THE DOCUMENT COMPANY
XEROX®

Phaser® 7700/7750
Color Laser Printer

PhaserMatch and PhaserCal Version 3.0 User Guide

Contents

1 Introduction

PhaserMatch Software, Version 3.0 1-1

PhaserCal 3.0 Software, Version 3.0 1-1

Requirements 1-2

Installing PhaserMatch/PhaserCal Software 1-2
- Installing on Macintosh Systems 1-2
- Installing on Windows Systems 1-2
- Next Recommended Reading 1-3

Introduction to Color Management 1-3

Typical Uses of PhaserMatch Software 1-4
- Calibrating a Printer 1-4
- Creating Custom TekColor Corrections 1-4
- Creating New ICC Profiles 1-6
- Printing with Custom TekColor Corrections 1-7
- Next Recommended Reading 1-8

2 Printer Calibration

Spectrophotometer-Based Calibration 2-1

Visual Color Calibration 2-2

3 Creating Custom TekColor Corrections

Creating and Using Phaser Printer Profiles 3-1
- Using Phaser Printer Profiles 3-1
- Creating New Phaser Printer Profiles 3-2

Creating and Using Target Device Profiles 3-3
- Using Target Device Profiles 3-3
- Creating Target Device Profiles 3-3

Creating Custom TekColor Corrections 3-4
- Device Link Profile Options Dialog 3-4
- Saving Device Link Profile Dialog 3-5
- Sending Custom TekColor Correction to the Printer Dialog 3-5

4 Printing with Custom TekColor Corrections

Printing to a Phaser 7750 Printer 4-1
Macintosh OS X 4-1
Macintosh OS 9.x 4-3

Printing to a Phaser 7700 Printer 4-7
Macintosh OS X 4-7
Macintosh OS 9.x 4-8
Windows 2000,Windows XP, and Windows Server 2003 4-8
Windows 98SE and Windows Me 4-9

5 Editing Custom TekColor Corrections

Editing Custom TekColor Corrections Overview 5-1
Editing Hints 5-2

6 Managing Custom TekColor Corrections

Managing TekColor Corrections on a Phaser 7750 Printer 6-1

Managing TekColor Corrections on a Phaser 7700 Printer 6-1

7 Troubleshooting

Macintosh System Requirements 7-1

Windows System Requirements 7-1

Color Calibration Data File 7-1

IT8 Targets and Reference Files 7-3
Acquiring New IT8 Targets 7-3
Acquiring New IT8 Reference Files 7-3
Caring for IT8 Targets 7-3

Troubleshooting Scanning Problems 7-4

Additional Information 7-5

A Glossary

1 Introduction

PhaserMatch Software, Version 3.0

PhaserMatch 3.0 is a color management application for the Phaser 7750 and Phaser 7700 printers. This application creates, edits, and manages TekColor corrections that are used with these color laser printers. Using PhaserMatch software, a user can modify the printed output from these printers to more closely match a different output device, such as a copy device or printing press. PhaserMatch can edit the built-in TekColor corrections provided with the printer, or create entirely new TekColor corrections from industry-standard ICC profiles. PhaserMatch can manage the TekColor corrections stored on a Phaser 7750 printer's internal hard drive.

PhaserMatch can also calibrate Phaser 7750 and 7700 printers. Color laser printers must be periodically calibrated to eliminate changes in printed colors caused by environmental conditions such as temperature and humidity, and normal wear on printer consumables, such as toner cartridges.

PhaserCal 3.0 Software, Version 3.0

PhaserCal 3.0 is a color calibration application for the Phaser 7700 or 7750 printers. PhaserCal is used to maintain consistent print results. Color laser printers must be periodically calibrated to eliminate changes in printed colors caused by environmental conditions such as temperature and humidity, and normal wear on printer consumables, such as toner cartridges. PhaserCal can calibrate a printer using a spectrophotometer.

Note

The calibration procedures are not intended to provide color matching from the printer to another printer or to any other output device; the full version of PhaserMatch should be used for this purpose.

Users of PhaserCal software who need to create or edit TekColor corrections for their printers should purchase the full version of PhaserMatch software.

The PhaserMatch software includes both color management and color calibration functionality. If you have installed the PhaserMatch software, you do not need to install the PhaserCal software.

Requirements

PhaserMatch 3.0 and PhaserCal 3.0 software is available for computers running:

- Apple Macintosh OS 9.2 / OS X version 10.2 and later operating systems (For detailed system requirements, see "Macintosh System Requirements" on page 7-1.)
- Microsoft Windows 98SE, Windows Me, Windows 2000, Windows XP, Windows Server 2003, and later operating systems (For detailed system requirements, see "Windows System Requirements" on page 7-1.)

This software supports the Phaser 7750 and Phaser 7700 color laser printers. Other printers by Xerox and other vendors are not supported.

Installing PhaserMatch/PhaserCal Software

The installer application deletes existing installations of PhaserMatch ICC 7700 and its components. If you would like to preserve a previous installation of the PhaserMatch ICC 7700 software, please make a backup before you begin your installation.

Before installing and using PhaserMatch or PhaserCal you should install the appropriate Xerox-supplied Phaser 7700 and Phaser 7750 PostScript printer drivers on your computer.

If you have both the PhaserMatch and PhaserCal CD-ROMs, you only need to install the PhaserMatch software. The PhaserMatch software includes the same calibration functionality as the PhaserCal software. If you install PhaserMatch after you install PhaserCal, only PhaserMatch is available for use. The installer for PhaserCal does not install PhaserCal if you have already installed PhaserMatch.

Installing on Macintosh Systems

1. Insert the PhaserMatch or PhaserCal CD-ROM into your computer's CD-ROM drive.
2. Double-click the Installer icon.
3. Click **Continue**.
4. Read the license agreement and click **Accept** to continue.
5. Follow the prompts in the installer to finish the installation.

Installing on Windows Systems

1. Insert the PhaserMatch or PhaserCal CD-ROM into your computer's CD-ROM drive.

   The CD-ROM automatically runs the installer.
2. Read the license agreement and click **Accept** to continue.
3. Follow the prompts in the installer to finish the installation.

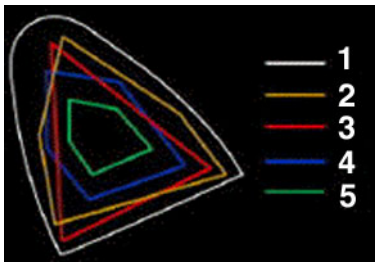
Next Recommended Reading

- For an introduction to using PhaserMatch or PhaserCal to calibrate your Phaser 7700 or Phaser 7750 printer, go to "Calibrating a Printer" on page 1-4.
- For an introduction to creating a custom TekColor correction, go to "Creating Custom TekColor Corrections" on page 1-4.
- For an introduction to printing using custom TekColor corrections, go to "Printing with Custom TekColor Corrections" on page 1-7.

Introduction to Color Management

Color management is based on color spaces. The range of colors, or gamut, perceived by the human eye, captured on film, displayed on a computer monitor, and rendered by a printer vary significantly. Each has its own color space, a mathematical means of describing its colors. RGB is an additive color space that combines red, green, and blue light to create all other colors. Monitors, digital cameras, and scanners typically use RGB colors. CMYK color, on the other hand, is a subtractive color space using cyan, magenta, yellow, and black inks on paper to absorb red, green, and blue light. The remaining reflected light is the color perceived by the viewer.

Both RGB and CMYK color are device dependent color spaces; the colors they render depend on the device that produces the colors. The colors produced by a scanner vary from a monitor since a scanner uses a CCD (charge coupled device) array to capture colors, while a monitor produces colors from light-emitting phosphors. Additionally, converting an image from RGB to CMYK compresses the colors into a smaller gamut. To complicate matters more, the CMYK color space of one printer can vary significantly from the CMYK color space of another printer. As the graphic below shows, the colors reproducible by different mediums can vary significantly.



1. Color visible to the human eye
2. Color film
3. Color monitor
4. Printer offset press on coated paper
5. Offset press on newsprint

The publishing industry has settled on a system of color management developed by the International Color Consortium (ICC). ICC-based color management relies on two things: device profiles called ICC profiles, which characterize how individual devices produce color, and a color engine (also called a color matching module or CMM), which reads those profiles and translates and corrects colors between devices.

ICC-based color management relies on a device independent color space. One of the common color spaces specified for use is CIE L*a*b* (CIE Lab, LAB). This color space provides a link between device dependent color spaces specific to various devices. LAB color space is based on the way the human eye perceives color and is device-independent. A LAB color engine can

translate RGB, and CMYK values to and from LAB values. This translation acts as an interpreter between the color spaces. ColorSync, a color-management software for the Macintosh operating system, currently supports CMM color engines from vendors, such as Heidelberg. These other vendors can use different algorithms to perform its color conversions. Image Color Management System (ICM), a color management system for the Windows operating system, also supports color engines from other vendors. When using PhaserMatch with Macintosh, make sure the default CMM is the Apple CMM. When using PhaserMatch with Windows, PhaserMatch is using its own CMM; the selection of CMM at the OS is not used.

When you create an image using an application that uses ColorSync or ICM, a profile can be embedded in the image file. PhaserMatch ignores the embedded profiles and expects the application to produce CMYK colors.

Typical Uses of PhaserMatch Software

Calibrating a Printer

Color calibration is one of the most important things you can do if you want to obtain optimal color output from your printer. Color laser printers must be periodically calibrated to eliminate changes in printed colors caused by environmental conditions, such as temperature and humidity, and normal wear on printer consumables, such as toner cartridges. Calibration may also be necessary if the printer has been used for long extended print runs or after extended periods of inactivity.

