAW

If you have additional color management requirements not offered by ColorWise, such as managing color on non-Fiery devices, you may want to consider using the color management features offered by CorelDRAW. For more information, see your CorelDRAW documentation.

Appendix A: Desktop Color Primer

This appendix covers concepts that are basic to printing in color, including:

- The properties of color
- Printing techniques
- Using color effectively
- Raster images and vector images
- Optimizing files for processing and printing

If you are already familiar with color theory and digital color printing, you can skip to the last section (“Optimizing files for processing and printing” on page A-10) for tips on optimizing files for printing.

The properties of color

This section introduces concepts that are basic to color theory. You will encounter some of these concepts (such as hue, saturation, and brightness) when you work with color in applications; others provide useful background information. *Color is a complex topic, so consider this a starting point for experimentation and further research.*

The physics of color

The human eye can see electromagnetic radiation at wavelengths between 400 nanometers (purplish blue) and 700 nanometers (red). This range is called the visible spectrum of light. We see pure **spectral light** as intensely saturated or pure colors. Sunlight at midday, which we perceive as white or neutral light, is composed of light from across the visible spectrum in more or less equal proportions. Shining sunlight through a prism separates it into its spectral components, resulting in the familiar rainbow of colors (plate 1).

Like the sun, most light sources we encounter in our daily environment emit a mixture of light wavelengths, although the particular distribution of wavelengths can vary considerably. Light from a tungsten light bulb, for example, contains much less blue light than sunlight. Tungsten light appears white to the human eye, which, up to a

point, can adjust to the different light sources. However, color objects appear different under tungsten light than they do in sunlight because of the different spectral makeup of the two light sources.

The mixture of light wavelengths emitted by a light source is reflected selectively by different objects. Different mixtures of reflected light appear as different colors. Some of these mixtures appear as relatively saturated colors, but most appear to us as grays or impure hues of a color.

CIE color model

In the 1930s, the Commission Internationale de l'Eclairage (CIE) defined a standard color space, a way of defining colors in mathematical terms, to help in the communication of color information. This color space is based on research on the nature of color perception. The CIE chromaticity diagram (plate 2) is a two-dimensional model of color vision. The arc around the top of the horseshoe encompasses the pure, or spectral, colors from blue-violet to red. Although the CIE chromaticity diagram is not perceptually uniform—some areas of the diagram seem to compress color differences relative to others—it is a good tool for illustrating some interesting aspects of color vision.

By mixing any two spectral colors in different proportions, we can create all the colors found on the straight line drawn between them in the diagram. It is possible to create the same gray by mixing blue-green and red light or by mixing yellow-green and blue-violet light. This is possible because of a phenomenon peculiar to color vision called **metamerism**. The eye does not distinguish individual wavelengths of light. Therefore, different combinations of spectral light can produce the same perceived color.

Purple colors, which do not exist in the spectrum of pure light, are found at the bottom of the diagram. Purples are mixtures of red and blue light—the opposite ends of the spectrum.

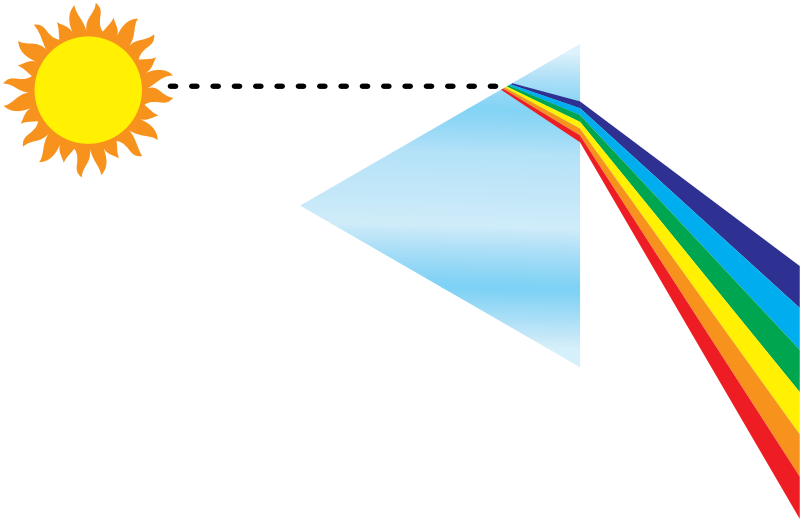


Plate 1: Sunlight split into spectral colors by prism

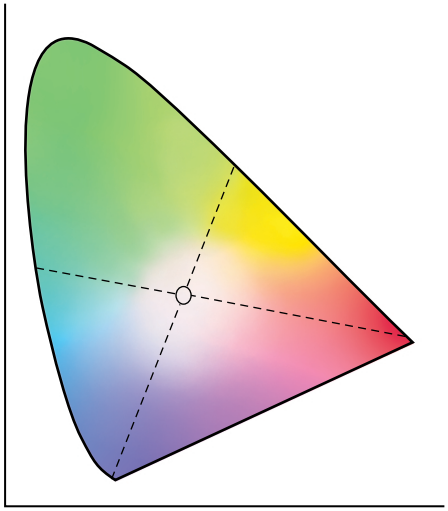


Plate 2: CIE chromaticity diagram

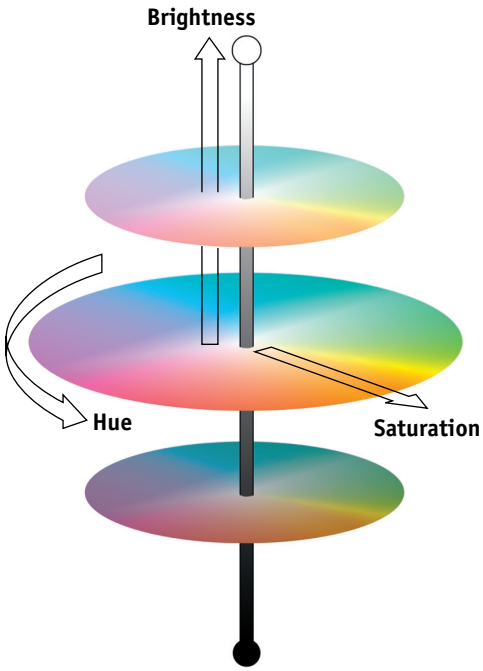


Plate 3: Hue, saturation, and brightness

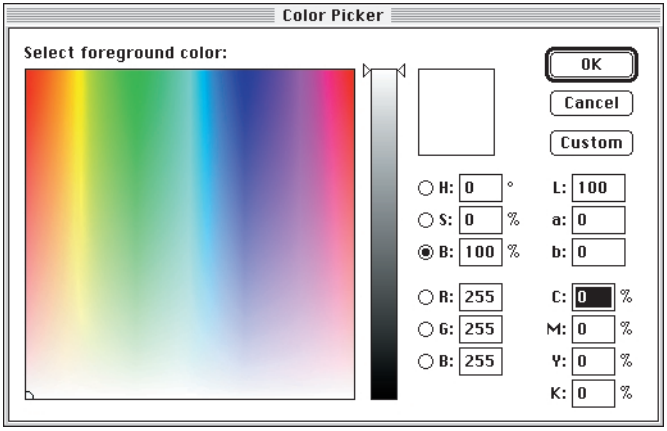


Plate 4: Adobe Photoshop Color Picker

Hue, saturation, and brightness

A color can be described in terms of three varying characteristics, called the **HSB** color model:

