DELUXE

Paint II

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MANUAL

FOR YOUR AMIGA

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Dan Silva's interest in computers and computer graphics dates back to the early sixties, when he was working towards his Master's degree in Mechanical Engineering at Stanford University. At that time he was using a computer to synthesize kinematic linkages, such as robot arms and universal joints. Like most computer programmers during that time, Dan was using the computer to avoid computational tedium, with no inkling that it would one day become a tool for self-expression and creativity.

He began to realize the computer's potential for creative self-expression during his four years with Informatics, a contractor to the NASA Ames laboratory. During his spare time there, Dan wrote an interactive language for displaying mathematical equations as graphic images. Like many computer programming pioneers, Dan did his most interesting work after hours, when the computers would otherwise have been sitting idle.

It was in 1978, when he started working for Xerox (doing user interface design for the Xerox Star system), that Dan realized he could make a living having fun with computers. There followed a year at the newly formed computer group at Lucasfilm designing a video editor, and then back to Xerox, where he worked with Bill Bowman creating a next generation bitmap editor. This effort produced Doodle, a Black and White paint program running on the Xerox Dandelion computer.

By the time Dan joined Electronic Arts in 1983, he had a clear idea of how the ideal paint program should behave. With this in mind, he started work on Prism, a paint program that was to be an in-house tool for software development. Needless to say, as Prism grew, so did its marketplace potential, especially with the advent of Commodore's Amiga and its thirst for powerful software. **DeluxePaint** was released in November, 1985, and became an instant success, achieving greater than 50 per cent market penetration among all Amiga owners.

Dan started work on **DeluxePaint II** almost immediately, without even pausing for breath. Software schedules being what they are, he had to wait until he started work on the second version before adding the features he wanted to include in the first.

Dan and Patricia live in Mill Valley, California with their 18-year old cat Pansy. Dan takes advantage of long compile times to keep in practice on the piano and guitar, and enjoys hiking, bicycling and playing Go.

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Welcome to the world of computer-generated art. ***DeluxePaint*** *is a graphics tool that can help you create works of art with an ease and precision that you may never have thought possible. After spending a little time with this manual, you will be able to create colorful graphics in a fraction of the time it would take you using more traditional techniques. You will learn how to create perspective effects, how to create and save your own custom brushes, how to mix your own color palette from a universe of 4096 possible colors, and how to create simple but effective on-screen animations, to name just a few of* ***DeluxePaint****'s powerful features.*

You don't have to read every word of this manual to become a proficient **DeluxePaint** user. We have organized the information so you can find what you need quickly and easily, and in a form best suited to your style. For example, you can learn by working through the tutorials in Chapter Three, or you can dive right in, and refer to Chapter Four, the reference section, for answering any questions that might arise. At the very least, however, you should read the section entitled "About This Manual" at the end of this Introduction, so you will know where to find the information you need. After that, you should feel free to use the manual as you see fit. Remember, however, that the more you read, the more you will get out of the program.

WHY COMPUTER GRAPHICS?

If you are new to computers or computer graphics, you may wonder what advantages **DeluxePaint** can provide over the more traditional media. To begin with, **DeluxePaint** does not pretend to be a substitute for every kind of graphic medium. After all, there will always be a place for fine oils on canvas, or for sculptures fashioned from Italian marble. What **DeluxePaint** can do, however, is help you create prototypes of your designs quickly and easily, letting you move from inspiration to execution in minutes instead of hours. Indeed, if Leonardo Da Vinci were alive today, he would probably be using **DeluxePaint** to design his masterpieces and inventions. And if so, his reasons would undoubtedly include the following:

First, **DeluxePaint** lets you do things that would be difficult, if not impossible, using traditional methods. For example, you can pick up any part of a picture and rotate it or flip it to create its mirror image. You can shrink and expand an image on the screen until it is just the right size, and then place it where it looks just right. Or you can create a mathematically precise tonal range just by specifying the beginning and ending shades and the number of steps in between.

Second, **DeluxePaint** is just like a word processor for graphic art. You can move images from one part of the picture to another, or you can copy an image and paste it in various places in your picture. You can create a forest of leaves just by drawing a single leaf and pasting it throughout your picture, or you can create clumps of leaves and paste *those* throughout your picture. In addition, you can make global changes to your artwork with ease. For example, if you decide that the blue border around a picture should be red, or that the flesh tones should contain a shade more tan, you can make the changes for the entire picture at one time, without having to do it element by element. Having created an element once, you don't need to create it a second time if all you want to do is change one or more of its characteristics.

Third, because you can save all your work on disk, you can build up a library of images or clip art to use in future designs, without having to create everything from scratch each time. And because you can save versions of your picture as you go, you can always return to an earlier state of a design and pick it up from there, if you like. Finally, because you can print as many originals of a picture as you need, or make unlimited copies of your data disks with no degradation from one generation to the next, there need never be just one original of a picture to lose or spill coffee on.

