

COLOR PRINTING GUIDE

CANVAS 5

Mac OS and Windows

CANVAS 5



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Canvas™ 5 Color Printing Guide

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Introduction

This book is a guide to preparing publications for commercial printing using Canvas 5 software. It also introduces general concepts and terms to help you better understand the publishing process.

Planning ahead is important for successful publishing. You can make decisions early in the process so problems don't show up on the printing press, when they're difficult and expensive to fix. Each section of this book includes questions about printing requirements and options that you might need to consider.

To learn more, you can find hundreds of current volumes about the technical and creative aspects of print publishing. The Resources section lists some publications and information sources you might want to use. You can also find the latest information and step-by-step procedures in the on-line Help system in Canvas 5.

AN OVERVIEW OF PRINTING METHODS

To understand the steps required to make a publication ready for printing, it helps to know about common printing methods and how printing presses operate.

The best way to learn about different types of presses is to visit printing plants and see presses in operation. Ask about their capabilities. For example, how many colors and pages can be printed at once? What types of paper can be used on each type of press?

Printing presses are based on four general printing methods — letterpress, gravure, lithography, and screen printing — which are described on the following pages.

Particular types of printing presses are designed for various printing tasks.

- Sheet-fed presses print on separate sheets of paper, printing one complete page at a time, or one large sheet that will be cut into separate pages.
- Web presses print on a continuous sheet of paper threaded through the press from a roll. Web presses are used to print newspapers and other timely publications.
- A “perfecting” press can print on both sides of the paper at once.
- On older mechanical presses, operators must adjust ink flow, web tension, printing plate alignment and other settings by hand.
- Modern presses have control systems that monitor printing and let the operator adjust the press with computerized precision.

Lithography and offset printing

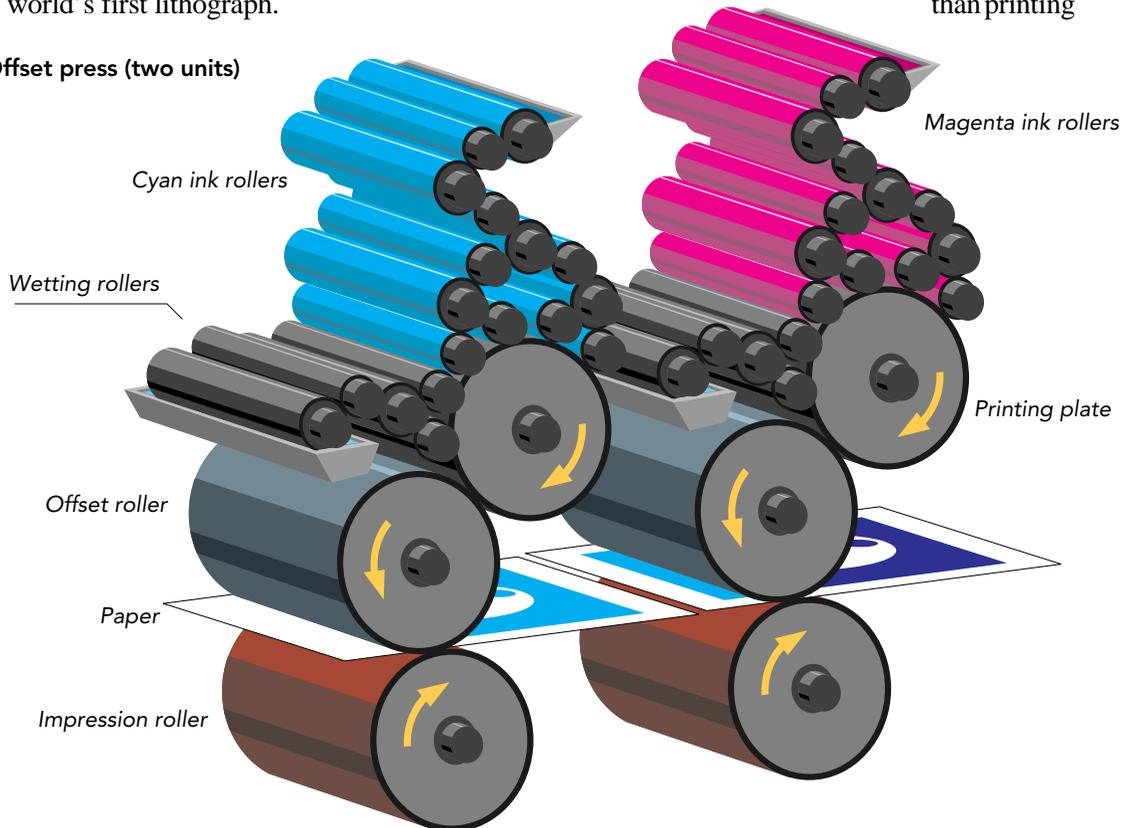
The term “lithography” is from the classical Greek words *lithos* (stone) and *graphein*, (writing). Today’s most widely-used printing method originated with the 1798 discovery by a Bavarian playwright that stones could be used to print images.

The playwright, Aloys Senefelder, drew a design with a greasy substance on a porous stone. He then spread a wetting solution on the stone, which dampened the blank areas. When Senefelder rolled a greasy ink onto the stone, the ink stuck to the design but not to the damp areas. By then pressing paper against the stone, Senefelder transferred the inked design to the paper and made the world’s first lithograph.

Today, printing presses based on lithography use flat metal or plastic printing plates that have a photosensitive emulsion surface. For printing, the plate is exposed against a negative film of the image to be printed. Developing the image and processing the plate changes the emulsion so only the image areas on the plate are receptive to ink; blank areas attract the wetting solution that flows over the plate on the printing press.

Offset lithography is the most common commercial printing process used today. The word “offset” refers to the press configuration. Rather than printing

Offset press (two units)



directly from an inked plate onto paper, the inked image is offset (transferred) from the plate to a rubber-covered roller. When paper passes between the offset roller and an impression roller, it picks up the image.



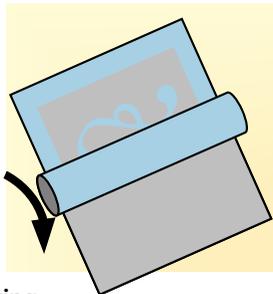
Platemaking

Offset lithography step-by-step

The printing process begins with platemaking. An exposure is made with a film negative in contact with the photosensitive emulsion on the plate.

When the plate is processed, the film image becomes a positive image on the plate. The printing plate is mounted on a cylindrical drum on the press.

Wetting: As the plate turns, a series of rollers apply a fountain solution that wets the plate. Image areas repel the solution.

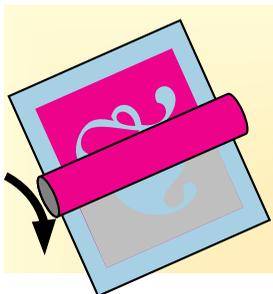


Wetting

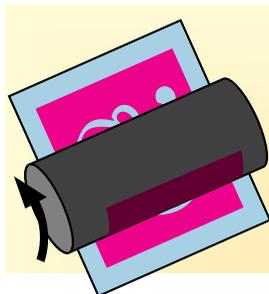
Inking: Another series of rollers applies ink to the plate. Ink adheres to the image, but the fountain solution prevents the ink from adhering to non-image areas on the plate.

Offsetting: As the inked plate turns, the image is transferred to a rubber blanket on the offset roller.

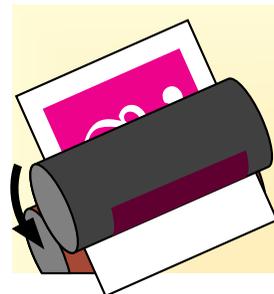
Printing: The image transfers from the offset roller to the paper.



Inking

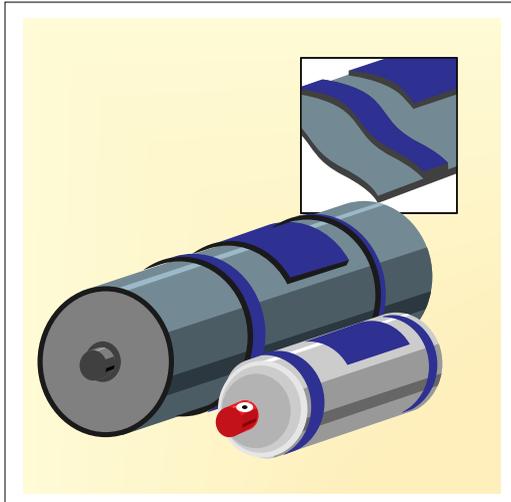


Offsetting



Printing

Letterpress



Letterpress uses a relief image — the design to be printed is raised above the surface of the printing plate — to transfer ink to paper, much like a rubber stamp.

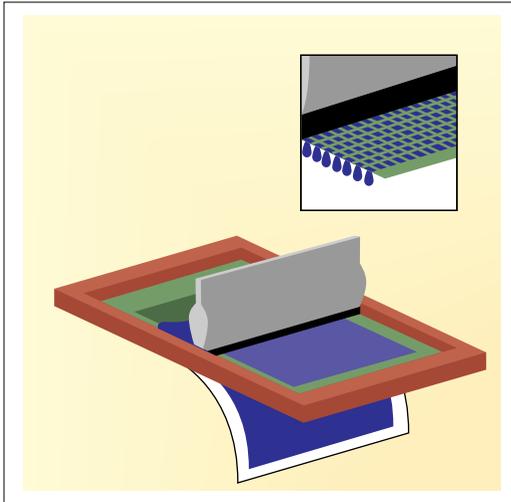
Letterpress is the world’s oldest printing method. Developed in ancient times and perfected over hundreds of years, it’s still in use for books, packaging, and specialty printing.

In letterpress printing’s long history, carved blocks of wood, type cast in metal, and molded plastics have been used to create the letterpress printing surface.

Historians trace the earliest development of type (individual letterforms) for letterpress printing to 1500 B.C. In China and Korea in the 13th century, type was being cast in metal. In 1440, Johann Gutenberg invented a system of letterpress printing with moveable metal type that led to the spread of printing throughout the Old and New worlds.

Flexography is a modern form of letterpress printing in which flexible rubber or plastic printing plates are used. Some modern applications rely on inkless letterpress techniques. These applications include effects such as embossing, hot foil stamping, and die cutting, in which raised forms make cutouts in paper and other products.

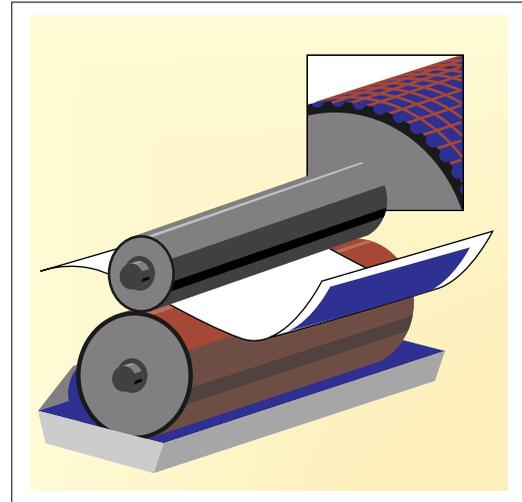
Screen printing



In screen printing, ink is pushed through a stencil onto the printed material. The stencil is attached to a fine mesh screen that is mounted in a frame. Because the screens were once made of silk, this printing method is now often called “silk screening.”

