

CLARIS™



MacDraw™ Pro
Colour Guide



MacDraw Pro

Color Guide

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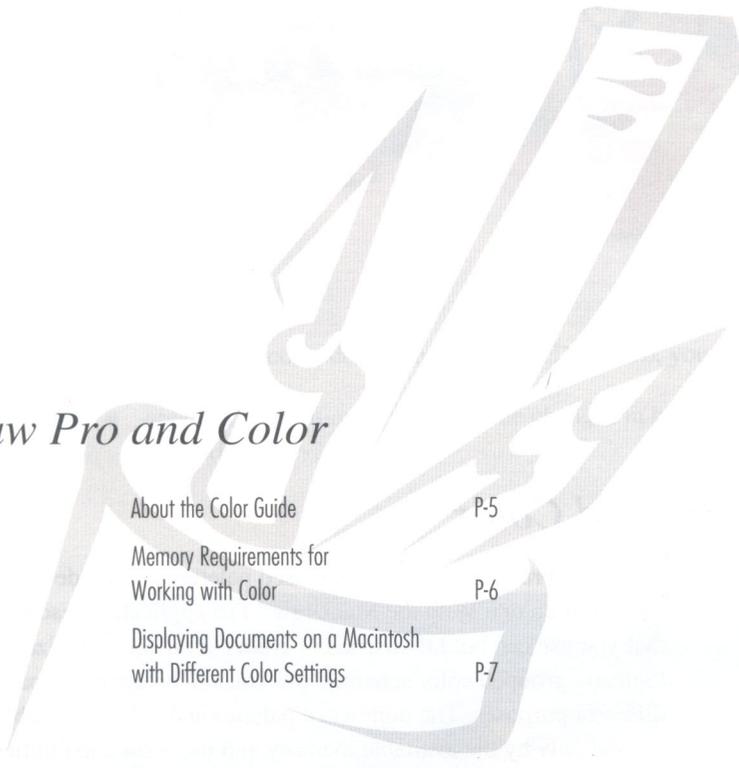
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MacDraw Pro and Color

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MacDraw Pro and Color

Paint-and-brush artists have long used palettes to provide a selection of dozens of colors. With the MacDraw™ Pro application, each electronic palette that you use can hold thousands of colors. You can organize colors in logically grouped color schemes and you can create many palettes for different purposes. The number of palettes and colors available to you is limited only by the available memory and the color capabilities of your Macintosh system software and hardware. With this large color selection, you can use MacDraw Pro to increase the visual impact, interest, and therefore, the success of your color graphics. Figure P-1 shows an example of a color graphic created in MacDraw Pro.

Figure P-1
Color graphics created in
MacDraw Pro



When creating color documents with MacDraw Pro, you can

- create colored drawings with subtle changes in hues, tints, shades, and tones (figure P-2).

Figure P-2
Drawing with subtle
changes in color



- import scanned images rendered in color or in many shades of gray, and edit the colors or grays that appear in the image (figure P-3).

Figure P-3
Scanned image



- use special shading patterns, called gradients, that provide graduated color changes in images and can also be used to produce highlights and simulate depth in your graphics (figure P-4).

Figure P-4
Image with gradients



- print your color documents in color or in black and white (figure P-5).

Figure P-5
Image in color and in
black and white



- ◆ **Important** Before using MacDraw Pro in color, make sure you have installed and set up the required software and hardware. Refer to the *MacDraw Pro Getting Started* manual for information about hardware and software requirements and installation instructions.

About the Color Guide

This guide provides a general introduction to using color with MacDraw Pro. It provides explanations of basic color principles and how to use MacDraw Pro color features.

Before you use this guide, you may want to familiarize yourself with the MacDraw Pro palettes and the Style bar. For complete information on the Color, Pattern, and Gradient palettes (including step-by-step procedures), refer to chapter 5, “Using the Style Palette,” in the *MacDraw Pro User’s Guide*.

This Guide is organized as follows:

- Chapter 1 introduces the fundamental concepts of color theory and the color systems that you can use to create and edit colors. If you are already familiar with the HSL, RGB, and CMYK color systems, you may want to skip chapter 1.
- Chapter 2 introduces MacDraw Pro color features and shows color examples. It explains the fundamentals of how MacDraw Pro produces color on a Macintosh and the functions of the Color Editor.
- Chapter 3 presents the different printing methods you can use to print your MacDraw Pro documents in color.
- ◆ **Note** All the artwork in this guide was created in MacDraw Pro. The final color graphics were color separated and then output on a Linotronic 300P imagesetter.

Memory Requirements for Working with Color

The amount of memory required to run MacDraw Pro depends on several factors, including your type of monitor and video card and the number of colors they can display. When determining how much memory you can allocate to the application (when running under MultiFinder), remember that the system software requires a significant amount of memory, and MacDraw Pro requires an additional 2 Megabytes (MB) of memory. If you are checking spelling as you type, MacDraw Pro requires an additional 70K of memory. Your desk accessories, INITs, and the RAM cache also require additional memory. The memory required to create a document also varies depending on the size and complexity of the drawing.

You can set up your Macintosh to display the maximum number of colors possible, limit it to showing fewer colors, or make it display only black, white, and grays. If limited memory is available as you use MacDraw Pro, you can use the Control Panel to set your system to use fewer colors or gray scales. Refer to your Macintosh Owner's Guide and monitor and color card manuals for information about setting up your monitor to display colors. These are some recommendations:

- *If you are using the Apple color monitor with 256 colors—Allocate at least 2 MB of RAM to MacDraw Pro for use with MultiFinder.*
- *If you use a color monitor and your Macintosh has 2 MB of RAM—Work with MacDraw Pro using the Finder (not using MultiFinder).*
- *If your Macintosh has 1 MB of memory—It's recommended that you limit your display to two colors (black and white).*

For information about allocating memory to MacDraw Pro, refer to “Allocating More Memory for Color Documents” in the *MacDraw Pro Getting Started* manual.

- ◆ **Tip** The amount of memory required for using MacDraw Pro also varies with the size of the document window. To increase the amount of available memory, make your document window smaller.

Displaying Documents on a Macintosh with Different Color Settings

When you create a document with your Macintosh set to display a specific number of colors, you can work on the same document using a Macintosh set to display a *different* number of colors. For example, you can open a 256-color document on a Macintosh set to display 16 colors. You can also change color settings as you work on a document.

Depending on the settings and hardware configuration, MacDraw Pro displays as many of the original colors as possible. For colors it cannot reproduce, MacDraw Pro displays approximated colors. For more information about approximated colors, refer to “Solid and Approximated Colors” later in this guide.

If you open or create a color document on a Macintosh that has a black-and-white monitor, color appears in shades of gray that approximate the gray value of the color (figure P-6). You can select and use colors and colored gradients from the palettes. (As you work on a document, you can display colors and gradients in a palette by name. This makes it easy to distinguish between different colors or gradients.) Although the document appears in shades of gray, it will appear in color when opened on a Macintosh that has a color monitor. (It will also appear in color if it is printed on a color printer.)

Figure P-6
Color document displayed in
color and shades of gray

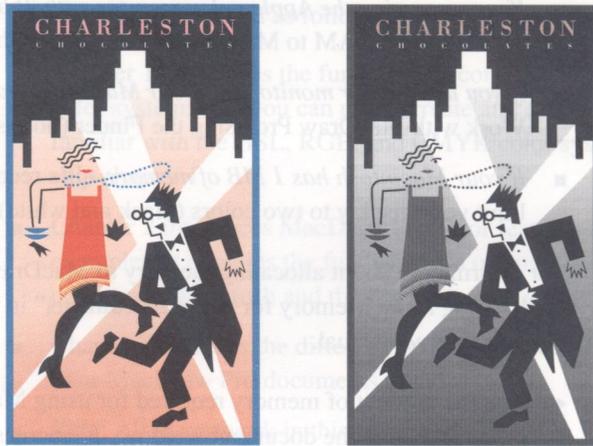


Figure 1-1
Red, yellow, blue color circle



Choosing a Color System

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Choosing a Color System

To work with MacDraw Pro documents in color, it is helpful to understand the fundamental concepts of color theory and how a computer system produces color. With MacDraw Pro you can create and edit colors using any of three color systems: HSL, RGB, and CMYK. (In addition, you can access other color systems via the Apple Color Wheel.) This chapter briefly discusses the three color systems and describes how you can use them to create and edit colors in MacDraw Pro documents.

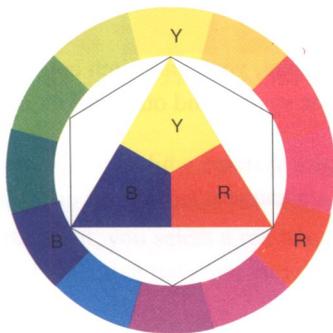
Color Basics

A color system is a way of systematically organizing and defining colors. You use a color system to define colors by specific components. Knowing a color's components, you can then reproduce the same color whenever you need it.

For example, a traditional color system for mixing paint is based upon the colors red, yellow, and blue (figure 1-1). In this color system, red, yellow, and blue are the *primary* colors; that is, you can produce all the colors of the system by mixing only these three basic color paints. To produce a

nonprimary color of a specific hue, you mix the two primary colors located on both sides of the desired color on the chart. For example, by mixing blue and yellow paint, you can produce green.

