CANVAS

COLOR PRINTING GUIDE

DENEBA

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INTRODUCTION

Whether you're creating one-page flyers for printing in one color, or multi-page, full-color publications, Canvas provides tools needed for all aspects of document design and publishing. This book is a guide to help you prepare documents for print publishing using Canvas software.

The *Color Printing Guide* begins with an introduction to printing terms and concepts to help you better understand the publishing process. The second section provides instructions for setting up Canvas documents and addressing printing issues. The last section describes how to complete prepress tasks and output your documents as color separations for commercial printing.

The key to successful print publishing is planning ahead. Making the correct decisions about printing issues, including the type of colors in the document, the resolution to use for images, and the document layout, is the best way to prevent problems from showing up on the printing press — where they're difficult and expensive to fix. This book can suggest questions that you should ask yourself about printing requirements and options during the planning and design stages for a print publication.

To learn more, you can find printed and on-line information about the technical and creative aspects of print publishing. The Resources section at the end of this book lists information sources that can help you learn more about traditional processes and keep up with new developments in print publishing.

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 press (two units)

Cyan ink rollers

Magenta ink rollers

Wetting rollers

Printing plate

Offset roller

Paper

Impression roller
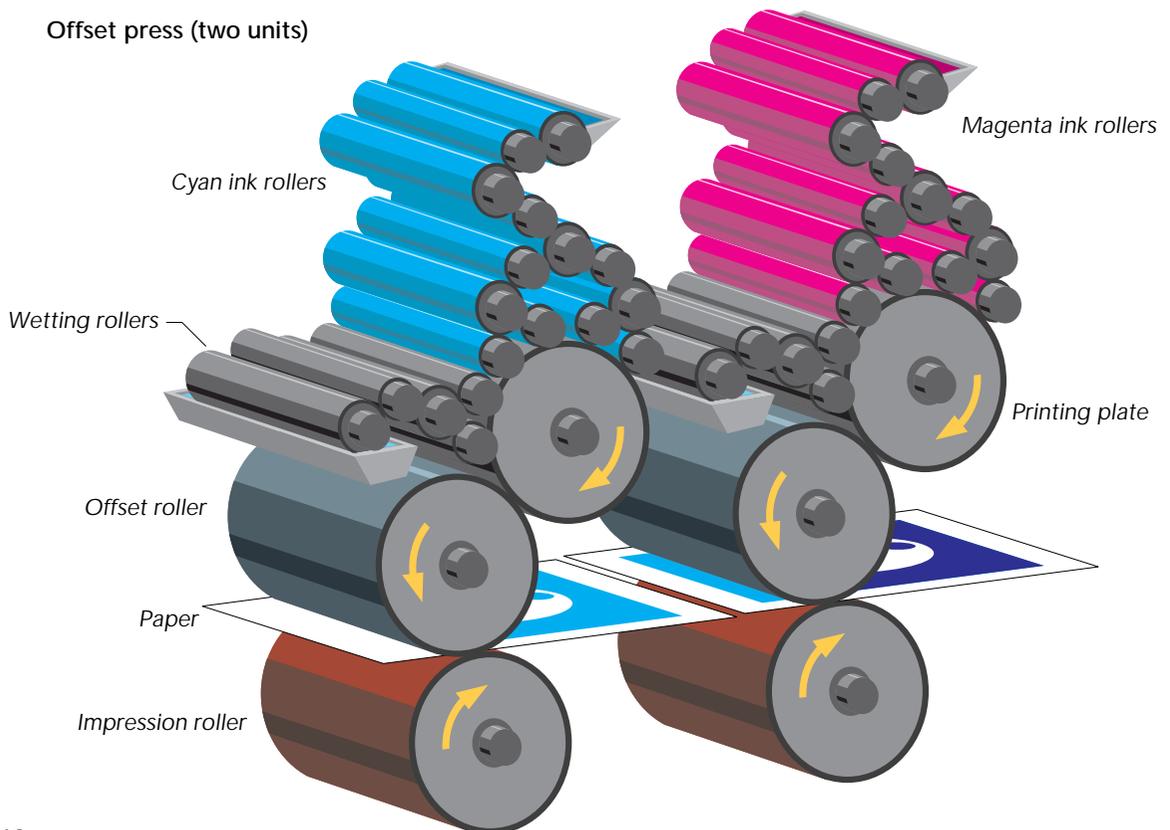
Offset lithography is the most common commercial printing process used today. The word "offset" refers to the press configuration: Rather than printing directly from an inked plate onto paper, the inked image is *offset* (transferred) from the plate to a rubber-covered roller. The paper picks up the image as it passes between the offset roller and an impression roller.

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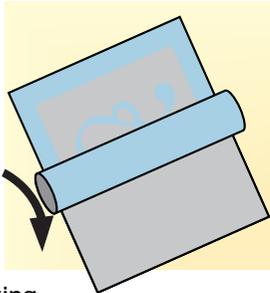
Inking: Another series of rollers applies ink to the plate. Ink adheres to the image, but the fountain solution prevents the ink from adhering to non-image areas on the plate.

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.