Stencils for screen printing were originally cut by hand. Now the image to be printed is exposed from a positive film onto a photo-sensitive emulsion. After development, the emulsion is applied to the screen and open areas around the edge are masked out. Specialized screen presses can print on bottles and other curved surfaces. The ink used is thicker than ink for other printing methods, which allows screen presses to apply dense colors or special finishes to wood, paper, cloth, leather, wallpaper, metal, and glass.

Gravure



For the gravure method, an image is etched as tiny pits or wells in the surface of a cylindrical metal printing plate. As the plate rotates on the press, the wells pick up ink from a reservoir or ink roller. A flexible blade wipes away excess ink, and then the paper, pressed by an impression roller against the plate, picks up the image as thousands of tiny ink dots.

Gravure presses are used to print newspaper supplements, magazines, catalogs, stamps, and paper currency. Gravure plates are expensive to produce but durable enough to be used for printing a million impressions or more.

Arranging publications for the press

Editors and designers look at a publication in “reader’s spreads,” with the pages in their normal sequence. This is the way Canvas displays publication documents (you can view facing-page spreads when you set up a two-sided publication with the Document Setup command).

However, printing requires a different page arrangement for the press. To see this, look at the front page of a newspaper. The single sheet has Page 1 and the last page printed on one side, and Page 2 and the next-to-last page on the reverse, like a book cover.

Imposition is the process of putting a publication’s pages in proper order for printing. The term “stripping” is used to describe the arranging of film images to make printing plates.

Presses are usually set up so four, eight, 16 or more pages print together on one large piece of paper, a “press sheet.” A form is a set of pages arranged for printing on one side of a press sheet. After the forms on both sides are printed, the sheet is folded to make a signature, a set of printed pages in the right order for binding.

Imposition charts show the arrangement of pages as they will be printed on both sides of a press sheet.

Newsletters and pamphlets might be printed on one signature. For larger publications, additional signatures are printed.

Though you might want to handle most other prepress tasks yourself, imposition is often done as part of the platemaking operation at the printing plant.

If you need to output film negatives with pages already in press order, or produce printing plates directly from digital files, you might want to consider using the commercial imposition software now available. Imposition programs can handle a variety of publications and press configurations. However, most software requires you to take your publication file (such as a native Canvas document) and convert it to separate PostScript printer files for each page.

16-page signature (two 8-page forms)

3	14	15	2
9	11	10	7

5	12	6	8
4	13	16	1

Finishing steps

Once its pages are printed, a publication often goes through steps such as trimming, folding, binding, and packaging.

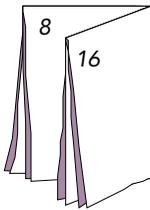
Most newspapers are run on web presses that have finishing equipment such as slitters and folders attached to the press line. Books are usually printed and then finished on separate machines. Advertising pieces and catalogs might go from the press to computerized addressing and insertion equipment.

Folding a publication is designed to make pages ready for binding, or to shape the final printed piece. Folds can be made parallel to each other or at right angles. For example:

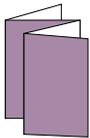
- A standard letter needs two parallel folds to fit in a business envelope.
- Greeting cards and invitations often have two right-angle folds.
- A one-sheet pamphlet can be folded into overlapping panels, or with accordion folds like a road map.

For binding, folds are cut open or trimmed off, dividing the sheet into separate pages.

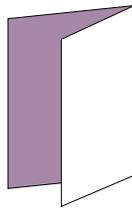
Types of folds for publications



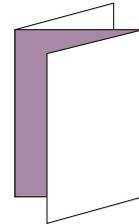
Folded 16-page signature



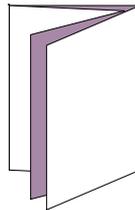
Multiple parallel folds



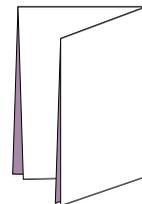
A single fold for a one-sheet pamphlet



Two parallel folds for brochures and maps



Three parallel folds



Two right-angle folds for invitations and cards

Binding

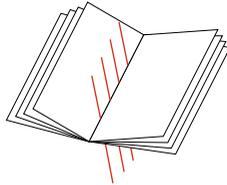
Binding a publication can be as simple as putting pages in a notebook, or as elaborate as designing custom covers and hand-applied decorations for keepsake and art publications.

Most books are saddle-stitched or perfect-bound inside a cover. The following are some common binding methods.

Saddle stitching

This type of binding is used for booklets of 72 pages or less. Signatures are gathered together so the spines are all inside the first

sheet. If a cover is included, it's folded around the gathered signatures. A machine stitches the signatures and cover together with wire staples on the spine. This type of binding lets a booklet lie flat and is often used for pamphlets, programs, and catalogs.



Perfect binding

This is the common method of binding paperback books. The signatures are gathered one after the other, and then their backs are ground off to leave a rough surface. A flexible binding adhesive is applied to glue the signatures together, and then the cover is folded and glued in place around the book.

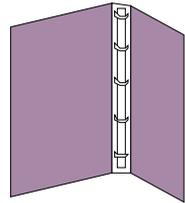
Edition binding

Edition binding is the traditional method of binding books between hard covers. This type of binding is expensive but long-lasting, and it lets a book lie relatively flat. School textbooks, journals, and other hardcover volumes use edition binding.

Mechanical binding

Some mechanical binding systems allow new pages to be inserted. The simplest devices are loose-leaf notebooks that accept pre-punched pages.

Other systems use plastic or wire spirals. For these bindings, the inner page margin must be wide enough for holes to be punched.



COLOR PRINTING AND IMAGE REPRODUCTION

When you create a color publication, the first thing to consider is the type of color you need. Do you want to print photographs and color images that require process colors? Do you want to use a few accent colors, or do you need to exactly match hues that can be printed only with spot colors?

You can choose thousands of colors to use in printing, but you can print only one color at a time on the press. Printing full-color images requires sequentially printing several colors on the page.

This section explores methods of color printing, including the basics of color separation, knockouts, overprinting, and trapping.

The concepts of color printing are closely related to the issues involved in printing images such as photographs and artwork. Halftone screening, the process that lets a printing press print a photograph as a grid of dots, is also required to print thousands of colors using only three primary hues on the press. This section also introduces some basic concepts of image reproduction, including halftones, resolution, types of source images, and scanning.

Halftone screening for images

If you look closely at a black and white newspaper photograph, you can see that the image is formed from thousands of tiny dots. If you magnify the image, you'll see that the size of the black and white dots differs in the lighter and darker areas. This is the result of halftone screening, a process that converts a photograph into a dot pattern for printing.

Halftone screening is necessary to print images with a full range of tones — photographs, drawings, and artwork — because presses can print only solid colors. Though each halftone dot is a tiny spot of solid color, when we view a printed halftone, our minds merge the dots so we see the shading of the original image.

At one time, making halftones required photographing an original image through a glass pane etched with a fine grid pattern. Even though software now does the work of glass screens, it's still common to say that images need to be “screened.” In both traditional and digital prepress, images must be made into halftones for the printing plate.

Halftone screen frequency

The dots in a halftone screen are arranged in a grid, with the size of the grid measured by the number of grid lines (the number of dots in a row) in one inch or centimeter. The measurement of lines per inch (abbreviated lpi) is the halftone screen frequency, also called the screen ruling, screen resolution, or line screen.

Comparing halftone screening

A photograph printed at several screen frequencies shows that higher screen frequency results in a smoother image with smaller halftone dots...



85 lpi



100 lpi

A typical halftone screen frequency for newspapers is 65 to 85 lpi. For magazines printed on web offset presses, 133 lpi is typical. For high-quality publications, halftones are screened at 150 or 175 lpi and higher. Halftones in the *Color Printing Guide* are screened at 150 lpi.

To determine the best halftone screen frequency for your publications, ask your printer for recommendations. View the examples in this and other publications, especially those printed on the same type of press and paper you will use, to see the results of halftone screening.

- Images should be scanned (or created) with sufficient resolution for halftone screening. Using a higher screen frequency requires higher resolution images. See “Resolution of images and output devices,” next.
- The maximum screen frequency (and the quality of printed images) depends a lot on the paper used. Presses can print finer halftone patterns on coated paper than on rough newsprint.
- When you print proof copies or final film negatives from Canvas, you can select different screen resolutions to match the capabilities of devices for proofing and final output.

...but using high screen frequency requires more information (higher resolution) in the original digital image. Higher resolution results in larger image files and longer processing time.



133 lpi



150 lpi

Resolution of images and output devices

It's easy to confuse halftone screen frequency with the numbers used to describe the resolution of an output device, a scanner, or an image that has been scanned.

Sometimes, the same term—dots per inch—is used to describe resolution and screen frequency.

The output resolution of devices such as laser printers is the maximum number of dots the device can print in an inch (dots per inch, abbreviated dpi). The finer the resolution, the smaller the dots and the higher the dpi value.

Resolution for digital scanners is measured as the number of dots (pixels) per inch that the scanner can capture. Higher resolution means the scanner captures more information in the same area.

For digital images, resolution measures the size of the pixels that make up the image, expressed as pixels per inch (ppi). This applies to digital images from any source, whether scanned, created on computer, or captured by a digital camera.

The resolution of an image tells you how much digital information the image contains. Each pixel making up the image is a dot of solid color, and the smaller the pixels, the finer the image appears.

Scanning to create digital images

Original art can be turned into digital art by scanning. Art can be scanned with low-cost desktop scanners or on drum scanners that can capture very high-resolution images.

Desktop scanners can be used to scan black-and-white and color photographs, diagrams and other line art, and even small, flat objects. Desktop scanners can't capture the same pixel information and tonal range as drum scanners, but they are much less expensive.

With a desktop scanner, you can save money and control the scanning process. The trade-off comes in image quality and the extra time that might be needed to color-correct the images.

Desktop scanner quality is sufficient to capture images for autotracing, photos “for position only” in layouts, and images to be printed at low or medium resolution.

If you require high-quality digital images, a scanning service can use a high-end scanner to make digital files from your source images. If you use a service bureau for

scanning, ask if they can also provide low-resolution copies of the images for you to use in layouts.

Determining scanning resolution

The table at right can be used as a guide to determine the image resolution needed for reproduction at common halftone screen frequencies.

Standard practice is to set image resolution to 1.5 or 2 times the halftone frequency (shown in the following table) when images will be printed at original size. However, even experts disagree on what is exactly the right ratio between resolution and screen frequency.

You want to make sure an image contains enough pixel information, but you don't want to use a higher resolution than necessary.

Screen frequency	Ratio	Image resolution
65 lpi	1.5	100 ppi
	2.0	130
85	1.5	130
	2	170
120	1.5	180
	2	240
150	1.5	225
	2	300

Higher resolution results in larger images that take up more memory. Larger images make your document files larger, so they take longer to open, save, and print. Very large images can slow down processing and cause extra expense when you print separations on an imagesetter.

However, you might need to scan or create images at higher resolution if the images will be enlarged. In that case, use the final image size to calculate the required resolution based on the amount of pixel information needed.

Also, keep in mind that enlarging digital images requires Canvas to use a mathematical process called interpolation to create new pixels from the existing data. This can cause the image to lose sharpness.

Source images

Sources of images include photographs, paintings, pen-and-ink diagrams, pencil sketches, watercolors and other visual art. Original images can be physical (like a photographic print) or digital (a Photo CD image file). The following are general types of source images.

Reflective art is hard-copy material — photographic prints, paintings, and illustrations on paper. **Transmission art** is material such as color photographic slides and transparencies for overhead projectors. Both forms of original art can be scanned to be used in digital form.