Calibration can be done using one of the following two methods.

- Method 1 is a spectrophotometer-based calibration done within PhaserMatch/PhaserCal software.

  This is the recommended method for calibration as it provides the optimum calibration method for your printer. If you do not have a spectrophotometer, it is suggested that you consider purchasing one because a spectrophotometer can be a valuable color tool for your business.

- Method 2 is a visual calibration done using the front panel of the printer.

Calibration should be performed after the printer is warmed up.

For more information on color calibration, see "Printer Calibration" on page 2-1.

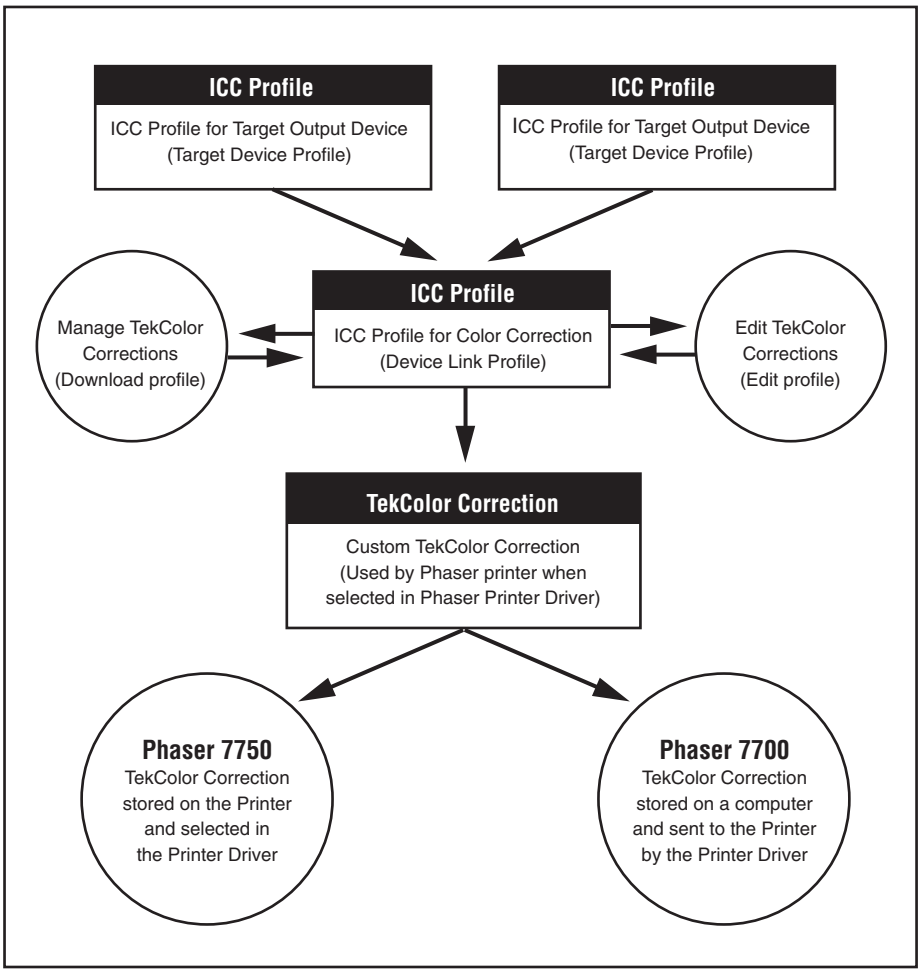
Creating Custom TekColor Corrections

Your Phaser printer has a number of TekColor corrections built into the printer. Try these color corrections before using PhaserMatch. Using the existing color corrections saves you time since you do not have to create new color corrections for your printer to get the output you want. For information on using the built-in color corrections, see the *Reference Guide* on the *User Documentation CD-ROM* that shipped with your printer or the Xerox web site at www.xerox.com/office/support.

If one of the TekColor corrections built into the printer do not meet your needs, you can generate new TekColor corrections using the ICC profiles supplied with your printer or PhaserMatch. Creating new TekColor corrections can be accomplished in several ways. The simplest way to create a new TekColor correction is to start from existing ICC profiles. You can use an existing ICC device link profile to create a TekColor correction and then download it to a Phaser 7750 printer or update the Phaser 7700 printer driver. You can also edit an existing ICC device link profile and then download it to a Phaser 7750 printer or update the Phaser 7700 printer driver. If an existing ICC device link profile meets your needs, you can use the "Download Profiles" and "Edit Profiles" functionality. Editing or downloading TekColor corrections can save time because you do not have to create new Phaser printer profiles and/or target device profiles.

If an existing ICC device link profile does not meet your needs, you can create new TekColor corrections by creating new ICC profiles for either a target CMYK output device or a Phaser printer or both devices. To create new device profiles, you can use the third-party ICC profile creation application you have or you can use the “Create Profiles” functionality within PhaserMatch. PhaserMatch comes with a built-in scanner-based profile creation method. If you do not want to use PhaserMatch or you want to use a spectrophotometer to generate the profiles, you need to acquire the ICC profile creation application and instrument from another vendor.

The following diagram shows the color matching elements of the software and the flow of the software.



Creating New ICC Profiles

PhaserMatch provides a scanner-based method for generating ICC profiles for Phaser printers and other CMYK output devices. In PhaserMatch, the ICC profiles for Phaser printers are called “Phaser printer profiles”. In PhaserMatch, the ICC profiles for other devices you wish to emulate are called “target device profiles”.

You can use the Phaser printer profiles supplied with the printer and/or PhaserMatch. You need to create new profiles when one of the following conditions exists:

- The colors produced by your printer have changed due to environmental or other conditions.
- The paper you are using differs from the paper used to create the supplied profiles.
- The supplied profiles do not meet your needs.

You can use the target device profiles supplied with the printer. Create new profiles when one of the following conditions exists:

- You do not have an ICC profile for the device you want the printer to match.
- The colors produced by the target device have changed due to environmental or other conditions.
- The ICC profiles supplied by the device's manufacturer do not meet your needs.

For more information on creating Phaser printer profiles within PhaserMatch, see the section "Creating New Phaser Printer Profiles" on page 3-2 or the help in the PhaserMatch application. For more information on creating target device profiles within PhaserMatch, see "Creating Target Device Profiles" on page 3-3 or the help in the PhaserMatch application.

Printing with Custom TekColor Corrections

Printing to a Phaser 7750 Printer

PhaserMatch downloads new TekColor corrections to the hard drive on a Phaser 7750 printer. Each Phaser 7750 can store up to 10 additional TekColor corrections. These new custom TekColor corrections are then selected in the Phaser 7750 PostScript Printer Driver. The custom TekColor corrections work just like the TekColor corrections, such as SWOP Press and Euroscale Press, built into the printer.

For more information on printing with custom TekColor corrections on a Phaser 7750 printer, see "Printing to a Phaser 7750 Printer" on page 1-7 or click the help button in the PhaserMatch application.

Printing to a Phaser 7700 Printer

PhaserMatch adds new TekColor corrections to the PostScript printer driver associated with a Phaser 7700 printer. PhaserMatch modifies the printer driver files to make the new TekColor corrections available in the driver on the computer being used. The custom TekColor corrections work just like the TekColor corrections, such as SWOP Press and Euroscale Press, built into the printer.

For more information on printing with custom TekColor corrections on a Phaser 7700 printer, see "Printing to a Phaser 7750 Printer" on page 4-1 or click the help button in the PhaserMatch application.

Next Recommended Reading

For more information about:

- making minor changes to one of the built-in TekColor corrections, go to "Editing Custom TekColor Corrections" on page 5-1".
- creating a custom TekColor correction, go to "Creating Custom TekColor Corrections" on page 3-1.
- printing using custom TekColor corrections, go to "Printing with Custom TekColor Corrections" on page 4-1.
- managing TekColor corrections, go to "Managing Custom TekColor Corrections" on page 6-1.

2 Printer Calibration

Spectrophotometer-Based Calibration

There are two methods provided for entering the calibration data values measured by a spectrophotometer. The first method allows you to use PhaserMatch or PhaserCal software to control and communicate with a spectrophotometer that is connected to your computer. The second method allows you to import a data file that contains the measurement data.

The spectrophotometers that can be controlled by PhaserMatch or PhaserCal software are:

- GretagMacbeth Spectrolino/SpectroScan
- GretagMacbeth Eye-One System
- X-Rite DTP-41
- X-Rite DTP-22
- SpectroStar SpectroCam

Note

PhaserMatch and PhaserCal software do not support any densitometers for doing color calibration.

PhaserMatch and PhaserCal software walks you through a series of steps that generate and download the calibration data to a printer. To do a spectrophotometer-based calibration:

1. Launch the PhaserMatch or PhaserCal application.
2. Click the **Calibrate Printer** button in the main dialog.
3. Click the **Spectrophotometer-Based Calibration** button in the main Calibrate Printer dialog.
4. Select a device from the list of supported spectrophotometers or select **Manually Enter Data**.
5. Select a printer, print quality, and paper type you use to do the calibration procedure.
6. Measure the color swatches.

Note

The instructions explaining how to manually measure the calibration data and create the needed data file are in section "Color Calibration Data File" on page 7-1.

7. View the measurement data.
8. Send the calibration data to the printer.

For more information on how to use these dialogs, click the help button in the application.

Visual Color Calibration

The printer contains a set of instructions that describe how to calibrate the printer visually. These instructions can be printed from the front panel, PhaserMatch, or PhaserCal. The color-balancing tutorial explains how to do visual color calibration.