Platemaking
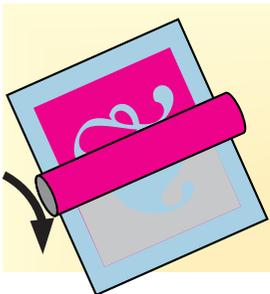
Wetting

Inking
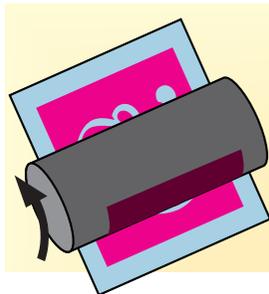
Offsetting
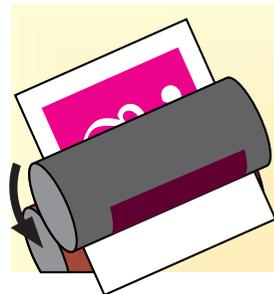
Printing
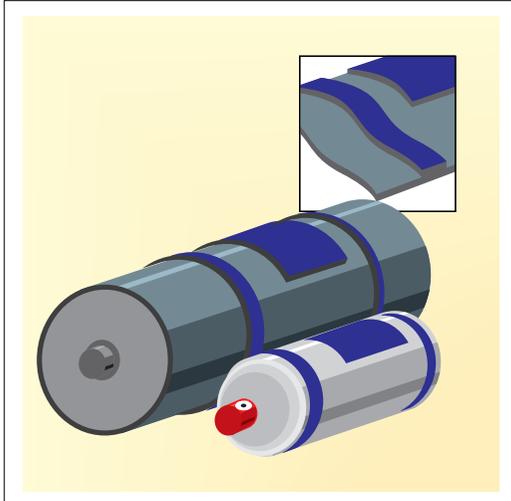
Letterpress

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 the 13th century in China and Korea, 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

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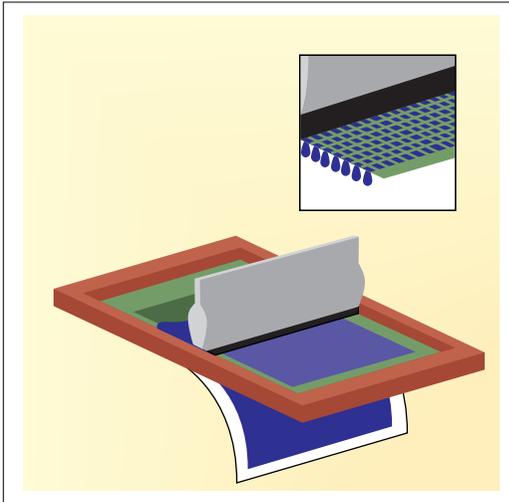
In screen printing, ink is pushed through a stencil onto the printed material. The stencil is attached to a fine mesh screen that is mounted in a frame. Because the screens were once made of silk, this printing method is now often called "silk screening."

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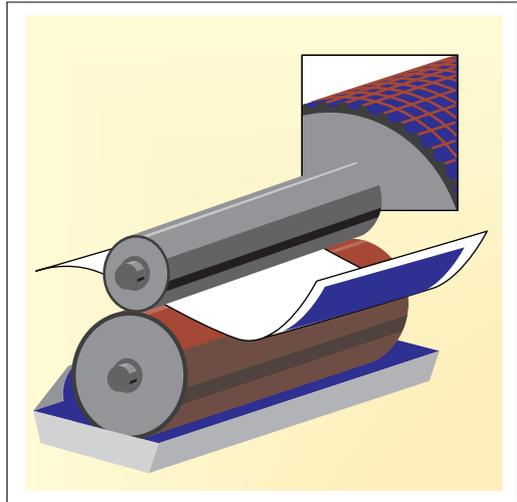
For the gravure method, an image is etched as tiny pits or wells in the surface of a cylindrical metal printing plate. As the plate rotates on the press, the wells pick up ink from a reservoir or ink roller. A flexible blade wipes away excess ink, and then the paper, pressed by an impression roller against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

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.

An imposition chart shows the arrangement of pages as they will be printed on both sides of a press sheet

3	14	15	2
6	11	10	7

5	12	9	8
4	13	16	1

16-page signature (two 8-page forms)

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
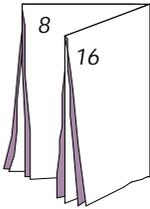
Folded 16-page signature

A single fold for a one-sheet pamphlet
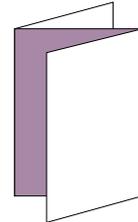
Two parallel folds for brochures and maps

Multiple parallel folds

Three parallel folds
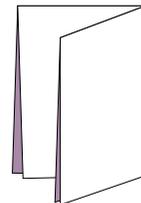
Two right-angle folds for invitations and cards

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.
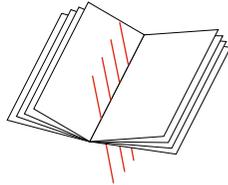
Perfect binding

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.
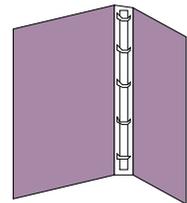
COLOR PRINTING AND IMAGE REPRODUCTION

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 best screen frequency to use (and the quality of printed images) depends 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 high screen frequency requires high resolution images, with large files and longer processing time. High screen frequency increases dot gain and can produce darker printed images.

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
133	1.5	200
	2	266
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 describes pixel size as the number of pixels in a set distance. Higher resolution results in smaller pixels, which generally produce finer images. However, if resolution is too high, an image can lose sharpness.