Figure 1-1
Red, yellow, blue color circle



Other color systems may define colors using different primary colors or color components, depending on the medium used to produce color.

The HSL color system, one of the three systems used by MacDraw Pro, is based on concepts artists have traditionally used for organizing color scales or palettes. This system defines colors according to three color components of hue, saturation, and lightness (HSL). Thus, if you are already familiar with creating or defining color in these traditional artistic terms, you'll find producing and changing colors using the HSL system easy.

The RGB color system, which is based upon mixing light, uses the primary colors of red, green, and blue.

The CMYK color system organizes colors based upon printing technology and inks developed to produce full-color images printed on paper. This system defines a color in the basic components of the cyan, magenta, yellow, and black inks used to produce it. Each color ink serves as a primary color for producing other printed colors. This system is useful for creating documents with colors that can be specifically reproduced by traditional ink printing technology.

You choose a color system according to your preferences and the color requirements of your work. For example, when creating color documents to be viewed on the computer screen, you can edit color using the RGB system

and directly manipulate the monitor's red, green, and blue color components. You can use the HSL system to create a special tint, tone, or shade. For documents that will be printed using a conventional printshop technology, you can use the CMYK system to produce colors that match standards in the printing industry.

As you work on a document, you can switch color systems and create the majority of colors in one system and other colors in another.

- ◆ **Note** Switching color systems while editing a document doesn't change the appearance of a document's colors; it only changes the way colors are defined.

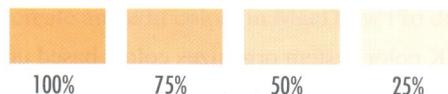
HSL Color System

The HSL color system is based on the three color components of hue, saturation, and lightness. Within this system, it is easy to produce colors in controlled shades, tints, and tones.

A color's *hue* distinguishes one color from another by its general look (wavelength) such as red, blue, green, or yellow.

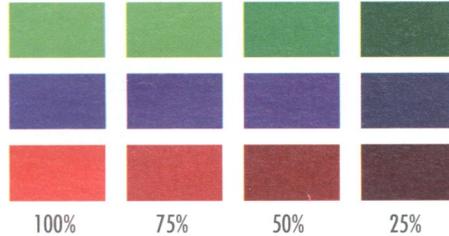
A color's *saturation* represents its intensity or purity (chroma). High saturation colors approach the look of pure hues; low saturation colors approach the look of neutral gray. Figure 1-2 shows an orange hue that varies in four different levels of saturation. By varying a color's saturation, you vary the hue from pure to gray.

Figure 1-2
Orange color with varied
saturation levels



A color's *lightness* refers to the lightness or darkness of the color (its brightness). Pink is a hue with high lightness. Maroon is a hue with low lightness. Changing the lightness of a color may appear to change its hue as you create color shades (actually the hue stays the same; only its lightness varies). For example, lowering the lightness of a red produces brown. Figure 1-3 shows four hues changed through four levels of lightness.

Figure 1-3
Colors changed given four
levels of lightness



When changing a color with the HSL color system, you select a hue and then change its saturation and lightness levels. For example, to produce a light pink tint, you select a red hue and increase its lightness. To produce a deep red, you give the color a high saturation and a medium amount of lightness (figure 1-4).

Figure 1-4
A red hue changed by
lightness and saturation



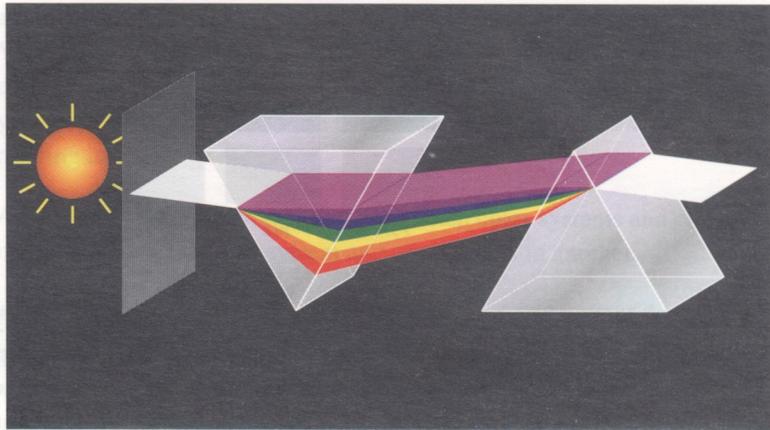
RGB Color System

The RGB color system is based on mixing light to produce colors. Because MacDraw Pro documents appear as dots of light on the computer monitor, using the RGB color system to edit colors most closely matches the way the computer actually produces color. This system is useful for creating documents to be viewed on the computer screen.

To understand the RGB color system, it's helpful to know about the properties of light and how a color monitor produces color.

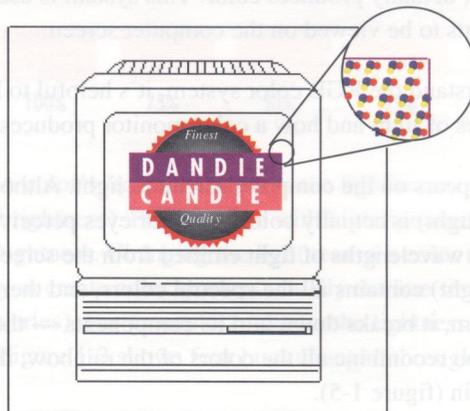
Color appears on the computer screen as light. Although electromagnetic energy (light) is actually colorless, your eyes perceive and interpret the different wavelengths of light emitted from the screen as colors. Sunlight (white light) contains all the spectral colors, and therefore when it is refracted by a prism, it breaks down into its components — the colors of the rainbow. When you recombine all the colors of the rainbow, the mix results in white light again (figure 1-5).

Figure 1-5
Refraction of sunlight into colors



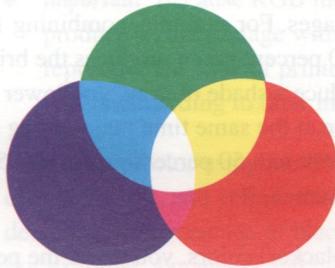
Color monitors create colors by mixing three primary color lights: red, green, and blue. For example, when the monitor displays a combination of red and blue light, your eyes perceive magenta. Most color monitors are equipped with three electron guns and have three different phosphors placed on the screen that emit red, green, and blue light only. Color images are made up of dots called pixels; each pixel in turn is made up of three dots that display red, green, and blue. The computer varies the amount of red, green, and blue light that appears at each pixel, and our eyes combine the primary colors to see colors of every hue (figure 1-6).

Figure 1-6
Red, green, and blue picture elements of a color monitor



To change a color using the RGB system, you vary the amounts of red, green, and blue that appear per pixel on the screen (figure 1-7). Your eyes pick up the different levels of red, green, and blue; your perception mixes them to see a specific color. For example, a combination of red and green light produces yellow (figure 1-7).

Figure 1-7
RGB color circle



- ◆ **Note** If you are familiar with mixing paints based on the red, blue, and yellow color theory, remember that combining two colors of light produces a different color than mixing the same two colors of paint. For example, combining red and green paint produces brown, whereas red and green light produces yellow.

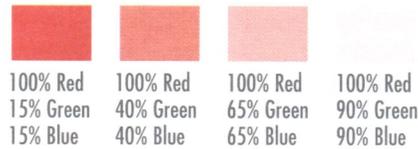
If you add a small amount of green light to red, the color appears more orange. If you add more green to the combination (keeping red the same) the orange becomes lighter and lighter until it appears yellow (figure 1-8).

Figure 1-8
Red and green light combine
to produce yellow



To create light (whiter) colors, you combine high amounts of red, green, and blue light. For example, to produce pink, you combine a high amount of red with lesser amounts of green and blue. Figure 1-9 shows the varying levels of red, green, and blue light used to produce progressively lighter tints of red.

Figure 1-9
Adding greater percentages
of green and blue to
produce a lighter color red



To produce white, you combine the maximum amount of red, green, and blue in equal percentages. For example, combining 100 percent red, 100 percent blue, and 100 percent green produces the brightest white the screen can produce. To produce a shade of gray, you lower the percentages of red, green, and blue, while at the same time maintaining an equal ratio of colors. For example, 50 percent red, 50 percent green, and 50 percent blue creates a medium gray on the screen.

To produce darker (black) colors, you lower the percentages of red, green, and blue in combination, until the screen emits no red, green, or blue light, which produces black.

CMYK Color System

Another color system used by MacDraw Pro is CMYK. It organizes colors based upon printing technology and inks developed to produce full-color images printed on paper. This system defines a color in the basic components of the cyan, magenta, yellow, and black inks used to produce it. Each color ink serves as a primary color for producing other printed colors. The four inks are combined in a method called *process color*. The MacDraw Pro CMYK system is useful for creating documents with colors that can be specifically reproduced by traditional ink printing technology.

- ◆ **Note** For more information about the printing processes used to produce color on paper, refer to chapter 3, “Printing Color Documents.”