Continuous-tone art contains a range of tones, as in a photograph, a painting, or a charcoal sketch. Because printing presses can only print solid colors, continuous-tone art must be screened for reproduction.

Line art, such as an ink drawing that contains only two tones (black and white), can be reproduced without screening. However, when line art is scanned, it becomes a pixel-based image. If it has variations in shade, it will become a screened halftone in color separations. If you want to preserve the solid appearance of line art, you can try autotracing the scanned image to create a vector illustration from it.

Digital art exists on a computer system. It can be stored in a standard file format, such as TIFF, or in the proprietary file format created by Canvas or other graphics software. Digital art either originates on the computer, or is scanned from hard-copy original material.

Original digital art can be vector or raster art created in Canvas (or other programs). For process printing, be sure that digital art contains process colors (CMYK). RGB colors won't be reproduced accurately with CMYK inks on the press.

Image resolution and memory requirements

This table shows the number of pixels and the amount of data contained in a one square inch image, based on the resolution and the color mode of the image.

The actual amount of space on disk occupied by an image file depends on the file format and whether the image data in the file has been compressed.

Image resolution	Pixels (square inch)	Amount of image data			
		Black & White (1 bit)	Grayscale (8 bit)	RGB Color (24 bit)	CMYK Color (32 bit)
100 ppi	10,000	1.2 KB	9.7 KB	29.3 KB	39.0 KB
150	22,500	2.7	22.0	65.9	87.9
200	40,000	4.9	39.0	117.2	156.3
250	62,500	7.6	61.0	183.1	244.1
300	90,000	11.0	87.9	263.7	351.6
350	122,500	15.0	119.6	358.9	478.5
400	160,000	19.5	156.3	468.8	625.0



12 picas

150 pixels (75 ppi)

Relative size of pixels

Resolution measures the size of pixels as how many fit in a set distance. Higher resolution results in smaller pixels filling the same area; smaller pixels produce finer images.



6 picas

150 pixels (150 ppi)

Separating colors for printing

Because each printing plate on a press prints one color, to print a document with more than one color requires an additional plate for each additional color. Printing black text and green illustrations, for example, requires one plate with black ink to print text, and another plate to print the illustrations in green.

To make the printing plates for a color publication, the objects on each page have to be separated by color, so all the objects that print with the same color appear on the same printing plate. Film or proofs created from the color-separation process are called color separations.

Process color and spot color printing require different types of color separations. By selecting appropriate colors in Canvas, you can make color separations for either type of color printing.

For spot color printing, separations are made based on the names of spot colors in the document. The names are preset in the spot color system you choose. In Canvas, you can use Pantone and Toyo color systems for spot colors. You can also create your own spot colors (and name them) in the Inks palette for special purposes.

For process color printing, color separation is somewhat more complicated, because all the colors in the document will be printed from three primary colors and black. When separated, objects often appear on more than one printing plate because their colors will be printed with a combination of process color inks.

For example, in process printing, red is made by printing magenta and yellow together. A red object in your document would appear on the yellow and magenta separations and plates.

When color separation was performed by hand, it was a tedious, exacting art. In Canvas, the separation process is automatic and almost as simple as printing a document.

When you create color separations with Canvas, the program determines which objects and images belong on which plates. You can print separations to check a document's colors in the proofing process and then create the final film separations needed to make plates for the printing press.

Process color combinations

The process colors Cyan, Magenta, and Yellow can theoretically make all hues. Black ink is used to provide shadow detail and reduce the overall amount of ink required.

For special situations, you can use layers in a Canvas illustration document to create color separations the way artists separate a physical layout using overlay sheets.

For example, you can use a layer as the separation for a gloss varnish on the press. Copy the objects that get varnish, or draw corresponding shapes on a new layer. Create a spot color named "Varnish" and apply it to the objects' fill and pen inks. You can print just the varnish layer as a separation. Also, you can let Canvas output a separation for the "Varnish" plate.

Y



Y+M



Y+M+C



Y+M+C+K



Printing with process colors

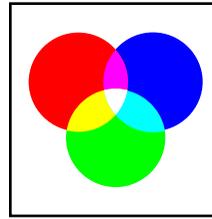
It might seem that printing a rainbow would require that a printing press be filled with a rainbow of color inks.

Actually, most color printing is based on the fact that only three primary colors are needed to reproduce a full spectrum of hues (with black added for darker shades). This printing technique is referred to as four-color or process printing.

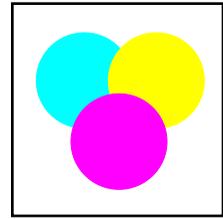
Cyan, magenta, yellow, and black (abbreviated CMYK) are the four ink colors used for process printing. Cyan, magenta, and yellow are special colors known as the subtractive primary colors.

These colors are called primary because they can be used (theoretically) to make all other colors. The term subtractive is used because, when white light (which contains all colors) reflects off these colors on the page, they subtract some of the light's colors and reflect the rest.

RGB



CMY



RGB colors (left) displayed on a computer monitor blend to make white light. The CMY colors used in process printing subtract color from white light and reflect the remaining color.

When cyan, magenta, and yellow inks are printed on top of each other, they subtract all color from light striking the printed surface. In theory, they appear as black. In fact, black ink is also needed to produce true blacks because of the limitations of the inks and presses.

Four-color printing requires four printing plates on the press, one for each of the



Yellow



Magenta



Cyan



Black

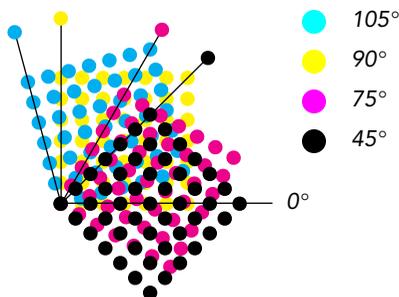
process colors. Presses that have more than four printing units can print a publication with spot colors and varnishes in addition to process colors.

Most colors are made with less than 100% of each process color, so they are separated into halftone images on each printing plate. The percentage of the primary color is the percentage of the halftone screen.

For example, to print orange with 90% yellow and 20% magenta, the yellow separation has a 90% halftone screen; the magenta separation has a 20% percent halftone. A separation has a solid (not screened image) only when a color is printed at 100% from the corresponding plate.

The halftone screening required for process printing makes an image into a grid of tiny dots. If this grid of dots was the same for each process color, the dots would form muddy spots on the page.

Instead, color separations are made with the halftone screens at different angles to each other. When printed, the screened dots line up in tiny circular rosettes. The rosette pattern lets our eyes see many colors in the dots of CMYK inks.



The halftone screens of process color separations are set at specific angles so the halftone dots form rosettes. Incorrect angles can create distracting patterns.



Four colors in process printing

Yellow, magenta, cyan, and black are printed together to reproduce full-color images such as photographs. Each separation is a halftone image, with gray levels that correspond to the amount of cyan, magenta, yellow, or black in the original image.

Designing documents in color

Problems with color separations and press limitations can lead to disappointment with the appearance of a printed publication. You can help ensure accurate color reproduction for your publications by keeping in mind potential problems as you design your documents.

The process color gamut

The range of colors that can be printed with CMYK inks is much smaller than the range of colors that the human eye can perceive. Colors printed with process inks seem less vibrant and saturated than they appear on the monitor of your computer.

Many colors that you see in nature or on your monitor can't be printed with process color inks. These colors fall outside the "CMYK gamut."

On screen, Canvas tries to simulate the appearance of all colors as they'll appear when printed. When you select inks for process printing, use the CMYK or Trumatch color models to avoid using colors that can't be printed accurately as process colors.

When you create color inks in Canvas using the RGB or HSL (hue, saturation, lightness) color systems, the program can tell you if a color is outside the CMYK gamut. While no color looks the same on a computer monitor as it does when printed, a color that Canvas identifies as "out of gamut" should be checked and possibly changed before you create color separations.

Specifying process colors

For specifying process colors in Canvas, you can use the Trumatch color system.

Trumatch is a system of 2,000 colors, arranged in 50 hues, with 40 tints and shades of each hue.

Trumatch is a patented system of color specification. It's designed to let you select from evenly spaced hues, with smooth, proportionate tints (lighter and darker shades) of the basic hues.

You can specify Trumatch colors from the Color manager in the Canvas Inks palette. If you use Trumatch colors, be sure to obtain and refer to the Trumatch Colorfinder, the printed reference guide that shows the actual appearance of all Trumatch colors. The Colorfinder is available in versions for coated and uncoated paper stock from Trumatch, Inc.

Printed guides like the Trumatch Colorfinder are the only reliable way to select colors based on their actual printed appearance.

Hi-fidelity color systems

High-fidelity color is a name for printing methods that use six colors to overcome some limitations of four-color printing.

“Hi-fi” color requires special printing inks, screening methods, and proofing systems. Though it might someday become common, hi-fi color is still an emerging technology.

New color systems can be difficult to adopt because they require new methods for creating, separating, proofing, and printing.

To select process color hues, refer to a color guide printed on the type of paper you are using. Use one of the CMYK models to enter CMYK percentages in the Canvas Inks palette. With the Trumatch Colorfinder, you can see printed colors and specify colors by number after selecting the Trumatch color model in the Inks palette.



Specifying spot colors

Process color inks can't be used to reproduce some hues, such as really bright orange shades. Also, using four plates to print process color is more expensive than using fewer plates when all you need are accent colors. In these situations, spot color is the solution.

A spot color is a pre-mixed color ink used on a printing press. Spot colors are available in hundreds of hues and special metallic and fluorescent shades.

Spot colors are used for both low-cost and high-quality publications. Using one spot color can open creative possibilities for inexpensive newsletters and advertisements. By printing with one spot color on colored paper, a designer can create eye-catching publications at lower cost than process color printing.

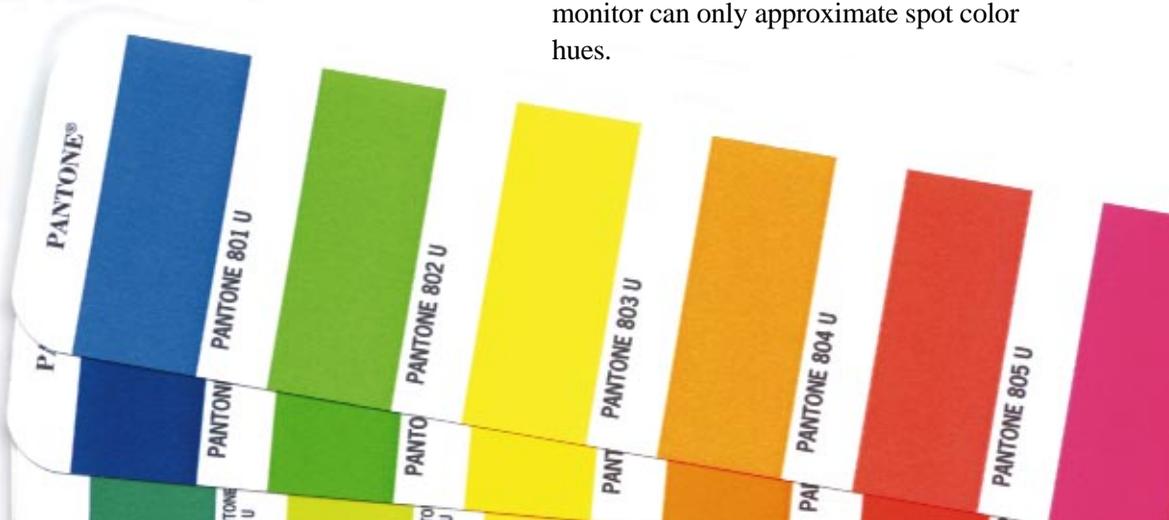
In high-end publications, spot colors can be used to gild a page with gold, bronze, silver and copper. Spot color inks also are called for when designers want rich, saturated hues that can't be made with CMYK inks.