Because of **DeluxePaint**'s ability to take you beyond traditional media, you will find yourself developing a "new way of seeing," a new approach to graphic art. Beginning landscape artists are sometimes advised to view the scene upside down between their legs to eliminate any extraneous factors brought about by past associations. In a similar fashion (although you may not want to go so far as to stand on your head), you can save yourself hours of tedium by finding new and more efficient ways to create old effects. We will be exploring some of these techniques in Chapter Three, but after a little experience you will be able to come up with your own. **DeluxePaint** is the kind of software that invites experimentation, so you should feel free to play around with its various tools and effects. Remember, you can't hurt anything by experimenting with the software, and you may even discover an artistic side you never knew you had.

ABOUT THIS MANUAL

If you are new to computer graphics, we suggest you begin with Chapter One, "A Guided Tour," where you will be introduced to computer graphics and to **DeluxePaint**'s fundamentals. There you will learn how to start the program and how to save and load your pictures. You will also learn about some of **DeluxePaint**'s tools and techniques through simple exercises. If you are a beginning computer graphics artist, you will get the most out of the program by starting there.

If you already have some experience with graphics programs, you may want to begin with Chapter Two, "The Elements," which describes each of **DeluxePaint**'s elements and explains how they interrelate. Each of the six elements (the Brushes, the Screen, the Palette, the Tools, the Painting Modes, and Text) work together to give you the power and versatility you need. There you will learn how to create your own brushes, how to mix your own palette from a universe of 4096 colors, how to customize tools, and how to mix text and graphics.

No matter what your level of expertise, Chapter Three, "Tutorials," will help you understand some of **DeluxePaint**'s more complex features. These tutorials, designed with the assistance of professional **DeluxePaint** artists, concentrate on the more advanced uses of the program, such as the use of stencils (or *friskets* in the parlance of airbrush artists), color mixing, perspective, and color cycling to create simple animation effects. The short time you invest working through these tutorials will pay off with interest when you become a proficient **DeluxePaint** artist.

If you are already familiar with **DeluxePaint**, or if you prefer to jump straight in without reading the documentation, Chapter Four, "Reference" can answer any questions you may have. Chapter Four documents every one of **DeluxePaint**'s features by menu item, keyboard command, and tool icon. If you need a quick reference to any of **DeluxePaint**'s features, you can find it there.

Finally, we have included a set of appendices to provide you with background information about the program. Appendix A provides information about memory usage and other technical aspects of the program, while Appendix B deals with hardware considerations.

NOTES

NOTES

DeluxePaint *has much to offer any user, whether amateur or professional. If you are new to computer graphics and to DeluxePaint, this section will introduce you to the new graphic medium through simple step-by-step exercises. Here you'll learn how to create some simple designs using the built-in brushes and tools, and how to save a picture onto a data disk.*

1 GETTING STARTED

SOFTWARE

Your **DeluxePaint** disk has two parts: the *program*, the set of instructions that tells the computer to behave like a graphics workstation, and the *data*, a collection of images you can use in your work. These images are stored in a collection of drawers, labeled in accordance with the images they contain. As we shall see shortly, you access these images by first specifying the drawer, and then specifying the image. You can save your work to disk in the same way.

HARDWARE

To use **DeluxePaint** you will need an Amiga, a monitor, and (if you are using an external drive) some initialized blank disks for saving your work. With an external drive you can keep the program disk in the internal drive and your data disk in the external drive, thus giving you more storage capacity for saving your work. Finally, if you intend to print the files you create, you will need a color printer. Consult your Amiga Users Guide for information about connecting printers and other peripherals to the Amiga.

ORGANIZING YOUR DISKS

We assume that you already know how to copy disks, how to delete files, and how to move them from one disk to another. If not, we suggest you consult your Amiga Users Guide before going any further.

The first thing you should do is to make one or more working copies of your **DeluxePaint** disk to reduce the chance of anything happening to

the original. Your Amiga Users Guide has information on making copies. If you are using just the Amiga's internal drive, you should make at least two working copies of your original disk. Keep one copy as is, with all its images intact; we will be looking at some of these in the Guided Tour and in the Tutorials. Remove all the files from the second copy to make room for your own work. Remove just the files, and keep all the drawers intact, by "dragging" the files into the Trash. You can put the stripped-down copy aside for now — you won't be needing it until later when you start saving your work.

If you are using an external drive in addition to the internal drive, make just one copy of your program disk, and leave all its files intact. In that case, you will need to have one or more blank initialized disks handy for saving your work. Your Amiga Users Guide has information on initializing disks.

POWER UP

When you are ready to go, just follow these instructions:

- Insert your Kickstart disk (see your Reference Card for details) in the internal drive and turn on the computer. When the request for the Workbench disk appears on the screen, eject the Kickstart disk and insert your working copy of **DeluxePaint**. (If you are using a two-drive system, put your working copy of the program in one drive and the original in the other; after the program has loaded, you can eject the original and replace it with your data disk.)

The drive will spin for a few seconds, and then the **DeluxePaint** disk icon will appear at the top right-hand corner of the screen.

- Double-click the disk icon (move the pointer onto the icon and press the left mouse button twice in quick succession) to open the disk window.