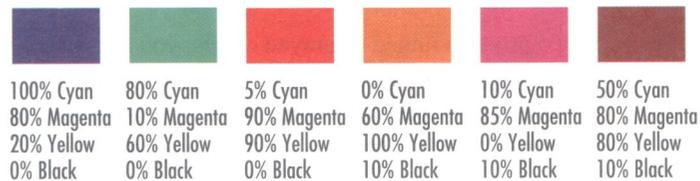
As primary colors, cyan, magenta, and yellow inks are used to produce a wide spectrum of color. Printers use black ink to enhance the definition and contrast of the color image. To print the different colors of an image, printers use a photographic method that separates out the different percentages of cyan, magenta, yellow, and black needed to produce it. They then print the four separated images on the same paper sheet, each time using a different colored ink. When you look at the page, your brain combines the four inked images to perceive a full-color image.

MacDraw Pro allows you to specify a document's printed colors using the color components of the CMYK system. This allows you to precisely designate the percentage combinations of the CMYK inks that a printer should use to print the document in color. For example, you can specify a color as 60 percent magenta, 25 percent cyan, and 15 percent yellow.

- ◆ **Important** Because RGB monitors produce color with light and printers produce a paper image with ink, your monitor may not be able to exactly reproduce the look of printed colors. CMYK colors in a document will appear according to their ink color specifications when printed.

To change a color using the CMYK system, you vary the percentages of cyan, magenta, and yellow that make up the color. You also increase or decrease the percentage of black to make the color appear darker or lighter. For example, a magenta and cyan combination produces blue; cyan and yellow produces green; and magenta and yellow produces red (figure 1-10).

Figure 1-10
Basic color combinations in
CMYK color system

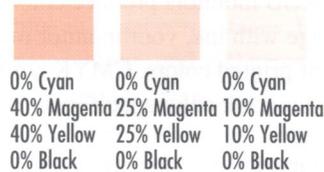


In the CMYK system, ink absorbs light, and so the more ink applied to a particular spot on the paper, the darker the resulting color. This result is opposite from the RGB color system in which high percentages of red, green, and blue light combine to produce white. In the CMYK color system high percentages of cyan, magenta, and yellow combine to produce black.

- ◆ **Important** When printing with process inks, the color and quality of the paper or other material on which your color image is printed will have an effect on the colors produced (along with numerous other factors).

To create lighter (whiter) colors, you combine low percentages of magenta, yellow, and cyan. For example, to produce pink, you combine a medium percentage of magenta with a lesser amount of yellow. Lowering the percentages of each color (while maintaining the same ratio of the components) produces lighter tints (figure 1-11).

Figure 1-11
Reducing the percentages of magenta and yellow to produce a lighter pink color



To create dark (blacker) colors, you combine high percentages of magenta, yellow, cyan and perhaps increase the percentage of black. For example, combining high percentages of magenta and yellow and increasing the percentage of cyan (or black) in the color produces progressively darker shades of brown.

To produce muted or grayed colors, you combine low to medium percentages of cyan, magenta, and yellow with a low percentage of black. Increasing the percentages, particularly the black, creates darker colors. If enough ink is present, or if the black percentage is very high, the image area appears black.

MacDraw Pro Color



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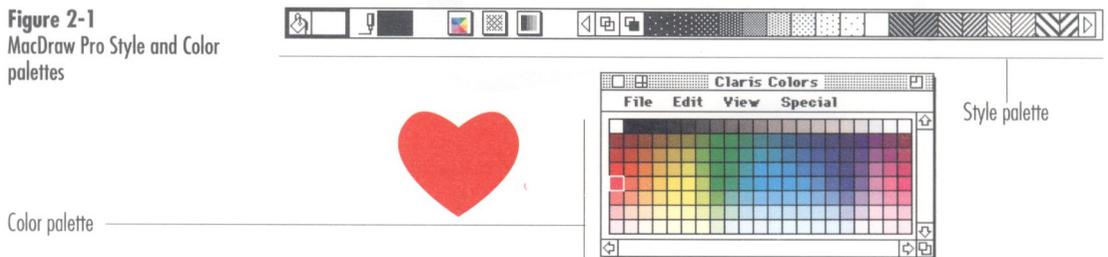
Chapter 2

MacDraw Pro Color

Colors and Objects

With MacDraw Pro, you can fill individual objects with any color in the Style or Color palettes (figure 2-1).

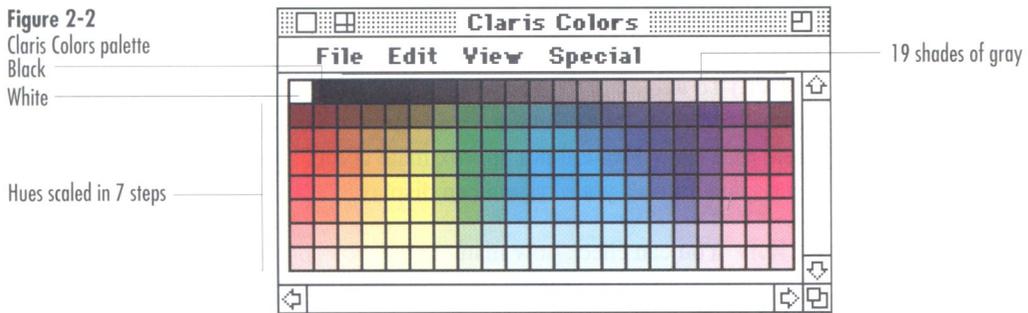
Figure 2-1
MacDraw Pro Style and Color palettes



After you fill an object with a color, MacDraw Pro records the object's color independently from the colors in the palettes. Even if you change or edit the colors in the Color or Style palettes, the filled objects in the document retain their original colors. Editing or eliminating colors from the Color or Style palette does not directly change the appearance of objects filled with those colors.

Color Palettes

MacDraw Pro comes preset with the Claris Colors palette ready for use (figure 2-2).



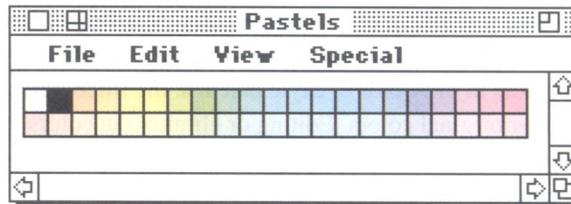
The Claris Colors palette has 168 colors, including white, black, and 19 shades of gray. The palette's colors are arranged in hues varied in equal steps.

You can customize the Claris Colors palette by adding new colors, changing or eliminating existing ones, and rearranging the order of the colors. For an explanation of the procedures used for editing and rearranging the cells of the Color palette, refer to chapter 5 in the *MacDraw Pro User's Guide*.

MacDraw Pro can have more than one palette of colors open at once; you can switch palettes to select different colors. You can create palettes of warm colors, cool colors, tints, shades, tones, and so on — organizing your palettes to suit your work (figure 2-3).

Figure 2-3

You can organize a selection of colors into a palette



Although MacDraw Pro displays one color palette in the Color palette window at a time, you can use colors from other palettes. When you switch palettes, some colors in a drawing may temporarily appear as approximated (dithered) colors. MacDraw Pro produces approximated colors by combining two colors to produce the look of a third color. (For more information about approximated colors refer to “Solid and Approximated Colors” in this chapter.) To avoid approximated colors, copy color cells selected from other palettes into one main palette for a document, or drag them into the Style bar. Then, MacDraw Pro will not approximate colors unless more colors appear in a document than your system can display.

- ◆ **Note** You can check how many colors you can use in a document by choosing About MacDraw Pro from the Apple menu and reading the Available colors display.

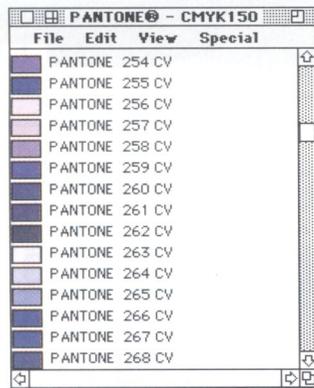
MacDraw Pro also provides additional color palettes that you can install and use. (Refer to the *MacDraw Pro Getting Started* manual for information about installation.) You can open and use these palettes as you work. Some of the color palettes supplied on the *Program 2* disk are:

- PANTONE palettes
- Apple System palette
- 16 Colors palette
- 100 Grays palette
- Special Color palettes
- Presentation Color palettes

PANTONE Palettes

You can use PANTONE colors to designate standard colors to appear in specific areas in a graphic. To specify colors using the PANTONE MATCHING SYSTEM, you use the PANTONE color palettes provided with MacDraw Pro. With these palettes you can precisely designate colors according to the PANTONE standards used by printers. You can also set the palette to display the colors accompanied by their standard printing-industry names (figure 2-4).