6 picas

150 pixels (150 ppi)

3 picas

150 pixels (300 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.

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.

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.

Y
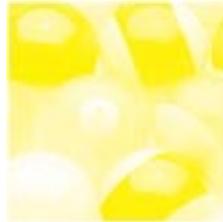
Y+M

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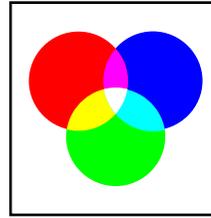
RGB   CMY
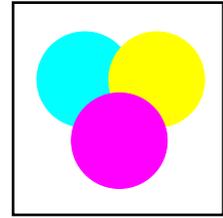
RGB colors (left) displayed on a computer monitor blend to make white light. The CMY colors used in process printing subtract color from white light and reflect the remaining color.

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.

Yellow   *Magenta*   *Cyan*   *Black*

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

105°
90°
75°
45°
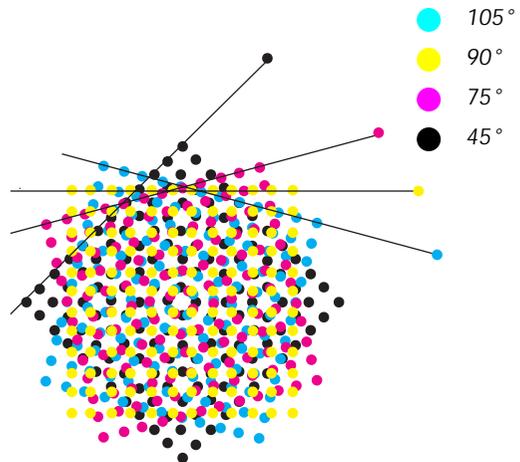
Halftone screens of process color separations are set at specific angles so the halftone dots form rosettes. Incorrect angles can create distracting patterns.

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 very 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.
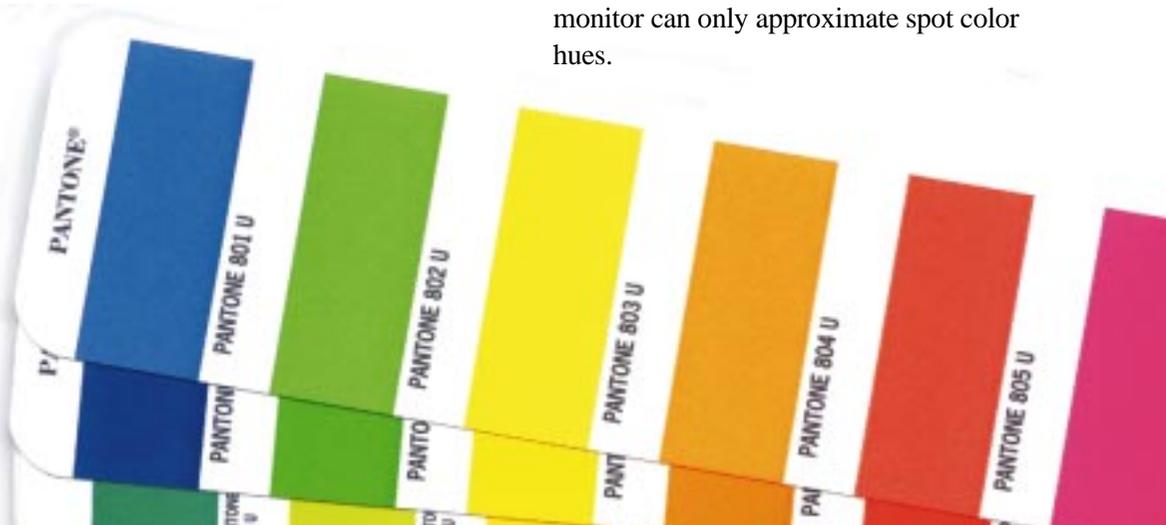
Knockouts and overprinting

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."

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.

Normally, a front object makes a knockout in a back object to prevent unwanted color mixing.
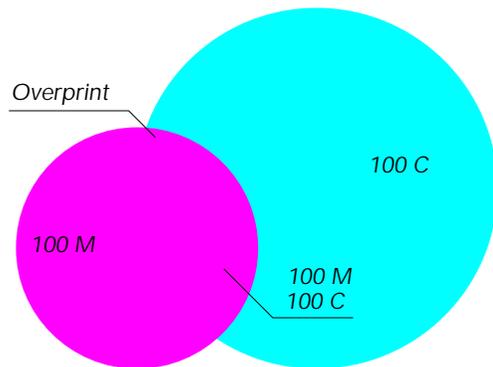
If the small circle is set to overprint, no knockout is made; the process colors combine into a new shade where the objects overlap.

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.

To overprint objects

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

Select the objects that you want to overprint and choose Object > Object Specs. Click the Options tab in the Object Specs palette. On the Options tab, select the Overprint Object option and then click Apply.
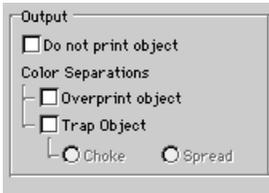
The Overprint option appears on the Options tab in the Object Specs palette.