- Hue—tint (the qualitative aspect of a color—red, green, or orange)
- Saturation—the purity of the color
- Brightness—relative position between white and black

While the CIE chromaticity diagram (plate 2) conveys hue and saturation, a three-dimensional color model is required to add the brightness component (plate 3).

Many computer applications include dialog boxes in which you choose colors by manipulating hue, saturation, and brightness. For example, Photoshop uses a square Color Picker (plate 4) which can be reconfigured according to your preference.

Additive and subtractive color systems

Color devices used in desktop publishing and printing *simulate* the range of visible colors using a set of primary colors that are combined to create other colors. There are two methods for creating a range of colors from a set of primary colors. Computer monitors and scanners are based on the **additive color model**. Printing technologies, including Fierys and offset presses, are based on the **subtractive color model**.

Additive (RGB) color

Color devices that use the additive color model make a range of colors by combining varying amounts of red, green, and blue light. These colors are called the **additive primaries** (plate 5). White is created by adding the maximum amount of red, green, and blue light available. Black occurs wherever all three colors are absent. Grays are created by adding equal amounts of all three color together. Combining varying amounts of any two of the additive primaries creates a third, saturated hue.

A familiar device that is based on this color model is the computer monitor (plate 6). Monitors have red, green, and blue **phosphors** that emit varying amounts of light to display a given color. Scanners create digital representations of colors by measuring their red, green, and blue components through colored filters.

Subtractive (CMY and CMYK) color

The subtractive color model is the basis for color printing and for color photographic prints and transparencies. While the additive color model simulates the visible spectrum of color by adding light of three primary hues, the subtractive color model starts with a "white" or neutral light source containing light of many wavelengths. Inks, toners, or other **colorants** are used to selectively absorb (subtract) certain wavelengths of light that otherwise would be reflected or transmitted by the media in use.

The **subtractive primaries** are cyan, magenta, and yellow; they absorb red, green, and blue light, respectively (plate 7). Combining any two subtractive primaries creates a new color that is relatively pure or saturated. For example, you can make red by combining magenta and yellow, which absorb green and blue light, respectively. White occurs when no colorant is applied. Combining all three subtractive primaries in theory yields black, but due to deficiencies of cyan, magenta, and yellow colorants, combining these three primaries actually yields a muddy brown. Black colorant is added to compensate for the deficiencies of cyan, magenta, and yellow colorants. Consequently, color printing uses four **process colors**: **C**yan, **M**agenta, **Y**ellow, and blac**K** (CMYK). The use of black toner helps in producing rich, solid blacks and allows for improved rendering of black text.

The CMYK colorants used in offset printing and by your Fiery copier are to some degree transparent. When one layer of colorant is applied on top of another, you see the effect of both. To create a range of intermediary colors, a method is required for varying the amount of each colorant that is applied. A technique called **halftoning** is used in offset printing, while color print devices typically use a proprietary system for applying ink or toner colors that is similar to halftoning.