Note that the disk window contains the **DeluxePaint** program icon (the one that looks like a can of paint) as well a number of drawers containing ready-made images.

- Double-click the **DeluxePaint** program icon to start the application.

If you are using a single drive, you will receive a message asking you to insert the original disk. In that case, eject the copy and insert the original. This process (which is known as the keydisk system because the original disk is the "key" that unlocks the system) allows **DeluxePaint** to read a code from the original disk to make sure that your copy is legitimate. When the drive stops spinning (and the drive light goes out), you can eject the original and put it back into storage. You won't be needing it again for the rest of the session. If you prefer, you can start with the original disk in the drive, and then replace it with the copy when the program has loaded.

This time when the drive stops spinning you will see a *requester* (a window that requires some input from you) inviting you to select a screen format. We'll be looking at some of these options later, but for now note that three of the settings are already highlighted ("Lo-Res," "32" and "Screen Size Page"). These are the *default settings*, the ones the program automatically uses unless you specify otherwise.

☛ Click OK with the left mouse button to tell **DeluxePaint** to use the default settings.

This last command brings us to the Painting Screen, with the painting area or page on the left and the Toolbox and Palette on the right (see Figure 1.1). If this is your first time, we recommend you work through the following section, where you will learn how to use many of **DeluxePaint**'s tools and techniques. If you are already acquainted with **DeluxePaint**, you may wish to skim this section to make sure you understand the basics of the program.

2 GETTING ACQUAINTED

THE PALETTE

The Palette, the selection of 32 shades (four columns of eight shades each) at the bottom right-hand corner of the screen contains a representation of the color spectrum as well as a 12-shade grey scale. (If you are using an Amiga with less than 512K of memory, or if you are using a screen resolution other than the default, you may have fewer than 32 colors available.) Note that the top color in the first row is the same as the color of the painting area to its left. This is the default *background* or *page* color, so called because it is the color of the imaginary "page" you are painting on. If you were to paint with the background color directly onto the background, it would appear to have no effect, as if you were putting white paint onto a white canvas. As we shall see in a moment, painting with the background color is a way of erasing an image on the page.

Directly above the Palette you will notice a filled circle sitting on a rectangle of background color. This circle is the *foreground* or *brush* color, and tells you which of the 32 colors your brush is currently loaded with. You can change this color at any time by clicking one of the other shades in the Palette with the left mouse button. Try it. Move the pointer to one of the colors in the Palette and click. Note that the circle above the Palette changes to show the new brush color. Click the other colors and see how the circle changes each time.

You can do the same thing with the background color, by clicking with the right mouse button. Move the pointer to one of the colors in the Palette and click the right button. Note that although the rectangle surrounding the circle is now filled with the new background color, the painting area itself is still the old background color. This is because **DeluxePaint** assumes that you want to maintain the old background color as a "wash" over the new background color, and will keep it there until you clear the painting area. Try it now. Click the button labeled CLR directly above the Palette. This clears the screen of the old background color and replaces it with the new one.

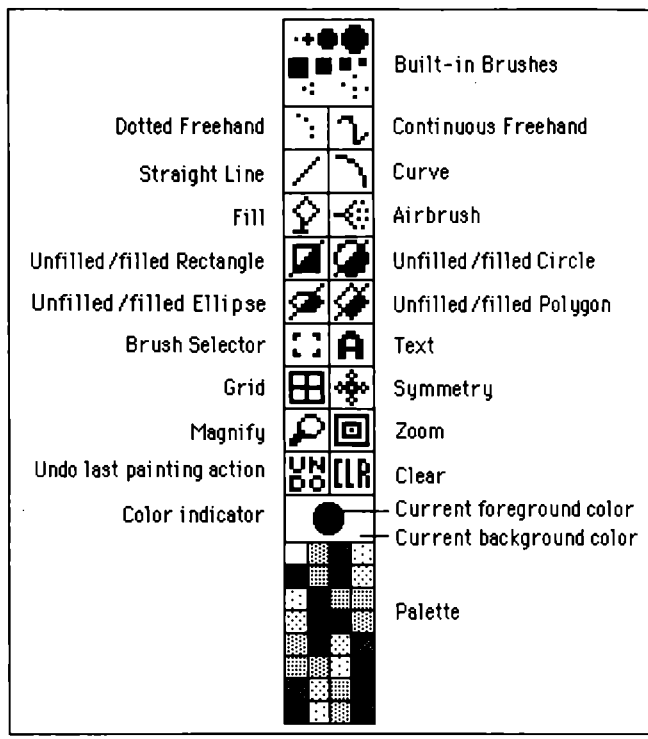


Figure 1.1. Toolbox and Palette

Before you do anything else, let's get acquainted with one of the most important tools in the Toolbox, the Undo button. Located to the left of the CLR button, the Undo button will generally "undo" your last action, and is a hedge against potentially disastrous mouse clicks. Click Undo now to bring back the old background color. As a general rule, Undo reverses your last action, provided there has not been an intervening mouse click, so if you were to click CLR twice, for example, clicking Undo would not reverse the clear command.

