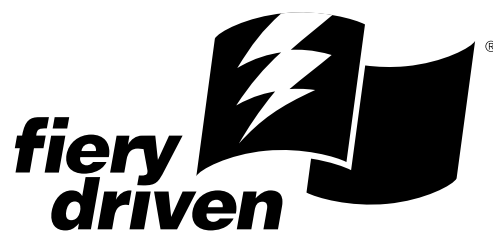

Operating Instructions Color Guide



For safety, please read this manual carefully before you use this product and keep it handy for future reference.

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Glossary

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Introduction

This manual introduces the concepts and issues associated with printing to the Fiery 3850C™. It outlines key workflow scenarios, provides information on calibration and color profiles, and contains application notes that explain how to print to the Fiery 3850C from popular Microsoft Windows and Apple Mac OS applications.

This manual is part of a set of documentation that includes manuals for users and system administrators. The other manuals should be available at your site—refer to them for a complete description of your Fiery 3850C.

NOTE: The name “Aero” is used in illustrations to represent the Fiery 3850C. The term “Windows 9x/Me” is used in this manual to refer to Windows 95/98/Me; individual differences are noted. Windows XP is supported. If you use Windows XP, follow the procedures for Windows 2000.

About the documentation

The *Color Guide* is organized to supply you with key information about managing the color output of your Fiery 3850C. Chapter 1 describes the Fiery 3850C print options and how to get the best color results, and Chapter 2 describes several effective workflows. Calibration is discussed in the next two chapters. Chapter 3 covers ColorWise Pro Tools™ and other methods of calibrating the printer, and Chapter 4 takes you through the features of Profile Manager™, used to manage color profiles on the Fiery 3850C, and Color Editor™, which lets you customize simulation and output profiles. Succeeding chapters provide tips for printing from business and graphics applications. Finally, the appendixes offer information about color theory and color management.

NOTE: PCL printer drivers are provided with the Fiery 3850C, but they support only a few of the color features described in this manual. To take full advantage of the color management features, use the PostScript printer drivers.

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.

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, read Appendixes A and B or check the glossary.

This manual is part of a set of Fiery 3850C documentation that also includes the following manuals for users and system administrators:

- The *Configuration Guide* explains basic configuration and administration of the Fiery 3850C for the supported platforms and network environments. It also includes guidelines for setting up UNIX, Windows NT /2000, and Novell NetWare servers to provide Adobe PostScript printing services to clients.
- *Getting Started* describes the process of installing the software that enables users to print to the Fiery 3850C. Specifically, it describes installation of printer drivers and other user software provided on the User Software CD. It also explains how to connect each user to the network.
- The *Printing Guide* describes the printing features of the Fiery 3850C for users who send jobs via remote workstations on the network.
- The *Job Management Guide* explains the functions of the Fiery 3850C client utilities, including the Command WorkStation™, and how you use them to manage jobs. This book is intended for an operator or administrator, or a user with the necessary access privileges, who needs to monitor and manage job flow and troubleshoot problems that may arise.
- *Release Notes* provide last-minute product information and workarounds for some of the problems you may encounter.

The *Printing Guide*, *Color Guide*, and *Job Management Guide* are provided on a CD-ROM.

Key features of ColorWise

ColorWise® is the **color management system (CMS)** built into the Fiery 3850C and designed to provide both casual and expert users the best color output for a variety of purposes. The ColorWise default settings provide great out-of-box color from many Windows and Mac OS applications. This allows casual users to get quality output without knowing about or changing any color settings on the Fiery 3850C.

For consistent color make sure the Fiery 3850C is calibrated on a regular basis. ColorWise Pro Tools include a simple-to-use calibrator, which allows you to calibrate using a **densitometer** (see Chapter 3).

You can modify printing results using ColorWise features. 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 printing using four-color press conditions or when printing 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 better color conversion of **RGB** data with no source information

ColorWise offers an open color architecture, letting users customize the Fiery 3850C 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.

Downloading ICC profiles to the Fiery 3850C enables it to simulate a custom press (or another printer), as well as accurately print colors from a particular monitor or a scanner. In addition, you can create customized ICC profiles for the printer.

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 will determine the quality of the calibration.

Chapter 1: Fiery 3850C Color Management

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

Beginning on page 1-11, there 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 and Mac OS computers.

PCL printer drivers are also available, but they support only a few of the color features described in this manual. To take full advantage of the color management features, use the PostScript printer drivers.

NOTE: If you use Windows XP, follow the procedures for Windows 2000.

Managing color on the Fiery 3850C

You can modify the Fiery 3850C printing behavior in several ways:

- Select ColorWise options for an individual print job using menus that appear from the printer driver.
- Select most ColorWise options as server defaults from the Color Setup application in ColorWise Pro Tools (see page 4-19). Defaults can also be set from Fiery 3850C Setup or from the Control Panel, as described in the *Configuration Guide*. These defaults apply to all subsequent print jobs unless you override them.
- Select some ColorWise options, particularly default **ICC profile** settings and calibration options, from ColorWise Pro Tools. These options include default Simulation Profile (see page 1-6), Appear in Driver as (see page 4-8), default Source Profile (see page 1-5), and associated calibration set (see page 3-4).

The table below illustrates the print options in the Fiery 3850C color management process that affect color data conversions. You access these print options when you send a print job to the Fiery 3850C. 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). If you send CMYK data to the Fiery 3850C in CIEBasedDEFG format, for example, by choosing PostScript Color Management in Adobe Photoshop, the Fiery 3850C Rendering Style selection—which normally affects only RGB data—will also affect this CMYK data.

You can specify settings for the following options via print options when you send a job to the Fiery 3850C. The administrator can also set some settings as defaults during Fiery 3850C Setup. Settings specified via print options override the defaults. For information about the default settings, see the *Printing Guide*.

Fiery 3850C color print option	What it does
Rendering Style Photographic/Presentation/Relative Colorimetric/Absolute Colorimetric (Default set at Setup)	Applies a Fiery 3850C color rendering style (CRD) to RGB data (see page 1-4), or to any incoming data with a PostScript source color space definition, including CMYK.
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 1-5). 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, the only ColorWise options that affects <i>only</i> DeviceRGB or calibrated RGB color spaces.
(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 1-5). To use this print option, you must choose Other as the RGB Source setting.
(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 1-5). To use this print option, you must choose Other as the RGB Source setting.
(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 1-5). To use this print option, you must choose Other as the RGB Source setting.

Fiery 3850C color print option	What it does
CMYK Simulation Profile SWOP-Coated/DIC/Euroscale/Simulation 1–10/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. Choosing None bypasses simulation (see page 1-6). NOTE: Some of the Simulation settings have slightly different names depending on the model of printer.
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 1-6). User-defined output profiles can be downloaded to the Fiery 3850C using ColorWise Pro Tools (see Chapter 4).
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 1-7).
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 1-8).
Spot Color Matching On/Off (Default set at Setup or with ColorWise Pro Tools)	The On setting enables Fiery 3850C matching of PANTONE colors; Off instructs the Fiery 3850C to match color output to a PANTONE-specified CMYK combination (see page 1-9).

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 3850C lets you select from the four rendering styles currently found in industry standard ICC profiles.

Fiery 3850C 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 <i>not</i> 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.	Relative Colorimetric
Absolute Colorimetric —Provides <i>no</i> 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.	Absolute Colorimetric

RGB Source Profile

The **RGB Source Profile** setting allows you to define the characteristics of the RGB data in your document so the appropriate color conversion can occur on the Fiery 3850C. Commonly used monitor color spaces are available from the driver and from the ColorWise Pro Tools Profile Manager. 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 3850C 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 None.

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 3850C will be consistent across platforms. Below are the Fiery 3850C RGB Source Profile options:

- **EFI RGB** 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 3850C 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 1-4). Non-PostScript RGB data and PostScript RGB data that does not contain a source color space definition is converted using a general **undercolor removal** conversion method.

CMYK Simulation Profile

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

The number of custom simulations is limited by the disk space on the Fiery 3850C.

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

- For images separated using a custom separation (such as a separation produced with an ICC profile), choose the corresponding profile on the Fiery 3850C with the CMYK Simulation Profile setting.
- For images 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 3850C. For more information about downloading ICC profiles to the Fiery 3850C, see “Downloading profiles” on page 4-5.

Output profile

The output profile is applied to all data in the print job, so make sure the selected profile is the right one for your job. The default output profile consists of both a profile for your printer, describing its color characteristics, and a calibration target that describes the expected behavior of the printer at a particular print resolution (600x600 dpi or 1200x1200 dpi).

In certain cases, you may want to customize the default output profile using the ColorWise Pro Tools Color Editor to achieve particular color effects (see page 4-11). If you do so, the new customized output profile is applied to all data in the print job.

Changing the output profile only does not affect its associated calibration target (since the target is based on a printer model). You can edit D-Max values of the calibration target separately (see page 4-6).

You can use the ColorWise Pro Tools Profile Manager to download your own output profile to the Fiery 3850C (see page 4-5). Downloaded output profiles are at first associated with the calibration target tied to the default output profile. You can edit calibration target D-Max values separately.

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, you can leave this option set to On. 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 you may want 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 printer.
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 printer.

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 3850C. 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 3 driver for Windows 2000. To print this single-color black at the maximum toner density of the printer, set the Pure Black Text/Graphics option to On.

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 effects 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 3850C.

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 printer.

Spot Color Matching

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

- **On**—The Fiery 3850C uses a built-in table to generate the closest CMYK matches of PANTONE colors your printer can produce. (New tables are generated when you add new output profiles.)

NOTE: Spot colors not included in the built-in table are treated as CMYK.

- **Off**—The Fiery 3850C 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 1-6).

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 5-6) prints differently depending on the Spot Color Matching setting.

- **On**—The Fiery 3850C uses a built-in table to generate the best matches of the PANTONE colors that your printer can produce. The PANTONE number is printed below each swatch.
- **Off**—The Fiery 3850C 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.

Printer drivers and print options

This section describes the role of the printer driver and explains how to use Windows and Mac OS PostScript printer drivers for Fiery 3850C printing. PCL printer drivers are also available, but they support only a few of the color features described in this manual. To take full advantage of the color management features, use the PostScript printer drivers.

NOTE: The term “PostScript” by itself is used to refer to Adobe PostScript Level 2 or later.

What a printer driver does

To take full advantage of the features of the Fiery 3850C, 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 printer. To do this, the printer driver must be matched with a **PostScript printer description file PPD** for your Fiery 3850C. The PPD contains information about the particular features supported by the Fiery 3850C and the printer. You can think of the PPD 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 printer and present print options within the application interface. Even these applications, however, require that you use a PostScript printer driver. See *Getting Started* for information on installing printer drivers.

We recommend you set the print options initially in Fiery 3850C Setup (see the *Configuration Guide*). This provides you with a default configuration that is appropriate for most Fiery 3850C print jobs.

PostScript printer driver for Windows computers

You can access the printer driver options described in this section by clicking Start\Settings\Printers, right-clicking the appropriate printer, and selecting Properties (Windows 9x/Me), Document Defaults (Windows NT), or Printing Preferences (Windows 2000) from the pop-up menu. These settings are also accessible from the Print Setup or Page Setup dialog boxes of most applications.

For Window 9x/Me, the Fiery 3850C driver interface enables you to save combinations of settings that you can later access. In addition, 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 3850C print options you selected. The printer driver sends the PostScript file to the Fiery 3850C. The Fiery 3850C 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 Adobe PageMaker, Adobe Photoshop, Adobe 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 9x/ Me and Windows NT

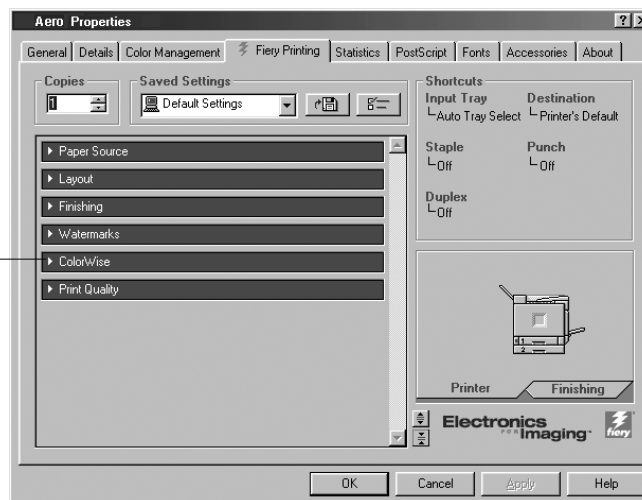
This section explains how to set Fiery 3850C color print options with the Adobe PostScript printer driver, a PostScript 3 printer driver that takes full advantage of the color features of the Fiery 3850C. Before you proceed, make sure you have completed the following procedures described in *Getting Started*.

- Install the Adobe PostScript Printer Driver and the Fiery 3850C PPD.
- Set up the Fiery 3850C for printing.

To set print options, see the information for your operating system on page 1-12.

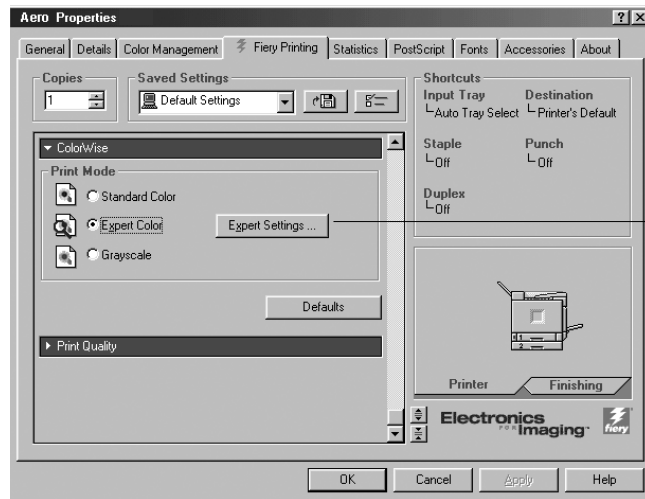
Under the Fiery Printing tab, click the ColorWise menu to select settings for the print options described on page 1-2.

Click the ColorWise menu

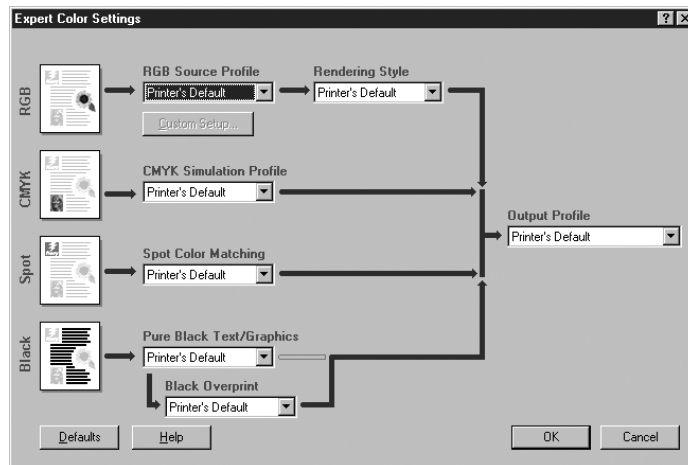


1

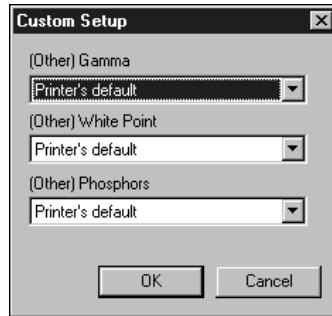
1-14 Fiery 3850C Color Management



Click Expert Settings to display additional color settings for the Fiery 3850C. Each option allows you to 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 1-5).



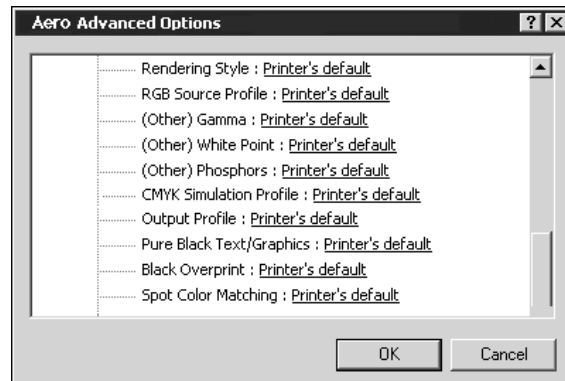
For most users, the default settings provide the right level of color control. For more information about individual print options, see page 1-2.

Setting color management print options for Windows 2000

This section explains Fiery 3850C color print options with the Microsoft PostScript Printer Driver for Windows 2000. This PostScript driver takes full advantage of the color features of the Fiery 3850C. Before you proceed, make sure you have completed the following procedures described in *Getting Started*:

- Install the Fiery 3850C PPD for the Microsoft PostScript Printer Driver.
- Set up the Fiery 3850C for printing.

To set print options, access the printer driver options as described on page 1-12. Click the Advanced tab in the Printing Preferences dialog box, and then choose settings for the print options described on page 1-2.



Adobe PostScript printer driver for Mac OS

This section explains how to set color management print options with the AdobePS printer driver for Mac OS, a PostScript 3 driver that takes full advantage of the color features of the Fiery 3850C 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 3850C PPD, as described in *Getting Started*.
- Select the Fiery 3850C in the Chooser and set it up with the Fiery 3850C 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 can choose print options from the various panes of the AdobePS driver dialog box. To access the initial AdobePS dialog box, choose Print from the File menu of your application.

NOTE: The word “pane” is used to describe the different pages that appear in the driver dialog box when you make selections from the pull-down menu at the upper 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 3850C, ColorWise provides all color conversions on the Fiery 3850C. Typically, you should use this option when printing to the Fiery 3850C.
- **PostScript Color Matching**—Can be used with PostScript devices such as the Fiery 3850C. It provides for color conversion using a color rendering dictionary (CRD) that is downloaded with the print job. This method requires that the file be saved as an EPS with PostScript Color Management selected.

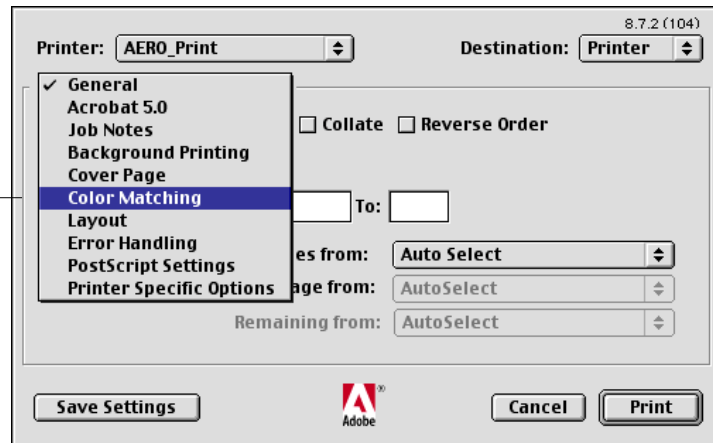
NOTE: If you use the PostScript Color Matching option, the driver may, depending on the application in use, attach a CMYK source definition to the CMYK data in your document. In this case, the CMYK data in the document is re-separated using a Fiery 3850C CRD and converted to the selected output profile’s 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 3850C, but it is intended for use with PostScript Level 1 devices. If you use this option, be sure to specify the Fiery 3850C 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 3850C.

Setting Fiery 3850C color management options

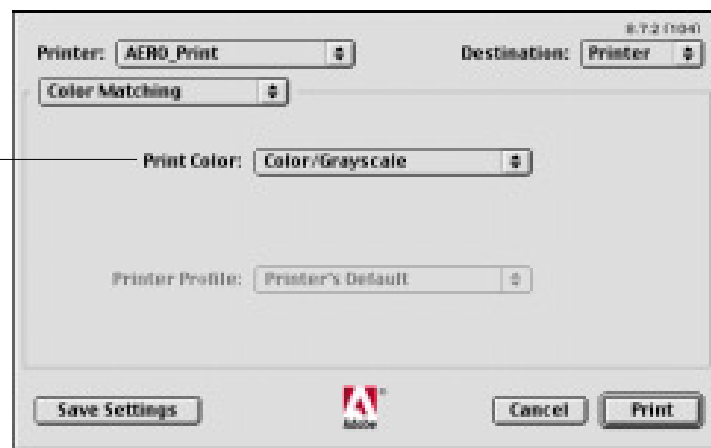
In the AdobePS Print dialog box, choose Color Matching from the pull-down menu.

Choose Color Matching from the pull-down menu

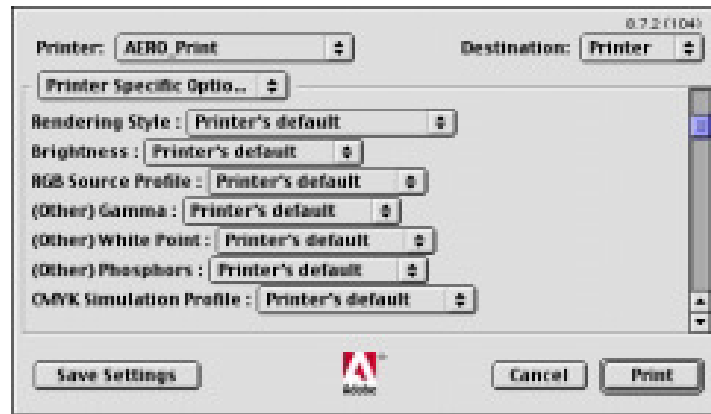


In the Color Matching pane, choose Color/Grayscale from the Print Color pull-down menu.

Choose Color/ Grayscale



In the Printer Specific Options pane, choose settings for the print options described on page 1-2.



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 3850C. It also gives examples of color management in specific desktop applications and discusses the interaction between those applications and ColorWise color management.

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 3850C, along with the notion that different versions of desktop applications handle color management differently. 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 3850C is the final print device. Printing jobs to the Fiery 3850C in preparation for printing on an offset press is referred to as color proofing. Both types of Fiery 3850C 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 the printer or, more simply, printer CMYK. See “Advanced Workflows” on page 2-7 for short-run printing examples.
- Offset jobs proofed on the Fiery 3850C require the printed colors to match those from another set of CMYK printing conditions. Colors specified for an offset press require CMYK simulation optimized for proofing on the printer. See “Advanced Workflows” on page 2-7 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 3850C. Color conversion workflows for CMYK and PANTONE colors are explained below.

- CMYK colors are device-dependent. In a proofing scenario, colors specified in prepress applications are adjusted so the gamut of the Fiery 3850C printer can simulate that of the press. In a short-run printing workflow, specifying CMYK colors according to the calibrated printer 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 printer toners or process color inks. Two basic workflows exist for printing PANTONE colors to the Fiery 3850C:

Spot Color Matching On instructs the Fiery 3850C to match the output of the printer to the PANTONE spot color.

Spot Color Matching Off instructs the Fiery 3850C to match the printer output to a PANTONE-specified process simulation. This CMYK combination is then printed with the CMYK Simulation setting you choose, such as SWOP or DIC.

Desktop versus Fiery 3850C 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 printer, so the processing occurs on your computer, as opposed to the Fiery 3850C.

One advantage of using ColorWise color management over desktop color management is that your computer is spared added processing. Delaying color conversions until the color data reaches the Fiery 3850C frees your computer so you can continue working, and color conversions on the Fiery 3850C are, in most cases, much faster than similar conversions on a host computer.

Managing most or all of your color on the Fiery 3850C can also eliminate the potential for undesirable color management-related conflicts, such as iterative color conversions and inconsistent color. The Fiery 3850C 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 3850C, network traffic is minimized and jobs generally print faster.

ColorWise uses ICC profiles to convert colors to the printer gamut or simulate other devices, such as an offset printing press. ColorWise manages color conversions for all users printing to the Fiery 3850C 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 3850C can intelligently manage the printed appearance of RGB, CMYK, and PANTONE colors. You can let the Fiery 3850C 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 printer, those colors need to be converted, which requires color management. You can define or modify colors 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 3850C 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 printer. 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 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 3850C 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. Fiery 3850C Color reference files are included on the User Software CD (see page 5-2). You can also print color charts from the Control Panel and select colors by number or 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 printer 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 printer. 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 printer.

NOTE: CMYK Simulation set to None is also useful when you want to prepare an output profile of your calibrated printer 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.

Workflow 1—Colors you define in an application

Colors in output from the printer



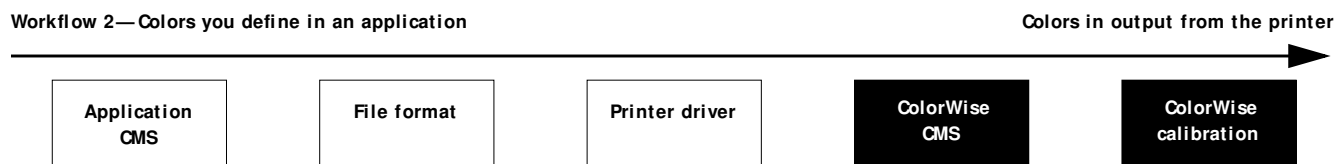
While this workflow lends some control over the color quality produced by the printer, you should consider additional ColorWise color management, as described in the next section.