Another reason for using spot colors is to avoid problems caused by misregistration of process colors. Also, a spot color printed at 100 percent (solid) doesn't have a halftone screen pattern; printing the same hue with process colors can result in a distracting dot pattern.

A widely used system for selecting and specifying spot colors is the PANTONE Matching System. Pantone, Inc. developed its set of standard inks and printed reference guides so designers and printers could guarantee specific solid colors.

In the Inks palette in Canvas, you can choose Pantone colors designed for coated and uncoated papers, as well as spot colors from the Toyo reference system.

When you specify a spot color, you must refer to a printed reference guide to be sure of the color's printed appearance. No color monitor, no matter how well calibrated, can show the true hue and appearance of a spot color ink. Even with the color matching systems in Canvas, colors displayed on a monitor can only approximate spot color hues.

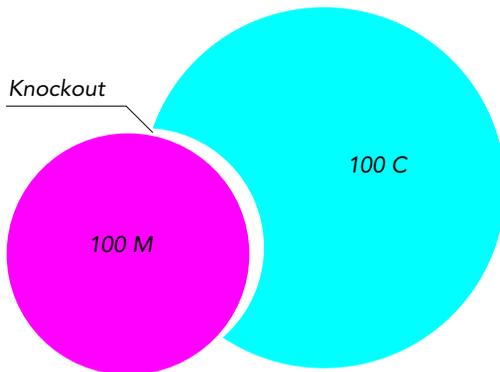


Knockouts and overprinting

PostScript graphics programs (including Canvas) usually don't print any part of an object that is covered by another object. A foreground object punches a hole, called a "knockout," where it overlaps a background object.

This is why Canvas displays objects as solid and opaque on screen. For example, if you draw a red object on a blue object, you see red, not the color that red would become with blue printed behind it.

Knocking out objects in color separations is necessary to avoid unwanted color mixing on the printed page. But it also means that plain paper will be seen at the edge of the knockout area if the plates don't print exactly "in register."

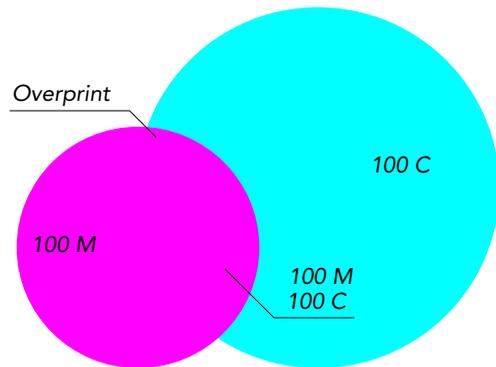


Normally, a front object makes a knockout in a back object to prevent unwanted color mixing.

If printing plates aren't properly aligned on the press, or the paper shifts even minutely during printing, gaps between colors will result in thin colors or blank paper showing through.

Problems with registration (alignment) are most common when printing newsprint on high-speed web presses. In this case, the tendency of newsprint to stretch will aggravate slight registration problems.

Overprinting — printing one ink color on top of another color without a knockout — is one technique that can be used to avoid registration problems. However, because process color inks are transparent, background colors change the appearance of an overprinted process ink. This can be used to your advantage if you plan ahead.



If the small circle is set to overprint, no knockout is made; the process colors combine into a new shade where the objects overlap.

Overprinting black

Often, the black plate is set to overprint rather than knockout the colors behind it. Black is generally strong enough to print over other colors without a significant color shift.

In almost all cases, black text should be overprinted when it appears on a colored background. Otherwise, misregistration can

let the knockout for each character become visible.

It's also a good idea to overprint black text if you need to change the text later. If the text is overprinted, only the black plate needs to be changed; the other separations can be reused.



Overprinting is a good idea to prevent knockouts and color gaps from appearing if printing plates are not perfectly aligned. The word at right is set to overprint, while the one below it is set to knockout the background.

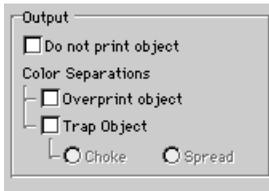
Spray

Spray

To overprint objects

You can use the Object Info palette in Canvas to overprint selected objects.

Select the objects that you want to overprint and choose Object Info in the Object menu. Click the Options tab in the Object Info palette. On the Options tab, turn on the Overprint Object option and then click Apply.



The Overprint option appears on the Options tab in the Object Info palette.

Remember that overprinting is an effect you can see only on the printed page. Canvas does not display the effect of overprinting on screen, and overprinting is not visible in proofs you print with the Composite option in the Print dialog box.

To see the effect of overprinting, you can print a proof of color separations and check how the objects appear on each separation. Objects that are set to overprint should not create a knockout in objects that they overlap.

You can also set the entire black plate to overprint by checking the Overprint Black option in the Separation Setup dialog box.

Overprinting text

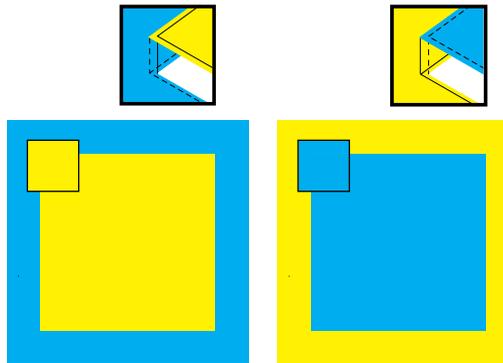
You can set text to overprint with the Overprint command in the Style submenu in the Text menu. Use this method to overprint an entire text object, or to overprint selected text within a text object.

Trapping

Trapping is the process of modifying illustrations so slight misregistration in printing doesn't cause knockouts or unwanted colors to appear. Trapping creates small areas of overlapping color (called traps) where objects of different colors meet.

You can tell Canvas to apply choke or spread trapping to selected objects. You can use spread trapping in text by selecting the text and choosing Spread in the Style submenu in the Text menu.

To use the trapping feature in Canvas effectively, discuss press registration and trapping with your commercial printer. Ask what the trap size should be for a particular printing setup. You can set the trap size Canvas uses on the Options tab in the Separation Setup dialog box.



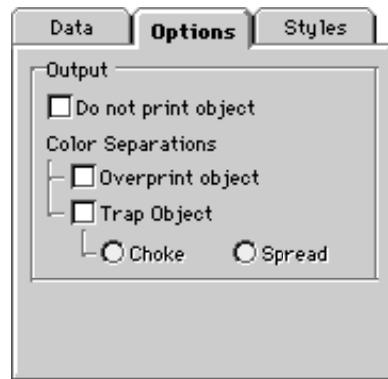
Spread

Choke

Applying traps to selected objects

You assign trapping to objects using the Object Info palette. Select the objects you want to trap and choose Object Info in the Object menu. On the Options tab, turn on the Trap Object option. You can apply a choke or spread trap by clicking an option button.

- Choke shrinks the knockout in a light background object, making a slight overlap with the edges of a darker foreground object. You can apply choke trap to objects that have a visible stroke.
- Spread increases the size of a selected foreground object so it slightly overlaps the knockout in a background object. You can apply spread to all objects except images. Spread is used to trap a selected foreground object against a darker background.



PROOFING AND PRINTING SEPARATIONS

Before you create a document that will be printed commercially, you can take steps to ensure that colors you use in your document are represented as accurately as possible on screen. Canvas provides tools to help you calibrate a monitor to achieve more accurate color displays.

You can also use special display modes in Canvas to check for color problems, such as RGB colors that can't be reproduced using process colors.

During the proofing stage of the publication process, you can select printing options that let you use desktop printers to verify that objects and colors will appear on the correct color separations.

When your document is ready for final output of film for color separations, you can print directly to high-resolution imagesetters or create PostScript separation files. An imagesetting service or your printer can use these files to output the separation films needed to make printing plates for your publication.

Monitor calibration

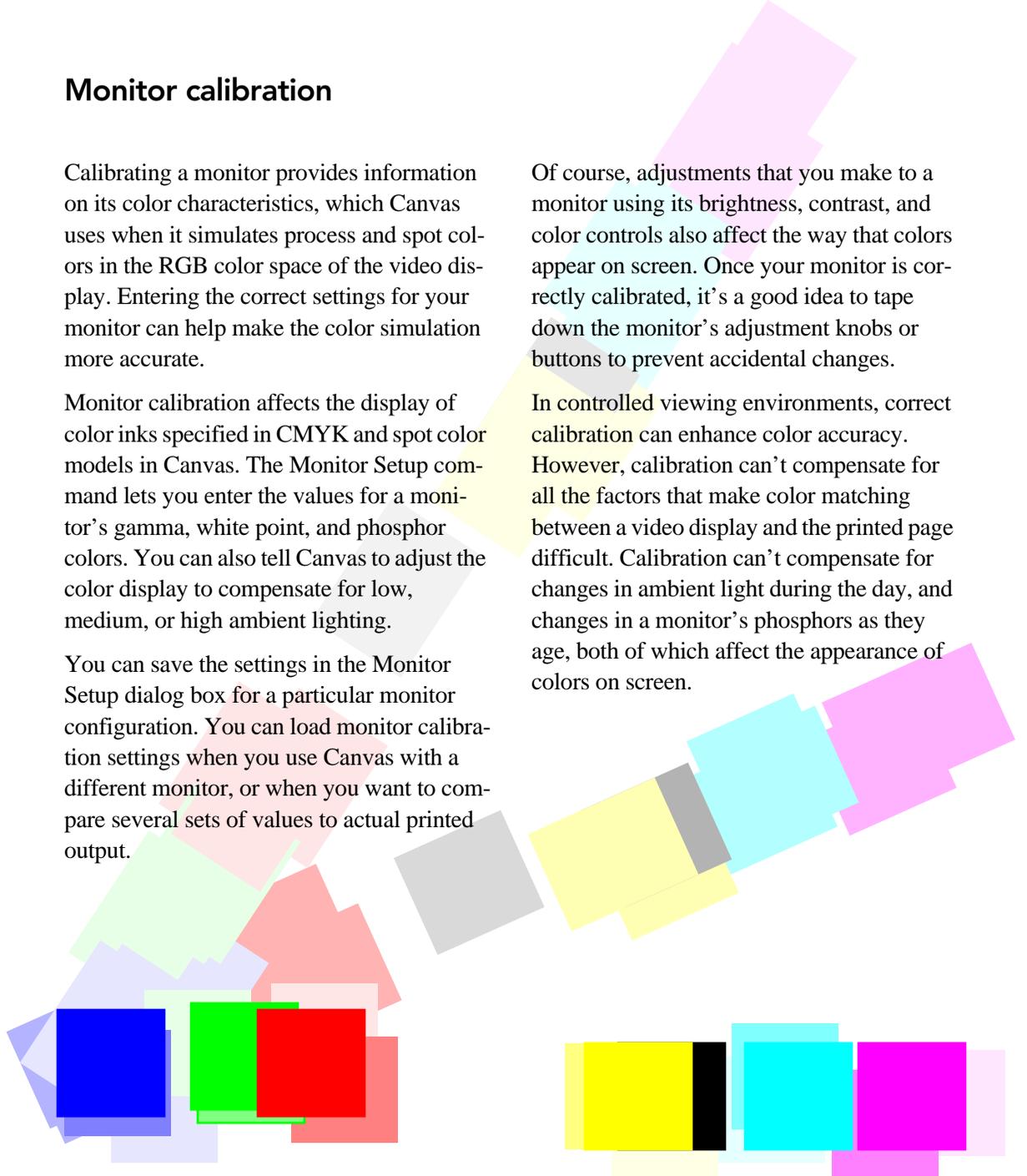
Calibrating a monitor provides information on its color characteristics, which Canvas uses when it simulates process and spot colors in the RGB color space of the video display. Entering the correct settings for your monitor can help make the color simulation more accurate.