Note

Using a spectrophotometer to do color calibration gives you the optimal printed colors on your Phaser printer. If you do not have a spectrophotometer, it is suggested that you consider purchasing one because a spectrophotometer is a valuable color tool for your business.

3 Creating Custom TekColor Corrections

You should make sure your printer has been calibrated using one of the methods mentioned previously in this document before creating new TekColor corrections. When the printer has been color calibrated you can create and use custom TekColor corrections.

To create a TekColor correction using a Phaser printer profile and a target device profile:

1. Launch the PhaserMatch application.
2. Click the **Create Profile** button in the main dialog.
3. Create or use a Phaser printer profile, see "Creating and Using Phaser Printer Profiles" on page 3-1.
4. Create or use a target device profile, see "Creating and Using Target Device Profiles" on page 3-3.
5. Create a new custom TekColor correction; see "Creating Custom TekColor Corrections" on page 3-4.

Creating and Using Phaser Printer Profiles

When creating new TekColor corrections, you need to either select an existing Phaser printer profile or create a new ICC profile. These profiles inform PhaserMatch of the colors being produced by the specific printer being used.

If you need to make minor changes in the color output of your printer, you should use one of the Phaser printer profiles supplied with your printer or PhaserMatch. If you need to generate new Phaser printer profiles, you can either: use your ICC profile creation application or use the scanner-based profile creation tool in PhaserMatch. If you have a third-party ICC profile creation application, use it to create the needed ICC profiles.

Note

When creating Phaser printer profiles using a third party ICC profile creation application, you should make sure the print to be measured is made with no color correction. Select **None** for the color correction in the Phaser printer's PostScript driver.

Using Phaser Printer Profiles

To use an existing Phaser printer profile, click the **Select Profile** button under the heading **Select a Phaser Printer Profile**, in the main **Create Profile** dialog.

Creating New Phaser Printer Profiles

If you have a scanner and would like to create a Phaser printer profile, click the **Create Profile** button under the heading **Select a Phaser Printer Profile** on the main **Create Profile** dialog. PhaserMatch then walks you through a series of steps that generates an ICC profile for the printer.

To create a Phaser printer profile:

1. Print a set of swatches on the Phaser printer you are going to use.
2. Attach an IT8 target to the printed swatches.

Note

An IT8 target is a physical photographic image. An IT8 target is supplied with each copy of PhaserMatch.

3. Scan the printed swatches using the software that you use with your scanner.

Note

You need to create a RGB TIFF image file using your third-party scanning software. Scanning must be done at minimum of 200 dpi with the scanner's automatic color correction/management turned off.

4. Import the scanned image into PhaserMatch.
5. Select the IT8 reference file for the IT8 target you used.

Note

An IT8 reference file is a data file containing the color values of a particular IT8 target. For more information about IT8 targets and IT8 reference files, see "IT8 Targets and Reference Files" on page 7-3.

6. PhaserMatch tries to automatically crop the scanned image. If the automatic cropping fails, you need to select a set of crop marks on the scan the printed swatches and the IT8 target to locate the crop marks.
7. Save the Phaser printer profile.

Note

Give the profile a name that is recognizable as a Phaser printer profile.

For more information on how to use these dialogs, click the help button in the PhaserMatch application.

Creating and Using Target Device Profiles

When creating new TekColor corrections, you need to either select an existing target device profile or create a new ICC profile. These profiles inform PhaserMatch of the colors being produced by a particular output device being matched. These profiles are sometimes called "output device profiles".

If you only need to make minor modifications to the color output by the printer, you should use one of the target device profiles supplied with PhaserMatch. If you need to generate new target device profiles, you can either: use your ICC profile creation application or use the scanner-based profile creation tool in PhaserMatch. If you have a third-party ICC profile creation application, use it to create the needed ICC profiles.

Using Target Device Profiles

To use an existing target device profile, click the **Select Profile** button under the heading **Select a Target Device Profile**, in the main Create Profile.

Creating Target Device Profiles

If you have a scanner and would like to create a target device profile, click the **Create Profile** button under the heading, **Select a Target Device Profile** in the main Create Profile. PhaserMatch then walks you through a series of steps that generate an ICC profile for the output device. To create target device profile:

1. Print a set of swatches on the output device you are going to match.
2. Attach an IT8 target to the printed swatches.

Note

An IT8 target is a physical photographic image. An IT8 target is supplied with each copy of PhaserMatch software.

3. Scan the swatches using the software that you use with your scanner.

Note

You need to create a RGB TIFF image file using your third-party scanning software. Scanning must be done at minimum of 200 dpi with automatic color the scanner's correction/management turned off.

4. Import the scanned image into PhaserMatch.
5. Select an IT8 reference file for the IT8 target used.

Note

An IT8 reference file is a data file containing the color values of a particular IT8 target. For more information IT8 targets and IT8 reference files, see "IT8 Targets and Reference Files" on page 7-3.

6. PhaserMatch tries to automatically crop the scanned image. If the automatic cropping fails, you need to select a set of crop marks to indicate where on the scan the printed swatches and the IT8 target.
7. Save the target device profile.

Note

Give the profile a name that is recognizable as a target device profile.

For more information on how to use these dialogs, click the help button in the PhaserMatch application.

Creating Custom TekColor Corrections

After selecting a Phaser printer profile and a target device profile, continue the process of generating a new TekColor correction by clicking the **Next** button in the main **Create Profile** dialog. The **Next** button is not active until a Phaser printer profile and a target device profile are shown in this dialog.

Device Link Profile Options Dialog

The **Device Link Profile Options** dialog has two check boxes. The check boxes are:

- **Pure Black Enhancement**
- **Preserve Paper Color**

Checking **Pure Black Enhancement** adds CMY toner to the printed black. By default, PhaserMatch modifies equal 100% CMY values so that these values are printed with black toner only.

Note

Pure Black Enhancement can make text appear sharper but it can also make text appear lighter on some prints. When unchecked PhaserMatch does undercover color removal on 100% CMY values only. It does not change equal CMY values of < 100%.

Checking **Preserve Paper Color** modifies the background colors of the prints. It tries to print the background of the print in the color of the paper used when the target device swatches were created.

Note

Preserve Paper Color can change the background color of the prints to make them simulate the paper that was used when creating the target device profile but it can also change the users' perceptions of other colors in the print.

Saving Device Link Profile Dialog

The **Save Device Link** dialog is used to a detailed description and a short name for the TekColor correction. When the **Save Profile** button is clicked, you can save the profile.

Note

The printer driver uses the short name entered in this dialog as the name of the TekColor correction.

Sending Custom TekColor Correction to the Printer Dialog

When you are creating a custom TekColor correction for a Phaser 7750 printer, the final dialog in this process enables you to select the printer to which you want to send the TekColor correction. This dialog is not shown when using a Phaser 7700 printer. The Phaser 7750 printer can store up to 10 custom TekColor corrections.

The **Printers** selection shows the Phaser 7750 printer installed on your computer and enables you to save to file. Selecting **Save to File** allows PhaserMatch to save the custom TekColor correction as a printable PostScript file. The file then could be sent to another system using **File Download** functionality within CentreWare Internet Services to send the file to a printer that is not installed on your computer.

The **Custom TekColor Corrections** selection shows the 10 custom TekColor correction slots that can be used to store the color corrections. When the printer selected is connected to the computer using TCP/IP, PhaserMatch also shows the **Short Name** and other information about the TekColor correction.

For more information about this dialog, click the help button in the PhaserMatch application.

4 Printing with Custom TekColor Corrections

Printing to a Phaser 7750 Printer

Macintosh OS X

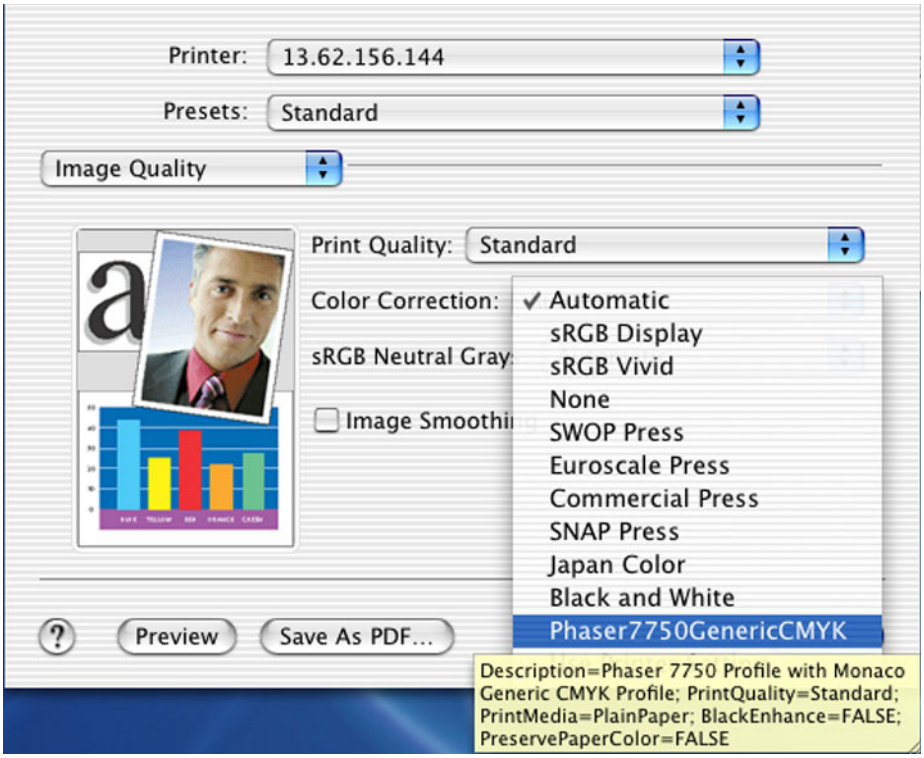
The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are examples of applications that can be set up to do this. Other applications, such as Microsoft Word for Macintosh OS X, generate CIE color values that are not affected by the TekColor corrections or they generate RGB colors that are not supported by the TekColor corrections that you have created.