Workflow 2 using ColorWise color management—standard workflow

Fiery 3850C servers are highly optimized for the specific printer they drive, and ColorWise addresses many issues unique to your printer, including screens, individual toner response, interactions among toners, natural smoothness of blends, and the capability to render PANTONE and custom colors. The Fiery 3850C 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 processor. When you use ColorWise, jobs leave your computer faster to be processed more quickly on the Fiery 3850C.

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



The Fiery 3850C comes into play near the end of the color workflow. To ensure the colors you selected reach the Fiery 3850C 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 2-7).

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 applies calibration, so the response of the printer will appear to be stable.

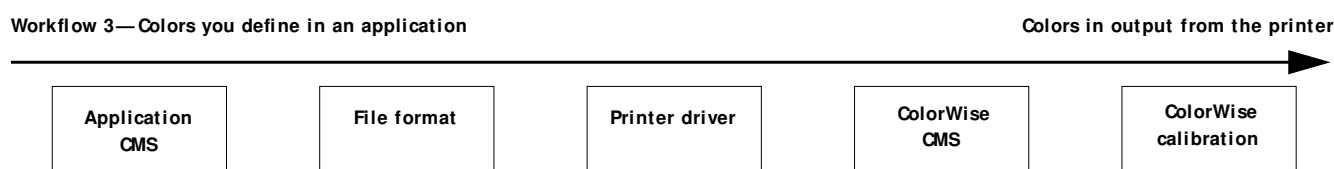
The recommended values for CMYK Simulation are SWOP in the US, Euroscale in Europe, and DIC in Japan—choices that respect the color standard for each region. If colors have been selected specifically for your calibrated printer, set CMYK Simulation to None.

See the table on page 1-2 for a list and descriptions of ColorWise print options that affect 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 printer. The Fiery 3850C still prints pages using your PostScript files, and drives the printer and its accessories, but it does not perform CMYK color transformation, nor does it consider the calibration of the printer. Calibration is needed in order to get consistent output, since the color response from your printer 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 3850C, you should disable color management in the application to ensure the Fiery 3850C receives color data properly and prints it accurately.

Save your files using color-safe settings

You can take several additional steps 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 3850C 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 does not conflict with this information, and such data is useful for identifying 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 computers, if the printer driver offers Image Color Matching options, select Printer Image Color Matching.

On Mac OS computers, set the printer driver to include *no* color management commands at print time (see page 1-16).

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 reference specific software applications to illustrate 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 3850C.

Photoshop RGB workflow

This short-run workflow of printing an RGB image from Photoshop is one of the simplest Fiery 3850C color workflows. RGB data is sent from the application, through the printer driver, to the Fiery 3850C, and the RGB-to-CMYK conversion takes place

on the Fiery 3850C using a CRD rather than 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 3850C.

See Chapter 7 for recommended print settings from Photoshop.

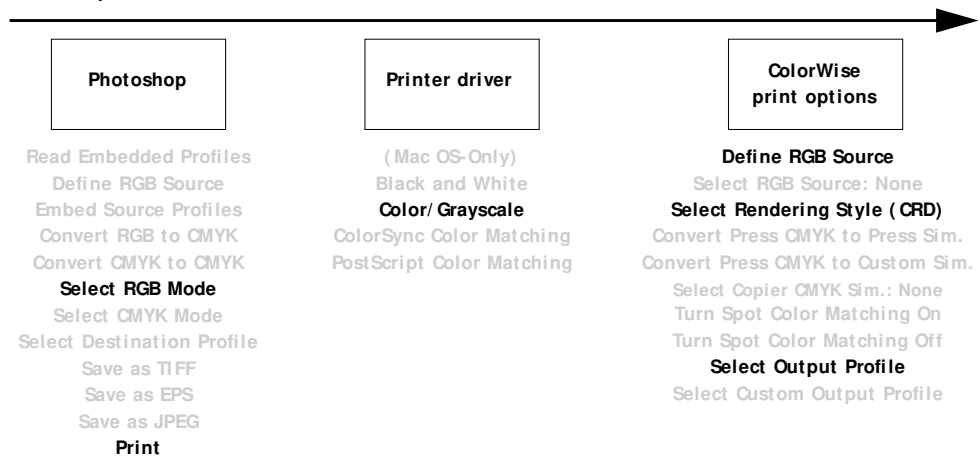
- Use ColorWise to convert the RGB image to printer CMYK, or the full copier gamut.

The ColorWise settings used in this example are:

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

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

Photoshop RGB workflow



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 you place CMYK colors in a document, select them from printed output (see page 2-3).

This document could be created as follows:

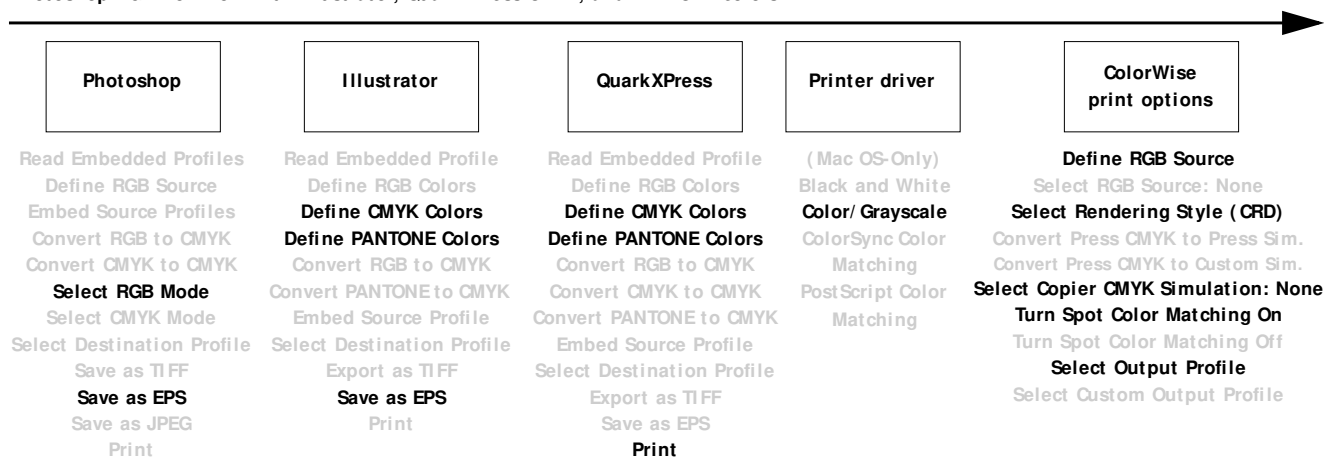
- Create an RGB image in Photoshop and save it as Photoshop EPS.
- Create a graphic in Illustrator using CMYK and PANTONE colors and save as Illustrator EPS.
- Use CMYK colors and a PANTONE color in a QuarkXPress document.
- Import the Illustrator EPS into QuarkXPress and place the Photoshop EPS image.
- Print the QuarkXPress document to the Fiery 3850C.
- Use ColorWise to convert the RGB image to printer CMYK, to adjust the process colors for short-run printing, and to match the PANTONE spot colors using the full printer 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
- CMYK Simulation set to 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 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:

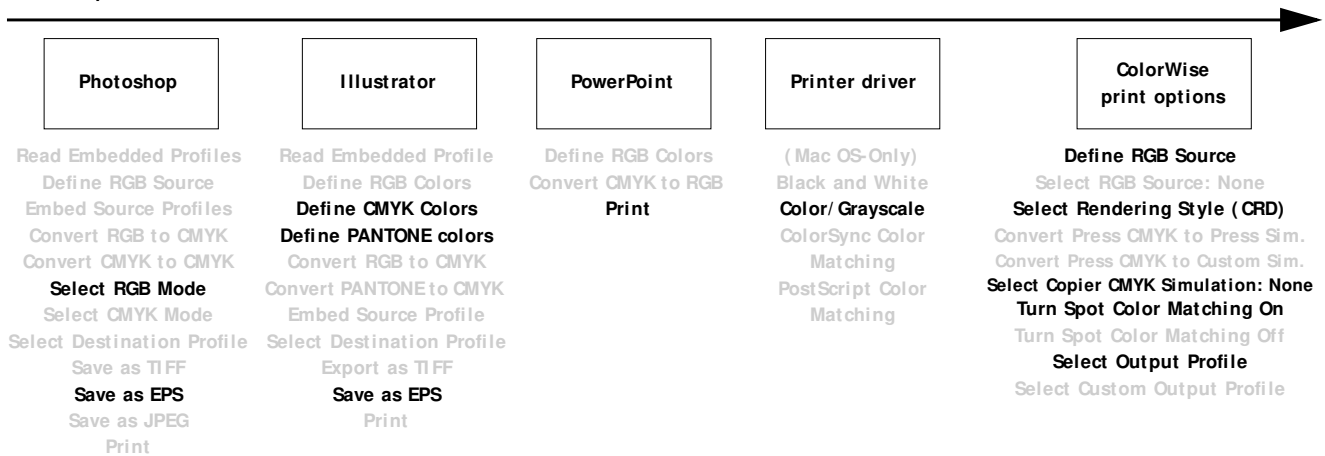
- Create an RGB image in Photoshop and save it as Photoshop EPS.
- Create a graphic in Illustrator using CMYK colors and a PANTONE spot color and save as Illustrator EPS.
- Create a presentation in PowerPoint using RGB colors.
- Import the Illustrator EPS graphic into the PowerPoint presentation and place the Photoshop EPS image.
- Print the PowerPoint document to the Fiery 3850C.
- Use ColorWise to convert the PowerPoint RGB colors and Photoshop RGB image to printer CMYK, to adjust the process colors for more saturated short-run printing, and to match the PANTONE spot colors using the full printer 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
- CMYK Simulation set to 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 into the Fiery 3850C, others use ColorWise Pro Tools (see Chapter 4) to download custom ICC output profiles to the Fiery 3850C 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 the Photoshop 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 3850C, and the output is made to appear as if it were printed on an offset press.

This document could be created as follows:

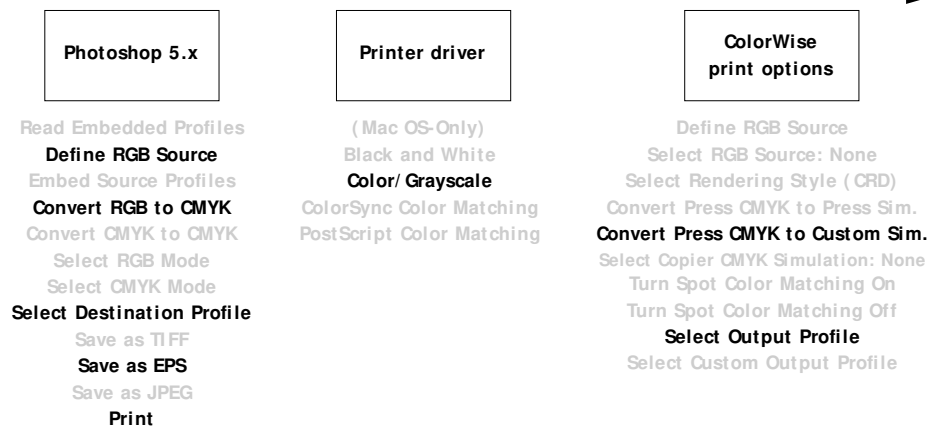
- In Photoshop 5.x, set CMYK Model in CMYK Setup to ICC.
- In the Profile menu, select an ICC profile for the desired offset press. Click OK.
- Open an RGB image. From the Image pull-down menu select Mode>CMYK Color.
- Save the image in any file format.
- Print directly to the Fiery 3850C.
- Use ColorWise Pro Tools to select a simulation profile or download a custom ICC profile to the Fiery 3850C 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

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

Photoshop RGB-to-CMYK workflow using ICC profile



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 the Photoshop 5.x/6.0 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 3850C, 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 option from CMYK Setup in Photoshop 5.x/6.0 Color Settings.
- Adjust the Ink Options and Separation Options to match your offset press.
- Select the Tables option in CMYK Setup and click Save.

This saves your settings as a CMYK ICC profile that you will later download to the Fiery 3850C as a custom simulation profile.

- Select the Built-in option in CMYK Setup again and click OK.
- Launch ColorWise Pro Tools and download your new CMYK ICC profile to the Fiery 3850C 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.)

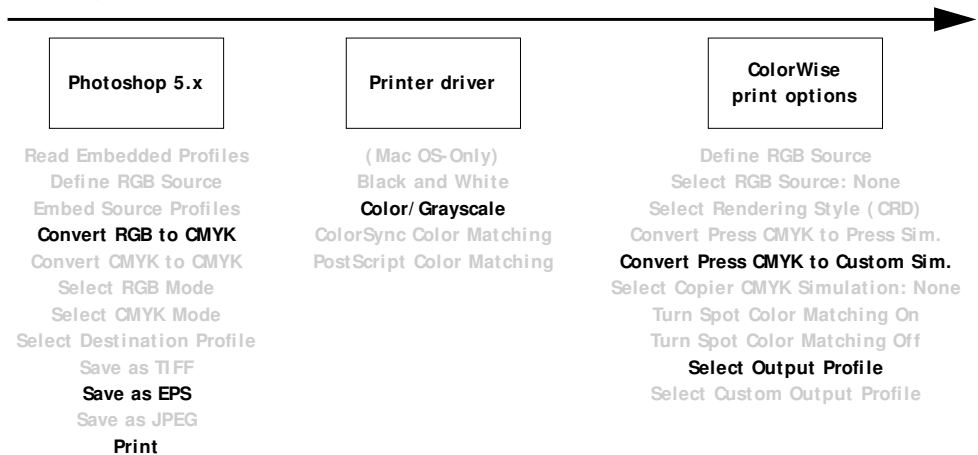
- Open an RGB image in Photoshop 5.x. From the Image menu, select Mode>CMYK Color. Save the image as Photoshop EPS.
- Print the image directly to the Fiery 3850C and choose Simulation-1 as the CMYK Simulation Profile setting.

The ColorWise settings used in this example are:

- CMYK Simulation Profile set to Simulation-1

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

Photoshop5.x RGB-to-CMYK workflow



Chapter 3: Color Calibration

Calibrating the Fiery 3850C ensures consistent, reliable color output. You can calibrate the Fiery 3850C with ColorWise Pro Tools using any of these instruments:

- X-Rite DTP41 automatic scanning spectrophotometer (page 3-7)
- X-Rite DTP32 automatic scanning densitometer (page 3-25)
- EFI ED-100 Densitometer (page 3-25)

Each of these instruments must be purchased separately. By connecting the instrument to the serial port on your computer, you can quickly measure color patches and download measurements to the Fiery 3850C. You can also obtain measurements from the printer's built-in scanner and calibrate using VisualCal, which does not require the use of a densitometer and can be run from ColorWise Pro Tools. VisualCal is run from the Control Panel on the Fiery 3850C.

This chapter explains how **calibration** works and provides instructions for all calibration procedures. Calibrating with VisualCal is described on page 3-5. Calibrating with ColorWise Pro Tools is described on page 3-29. For information on advanced calibration and simulation features 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 and Mac OS computers. The main differences are the interface cable and the port used to connect to the densitometer.

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 printer.
- Calibration sets are sets of measurements.
- A calibration target that describes the expected behavior of the printer is contained in each output profile.

Once you have calibrated the Fiery 3850C with ColorWise Pro Tools or with VisualCal, a calibration set is stored on the Fiery 3850C. This calibration set is 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. You can set an Administrator password from the Fiery 3850C Control Panel or in Setup from Command WorkStation to control access to calibration.

Understanding calibration

Although most users' needs are met by the default calibration set, the Fiery 3850C 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 3850C.
- Ensure consistent color quality over time.
- Produce consistent output across Fiery 3850C 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 3850C for using ColorWise rendering styles (CRDs), CMYK simulations, and ICC profiles.

How calibration works

Success in obtaining satisfactory print quality from a color server, such as a Fiery 3850C, connected to a printer 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 3850C 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 3850C 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 printer 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. Then you measure the patches using the EFI Densitometer 100, the X-Rite DTP41 spectrophotometer, or an X-Rite DTP32 densitometer connected to a computer on the network or the printer's scanner. The new measurements are automatically downloaded to the Fiery 3850C.

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 3850C. When you calibrate the Fiery 3850C, 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 1-6.)

Scheduling calibration

In general, you should calibrate the Fiery 3850C at least once a day, depending on the volume of print jobs. If it is very important to maintain consistent color, or if the printer 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 3850C after printer maintenance. However, because the printer may be less stable immediately after maintenance, wait until you have printed approximately 50 pages before you calibrate.

NOTE: Since printed output from the printer is very sensitive to changes in temperature and humidity, the printer should *not* be installed near a window, in direct sunlight, or 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 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 3850C.

When you examine the Test Page, keep in mind that all color patches should be visible, even though they may be very faint in the five percent and two percent range, and each color's patch set should show uniform gradation from patch to patch as the color lightens from 100 percent to zero percent.

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

Checking calibration status

You can check whether the Fiery 3850C is calibrated, which calibration set and output profile were used, and when the printer was last calibrated:

- Print a Configuration page or Test Page from the Control Panel or the Command WorkStation.

For information about printing these pages, see the *Configuration Guide*.

- When you select a calibration set in Calibrator, the last calibration and the user who performed it are displayed.

Calibrating from the Control Panel using VisualCal

VisualCal is a calibration method that allows you to calibrate your printer to a color output standard defined by the manufacturer. The calibration calculations performed by the controller software are based on a series of values entered on the control panel. The values used in the calculations are determined by evaluating toner densities and color combinations produced on two specially designed calibration pages printed from the control panel.

Limits and 30% Match

The first VisualCal page, "Limits and 30% Match," provides the basis for calculating the most acceptable luminosity (brightness) of the toners. This page consists of rows of CMYK dots in a graduated range of toner densities.

The variables needed to recalculate the *density* of the colored toners are determined by identifying the leftmost dots that can be fully distinguished against their fields in each row, and sequentially entering their corresponding numeric values on the control

panel. The variable needed to recalculate the *luminosity* of the toners is determined in a slightly different way—you identify the black dot that best matches a 30% dot gain field. When all values have been entered, the printer's toner density and luminosity settings are recalculated.

Gray Balance

The second VisualCal page, "Gray Balance," provides the basis for calculating a "neutral gray balance," that is, a CMY gray that as closely as possible matches a pure K (black) gray produced by the printer's engine. This page consists of rows of CMY gray patches on a field of gray produced solely from black. The variables needed to calculate the printer's most neutral gray balance are determined by identifying the CMY patch that best matches this field, and entering its row and column location on the control panel. When the values have been entered, the printer's gray balance is recalculated.

TO PERFORM VISUALCAL CALIBRATION

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 3850C, 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 3-35).

4. **For Measurement Method, chose VisualCal.**

5. **Back at the main calibration screen, select Calibrate.**

6. **Press Yes to print the Limits and 30% Match page.**

To reset the printer's toner density and luminosity settings, follow the instructions provided on the Limits and 30% Match page. Use the touch screen to change numbers; do not use the numerical keypad.

NOTE: Zero (0) and 9 are unacceptable values for color calibration. If you select 0 for any of the colors, the resulting calibration will be inaccurate. If the entered value for any color is 9, the Limits and 30% Match page is reprinted automatically. Re-enter values for all color rows starting with Black Start.

When you have finished entering all values, the PRINT GRAYS screen appears.

7. **Press Yes to print the Gray Balance page.**

To reset the printer's gray balance, follow the instructions provided on the Gray Balance page. When you have finished entering all values, the PRINT COLOR TEST screen appears.

NOTE: If the Gray Balance page is printed after the Limits calculations have been made, the gray field on which the CMY patches appear on the Limits page will use the new density and luminosity calibration settings.

Select **Yes** to print a color test page that uses the original values (**CURRENT COLOR TEST PAGE**) and a Color test that uses the new values (**NEW COLOR TEST PAGE**), and use the up and down arrows to select **YES**. Press **Enter** to print the pages.

8. **If you are satisfied with the printer's calibration based on the new values, select YES from the APPLY CHANGES screen that appears, and press OK to calibrate the printer based on the previously entered values.**

9. **Choose Exit Calibration to return to the Functions menu.**

Use the following suggestions for adjusting VisualCal for your specific preferences:

- If your print seem to be color balanced but too dark, enter a lower value for the 30% Match entry on the Limits and 30% Match page, last row.
- If your print seems too light, enter a higher value.
- If light areas on your prints have a color cast, enter a lower value in the Start row for that toner.
- If dark areas on your prints have a color cast, enter a higher value in the End row for that toner.

Using a spectrophotometer

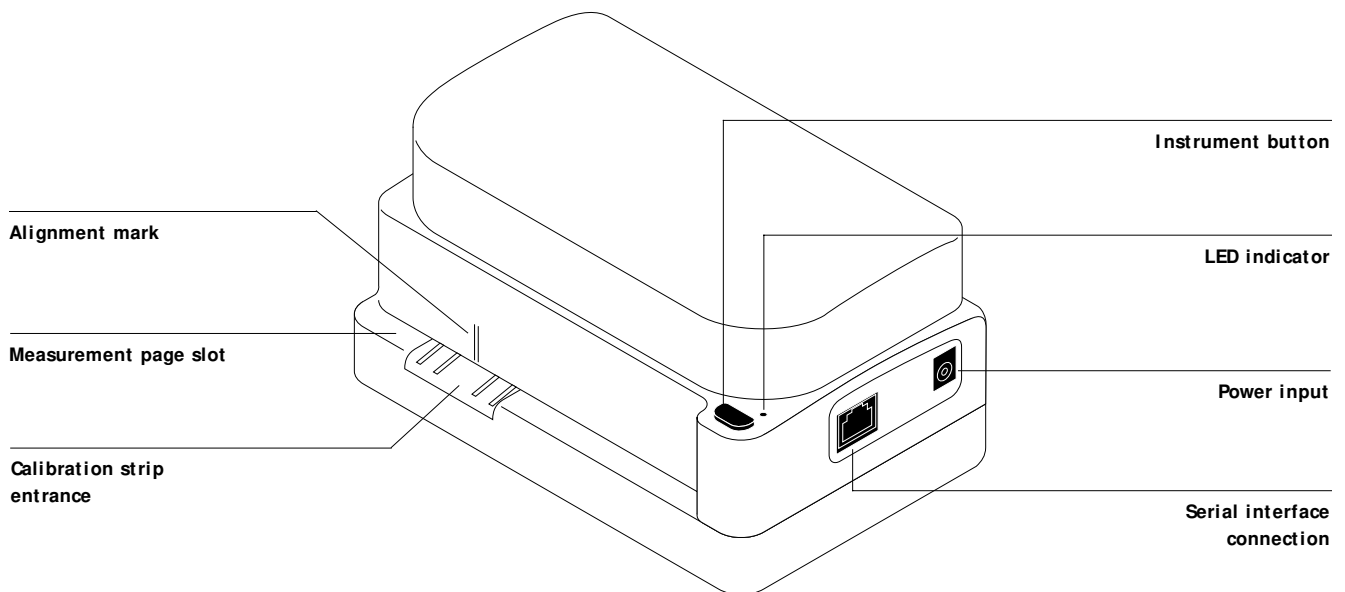
ColorWise Pro Tools Calibrator is designed to work with the X-Rite DTP41 spectrophotometer, a device that measures density and color data. The DTP41 communicates directly with the Calibrator application in ColorWise Pro Tools, sending measurements to the Fiery 3850C automatically.

Setting up the spectrophotometer

Before you calibrate the Fiery 3850C, you need to connect, configure, and calibrate the spectrophotometer to prepare for measuring the printed patches (see “Calibrating the X-Rite DTP32 densitometer” on page 3-28). For additional information about setting up and using the DPT 41, see the *Instrument Operator’s Manual* that came with it.