Monitor calibration affects the display of color inks specified in CMYK and spot color models in Canvas. The Monitor Setup command lets you enter the values for a monitor's gamma, white point, and phosphor colors. You can also tell Canvas to adjust the color display to compensate for low, medium, or high ambient lighting.

You can save the settings in the Monitor Setup dialog box for a particular monitor configuration. You can load monitor calibration settings when you use Canvas with a different monitor, or when you want to compare several sets of values to actual printed output.

Of course, adjustments that you make to a monitor using its brightness, contrast, and color controls also affect the way that colors appear on screen. Once your monitor is correctly calibrated, it's a good idea to tape down the monitor's adjustment knobs or buttons to prevent accidental changes.

In controlled viewing environments, correct calibration can enhance color accuracy. However, calibration can't compensate for all the factors that make color matching between a video display and the printed page difficult. Calibration can't compensate for changes in ambient light during the day, and changes in a monitor's phosphors as they age, both of which affect the appearance of colors on screen.



To calibrate a monitor

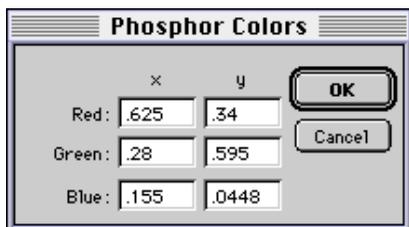
1 Once your monitor has warmed up for several minutes, choose Calibration > Monitor Setup in the Edit menu. The Monitor Setup dialog box opens.

2 If your monitor type is listed in the Monitor pop-up menu, select it to use the standard settings. Otherwise, choose Default.

3 In the Ambient Light pop-up menu, select Low, Medium, or High, depending on whether the light in the room is dim, medium, or bright.

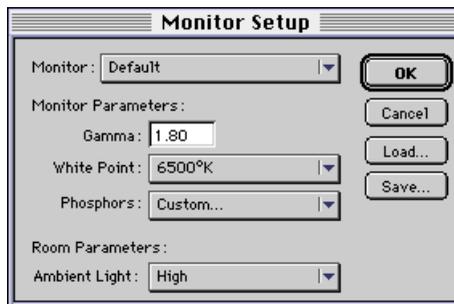
4 If you know your monitor's parameters and want to enter custom values, do the following:

- Enter a custom gamma value in the Gamma text box. The gamma value must be between 0.75 and 3.0, or Canvas alerts you and substitutes the closest acceptable value. In general, higher gamma values lighten the color palette.
- Select a value in the White Point pop-up menu. Or, choose Custom, enter X and Y values in the White Point dialog box, and click OK to return to the Monitor Setup dialog box.
- Select a phosphor type in the Phosphors pop-up menu, or select Custom, enter values in the appropriate text boxes in the Phosphors dialog box, and click OK to return to the Monitor Setup dialog box. Phosphor values must be between 0.0001 and 1.0.



The Phosphor Colors dialog box is titled "Phosphor Colors". It contains a table with columns for "x" and "y" values, and rows for "Red", "Green", and "Blue". The values are: Red (.625, .34), Green (.28, .595), and Blue (.155, .0448). There are "OK" and "Cancel" buttons.

	x	y
Red:	.625	.34
Green:	.28	.595
Blue:	.155	.0448



The Monitor Setup dialog box is titled "Monitor Setup". It contains several sections: "Monitor:" with a dropdown menu set to "Default"; "Monitor Parameters:" with "Gamma:" set to "1.80", "White Point:" set to "6500°K", and "Phosphors:" set to "Custom..."; and "Room Parameters:" with "Ambient Light:" set to "High". There are "OK", "Cancel", "Load...", and "Save..." buttons.

5 To save the current settings as a custom setup file, click Save. In the directory dialog box, select a location and type a file name for the setup file. Click Save to save the file.

6 To load a monitor setup file, click Load. In the directory dialog box, select the monitor setup file you want to use and click Open.

Display modes for previewing colors

When preparing publications for printing, you want to be sure that the colors used in the document files will separate correctly, and that the final printed result will match your expectations.

Colors specified in RGB, HSL, and Pantone color systems can be outside the CMYK gamut, the range of colors that can be reproduced exactly with CMYK inks. When Canvas separates a document for process color printing, it converts colors that are out of the CMYK gamut to the closest CMYK color. The result can be printed colors that differ significantly in hue and lightness from the originals.

Canvas provides display modes to help you avoid color problems. Canvas can highlight colors that might cause problems during separation or printing. Canvas can also display a simulation of the effect of converting all colors in a document to process colors.

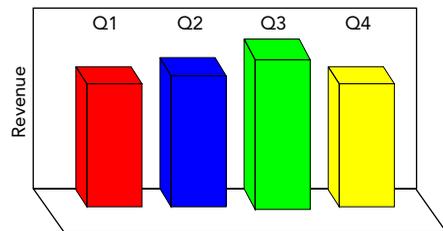
Gamut warning display

You can tell Canvas to highlight on screen any colors in a document that are outside the CMYK gamut. These colors are likely to differ the most between on-screen and printed appearance.

To show out-of-gamut colors

When you turn on the Gamut Warning display, Canvas displays a special highlight color on all objects that are outside the CMYK gamut. By default, the gamut warning color is bright green.

- 1 Choose the Display > Gamut Warning command in the Layout menu. A check mark appears next to the command in the menu when this display mode is active. To return to normal display mode, choose Gamut Warning again.
- 2 To change the gamut warning color, choose Calibration > Gamut Warning in the Edit menu.
 - Select a color from the pop-up menu.
 - Enter an opacity percentage value in the Opacity box.
- 3 Click OK to implement the new setting.



RGB colors appear more vibrant than process colors

CMYK Preview mode

CMYK Preview is a display mode that simulates the appearance of colors in the CMYK color space used in process color printing.

For example, in CMYK Preview mode, bright green (Green value 255 in RGB) appears darker and duller. Of course, this color change is a simulation of actual CMYK colors, because computer monitors can display only RGB colors.

It's a good idea to look over a document's colors in CMYK Preview mode if you import illustrations that use RGB colors into a document that will be printed with process colors. The CMYK Preview mode should also be used to check spot colors if these colors will be converted to process colors for printing.

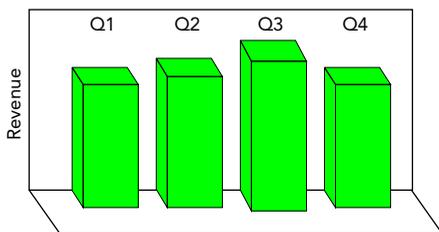
The CMYK Preview mode is the same as the preview in the Inks palette's Color manager. The box by the warning symbol is a CMYK preview of the current color.



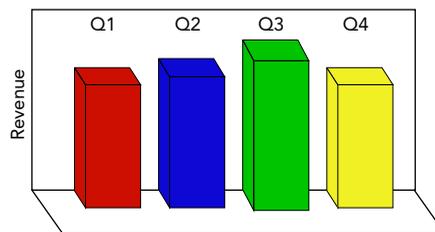
To preview CMYK colors

Use the CMYK Preview command to see a document in simulated CMYK color space.

- 1 If the Gamut Warning command (in the Display submenu in the Layout menu) is active, turn this display mode off by choosing the Gamut Warning command.
- 2 Choose Display > CMYK Preview in the Layout menu. A check mark appears next to the command in the menu when CMYK Preview is active.



Gamut Warning display mode highlights colors that are outside the CMYK gamut



CMYK Preview display mode simulates the appearance of printed process colors

Selecting and setting up a printer

Canvas lets you print your publications on desktop printers (using any printer driver compatible with your system) and output documents on high-resolution PostScript imagesetters.

Desktop printers can serve a number of purposes during the preparation of your publication. You can print to black-and-white desktop printers to check text and images. You can use color printers for general color proofing and to check that colors are assigned correctly. You can also use black-and-white or color printers to proof the color separations produced by Canvas.

To create color separations of a document for commercial printing, you can print directly to an on-site imagesetter, or create files that can be handed off to an imagesetting service or commercial print shop.

When you set up a printer to use with Canvas, you can select paper sizes and other output options. You can configure desktop printers for proofing your publication, and then change output options before you send final color separations to an imagesetter.

Using PPD files

Canvas uses a PostScript Printer Description (PPD) file when it prints to a PostScript printer. When you select a printer, you can also select a PPD file for the printer. If you

send PostScript files to a commercial printer, find out which PPD file you should use.

A PPD file is simply a text file containing information and PostScript commands. Canvas reads the PPD file to obtain information about the printer's capabilities.

Using the correct PPD file is important — especially for output of final color separations — because the PPD file tells Canvas the resolution, halftone screen settings, built-in fonts, color capability, and available memory in the output device.

In Mac OS, a PPD's file name contains the printer name and a version number. In Windows, the PPD file name is a short (8-character) name; the file itself contains the full printer name. For example, the PPD file named "LaserWriter IIg v2010.113" on Mac OS is named "APLWIIg1.PPD" on Windows systems. This information can be read in the first section of the PPD file itself.

You can select any PPD file to use with any printer, but if you don't use the correct PPD, the information Canvas reads won't be accurate. Some printers have more than one PPD for the same model with different amounts of memory installed.

To select a PPD file

Mac OS PPD files are in the Printer Descriptions folder inside the Extensions folder. After you select a printer in the Chooser, select a corresponding PPD file by clicking the Setup button.

Windows After you use the Printer Setup command to select a printer, click the PPD pop-up menu in the Printer Setup dialog box to select a corresponding PPD file. If no PPD file names appear in the pop-up menu, choose Other. In the directory dialog box, navigate to the folder where PPD files are stored on your system, select the file you want to use, and click Open.

If a text file named “Filename.map” is in the folder where you select a PPD file, Canvas reads the list of PPD file names from the text file. Canvas displays these PPD names in the PPD pop-up menu in the Printer Setup dialog box.

If the “Filename.map” file doesn’t exist, you can use any program that saves plain text files to create it. In the file, type one PPD file name on each line. Following each file name, type a space and the name of the printer associated with the PPD file.

What’s in a PPD file?