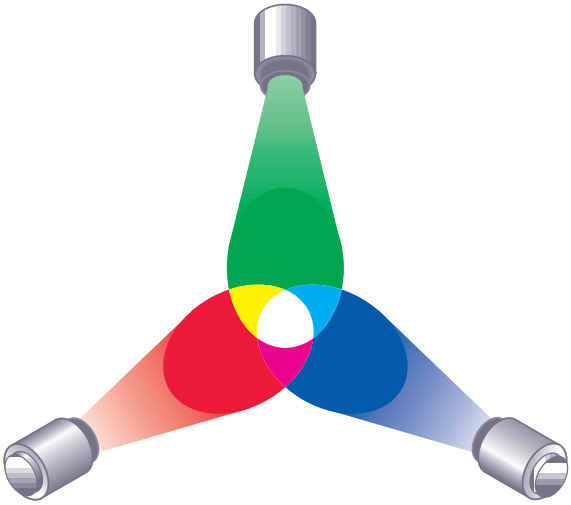


Plate 5: Additive color model

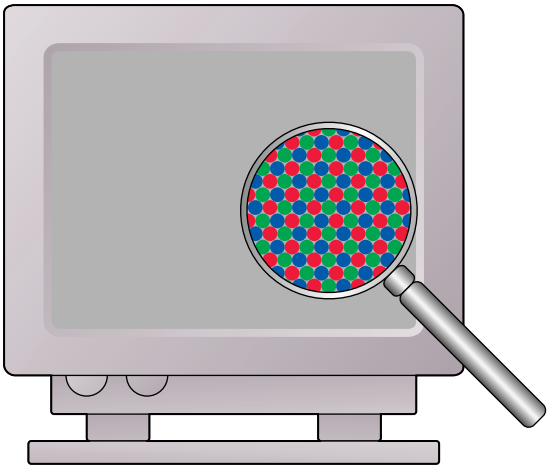


Plate 6: Color monitor

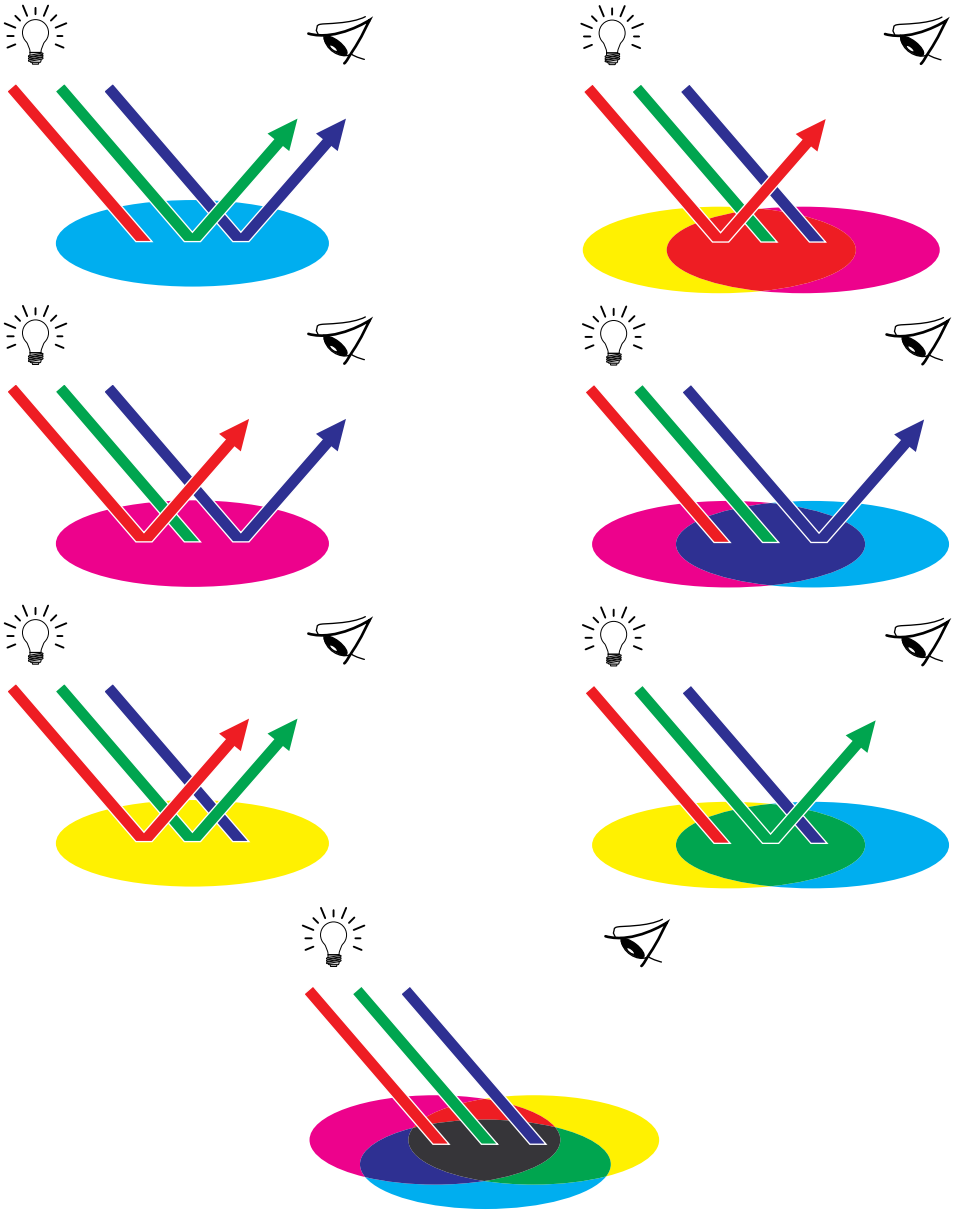
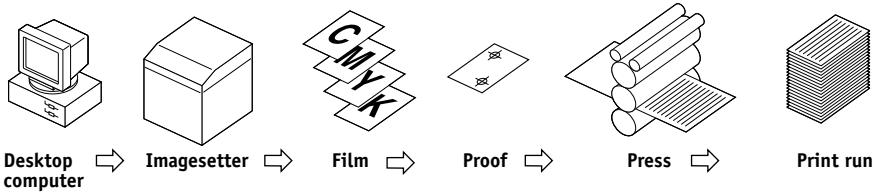


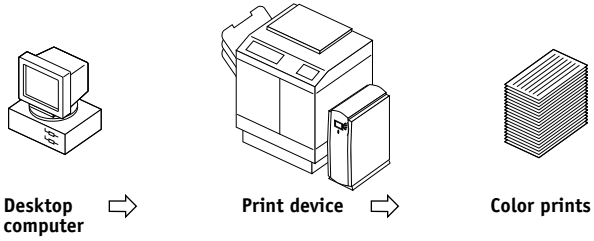
Plate 7: Subtractive color model

Printing techniques

Until recently, most color printing was done on printing presses using one of several printing techniques—**offset lithography**, **flexography**, and **gravure**, to name a few. All traditional printing techniques require lengthy preparation before a print run can take place. Short-run color printing, including Fiery printing, eliminates most of this preparation. By streamlining the process of color printing, the Fiery makes short print runs economically feasible.

In contemporary offset lithographic printing, digital files from desktop computers are output to an imagesetter, which creates film separations. The film is used to make a **prepress proof**, which is an accurate predictor of the final print job and allows you to make corrections before going to press. Once the proof is approved, the printer makes plates from the film and runs the print job on the press.





With a Fiery, you simply print the file. The Fiery processes the **PostScript** information in the file and sends four **bitmaps** (one each for cyan, magenta, yellow, and black) to the print engine. The ease of Fiery printing makes possible experimentation that would be too costly on press, allowing unlimited fine-tuning of color and design elements.

Halftone and continuous tone devices

Halftoning is used in offset printing to print each process color at a different intensity, allowing millions of different colors to be reproduced using only the four process colors. Depending on the required intensity of a given color, toner is placed on paper in dots of different size. The grid of dots used for each toner color is called a screen. Halftone screens are aligned to unique angles designed to eliminate interference patterns called **moiré** that can arise with halftoning.

Some color print devices are commonly referred to as **continuous tone** (or "contone") devices. They do not use traditional halftone screen patterns and angles. Contone devices are capable of varying the intensity of individual dots.

Even if your color printing is done exclusively on the Fiery, you will encounter concepts from offset printing if you use high-end graphics applications. For example, color controls in illustration applications such as Illustrator are geared toward specifying color for offset printing using process and **spot colors**. Many applications allow you to specify the screening used for each printing plate.

Using color effectively

The ability to print in color can greatly increase the effectiveness of your message, whether you are printing a presentation or a newsletter, or proofing an ad concept that will later be printed on press. Some potential benefits of using color include:

- Conveying information rapidly by using color cues
- Making use of the emotive aspects of different colors
- Increasing impact and message retention

Color can also be a source of distraction and discord if it is used poorly. This section outlines some tips and concepts that will prove useful as you approach designing color materials.

A few rules of thumb

Try some of the following strategies for creating successful color materials:

- Rather than applying colors indiscriminately, use color to aid comprehension. In presentations, graphs, and charts, use color to highlight patterns and emphasize differences.
- In general, fewer colors work better than many colors.
- Use red as an accent color. Red is particularly effective when used in otherwise monochromatic materials.
- Consider the tastes of your target audience when choosing colors.
- Keep a file of printed color pieces that appeal to you or strike you as effective. Refer to it for ideas when designing your own documents.

Color wheel

A color wheel (plate 8) is a helpful tool for understanding the interrelation of colors. The colors on one side of the color wheel, from magenta to yellow, appear to most people to be warm colors, while those on the other side, from green to blue, appear to be cool. The distance between two colors on the color wheel can help predict how they will appear when seen side by side.