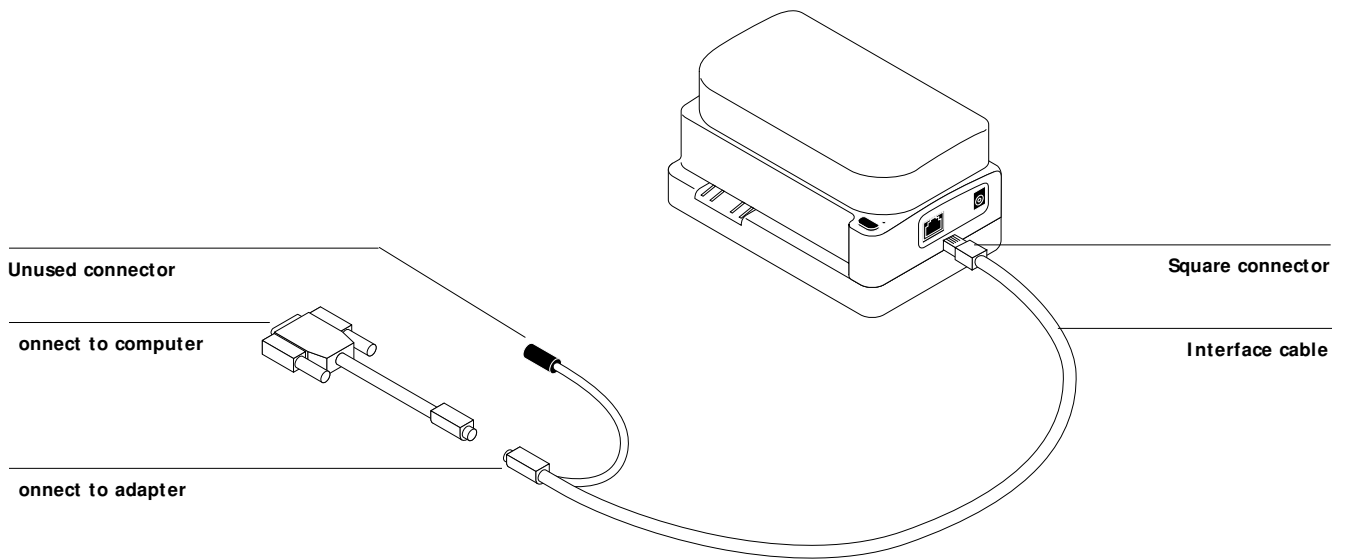
TO CONNECT THE X-RITE DTP41 TO THE COMPUTER

1. Turn off the computer.
2. Unpack the X-Rite DTP41, and remove the spacer from the measurement page slot.
3. Plug the square end of the interface cable (looks like a modular phone plug) into the serial interface connection on the side of the X-Rite DTP41.

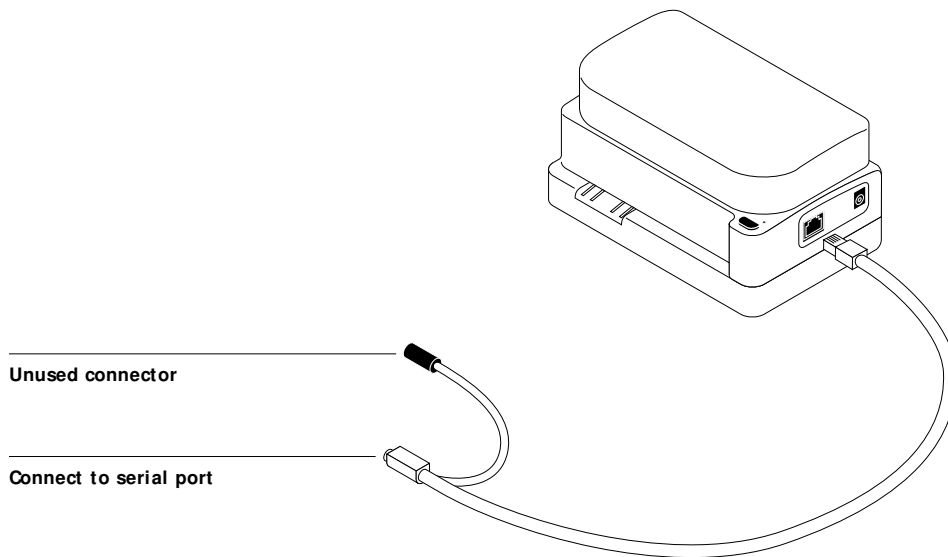


4. Attach the connector to the computer.

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.



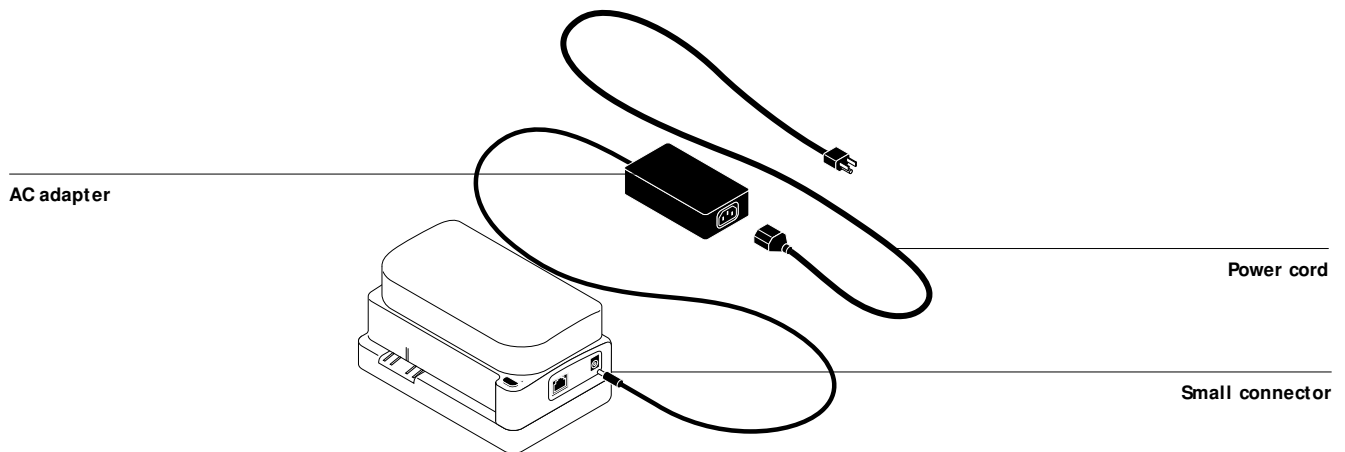
For a Mac OS computer, connect the 8-pin mini-DIN plug directly into the serial port of the computer.



NOTE: For Macintosh computers with a USB port (for example, an iMac) you need an adapter to connect the DTP41 to your computer. See the X-Rite, Inc. web site (www.x-rite.com) for information on supported adapters.

5. Use the AC adapter to provide power.

Plug the small connector on the adapter cable into the power input of the X-Rite DTP41 and plug the AC adapter into the power cord. Plug the power cord into a wall outlet.

**6. Turn on the computer.****7. Use ColorWise Pro Tools to calibrate the X-Rite DTP41 (see page 3-28).****8. Use ColorWise Pro Tools and the DTP41 to calibrate the Fiery 3850C (see page 3-16).****Calibrating the spectrophotometer**

For the best color accuracy, you should calibrate the X-Rite DTP41 spectrophotometer every time you calibrate the Fiery 3850C. You can initiate the calibration sequence in ColorWise Pro Tools Calibrator as part of the process of Fiery 3850C calibration. The computer may also prompt you that it is necessary to calibrate the spectrophotometer.

Alternatively, you can initiate the DTP41 calibration process using the Instrument button on the DTP41. See the *Instrument Operator's Manual* that accompanied the X-Rite DTP41 for more information on this method.

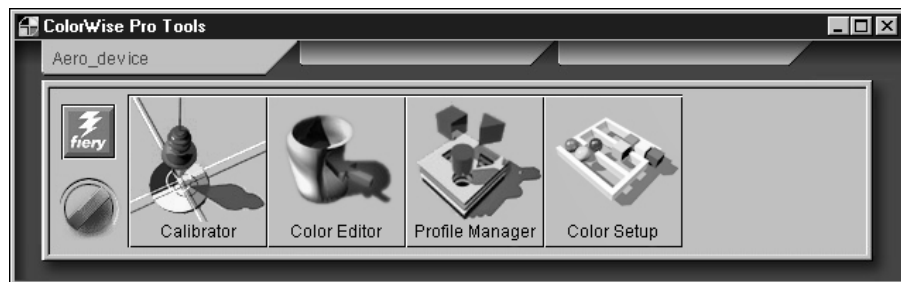
Multiple users connect to one Fiery 3850C server with ColorWise Pro Tools, but only one user at a time can use the Calibrator module. An error message appears if you try to calibrate when another user is already using ColorWise Pro Tools to calibrate.

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

You will need the Color Reflection Reference strip included with the spectrophotometer. Remove the strip from its protective envelope, handling it only by the edges. Keep the strip free of dust and smudges, and always store it in the protective envelope.

TO CALIBRATE THE X-RITE DTP41

1. Connect the spectrophotometer to the computer and turn on power (see page 3-8).
2. Launch ColorWise Pro Tools and connect to the Fiery 3850C.



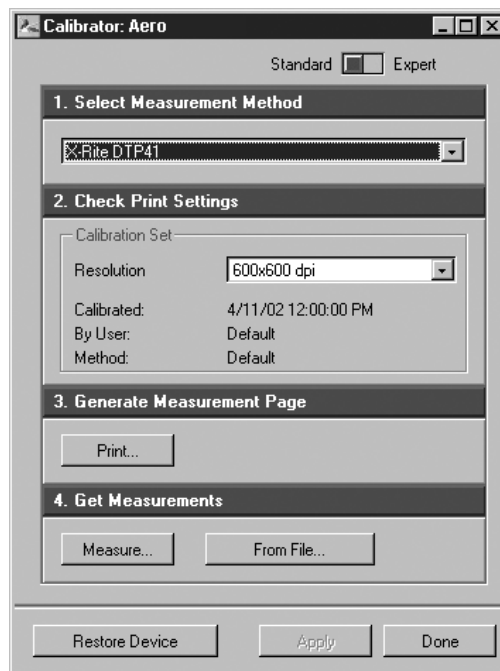
For instructions on configuring the connection to the Fiery 3850C, see *Getting Started*.

NOTE: If the connection to the Fiery 3850C from Command WorkStation that also allows for access to ColorWise Pro Tools is not established, you can directly launch ColorWise Pro Tools independently of Command WorkStation.

3. Click **Calibrator**.

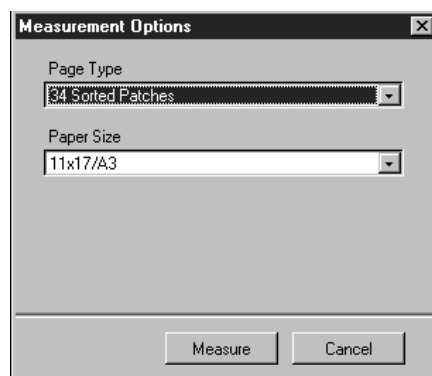
4. **Select DTP41 as the measurement method.**

X-Rite DTP41 should appear as a measurement method. This information is provided to Calibrator by the Fiery 3850C. If this option does not appear, make sure you are connected to the Fiery 3850C.



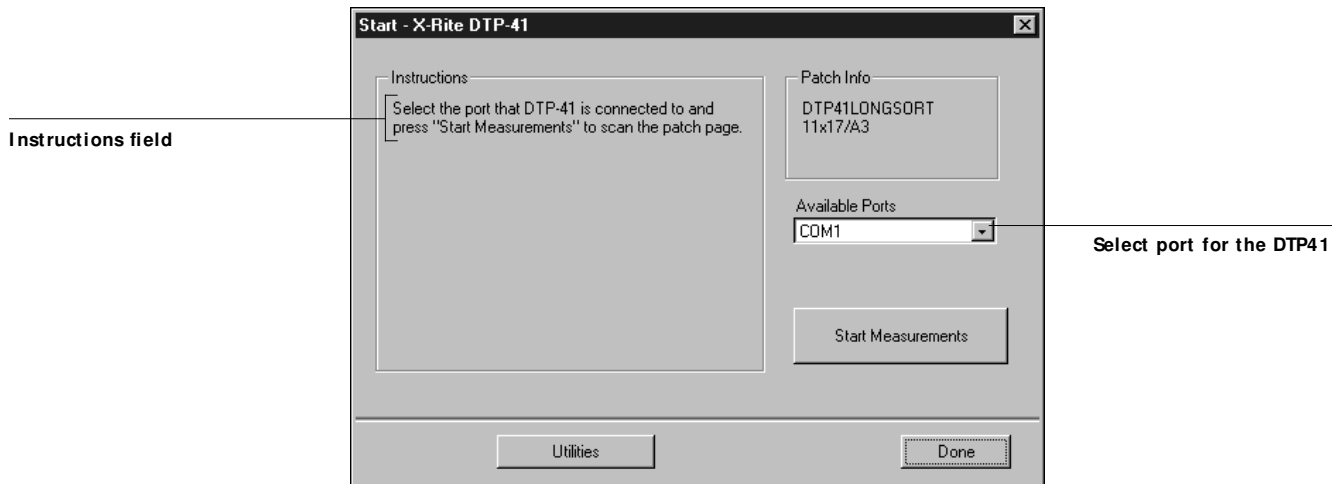
5. **Under Get Measurements, click Measure.**

6. **In the Measurement Options dialog box, click Measure.**

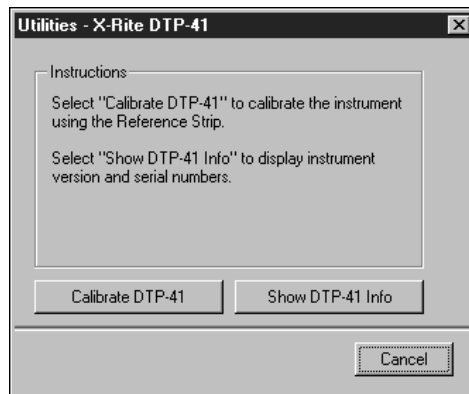


7. **Select the appropriate COM port for the DTP41 from the Available Ports menu.**

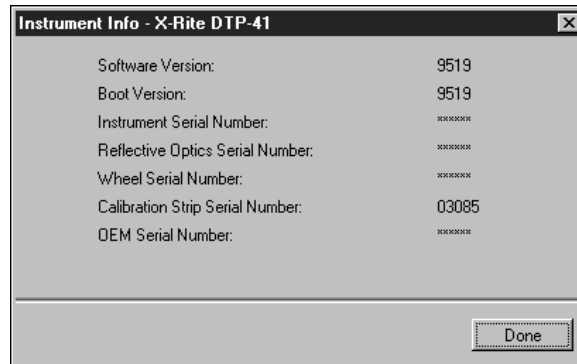
The Instructions field displays instructions for selecting the port.



8. Click **Utilities**.
9. Click **Calibrate DTP-41**.



NOTE: To view version and serial number information, click Show DTP-41 Info. When finished, click Done.

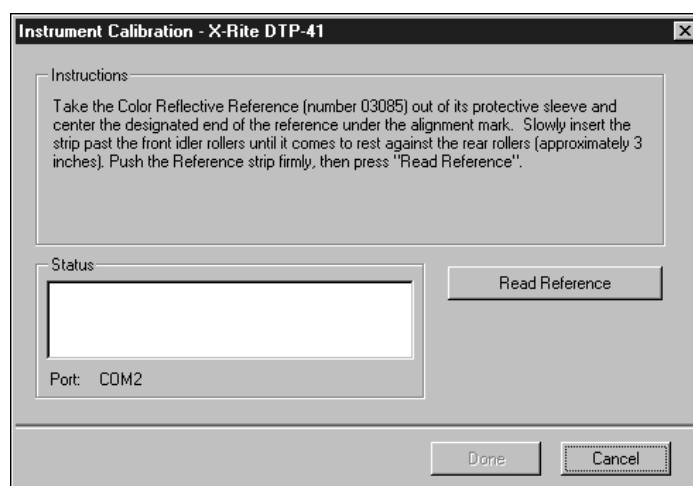


10. **Remove the shipping spacer from the measurement page slot, if you have not already done so.**
11. **Insert the end of the Color Reflection Reference strip with the arrow into the calibration strip entrance on the DTP41, centering it below the alignment mark (see the diagram on page 3-8).**

Insert the strip about 3 inches, past the front idler rollers, until it rests against the rear drive rollers.

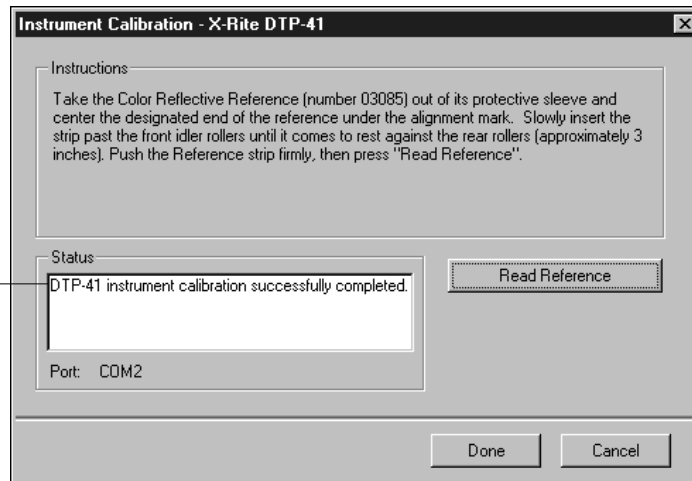
12. **Click Read Reference.**

The DTP41 will pull the calibration strip through automatically.



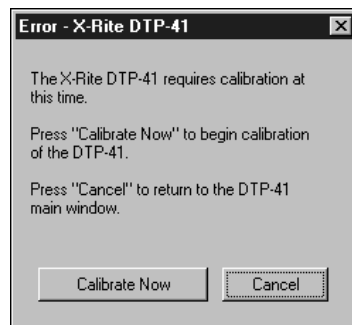
13. Click Done.

Status field indicates DTP41 was calibrated successfully

**14. Close the Utilities window.**

This completes DTP41 calibration.

When the DTP41 requires calibration, your computer prompts you.



When this dialog box appears, click Calibrate Now and follow the instructions, starting with step 9 on page 3-14.

After calibrating the DTP41, calibrate the Fiery 3850C (see page 3-16).

Calibrating with ColorWise Pro Tools and DTP41

Using the ColorWise Pro Tools Calibrator application and the DTP41

spectrophotometer, you can quickly measure color patches generated by the printer and automatically download these measurements to the Fiery 3850C.

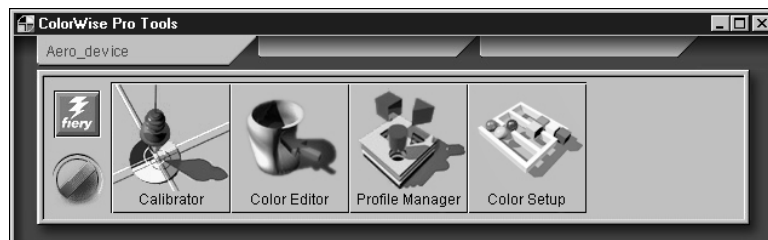
Changing the calibration has the potential to affect *all* jobs for *all* users, so you may want to limit the number of people authorized to perform calibration. You can set an Administrator password from the Fiery 3850C Control Panel to control access to calibration.

Multiple users can connect to one Fiery 3850C server with ColorWise Pro Tools, but only one user at a time can use the Calibrator module. An error message appears if you try to calibrate when another user is already using ColorWise Pro Tools to calibrate.

NOTE: Before using ColorWise Pro Tools and the DTP41 to calibrate the Fiery 3850C, follow the instructions on page 3-28 for calibrating the DTP41 spectrophotometer.

TO CALIBRATE THE FIERY 3850C USING THE DTP41

1. Launch ColorWise Pro Tools and connect to the Fiery 3850C.



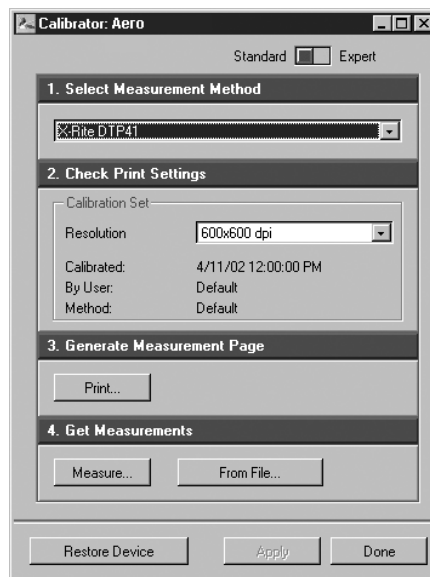
For instructions on configuring the connection to the Fiery 3850C, see *Getting Started*.

NOTE: If the connection to the Fiery 3850C from Command WorkStation that also allows for access to ColorWise Pro Tools is not established, you can directly launch ColorWise Pro Tools independently of Command WorkStation.

2. Click **Calibrator**.

3. **Select DTP41 as the measurement method.**

X-Rite DTP41 should appear as a measurement method. This information is provided to Calibrator by the Fiery 3850C. If this option does not appear, make sure you are connected to the Fiery 3850C.



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

Choose the appropriate calibration set for the print resolution 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.**

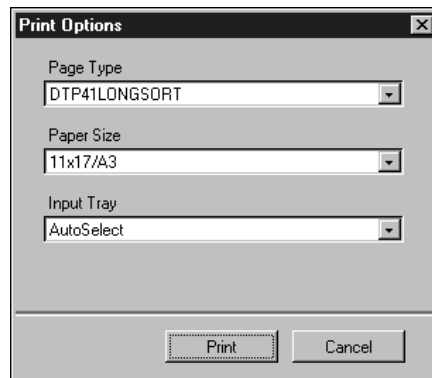
6. **In the Print Options dialog box, choose the Page Type, Paper Size, and Input Tray to use for the measurement page, and then click Print.**

In the Page Type pop-up menu, select either 34 or 21 Sorted Patches.

In the Paper Size pop-up menu, 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.

Print Options window for
DTP41 calibration
method

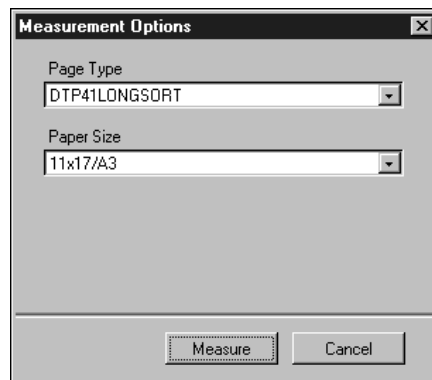


7. Retrieve the measurement page from the printer.

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

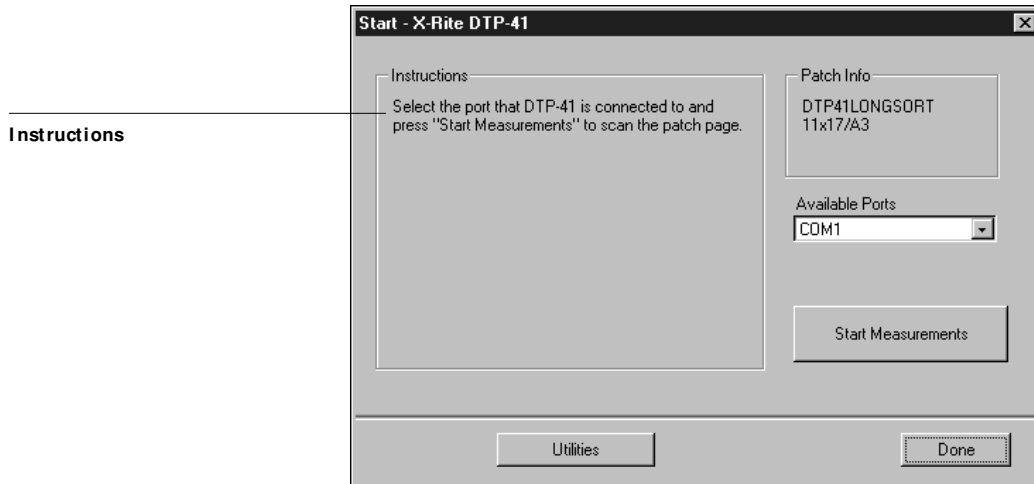
The selected Page Type and Paper Size options appear.

9. Click **Measure**.



10. If necessary, select the appropriate COM port for the DTP41 from the Available Ports pop-up menu.

The Instructions field displays instructions for selecting the port.

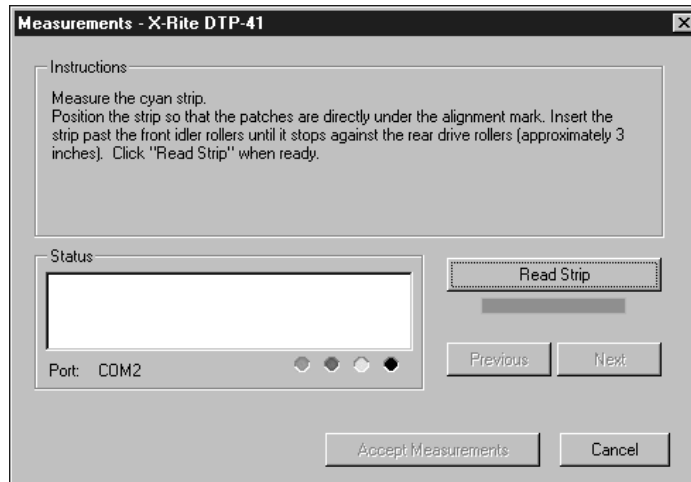


11. Feed the measurement page into the DTP41, starting with the cyan strip.

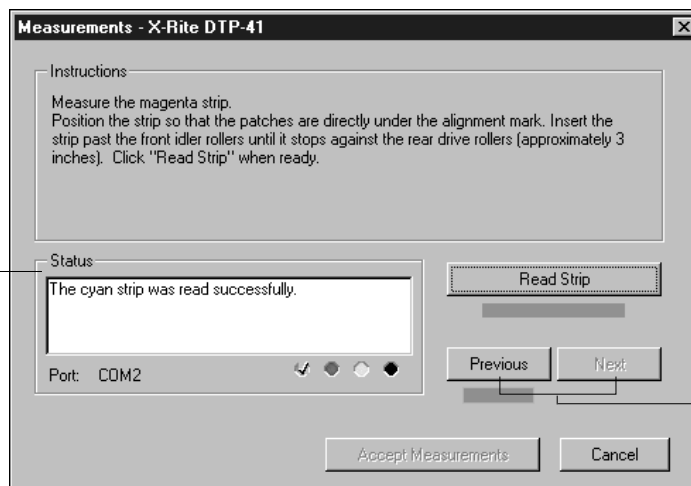
Align the page in the measurement page slot of the DTP41, so the appropriate color column is centered below the alignment mark (see the diagram on page 3-8). Insert the page about 3 inches, past the front idler rollers, until it rests against the rear drive rollers.