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.
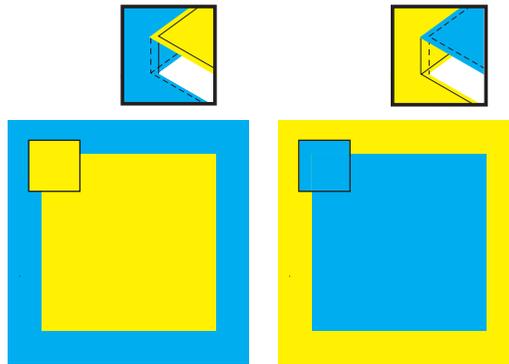
Applying traps to selected objects

You assign trapping to objects using the Object Specs palette. Select the objects you want to trap and choose Object > Object Specs. On the Options tab, select 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.

Spread   Choke
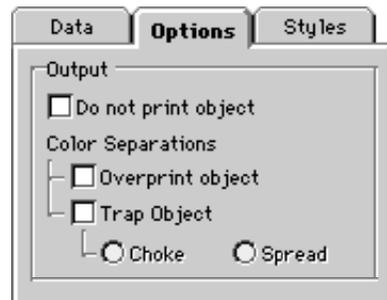
You can apply Spread trapping to text by choosing the Spread command in the Style submenu in the Text menu.

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 includes Kodak color-management technology that uses industry-standard ICC color device profiles to help you achieve accurate color reproduction.

You can also use special display modes in Canvas to check for color problems. For example, a document might contain RGB colors that are "out of gamut," which means that they can't be reproduced using process colors on a printing press or desktop printer. Canvas can highlight objects that contain out-of-gamut colors. You can also select a display mode that simulates the printed appearance of RGB 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 to be output as color separations on film, which will be used to make printing plates for your publication, you can print from Canvas to a high-resolution imagesetter. You can also print from Canvas to create PostScript files, which a service bureau or printer can use to output color separations.

Color management

Canvas uses the Kodak Digital Science Color Management System to achieve accurate color reproduction in printing and display. This system handles conversions from one color mode to another.

The Kodak Color Management System supports ICC (International Color Consortium) profiles. You can use ICC profiles to calibrate monitors and output devices.

System requirements

The Canvas installer copies several files that are required to use the Kodak Color Management System. After installation, do not move, rename, or delete these files. Otherwise, the Kodak external tool won't load.

Mac OS   Installation places these files in the Extensions folder: pfpick, icccodes, kdssys, Kodak Precision Profile API, and Kodak Precision CPI.

Installation places the file iccsigs.dat in the Preferences folder.

Installation also places a CMSCP folder in the System Folder. In addition, installation creates a Color Profiles folder in the Canvas 6 folder. This folder stores the Kodak ICC profiles. By default, Canvas installs Kodak's generic ICC profiles only. Additional ICC profiles are available on the Canvas CD.

Windows   Installation places various .DLL files throughout the system. It also creates a KPCMS folder at the root level of the hard disk if one doesn't exist already.

On Windows 95, Windows 98 and Windows NT, Kodak ICC profiles are stored in the Color Profiles folder in the Canvas folder. By default, Canvas installs Kodak's generic ICC profiles only. Additional ICC profiles are available on the Canvas CD.

Setting up a monitor

When you use monitor calibration and an ICC profile that matches your monitor, the display will be more accurate than when a monitor is not calibrated. Selecting a profile that matches your monitor lets Canvas display colors as accurately as possible. The correct profile also helps Canvas to display accurate simulated previews of printed colors on screen.

To select a monitor profile

1   Make sure Edit > Calibration > Use Calibration is selected. When this command is in effect, a check appears next to the Use Calibration command.

2   Choose Edit > Calibration > Monitor Setup. A directory dialog box with two panes appears. In the upper pane, available Kodak Digital Science ICC profiles appear.

3 Select an ICC monitor profile that matches your monitor. You can see the specifications for each profile in the lower pane when a profile is selected. The specifications include a profile description and show the device color space for the selected profile.

4 Once you select an ICC profile that matches your monitor, click Open. Canvas uses the selected profile to calibrate your monitor when the Use Calibration command is in effect.

Setting up a color printer

Printer calibration gives Canvas information about the color gamut and capabilities of your printer. You can select ICC profiles for calibrating desktop color printers. Using the correct profile can help Canvas match the screen display to the printer.

To select a printer profile

1 Make sure Edit > Calibration > Use Calibration is selected. When this command is in effect, a check appears next to Use Calibration.

2 Choose Edit > Calibration > Printer Setup. A directory dialog box with two panes appears. In the upper pane, available Kodak Digital Science ICC profiles appear.

3 Select an ICC printer profile. In the lower pane, the specifications for the selected profile appear. The description specifies the printer's GCR and UCR settings, the type of proofing, and the device color space.

4 After you select an ICC profile, click Open. Canvas uses the ICC profile for printer calibration when the Use Calibration command is in effect.

Turning calibration on and off

You can turn color calibration on or off at any time in Canvas. When you want Canvas to use calibration to display colors on screen to simulate their appearance in printed output, turn monitor calibration on.

In other situations, turning monitor calibration on is not necessary. For example, if you design web graphics using RGB colors only, you don't need to use the color matching system's calibration.

To turn calibration on or off

Choose Edit > Calibration > Use Calibration. A check appears next to the Use Calibration command when calibration is in effect. When you turn on calibration, the current ICC profiles are used.