Computers with TCP/IP Connections to the Printer

When using a computer with a TCP/IP connection to the printer, the driver lists the TekColor corrections using the short name of the correction. To select a custom TekColor correction:

1. In the **Print** dialog, select the **Copies & Pages** pop-up menu, then select **Image Quality**.
2. Click on the **Color Correction** pop-up menu.

3. Click on the short name of the desired color correction. For instance, click on **Phaser 7750 Generic CMYK** in the list of color corrections.



Note

AppleTalk, EtherTalk, and USB connections are not TCP/IP connections.

Computers without TCP/IP Connections to the Printer

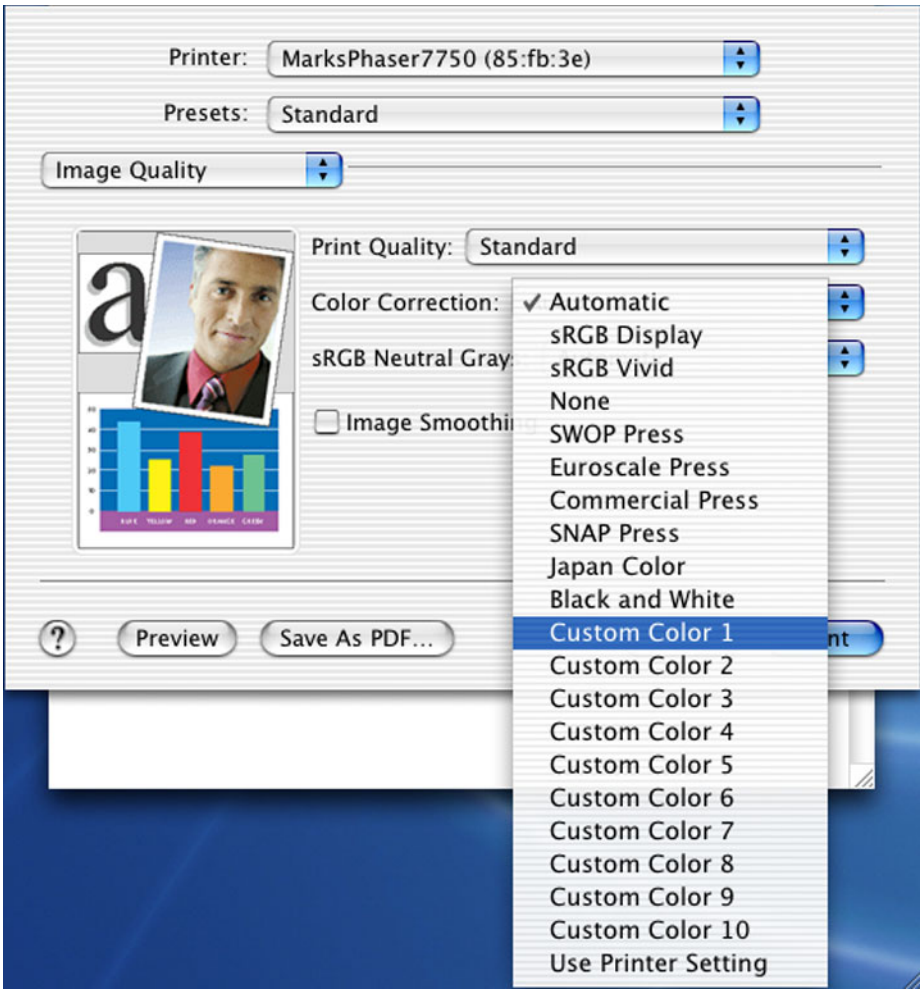
When using a computer without TCP/IP connection to the printer, the driver lists the custom TekColor correction selections as **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**. To select a custom TekColor correction:

1. In the **Print** dialog, select the **Copies & Pages** pop-up menu, then select **Image Quality**.
2. Click on the **Color Correction** pop-up menu.

3. Click on the name **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**.

Note

The Custom Color number should be the same one you used when you downloaded the color correction to the printer.



Note

AppleTalk, EtherTalk, and USB connections are not TCP/IP connections.

Macintosh OS 9.x

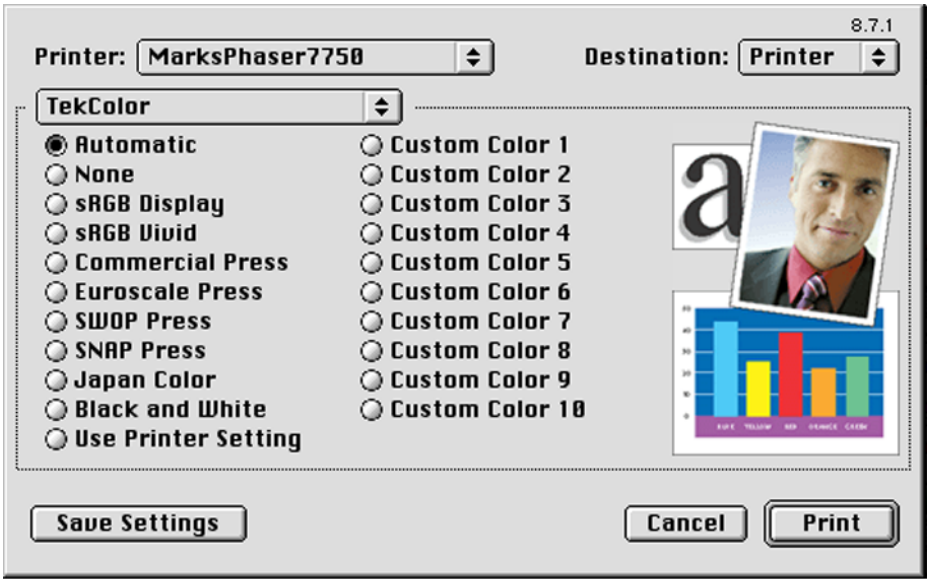
The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word, for Macintosh OS 9.x generate CIE color values that are not affected by the TekColor corrections or they generate RGB colors that are not supported by the TekColor corrections that you have created.

The printer driver supplied for this OS lists the custom TekColor correction selections as **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**. To select a custom TekColor correction:

1. In the **Print** dialog, select the **General** pop-up menu, then select the **Print Quality/Color** selection.
2. Select **Color Correction** pop-up menu.
3. Select the name **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**.

Note

The Custom Color number should be the same one you used when you downloaded the color correction to the printer.



Windows 2000, Windows XP, and Windows Server 2003

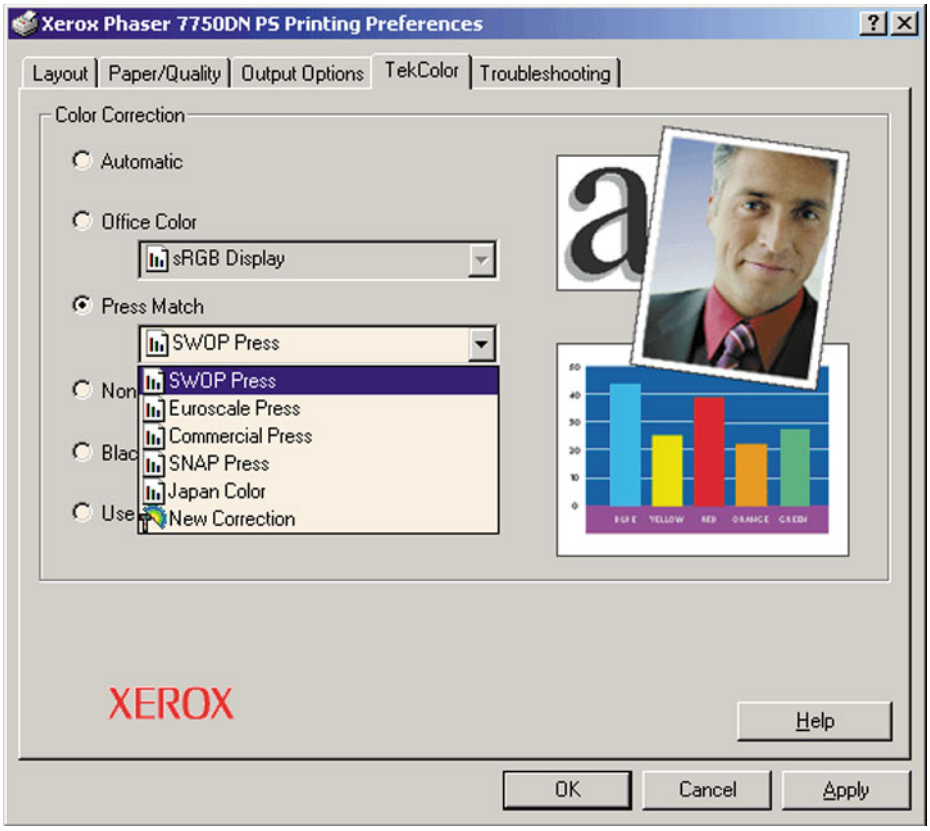
The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word, generate CIE color values that are not affected by the TekColor corrections or they generate RGB colors that are not supported by the TekColor corrections that you have created.