PPD files use a common structure and provide information about specific printers. Users who understand PostScript can modify PPD files to add custom settings. To view the contents of a PPD file, you can open it in a word processor that supports plain text (such as TeachText or WordPad).

```
*% Color Separation Information
=====
*% Use Linotype Utility 3.0 to invoke HQS
*DefaultColorSep: ProcessBlack.120lpi.2438dpi/120 lpi / 2438
dpi
*InkName: ProcessBlack/Process Black
*InkName: CustomColor/Custom Color
*InkName: ProcessCyan/Process Cyan
*InkName: ProcessMagenta/Process Magenta
*InkName: ProcessYellow/Process Yellow

*% For 133 lpi / 3251 dpi
*ColorSepScreenAngle ProcessBlack.133lpi.3251dpi/133 lpi /
3251 dpi: "45.0"
*ColorSepScreenAngle CustomColor.133lpi.3251dpi/133 lpi /
3251 dpi: "45.0"
*ColorSepScreenAngle ProcessCyan.133lpi.3251dpi/133 lpi /
3251 dpi: "15.0"
*ColorSepScreenAngle ProcessMagenta.133lpi.3251dpi/133
lpi / 3251 dpi: "75.0"
*ColorSepScreenAngle ProcessYellow.133lpi.3251dpi/133 lpi
/ 3251 dpi: "0.0"

*ColorSepScreenFreq ProcessBlack.133lpi.3251dpi/133 lpi /
3251 dpi: "133.0"
*ColorSepScreenFreq CustomColor.133lpi.3251dpi/133 lpi /
3251 dpi: "133.0"
*ColorSepScreenFreq ProcessCyan.133lpi.3251dpi/133 lpi /
3251 dpi: "133.0"
*ColorSepScreenFreq ProcessMagenta.133lpi.3251dpi/133 lpi
/ 3251 dpi: "133.0"
*ColorSepScreenFreq ProcessYellow.133lpi.3251dpi/133 lpi /
3251 dpi: "133.0"

*% For 150 lpi / 3251 dpi
*ColorSepScreenAngle ProcessBlack.150lpi.3251dpi/150 lpi /
3251 dpi: "45.0"
*ColorSepScreenAngle CustomColor.150lpi.3251dpi/150 lpi /
3251 dpi: "45.0"
*ColorSepScreenAngle ProcessCyan.150lpi.3251dpi/150 lpi /
3251 dpi: "15.0"
*ColorSepScreenAngle ProcessMagenta.150lpi.3251dpi/150
lpi / 3251 dpi: "75.0"
*ColorSepScreenAngle ProcessYellow.150lpi.3251dpi/150 lpi
/ 3251 dpi: "0.0"
```

Page Setup for Mac OS

In Mac OS, you can use the Page Setup command to change page size, orientation, positive or negative imaging, and scaling for output.

Some options in the Page Setup dialog box depend on the printer you select in the Chooser. The Page Setup dialog box with the Apple LaserWriter 8.3 driver selected is shown below.

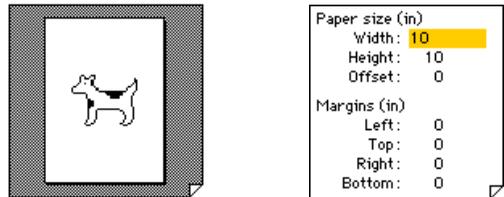
Several Canvas options in the lower part of the Page Setup dialog box affect the way Canvas formats large and small documents to fit on standard paper. See “Centering and tiling illustrations” on page 54 for more information.

Paper

This pop-up menu contains the paper sizes specified by the printer driver or the PPD file for the printer. Choose the paper

size used in your desktop printer or the size of the media used in the imagesetter.

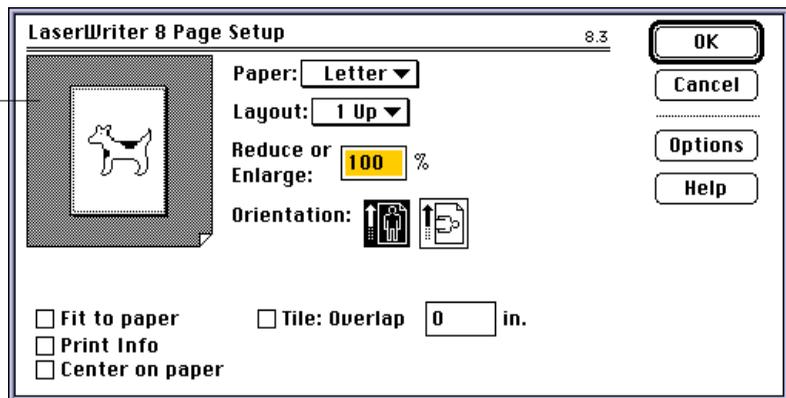
The “dogcow” illustration gives a visual representation of the Page Setup settings. The illustration shows the Paper, Layout, and Orientation settings, but not a scaling factor in the “Reduce or Enlarge” box.



Click the bottom-right corner of the illustration (left) to show paper and margin dimensions (right).

The illustration reflects the current settings.

When you change the page orientation in the Page Setup dialog box, the change isn't reflected on-screen or in the Document



Setup dialog box. However, the document prints with the selected page orientation. Conversely, changing the page orientation in the Document Setup dialog box changes the on-screen page layout, but won't affect the way a document prints.

To change the page orientation both on-screen and for the printed product, you need to set the orientation using both the Document Setup command in the Layout menu and the Page Setup command in the File menu.

Custom paper size

If you use LaserWriter printer driver 8 or later, you can choose Custom in the Paper pop-up menu if the selected PPD supports "custom" paper size. Click the bottom-right corner of the illustration to show paper and margin dimensions. Select the numeric values and enter the custom dimensions.

Choose Imagesetter button

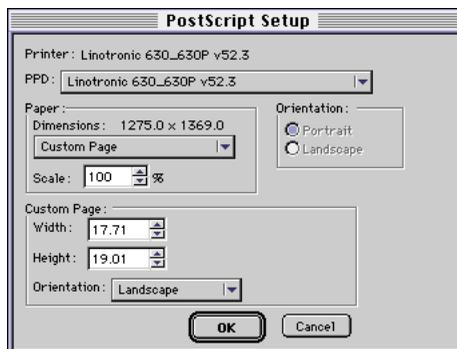
The Choose Imagesetter button appears only when you select a LaserWriter 7 printer driver in the Chooser, because this driver doesn't let you select Custom in the Paper pop-up menu.

1 To specify a custom page size, click the Choose Imagesetter button.

2 In the PostScript Setup dialog box, use the options to specify dimensions, scaling, and orientation for custom-size pages.

3 Choose a PPD file for the output device from the PPD pop-up menu. The name of the associated printer appears above the menu.

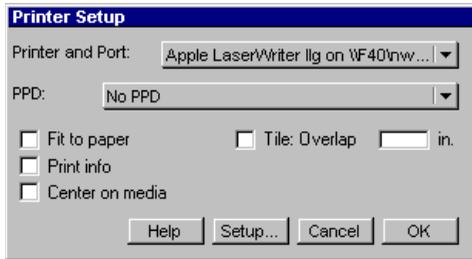
4 The Paper area shows the dimensions for the selected page size. To enter your own dimensions, choose Custom Page in the pop-up menu. In the Custom Page area, enter the page dimensions in the Width and Height boxes. Choose Portrait or Landscape in the Orientation pop-up menu. Click OK to implement the settings.



Use this dialog box to set custom paper sizes when you use a driver that doesn't offer a Custom Paper option.

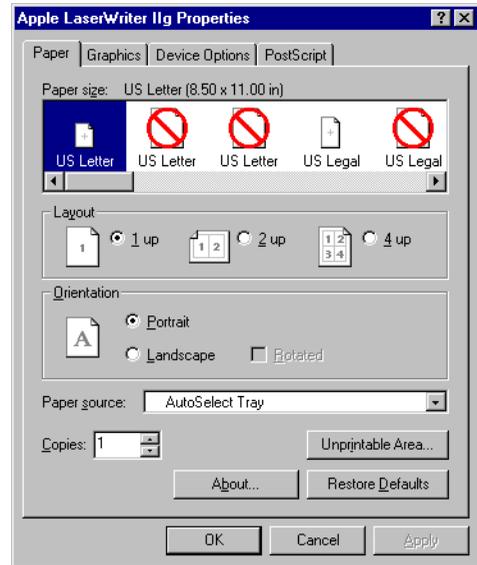
Printer Setup for Windows

You can use the Printer Setup command in Canvas to select a printer and PPD file. In the Printer Setup dialog box you can set options for scaling, centering, and tiling a publication and for printing information on color separations.



In the Printer Setup dialog box, click the Setup button to open the properties dialog box for the selected printer. In this dialog box, you can change paper size, orientation, positive or negative imaging, and scaling for output.

The Apple LaserWriter Properties dialog box shown here is similar to ones for most PostScript printers, with page setup and printing options organized on tabs.



Paper tab

Use the Paper tab to select paper size, layout, orientation, and number of copies. Related options, which let you tile and center output, are available in the Print dialog box.

When you select a paper size, be sure it provides enough extra space outside the document for bleeds and printer information. If the printer driver lets you select a custom paper size, a Custom icon appears under Paper Size and you can enter your own paper dimensions.

Graphics tab

The Graphics tab contains options for output resolution, halftones, and imaging. For output of final film separations, however, these options should be set in Canvas using the Separation Setup dialog box, not here.

- A resolution setting in effect at the imagesetter or RIP takes precedence over the Resolution setting on the Graphics tab.
- Halftone settings in Canvas always supersede the Screen frequency and Screen angle settings on the Graphics tab. For color separations, Canvas uses the settings on the Screens tab in the Separation Setup dialog box. For regular printing, Canvas uses the settings on the Printing tab in the Preferences dialog box.
- You can select negative and mirror image (wrong-reading) output options on the Graphics tab. However, some output devices also let you set these options. You might need to test the output before producing final film separations to be sure the correct settings are in effect.

Device Options

This tab contains options for the output device, such as text and photo-enhancement, that can be controlled through software. The available options depend on the device. Consult the device documentation for information.

PostScript

This tab has options for PostScript formatting from the printer driver. However, Canvas creates PostScript data itself, rather than relying on the printer driver, so these options affect only the preamble or header information sent to the output device or file along with the PostScript page descriptions generated by Canvas.

Outputting color separations

To output color separations, you can print to a desktop printer or imagesetter, or create PostScript separation files by printing to disk.

When creating color separations in Canvas, first select the output device and the matching PPD file before configuring other settings. Canvas reads information in the PPD file for paper size and halftone screen angles. If you don't select the correct printer and PPD file, the available paper options and screen angles might not match those available on the output device.

In Mac OS, you use the Chooser to select printers and PPD files. In Windows, you use the Printer Setup command in Canvas or the Printers control panel. For more information about connecting to printers, refer to the documentation for the operating system you use.

Some of the options available with the Page Setup (Mac) and Printer Setup (Windows) commands also affect color separations. For example, use these commands to select document orientation (portrait or landscape) and image format (positive or negative, normal reading or reversed).

You usually choose paper size and orientation and set other options when you first create a document. However, you might change

some settings depending on whether you're creating color separations for proofs or final film output.

After selecting the printer and PPD file, you can prepare to output color separations in Canvas.

- To set options for color separations, use the Printing Inks, Color Separations, and Separation Tables commands in the Calibration submenu in the Edit menu. For more information, see “Calibrating printing inks and color separations” on page 51.
- In the Print dialog box, you can choose the data format for images and the color format for the separations.
- Click the Setup button in the Print dialog box to open the Separation Setup dialog box. Use this dialog box to set the halftone screen frequency, choose which plates to print, and set other options for separations. For more information, see “Separation Setup dialog box options” on page 49.

Steps to follow for creating color separations

1 Open the document in Canvas. In illustration and presentation documents, be sure that all layers you want to include are visible. Because Canvas can separate any object into CMYK process colors, you don't need to convert objects before creating separations.