Color management tips

If you require the highest quality color matching and output, becoming familiar with the factors that can cause problematic color shifts can help you to avoid unexpected results.

In general, the Kodak color management system handles conversion between color systems, such as RGB and CMYK. The system makes the conversion as accurate as possible, taking into account the characteristics of the color display and color printing devices.

If you want to prevent even slight changes in color values, avoid conversion from one color system to another. When you paint in an image, use the color system that matches the image mode — use RGB colors for RGB Color mode, and CMYK colors for CMYK Color mode, for example.

If you paint a CMYK color into an RGB Color mode image, Canvas converts the CMYK color values to RGB values. When color calibration is active, the color management system uses the specifications of the selected ICC profiles in the conversion process.

Avoid using RGB color in a document that will be printed commercially using process (CMYK) colors. When you specify process colors, it's best to use a matching system such as TruMatch, which is included in the

Canvas Inks palette. TruMatch provides calibrated colors in a series of hues and shades that let you easily select the exact color you want. In any case, you must use a printed swatchbook to view the printed appearance of a color. You should never rely entirely on the appearance of a color on screen.

Using Registration black

The Canvas Inks palette includes a special color called Registration black. The name "Registration" appears in the Inks palette when this color is selected.

Registration black is a special color that will appear on all four (CMYK) plates when you output process color separations. Although the Inks palette shows that this color contains 100% black only, Canvas separates the color as if it contains 100% of each process color ink.

You can assign Registration black to objects that you want to appear on all process color separation plates.

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 Layout > Display > Gamut Warning. 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 Edit > Calibration > Gamut Warning.

- Select a color from the pop-up menu.
- Enter an opacity percentage value in the Opacity box.
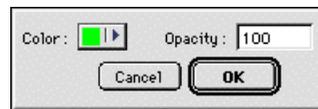
3   Click OK to implement the new setting.

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 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.


A *Simulated CMYK preview*
**B** *Original RGB 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 Layout > Display > CMYK Preview. 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
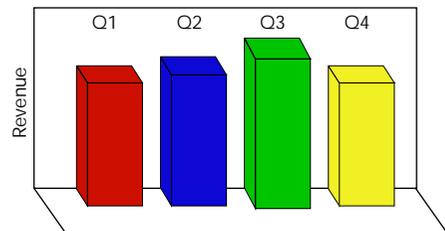
CMYK Preview display mode simulates the appearance of printed process colors

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 (see example below) 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 8.3.3 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 56 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.
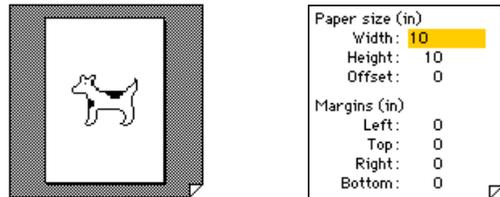
Click the bottom-right corner of the illustration (left) to show paper and margin dimensions (right).

When you change the page orientation in the Page Setup dialog box, the change isn't reflected on-screen or in the Document
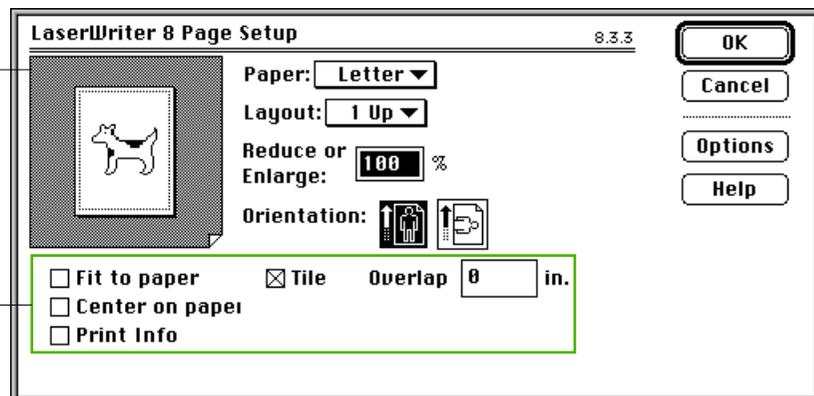
Setup dialog box (unless you select the From Printer option). However, the document prints with the selected page orientation. Conversely, changing the page orientation in the Document Setup dialog box changes the on-screen page layout, but won't affect the way a document prints.

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.
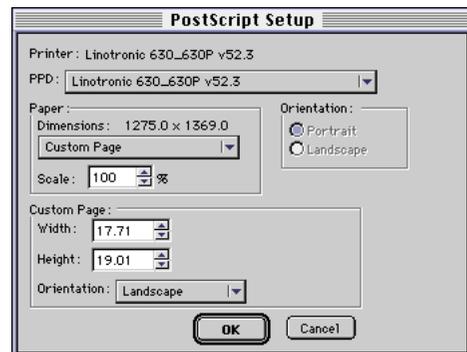
Use this dialog box to set custom paper size if the driver doesn't offer a Custom option