Figure 2-4
Pantone palette with colors displayed by names

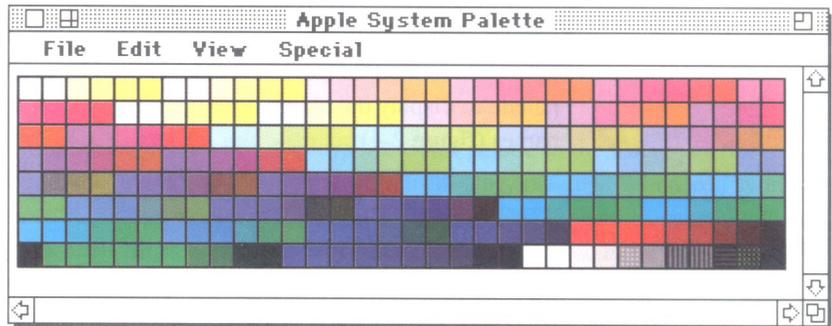


- ◆ **Note** If you don't have a 8-, 24-, or 32-bit color display card, your Macintosh may approximate some of the many PANTONE colors in the PANTONE palettes. Approximating on the screen does not affect the look of the printed color. When printed with a printer licensed to produce PANTONE color simulations, all PANTONE colors in a document will print according to their standard specifications.
- ◆ **Tip** To work with spot colors in MacDraw Pro, create a layer and place objects on it that you want to hold a specific PANTONE color. You can create a layer for each spot color used. Then you can print the individual layers and give them to your printer with instructions noting the PANTONE colors to be used.

Apple System Palette

The Apple System Palette displays the Apple standard 256 colors (figure 2-5).

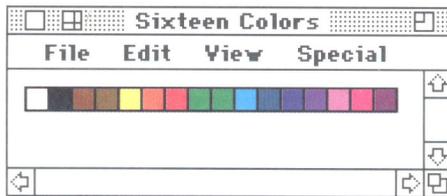
Figure 2-5
Apple System Palette



Sixteen Colors Palette

If you set your Macintosh to display 16 colors, use the Sixteen Colors palette for a balanced selection of 16 different colors (figure 2-6).

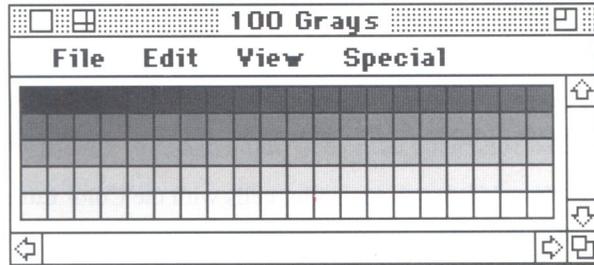
Figure 2-6
Sixteen Colors palette



100 Grays Palette

The 100 Grays palette provides a selection of 100 grays (figure 2-7). Use this palette when creating black-and-white documents.

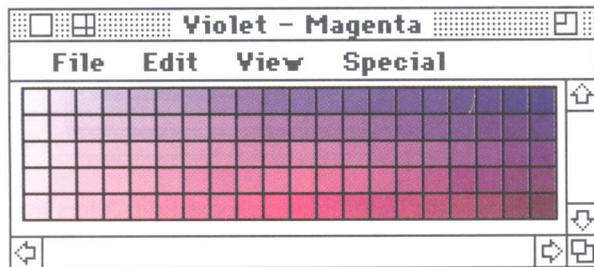
Figure 2-7
100 Grays palette



Special Color Palettes

Also provided are palettes with blends of specific colors, such as violet and magenta (figure 2-8).

Figure 2-8
Violet-Magenta palette

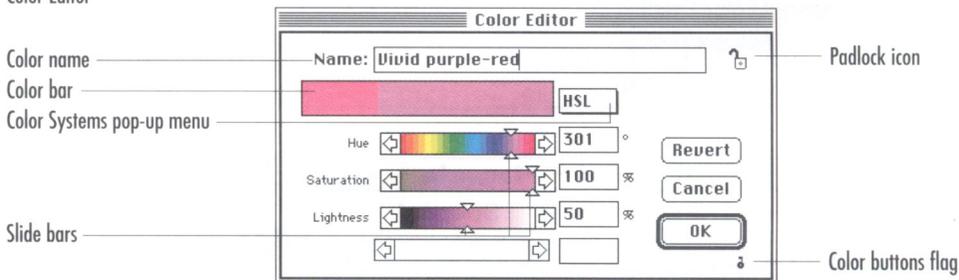


Creating and Editing Colors

You create new colors in the Color palette by adding color cells or by editing existing colors. You create new color cells by choosing New Color from the Color palette's File menu, or by copying and pasting color cells into a palette.

You change selected color cells with the Color Editor dialog box (figure 2-9).

Figure 2-9
Color Editor



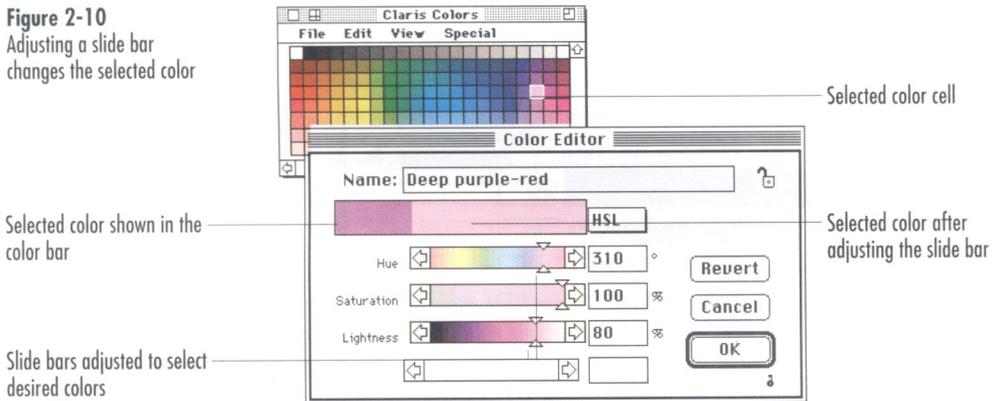
To display the Color Editor, choose Edit Colors from the Color palette's Edit menu, choose Colors from the Layout menu, or double-click the color cell you want to edit in the Color palette.

You use the Color Editor and the Color palette together. You can select a color in the Color palette, edit it with the Color Editor, and then select other colors in the Color palette for editing. As you edit a palette, you can keep the Color Editor open on the screen until you no longer need it. When your color editing is complete, click OK to accept your color changes and the editor disappears. (The Color palette also disappears if it was not previously displayed.)

When you select a color for editing, the Color Editor automatically selects the color system last used to specify the color's components. As you work with the Color Editor, each slide bar represents a color component for the current color system, such as hue, saturation, or lightness (HSL color system).

The slide bars also show the colors you can obtain by adjusting each bar. You drag the handle of the slide bar to the position of the desired color. As you drag a slide bar handle, the colors shown in the other slide bars adjust to show the new available colors. If the color you want doesn't appear in a particular slide bar, adjust one of the other slide bars to produce the color (figure 2-10).

Figure 2-10
Adjusting a slide bar
changes the selected color

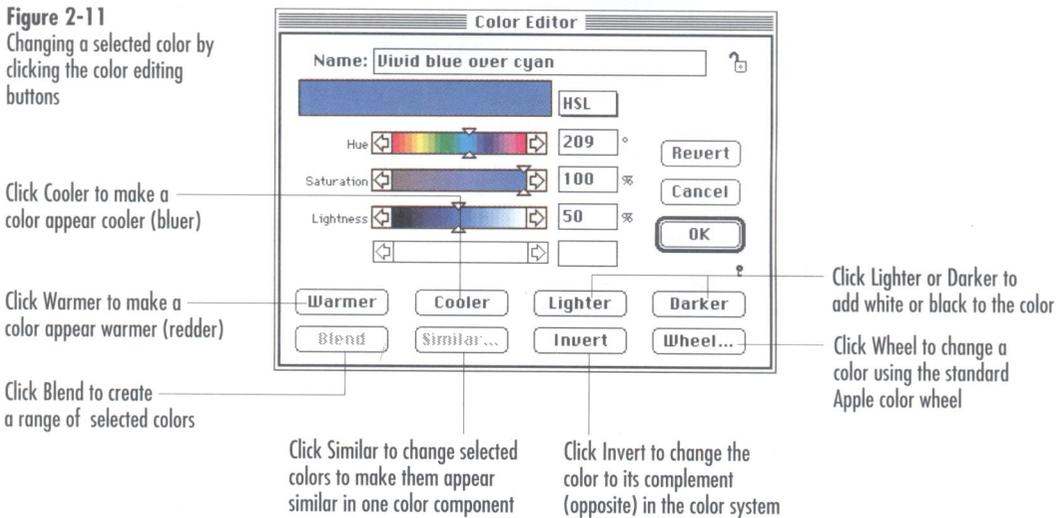


- ◆ **Note** If no colors appear in the slide bars (they appear gray), your document may be reaching the maximum number of colors available and the slide bars cannot show a full range of new color choices. This is also true if you have selected more than one color in the Color palette. Although the slide bars appear gray, you may still be able to create additional solid colors in your document until the maximum number of solid colors is reached.

As you edit a color, the color bar always shows you the original selected color and the result of your color editing. (If you select several colors for editing, the color bar shows all the colors you selected and the results of your editing.) You can also specify the exact amount of a color component by entering a number in the corresponding entry box.