Computers with TCP/IP Connections to the Printer

When using a computer with a TCP/IP connection to the printer, the driver lists the TekColor corrections using the short name of the correction. To select a custom TekColor correction:

1. In the **Print** dialog, click the **Properties** button.
2. Select the **TekColor** tab.
3. Click the **Press Match** color selection.

4. Click on the short name for the desired color mode. For instance, click on **New Correction** in the list of Color Corrections.



Note

USB, NetWare, and NetBEUI are not TCP/IP connections.

Computers without TCP/IP Connections to the Printer

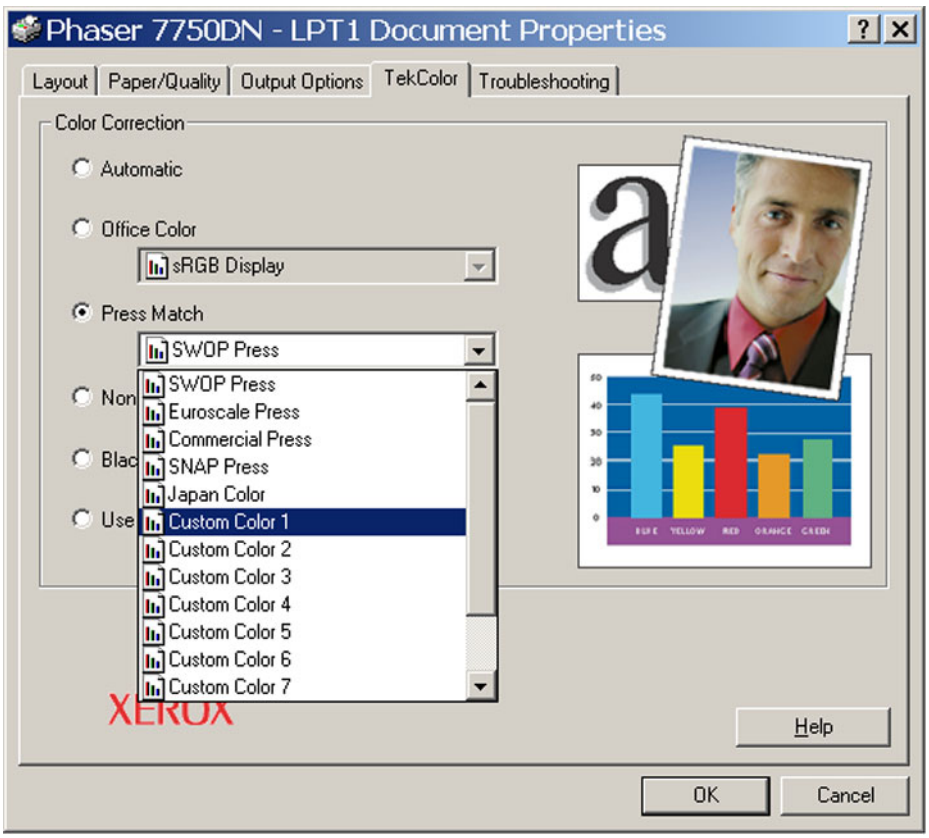
When using a computer without TCP/IP connection to the printer, the driver lists the custom TekColor correction selections as **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**. To select a custom TekColor correction:

1. In the **Print** dialog box, click the **Properties** button.
2. Select the **TekColor** tab.
3. Click on the **Press Match** color selection.

4. Click on the name **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**.

Note

The Custom Color number should be the same one you used when you downloaded the color correction to the printer.



Note

USB, NetWare, NetBEUI, AppleTalk are not TCP/IP connections.

Windows 98SE and Windows Me

The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word, generate CIE color values that are not affected by the TekColor corrections or they generate RGB colors that are not supported by the custom color corrections that you have created.

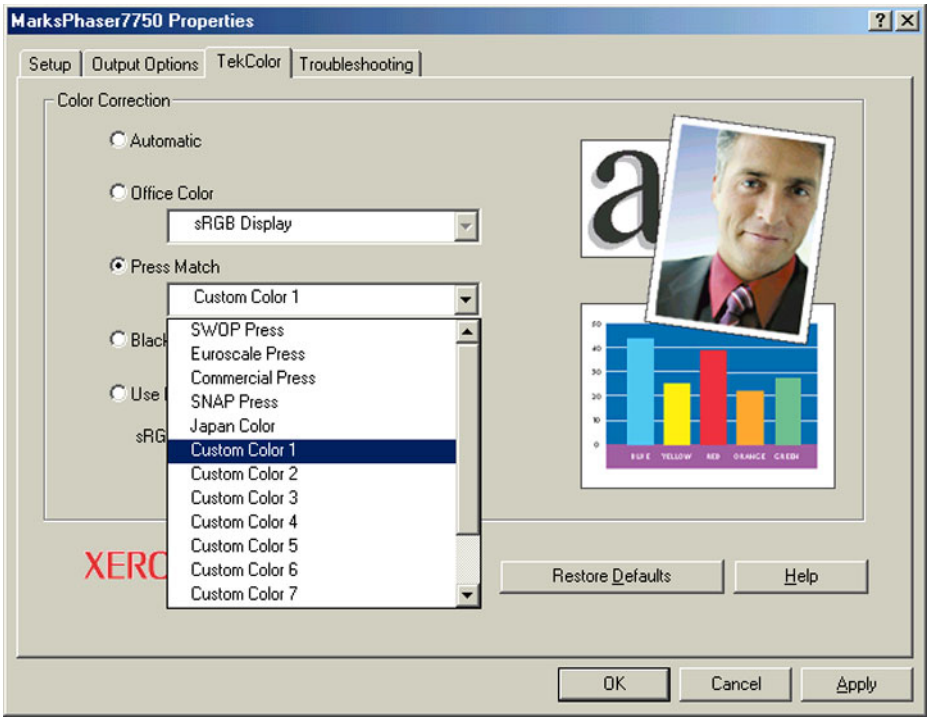
The printer driver supplied for this OS lists the custom TekColor correction selections as **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**. To select a custom TekColor correction:

1. In the **Print** dialog box, click the **Properties** button.
2. Select the **TekColor** tab.

3. Click on **Press Match Color**.
4. Click on the name **Custom Color 1**, **Custom Color 2**, through **Custom Color 10**.

Note

The Custom Color number should be the same one you used when you downloaded the color correction to the printer.



Printing to a Phaser 7700 Printer

Macintosh OS X

The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word for Macintosh OS X, generate CIE color values that are not affected by the TekColor corrections or generate RGB colors that are not supported by the custom color corrections that you have created.

The printer driver supplied for this OS works with PhaserMatch driver lists the custom TekColor correction selections using the short name of the correction. To select a custom TekColor correction:

1. In the **Print** dialog box, select the **Copies & Pages** pop-up menu, then select **Image Quality**.

2. Click on the **Color Correction** pop-up menu, then click on the short name of the desired color correction. For instance, click on **Custom Color 1** in the list of color corrections.

Macintosh OS 9.x

The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word for Macintosh OS 9.x, generate CIE color values that are not affected by the TekColor corrections or generate RGB colors that are not supported by the custom color corrections that you have created.

The printer driver supplied for this OS lists the custom TekColor correction selections using the short name of the correction. To select a custom TekColor correction:

1. In the **Print** dialog box, select the **General** pop-up menu, then select **Print Quality/ Color**.
2. Select the **Color Correction** pop-up menu and select the short name of the desired color correction.

Windows 2000, Windows XP, and Windows Server 2003

The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word, generate CIE color values that are not affected by the TekColor corrections or generate RGB colors that are not supported by the custom color corrections that you have created.

The printer driver supplied for this operating system lists the custom TekColor corrections using the short name of the correction. To select a custom TekColor correction:

1. In the **Print** dialog, click the **Properties** button.
2. Select the **TekColor** tab.
3. Click on the **Press Match Color** selection.
4. Click on the short name for the desired color mode.

Windows 98SE and Windows Me

The TekColor corrections created by PhaserMatch work with applications that generate CMYK color values when printing. Applications, such as Adobe PhotoShop and Illustrator, are a couple of applications that can be set up to do this. Other applications, such as Microsoft Word, generate CIE color values that are not affected by the TekColor corrections or generate RGB colors that are not supported by the custom color corrections that you have created.

The printer driver supplied for this OS lists the TekColor corrections using the short name of the correction. To select a custom TekColor correction:

1. In the **Print** dialog, click the **Properties** button.
2. Select the **TekColor** tab.
3. Click on the **Press Match Color** selection.
4. Click on the short name for the desired color mode.

5 Editing Custom TekColor Corrections

Editing Custom TekColor Corrections Overview

Use Edit Profile to modify the color printed by a Phaser 7700 or Phaser 7750 printer. Edit Profile can be used to make minor changes in the colors printed when a TekColor correction has been selected. To correct color printing problems with individual images use your image-editing software, such as Adobe Photoshop.

New custom TekColor corrections are created by editing device link profiles. The TekColor corrections built-into the printer can be used as the starting point for creating new TekColor corrections by selecting one of the device link profiles supplied with PhaserMatch.

To begin editing:

1. Launch the PhaserMatch application.
2. Click on the **Edit Profile** button in the main dialog.
3. Select a Device Link Profile to edit.

Note

A number of Device Link Profiles have been supplied with PhaserMatch when the **Select Profile** button is clicked in the **Choose Profile** and **Preview Image** dialog. In addition, Device Link Profiles that you created are shown in the **Select a Device Link Profile for Editing** dialog.

4. You can either use the default preview image or select a different RGB tiff image.

Note

The preview image is used in the editing screen to show the changes you are making to the color correction being edited.