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.
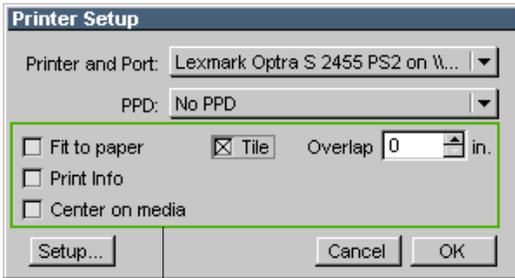
Canvas options

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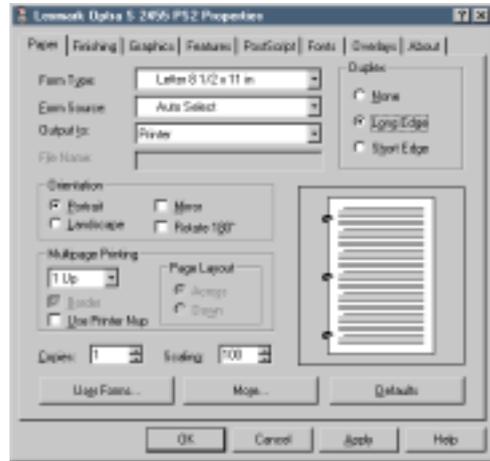
PostScript printer Properties

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.

Features

This tab contains options for the output device, such as text and photo-enhancement, print darkness, and smoothing, which can be controlled through software. The available options depend on the device. Refer to the output device documentation for details.

PostScript

The PostScript 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 that Canvas sends to the output device or file, along with the actual PostScript page descriptions generated by Canvas.

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.

Printing proofs of color separations

It's always a good idea to include a proof copy of a publication when you give separations files to a service bureau 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 most accurate color proofs are those made from the actual separation films that will be used to create printing plates, or color proofs run on the printing press.

Print Preview window
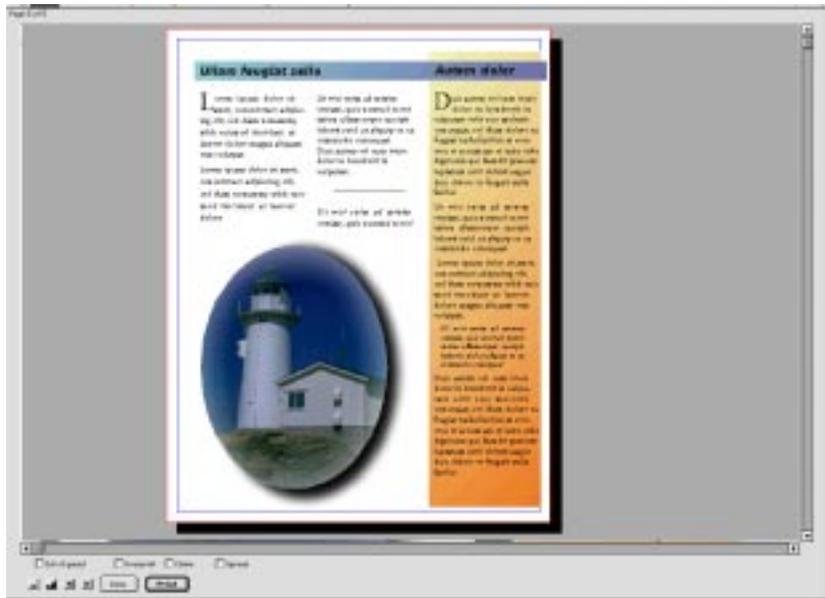
Outputting color separations

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.

- If your document contains grayscale images, check the grayscale separation setting. Choose File > Preferences and click the Painting tab. To make grayscale images appear on the black plate only, make sure "Separate Grayscales as Black" is selected.

- In the Print dialog box, you can choose the data format for images and the color format for the separations.

To set up and output color separations

1 Open the document you want to output in Canvas. 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 43 or "Printer Setup for Windows" on page 45 for more information.

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

- Select All pages to print.
- Specify 1 copy to print.
- In the Print pop-up menu, choose Document. If you want to proof individual items, 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.
- Select the Print Info option to include printer's marks on separations. In the Separation Setup dialog box, you can select options to print information on separations.
- In the Images pop-up menu, choose the data format for images (paint objects). For compatibility with most 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 50 for information on separation options.

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

**5** Click Print to output the color separations.

Creating disk files of color separations

You can create PostScript separation files when you need to output a separated document at a remote site without Canvas.

1 When you are ready to output the document, Choose File > Print. Click the File option in the Print dialog box, and then click Save (Mac OS) or OK (Windows).

2 In the directory dialog box, select a location and type a name. In Mac OS, choose All in the Font Inclusion pop-up menu. In Windows, fonts are automatically included in PostScript files.

3 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, overprinting text, printing spot colors as process, and printing plates in color for proofing. Ask your commercial printer about the settings for your publication.
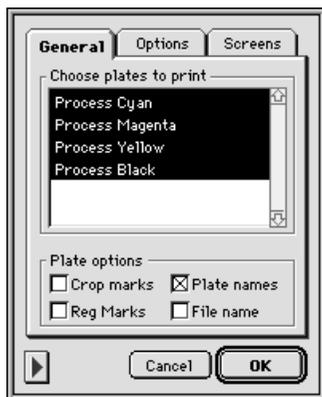
General tab

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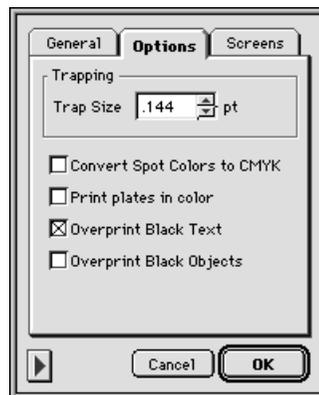
If your document contains spot colors that you want Canvas to convert to process colors, select the "Convert Spot Colors to CMYK" option. However, keep in mind that many spot colors can not be reproduced with process colors. Selecting this option tells Canvas to separate the colors as if they were process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

If you want to print color separations in color, rather than grayscale, select 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, select the Overprint Black Objects 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 objects, especially hairline rules.