If you prefer, you can use buttons in the Color Editor to change a color instead of using the slide bars (figure 2-11). You click the small flag at the bottom right corner of the Color Editor to display the color editing buttons.

Figure 2-11
Changing a selected color by clicking the color editing buttons



For an explanation of the procedures and other Color Editor options you can use to edit colors, refer to chapter 5 in the *MacDraw Pro User's Guide*.

- ◆ **Note** Switching color systems while editing a document doesn't change the appearance of a document's colors; it only changes the way in which they are defined in the Color Editor dialog box.

Editing Colors Using HSL

When you edit colors using the HSL color system, the Color Editor displays slide bars that you can use to change the hue, saturation, and lightness that make up the color (figure 2-12).

Figure 2-12
Color Editor set to HSL system

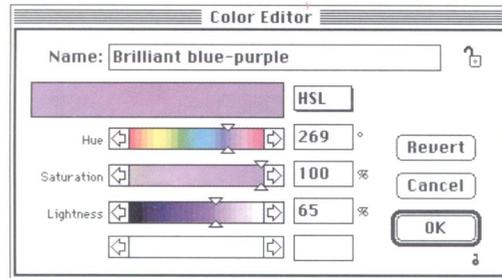
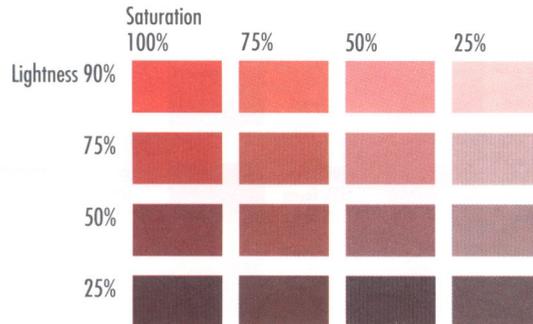


Figure 2-13 shows how changing the saturation and lightness of a color by different amounts affects a specific hue.

Figure 2-13
Changing a hue by varying its saturation and lightness

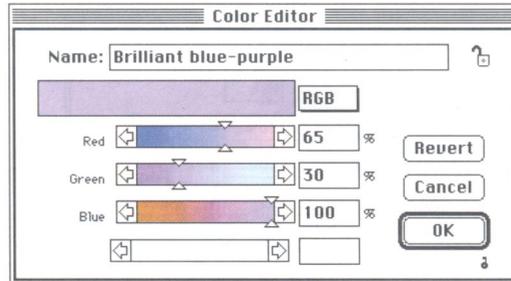


- ◆ **Note** The illustrations reproduced in this manual are printed approximations of HSL and RGB colors that you see on your monitor. The colors produced by printed inks do not always accurately reflect colors produced as light on the computer screen.

Editing Colors Using RGB

When you edit colors using the RGB color system, the Color Editor displays slide bars that change the percentage of red, green, and blue that make up the color (figure 2-14).

Figure 2-14
Color Editor set for RGB system



You change a color by adjusting the slide bars to different percentages of each component. Use this table to help you determine which components to change when editing colors in RGB. Figure 2-15 shows the percentages of red, green, and blue required to produce different basic colors.

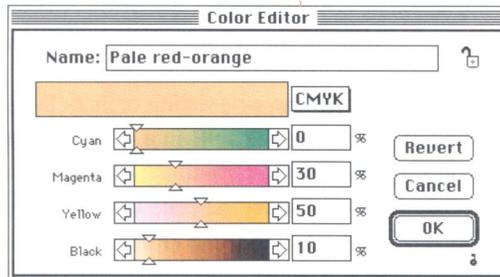
Figure 2-15
RGB color table

75% Red 40% Green 100% Blue		40% Red 0% Green 80% Blue		0% Red 40% Green 80% Blue		30% Red 65% Green 100% Blue	
100% Red 30% Green 75% Blue		100% Red 35% Green 10% Blue		0% Red 40% Green 20% Blue		0% Red 80% Green 10% Blue	
100% Red 0% Green 0% Blue		60% Red 0% Green 0% Blue		40% Red 20% Green 0% Blue		100% Red 100% Green 10% Blue	

Editing Colors Using CMYK

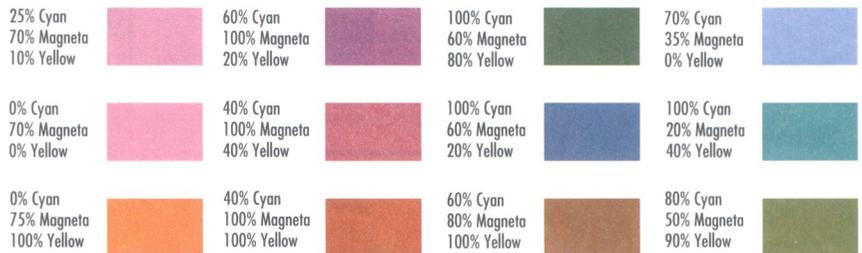
When you edit colors using the CMYK color system, the Color Editor displays slide bars that you can use to change the percentages of magenta, yellow, cyan, and black that make up the color (figure 2-16).

Figure 2-16
Color Editor set for
CMYK system



To help you determine which components to change when editing color in CMYK, figure 2-17 shows the percentages of magenta, yellow, and cyan required to produce different basic colors.

Figure 2-17
CMYK colors



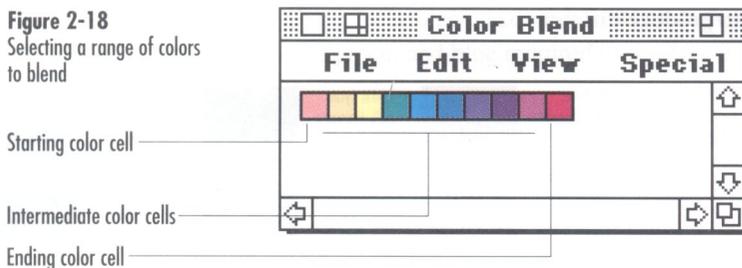
The printing industry uses color charts to specify the various percentages of cyan, yellow, magenta, and black inks used to produce specific colors. You can also use these charts to guide you when specifying colors in the MacDraw Pro Color Editor. The charts are often available from film or printing vendors.

Creating a Range of Colors with Blend

MacDraw Pro can automatically create a range of colors that change from one color to the next in equal amounts. For example, you can have MacDraw Pro create a range of five different yellows that change from light yellow to yellow-orange in five equal steps. Blending colors allows you to create intermediate colors between a starting color and ending color that you select. You can create as many intermediate steps in a range as you want.

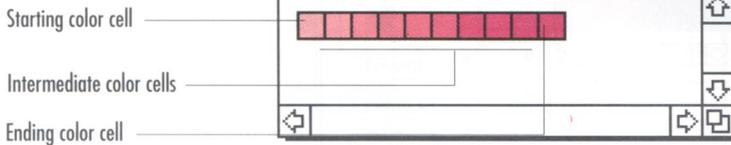
To create a blend, drag new or existing cells to hold the blend into position in the Color palette. Arrange the cells in a row or column beginning with the starting color, followed by intermediate color cells, and ending with the ending color cell. Next, select the cells to be blended including the starting and ending color (figure 2-18). (To create a blend, you must select at least three cells.) When you select cells, the starting and ending colors are the cells on the ends of the row or at the top and bottom of the column. You can select cells by Shift-clicking or dragging a selection box around the cells.

Figure 2-18
Selecting a range of colors
to blend



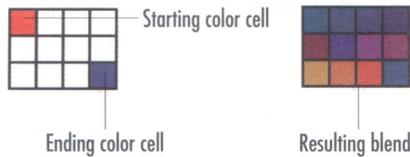
After selecting the cells, display the Color Editor (if it is not already displayed) and click the Blend button. MacDraw Pro fills the intermediate cells with colors that change in equal steps from the starting color to the ending color (figure 2-19). The more cells you place between the starting and ending colors, the more intermediate colors MacDraw Pro produces.

Figure 2-19
Resulting blend of colors



You can also select several rows or columns of color cells and blend them. MacDraw Pro creates a blend using the cell in the top left corner of the selected block of cells as the starting color and last cell in the lower right corner of the block as an ending color. All cells between the starting and ending color are filled with the blend (figure 2-20).

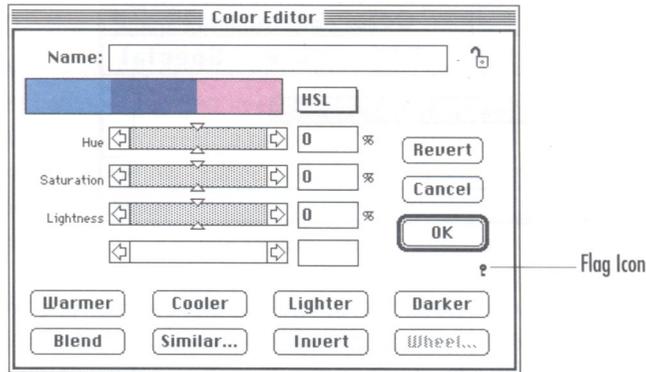
Figure 2-20
Blending a block of color cells



To create a range of colors:

1. Select the starting color, ending color, and intermediate cells that you want to fill with a range of colors.
2. Choose Colors from the Layout menu.
The Color Editor dialog box appears.
3. Click the flag icon to display the color buttons for editing (figure 2-21).