PAINTING WITH THE LEFT SIDE OF THE MOUSE

Now that we've seen how to choose colors from the Palette, let's put brush to paper and create our first freeform drawing. Select a foreground and a background color by clicking with the appropriate buttons on the palette. Choose contrasting colors, such as blue for the foreground and yellow for the background. Click CLR to cover your page with the background color.

Move the pointer over to the page (where it turns into a crosshair) and, while holding down the left mouse button, draw a figure on the screen. Don't worry about quality for the moment — a squiggly line or a rough circle will do. Now press the right mouse button and draw over your first figure. Note that the right mouse button has the effect of erasing your drawing, although what you are actually doing is painting over it with the background color. The rule here is simple: use the left mouse button for painting with the brush color, and the right button for painting with the background color. Notice that this parallels the rule we noted above for selecting colors from the Palette: select the brush color by clicking with the left button and the background color by clicking with the right button.

Practice drawing with the mouse for a while. Remember, you can always click Undo to reverse your last action, or CLR to clear the screen and start afresh. As soon as you're ready, let's move on to the next section, where we will be examining **DeluxePaint**'s collection of brushes and tools.

THE TOOLBOX

THE BUILT-IN BRUSHES

DeluxePaint includes ten built-in brushes: four round ones, four square ones, and two made up of a number of separate *pixels* (a pixel, short for *picture element*, is the smallest unit observable on the screen). The built-in brushes are at the very top of the Toolbox (refer to Figure 1.1). To select a brush, move the pointer to the top of the column and click one of the brush shapes with the left mouse button. Note that clicking a brush shape highlights it, indicating that it is the currently selected brush. As we shall see, this convention applies to all the other tools, as well as to the currently selected foreground color in the Palette.

With your new brush selected, go ahead and paint as before, using the left button to draw with the brush color and the right button to draw (or erase) with the background color. If you haven't already done so, try the three- and five-pixel brushes (the ones below the eight solid brushes) and see what they can do. In the next section we will be looking at the other drawing tools and seeing how they interact with the brushes.

THE TOOLS

The ten icons below the brushes (in two columns of five) control the drawing tools that work in combination with the brushes and the Palette. Because any brush can operate with any given tool, you have a wide variety of brush combinations at your fingertips. We'll describe the tools in order, moving left to right and top to bottom:

THE DOTTED FREEHAND TOOL allows fast freehand drawing. No matter how fast you draw with this tool, it keeps up with you, making it ideal for sketching out a shape quickly before concentrating on the intricate details. Note, however, that the faster you go, the bigger the gaps in your drawing. Once you have roughed out a shape with the Dotted Freehand tool, you can then refine your image using some of the other tools at your disposal. Try drawing with it using some of the other brushes to get a feeling for how it works.

THE CONTINUOUS FREEHAND TOOL. Because it produces unbroken lines, but doesn't keep up with you if you draw fast, the Continuous Freehand tool is better suited for slower, more painstaking drawing. Note, however, that the smaller the brush, the better it is at keeping up. Try it with different brushes and see how brush size affects speed.

THE STRAIGHT LINE TOOL lets you draw straight lines just by clicking and dragging the mouse. Here's how it works: First, click on the Straight Line tool to activate it, and then move the crosshair to the point on the page where you would like the line to begin. Now press the left mouse button to anchor the line at that point, and, while holding the button down, drag the mouse to the point where you want the line to end. When you release the button, you have a straight line in your selected brush color and brush size. Note that you can also draw straight lines with the background color by using the right mouse button.

THE CURVE TOOL draws curved lines between two points on the painting area. It works just like the Straight Line tool except that it requires an additional mouse click to complete the process. Here's how: First, anchor the curve by pressing the mouse button. Drag it to the point where you want the curve to end, and release the button. Now, as you move the mouse away from the endpoints, you'll notice that the line is still "active," behaving as though it were a rubber band attached to the crosshair. Accordingly, the line will curve to follow the crosshair wherever you drag it. As soon as the curve is the right shape, click the mouse button to freeze it at that position. With a little practice, you'll be able to make curves of any shape and size, giving you much more flexibility than any collection of plastic templates with their limited selection of shapes and sizes. Try joining a series of curves to make flowing shapes with changes in curve direction.

THE FILL TOOL fills any enclosed shape with the current foreground or background color. To use the Fill tool, click the icon with the left button, move the cursor (which now looks like a paintcan) to an enclosed shape, and click one of the mouse buttons. You can fill the shape with the current foreground color by clicking the left button, and with the current background color by clicking the right button. Note that the Fill tool fills all the way to the boundaries of an *enclosed* shape. If the shape is not completely enclosed (that is, if there is hole in its perimeter), the paint will "leak" through and fill the entire page. If this ever happens, you can stop the filling process by pressing the Spacebar. This nips any ongoing process in the bud and returns the screen to its pre-command state.

It is important to realize which part of the paintcan cursor is the spout — that is, which part of it needs to be within the enclosed shape when you give the fill command. This becomes important if you need to fill a shape smaller than the paintcan cursor itself. The paintcan's spout is the small (one-pixel) gap at the base of the icon. With careful maneuvering, you can fill a space as small as one pixel, so long as the spout coincides with that space.