Colors opposite one another on the wheel are called complements (plate 9), and create a striking contrast side by side. This can be the basis for a bold graphical design, but it is an effect you should use with discretion since it can be visually fatiguing. Other bold combinations to consider are split complements (a color and the two colors adjacent to its complement) and triads (three colors evenly spaced on the color wheel). Colors adjacent to one another on the color wheel result in subtle harmonies.

The color wheel simplifies color relationships for the purpose of clarity, showing only saturated or pure colors. Adding the myriad variations of each hue to the palette (more or less saturated, darker or lighter) creates a wealth of possibilities. Taking a pair of complements from the color wheel and varying the saturation and brightness of one or both colors produces a very different result from the pure complements. Combining a light tint of a warm color with a darker shade of its cooler complement often gives pleasing results. Combining a darker shade of a warm color with a light tint of its cooler complement produces an unusual effect you may like.

Once you have mastered the concept of the color wheel, you have a good framework for experimenting with color combinations. Many books targeted at graphic designers show groups of preselected color combinations. Some are organized by themes or moods, and some are based on a **custom color system** such as PANTONE. The more you develop a critical facility for judging color combinations, the more you will be able to trust your own eye for color. The bibliography at the back of this manual includes books on design.

Color and text

It is not a coincidence that the overwhelming majority of text you see is printed in black on white paper. Text in black on white is highly legible and is not fatiguing to read for extended periods. For many color materials, using black text on a white background and confining color to graphic elements and headings is a good choice.

Color text can add flair to documents printed on paper when used skillfully. This technique is widely used in presentations. When using color text, avoid dazzling text and background combinations created from primary complements, especially red and cyan or red and blue; they are visually fatiguing and hard to read. Color text is more legible when distinguished from its background by a difference in lightness—for example, dark blue text on a light beige background. In addition, using many different colors in a string of text makes for a confused appearance and is hard to read. However, using a single highlight color is an effective way to draw the reader's eye to selected words. See plate 10 for color text samples.

When using color text, keep in mind that small font sizes typically do not print in color with the same sharpness as in black. In most applications, black text prints exclusively in black toner, while color text usually prints with two or more toners. Any misregistration between the different toners on paper causes color text to lose definition. You can make test prints to find the smallest point size at which color text prints clearly. When using high-end graphics applications that allow you to specify color as percentages of cyan, magenta, yellow, and black, you can create pure cyan or pure magenta text that prints with the same sharpness as black text. (Pure yellow text is extremely hard to read on anything but a dark or complementary background.)

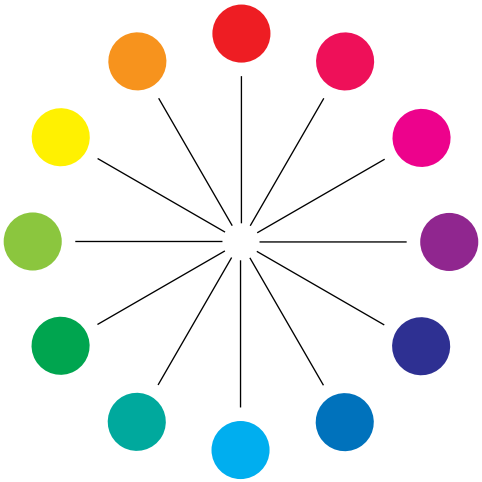


Plate 8: Color wheel

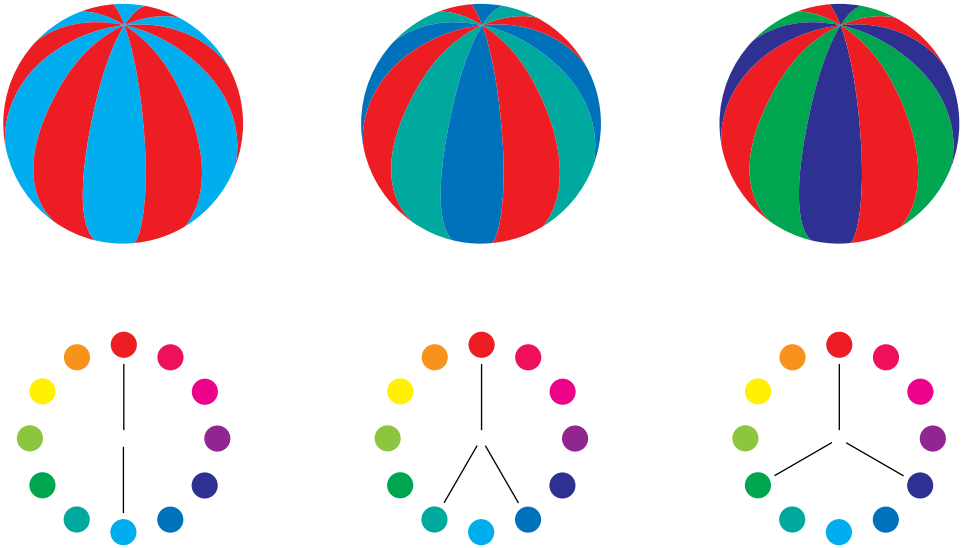


Plate 9: Complements, split complements, and triads

STOP!

STOP!

De gustibus non est disputandum.

Exceptio probat regulam de rebus non exceptis.

Plate 10: Good and bad uses of color with text

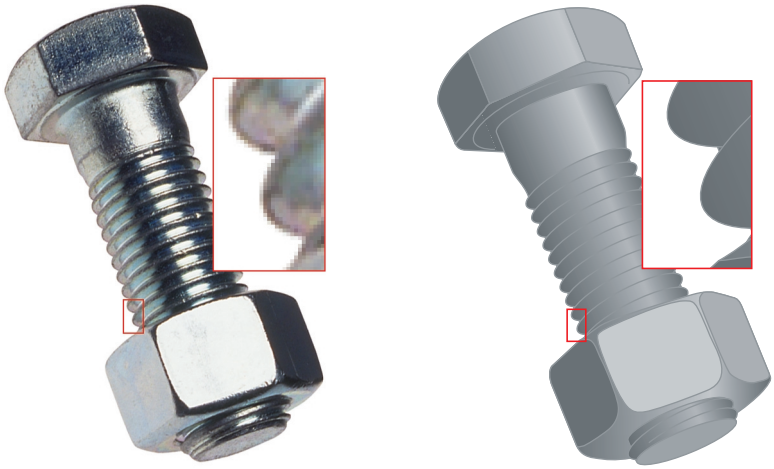


Plate 11: Raster versus vector artwork

Raster images and vector images

Two broad categories of artwork can be printed from a personal computer to a color printer: raster and vector images (plate 11).