12. Click Read Strip.

The DTP41 pulls the measurement page through automatically.

**13. Once the measurement page is read, Calibrator instructs you to insert and align the page again for the next color. Repeat the measurement process for the magenta, yellow, and black strips.**

Status field indicates color was measured successfully

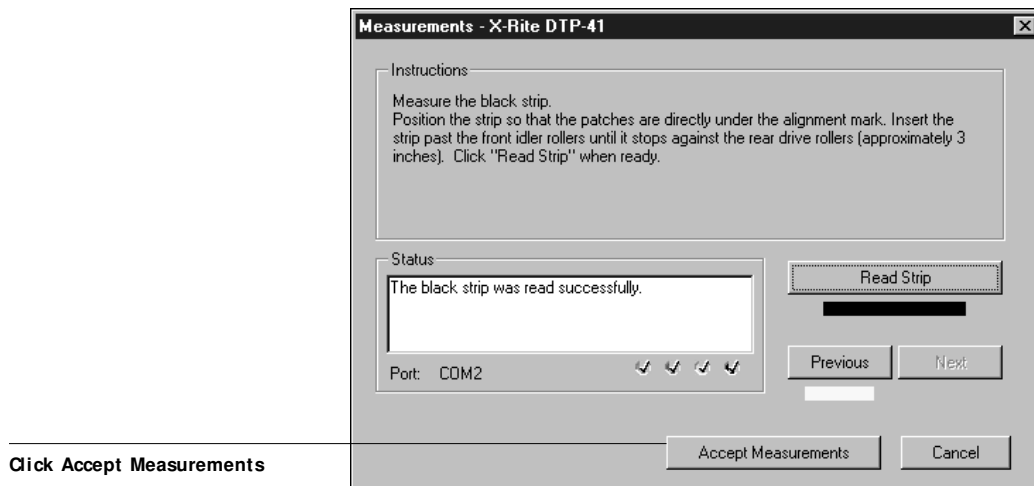


Previous and Next buttons let you advance or reverse to repeat a measurement

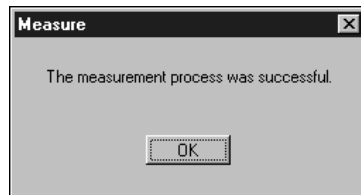
A check mark appears on the circle of the color just read, and the Status field indicates that color was measured successfully.

You can use the Previous and Next buttons on the Measurements window to reverse or advance to another step in the measurement sequence to repeat a measurement.

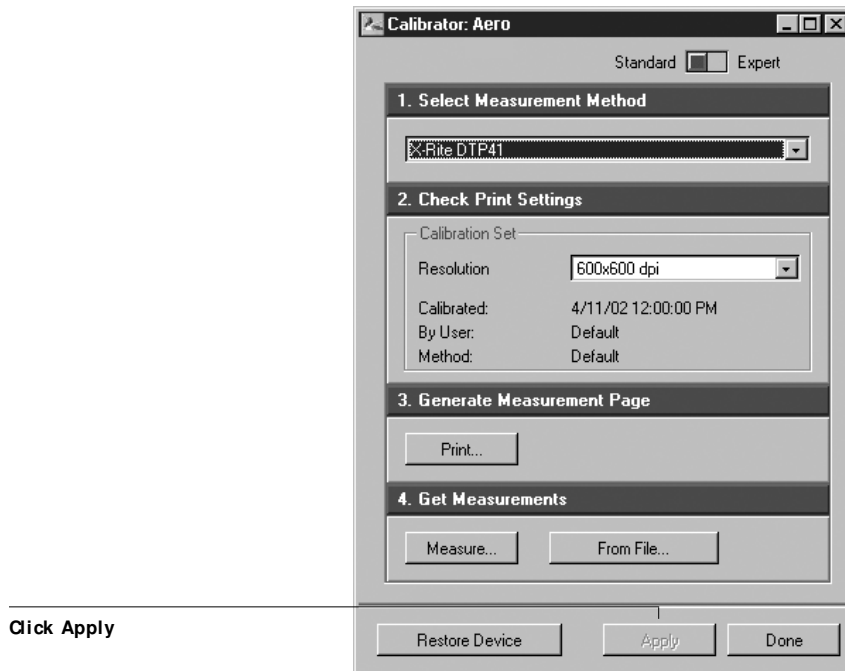
14. When the Status field indicates that all four color strips have been read successfully, click **Accept Measurements**.



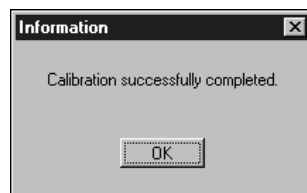
15. In the Measure dialog box, click **OK**.



16. In the Calibrator dialog box, click Apply to implement the new calibration set.



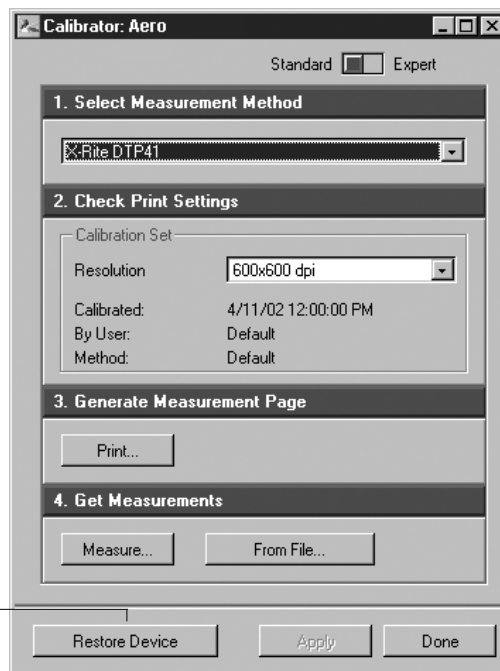
17. In the Information dialog box, click OK.



This completes the Fiery 3850C calibration process.

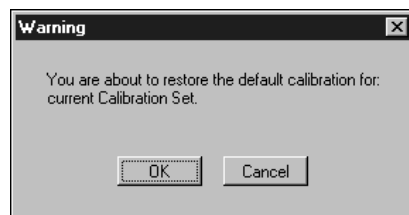
TO RESTORE DEFAULT CALIBRATION MEASUREMENTS

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



Click Restore Device

3. Click **OK** to restore the preset default calibration set (print resolution setting).



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

Using a densitometer

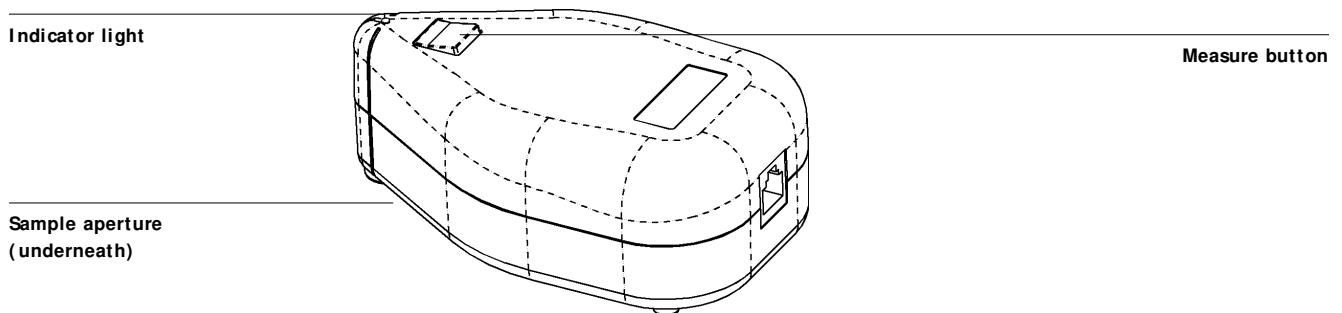
ColorWise Pro Tools are designed to work with the EFI Densitometer 100 and the X-Rite DTP32, both of which are reflection densitometers which feed color measurements to the Fiery 3850C automatically.

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

Setting up the ED-100 densitometer

To use the ED-100 for calibration purposes, you must first set it up for use with your computer. For complete instructions on setting up the ED-100, see the documentation that is included with the instrument.

The following illustration shows the different components of the ED-100.

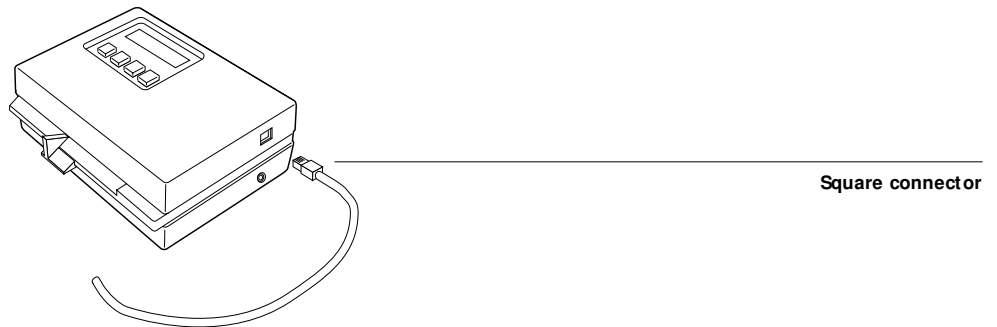


Setting up the X-Rite DTP32 densitometer

Before you calibrate the Fiery 3850C using the X-Rite DTP32, you need to connect, configure, and calibrate the densitometer to prepare for measuring the printed patches (see “Calibrating the X-Rite DTP32 densitometer” on page 3-28). For additional information about setting up and using the DTP32, see the documentation included with it.

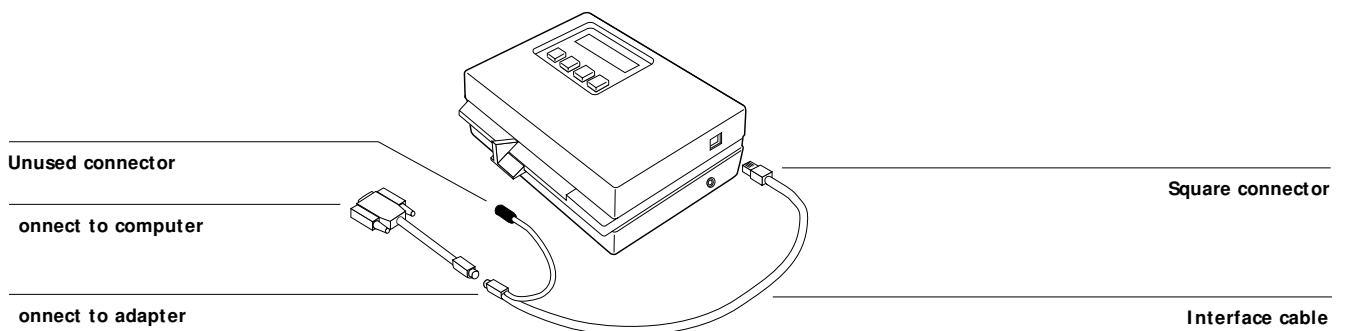
TO CONNECT THE X-RITE DTP32 TO THE COMPUTER

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.

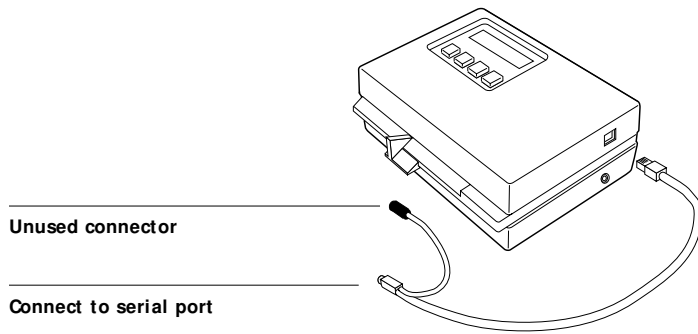


3. Attach the connector to the computer.

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.



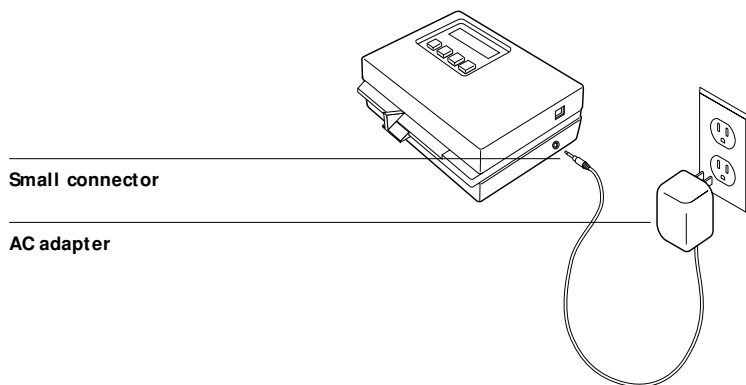
For a Mac OS computer, connect the 8-pin mini-DIN plug directly into the serial port of the computer.



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 3850C (see page 3-29).

Calibrating the X-Rite DTP32 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 3-25).**
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 3850C (see the next section).**

Recalibrate the densitometer at least once per month. For critical color, calibrate the densitometer every time you calibrate the Fiery 3850C. The densitometer may also warn periodically that it requires calibration.

Calibrating with ColorWise Pro Tools and DTP32/ ED-100

Using the densitometer, you can quickly measure color patches and download these measurements to the Fiery 3850C using ColorWise Pro Tools Calibrator.

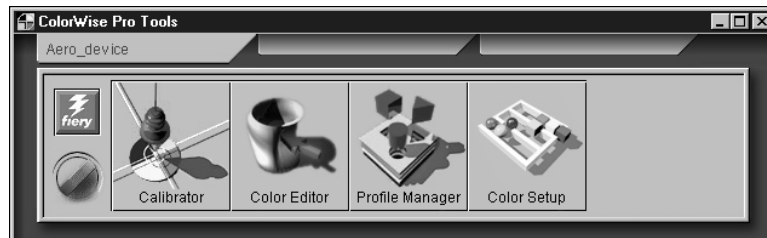
NOTE: Multiple users can connect to one server with ColorWise Pro Tools, but only one user at a time can use Calibrator. An error message appears if you try to calibrate when another user is already using ColorWise Pro Tools to calibrate.

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 3850C Control Panel to control access to calibration.

TO CALIBRATE THE PRINTER USING CALIBRATOR

1. Launch ColorWise Pro Tools and connect to the Fiery 3850C.

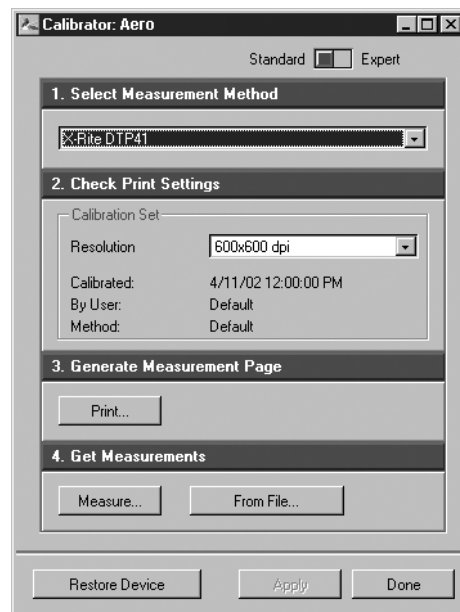


For instructions on configuring the connection to the Fiery 3850C, see *Getting Started*.

NOTE: If the connection to the Fiery 3850C from Command WorkStation that also allows for access to ColorWise Pro Tools is not established, you can directly launch ColorWise Pro Tools independently of Command WorkStation.

2. Click **Calibrator**.
3. Select a measurement method.

X-Rite DTP32, X-Rite DTP41, and EFI Densitometer ED-100 appear as the measurement methods. If none of these options appears, make sure you are connected to the Fiery 3850C.



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

If there is more than one option, choose the appropriate calibration set for the print resolution you use most often.

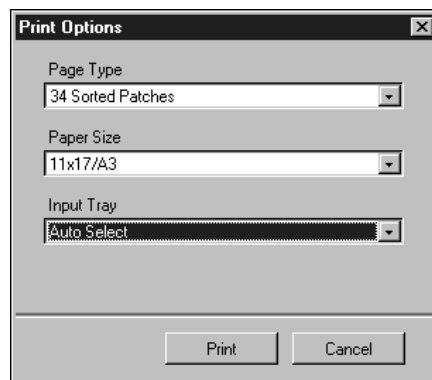
NOTE: For this calibration to take effect, the calibration set must be associated with one or more output profiles. The default calibration set is already associated with the default output profile, so there is no need to make any new associations.

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

6. In the Print Options dialog box, choose the Page Type, Paper Size, and Input Tray to use for the measurement page, and then click Print.

For the densitometer method, select either 34 or 21 Sorted Patches.

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



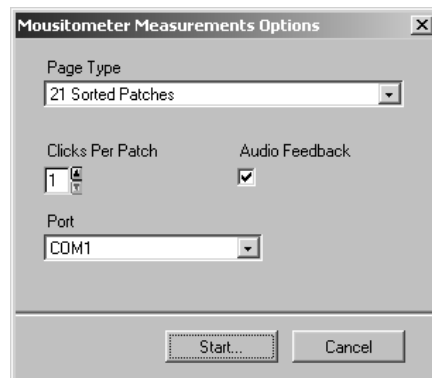
7. Retrieve the Measurement Page and click Cancel.
8. Under Get Measurements, click Measure.
9. If you chose the DTP32 method, proceed to step 13.
10. If you chose the EFI Densitometer 100 method, select options in the options dialog box and click Start.

For Page Type, the previously selected page information appears.

For Clicks Per Patch, select how many measurements (clicks of the measurement button on the EFI Densitometer 100) you want to use for each color patch, up to three clicks per patch. The average measurement is returned to the Fiery 3850C. More than one measurement per patch results in a more accurate measurement of that patch, but it takes more time. If you select multiple clicks per patch, it is a good idea to move the EFI Densitometer 100 slightly after each measurement while keeping it within the patch circle.

Checking the Audio Feedback check box instructs the computer to signal you audibly after each patch measurement is completed. This allows you to take the measurements without having to see the computer screen. One tone indicates the patch was measured successfully, while another indicates a measurement error occurred.

For Port, select the COM port to which the EFI Densitometer 100 is connected.



11. Measure each color patch using the EFI Densitometer 100.

The Status field of the Mousitometer Measurements dialog box indicates whether the connection to the EFI Densitometer 100 was successful.

The EFI Densitometer 100 Measurements dialog box also provides a visual map of your progress.

Begin with Strip A, placing the EFI Densitometer 100 *directly on* the Measurement Page and *directly over* the first color patch. Click the measurement button on the EFI Densitometer 100 to take a reading. You must click the button the number of times that you selected for Clicks Per Patch. If you selected multiple clicks per patch, it is a good idea to move the EFI Densitometer 100 slightly after each measurement while keeping it within the patch circle.

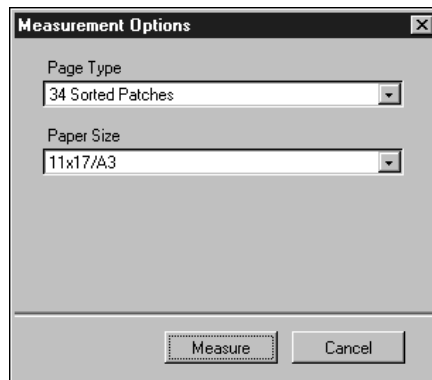
NOTE: For more accurate measurement, place a plain sheet of paper beneath the Measurement Page to block underlying colors from being read by the EFI Densitometer 100.

Continue measuring every color patch on the Measurement Page, being sure not to skip a single patch.

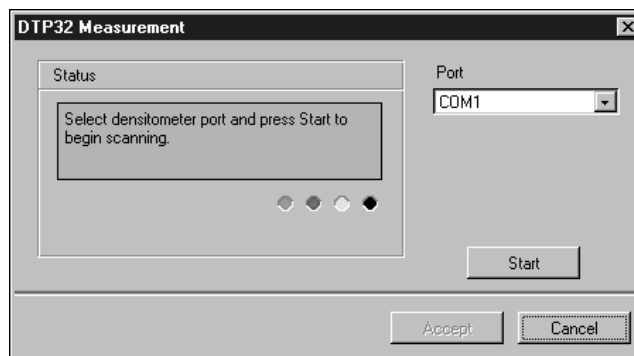
NOTE: It is critical that you take the measurements in the order outlined in the EFI Densitometer 100 Measurements dialog box and on the Measurement Page.

12. When all patches have been measured successfully, click Accept and skip to step 15.

13. If you chose the DTP32 method, select the Page Type and Paper Size options you selected for the measurements page, and click Measure.



Follow the directions in the dialog box that appears for feeding the measurement page through the X-Rite DTP32.



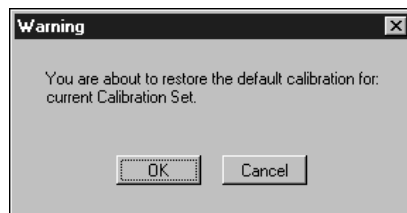
The Status field displays instructions for selecting the port and feeding the measurement page through the DTP32 four times, once for each color strip.

14. When the Status field indicates that the measurements were read successfully, click Accept.
15. In the Measure dialog box, click OK.
16. In the Calibrator window, click Apply to implement the new calibration set.
17. In the Information dialog box, click OK.

This completes the calibration process.

TO RESTORE DEFAULT CALIBRATION MEASUREMENTS

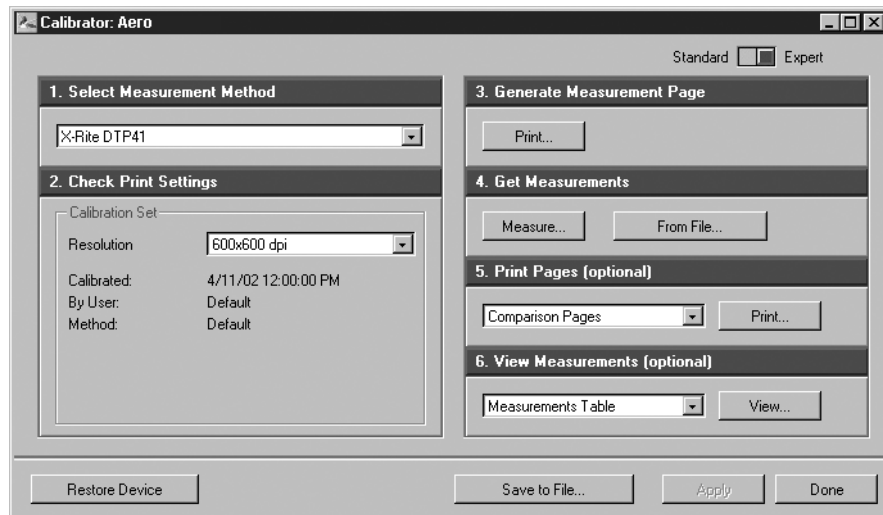
1. Launch ColorWise Pro Tools and click Calibrator.
2. Click Restore Device.
3. Click OK to restore the preset default calibration set.



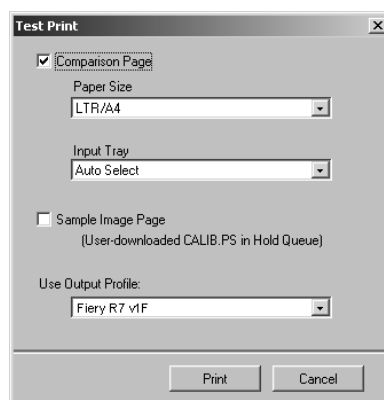
NOTE: Restore device applies only to the currently selected calibration set.