THE AIRBRUSH TOOL is a full-featured airbrush with adjustable tips and nozzles. By using the Airbrush in combination with the different brushes, you can create a variety of effects, ranging from a fine one-pixel spray to a coarse spray made with the big brushes. In the following chapter we will see how to adjust the width of the spray, but for now let's try it as is. Click the Airbrush icon with the left button, and then try painting with it using the various brushes.

Try it with the three- and five-pixel brushes, and then try it with the big brushes. Note that, just like a regular airbrush, if you keep the mouse button pressed without moving the mouse, the paint continues to build up in one spot.

THE RECTANGLE TOOL lets you draw squares or rectangles, either unfilled or filled with the current brush or background color. Note that the Rectangle Tool icon has a diagonal line running from its top right to its bottom left corner. This is because it is actually two tools in one — the top left one creates unfilled shapes, while the one at bottom right creates shapes filled with the current foreground or background color.

Let's try making a few rectangles. Click the top left half of the icon with the left mouse button. Move the pointer onto the painting area (where it changes into a large crosshair), press the left mouse button to anchor one of the corners of the rectangle, and, while holding the mouse button down, drag the mouse away from the anchor point. You can drag the mouse down and to the right (in which case the first button press anchors the rectangle's top left corner), or in any other direction you wish. In any case, the rectangle is completed as soon as you release the button. Note that it is unfilled and bordered by the current foreground color. You can also create an unfilled rectangle bordered by the background color by using the right mouse button. First, click another color on the Palette with the right mouse button, and then make a rectangle using the right mouse button.

To create a filled rectangle, click the lower right part of the Rectangle icon and repeat the above procedure. This time, the rectangles you create will be filled with either the foreground or the background color, depending on which mouse button you press when you create the rectangle. Incidentally, if you hold down the Shift key as you draw, you can constrain the rectangle so that its height and width are equal. (*Note*: because the Amiga's pixels are not perfectly square, "constrained" rectangles will not appear square on the screen. You can compensate for this at the printing stage, or by selecting Be Square from the Prefs menu. See discussion in the Reference section under Prefs Menu.)

THE CIRCLE TOOL works like the Rectangle tool, above: click the top left part of the icon with the left mouse button to get an unfilled shape, or the bottom right to get a filled shape. Move to the painting area, then press and drag with the left button to create a circle with the current foreground color, or with the right mouse button to create a circle bordered or filled with the current background color.

THE ELLIPSE TOOL works just like the Circle tool, except that it is still "active" after you release the mouse button. Try it. Click the icon with the left mouse button (remember, top left for unfilled, and bottom right for filled shapes), move the pointer to the painting area, and draw an ellipse by dragging the mouse. Now release the button. Note that even though you have released the button, the ellipse continues to change shape as you drag the mouse around. By doing so you can make the ellipse any shape you like. As soon as it is just the right shape and size, click the mouse button. When you do so, the small crosshair changes into the large crosshair to let you know that **DeluxePaint** is ready for the next ellipse. Note that you can rotate the ellipse to any orientation by pressing and holding down the mouse button instead of clicking it. With the button held down you can rotate the ellipse about its center, releasing it when the orientation is just right.

THE POLYGON TOOL lets you keep drawing straight lines until you have created a closed figure. Here's how it works: click the Polygon tool with the left mouse button, move the crosshair into the painting area and click the button once to anchor the starting point of your polygon, and then a second time to complete the first line, as if you were using the Straight Line tool. This time, however, you will notice that your crosshair is still connected to the first line by a second straight line. Click the button again to finish that line, and so on until you have completed your polygon. The polygon is completed as soon as you click the button with the crosshair on your starting point. If you are creating a filled polygon, it will be filled with the current foreground color if you complete the figure with a left button click, and the current background color if you complete it with a right button click. Because it can sometimes be a little tricky to end up on the exact pixel you started with, you can complete a polygon at any time by pressing the Spacebar. This automatically connects the last anchored point to the point of origin and, if it is a filled polygon, fills it with the current foreground color. Try drawing some five-pointed stars with the filled Polygon tool and see what happens.

ANYTHING CAN BE A BRUSH

We'll skip over the rest of the tools for now, except one. (The remaining tools will be covered in Chapter Two.) The icon just below the Ellipse is the **Brush Selector** , a special tool that is an essential part of **DeluxePaint**'s versatility. With the Brush Selector, *anything*

can be a brush — any piece of artwork or text you put on the screen. To see it in action, click the icon, then move the cursor over to the painting area. Notice that your cursor is now a large crosshair that reaches to the edges of the screen.

Select one of the stars you made earlier by putting the center of the crosshair to the upper left of the star. Then, while holding down the left mouse button, drag the cursor to the lower right of the star, as if you were using the Rectangle tool to enclose the star in a box. When you release the mouse button, the cursor now has a copy of the star attached to it. This second star is your new brush! To stamp a star in a new location, click the left mouse button. There's no need to stop with one — go ahead and star-spangle the screen. We will be covering this powerful feature in greater depth in Chapter Two. For now, however, there is one aspect of brush selection you should be aware of: if any parts of your brush consist of the current background color, those parts will be transparent. In other words, whenever you pick up a brush, it's as if you are picking up only the non-background colors; any background colors in the brush will remain invisible even after you change to a new background color. This means that you can create brushes with intricate outlines without fear of picking up a rectangle of the surrounding background color.