Figure 2-21
Color Editor with color
buttons displayed



4. Click Blend.

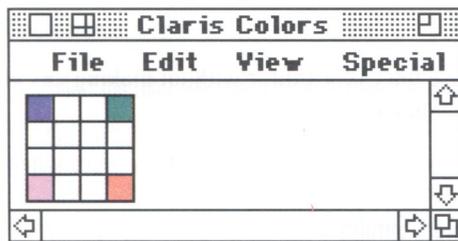
MacDraw Pro fills the selected intermediate cells with the range of colors.

5. Click OK.

- To close the Color Editor without making any changes to the selected colors, click Cancel.
- To restore the colors to the way they were when selected, click Revert.
- ◆ **Tip** MacDraw Pro blends the colors using the color system you have chosen. Different color systems will produce different blends of colors. For blends of the finest visual gradations, use the CMYK color system. To display gradients on screen with finely graduated color changes, blend colors and select the blended colors as the gradient's starting and ending colors.

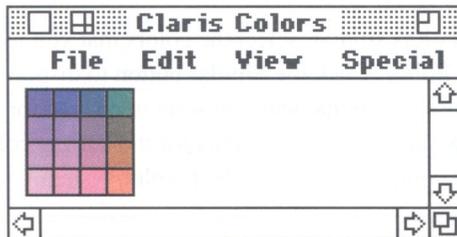
Creating four-corner blends You can create blends that change between four colors (instead of between a starting and ending color only). To create a blend based upon four colors (called a *four-corner blend*), you arrange four base colors in the corners of a block of cells (figure 2-22).

Figure 2-22
Block of cells selected for
blending



You then select the block and Option-click the Blend button in the Color Editor. MacDraw Pro calculates intermediate color steps between the four base colors and reproduces them in the cells in the block (figure 2-23).

Figure 2-23
Block of cells blended to
produce intermediate colors



To create a four-corner blend of colors:

1. With a color palette open, arrange four base colors in the corners of a block of cells and select the block.
2. Choose Colors from the Layout menu.
The Color Editor dialog box appears.
3. Click the flag icon to display the color buttons for editing.
4. Option-click Blend.

MacDraw Pro fills the selected block of cells with intermediate colors.

5. Click OK.

To close the Color Editor without making any changes to the selected colors, click Cancel.

To restore the colors to the way they were when selected, click Revert.

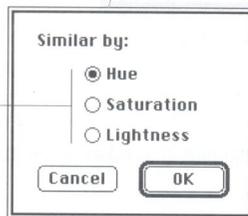
Making Colors Similar

With MacDraw Pro you can select a range of different colors and change them so that they appear similar. Colors appear similar because they are given the same amount of one color component of the color system. For example, using the HSL color system, you might change a selection of colors so that they all have the same saturation. The different colors will appear similar because they are alike in one component of the color system.

To make colors similar, select the colors that you want to change and display the Color Editor. Click the Similar button to display the Similar By dialog box. Choose the component you want to change for the selected colors. The dialog box shows the components for the current color system. Figure 2-24 shows the components for the HSL color system.

Figure 2-24
Similar By dialog box

Components for the HSL
color system



Click the button for the color component that you want the colors to share and then click OK. For example, to give the selected colors all the same saturation, you click the Saturation button. MacDraw Pro then calculates the average of that color component for all the selected colors and assigns that average value to each color.

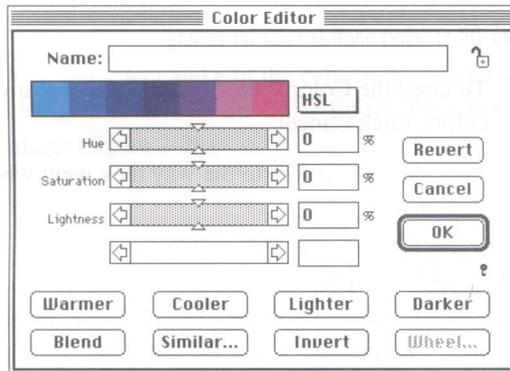
To create a range of similar colors:

1. Select the color cells that you want to make similar.
2. Choose Colors from the Layout menu.

The Color Editor dialog box appears.

3. Click the flag icon to display the color buttons for editing (figure 2-25).

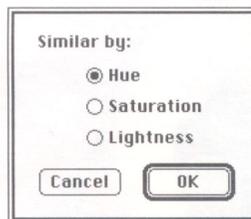
Figure 2-25
Color Editor with color
buttons displayed



4. Click Similar.

The Similar By dialog box appears (Figure 2-26).

Figure 2-26
Similar By dialog box



A button for each component of the current color system appears in the dialog box.

5. Click the button for the color component that you want all the colors to share.
6. Click OK.

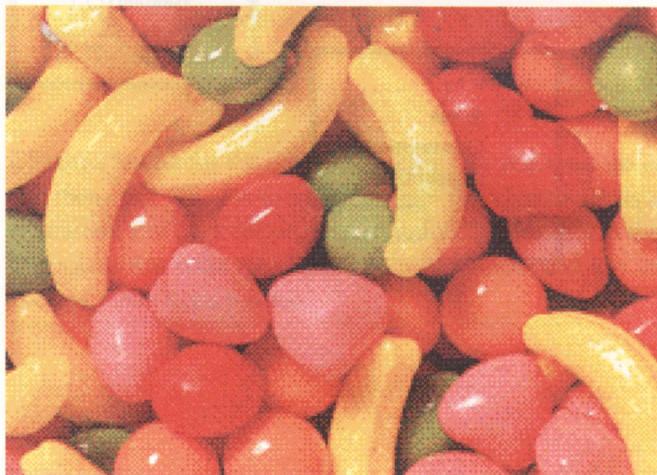
MacDraw Pro finds the average value of that component for the selected colors. It then assigns the average value for that component to all the selected colors.

7. Click OK or select another color for editing.
 - To close the Color Editor without making any changes to the selected colors, click Cancel.
 - To restore the colors to the way they were when selected, click Revert.

Changing Color in Imported Images

You can import color images that have been scanned or created in other applications (figure 2-27). Once the color image is imported as an object in the document, you can edit the colors in the image. For example, a scanned image might show red. If the particular red does not go well with the colors in a document, you can change the red to a violet or a different color.

Figure 2-27
Imported image

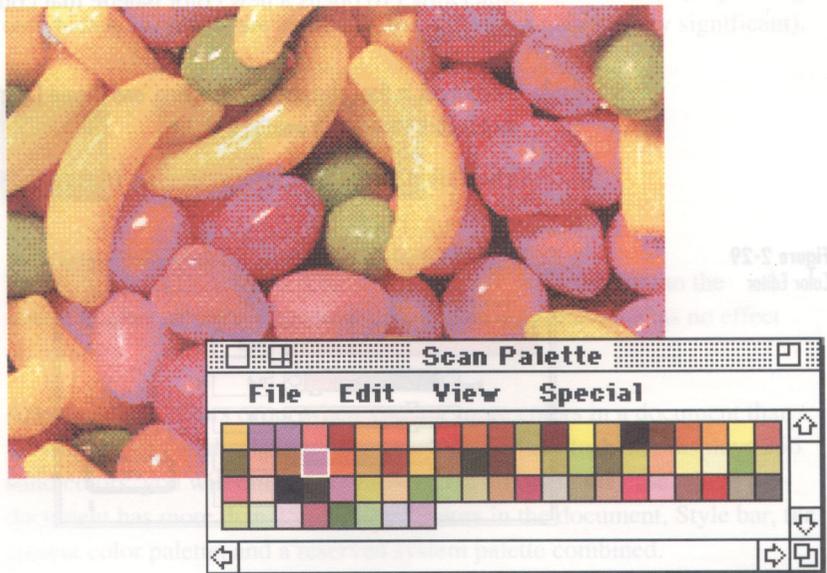


To change the colors in an imported image, select the image as an object and choose Image Colors from the Color palette's Special menu. MacDraw Pro analyzes the colors used in the image and creates a special Color palette whose colors are linked to the imported image. Each cell in the palette holds a color found in the image. You cannot add colors or delete them from this palette.

- ◆ **Note** A 24- or 32-bit color image can potentially have many thousands of colors. When you use Image Color to edit such an image, MacDraw Pro will create a palette of over 200 of the most used colors in the image. Slight color variations of a particular color may be represented as one color.

You can select and edit the cells in the palette with the Color Editor. As you change a color with the Color Editor, the color also changes in the color image (figure 2-28).

Figure 2-28
Editing a color cell in the palette changes that color in the image



When you edit a color, the edited color changes everywhere it appears in the image. For example, if a color appears in two places in an image, editing the color changes it in both places. Thus, by editing the different colors in the special palette, you change the colors in the imported image.

This special color palette becomes the current palette. Its name appears in italic letters in the palette's View menu. You can select other objects and fill them with colors from this palette. You can save the palette, copy colors from it, and then paste them into other palettes in the document.