Expert Mode

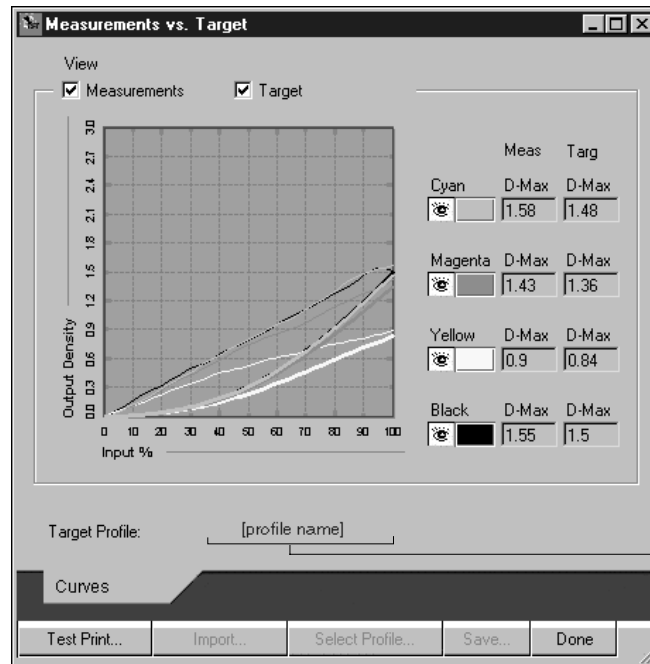
Expert Mode offers two additional options: Print Pages and View Measurements.



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 you can print the file to the Hold Queue of the Fiery 3850C from your application or download it to the Hold Queue with Command WorkStation. In addition, you can create the CALIB.PS file by renaming 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.



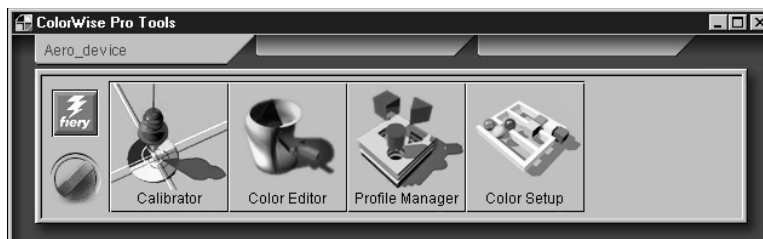
Output profile name
appears here

When more than one profile use the same target, an additional menu called Plot Against appears in the upper right of the window above. It lists all output profiles that use the 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.

Chapter 4: ColorWise Pro Tools

ColorWise Pro Tools include the following color management tools that give you flexible control of color printing:

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



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: If the connection to the Fiery 3850C from Command WorkStation that also allows for access to ColorWise Pro Tools is not established, you can directly launch ColorWise Pro Tools independently of Command WorkStation.

Profile Manager

Profile Manager allows you to manage and edit ICC profiles. In the case of the Fiery 3850C, these profiles are divided into RGB Source, Simulation, and Output profiles.

- **RGB Source** contains all monitor profiles resident on the Fiery 3850C. RGB Source profiles define the source color space for RGB colors processed by the Fiery 3850C.

NOTE: If you use Photoshop 5.x/6.0, you can upload the profile for your selected working space to the Fiery 3850C and choose that as your RGB Source profile.

- **Simulation** contains printer profiles used to simulate another device on the Fiery 3850C.
- **Output** contains printer profiles that describe the attached printer.
For more information on output profiles, see page 1-6.

NOTE: Changing the Fiery 3850C 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 3850C, and you can create additional profiles as needed by modifying the existing ones. You can also download profiles listed below from any workstation to the Fiery 3850C.

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
- **EFI RGB**—preset default setting for a Fiery 3850C

Simulation:

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

Output:

- **Fiery 3850C 600dpi v1F**—profile that describes the printer
- **Fiery 3850C 1200dpi v1F**—profile that describes the printer at a higher print resolution

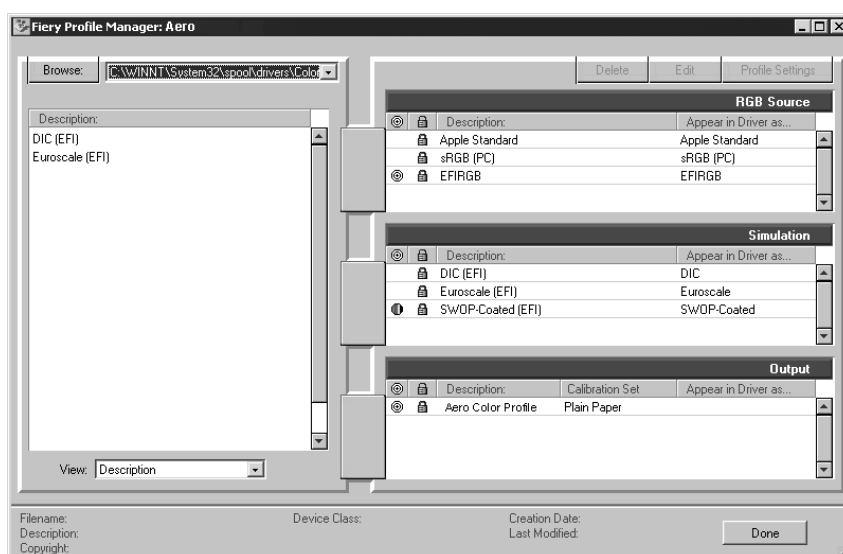
NOTE: For more information on output profiles, see page 1-6.

Setting the default profiles

The default profiles are applied to all print jobs sent to the Fiery 3850C, 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**.



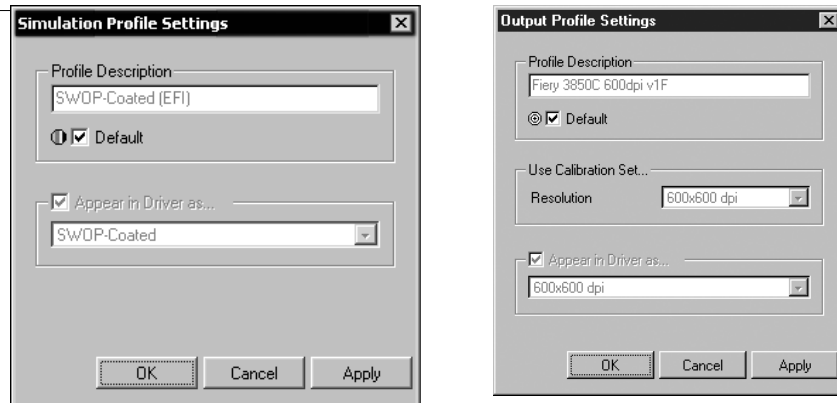
The left side of the screen lists the ICC profiles in the default directory of your computer. The right side lists each of the three types of profiles on the Fiery 3850C.

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 (🎯).

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**.

Profile Settings dialog box for Simulation (left) and Output (right)



4. Click **OK**.

In the main Profile Manager window, the target icon appears next to the new default profile you specified.

5. Repeat steps 2 through 4 for each type of profile.

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

The Output profile always has 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 3850C comes with default profiles. You can download additional profiles from any computer connected to the Fiery 3850C.

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.

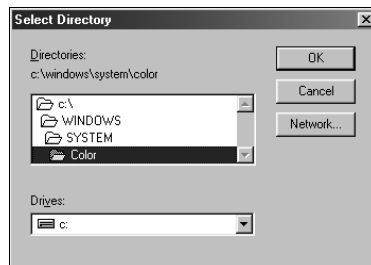
For Windows 9x/Me, the default directory is Windows\System:Color.

For Windows NT 4.0 and Windows 2000, 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 for ColorSync 2.5 or later.

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

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



4. When the profile you want to download appears in the list in the main Profile Manager window, select it.

If the profile is compatible with the Fiery 3850C, 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 3850C.

Simulation profiles should be only profiles of devices for which you want the Fiery 3850C to match in terms of color output characteristics. Output profiles should be only profiles of the device to which your Fiery 3850C is connected. Although CMYK printer profiles can be downloaded as Simulation or Output, consider how they will be used. If you want the Fiery 3850C prints to look like another printer, download that profile as a Simulation. If you have a custom profile of the printer your Fiery 3850C is connected to, download that profile as an Output profile.

5. **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 Source-10 for RGB Source, Simulation-1 through Simulation-10 for Simulation, or Output-1 through Output-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.

Editing profiles

You can customize the profiles on the Fiery 3850C to meet your specific needs and the characteristics of your printer using Color Editor, either directly or through Profile Manager. See “Color Editor” on page 4-11 for more information on editing profiles.

Managing profiles

Profile Manager lets you back up profiles to ensure that no custom profiles are lost when the Fiery 3850C software is updated. You can also upload a copy of a built-in Fiery 3850C profile to your workstation in order to use it with an ICC-aware application, such as Photoshop. Profile Manager also lets you delete unwanted profiles.

NOTE: You can back up and delete only those profiles that appear in the main Profile Manager window *without* a 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 3850C 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 file name of the profile, but the profile description will be the original description, 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 3850C (although profiles are small and do not take up much space).

TO DELETE PROFILES FROM THE FIERY 3850C HARD DISK

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

2. **Select the profile you want 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 currently set as the default or associated with a custom name, click Profile Settings and clear the default option.

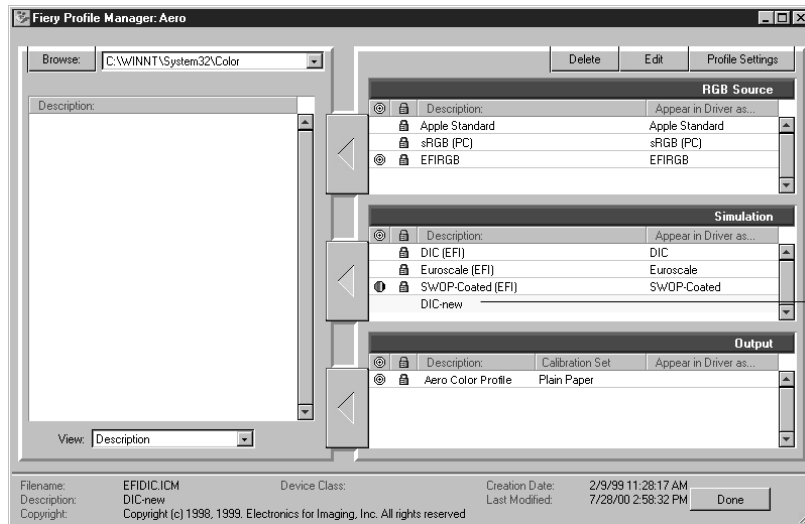
Defining profiles

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 Simulation-10 for Simulation, or Output-1 through Output-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.



Custom profile
created with
Color Editor

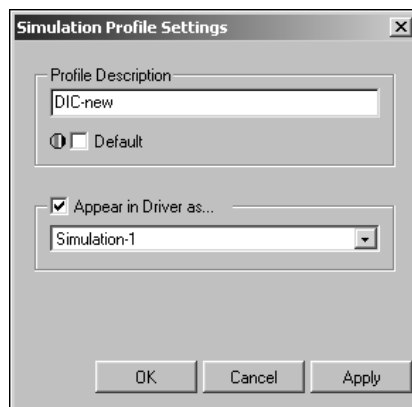
For the purposes of this example, assume DIC-new is a custom simulation profile created with Color Editor. As you can see, no information is displayed for DIC-new under the heading “Appear in Driver as.”

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**.

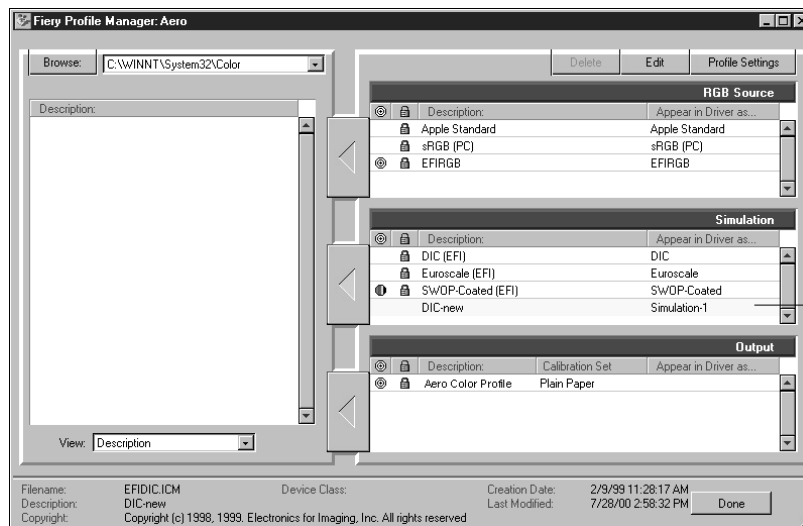
NOTE: While you cannot delete a preset profile, you can use the name of a preset profile name for your edited profile when you select the “**Appear in Driver as**” option. This replaces the preset profile with your own profile.



When you choose **Profile Settings** for an output profile, the **Use Calibration Set** option also appears. You must calibrate the Fiery 3850C 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.

Color Editor

Color Editor allows you to customize simulation and output profiles. You can access Color Editor 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 3850C 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**—Edit output profiles and save customized versions of them.
- **% Density**—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 these Edit Modes for editing simulations.

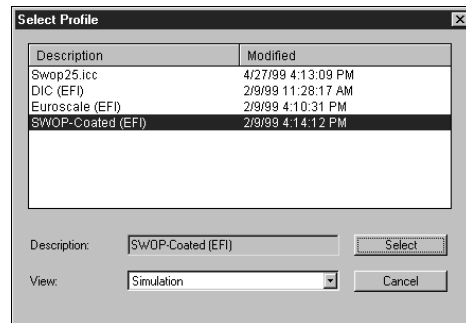
- **Master**—Create a custom *master* simulation that affects all print jobs to which it is applied, unless a linked simulation exists for the selected combination of simulation profile, simulation method, and output profile.
- **With CRD**—Create custom *linked* simulations. Linked simulations affect the print job only if the corresponding simulation profile and output profile are selected. If you choose an output profile 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. “With CRD” implies that the conversion is according to the CRD, or rendering style, that you select.

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.**

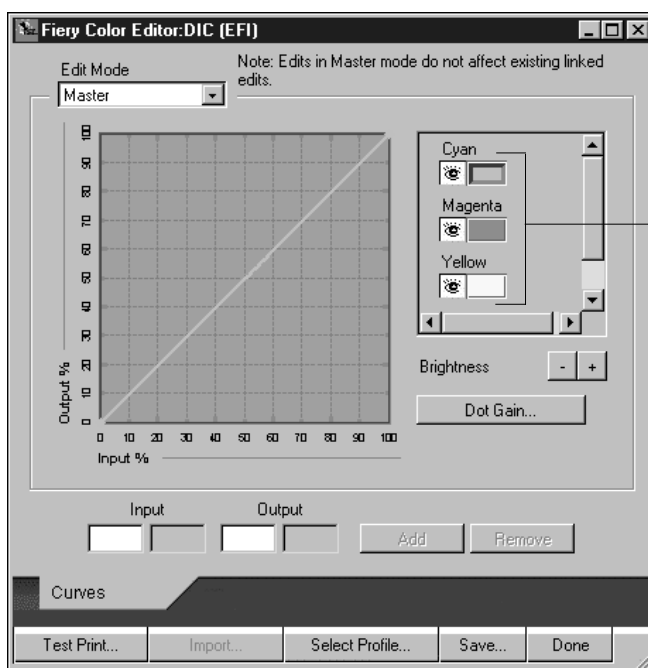
Simulation lists the simulation profiles resident on the Fiery 3850C, and Output lists the output profiles resident on the Fiery 3850C.



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.



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.

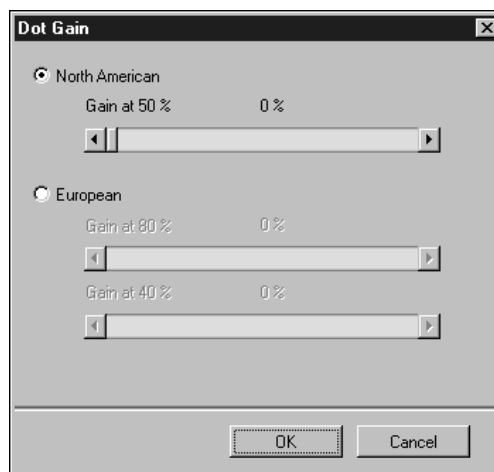
NOTE: When you edit an output profile in Custom mode, the Import button at the bottom of the Color Editor window lets you import a calibration target file (.trg) created on another Fiery using the previous version of ColorWise. The current version of ColorWise does not allow you to save a target separately;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



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.

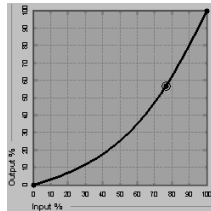
7. Use the plus and minus buttons to adjust brightness.

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

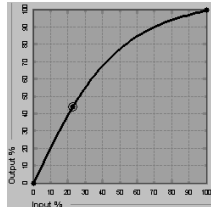
8. You can adjust the curves directly by clicking and dragging points on the curve or by entering numbers into the input and output boxes.

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.

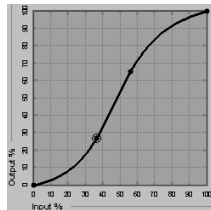
A curve with this shape makes a color appear lighter by reducing density in the midtones.



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 3850C 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 Simulation-10 for Simulation or Output-1 through Output-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.

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. Select “Printer’s default” from the printer driver.

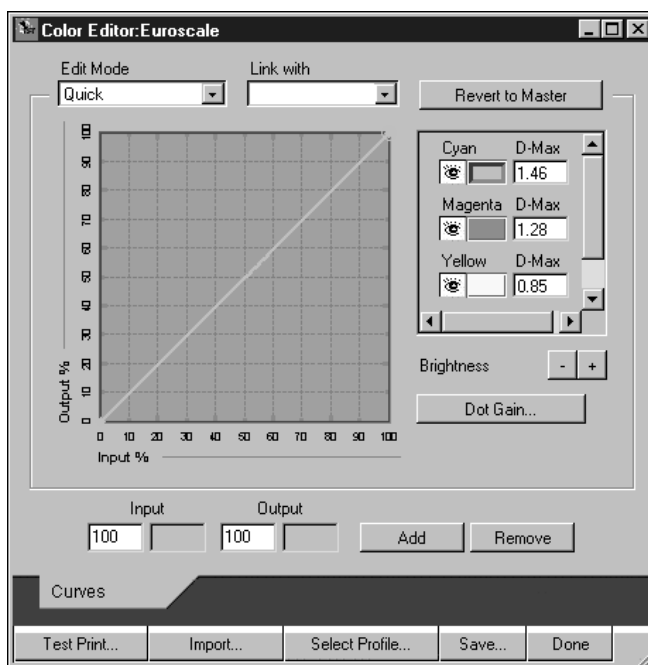
Undoing simulation edits

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

- If you have not yet saved your edits, click Done on the Color Editor menu bar, and do not save the changes.
- If you saved your edits under a new simulation name and want to delete all edits to the simulation, see page 4-7.
- 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

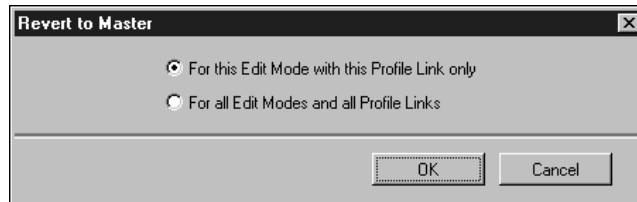
1. Launch ColorWise Pro Tools and click either Color Editor or Profile Manager.
2. Choose Simulation from the View pop-up menu, choose the simulation for which you want to undo edits, and click Select (Color Editor) or Edit (Profile Manager).
3. Choose the output profile with which your unwanted edits are linked from the Link with menu.



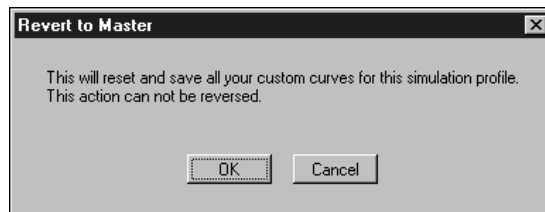
4. Click Revert to Master.

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

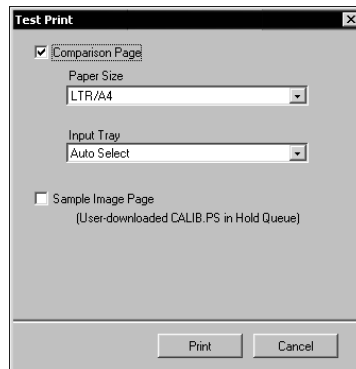
You can view a printed sample of a profile before you save it to the Fiery 3850C. To do so, print one of the following:

- 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 Encapsulated PostScript (EPS) file called CALIB.PS and then print the file to the Hold Queue of the Fiery 3850C from your application or download it to the Hold Queue with Fiery Downloader (see page 3-35).

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 11 x 17 /A3) in the **Paper Size** pop-up menu. In the **Input Tray** pop-up menu, specify the paper source.

Color Setup

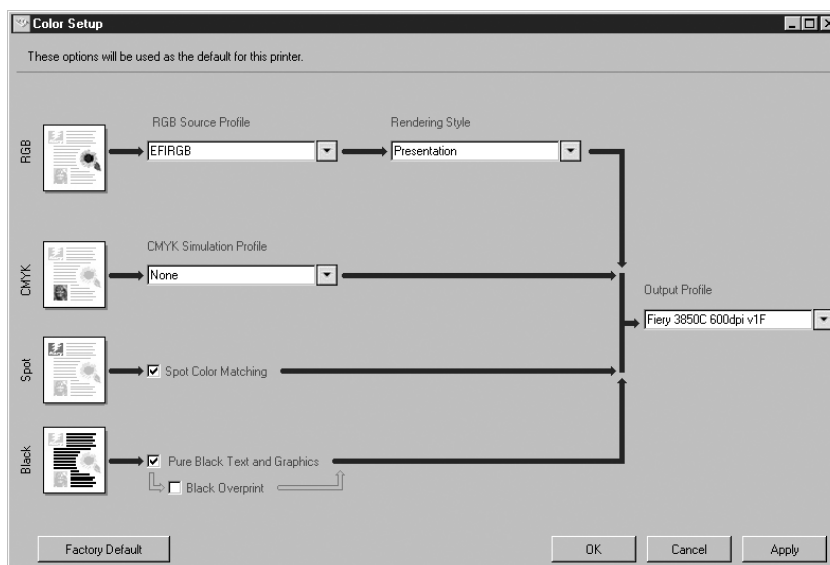
Color Setup is used to set the default ColorWise settings for the Fiery 3850C. To access Color Setup, click its icon in the ColorWise Pro Tools main window.

Setting default ColorWise options

Color Setup allows you to configure the default color management settings for the Fiery 3850C. These settings are applied to all print jobs sent to the Fiery 3850C, unless a user overrides them for an individual job by changing settings in the printer driver. These default settings can also be overridden using Command WorkStation or Fiery WebSpooler. Color Setup maintains a connection to the Fiery 3850C, so changes made in Profile Manager appear automatically. In addition, the defaults set in Color Setup are automatically reflected in other Fiery 3850C tools that list default settings.

You can also reset the Fiery 3850C to its factory default settings by clicking the **Factory Default** button in the lower-left corner of the Color Setup window.

The options in Color Setup are arranged in a pattern representing the flow of color processing that takes place on the Fiery 3850C.



For those color options that offer multiple choices, click the down arrow and make your selection from the pop-up menu that appears. Other options are selected by selecting a checkbox next to the option name. Once you have made your changes, you must click OK or Apply for the changes to take effect. Clicking OK sets the new defaults and closes the Color Setup window. Clicking Apply sets the new defaults and keeps the Color Setup window open. Clicking Cancel closes the Color Setup window without applying any changes to the default settings.

For most users, the factory defaults result in optimal color output.

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 and word processing applications
- Choosing colors in applications that have the ability to write their own PostScript, such as some page-layout, illustration, and pixel-editing applications

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 3850C versus color proofing for eventual printing on an offset press—determines the way you define colors in addition to the print option settings you choose.

- For short-run color printing on the Fiery 3850C, use any 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 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).

Color reference pages

Fiery 3850C user software includes several types of color reference pages that let you see the range of colors that can be printed on your printer. 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 3850C (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 5-6).

In addition, you can print RGB, CMY, and PANTONE color charts from the Fiery 3850C Control Panel.

Office applications

The Fiery 3850C must receive PostScript instructions to print an image or a document. Many applications do not create these PostScript instructions, relying on the printer driver to create them. Included in this category are most word processors, spreadsheets, and presentation applications. These applications use Windows Graphics Device Interface GDI to display and print when running Windows, and Apple QuickDraw to display and print when running Mac OS. 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 3850C. (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 printer. When you print the document, out-of-gamut RGB colors are mapped to colors your printer can produce.
- Office applications send only RGB data to the Fiery 3850C. You control the rendering style of the color conversion with your selection of a CRD.