Let's try one more trick. Click the Brush Selector again and select a star from the painting area, but this time use the right mouse button to drag the crosshair over the star. Unlike the last exercise, which yielded two stars — one unmoving original, plus the one on your brush — this time you are picking up and moving just the one star. While the first feature lets you copy and move anything on the screen, the second lets you to move images from one part of the screen to another, while leaving no trace behind.

3 GETTING GOING

SAVING YOUR WORK

Before we move on to the next chapter, where we'll be looking at **DeluxePaint**'s basic elements, let's see how to save and load the pictures (or "files") you create. First, let's learn how to save a file, just in case you feel that the recent exercises were a first step towards a masterpiece. Even if you don't feel quite this way about your creations, you might want to follow along for future reference.

DeluxePaint provides access to hundreds of additional features that are not constantly visible like the Palette and the Toolbox. These features (which include loading and saving, among others) are available through a series of menus that are activated by pressing the right mouse button while the pointer is at the top of the screen. No matter what mode you happen to be in, whether the cursor is a large crosshair or a paintcan, whenever you move the cursor to the white bar at the top of the screen, it changes into a pointer. Now when you press the right mouse button, you will see a new set of titles on the Menu Bar, the bar at the top of the screen. In addition, you will see one of the menus extending down into the painting area.

As you move your pointer from left to right along the Menu Bar, one after another of the menus extends down, each one displaying its selection of options. We will be looking at each menu item in detail later, but for now we just need to use the first two options on the leftmost menu, the Picture menu. So, with the right button held down, move the pointer all the way to the left on the Menu Bar to produce the Picture menu options. With the button still held down, move the pointer down to Save, the second item on the list of options, and release the button. This results in a *Save Requester* (see Figure 1.2).

It is through the Save Requester that you provide **DeluxePaint** with the information it needs to save your files. Let's take a closer look. First, notice that the top part of the requester contains a list of filenames. You can scroll through these filenames (not all of them are always visible at one time) by dragging the *elevator* (the white rectangle within a dark vertical column on the right side of the requester) up and down. Just point to the elevator, press the left mouse button, and drag it up or down. As soon as you release the button, the new filenames will appear in the window.

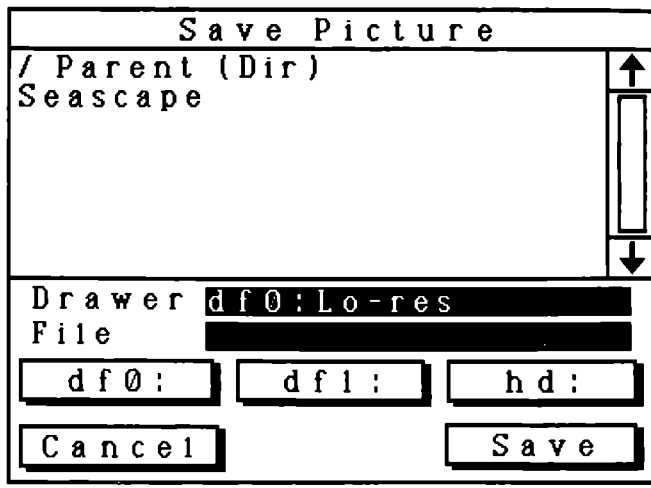


Figure 1.2. Save Requester

You can also scroll through the filenames one at a time by clicking the up and down arrows, or you can scroll one page at a time by clicking in the black areas above and below the elevator. Incidentally, note that the size of the elevator is a function of the number of filenames in that particular directory. For example, with a large number of filenames, the elevator is relatively small, to show that the ones currently visible are only a small percentage of the whole. On the other hand, if all the filenames are visible at one time, the elevator will fill the entire column.

The bottom half of the Save Requester consists of the additional information **DeluxePaint** needs in order to save the file in its proper classification. The first of these, Drawer, tells **DeluxePaint** which drawer to save the file in. By using drawers to classify your pictures, you can keep related images together, in the same way you keep related papers together in one file folder. In this case, the setting is df0: Lo-res, which means that the drawer exists on a disk in the internal drive ("df0") and that the drawer is named "Lo-res." Directly below this box (or *gadget* in Amigaspeak) is one labeled File. This is where you enter the name of your picture the first time you save it.

If you want to save your current creation, this is your chance to do so. If you are using only one disk drive, eject your working copy of the **DeluxePaint** disk and replace it with the stripped-down copy you made earlier. Now click anywhere in the File gadget, type in the name you have chosen for your new file, and click Save. If you are using two drives, put the data disk in the external drive, click df1: (to choose the external drive), click anywhere in the File gadget, and type in the filename. Click Save to complete the process. The disk drive will spin for a few moments; when the red light goes out, the file is saved.