2 Make sure the correct printer and PPD file are selected on your system. If necessary, use the Page Setup command (Mac) or Printer Setup command (Windows) to verify the paper orientation and layout settings. See "Page Setup for Mac OS" on page 42 or "Printer Setup for Windows" on page 44 for more information.

3 Choose Print in the File menu. Set up the options in the Print dialog box as follows:

- Select the All option button.
- Set copies to the number desired.
- In the Print pop-up menu, choose Document. If you want to proof individual illustrations, first select the object in the document, and then select Selection in the Print pop-up menu.
- In the Print As pop-up menu, choose Separations. This option is available only if the document contains objects that can be separated.
- Turn on the Print Info option to include printer's marks (which you can select separately in the Separation Setup dialog box) on separations.
- In the Images pop-up menu, choose the data format for images (paint objects). For compatibility with most networks, including Internet Protocol networks, select ASCII. You can use Binary for Mac OS and other networks that can transmit binary data. Binary transmission is twice as fast as ASCII format for image data.

- Click the Setup button to open the Separation Setup dialog box. See "Separation Setup dialog box options" on page 49 for information on how to configure these options.

4 After you configure the options in the Separation Setup dialog box, click OK.

5 Click Print to print the color separations.

Printing proofs of color separations

It's always a good idea to include a proof copy of the publication when you give separations files to an imagesetting service or commercial printer. The proof copy can be a full-color or black-and-white version of the publication.

If you have access to a color printer, you can check that colors are printing correctly and you can view the printing plates in color.

Keep in mind that the only accurate color proofs are those made from the actual separation films that will be used to create the printing plates, or color proofs run on the printing press.

For printing separation proofs, you might want to use the Skip Blank Pages option in the Print dialog box. Turn on this option to tell Canvas not to print any pages in the document that are completely blank.

For proofing large documents, you can tell Canvas to divide the pages into tiles. See "Centering and tiling illustrations" on page 54.

Previewing a document before printing

In the Print dialog box, you can click the Preview button to see an on-screen preview of the pages Canvas will print. When you are printing separations, you can see the individual separations in the preview window.

The preview reflects all the settings in the Print dialog box and Separation Setup dialog box. For example, the preview shows the plates you select to print and shows the plates in color or grayscale depending on whether you turn on the “Print Plates in Color” option on the Options tab in the Separation Setup dialog box.



Creating disk files of color separations

Rather than printing directly to an output device, you can create digital separation files in Canvas. Separation files are PostScript files that can be downloaded to an imagesetter for output. Separation files let you transfer a finished, separated document for remote printing without Canvas.

- 1 Follow the instructions for page setup and selecting options in the Print dialog box and Separation Setup dialog box.
- 2 Click the File option in the Print dialog box, and then click Save (Mac OS) or OK (Windows).

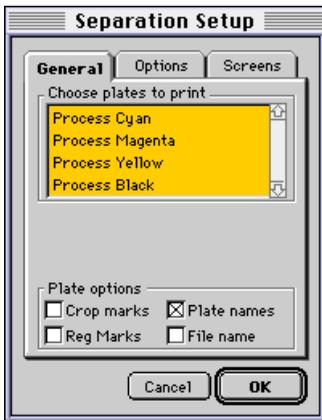
Destination

- Printer
- File

- 3 In the directory dialog box, select a location and type a name for the file that will be created. In Mac OS, choose All in the Font Inclusion pop-up menu if your document contains type. In Windows, fonts are automatically included in the PostScript file.
- 4 After entering the settings you want, click Save (Mac OS) or OK (Windows) to create the separations PostScript file.

Separation Setup dialog box options

Use the Separation Setup dialog box to select the separation plates to print, and to configure options for screening halftones, trapping, overprinting black, printing spot colors as process, and printing plates in color for proofing. Ask your commercial printer about the settings for your publication.



General tab

At the top of the General tab, select the plates you want to print by Shift-clicking the plate names. Selected plates are highlighted. For process-color publications, select all four plates whose names begin with “Process.”

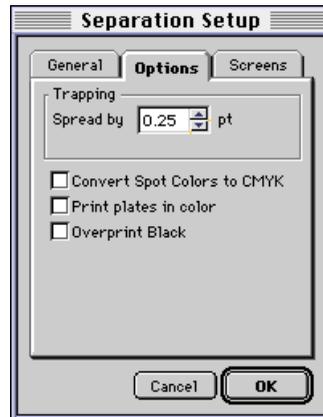
The process color plates (cyan, magenta, yellow, and black) always appear in this list. If the document contains named spot colors, their names also appear in the list. Canvas

prints a color separation for each spot color you select.

In the Plate Options area, you can check these options to add printer’s marks and other information to the separations.

Options tab

On the Options tab, you can tell Canvas how to treat certain colors and set a universal width for traps that Canvas creates.



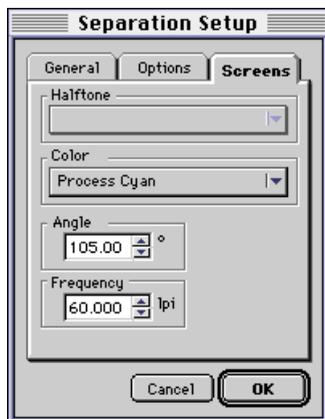
If your document contains spot colors that you want Canvas to convert to process colors, check the “Convert Spot Colors to CMYK” option. However, keep in mind that many spot colors can’t be reproduced with process colors. Using this option tells Canvas to separate the colors as if they were process colors, but does not change the colors permanently in the document.

If you want to print the color separations in color, rather than grays, check the “Print plates in color” option. This lets you simulate the actual appearance of the color separations. Some publishers use this option and print on clear acetate to create a simulated color key.

If you want Canvas to overprint the entire black separation, check the Overprint Black option. When this option is on, no object containing 95 percent or more black will knock out objects on the other separation plates. This is usually recommended to avoid registration problems with black text and hairline rules.

Screens tab

On the Screens tab, you can set halftone screen frequency and angles for separations.



Choose a halftone setting from the Halftone pop-up menu. Canvas reads the settings

from the printer driver and PPD file. When you choose a setting, Canvas sets the screen frequencies and angles for all plates.

You can use the Color pop-up menu to change settings for specific plates. Select the plate you want to change, and enter values in the Angle and Frequency boxes.

After you set the options in the Separation Setup dialog box, click OK to close the dialog box and return to the Print dialog box.

Selecting halftone screen frequency

You might want to use a different halftone frequency for proofing than for final output. Most desktop printers achieve resolutions of 600 to 1,200 dpi, which isn't enough to reproduce a full range of tones at halftone screen frequencies much higher than 65 lpi (lines per inch).

Even though your publications will probably use halftone frequencies of 85 to 150 lpi, a desktop printer can produce cleaner halftones if you choose a screen frequency within its range. If you use the publication's actual screen frequency, the halftones will lose tonal range and clarity.

Calibrating printing inks and color separations

Before you print separations, you should use the Printing Inks and Color Separations commands in the Calibrate submenu (in the Edit menu) to check the settings that Canvas uses for generating process color separations.

Printing Inks calibration

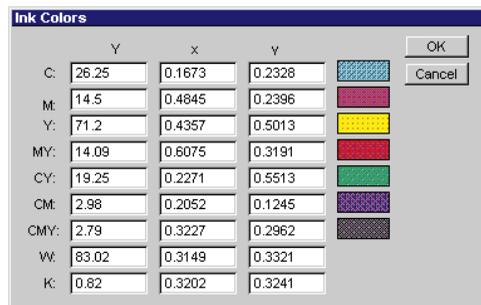
Printing Inks calibration tells Canvas how to compensate for the type of paper and printing press used to print a document. If you are working on multiple projects, you can create printing inks setup files for each one.



Ink color These options correspond to standard types of presses, inks, and paper stock. Standard Web Offset Press (SWOP) inks are used in the United States for offset lithography on web presses (which use roll paper). Inks used in commercial printing in Europe and Asia differ somewhat from those used by U.S. printers.

If your print shop advises you to adjust the ink colors, you can choose Custom in the

Ink Color pop-up menu. In the dialog box, enter the CIE-LAB color values that your print shop specifies. These values are based on readings from a spectrophotometer or colorimeter.



Dot Gain This value tells Canvas the expected amount (in percent) that halftone dots will spread (gain) on the paper surface. Different surfaces cause different amounts of dot gain. Newsprint requires compensation for greater dot gain than does printing on coated stock. A setting of 20% is typical for offset printing on coated stock.

To calibrate printing inks

- 1 Choose Calibration > Printing Inks in the Edit menu.
- 2 In the Printing Inks dialog box, choose a setting from the Ink Colors pop-up menu.
- 3 Use the standard value in the Dot Gain box or enter the value suggested by your printer.

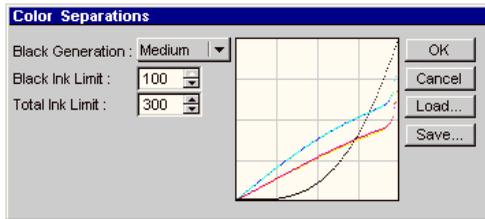
4 To save the setup, click Save. In the dialog box, type a file name and click Save. To load a settings file, click Load. Select the file in the directory dialog box and click Open. The name of the custom setting appears in the Ink Color pop-up menu.

5 To enter custom settings, choose Custom in the Printing Inks pop-up menu and enter ink color values in the boxes. Click OK to save the custom settings.

6 After entering the settings you want, click OK.

Color Separations calibration

Calibration for color separations gives Canvas information on the total ink limits of the press and the total ink density of the black plate. Ask your commercial printer for the settings you should use. Otherwise, use the Canvas defaults.



Black Generation These options affect the amount of black ink generated on the black plate of a color separation. By default, Canvas chooses Medium. Heavy increases the amount of black ink and Light decreases the amount. None tells Canvas to generate separations without a black plate. Maximum maps gray values to only the black separa-

tion. Custom lets you adjust the black generation curve manually.

Black Ink Limit and Total Ink Limit The Black Ink Limit sets the maximum density (by percentage) of black ink used in color separations. By default, the black ink limit is 100. The Total Ink Limit is the sum of the total percentage of CMYK inks used in color separations. By default, this value is 300 percent. The maximum value you can enter is 400 percent.

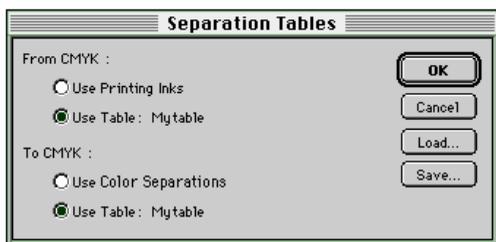
To calibrate color separations

- 1** Choose Calibration > Color Separations in the Edit menu.
- 2** Choose an option in the Black Generation pop-up menu. If you choose Custom, drag the curve in the Black Generation dialog box to adjust it, and then click OK.
- 3** Enter a percentage value in the Black Ink Limit and Total Ink Limit text boxes.
- 4** To save color separation settings, click Save. In the dialog box, type a file name and click Save. To load a settings file, click Load. Select the file in the directory dialog box and click Open.
- 5** After entering the settings you want, click OK.

Using separation tables

You can save the settings in the Printing Inks and Color Separations dialog boxes separately, or you can save one “separation table” with the settings from both dialog boxes.

If you load a saved separation table, Canvas will use the separation table settings regardless of changes made with the Printing Inks and Color Separations commands.