A **raster image**, also referred to as a bitmap, is composed of a grid of **pixels**, each assigned a particular color value. The grid, when sufficiently enlarged, resembles a mosaic made from square tiles. Examples of raster images include scans and images created in painting or pixel-editing applications, such as Photoshop and Painter.

The amount of data found in a raster image depends on its **resolution** and **bit depth**. The resolution of a raster describes the compactness of the pixels and is specified in pixels per inch (ppi). The bit depth is the number of bits of information assigned to each pixel. Black and white raster images require only one bit of information per pixel. Grayscale images require 8 bits per pixel. For photographic quality color, 24 bits of RGB color information are required per pixel, yielding 256 levels of red, green, and blue. For CMYK images, 32 bits per pixel are required.

When printing raster artwork, the quality of the output depends on the resolution of the source raster. If the raster resolution is too low, individual pixels become visible in the printed output as small squares. This effect is sometimes called "pixelation."

In **vector images**, picture objects are defined mathematically as lines or curves between points—hence the term "vector." Picture elements can have solid, **gradient**, or patterned color fills. Vector artwork is created in illustration and drawing applications such as Illustrator and CorelDRAW. Page layout applications such as QuarkXPress also allow you to create simple vector artwork with their drawing tools. PostScript fonts are vector-based as well.

Vector artwork is resolution-independent; it can be scaled to any size and resolution without danger of pixels becoming visible in printed output.

Optimizing files for processing and printing

The following sections provide tips on how to create image files that produce the highest possible print quality while minimizing the processing time and disk space they require.

Resolution of raster images

While a 72 ppi raster image appears sharp on a monitor, the same image would likely appear pixelated when printed to the Fiery. Color print devices are capable of much greater detail than monitors, and require correspondingly higher resolution image files. However, high-resolution files can be large, and therefore cumbersome to transmit over a network, process for printing, store on disk, and edit.

Beyond a certain threshold, a higher image resolution greatly increases file size while having a minimal effect on output quality. The optimal image resolution depends on the resolution of the final print device. Aim for the resolution that optimizes both file size and output quality.

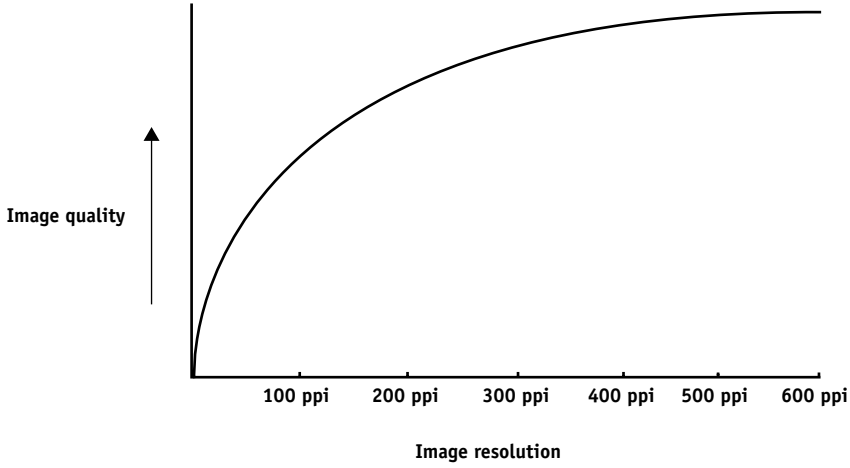
The resolution of a raster image, along with its bit depth and physical dimensions, determine its file size. The following table shows the file sizes of color raster images at different dimensions and resolutions.

Image size:	File size at:				
	100 ppi	150 ppi	200 ppi	400 ppi	600 ppi
	RGB/CMYK	RGB/CMYK	RGB/CMYK	RGB/CMYK	RGB/CMYK
3" x 4"	0.4/0.5 MB	0.8/1.0 MB	1.4/1.8 MB	5.5/7.3 MB	12.4/16.5 MB
5" x 7"	1.0/1.3 MB	2.3/3.0 MB	4.0/5.3 MB	16.0/21.4 MB	36.1/48.1 MB
8.5" x 11"	2.7/3.6 MB	6.0/8.0 MB	10.7/14.3 MB	42.8/57.1 MB	96.4/128.5 MB
11" x 17"	5.4/7.1 MB	12.0/16.1 MB	21.4/28.5 MB	85.6/114.1 MB	192.7/256.9 MB

In this table, the shaded areas indicate that 200 ppi is typically the best trade-off between image quality and file size. However, higher resolutions (e.g., 250 to 300 ppi) may be needed for offset printing, when quality is of the utmost importance, or for images containing sharp diagonal lines.

To find the best image resolution for your purposes, make test prints of some raster artwork at different resolutions. Start with a high-resolution image (400 ppi) and save versions at progressively lower resolutions, down to 100 ppi, using a pixel-editing application such as Photoshop. Always save a copy of the original high-resolution version in case you need to revert to it. The high-resolution data cannot be recreated from a lower resolution version.

Print the files and examine the output. You will likely begin to see a marked deterioration in output quality at resolutions below 200 ppi, while above 200 ppi the improvement may be very subtle.



Raster images prepared for offset printing may need to be at higher resolutions than needed for proofing on your Fiery.

Scaling

Ideally, each raster image should be saved at the *actual* size it will be placed into the document and at the *optimal resolution* for the print device. If the image resolution is correct for the print device, there is no quality advantage to be gained by scaling an image down to a percentage of its actual size. If you scale a large image down to a percentage of its actual size, you incur unnecessary file transfer time because the image data for the entire large image is sent to the printer. If an image is placed multiple times at markedly different sizes in a document, save a separate version of the image at the correct size for each placement.

If you need to place an image at greater than 100% in a document, remember that the output image resolution is affected. For example, if you scale a 200 ppi image to 200%, the image is printed at 100 ppi.

Appendix B: Color Management

This appendix provides information on controlling and managing color output in order to achieve predictable color results. It also discusses the basics of color management.

Controlling printed color

When working with color materials, whether they be presentations, illustrations, or complicated page designs, you make aesthetic decisions about the colors you use. Once you have decided on your goal, you then need to realize it in print. Your color printing system becomes an ally in this creative process to the extent that results are *predictable*.

- If you designed a poster to print on the Fiery, you want the printed colors to match the design specification.
- If you are printing presentations on the Fiery, you want to preserve the vivid colors you see on your monitor.
- If you are working with color that will be printed on an offset press, you want the Fiery output to match other prepress proofs or PANTONE color swatch books.

The type of print job and the final print device, Fiery or offset press, determine the methodology you use to achieve the best results.