The next time you save this file (it's a good idea to save work in progress every 15 minutes or so, so that a power failure or other breakdown doesn't turn hours of work into a bitter memory), the Save Requester uses this same information, which means you won't need to type anything more unless you want to change the filename. You might want to do this to save it under another name, if you want to save each version as a separate file. In that case, you would click the File gadget as before, backspace over the old filename (or over those parts you wish to change) and type in the new name. Or you could just keep adding suffixes, such as 1, 2, 3, etc., to signify succeeding versions.

You can specify drawer names in the same way: click in the Drawer gadget, backspace over the old name, and type in the new name. You can open any drawer already on the disk, but you cannot create one from the Save Requester. See your Amiga User Guide for information on creating new drawers.

LOADING A PICTURE

Now that we've seen how to save a file, let's see how to load one of the pictures on your disk. Let's load the one called **Seascape**. First, move the pointer up to the Menu Bar and to the left to the Picture menu. Press the right mouse button to extend the menu, and then select Load. This time you are presented with the Load Requester (see Figure 1.3).

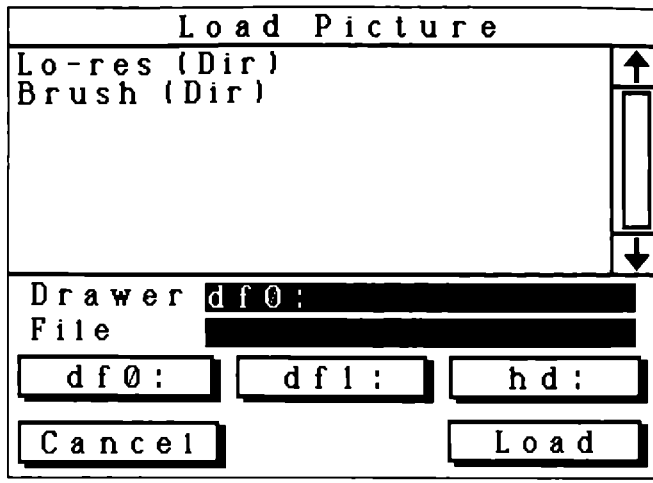


Figure 1.3. Load Requester

Note that the Load Requester is just like the Save Requester in almost every respect. To load a file, simply click on the filename in the requester window to put that name into the File gadget. Try it. Click on any name and watch it appear in the File gadget. Now click another name and watch it change. When you are ready, click the file **Seascape**, and then click Load. The disk drive will spin for a few moments, and then the picture will appear on the screen.

NIGHT AND DAY

Take a few moments to examine the picture carefully. Note, for example, that the Palette is different from the one we were using before. This is because the new picture comes with its own Palette, which supersedes the old one. You can revert to the Default Palette at any time through a simple menu selection. Let's try it now and see what happens. Pull down the Picture menu and drag the pointer down to Color Control. When you do, you will see a secondary menu appear to the right of the selected option. With the button still held down, move the pointer to the right and down the secondary menu until the option Default Palette is highlighted, and then release the button.

Did you see what happened? The new Palette was replaced by the Default Palette, making the picture change from night to day! If you want to restore the original Palette, return to the Picture menu, drag down to Color Control as before, and then to the right and down to Restore Palette. When you release the button, the Palette reverts to the original. This is just one example of the many ways you can make global (and dramatic) changes to a picture with just one action.

FIXING THE BACKGROUND

Let's try one more trick before we move on to the next section. Click the CLR button once to clear the screen, and then click Undo to restore the picture. (If you clicked CLR twice, Undo will not work to restore the picture. You will need to load it again.) Now open the Effects menu — toward the right end of the Menu Bar — drag down to Background, move the pointer to the right and down to Fix, and then release the button.

What you have just done is remarkably simple, and yet remarkably powerful. You have fixed the picture onto the background so that it cannot be removed. Try it. Click CLR as you did before and see what happens. That's right — nothing. The picture is fixed, which means you can draw over it any way you like, and then click CLR to restore it to its original form. Go ahead, select a thick brush and draw a mustache on the Mona Lisa. Do it with the airbrush if you like. Then click CLR for the easiest art restoration job ever.

Note that you can continue fixing the background each step of the way, with each "fix" stamping the entire picture into the background. This way you can erase everything you did since the last fix with a single mouse click. And you can "unfix" the background just as easily as you fixed it: just go to the Effects menu, drag down to Background, and then select Free from the secondary menu. This restores everything back to normal, so that clicking CLR clears the entire picture.

We will be looking more closely at this feature in the next section when we look at custom brushes and the way they interact with the background. Meanwhile, feel free to experiment further with this feature Art restorers should have it so easy.

NOTES

In this chapter we examine the fundamental "elements" that make up ***DeluxePaint****. If you have some experience with computer graphics software, you may want to use this chapter to learn how* ***DeluxePaint*** *handles features you may have encountered in other programs. As with any other part of this manual, however, you should feel free to skip around and read only those sections that interest you at the time.*

We have classified the elements as follows:

The Brushes examines **DeluxePaint**'s custom brush capabilities. This part looks at the various techniques available for modifying a brush, such as resizing, flipping, and, by entering perspective mode, rotating it about its three spatial axes.