After selecting a Device Link Profile and a preview image, continue the process of generating a new custom TekColor correction by clicking the **Next** button. After you are done with each subsequent editing step in this process, click the **Next** button to have PhaserMatch walk you through the steps needed to create custom TekColor corrections.

Editing Hints

Editing is best done in a series of small steps. While editing, you can make a small change and print the results. Then continue by repeating this operation until you get the desired results. Finally after making incremental changes, if the results are satisfactory, click the **Next** button in the application to save the results and create a new custom TekColor correction or if the results do not meet your needs, click the **Close** button in the edit window and start again.

Note

It is safer to create a new TekColor correction than to overwrite an existing one.

Device Link Profiles have three parts:

- A set of output lookup tables (known as the Output Gamma Curves)
- A color transform (also known as the color cube)
- A set of input lookup tables (known as the Input Gamma Curves)

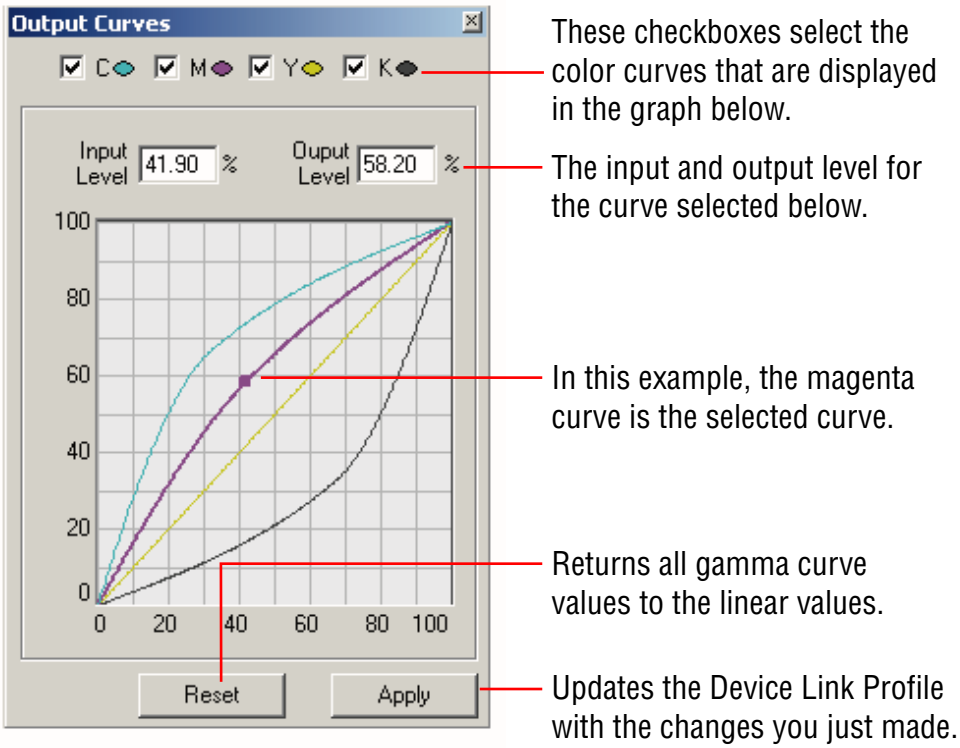
The PhaserMatch editor provides buttons to edit all three parts of the Device Link Profile. The buttons are shown in the following figure.

Output Gamma Curves Editing Tool Button

Selective Editing Tool Button

Input Gamma Curves Editing Tool Button

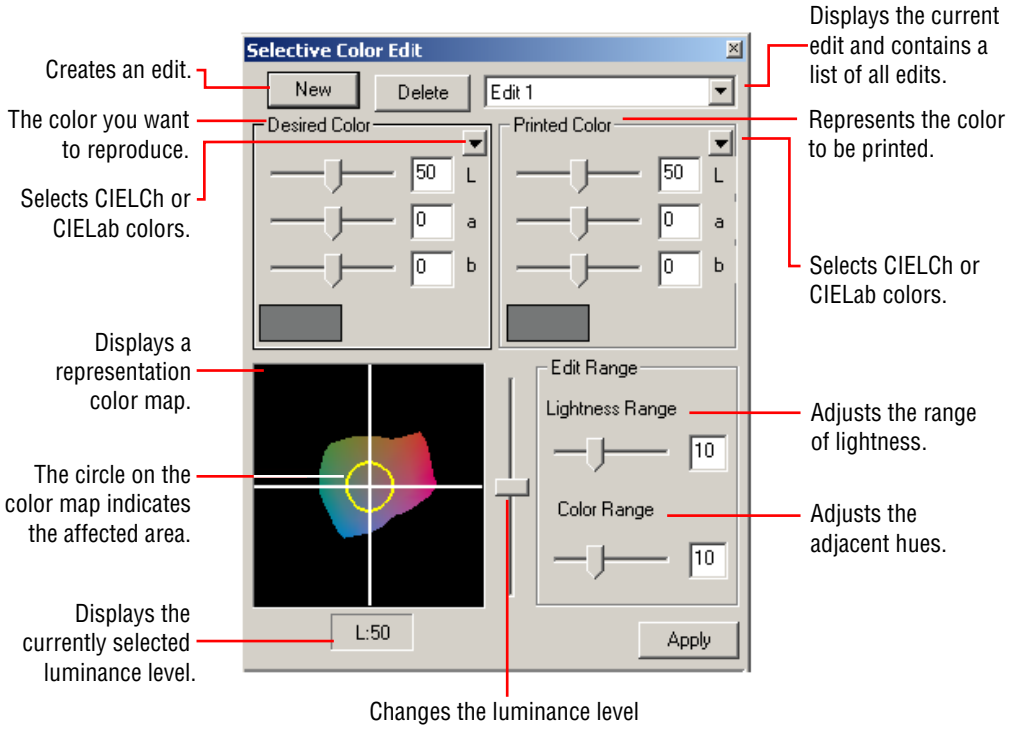
Use the **Output Gamma Curves Editing Tool** to make changes in the output lookup tables. The changes you make when using this tool are shown in the preview image and should model what you expect to see when printing.



Use the **Selective Edit Tool** to make changes in the color transform within the Device Link Profile.

Caution

This tool has advanced features. Practice with this tool before overwriting previously created profiles.



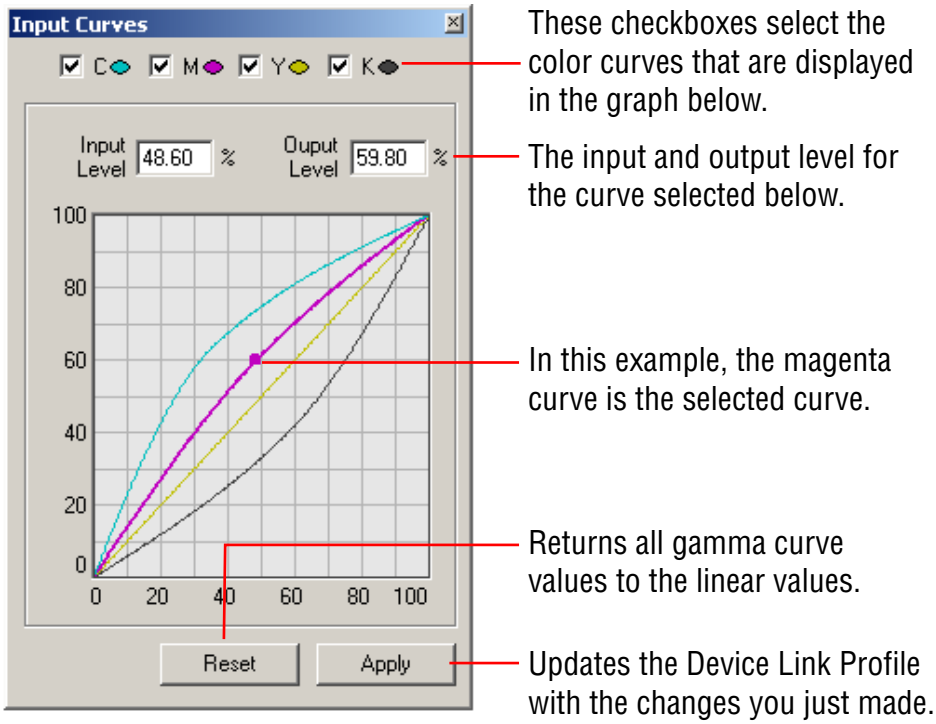
Use the **Input Gamma Curves Editing Tool** to modify the input lookup tables. These edits then pass through the color cube and the output lookup tables. Make small changes because changes made in this tool may be greater than expected. For example, if you move up the magenta curve 5% in the mid-tone of the input lookup table, that change passes through the color cube and the output lookup table and may end up being the equivalent of a 2% change in the 3/4 tone of the input lookup table. This is may not be what you expected.

Caution

This tool has advanced features. Practice with this tool before overwriting previously created profiles.

Caution

Editing **both** the Output Gamma Curves and the Input Gamma Curves is not recommended.



6 Managing Custom TekColor Corrections

Use Download Profile to manage the custom color corrections associated with a Phaser 7700 or Phaser 7750 printer.

Managing TekColor Corrections on a Phaser 7750 Printer

When using a Phaser 7750 printer the **Download Profile** button is used to download the custom TekColor corrections to the printer. This functionality can create new custom TekColor corrections from existing Device Link Profiles. After selecting a Device Link Profile, PhaserMatch displays the **Send a Color Correction to the Printer** dialog. For more information, see "Sending Custom TekColor Correction to the Printer Dialog" on page 3-5. This dialog is used to send a custom color correction to the printer.