No matter what your goals are, two factors always impact color print output: print device consistency and the range of colors the device can print, known as its gamut. These concepts are covered briefly in this chapter. Creating successful color documents and presentations also requires an understanding of color management software as it is implemented by the Fiery and on your desktop computer. Most of this chapter is devoted to discussing the various elements of color management that contribute to predictable color results.

Maintaining copier consistency

The factors described below affect print device consistency, as well as color fidelity and overall output quality.

Paper stock and toner

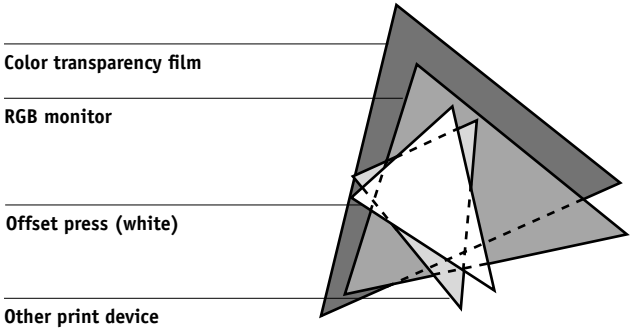
The paper and toner used by your copier can greatly affect printed color. For best results, use the supplies recommended by the manufacturer of the copier.

Maintenance

Problems such as streaking and insufficient or excessive amounts of one or more toners arise when a copier does not receive periodic maintenance or needs major repairs. In addition to having it serviced regularly, monitor the condition of your copier by making standard test prints at regular intervals. You can do this easily by printing the Fiery Test Page. Save the prints and show them to the service technician whenever output densities vary from the norm or other problems appear.

Print device gamut

Different color reproduction techniques have different color capabilities, or **gamuts**. Color transparency films have comparatively large gamuts, as do color monitors. The color gamut that can be produced using process inks or CMYK toners on paper is smaller. This is why some colors that can be displayed on a color monitor, especially bright saturated colors, cannot be reproduced exactly by your Fiery copier—nor, for that matter, can they be reproduced on a press using process colors. Moreover, different print devices have different gamuts—some colors that your copier can produce cannot be reproduced on an offset press, and vice versa. The following illustration provides a graphical representation of this concept.



You need to account for the gamut of your print device when designing on a color monitor. When printed, colors that fall outside the print device gamut are "mapped" to printable colors. This process, referred to as **gamut mapping**, takes place when color data is converted or adjusted to meet the gamut requirements of a print device.

The Fiery is specially designed to perform gamut mapping at high speed with high quality results. It provides these color management features automatically, using either built-in default settings or settings that you specify for a particular print job. For added flexibility, the Fiery color management system can also be used in combination with color management systems on Windows and Mac OS computers.

Basics of color management

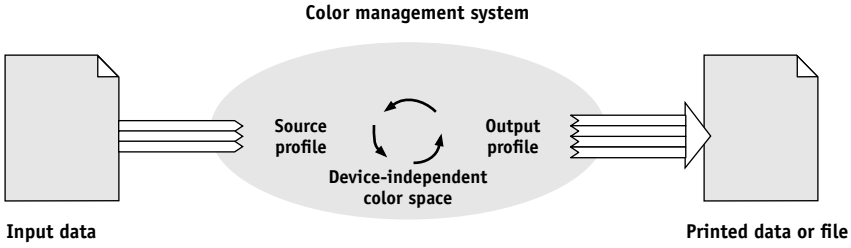
The past several years have seen progress toward standardization in the field of digital color management systems. Both the Windows 95/98 and Mac OS operating systems now support a standard format developed by the International Color Consortium (ICC). This ICC format is implemented on Windows 95/98 and Windows NT 4.0 computers in Image Color Matching (ICM) and on Mac OS computers in ColorSync. More and more software developers are also incorporating color management systems into high-end applications. The Fiery color management system, ColorWise, supports this industry standard profile format.

A color management system, or CMS, is a "translator" between the color space of the source image (the monitor, or a scanner, for example) and the color space of the output device. The CMS uses a device-independent color space, such as CIELAB, as its intermediate color space. To perform its translation, the CMS needs information about the color space of the source image and the gamut of the print device. This information is provided in the form of profiles, often created by the makers of the monitor or print device. The end product of a CMS conversion is a printed document or an image file in the gamut of a particular device.

NOTE: If color matching between computer display and printed output is critical, you should calibrate your monitor as well as your printer. For most users, predictability of printed color output is adequate and monitor calibration is not necessary. For information on monitor calibration, see your Photoshop or Illustrator documentation.

Color conversion

Before a color document can be printed, the color data in it must be converted to the gamut of the print device. Whether performed by the Fiery or by a host-based CMS, the process of converting color data for a print device is the same: the CMS interprets RGB image data according to a specified source profile and adjusts both RGB and CMYK data according to a specified output profile, also called a destination profile by some color management systems.



The source profile defines the RGB color space of the image's source—characteristics such as the white point, gamma, and type of phosphors used. The output profile defines the gamut of the output device. The Fiery (or the host-based CMS) uses a device-independent color space to translate between the source color space and the color space of the output device.

The Fiery allows you to specify default and override settings for the source color space information and the output profile information (see page 1-1). When you use these settings, you do not need to use the features of other color management systems. Your Fiery software includes ICC profiles for use with other color management systems, if you choose to use them, although conflicts may arise when the Fiery CMS is used in conjunction with a host CMS.

Color management systems can also be used to adjust color data to the gamut of a print device other than the one to which you are printing. This process of simulating another print device is commonly used for proofing jobs that will print on an offset press. The Fiery simulation feature is described on page 1-8.

Appendix C: Importing densitometer measurements

This appendix describes Simple ASCII File Format, which can be used to import density measurements from measurement devices. To use your own measurement data from an alternate densitometer, record your individual readings in a text file and structure it as described below.

Simple ASCII Import File Format (SAIFF)

This format describes **Status T** measurement data and is for import into the ColorWise Pro Tools Calibrator. There are three possible file formats:

- 1D Status T density for EFI 34 patch page
- 1D Status T density for EFI 21 patch page
- 1D Status T density for other pages (maximum of 256 patches per ink)

The file format is ASCII and has no tabs. A single space or multiple spaces are used as delimiters. Blank lines are not allowed. Each line in the file represents four patches (C, M, Y, K) of a specific ink value. Comments may be on any line in the file, and these lines start with a pound sign (#) followed by a space. A line with a pound sign followed by any character other than a space has been reserved. Comments must be on an entire line by themselves.

Each line of data contains five values. The first number is the sequential patch number (for EFI 34 and EFI 21 pages) or the ink value percentage (for other pages). The following four values are the density values of C, M, Y, and K of the corresponding patch. Lines are ordered either by increasing sequential patch numbers or by increasing the ink percentage.