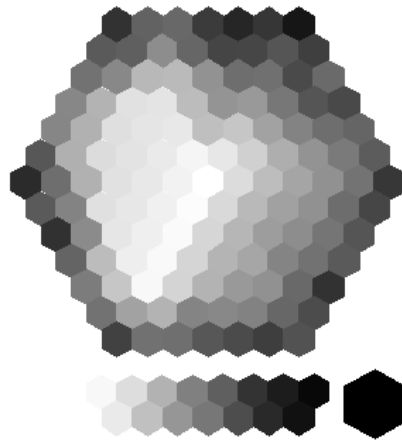
Each CRD uses a different color rendering style, and therefore has a different way of mapping unprintable colors to the color gamut of your printer. Fiery 3850C color rendering styles are described on page 1-4.

Choosing colors in office applications

Two RGB color reference pages, a Microsoft Word file and a Microsoft PowerPoint file, are provided with your Fiery 3850C user software. Print these files using different CRDs to see how the colors appear when printed to the Fiery 3850C. 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

Print this page to use for reference when designing files for printing.



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 printer or save in PostScript files. Illustrator, Photoshop, PageMaker, QuarkXPress, and Macromedia 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), in addition to **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 printer. 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 3850C as CMYK data. An exception to this is an RGB image placed in the document, which is sent directly to the Fiery 3850C (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 3850C 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 3850C. Displayed versions of colors you choose in these applications may not match Fiery 3850C output exactly, and named colors may not print accurately on the Fiery 3850C, 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 5-6).

You should use swatch color matching to ensure predictable color printing results with the Fiery 3850C or to match the Fiery 3850C color output to colors produced by other print devices.

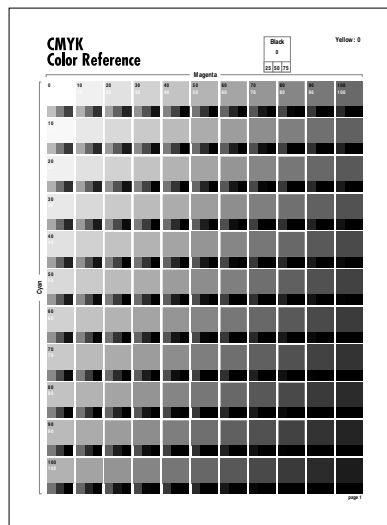
Swatch color matching

Fiery 3850C user software includes several color reference pages (see page 5-2). By choosing colors from these reference pages, you can ensure that you get the same color from your printer. For best results, calibrate the Fiery 3850C 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 3850C user software lets you see how various cyan, magenta, yellow, and black combinations look when printed on your printer.



CMYK Color Reference

To print the CMYK Color Reference, download the file to the Fiery 3850C. 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 3850C 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 printer can produce. The equivalent PANTONE color name/number 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 name/number, are printed below each swatch.

To print the PANTONE Coated Color Reference, download the file to the Fiery 3850C. (For the location of the file on the User Software CD, see *Getting Started*.) If the default Spot Color Matching setting on the Fiery 3850C is not the setting you want to use for printing the PANTONE colors, download the file to the Hold queue. Then use Fiery WebSpooler or Command WorkStation to override the Spot Color Matching setting.

Default output profile

The default output profile consists of both a profile for your printer, [describing its color characteristics](#), and a calibration target that describes the expected behavior of the printer at a particular print resolution (600x600 dpi or 1200x1200 dpi). For more information on output profiles, see page 1-6.

In certain cases, you may want to customize the default output profile to achieve particular color effects (see page 4-11). When you do 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 3850C (see page 4-5). Downloaded output profiles are at first associated with the default calibration target.

CMYK simulation

If you use the Fiery 3850C to print proofs for an offset press job or simulate another print device, choose the appropriate CMYK Simulation Profile and CMYK Simulation Method print option settings (see page 1-6).

Chapter 6: Office Applications

The Fiery 3850C ColorWise color management system provides complete color management for jobs printed from office applications. This chapter provides instructions for printing color documents from **GDI** and **QuickDraw** applications such as presentation, spreadsheet, and word processing programs. You can use these instructions with the Microsoft Office applications.

Working with office applications

Before printing from these applications, make sure the appropriate printer driver and the Fiery 3850C PPD are installed on your computer, as described in *Getting Started*.

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 office documents. Colors in EPS files are preserved until they reach the Fiery 3850C (assuming no PostScript Color Management information was included.)

Office applications lack finesse when displaying EPS files, so use these files only if 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 Microsoft 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 unable 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. Save the image as a Photoshop EPS and import it into the document.

Selecting options when printing

There are few differences among office applications with regard to Fiery 3850C 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 3850C, 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 1-4).

Output profiles

All color data in the job is affected by the output profile on the Fiery 3850C. This profile may be the one designed for your printer and shipped with the Fiery 3850C, or it may be a custom profile created at your site (see page 1-6). If necessary, print the Test Page to see which profile is currently resident on the Fiery 3850C.

Chapter 7: Adobe Photoshop

This chapter covers features of Adobe Photoshop versions 6.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.

Specifying color settings

The following sections outline the recommended color settings for Photoshop 6.x and 5.x in a Fiery 3850C workflow.

These color settings include:

Working Spaces—Default color spaces to use when working with RGB and CMYK documents. ICC color profiles describe the gamut and color characteristics of these working spaces.

Color Management Policies (Photoshop 6.x) or Profile Mismatch Handling (Photoshop 5.x)—Instructions that tell Photoshop what to do when it encounters color data from a color space other than the specified working space.

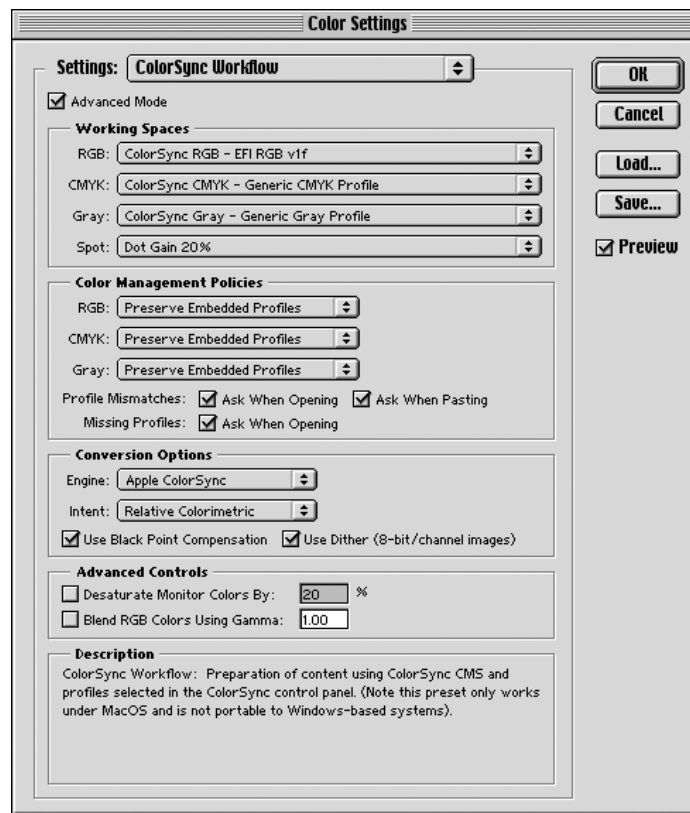
Photoshop 6.x color settings

Photoshop 6.x uses a sophisticated color management system that handles document colors for a variety of color-managed workflows. By customizing color settings, you can specify the amount of color management you want to use while working in Photoshop 6.x.

TO SPECIFY COLOR SETTINGS FOR PHOTOSHOP 6.X

1. **Choose Color Settings from the Edit menu.**
2. **Select Advanced Mode.**

In Advanced Mode, a more extensive list of options is displayed.



3. Choose the desired working space profile for each color mode in the Working Spaces area.

Use the following guidelines for specifying working spaces:

- For RGB, choose the profile for the default RGB color space used by the Fiery 3850C. In most cases, this is EFIRGB. Consider sRGB if you usually view images on a generic PC monitor or rely on a Windows operating system to manage color on your monitor. If you choose sRGB as a working space, you must print with the ColorWise RGB Source option set to sRGB.

New RGB documents you create in Photoshop will use this working space.

NOTE:EFIRGB is set as the default RGB Source color space on the Fiery 3850C. No matter what RGB space you select, make sure it is available on the Fiery 3850C.

- For CMYK, choose a profile that describes your target press (such as SWOP) if you are a prepress user. If you are an office user printing final output, choose an output profile that describes the printer connected to the Fiery 3850C. To use a device-specific output profile, you must first upload the profile from the Fiery 3850C to your computer. New CMYK documents you create in Photoshop will use the specified working space.
- For guidelines on specifying Gray and Spot working spaces, see your Photoshop 6.x documentation.

4. In the Color Management Policies area, choose policies for handling documents without embedded profiles or with embedded profiles that differ from the working space.

Unless you are an advanced color user, we recommend that you choose Off from the RGB, CMYK, and Gray menus. This option discards the original profile embedded in a document if it differs from the specified working space, while preserving the numeric color values in the document.

For Profile Mismatches, select Ask When Opening. This option displays an alert message that lets you override the specified policy behavior (Off) when opening documents or importing color data.

5. In the Conversion Options area, specify settings for converting between color spaces.

Choose Adobe (ACE) from the Engine menu to use the built-in color management engine for Photoshop.

Choose a rendering intent from the Intent menu that will optimize the color quality of the conversion. For guidelines on choosing the rendering intent, see your Photoshop 6.x documentation.

Select Use Black Point Compensation and Use Dither (8-bit /channel images) to optimize the quality of color conversions.

6. **Clear the Desaturate Monitor Colors By and Blend RGB Colors Using Gamma options in the Advanced Controls area.**

Deselecting these options helps optimize the matching of the monitor display to printed output.

7. **Click Save to save the current group of color settings.**

The Save dialog box appears.

8. **Name the settings file, accept the default saved location, and click Save.**

You can switch to your saved settings at any time by choosing the group name from the Settings menu at the top of the Color Settings dialog box.

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 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 (Mac OS) or Adobe Color Management Wizard (Windows) by choosing Help>Color Management. (See your Adobe Photoshop 5.x documentation or the Adobe Technical Guidelines for Photoshop at www.adobe.com.)

Photoshop 5.x color settings

The settings you select in the Photoshop 5.x control panel and three setup dialog boxes 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 the Photoshop's Profile Setup, RGB Setup, and CMYK Setup dialog boxes before you begin working with images in Photoshop.

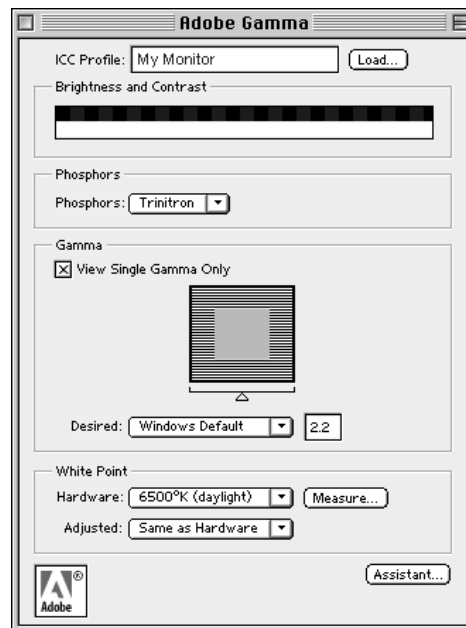
NOTE: The Adobe Gamma control panel performs similar functions on both Windows and Mac OS computers.

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.

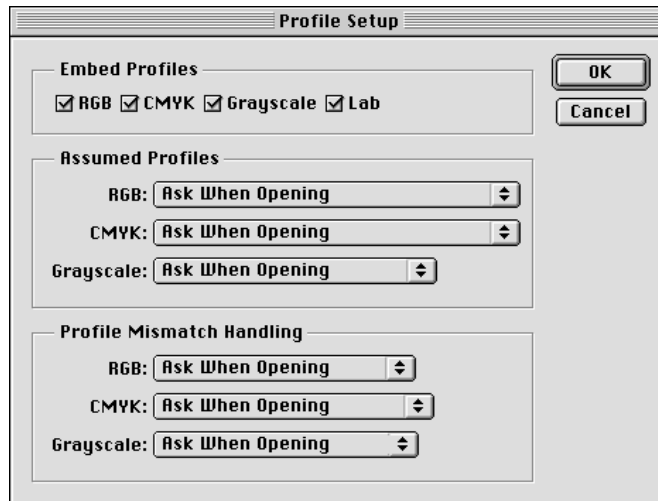
NOTE: If a profile for your particular monitor is not available, use the Adobe Gamma control panel setup Assistant (Wizard on Windows) to customize an available profile that *at least* has the same type of phosphors as your monitor.

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 profile or want 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, select 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).

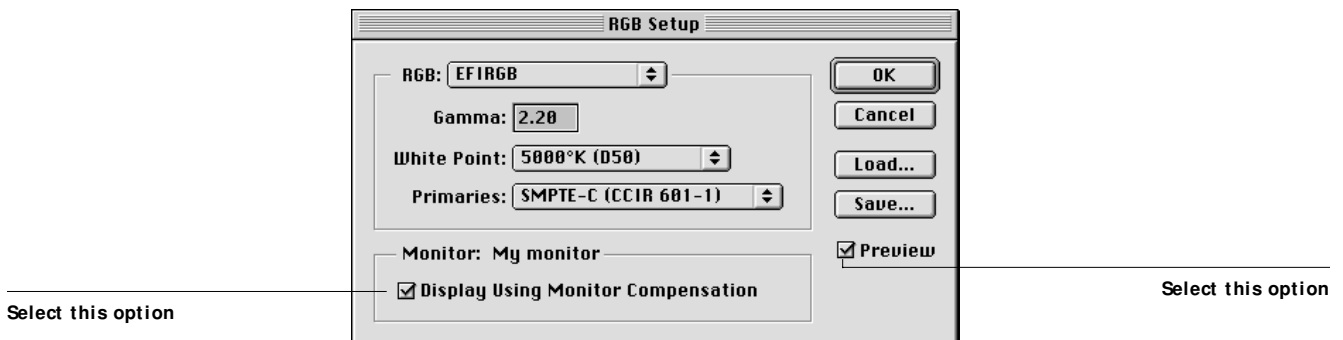
In the Assumed Profiles area, choose Ask When Opening from the RGB and CMYK menus. When you open files that do not contain an ICC profile, you can convert the file to your current Photoshop working space setting or leave the file unconverted—the preferred choice, but make sure the current Photoshop working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

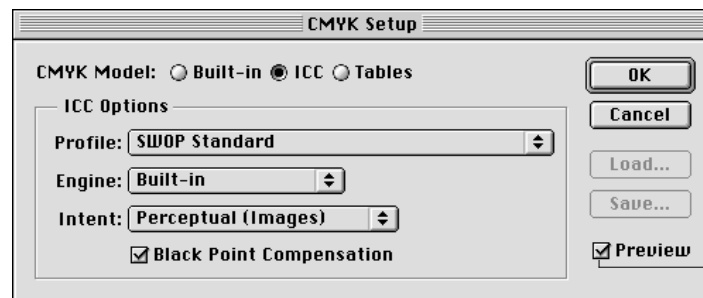
Click Load if the file is not visible in the RGB pop-up menu. You can load the Calibrated RGB setup file, EFIRGB ICC ColorSync file, or EFIRGB.ICM file. All describe the same RGB space and automatically set the Gamma, White Point, and Primaries. You may consider sRGB if you usually view images on a generic 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 3850C RGB Source option set to sRGB.

NOTE: EFIRGB is set as the default RGB Source color space on the Fiery 3850C. No matter what RGB space you select, make sure it is available on the Fiery 3850C. For more information on downloading RGB Source profiles to the Fiery 3850C, see Chapter 4.

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

CMYK Setup

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



Check this option

Select 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 printer ICC profile. Prepress users should choose an ICC describing their target press, such as SWOP. Office users should choose the ICC profile describing the printer connected to the Fiery 3850C. In this case, we recommend you leave images in RGB and allow the Fiery 3850C to convert them to CMYK. However, if you want to use Photoshop to convert RGB images to the CMYK color space of the Fiery 3850C, you must first upload one of the output profiles from the Fiery 3850C to your computer (see page 4-7), and then select it in Photoshop CMYK Setup. The output profile for the Fiery 3850C is also available on the User Software CD (see *Getting Started*).

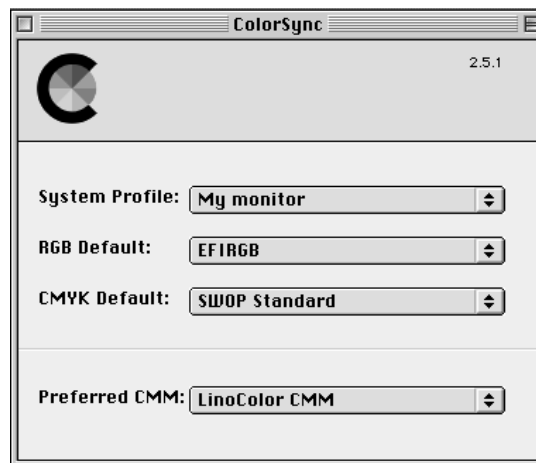
NOTE: For information about uploading and downloading profiles, see Chapter 4.

- For Engine, choose Built-in so the Photoshop engine will be used.
- From Intent, 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 select 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; if not, clear the selection.

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. Set up the Adobe Gamma profile to ensure that your monitor profile is present (Mac OS only).
- **RGB default**—choose the same RGB working color space you set in Photoshop 5.x.

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

- **CMYK default**—choose the same CMYK color space 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

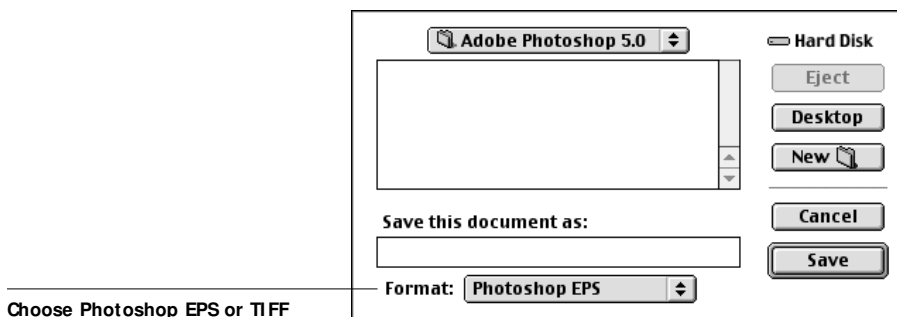
You can choose colors in Photoshop with various color models, including HSB, CIE Lab, RGB, and CMYK. You can also choose named colors from the PANTONE Coated color library. For best results, use the color definition methods described in Chapter 5.

Saving files for importing into other documents

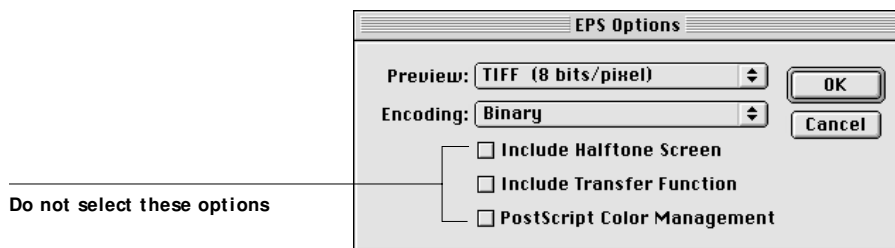
Before saving a file, perform any rotating, cropping, and resizing needed. This speeds processing when printing from the application in which the image is placed.

We recommend you use EPS or TIFF file formats to save RGB images that will be imported into other documents and printed to the Fiery 3850C. 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 are imported. EPS files are unaffected.



In the EPS Options dialog box, choose binary encoding and do *not* select 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, save a backup of the original image saved with binary encoding until you see 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.

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.

Advanced tips for using PostScript color management

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

Saving EPS Documents with PostScript Color Management

Selecting 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 3850C.

Printing RGB EPS Files Saved with PostScript Color Management

When you print an RGB EPS file that contains an embedded profile to the Fiery 3850C, the working space information from the embedded RGB profile can be used as an RGB source definition for Fiery 3850C CRDs. To use the source color space information from the embedded profile with Fiery 3850C CRDs, choose None as the Fiery 3850C RGB Source when you print. This applies when you print directly from Photoshop, or when the same RGB EPS file is output from another application.

To override the embedded profile in an EPS file using an RGB Source definition made available by the Fiery 3850C, choose anything except None as the Fiery 3850C RGB Source Profile.

Printing CMYK EPS files saved with PostScript Color Management

If you select the Photoshop 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 3850C, CRDs are used instead of ColorWise CMYK Simulation setting. Make sure to choose the appropriate setting for the Rendering Style option.

Selecting options when printing

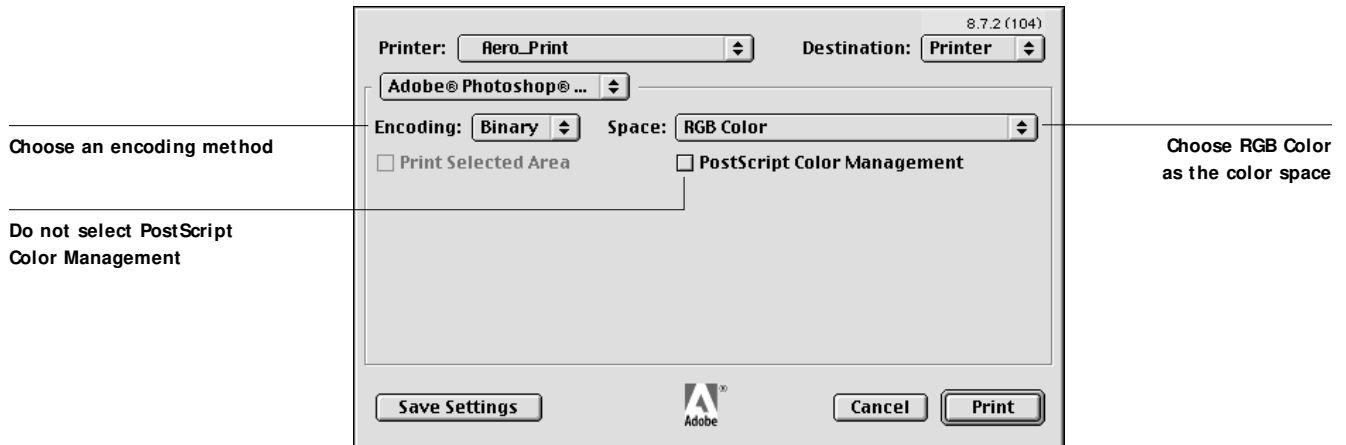
You can print RGB or CMYK images from Photoshop.

- When you print an RGB image, you choose whether the conversion to CMYK is performed by the Fiery 3850C (using a CRD), by PostScript (using PostScript Color Management), or by the Photoshop 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 3850C to recombine separations printed from Photoshop.

Printing RGB images

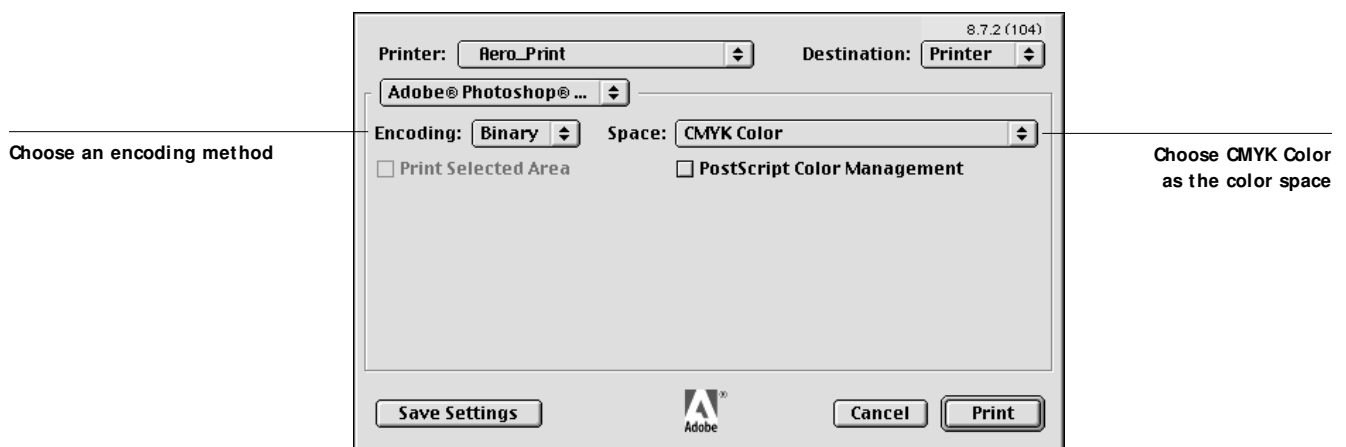
Use the following instructions to print RGB images.