Managing TekColor Corrections on a Phaser 7700 Printer

When using a Phaser 7700 printer under a Macintosh OS, the **Download Profile** button is used to manage the custom TekColor corrections associated with a printer driver. This functionality can be used to generate new color corrections from existing Device Link Profiles. After selecting a Device Link Profile, PhaserMatch displays the **Send a Color Correction to the Driver** dialog. This dialog is used to add a new custom color correction to the printer driver or to delete a custom color correction from the driver installed on the particular computer being used.

7 Troubleshooting

Macintosh System Requirements

- Apple Power Macintosh computer
- Macintosh OS 9.2.2, or OS X, version 10.2 (version 10.2.3 recommended) operating system
- Apple ColorSync 2.6 or later
- Apple LaserWriter 8.6 or later printer driver
- 64 Mbytes RAM required, 128 Mbytes RAM recommended
- 600 x 800 dpi resolution color monitor with the ability to display thousands of colors
- Xerox Phaser 7700 or 7750 color laser printers only
- Installation of the Xerox Phaser 7700 or the Phaser 7750 Macintosh printer driver (This driver must be used in order to use PhaserMatch 3.0 TekColor corrections.)

Windows System Requirements

- Intel Pentium III computer or better
- Windows 98SE, Windows Me, Windows 2000,Windows XP, or Windows Server 2003
- 64 Mbytes RAM required, 128 Mbytes RAM recommended
- 600 x 800 dpi resolution color monitor with the ability to display thousands of colors
- Xerox Phaser 7700 or 7750 color laser printers only
- Installation of the Xerox Phaser 7700 or the Phaser 7750 Windows printer driver (This driver must be used in order to use PhaserMatch 3.0 TekColor corrections.)

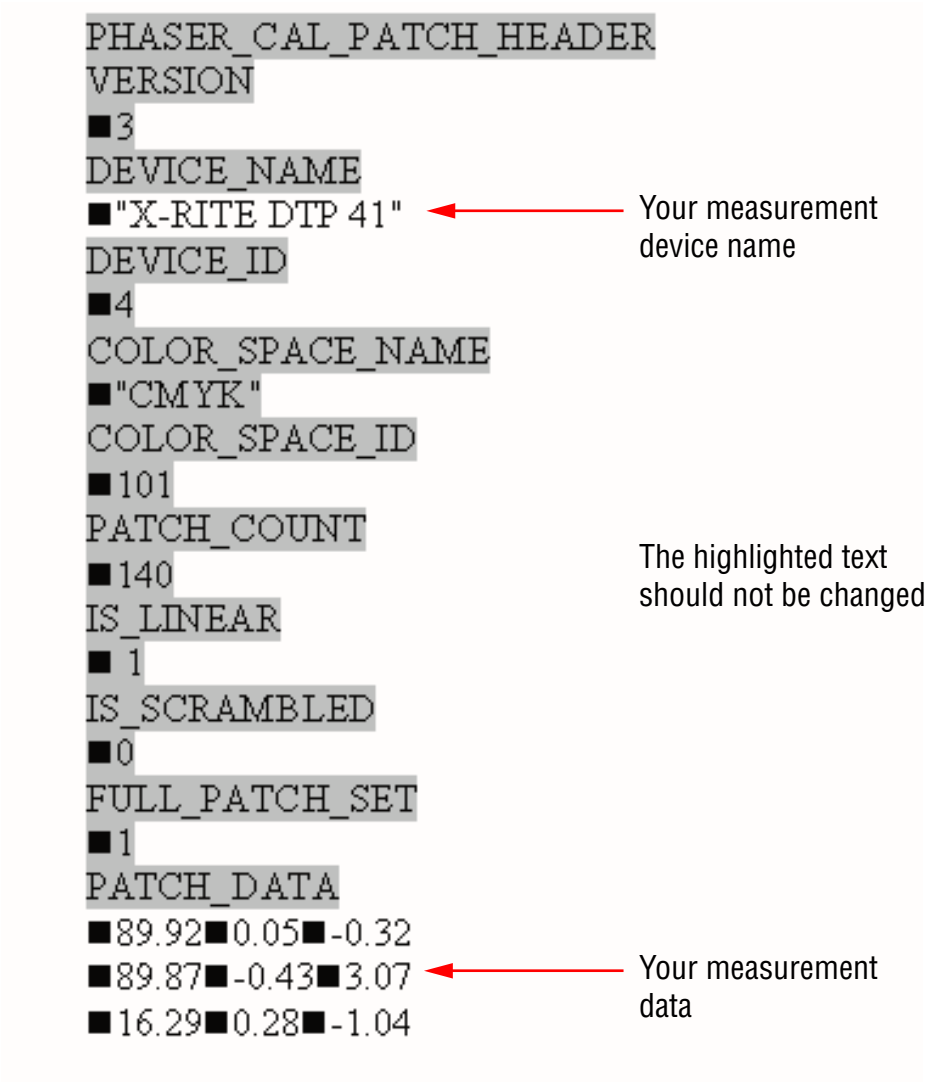
Color Calibration Data File

When using "Manually Enter Data" in the spectrophotometer-based calibration procedure you need to create a measurement file and import it into PhaserMatch. When creating a calibration measurement file you need to set up your measurement device as follows:

- Set the device so it is measuring CIE Lab color.
- Set the device to use a D50 2° light source.

- Set the device up so that it is generating data with three decimal places of accuracy.

Once the instrument is set up correctly, measure the set of printed color swatches in sequence from top to bottom, reading down each column before moving to the next column on the right. When you complete the measurements, save the measured data as a "space-delimited" ASCII text file. The format of the ASCII text file to be imported is as follows:



The ■ symbol above indicates a single space. You must have one single space in place of the box and only one single space.

If you are using a Microsoft Excel file:

1. In the **Save as type** field, select **Formatted Text (Space delimited) (*.prn)**.
2. In the **File name** field, type the name as "filename.mpd" or "filename.txt". You must use the quotation marks in the file name.

IT8 Targets and Reference Files

Acquiring New IT8 Targets

PhaserMatch and PhaserCal include an IT8 target in the package provided. To acquire a new IT8 target, go to the Xerox web site at www.xerox.com/office.

Acquiring New IT8 Reference Files

Each IT8 Target has a specific computer reference file. This reference file contains the color values for the IT8 Target. The reference file contains values that mathematically describe the colors on the IT8 target. The reference files are installed on your computer as a part of the PhaserMatch installation. In some instances, you may receive an IT8 Target that was produced after the PhaserMatch CD-ROM was created, and therefore, it was not installed on your computer. To get the target file, download the appropriate reference file from the Xerox web site.

To download the target file:

1. Go to the Xerox web site at www.xerox.com/office.
2. Select **Software and Drivers**.
3. In the **Which Printer do you have?** pull-down list, select a Phaser 7700 or 7750 printer.
4. In the **Which Files for your printer would you like?** pull-down list, select PhaserMatch.
5. Click the **go to downloads button**.
6. Locate the IT8 Target files and click on the file to download the files to your computer
   - When using Windows, select the file: 7700IT8.exe
   - When using a Macintosh, select the file: IT8 Profiles.sea.hqx
7. Extract the files to your computer.
   - When using Windows the self-extracting file, copy the files to the appropriate PhaserMatch preferences directory.
   - When using a Macintosh, you must copy the files in the self-extracting to the appropriate PhaserMatch preferences folder.
8. If PhaserMatch is currently running, restart PhaserMatch.

Caring for IT8 Targets

Under a normal amount of use and stored correctly, the IT8 Target is accurate for approximately three years. The best storage conditions for color prints are the same as those for most other photographic products. Store prints in the dark at 75 degrees F (24 degrees C) or lower and at 30 to 50% relative humidity. Perceptible fading occurs in less than 10 years in normal room temperature dark storage. For long-term storage, store prints in a frost-free refrigerator at 35 degrees F (1.7 degrees C) and keep relative humidity between 20 to 35%.

Troubleshooting Scanning Problems

If PhaserMatch/PhaserCal reports an error when importing the scanned image, you should try to solve the problem by doing the following:

- Ensure that the IT8 reference file selected matches the IT8 target used. If you do not have the needed IT8 reference file, see "Acquiring New IT8 Reference Files" on page 7-3. If the dialog shows an incorrect IT8 reference file select a new file and import the scanned image again.
- Ensure that the orientation of the scan is correct and that the image is not titled. The orientation can be checked against the thumbnails shown on the **Import Scan** dialog. If the orientation is incorrect, rescan the page with the IT8 target.
- Ensure that the entire page is in the scanned image including IT8 target. The scanned image should show everything inside the dotted lines on the borders of the printed page. The grayscale section at the bottom of the IT8 target must be part of the scanned image and it must be within the dotted lines on the borders of the printed page. If part of the page is missing from the scan, rescan the page with the IT8 target making sure that the cropping done by your scanner software is not clipping the image incorrectly.
- Ensure that the IT8 target has been placed squarely on the ghost image on the printed page and that it does not cover up any of the printed swatches and fits inside the dotted lines on the borders of the printed page. Also, make sure that the tape holding the IT8 target does not cover any of the printed swatches on the page. If either of these conditions exists, you may need to reprint the page of swatches. If the printed page is okay after the IT8 target is removed you can reattach the IT8 target to the page and then rescan the page.
- Ensure that the scan was done with color management, automatic color, exposure correction off and a minimum of 200 dpi was used. Check the scanner software settings. If the settings are incorrect, rescan the page with the IT8 target.
- Ensure that the printed page and scanned image are free from scratches, fingerprints or other damage. If the print is damaged, reprint and rescan. If the print is okay but the scanned image shows streaks or other problems, clean the glass on your scanner and rescan the page with the IT8 target.
- Ensure that the gamma control on your scanner is correct. If the scanned image looks too dark, check the scanners gamma setting. If the setting is incorrect, change the setting and rescan the page with the IT8 target.