To edit an imported color image:

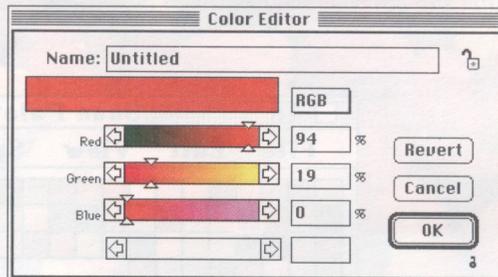
1. Select the imported image.
2. Tear off the Color palette and choose Image Colors from the Special menu.

MacDraw Pro opens a new color palette that contains the colors found in the image.

3. Select a cell in the Color palette for editing, and choose Colors from the Layout menu; or double-click the cell you want to edit.

The Color Editor dialog box appears (figure 2-29).

Figure 2-29
Color Editor



4. Edit the color.

For information about using the Color Editor to edit colors, refer to “Editing Colors” in this chapter.

5. Click OK or select another cell in the Color palette for editing.

The color changes you made appear in the imported color image.

Solid and Approximated Colors

Each palette can hold thousands of colors, limited only by the available memory of your Macintosh. If you use a color monitor with a 32-bit color card, 32-bit QuickDraw installed (refer to *MacDraw Pro Getting Started* for installation instructions) and your monitor is set to display millions of colors, all the colors in the palette will appear as solid colors. Other Macintosh configurations will show fewer solid colors (up to 256 solid colors for Macintosh computers with an 8-bit Apple color card). Other colors will appear as approximated colors.

The Macintosh produces approximated colors by mixing colors already on the palette in alternating dots on the screen. The mixing of two colors of dots, called *dithering*, creates nearly the same look as a solid color. However, you may notice a difference between a color produced as solid and the same one produced as an approximated color (figure 2-30). (Depending on which solid colors are available, the difference may be very significant).

Figure 2-30
Sample solid and
approximated color

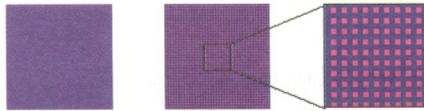


Illustration by Apple Computer, Inc.

The appearance of solid or approximated colors only pertains to the screen display of color. The display of approximated colors has no effect on printing.

Approximated colors occur when you use more colors in a document than the Macintosh can display on the screen. On a Macintosh that displays 256 solid colors, you will only see approximated colors in the case where a document has more than 256 different colors in the document, Style bar, the current color palette, and a reserved system palette combined.

If the number of solid colors in a document is near the maximum number that the Macintosh can display, changing the current color palette to a palette with different solid colors may produce approximated colors in the document. You can restore the approximated colors to solid by making the previous color palette the current Color palette again.

MacDraw Pro approximates the color assigned to an object by alternating two solid colors from the current Color palette, Style bar, or the reserved system palette. How closely the approximated color matches the desired solid color depends on the solid colors available in these palettes. MacDraw Pro selects the best color combination to approximate the color as closely as possible.

If you use palettes in which approximated colors appear, you may want to choose which colors appear as solid and which appear as approximated colors. You can select colors in the Color palette and convert them to solid by choosing the Solid command from the Special menu. Setting a color to solid instructs MacDraw Pro to give that color a higher priority to be a solid color than the other colors in the palette. Converting one color cell to solid can change an existing solid color cell to an approximated color.

To change a color to solid:

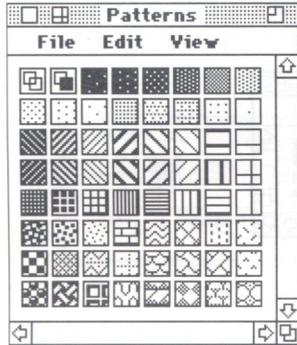
1. Tear off the Color palette.
2. Select the color you want to convert.
3. Choose Solid from the Color palette's Special Menu.

- ◆ **Tip** If you want certain colors to always appear solid, place them in the Style bar where MacDraw Pro can find them no matter which palette is current, or copy them into the Color palette you use most often. Also, you may want to eliminate unused solid colors from the current Color palette to allow you to create additional solid colors.

Color Patterns

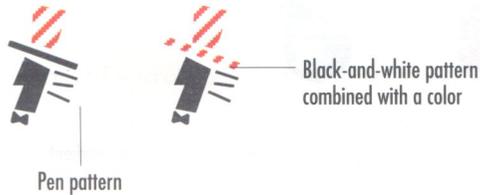
The Pattern palette provides a choice of black-and-white patterns (figure 2-31).

Figure 2-31
Pattern palette



MacDraw Pro also lets you combine a color with a black-and-white pattern to produce interesting effects (figure 2-32).

Figure 2-32
Objects drawn with color patterns



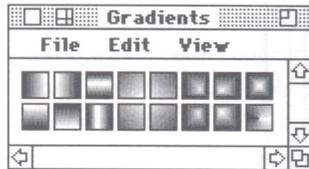
To create a pattern combination, fill an object with a black-and-white pattern from the Pattern palette. With the object still selected, select a color from the Color palette. MacDraw Pro will apply the color to the black portions of the black-and-white fill pattern. To eliminate the pattern combination, select the object and click the black color cell in the Style bar or Color palette to create a black-and-white pattern again, or click the solid pattern cell to create a solid color.

For more information about working with the Pattern palette and Pattern Editor, refer to chapter 5 in the *MacDraw Pro User's Guide*.

Color Gradients

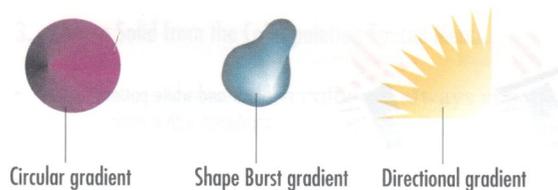
The Gradient palette can hold black-and-white and color gradients. The preset Gradient palette contains black-and-white gradients only. You can change the preset gradients, adding color to them, or create new gradients with colors of your choosing (figure 2-33).

Figure 2-33
Gradient palette



You can use the gradients as fill patterns as you draw and change objects. You cannot use them as pen patterns. You can create three kinds of gradients: Directional, Shape Burst, and Circular. Each type fills objects differently (figure 2-34).

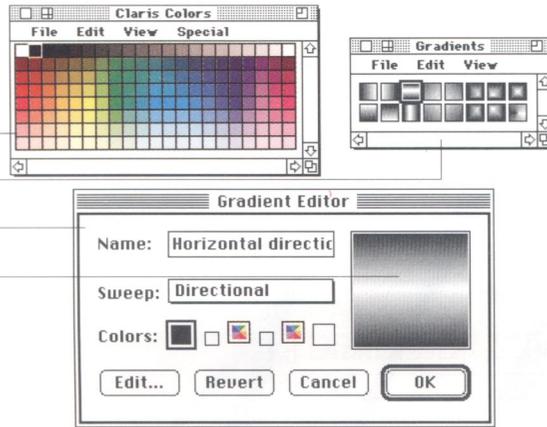
Figure 2-34
Objects drawn with color gradients



To create or edit a color gradient, choose Gradients from the Layout menu, or double-click a cell in the Gradient palette. The Color palette, Gradient palette, and Gradient Editor appear (figure 2-35).

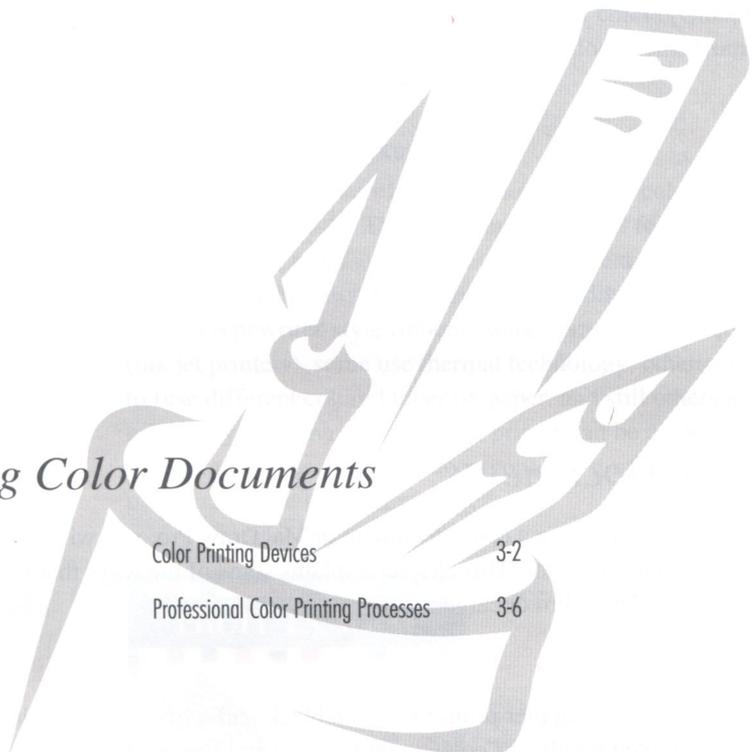
Figure 2-35
Color palette, Gradient palette, and Gradient Editor

Color palette
Gradient palette
Gradient Editor
Sample of edited gradient



With the Gradient Editor on the screen, select the type of gradient you want, and then select colors for it from the Color palette. When a gradient is to your liking, you can select another gradient in the Gradient palette for editing without closing the Gradient Editor. Once you have finished editing gradients and want to close the Gradient Editor, click OK to accept your changes.