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 3850C. With the AdobePS 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 3850C. (With the AdobePS printer driver for Mac OS, these options appear in the Adobe Photoshop pane of the Print dialog box.)

NOTE: If you choose JPEG encoding, save a backup of the original image with binary encoding until you see 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 the binary version.

Advanced tips for printing with Photoshop PostScript color management

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 Photoshop pane of the printer driver, Photoshop sends RGB data to the Fiery 3850C along with PostScript color information defining this RGB color space. Remember that when you select PostScript Color Management, a CRD will be used to perform color conversions to CMYK.

NOTE: The included RGB source color space information is overridden by the Fiery 3850C RGB Source option unless it is set to None. With Photoshop 5.x, the Fiery 3850C Rendering Style option specified will take effect if the Fiery 3850C RGB Source Profile option 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 select a CMYK color space and decide to use PostScript Color Management from the Photoshop pane of the printer driver, Photoshop sends CMYK data to the Fiery 3850C along with PostScript color information defining this CMYK color space. Remember that when you select PostScript Color Management, a CRD will be used to perform color conversions to the CMYK color space of the Fiery 3850C.

As for the destination color space for the CRDs, the CMYK image is converted to the CMYK color space of the selected output profile.

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 3850C.

NOTE: The above custom simulation setting requires that the same profile used for separation in Photoshop also resides on the Fiery 3850C. For more information on downloading CMYK Simulation profiles to the Fiery 3850C with ColorWise Pro Tools, see page 4-5.

Photoshop 4.x

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 1-5).

Defining colors

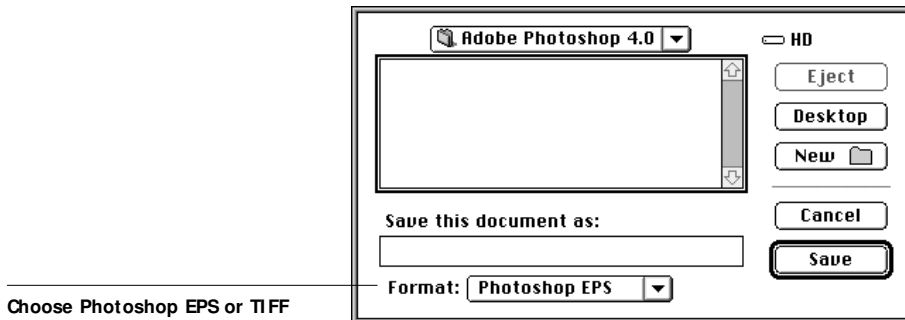
You can choose colors in Photoshop with various color models, including HSB, CIE Lab, RGB, and CMYK. You can also choose named colors from the PANTONE color library in Photoshop. For best results, use the color definition methods described in Chapter 5.

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 1-5).

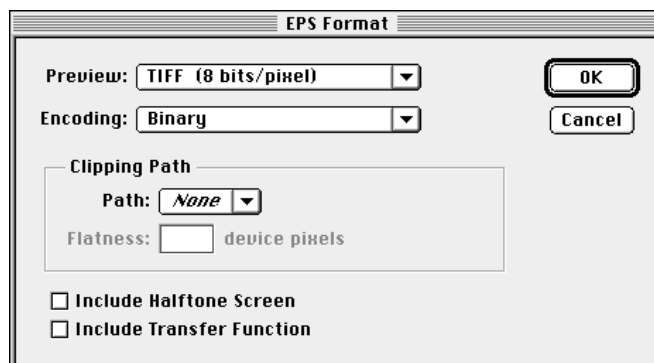
Before saving a file, perform any rotating, cropping, and resizing needed. This speeds processing when printing from the application in which the image is placed.

We recommend you use the EPS or TIFF file formats to save RGB images that will be imported into other documents and printed to the Fiery 3850C. EPS and TIFF files can be imported into virtually all page layout applications.



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 can cause printing problems with some system configurations. If you choose JPEG encoding, save a backup of the original image 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

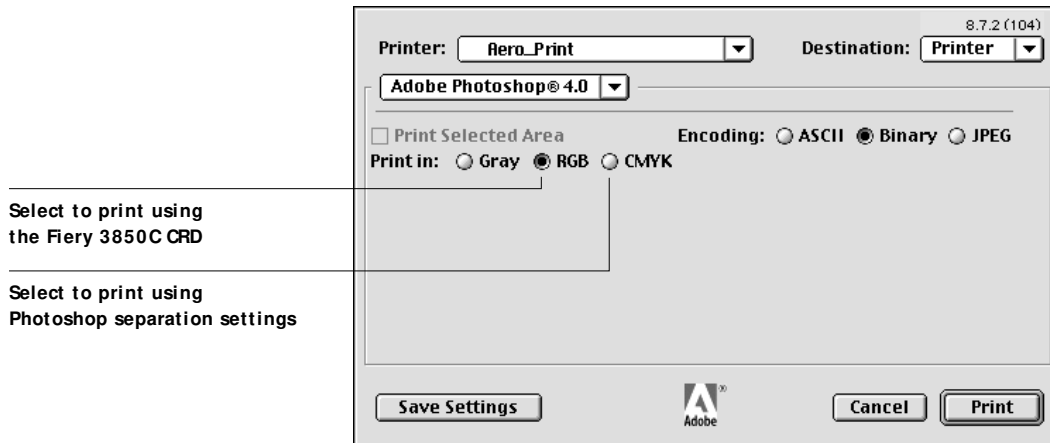
You can print RGB or CMYK images from Photoshop.

- When you print RGB images, you choose whether the conversion to CMYK data is performed by the Fiery 3850C (using a CRD), by PostScript (using PS Color Management), or by Photoshop (using Photoshop separation settings).
- When you print RGB images, you can choose whether a color conversion is performed by the Fiery 3850C 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 3850C to recombine 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 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 3850C and a CRD performs color conversion. Choose the appropriate print option settings for RGB data (see Chapter 1).

NOTE: The Fiery 3850C Rendering Style option specified will take effect if the Fiery 3850C RGB Source Profile option is set to None.

- If you select **Print in CMYK**, Photoshop performs a color conversion and sends CMYK data to the Fiery 3850C. 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 you apply a CMYK Simulation setting (other than None) to the job, choose Color Proofing (Photo) or Color Proofing (Solid) for the Rendering Style setting (see page 1-4).
- 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 3850C 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, save a backup of the original image with binary encoding until you see the printed results of the JPEG-encoded file. 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, revert to the a binary-encoded version.

Printing CMYK images

Choose an encoding method. (With the AdobePS 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.

NOTE: 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.

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 you apply a CMYK Simulation setting (other than None) to the job, choose Color Proofing (Photo) or Color Proofing (Solid) for the Rendering Style setting (see page 1-4).
- 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 3850C 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 7.x and 6.5, QuarkXPress 4.02, and QuarkXPress 3.32.

Before printing from these applications, make sure the appropriate printer driver and the Fiery 3850C 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 3850C in those other color models. However, CRDs (which affect only RGB data) usually 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 3850C. If it does, this will determine which Fiery 3850C 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 3850C, 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 5-6.

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 3850C 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 3850C.

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 the Quark 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. Save the file as EPS or TIFF and import it into the document.

If your application supports this feature, 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.

CMYK simulation

You can specify a CMYK Simulation profile for the job using the CMYK Simulation Profile print option (see page 1-6). The CMYK Simulation setting affects all CMYK color data sent by the page layout 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 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), choose the corresponding profile as the CMYK Simulation Profile print option on the Fiery 3850C.

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 3850C. For more information on downloading CMYK Simulation profiles to the Fiery 3850C with ColorWise Pro Tools, see Chapter 4.

Adobe PageMaker 7.x and 6.5 for Mac OS and Windows

The Mac OS and Windows versions of PageMaker 7.x and 6.5 are essentially the same. The illustrations in this section show only the Windows version, except where differences exist between the two versions.

PageMaker color settings

We recommend you use ColorWise color management rather than the CMS options built into Adobe PageMaker.

NOTE: Do not use both systems for the same print job.

TO DISABLE PAGEMAKER COLOR MANAGEMENT

1. Choose **Preferences > General** from the **File** menu.
2. Click **CMS Setup**.
3. Choose **Off** from the **Color Management** menu.
4. Click **OK**, and then click **OK** again to close the dialog boxes.

TO DISABLE COLOR MANAGEMENT FOR A BITMAPPED IMAGE

1. **Select the bitmapped image in the document.**
2. **Choose Image > CMS Source from the Element menu.**
3. **Choose None from the This Item Uses menu and click OK.**

Windows version requirement

For the Windows version of PageMaker 6.5, make sure a copy of the Fiery 3850C PPD file is in the following folders:

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

Importing images

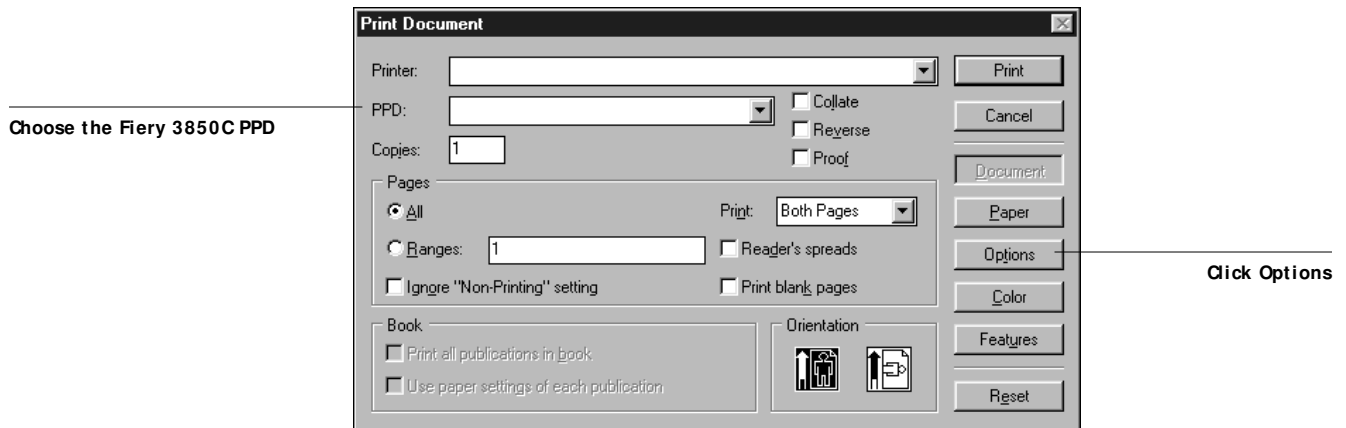
All RGB images placed in a document are affected by your RGB Source and Rendering Style settings. For best results with placed images, use the instructions in “Importing images” on page 8-2 and “CMYK simulation” on page 8-3.

Selecting options when printing

All print settings are specified from the Print dialog boxes in PageMaker 7.x or 6.5. The printer driver interface described in Chapter 1 is not used.

TO SET PRINT OPTIONS WHEN PRINTING FROM PAGEMAKER

1. Choose the Fiery 3850C PPD from the PPD menu in the Print Document dialog box.

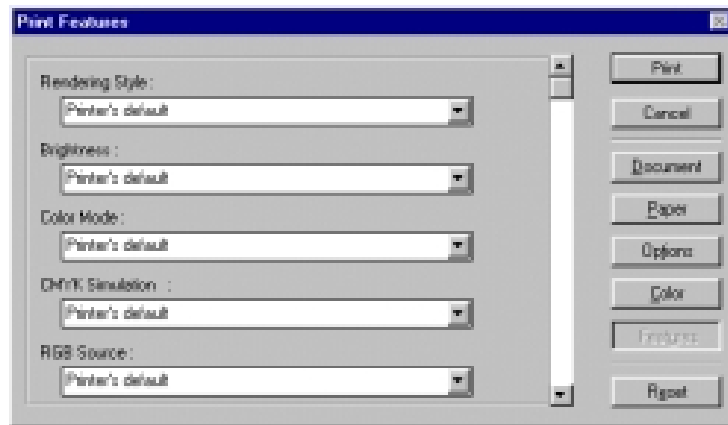


2. Click Options.
3. Choose Normal from the "Send image data" menu in the Print Options dialog box and click Features.

To ensure that TIFF images print at their full resolution, do *not* choose the Optimized Subsampling default from the "Send image data" menu.

4. 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.



5. Click Print from any of the PageMaker dialog boxes to send the job to the Fiery 3850C.

NOTE: The printer driver dialog boxes described in Chapter 1 do not appear.

Optional Color Management from PageMaker

If you have additional color management requirements not offered by ColorWise, such as managing color on non-Fiery 3850C devices, consider using the PageMaker color management features. For more information, see your PageMaker documentation.

QuarkXPress 4.x for Mac OS and Windows

If you have additional color management requirements not offered by ColorWise, consider using 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 3850C. RGB Source and Rendering Style settings have no effect on this data unless you use Quark 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 use Quark PrintRGB XTension, QuarkXPress 4.02 converts all RGB data into CMYK, even when Quark CMS XTension is disabled.

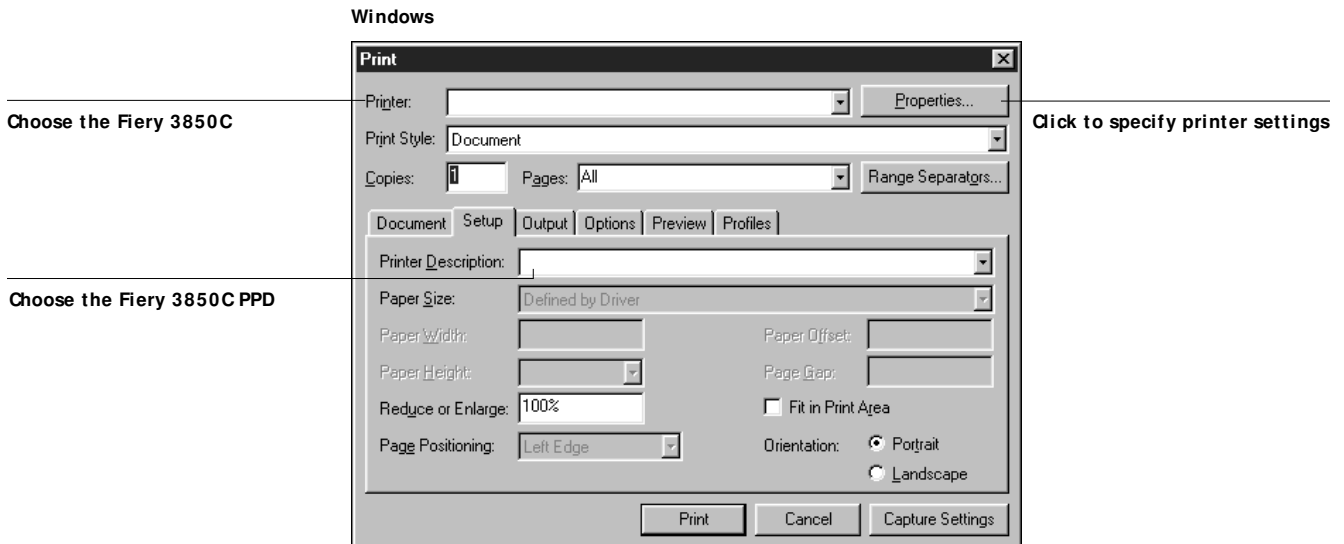
Only RGB images saved in EPS format are affected by RGB Source and Rendering Style settings. For best results with placed images, use the instructions in “Importing images” on page 8-2 and “CMYK simulation” on page 8-3.

Selecting options when printing

You can select the print options that suit your print needs. Choose the Fiery 3850C PPD from the Printer Description menu in the Print dialog box.

Mac OS

Mac OS	
Choose the Fiery 3850C PPD	<div> <div>Print</div> <div> Print Style: Document </div> <div> Copies: 1 Pages: All Range Separators... </div> <div> Document Setup Output Options Preview Profiles </div> <div> Printer Description: </div> </div>
Choose an output paper size	<div> <div> Paper Size: Letter </div> <div> Paper Width: 8.5" Paper Height: 11" Reduce or Enlarge: 100% Page Positioning: Left Edge </div> <div> Paper Offset: Page Gap: Fit in Print Area Orientation: </div> </div>
Click to specify printer settings	<div> Page Setup... Printer... Capture Settings Cancel Print </div>



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 3850C devices, consider using the QuarkXPress color management features. 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 3850C 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 3850C 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.

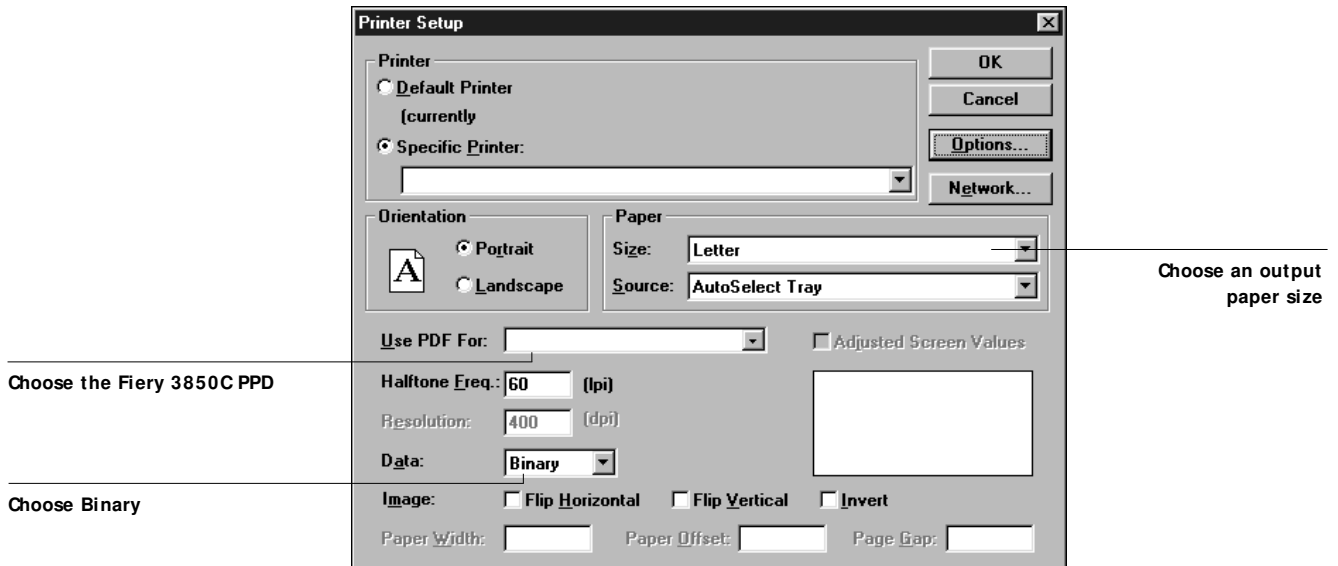
Selecting options when printing

Select the Fiery 3850C PPD from the Printer Type menu in the Page Setup (Mac OS) or Printer Setup (Windows) dialog box.

Mac OS

	Printer: Aero_Hold	8.7.2 (104)
	QuarkXPress™	
Choose the Fiery 3850C PPD	Printer Type: [PPD name]	Paper Offset: <input type="text"/>
	EfiColor Profile:	Paper Width: <input type="text"/>
	GCR:	Page Gap: <input type="text"/>
Choose an output paper size	Resolution: 600 (dpi)	Halftoning C: 150.918 lpi, 82.5° M: 150.918 lpi, 52.5° Y: 150.918 lpi, 7.5° K: 150.918 lpi, 112.5°
Choose Binary	Paper Size: Letter	<input checked="" type="checkbox"/> Use EfiColor Screen Values
	Data Format: Binary	
	Halftone Screen: 60 (lpi)	
	Cancel	OK

Windows



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 Illustrator for Windows and Mac OS, 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 3850C 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 3850C. 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 3850C. This conversion by the application will determine which Fiery 3850C 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 3850C, 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 page 5-6.

Importing images

In general, all images placed into illustration applications should be in EPS file format.

All RGB images placed in a document are affected by the RGB Source and Rendering Style settings in the PPD. The Fiery 3850C 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" below). In this case, the application performs the color conversion of the image and sends CMYK data to the Fiery 3850C.

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. Save the image as an EPS or TIFF file and import it into the document. Or 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 Chapter 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 3850C.

NOTE: The workflow described above requires that the profile used for the separation of CMYK images in the document also resides on the Fiery 3850C. For more information on downloading CMYK Simulation profiles to the Fiery 3850C with ColorWise Pro Tools, see Chapter 4.

Adobe Illustrator for Windows and Mac OS

The following sections provide guidelines for working with versions 9.x and 8.x of Adobe Illustrator.

Illustrator 9.x color settings

Illustrator 9.x uses a sophisticated color management system that can handle both RGB and CMYK colors for a variety of color-managed workflows. By customizing color settings, you can specify the amount of color management you want to use while working in Illustrator 9.x. These color settings include:

Working spaces—Default color spaces to use when working with RGB and CMYK documents. ICC color profiles describe the gamut and color characteristics of these working spaces.

Color management policies—Instructions that tell Illustrator 9.x what to do when it encounters color data from a color space other than the specified working space.

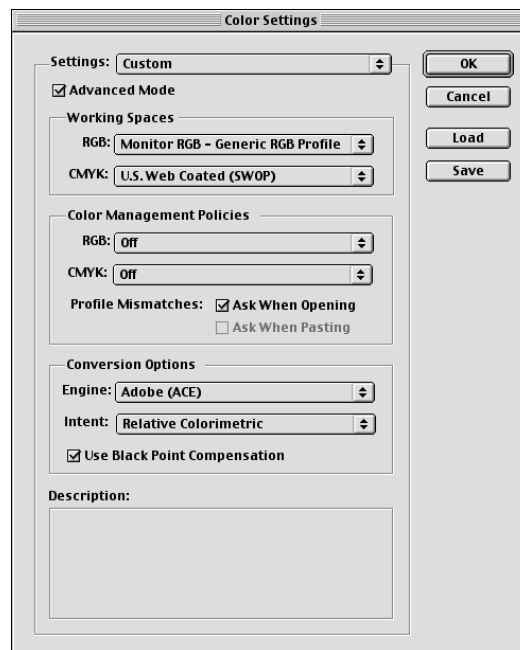
Specifying print options

The following procedure outlines the recommended color settings for Illustrator 9.x in a Fiery 3850C workflow.

TO SPECIFY COLOR SETTINGS

1. **Choose Color Settings from the Edit menu.**
2. **Select Advanced Mode.**

In Advanced Mode, a more extensive list of options is displayed.



3. **Choose the desired working space profile for each mode in the Working Spaces area.**

Use the following guidelines for specifying working spaces:

- For RGB, choose EFIRGB. This profile represents the default RGB color space used by the Fiery 3850C. New RGB documents you create in Illustrator will use this working space.
- For CMYK, choose a profile that describes your target press (such as SWOP) if you are a prepress user. If you are an office user printing final output, choose an output profile that describes the printer connected to the Fiery 3850C. To use a device-specific output profile, upload the profile from the Fiery 3850C to your computer. New CMYK documents you create in Illustrator will use the specified working space.

4. **Choose policies for handling documents without embedded profiles or with embedded profiles that differ from the working space in the Color Management Policies area.**

Choose Off from the RGB and CMYK menus. This option discards the original profile embedded in a document if it differs from the specified working space.

In the Profile Mismatches area, select the Ask When Opening option. This option displays an alert message that allows you to override the specified policy behavior (Off) when opening documents or importing color data.

5. **Choose settings for converting between color spaces in the Conversion Options area.**

Choose Adobe (ACE) from the Engine menu to use the built-in color management engine for Photoshop.

Choose a rendering intent from the Intent menu that will optimize the color quality of the conversion. For guidelines on choosing the rendering intent, see your Photoshop 6.x documentation.

Select the Use Black Point Compensation option to optimize the quality of color conversions.

6. **Click Save to save the current group of color settings.**

The Save dialog box appears.

7. **Name the settings file, accept the default saved location, and click Save.**

You can switch to your saved settings at any time by choosing the group name from the Settings menu at the top of the Color Settings dialog box.

Illustrator 8.x color settings

If you are using ColorWise color management, disable the Illustrator 8.x color management system by removing the Color Conversion and Color Conversion Utilities files from the Adobe Illustrator > Plug-ins > Extensions folder.

Consider the following points when working in Illustrator 8.x:

- 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 page 5-5.
- 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.

If you have additional color management requirements not offered by ColorWise, such as managing color on devices not controlled by the Fiery 3850C, you may want to consider using the Illustrator color management features. For more information, see your Illustrator documentation.

Specifying print options

The following procedure explains how to set print options when printing a document from Illustrator 9.x or 8.x to the Fiery 3850C.