To save a color separation table

- 1 Choose Calibration > Printing Inks in the Edit menu. Enter the settings for ink colors, dot gain, and gray balance as described above and click OK.
- 2 Choose Calibration > Color Separations in the Edit menu. Enter the settings for black generation and ink limit as described above and click OK.
- 3 Choose Calibration > Separation Tables in the Edit menu and click Save.
- 4 In the Save As dialog box, type a name for the separation table, choose a location to save the file, and click Save.

To load a separation table

- 1 Choose Calibration > Separation Tables in the Edit menu.
- 2 In the Separation Tables dialog box, click Load. In the directory dialog box, locate and select a separation table file.
- 3 Click Open to load the separation table and return to the Separation Tables dialog box. In this dialog box, the Use Table options are now selected with the name of the separation table file that you loaded.
- 4 Click OK to close the dialog box and to tell Canvas to use the settings from the separation table.

To override settings in a separation table

- 1 Choose Calibration > Separation Tables in the Edit menu. If a separation table has been loaded, its name appears with the Use Table options.
- 2 To use the settings in the Printing Inks dialog box instead of those saved in the table, click Use Printing Inks in the From CMYK area.
- 3 If you want to use the settings in the Color Separations dialog box instead of those saved in the table, click Use Color Separations in the To CMYK area.
- 4 Click OK to close the dialog box and use the new settings.

Centering and tiling illustrations

Centering and tiling options in the Print dialog box (Mac and Windows) determine how Canvas positions a document when printing. When printing proofs, you might need to tile the document because of your printer's paper size.

Center on Paper When this option is on, Canvas arranges the document so it prints in the center of the page. The result depends on the size of the document in relation to the paper size.

- If the area of interest of a large document is near the center, you can use this option to print only the center tile when Canvas tiles the document to fit on smaller paper.
- If the document is smaller than the paper size, Canvas positions it at the upper left of the paper when the Center on Paper option is off. When this option is on, Canvas prints the document in the center of the sheet.
- If the document contains only one illustration and you want to center it on the output page, select the object first. In the Print dialog box, choose the Print Selection option and check the Center on Paper option.

Tile Turn on this option when you want to divide a large document into multiple tiles that fit the selected paper size. This option

lets you proof a document that's larger than the paper in a desktop printer. Make sure this option is off when you output final color separations to film.

You can specify how much each tile overlaps adjacent tiles by entering a value in the Overlap box.

When Center on Paper is off, Canvas starts tiling at the top left. When Center on Paper is on, Canvas creates one full tile in the center and fits the remaining tiles around it.

Tiling a document for proofing

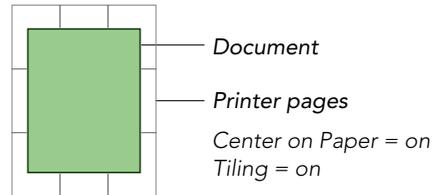
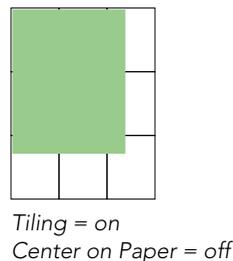
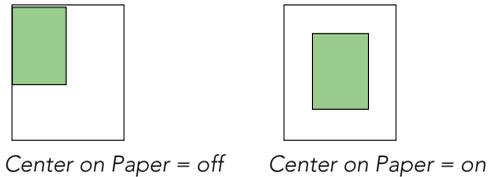


Illustration printed on large paper



RESOURCES

In the constantly changing field of digital prepress and color printing, in addition to mastering the basics, you need to stay on top of new

developments. This list of resources can help you find information to increase your publishing knowledge and improve your graphic arts skills.

Books and magazines

The following publications provide information on graphics applications, digital prepress, and commercial printing. The periodicals listed include paid-subscription, controlled-circulation, and membership journals.

A GUIDE TO COLOR SEPARATION

Published by Agfa Prepress Education Resources
P.O. Box 7917
Mt. Prospect, IL 60056
800-395-7007

As part of Agfa's prepress series, this technical booklet leads you through the course of preparing documents for process color printing.

THE DESKTOP COLOR BOOK

Michael Gosney and Linnea Dayton
Published by MIS Press
115 West 18 Street
New York, NY 10011
619-944-9977

This book is an introduction to color models, color-matching software, and output options.

FLASH MAGAZINE

Riddle Pond Road
West Topsham, VT 05086
415-661-7406
Fax: 802-439-6463

Flash Magazine is geared toward laser printer users and desktop publishers. Articles include glass etching with your laser printer; designing with color; and print-on-demand publishing.

IMAGING MAGAZINE

1265 Industrial Highway
Southampton, PA 18966-9839
800-677-3435
Fax: 215-396-8992

This monthly magazine contains news, reviews, ads, and articles for business-oriented imaging needs.

NATIONAL ASSOCIATION OF DESKTOP
PUBLISHERS JOURNAL

462 Boston Street
Topsfield, MA 01983-9915
508-887-7900

NADTP membership
2121 Precinct Line Road, Suite 215
Hurst, TX 76054
800-492-1014
Fax: 817-428-4240

The association publishes the NADTP Journal, a monthly magazine of trade news, tips, and technology available to members and the public. Articles include how to find royalty-free stock photography, the best scanner for your needs, and working with your commercial printer.

PHOTO>ELECTRONIC IMAGING

57 Forsyth St. N.W., Suite 1600
Atlanta, GA 30303
<http://www.peimag.com>

This monthly periodical aimed at digital-imaging professionals explores electronic imaging, photography, and computer graphics. It includes industry news and tutorial guides.

POCKET PAL, A GRAPHIC ARTS
HANDBOOK, 15TH EDITION

Published by International Paper Company
77 West 45 Street
New York, NY 10036
Copyright 1992

This concise reference book includes a history of printing, a glossary of printing terms, and an illustrated tour of the printing process from paper to book binding.

PRINT ON DEMAND

One Snow Road
Marshfield, MA 02050
617-834-0001
Fax: 617-834-0002

This monthly magazine contains articles on digital publishing, including hardware and software reviews and prepress organizational tips, with special emphasis on short-run digital printing technology.

STEP-BY-STEP PUBLISHING

6000 North Forest Park Drive
Peoria, IL 61614
800-255-8800

Step-by-Step publishes two magazines of interest to graphic designers and publishers. *Step-by-Step Electronic Design* is a newsletter covering publishing software. *Step-by-Step Graphics* is a bi-monthly magazine of design and production techniques.

Publishing technologies

The following companies develop and manufacture publishing hardware and software, including scanners, operating systems, color matching systems, and printers.

APPLE COMPUTER

Main number: 408-996-1010
Apple Fax Info Line: 800-776-2333
<http://www.info.apple.com>

Apple develops and markets Macintosh and Power Macintosh computer systems and the Mac OS operating system. Its worldwide web site includes links to technical publications, software updates, and product information.

EASTMAN KODAK COMPANY

901 Elmgrove Road
Rochester, NY 14653-5200
Eastman Kodak Color Management Systems
900 Chelmsford St., Tower Three
Lowell, MA 01851
General information: 800-255-3434
<http://www.kodak.com>

Kodak manufactures printers, scanners, digital cameras, and graphics reproduction materials. The Kodak PhotoCD Acquire module 3.0 and Kodak Color Management software are integrated in Canvas 5 for Mac OS and Windows.

MICROSOFT CORP.

One Microsoft Way
Redmond, WA 98052-6399
General information: 206-882-8080
Desktop Applications FastTips: 800-936-4100
Operating Systems FastTips: 800-936-4200
<http://www.microsoft.com>

Microsoft develops and markets Windows operating systems and software for both Windows and Mac OS. FastTips is an automated, toll-free service providing technical information and tips on key Microsoft applications.

PANTONE, INC. (AMERICA)

590 Commerce Boulevard
Carlstadt, NJ 07072-3098
201-935-5500

Pantone develops color-matching systems for printing inks and products. The company publishes color guidebooks for their approved printing inks and color materials. Canvas 5 includes Pantone-licensed computer video simulations for selecting Pantone colors.

PRINTER DESCRIPTION FILES BBS

Adobe Systems, Inc.
Bulletin Board System: 206-623-6984
This electronic bulletin board lets you download up-to-date PostScript printer description files.

TRUMATCH

25 West 43 Street, Suite 817
New York, NY 10036-7406
212-302-9100
Fax: 212-302-0890
<http://www.trumatch.com>

Trumatch develops and markets visual reference tools for 4-color selection and matching. The company publishes the TRUMATCH Colorfinder swatchbook for selecting process inks, and TRUMATCH Reference Guide software. Trumatch color selection software is built in to Canvas 5.

Image collections

The following collections of stock images are available in a variety of subjects and formats.

DIGITAL STOCK CORP.

400 South Sierra Avenue, Suite 100
Solana Beach, CA 92075
USA: 800-545-4514
International: 619-794-4040
Fax: 619-794-4041

KPT POWER PHOTOS

MetaTools
6303 Carpinteria Avenue
Carpinteria, CA 93013
805-566-6200
Fax: 805-566-6385
<http://www.metatools.com>

PHOTODISC

2013 Fourth Avenue, Suite 402
Seattle, WA 98121
USA: 800-528-3472
International: 206-441-4961
Fax: 206-441-4961
<http://www.photodisc.com>

PUBLISHERS DEPOT

800-764-7427
<http://www.publishersdepot.com>

On-line information sites

The following files and pages on the worldwide web provide useful links for desktop publishers.

DTP INTERNET JUMPLIST

<http://www.cs.purdue.edu/homes/gwp/dtp/clipart.html>

A list of links to sites with downloadable images.

FUTURE IMAGE INC.

<http://www.imagesite.com/futureimage>

A site with information on digital photo-imaging.

GURUS

<http://techweb.cmp.com/gurus>

A forum for discussions and tips on digital technology.

THE PRINTED IMAGE

<ftp://users.aol.com/printdimag/outgoing/>

An electronic publication (in .PDF format) with information to aid communication between print designers and commercial printers.

THE WORLDWIDE WEB VIRTUAL LIBRARY: ELECTRONIC JOURNALS

<http://www.edoc.com/ejournal/>

A directory of publications available on the Web, including digital printing resources and guides.

ZD NET

<http://www.zdnet.com>

As one of the largest publishers of computer industry periodicals and books, including PC Magazine, MacUser, and Windows Sources, the ZD NET site offers links to many of the company's publications and archives of industry news, articles, and software.

Paper companies

The following companies are good sources for free publishing information and printed samples.

HAMMERMILL PAPERS

6400 Poplar Avenue
Memphis, TN 38197
800-242-2148

Hammermill's free brochure, *Your Guide to the Exciting World of Digital Electronic Imaging*, reviews information such as color and monochrome digital imaging, electronic digital prepress, and digital proofs.

NEENAH PAPER

800-558-5061

Neenah's *Classic Columns Text and Cover Printability Guide* and *Ample Sample 2* provide abundant examples of printing applications from invitations to conference brochures.

OCÉ-USA, INC.

1800 Bruning Drive W.
Itasca, IL 60143
800-247-5431

The company produces ink jet, laser printer, thermal transfer printer, and color copier papers and transparencies for a wide range of printers.

S.D. WARREN COMPANY

225 Franklin Street
Boston, MA 02110
617-423-7300

S.D. Warren, whose *Somerset recycled* is used in the Canvas 5 printed documentation, produces many fine papers and informative publications on printing and pre-press, including *The Warren Standard*, also available as a multimedia CD-ROM. S.D. Warren also runs the Idea Exchange, 1-800-882-IDEA, which collects and catalogs all types of print publications.

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