To specify that all text appearing in black should be overprinted, select Overprint Black Text.

Screens tab

On the Screens tab, you can set halftone screen frequency and angles for separations.
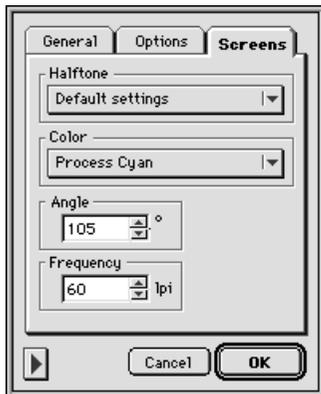
Choose a halftone setting in the Halftone pop-up menu. Canvas reads the settings from the printer driver and PPD file. When you choose a setting, Canvas sets the screen frequencies and angles for all plates.

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 high 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.

Collecting items for remote output

The Collect for Output command collects the files needed for you to output a Canvas document from a different computer, such as a service bureau's. It places a copy of a Canvas document file, required fonts, and linked images in an output folder. Collect for Output checks a document for problems that could affect color separations and commercial printing, and then prepares an output report.

Whether you're printing to a bubble jet printer or an imagesetter, Collect for Output makes it easy to gather the items you need to print a document. It's a good idea to use Collect for Output when a document is going to be output on a computer other than the one it was created on. When a document will be sent for color separation to a printer or service bureau, it's also best to use Collect for Output.

The information that Collect for Output gathers can help insure high-quality results whenever you prepare documents for commercial printing. However, if you're printing to a desktop printer for proofing or final output, you don't need to use Collect for Output.

Note: Printing a Canvas document requires that Canvas be installed on the computer used for output, whether you use the Collect for Output feature or not. If this isn't practical, Collect for Output lets you copy a document file most service bureaus can read, such as EPS. Or, you can use the Print command to generate a PostScript printer file. Most service bureaus can download these files to an output device without using the application that created the files.

To use Collect for Output

1   Save a copy of the document in Canvas file format before collecting for output.

2   When you're ready for final output, choose File > Collect for Output. Or, in the Print dialog box, click Collect. The Collect for Output dialog box lets you select items to save and warnings to report.

3   Under "Copy to Output Folder," specify items you want Canvas to copy to an output folder.

4   In the Warnings area, select warnings that you want included in the output report.

Note: If you select no options, the output report will contain basic information about the document, printing plates for color separations, and fonts (if any).

5   After setting the options you want, click OK.

6   A directory dialog box appears. Select the location in which you want to save the Collect for Output items, and then click Select. Another directory dialog box appears.

7   In the directory dialog box, choose a format in which to save the document file you're collecting, and then click Save.

You can save the document in any file format Canvas supports, such as EPS — a format popular with many service bureaus. However, if you're collecting a multi-page document, do not use EPS file format because only the first page of the document will be saved.

Note: Due to the limitations of non-Canvas formats, it's strongly recommended that you save a copy of the document in Canvas file format before collecting for output.

8   If you selected Fonts under "Copy to Output Folder" and the document contains fonts, a dialog box lets you specify which fonts to copy. Select the fonts you want to include. To copy all fonts in the document, click Select All. To copy no fonts, click Select None. Click OK to continue.

Note: For Mac OS systems, the dialog box lists system fonts, such as TrueType Chicago and Geneva, if they are used in the document. However, the checkboxes for these fonts will appear dimmed because they won't be copied to the output folder.

Canvas copies the specified items to the output folder and generates an output report. The report file is named the same as the document, plus the extension "TXT." You can view the report in Canvas or a text editor such as SimpleText (Mac) or Notepad (Windows).

Previewing the output report

To preview an output report before saving it, click Preview in the Collect for Output dialog box. A tabbed dialog box presents the report information. To close the dialog box, click OK.

General tab   Displays general document information: file name; document type (Illustration, Publication, or Presentation); paper size and total number of pages; and trapping information. It also reports if black text and black objects are set to overprint.

Plates tab   Displays information about each printing plate, including process color and spot color plates. The tab displays the plate name and its halftone screen angle and frequency.

Proxies tab   Displays information about each proxy and linked image, including: the location of the file linked to a proxy; the file name; the proxy dimensions in pixels; the image color depth; the number of channels in the image; the original image resolution; and the resolution reduction of the proxy.

Fonts tab   Lists the fonts used in the document.

Warnings tab   Displays warnings based on the checkboxes selected in the Warnings area of the Collect for Output dialog box. If you see a warning about an object in the document, you can select the warning on the tab, and then click Select Object to select the object in the document.