TO SET PRINT OPTIONS IN ILLUSTRATOR

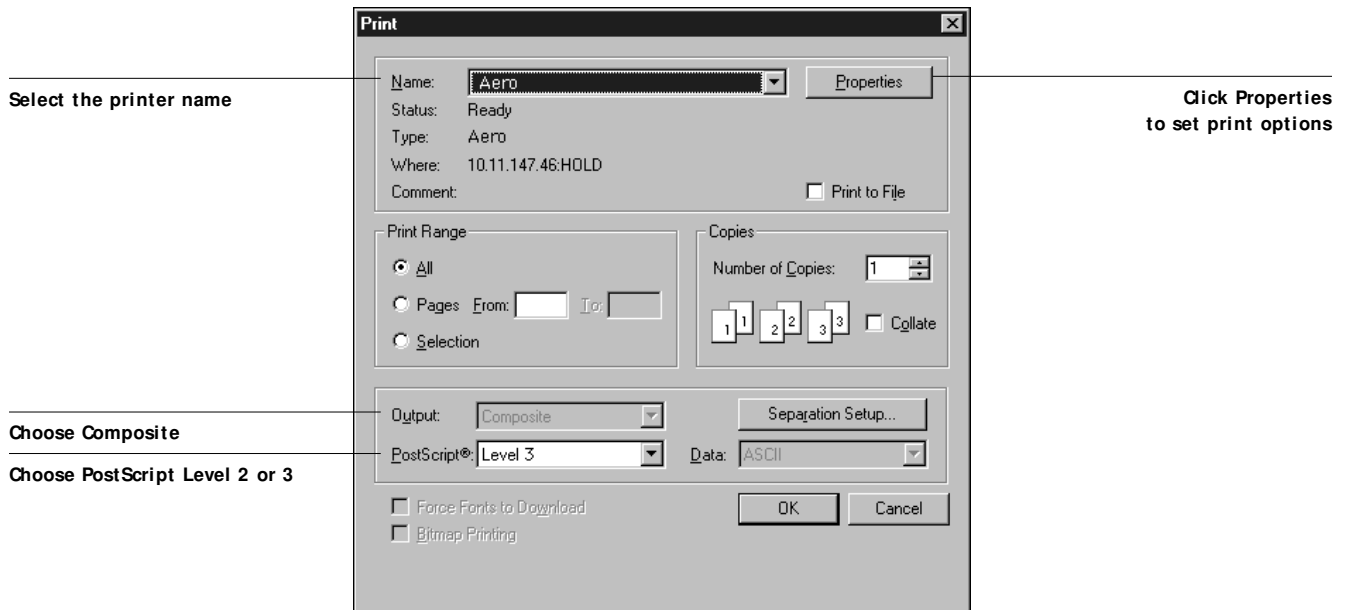
1. **Choose Print from the File menu in Illustrator.**

The Print dialog box appears.

2. **For the Windows version of Illustrator, specify appropriate print options.**

- Choose the Fiery 3850C printer from the Name menu.
- Choose Composite from the Output menu.

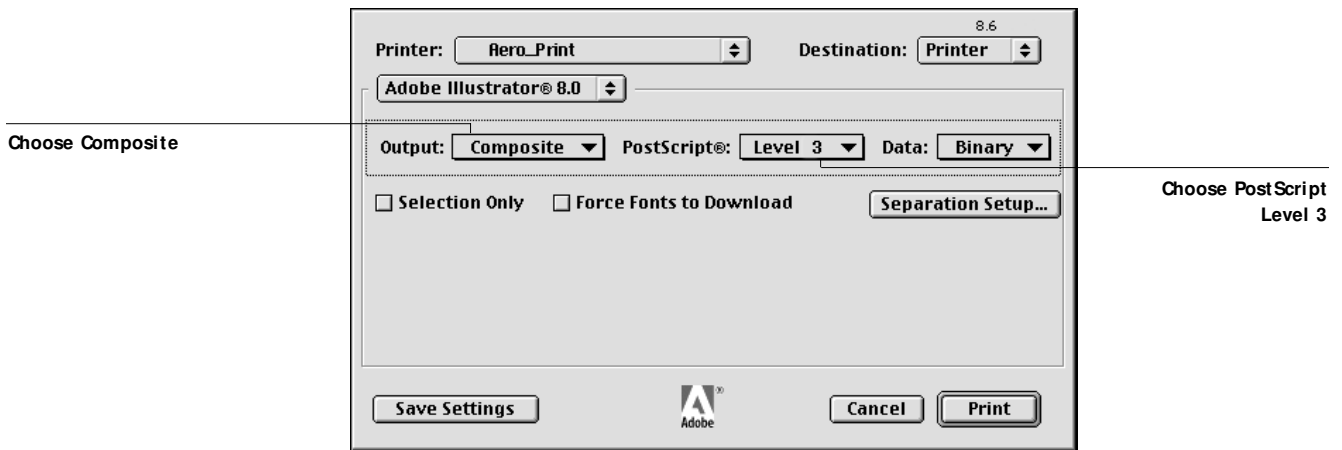
- Choose Level 2 or 3 from the PostScript menu.

Windows

3. For the Mac OS version of Illustrator, specify appropriate print options.

- Choose the Fiery 3850C printer from the Printer menu.
- Choose Adobe Illustrator from the option menu below the Printer menu.
- Choose Composite from the Output menu.
- Choose Level 3 from the PostScript menu.

Mac OS



4. If necessary, click Properties (Windows) or choose Printer Specific Options from the option menu (Mac OS) and choose RGB Source and Rendering Style settings for the Fiery 3850C.

You only need to specify these settings if you have a CMYK document containing placed RGB images, or an RGB document in Illustrator 9.x. In all other cases, colors remain unaffected by the settings.

5. 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 Illustrator 9.x or 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 ColorWise RGB Source and Rendering Style settings affect 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.

FreeHand 9.x and 8.x for Windows and Mac OS

The information in this section applies to both the Windows and Mac OS versions of FreeHand 9.x and 8.x. Only Mac OS dialog boxes are shown, but the information and instructions are identical for the Windows version.

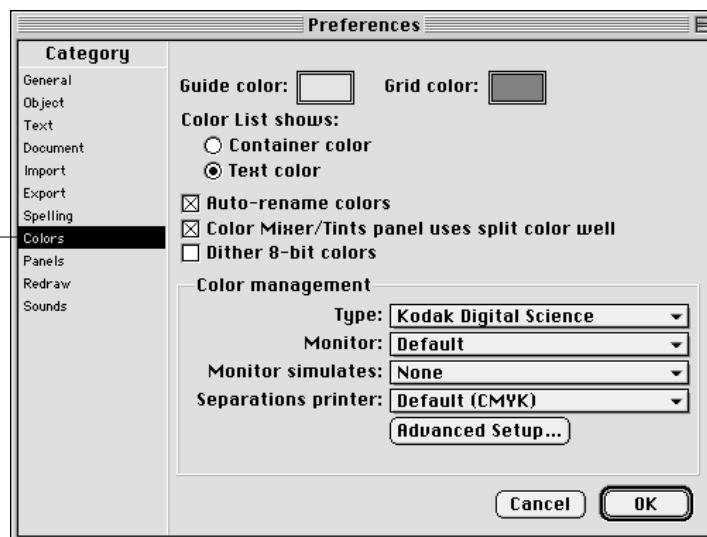
FreeHand color settings

When using ColorWise color management, turn off FreeHand color management features.

TO DISABLE COLOR MANAGEMENT IN FREEHAND 9.X OR 8.X

1. Choose Preferences from the File menu.
2. Click the Colors category in the Preferences dialog box.

Click Colors to access the color management settings



3. Choose None for the type of color management.

Defining colors

Any colors defined in FreeHand are sent to the printer in CMYK—even those defined using other color models. For best results, use the color definition methods described 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 choosing Color Management from the FreeHand menu on the Print dialog box.

Importing images

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

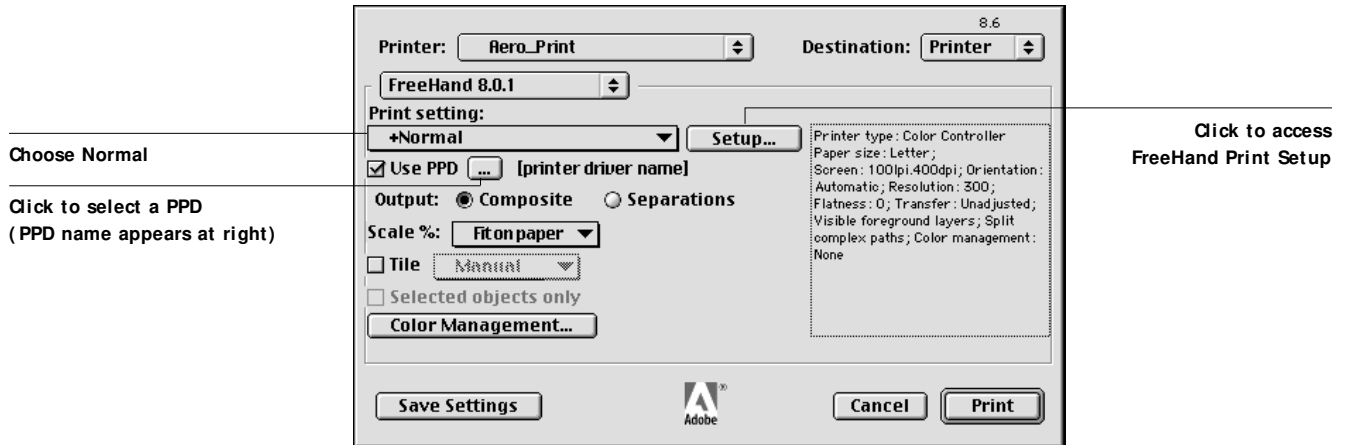
When you import an EPS image into a document, FreeHand inserts a link to the image rather than embedding the original file, resulting in a smaller file size. If the image is a CMYK EPS file, the colors print just as they would from the originating application.

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 activated, 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, follow the instructions in “Importing images” on page 9-2 and “CMYK simulation” on page 9-2.

TO SET OPTIONS WHEN PRINTING FROM FREEHAND

1. Select the Use PPD option in the Print dialog box.

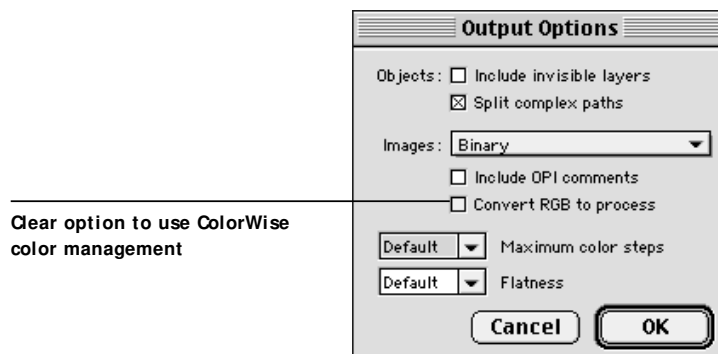


2. Choose Normal from the Print setting menu.

- If the Use PPD option is selected, a plus sign (+) appears in front of the word "Normal."
- If the PPD name for your Fiery 3850C is not displayed, click the button labeled "..." and choose the appropriate PPD from the menu that appears.

3. To use ColorWise color management features, clear the "Convert RGB to process" option in the File > Output Options dialog box.

If this option is selected, FreeHand color management settings are used to convert RGB colors and RGB TIFF, PICT, and JPEG images to CMYK.



4. **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.

For information about other FreeHand print options, see your FreeHand documentation.

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 types 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 devices not controlled by the Fiery 3850C, you may want to consider using the FreeHand color management features. 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 printer 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 in Edit:Preferences:Global.

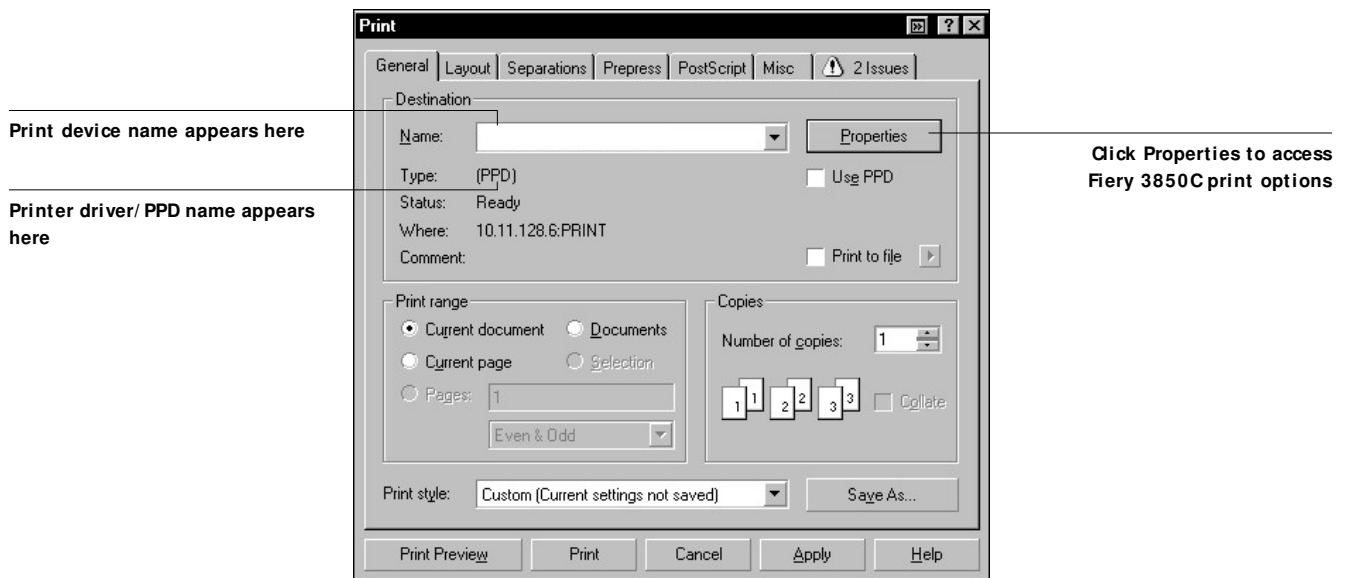
NOTE: If you do not want to use color management in CorelDraw, do not select options under Color Management and Color Management General, and select None from the Composite Printer pop-up menu under Color Management/Profiles.

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

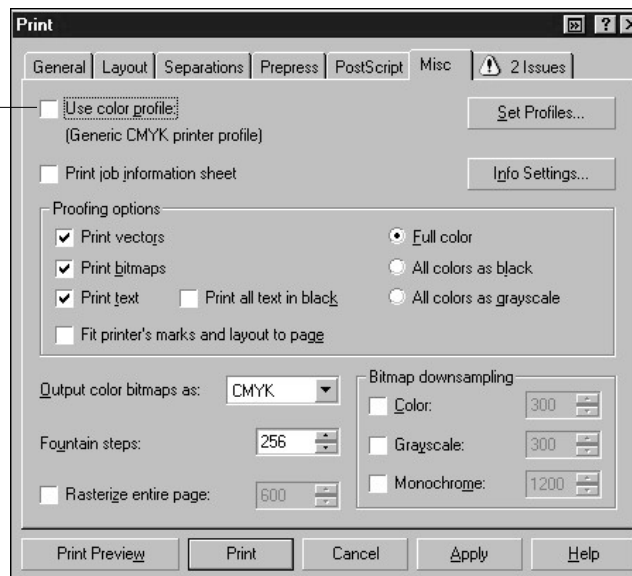
On Windows computers, in the Print dialog box under the General tab, make sure the correct printer and PPD are selected and select the Use PPD check box. Click Properties to specify Fiery 3850C print options.



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

To use Fiery 3850C color management, make sure the “Use color profile” option in the Misc tab of the Print dialog box is *not* selected. If this option is selected, CorelDRAW color management settings are used to convert RGB colors and images to CMYK.

Do not select to use
Fiery 3850C Color Management.



If a document contains placed RGB images, choose RGB Source and Rendering Style settings for your printer. 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 3850C devices, consider using the CorelDRAW color management features. For more information, see your documentation.



Appendix A: Desktop Color Primer

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

- 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, refer 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 (color example 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 (color example 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.

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 (color example 2) conveys hue and saturation, a three-dimensional color model is required to add the brightness component (color example 3).

Many computer applications include dialog boxes in which you choose colors by manipulating hue, saturation, and brightness. For example, some applications use a color picker (color example 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 the Fiery 3850C 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** (color example 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 colors together. Combining varying amounts of any two of the additive primaries creates a third, saturated hue.

A familiar device based on this color model is the computer monitor (color example 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.

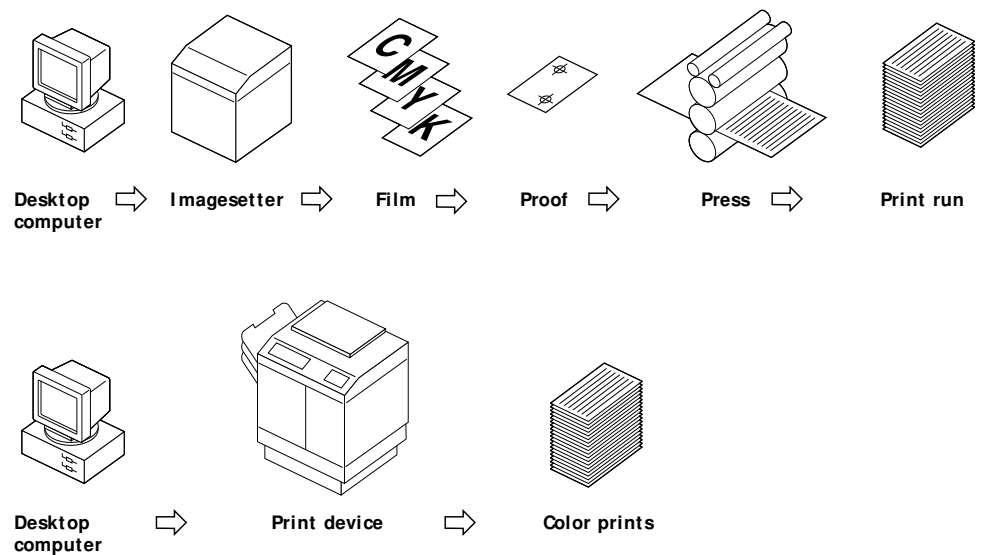
The **subtractive primaries** are cyan, magenta, and yellow; they absorb red, green, and blue light, respectively (color example 7). Combining any two subtractive primaries creates a new color that is relatively pure or saturated. For example, you can make red by combining magenta and yellow, which absorb 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**: Cyan, Magenta, Yellow, and black (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 printer toner 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.

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 3850C printing, eliminates most of this preparation. By streamlining the process of color printing, the Fiery 3850C 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 3850C, you simply print the file. The Fiery 3850C 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 3850C 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 3850C, 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 (color example 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 (color example 9a), 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; color example 9b) and triads (three colors evenly spaced on the color wheel; color example 9c). 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 color example 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.)

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.

A **raster image**, also referred to as a bitmap, is composed of a grid of **pixels**, each assigned a particular color value (color example 11a). 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” (color example 11b). 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 3850C. 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.

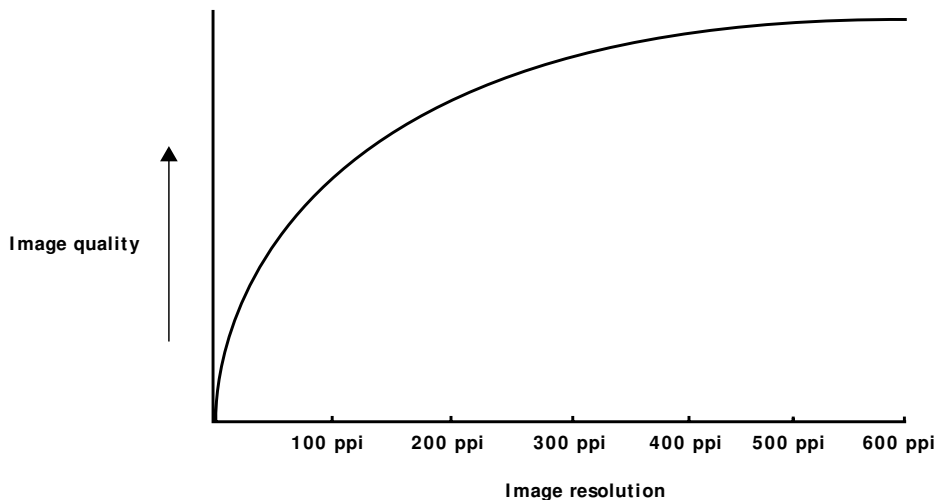
The resolution of a raster image, along with its bit depth and physical dimensions, determine its file size. The following table shows the file sizes of color raster images at different dimensions and resolutions.

Image size (inches)	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 (for example, 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 3850C.

Scaling

Ideally, each raster image should be saved at the *actual size*, and it will be placed into the document 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 3850C, you want the printed colors to match the design specification.
- If you are printing presentations on the Fiery 3850C, 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 3850C output to match other **prepress proofs** or PANTONE color swatch books.

The type of print job and the final print device, Fiery 3850C 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 3850C 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 printer consistency

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

Paper stock and toner

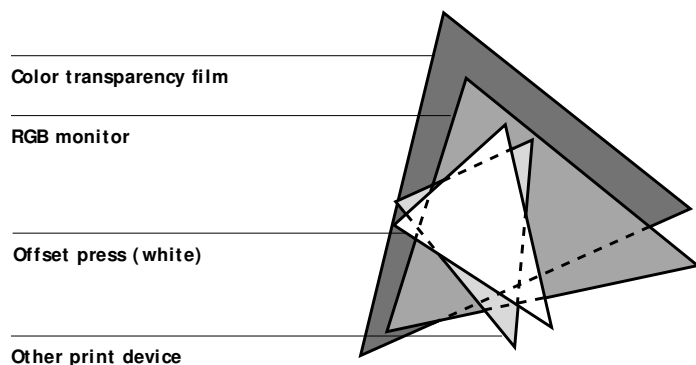
The paper and toner used by your printer can affect printed color. For best results, use the supplies recommended by the manufacturer of the printer.

Maintenance

Problems, such as streaking and insufficient or excessive amounts of one or more toners, arise when a printer does not receive periodic maintenance or needs major repairs. In addition to having it serviced regularly, monitor the condition of your printer by making standard test prints at regular intervals. You can do this easily by printing the Fiery 3850C 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 3850C printer, nor can they be reproduced on a press using process colors. Moreover, different print devices have different gamuts—some colors your printer 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 3850C 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 you specify for a particular print job. For added flexibility, the Fiery 3850C color management system can also be used in combination with color management systems on Windows and Mac OS computers.

Basics of color management

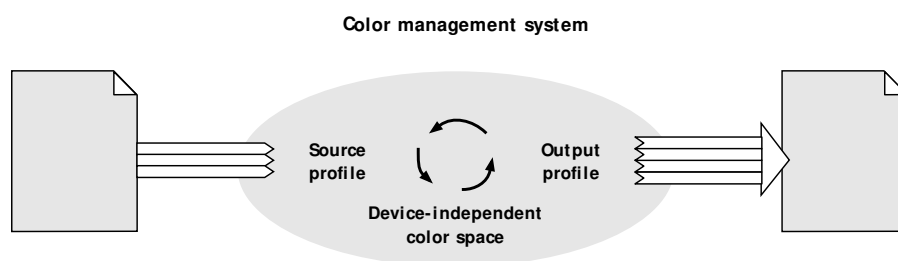
The past several years have seen progress toward standardization in the field of digital color management systems. Both the Windows and Mac OS operating systems now support a standard format developed by the International Color Consortium (ICC). This ICC format is implemented on Windows 98/Me and Windows 2000 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 3850C 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 3850C 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 3850C (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 3850C 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 3850C software includes ICC profiles for use with other color management systems, if you choose to use them, although conflicts may arise when the Fiery 3850C 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 3850C simulation feature is described on page 1-6.

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:

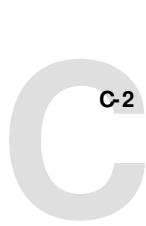
- 1D Status T density for EFI 34 patch page
- 1D Status T density for EFI 21 patch page
- 1D Status T density for other pages (maximum of 256 patches per ink)

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

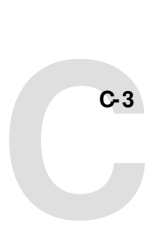
This file format is used to specify the Status T density measurements of the EFI 34 patch page. The value in the first column is the patch number. The first patch must be 1 and the last must be 34.

```
#!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
# percent 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 printers 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 3850C 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 printers 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 printer's PostScript interpreter when converting data between color spaces. The Fiery 3850C 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.

densitometer

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

density

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

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 printer, 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 printers.

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, Windows NT 4.0, and Windows 2000 computers in Image Color Matching (ICM). The Fiery 3850C 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 International Standards Organization (ISO); 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 printer and a calibration target that defines the expected density response of the printer.

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 colors used in printing to simulate full-spectrum color images: Cyan, Magenta, Yellow, 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 printers.

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 3850C 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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