For more information about working with the Gradient palette and Gradient Editor, refer to chapter 5 in the *MacDraw Pro User's Guide*.



Printing Color Documents

Color Printing Devices 3-2

Professional Color Printing Processes 3-6

Printing Color Documents

After creating a color document in MacDraw Pro, you will probably want to print it in color. This chapter explains some of the ways that you can produce MacDraw Pro documents in color.

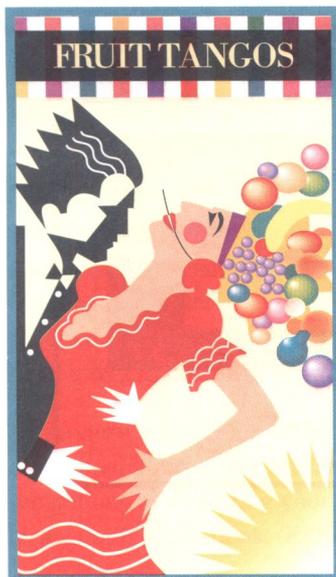
If your computer printer prints in black-and-white only, or if it prints with a limited number of colors, you have several options for producing high-quality color documents. MacDraw Pro can print color documents on many different types of printing devices, including direct color printers, film recorders for creating slides, and professional imagesetting devices. To use a specific kind of printer, you install the printer's printing resources into your System Folder. Then you can use the Print and Page Setup commands to print documents using the color printer's printing options. For information about installing printing resources and printing documents, refer to the manual that came with the printer.

- ◆ **Note** When printing a color document with a black-and-white PostScript printer, such as the LaserWriter, you can print your document in shades of gray by selecting the Color/Grayscale option in the Print dialog box. A Macintosh that displays black-and-white only, such as the Macintosh SE or Plus, doesn't support full-color printing on color printers; however, you can print using a limited number of colors (QuickDraw colors). For best color printing results, print color documents from a Macintosh capable of displaying full color.

Direct Color Printing Devices

Some computer printers are capable of creating color images printed directly on paper (figure 3-1). These printers are useful for printing color overhead transparencies, proofs, or a final version. The technology used to print color varies among printers. For example, some direct color printers use simple colored typewriter-style ribbons, some spray different color inks on the page (ink jet printers), some use thermal technology, others use laser technology to fuse different colored toner on paper, and still others use a process of mixing dyes. Using a direct color printer can be a good way to produce limited quantities of a color document, but it may be an expensive choice for producing more than a few copies.

Figure 3-1
Color image printed with a
direct color printer
(simulated)



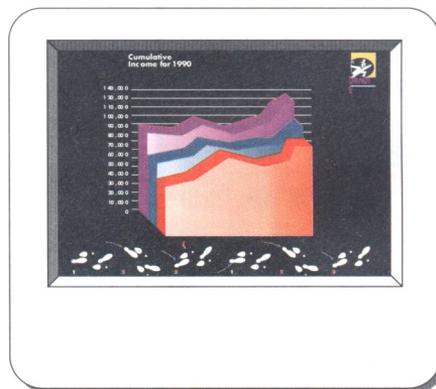
Printing Slides with a Film Recorder

For interesting and effective presentations, you can display MacDraw Pro color graphics as slides. You have two display options when you work with MacDraw Pro documents as slides. You can display your slides on the Macintosh screen, or you can use a film recorder to create actual slides for a slide projector.

After creating slides, you can run a slide presentation directly on the Macintosh; or you can use a large-screen projection device that displays an enlarged image of the Macintosh screen. Then, you can use keyboard commands to display the MacDraw Pro slides one by one on the Macintosh. The *MacDraw Pro Quick Reference Guide*, *MacDraw Pro Help System*, and chapter 7, in the *MacDraw Pro User's Guide* provide a list of command keys you can use to give presentations.

You can also print MacDraw Pro color documents as 35mm slides that you can display with a standard slide projector (figure 3-2). To produce standard slides, you attach a computer film recorder to the Macintosh to expose the images of the MacDraw Pro slides on slide film. This film can then be developed and mounted as slides. Most film recorders can reproduce the brilliant screen colors of MacDraw Pro documents with great accuracy. If you don't have access to a film recorder device, many service bureaus can also create 35mm slides from your MacDraw Pro documents.

Figure 3-2
Color slide produced from a
MacDraw Pro document
(simulated)

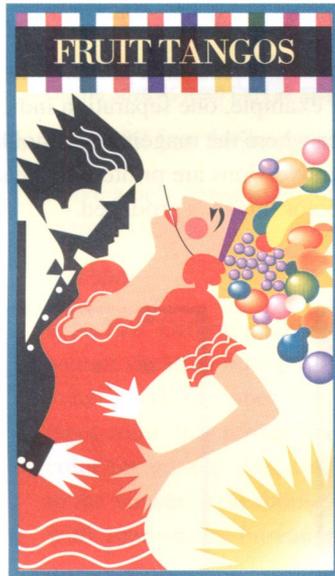


Printing a Color Image on an Imagesetter

To produce many copies of a full-color document with high-quality color, you may consider using a professional printer.

You or your printer can print color-separated MacDraw Pro documents using a PostScript imagesetter (3-3).

Figure 3-3
Color document produced
with an imagesetter



Because imagesetters print images with very high resolution, your MacDraw Pro document can be reproduced with highly defined detail that a commercial printer can then print in vivid color. Although commercial printing is an added cost, the printer can produce thousands of copies of your MacDraw Pro documents.

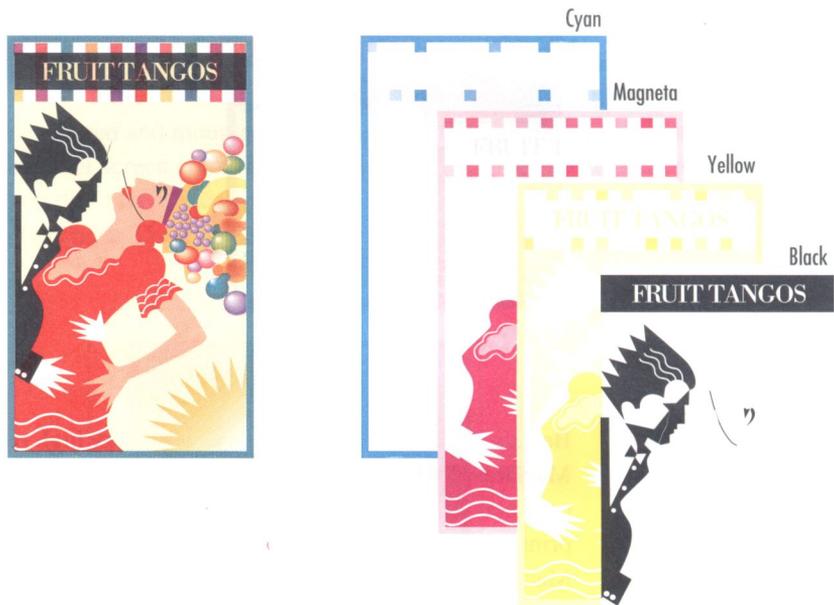
To produce a full-color printed document, you or your printer must create color separations of the MacDraw Pro document. You can create the color separations by exporting your document to a page layout application that can create color separations. (Refer to page 3-7 for step-by-step procedures.)

Professional Color Printing Processes

To produce color images, commercial printers use a process of overprinting an image several times with different color inks. Each time color ink is printed over an image, the ink must print in the right location and in the right amount so that a combination of different inks produces the desired colors. To produce a four-color image, printers print an image four times with ink that is cyan, magenta, yellow, and black. To print just the right amount of ink in the right places, printers use color separations.

A color separation shows the areas in a graphic where one color ink should print (figure 3-4). For example, one separation indicates where the cyan ink should appear, another where the magenta ink should appear, and so on. When the four different versions are printed on the same page, using the four different inks, a full-color image is produced.

Figure 3-4
Color images are printed by creating color separations that represent cyan, magenta, yellow, and black inks



Creating Color Separations

To create color separations, you transfer a document to another application that creates color separations, or give an electronic copy of your document to a printer to create color separations. You must save the document in the EPSF (Encapsulated PostScript) format. You can then open the EPSF file with the other application or give it to a printer with a PostScript imagesetting device to print the EPSF file as color separations.

To create an EPSF file of your document:

1. Choose **Save As** from the **File** menu.
2. Choose **EPSF** from the **Show pop-up** menu.

Give a new name to the document, if you like, by typing one in the name box.

3. Click **Save**.

Important Different equipment or processes (xerography, photography, web or sheetfed lithography, intaglio, gravure, or flexography), different materials (film, paper, board, or plastic), and different design properties (spot color, line screen count, or undercolor removal) can affect the way color separations need to be made, and the way the color image can appear to the viewer. You should know these requirements in advance, or consult with your service bureau, film vendor, printer, or a professional advisor.

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