Collect for Output options

Copy to Output Folder   In this area, you can choose which items to copy into a designated output folder. Canvas can copy the document, required fonts and linked images to the output folder.

Document   To place a copy of the document in the output folder, select the Document checkbox.

Fonts   To place copies of the fonts used in the document in the output folder, select the Fonts checkbox.

Note: On Mac OS systems, Canvas does not copy system fonts (such as TrueType fonts Chicago and Geneva) into the fonts folder. If you must use system fonts in a document, you can place copies in the output folder after you exit Canvas. However, service bureaus usually recommend against using TrueType fonts for high-end output, because they can cause errors or fail to print when processed by a PostScript Raster Image Processor (RIP) for imagesetting.

Linked Images   To copy image files that are linked to proxy images in the document, select the Linked Images checkbox.

Warning options

In the Warnings area, you can select warnings that you want Canvas to include in the output report. The warnings can identify problems that might occur during output or printing, depending on the capabilities and requirements of the RIP or output device.

Resolution Out of Bounds   Identifies images whose resolution is outside the range specified in the "dpi min" and "dpi max" text boxes. You can change the default resolution range by typing minimum and maximum values in the text boxes. If the resolution of an image is higher than the specified maximum or lower than the specified minimum, a warning appears in the output report.

Proper image resolution can be a major factor in the successful output of a document. If resolution is too high, the extra data that isn't needed for image quality can cause delays and additional expense during file transfer, RIP processing, and imagesetting.

If resolution is too low, images can appear jagged, or the full range of grays or color shades can be lost; the maximum number of shades is relative to the screen frequency and image resolution. For more information on resolution, see the "Color printing and image reproduction" section.

Gamut Warnings   Identifies non-CMYK colors that are outside the CMYK gamut. The output report identifies the number and object type of an object that has an out-of-gamut color.

If a color is outside the CMYK gamut, its on screen appearance might not be reproducible when printing with CMYK inks. While no

on-screen color is exactly the same as a printed color, the difference can be significant when colors are outside the CMYK gamut. For example, a bright green that you see on screen will probably print as a muted, deeper shade. For more information, see "Display modes for previewing colors" on page 38.

Polygons and Beziers   Identifies very complex paths that might cause RIP errors or not print as expected. In nearly all cases, selecting this option will not generate a warning. A warning appears only if the document contains a path comprising more than 4,000 anchor points.

Font Sizes Out of Bounds   Identifies fonts larger or smaller than the point sizes specified in the "pts min" (minimum) and "pts max" (maximum) text boxes. To change the default values, type new values in the text boxes. If the size of a font in the document is larger than the specified maximum or smaller than the specified minimum, a warning appears in the output report.

Maximum Ink Coverage   Identifies colors that will print with more total ink than the specified maximum percentage. To change the default value, enter a different percentage in the text box.

To determine the correct value for maximum ink coverage, many variables need to be considered: paper type and quality; the type of printing press and capability of the press operator; the type of inks to be used; and the document contents, including the type of images and page layouts.

These factors influence the quality of the final piece. To ensure high quality, be sure to ask your commercial printer about the recommended maximum value for total ink coverage, based on the factors listed above, before you create color separations.

General guidelines used by printing professionals suggest a maximum 300% ink coverage for offset web printing. Magazines printed on lower-grade paper recommend 280% total ink coverage. Newsprint can require a total ink coverage of no more than 250%. In general, high-quality papers can handle higher total ink coverage than lower-quality ones.

Centering and tiling illustrations

Centering and tiling options in the Print dialog box 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 and centering documents

Printer pages

*Center on Paper = on
Tiling = on*

*Center on Paper = off
Tiling = on*
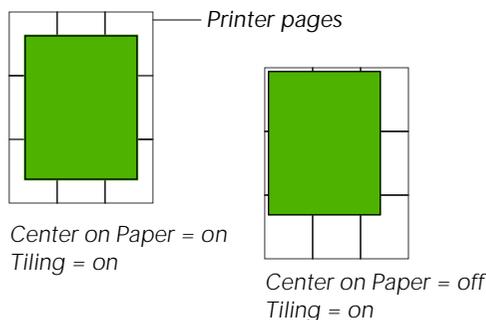
Illustration printed on larger paper

Center on Paper = off   *Center on Paper = on*
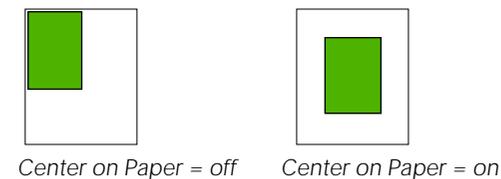
RESOURCES

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.

Deneba Imaging Services Center

Deneba Software offers professional prepress services that include high-resolution digital imaging, Matchprints, imagesetting to film and positive media, and Kanji film output from your Canvas files. Deneba's prepress facilities can run everything from simple grayscale documents to four-color separations. You can send your files to Deneba in Mac OS or Windows 95 / NT format on 3.5 inch diskettes, Zip, Jaz or 44 or 88 Mb Syquest cartridges. You can also send files via Internet ftp or e-mail. For more information on services and fees, contact:

DENEBA IMAGING SERVICES CENTER
7400 SW 87th Avenue
Miami, Florida 33173
305-596-5644
Fax: 305-273-9069
Internet: www.deneba.com

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.

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 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.

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.

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.

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