Additional Information

Resource	Link
For additional troubleshooting information, go to the Support Knowledge Base web site:	www.xerox.com/office/infoSMART
For automated printer diagnostics and troubleshooting using your web browser, go to the PhaserSMART web site:	www.phasersmart.com
For general support, go to the Xerox support web site:	www.xerox.com/office/support
For Xerox Phaser printer information, go to the Xerox Office web site:	www.xerox.com/office

A Glossary

Calibration	The checking, adjusting or standardizing of a device. See also *Printer Color Calibration*.
CIE	The Commission Internationale de l'Eclairage. The main international organization concerned with color appearance and color measurement.
CIE Lab	The CIE L*, a*, b* color space where: L* represents lightness a* represents redness/greenness b* represents yellowness/blueness This is one of the most popular device independent color spaces.
CMYK Color Values	The numerical color values for the primaries Cyan, Magenta, Yellow, and Black which are used by printers and other output devices. These colors are referred to as device dependent colors.
Color Appearance	The perception of the color or colors of an object or image. This can be described in terms of hue, saturation, chroma, and lightness. There are a large number of human perception factors and color reproduction factors that determine the color appearance of a printed page.
Color Management	The process of managing color reproduction. This often involves doing color matching between various devices, such as scanners, monitors, printers and presses.
Color Patches	See *Printed Color Swatches*.
Color Swatches	See *Printed Color Swatches*.
Color Transform	This refers to the portion of an ICC profile that is the mapping of colors from CIE Lab color values to and from CMYK color values.
ColorSync	Apple's implementation of ICC-based color management.
ColorSync Profiles	See *ICC Profiles*.
Densitometer	A device that measures the density of colors or images. PhaserMatch does not support any densitometer.

Device Link Profiles	ICC profiles that describe the color behavior of two CMYK devices: your Xerox Phaser printer and a target device, such as a printing press or a proofing device. These two profiles are combined together into a single file. Creating link profiles or editing existing link profiles lets you alter the colors printed by your Xerox printer so they more closely match the colors produced by the output device of your choice.
DLP	See *Device Link Profile*.
Download	Send data from a computer to the printer, for example, download calibration data to the printer or download TekColor correction to the printer.
Download Profile	This is the name of a button in PhaserMatch that is used to use the "manage custom TekColor corrections" functionality within PhaserMatch. PhaserMatch can download TekColor corrections to the hard drive on a Phaser 7750 printer. PhaserMatch can add TekColor corrections to the PostScript printer driver associated with a Phaser 7700 printer.
D50	The CIE standard illuminant. This color temperature is often used for color measurements, color matching and viewing colors in light booths.
ICC	See *International Color Consortium*.
ICC Profiles	Device characterizations that are implemented per the ICC standard, these are sometimes referred as color profiles or device profiles.
ICM	Microsoft Windows Color Management System and the file extension for ICC profiles.
International Color Consortium	Established in 1993 by eight industry vendors for the purpose of creating, promoting, and encouraging the standardization and evolution of an open, vendor-neutral, cross-platform color management system architecture and components. The outcome of this co-operation was the development of the ICC profile specification. The intent of the International Color Consortium (R) profile format is to provide a cross-platform device profile format. Device profiles can be used to translate color data created on one device into another device's native color space. The acceptance of this format by operating system vendors allows end users to transparently move profiles and images with embedded profiles between different operating systems. This permits tremendous flexibility to both users and vendors. For example, it allows users to be sure that their image retains its color fidelity when moved between systems and applications. Furthermore, it allows a printer manufacturer to create a single profile for multiple operating systems.(Quoted from the http://www.color.org)
IT8 Reference File	The color values associated with IT8 Targets. This is typically a file containing the LAB color values for the color swatches on the IT8 Target supplied with PhaserMatch.
IT8 Target	Refers to the photographic set of color swatches used by the scanner portion ICC profile creation and color calibration. This should not be confused with the "Printed Color Swatches". The IT8 Target is used in conjunction with the "Printed Color Swatches" to create the ICC profiles. These are often called reference images.

Lookup Table	ICC Profiles contain an input lookup table and an output lookup table. These tables are used to implement color transformations per the ICC Profile specification for look up tables.
LUT	This is an abbreviation for Lookup Table.
Patches	See *Printed Color Swatches*.
PhaserCal	Name for the limited version of PhaserMatch (calibration only functionality).
PhaserMatch	Name for the color matching software.
Phaser Printer Profiles	Phaser Printer Profiles are standard ICC profiles that describe the Phaser 7750 and 7700 printers. A printer profile is a file describing to the computer operating system's color management software how the printer describes the colors it prints.
Printed Color Swatches	Refers to the color swatches used to create ICC profiles and calibration data. This should not be confused with the IT8 Target that also has color swatches. The IT8 Target is used in conjunction with the printed color swatches to create the new ICC profiles.
Printer Color Calibration	The checking and adjusting of the colors of the printer to standardize the device to a known condition.
Reference File	See *IT8 Reference File*.
Reference Images	See *IT8 Target.*
RGB Color Values	The numerical color values for the primaries Red, Green, and Blue that are used by some output devices. These colors are referred to as device dependent colors.
Spectrophotometer	Color measurement device; no support is provided for a densitometer (a density meter).
Swatches	See *Printed Color Swatches*.
Target Device Profiles	Standard ICC profiles that describe the color capabilities of output devices such as printing presses or proofing devices. These files are used by PhaserMatch to create link profiles. While the target device profiles created by PhaserMatch are readable by any ICC-compatible application or operating system, they are only intended for use by PhaserMatch.
TekColor Corrections	TekColor corrections are the color technology built into Xerox Phaser printers. TekColor corrections give you the option of selecting from a number of built-in color matching options, such as SWOP Press, Euroscale Press, Commercial Press, and Fuji Press, as well as others. New color corrections can be created with PhaserMatch.

Index

A

ASCII text file, 7-2

C

calibrating
    overview, 1-4
    using a spectrophotometer, 2-1
    visually calibrating, 2-2
caring for IT8 targets, 7-3
CIE Lab, 1-3
CMM, 1-4
color calibration, 1-4, 2-1, 2-2
color calibration data file, 7-1
color cube, 5-2
color management, 1-3
color transform, 5-2
ColorSync, 1-4
creating custom, 1-4
custom TekColor corrections
    creating, 1-4, 3-1, 3-4
    editing, 5-1
    editing hints, 5-2
    managing, 6-1
    overview, 1-4
    printing, 1-7, 4-1
    sending to printer, 3-5

D

device link profile
    options, 3-4
    saving, 3-5

I

ICC profiles, 1-5
    creating, 1-6
input gamma curves, 5-2
    using the editing tool, 5-5
installing
    on a Macintosh system, 1-2
    on a Windows system, 1-2
installing PhaserMatch/PhaserCal, 1-2
IT8 targets, 7-3
    acquiring, 7-3
    caring for, 7-3

M

Macintosh
    installing, 1-2
    system requirements, 7-1
Macintosh OS 9
    printing to a Phaser 7700 printer, 4-8
    printing to a Phaser 7750 printer, 4-3
Macintosh OS X
    printing to a Phaser 7700, 4-7
    printing to a Phaser 7700 printer, 4-7
    printing to a Phaser 7750 printer, 4-1
Microsoft Windows
    system requirements, 7-1

O

output gamma curves, 5-2
    using the editing tool, 5-3

P

Phaser 7700 printer
    printing to a, 4-7
Phaser 7750 printer
    printing to a, 4-1
Phaser printer profiles
    creating, 3-2
    creating and using, 3-1
    using, 3-1
PhaserCal, 1-1
PhaserMatch, 1-1
preserve paper color, 3-4
printer profiles
    creating, 3-2
    creating and using Phaser printer profiles, 3-1
    using, 3-1
printing to a Phaser 7700 printer, 1-7, 4-7, 4-8, 4-9

printing to a Phaser 7750 printer, 1-7, 4-1, 4-3, 4-4, 4-6
profile
    saving device link profile, 3-5
profiles
    creating and using Phaser printer profiles, 3-1
    creating and using target device profiles, 3-3
pure black enhancement, 3-4

R

requirements
    system, 1-2

S

scanning problems, 7-4
selective edit tool
    using, 5-4
spectrophotometer-based calibration, 2-1
system requirements
    Macintosh, 7-1
    Windows, 7-1

T

target device profiles
    creating, 3-3
    creating and using, 3-3
targets, 7-3
TCP/IP connections, 4-4
    Macintosh OS X, 4-1
    Windows 2000/XP, 4-4
TekColor corrections, 1-4
    creating, 3-4
    editing, 5-1
    editing hints, 5-2
    managing, 6-1
    printing, 1-7, 4-1
    sending to printer, 3-5
troubleshooting, 7-1
    scanning problems, 7-4

V

visual color calibration, 2-2

W

Windows
    installing, 1-2
Windows 2000/XP
    printing to a Phaser 7700 printer, 4-8
    printing to a Phaser 7750 printer, 4-4
Windows 98/Me
    printing to a Phaser 7700 printer, 4-9
    printing to a Phaser 7750 printer, 4-4, 4-6
Windows system requirements, 1-2, 7-1