For Windows computers, the file extension must be .cm1. For Mac OS computers, the file type must be ‘TEXT’.

Measurement data in EFI 34 and EFI 21 are paper-relative. For other pages, if the first line corresponds to zero ink value, the Calibrator assumes that the measurement data is absolute and adjusts it to become paper-relative by subtracting the density values of the first line from the remaining patches.

Example of 1D Status T density for EFI 34 patch page

This file format is used to specify the Status T density measurements of the EFI 34 patch page. The value in the first column is the patch number. The first patch must be 1 and the last must be 34.

```
#!EFI 3
# EFI ColorWise 2.0 Data
type: 1DST34
# Cyan   Magent Yellow Black
1 0.0300 0.0400 0.0200 0.0400
2 0.0600 0.0700 0.0800 0.0700
3 0.1000 0.1000 0.1000 0.1000
(…more data…)
33 1.6700 1.3400 0.8900 1.6700
34 1.7200 1.4300 0.9300 1.7500
```

Example of 1D Status T density for EFI 21 patch page

This file format is used to specify the Status T density measurements of the EFI 21 patch page. The value in the first column is the patch number. The first patch must be 1 and the last must be 21.

```
#!EFI 3
# EFI ColorWise 2.0 Data
type: 1DST21
# Cyan   Magent Yellow Black
1 0.0300 0.0400 0.0200 0.0400
2 0.0600 0.0700 0.0800 0.0700
3 0.1000 0.1000 0.1000 0.1000
(…more data…)
20 1.6700 1.3400 0.8900 1.6700
21 1.7200 1.4300 0.9300 1.7500
```

Example of 1D Status T density for an arbitrary page

This file format is used to specify the Status T density measurements of a user-defined patch page. The value in the first column is the ink/toner percentage of the patch. The first percentage must be 0 and the last percentage must be 100. The percentages must increase in between.

```
#!EFI 3
# EFI ColorWise 2.0 Data
type: 1DST
# percnt Cyan Magent Yellow Black
0.0000 0.0300 0.0400 0.0200 0.0400
0.3922 0.0600 0.0700 0.0800 0.0700
1.1765 0.1000 0.1000 0.1000 0.1000
(…more data…)
98.0000 1.6700 1.3400 0.8900 1.6700
100.0000 1.7200 1.4300 0.9300 1.7500
```

Glossary

additive color model
A system in which colors are produced by combining red, green, and blue light (the additive primaries). An RGB video monitor is based on an additive color model.

additive primaries
Red, green, and blue light that is used in additive color systems. When added together in proper amounts, these colors of light produce white.

artifact
A visible defect in an image, usually caused by limitations in the input or output process (hardware or software); a blemish or error.

banding
Visible steps between shades in a color gradient.

bit depth
Amount of information used for each pixel in a raster image. Black and white images require only one bit per pixel. Grayscale images with 256 shades of gray require 8 bits (or 1 byte) per pixel. Photographic quality color images can require 24 bits per pixel (RGB images) or 32 bits per pixel (CMYK images).

bitmap
An image comprised of small squares arranged in a grid. Each square in the grid is a pixel. The number of pixels per inch defines the resolution of a bitmap.

blasting
An undesirable effect that occurs when excess amounts of toner, possibly combined with certain types of paper stock, cause objects in an image to spread beyond its boundaries as defined in the file.

BMP
A graphics file format established by Microsoft and native to the Windows operating system.

calibration
The process of ensuring that a device behaves consistently with respect to a set of specifications.

CMS
See color management system.

CMYK
A subtractive color model that uses cyan, magenta, yellow, and black, or process colors, used in color printing; a color model used in the printing of colors in four-color process printing.

color channel
A single-color image that can be edited separately from the other color channels comprising a color space—for example, the red channel of an RGB image.

color gamut
See gamut.

color management system (CMS)
System used to match color across different input, display, and output devices.

color rendering dictionary
See CRD (color rendering dictionary).

color separation
The process of separating a color image into the color components for printing—cyan, magenta, yellow, and black. Also used to refer to the four sheets of film that result from the process of separating a color image.

color space
A model for representing color in terms of measurable values, such as the amount of red, green, and blue in an image. RGB and CMYK color spaces correspond to color devices—monitors and copiers respectively. Other color spaces, such as CIE Lab, are based on mathematical models and are device-independent. They are not based on the color response of a particular device. *See* gamut.

colorant
An ink, dye, toner, paint, or other pigment that modifies the color of media to which it is applied.

ColorWise color management
Fiery's ICC-open color management solution, which is an easy-to-use system that addresses the needs of both casual and experienced color management users.

composite printer
Any output device that can print directly in color without first creating color separations. A composite print can be used as an early proof of an offset print job.

continuous tone (contone)
Describes a photographic image that contains gradient tones from black to white (such as a 35mm transparency or a photograph). Continuous tones cannot be reproduced in that form for printing, but must be screened to translate the image into dots.

continuous tone (contone) image
An image containing fine gradations of tones, such as a photographic image.

CRD (Color Rendering Dictionary)
A feature of color management systems and PostScript Level 2 and PostScript 3 color copiers that maintains the best possible translation of color from one color device to another. A color rendering dictionary (CRD) is used by the color management system or the copier's PostScript interpreter when converting data between color spaces. The Fiery includes several CRDs, each of which provides a different color rendering style.

custom color system
A system of named color swatches that can be matched on press using process or spot colors. PANTONE and TruMatch are examples of custom color systems.

DCS (Desktop Color Separation)
A data file standard defined by Quark, Inc., to assist in making color separations with desktop publishing system; five files are created, four color files (one each for C, M, Y, and K) and a composite color preview file of the color image. It allows an image-editing application to perform color separation and pass it through to final output with its integrity intact.

density
A measurement of the light-absorbing quality of a photographic or printed image.

densitometer
An instrument commonly used in the graphic arts industry to measure density according to a specified standard.

desktop color separation
See DCS.

DIC
A Japanese standard of specifications for separations, proofs, and color printing.

EPS or EPSF (Encapsulated PostScript)
A PostScript file format designed to be embedded in another PostScript stream.

Euroscale
A European standard of specifications for separations, proofs, and color printing.

flexography
A printing technology that uses flexible raised-image plates. Flexography can be used to print on non-flat materials such as cans.

four-color printer
A printing device that uses cyan, magenta, yellow, and black ink or toner.

gamma
A numeric value representing the relationship (gamma curve) between the input and output values of a color device. If gamma equals 1, input values are mapped exactly to output values.

gamut
A range of colors. A device gamut is the range of colors that a device, such as a copier, can produce. An image gamut is the range of colors in a particular image.

gamut mapping
The conversion of color coordinates from one device's gamut to another—usually accomplished with algorithms or look-up tables.

GDI (Graphics Device Interface)
Graphics and display technology used by computers running Windows. GDI applications rely on GDI (rather than the PostScript language) to send text and pictures to copiers.

GIF (Graphics Interchange Format)
A standard developed by CompuServe for bitmap graphics of up to 256 colors and used for posting photographic images on the Internet or intranet pages; rarely used for professional printing.

gradient
A smooth transition between two different colors or between two shades of a color.

Graphics Device Interface
See GDI.

Graphics Interchange Format
See GIF.

gravure
A printing technology that uses an etched cylinder that has been immersed in ink. The ink that remains in the etched areas is applied to the paper. The non-etched surfaces of the cylinder are non-printing areas.

halftoning
A method for representing an original continuous tone image using a pattern of dots, lines or other patterns.

HSB
A color model where each color is represented by its hue, saturation, and brightness components; supported by most color applications.

ICC profile
An industry standard color profile format developed by the International Color Consortium (ICC) that describes the color capabilities, including the gamut, of a color device based on the differences between an ideal and the current device. The ideal is often provided by the manufacturer as a color reference file. ICC profiles are implemented on Mac OS computers in ColorSync and on Windows 95/98 and Windows NT 4.0 computers in Image Color Matching (ICM). The Fiery's color management system, ColorWise, supports ICC profiles.

imagesetter
Raster-based film output device; a high-resolution laser output device that writes bitmapped data onto photosensitive paper or film.

JPEG
A graphics file format defined by the Joint Photographic Experts Group committee of ISO (International Standards Organization); a standard for digital compression of still image graphic data.

metamerism
Phenomenon in which two colors composed of different combinations of light wavelengths appear identical under a specific light source, but may look different under other light sources. The colors are called "metamers."

moiré
An undesirable pattern in images made using halftone screens. Moiré can be caused by the improper line frequency of the screens, improper screen angles,

improper alignment of halftone screens, or by the combination of a halftone screen with patterns in the image itself.

named color
A color that is defined according to a custom color system. For example, PANTONE 107 C is a named color.

office applications
Software applications commonly used for business purposes, including presentation applications, spreadsheets, and word processing programs.

offset lithography
Printing in which ink is transferred from printing plates to a rubber blanket and then from the blanket to paper.

output profile
The output profile describes the color characteristics of a printing device. It consists of both a profile for your copier and a calibration target that defines the expected density response of the copier.

phosphor
Material used in making computer monitors; phosphors glow and emit red, green, and blue light when struck by an electron beam, thus creating an image.

photographic rendering
A color rendering style that preserves tonal relationships in images. Unprintable colors are mapped to printable colors in a way that retains differences in lightness, sacrificing color accuracy as necessary.

pixel
The smallest distinct element of a raster image. The term is a combination of the words “picture” and “element.”

PostScript
A device-independent page description language developed by Adobe, which is used to print and display pictures and text. PostScript 3 includes many enhancements to older versions of PostScript, including improved image quality and color with Enhanced Image Technology, faster performance with Advanced Page Processing, and ease of use and setup with NetWorks System.

PPD (PostScript Printer Description file)
A file containing information about a particular PostScript print device’s capabilities and restrictions. The information in the PPD is presented via the printer driver.

prepress proof
A print made from a set of film separations or other file to simulate the results of printing. A prepress proof is the last opportunity to catch problems before the print job goes to press.

presentation graphics rendering
A color rendering style that creates saturated colors but does not match printed colors precisely to displayed colors. It is appropriate for bright saturated colors used in illustrations and graphs.

process colors
The four ink colors used in printing to simulate full-spectrum color images: Cyan, Magenta, Yellow, and blacK (CMYK).

QuickDraw
Graphics and display technology built into Mac OS computers. QuickDraw applications rely on QuickDraw (rather than the PostScript language) to send text and pictures to copiers.

raster image
Electronic representation of a page or image using a grid of points called pixels.

rendering intent
The style of color rendering, or gamut mapping, designed for a particular type of color job. An example of a rendering intent is Photographic rendering—also referred to as Image rendering or Contrast rendering—which is designed for photographic images.

resolution
The number of pixels per inch (ppi) in a bitmap image or the number of dots per inch (dpi) that a device can render.

RGB
An additive color model that makes a range of colors by combining red, green, and blue light, called the additive primaries. Commonly used to refer to the color space, mixing system, or monitor in color computer graphics.

simulation profile
The simulation profile describes the color characteristics of another print device, such as a printing press, that you want the Fiery to simulate.

solid color rendering
A color rendering style intended for use when color accuracy is crucial. Unprintable colors are mapped to the closest printable colors. Solid color rendering does the best job of preserving the saturation of displayed colors.

source color space
The color environment of the originating source of an image, including scanners and color monitors.

source profile
A profile used by the color management system to determine the characteristics of the color values specified in a source digital image.

spectral light
The wavelengths of electromagnetic radiation emitted by a given light source that can be seen by the human eye.

spot color
A color that is printed on its own separation plate when separations are specified. A spot color is printed using a custom ink for that color, in contrast to process colors that are printed using combinations of cyan, magenta, yellow, and black.

Status T
A spectral response for graphic arts reflection densitometers defined by ANSI (the American National Standards Institute).

subtractive color model
A system in which color is produced by combining colorants such as paint, inks, or dyes on media such as paper or transparent film or acetate. All printing devices use the subtractive color model.

subtractive primaries
Cyan, magenta, and yellow colorants used in subtractive color systems for color printing. Combining the subtractive primaries produces darker colors. Black is added to the subtractive primaries to compensate for deficiencies of the toners or inks, and for more efficient black printing.

substrate
In printing, the material upon which the job is printed.

SWOP
The abbreviation for Specifications for Web Offset Publications. A standard of specifications for separations, proofs, and color printing on a web offset press (*not* a sheet fed press).

undercolor removal
In areas where all three process colors (C, M, Y) overprint, the amounts of those colors are reduced and replaced by black. This improves wet ink trapping and reduces ink costs in process color printing.

vector image
Graphic illustration created on computers where picture objects are defined mathematically as lines or curves between points. These mathematical definitions are interpreted by an image language such as PostScript. Vector images include artwork created with illustration applications (such as Illustrator or FreeHand) and page layout applications (such as PageMaker).

white point
The color temperature of any white light source, typically expressed in degrees Kelvin (for example, 6500 K, typical for the white of a monitor).

workflow
The path a print job follows from creation to destination. A workflow may originate with an RGB scan imported to the client workstation and opened on the desktop in an image processing application, such as Photoshop. After adjustments are made to the scanned image, it is evaluated on a color proofing device for eventual color printing on the same device or on press.

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