The Screen deals with all those techniques that affect the entire **DeluxePaint** screen, such as switching pages, magnifying and zooming, gridding, symmetry, screen resolutions, and fixing background.

The Palette looks at **DeluxePaint**'s color mixing and color cycling capabilities, and examines how color availability relates to screen resolution and memory usage.

The Tools looks at advanced tool techniques, and shows how to customize some of the standard tools to create just the right tool for the job.

The Painting Modes deals with the various ways you can affect paint once it is already on the page, such as smearing, blending or smoothing it to give you special effects.

Text shows how to use **DeluxePaint** as an elementary word processor, showing how to select fonts, how to enter text, and how to move it about the page.

Many of the techniques discussed in this chapter are also covered in the tutorials in Chapter Three. If you prefer to learn by doing, you may want to work through the tutorials first, and then refer to the relevant parts of this chapter if you need more information. Or you may want to read this chapter first to understand how **DeluxePaint** is structured, and then try some of the tutorials to see how it works in practice.

1 THE CUSTOM BRUSHES

As we saw in the Guided Tour in Chapter One, **DeluxePaint**'s "anything can be a brush" feature lets you select any image on the screen and define it as a brush. Thus, you can keep a selection of images on the spare page and move them over to the main page by picking them up as brushes. In addition, you can load and save brushes as though they were pictures.

CREATING A BRUSH

To create a brush out of an on-screen image, click the Brush Selector (the tool to the left of the Text tool) with the left mouse button and then drag the large crosshair to form a rectangle around the image. When you release the mouse button, an exact copy of the image is attached to your arrow cursor. You can now paint with your new brush just as you would with any of the built-in brushes.

You can drag a rectangle around an on-screen image using either the left or the right mouse button. As we have already seen, when you use the left button, **DeluxePaint** makes a duplicate of the image and attaches it to the arrow cursor, while leaving the original image in place on the page. We also saw that if you use the right mouse button to surround the image, the image itself becomes the brush, as if the original image had been lifted up off the page. This technique provides an ideal method for picking up objects and moving them around the page as you experiment with different compositions. In particular, the combination of right-button brush selection and Fix Background (which we covered briefly in the Guided Tour) lets you lift any complex shape off a fixed background (provided the shape was applied after the background was fixed), without lifting up any of the background. **DeluxePaint** preserves in memory all those parts of a fixed background that are covered by unfixed shapes, which means that you can move the shapes around the page and uncover the previously hidden background.

SELECTING COMPLEX SHAPES

As we saw earlier, clicking the Brush Selector once with the left button lets you draw a rectangle around any image on the page. Clicking it a second time lets you corral any image, thereby letting you pick up shapes from a "crowded" background. To corral an image, move the arrow cursor and click around the shape you wish to define, just as if you were describing a polygon around it with the Polygon tool (see "The Toolbox" in Chapter One). As soon as you complete the polygon, the complex shape becomes your new brush. Note that the left button-right button convention works here as well: corralling the shape with the left button duplicates the shape, while corralling with the right button lifts it up off the background. Note also that this corralling function works just like the Polygon tool in one more important respect: pressing the Spacebar completes the polygon for you, so you don't have to search for the starting pixel in order to complete it.

THE BACKGROUND COLOR IS TRANSPARENT

When you pick up a custom brush (with either the left or right button), you will notice that any part of the brush which matches the current background color appears transparent. For example, if you pick up a round object sitting on the Background color, you pick up part of the background as well (because the Brush Selector picks up rectangular shapes), but when you move your new brush over to a contrasting object, the brush contours will appear round and not rectangular. This is because **DeluxePaint** treats as transparent any color which was designated as the background color when the brush was created, which means you can create a brush out of a complex image (such as intricate lace, for example) and be able to see through it to other objects behind the brush. Any parts of the brush that consisted of Background color when the brush was first created remain transparent, even after you change background colors.

A BRUSH IS A LITTLE PICTURE

Because a brush can be as complex as you like, you can treat brushes just like full pictures. Brushes even have their own menu (the Brush menu,

the second one from the left), from which you can Load and Save brushes just as you can other pictures. When you load a saved brush, it comes equipped with its own palette, the one that was in effect when the brush was first saved. If the current picture is using a palette different from that of the newly-loaded brush, you can change the current palette to the brush's palette by selecting Use Brush Palette from the Color Control option of the Picture menu. On the other hand, if you want to use the newly-loaded brush with the current palette, select Change Color and then Remap from the Brush menu. The other items in the Brush menu let you resize, reshape, and recolor brushes in various ways. See Tutorial Two for a series of exercises using items from the Brush menu.

Your **DeluxePaint** disk contains a number of saved brushes, in addition to the ones used in the tutorials. To load a brush, select Load from the Brush menu. This brings up a Load Brush Requester, similar to the Load Picture Requester we used when we loaded a picture in the Guided Tour (see Chapter One). Note that the default drawer is named Brush. Feel free to experiment with some of the saved brushes. Select Use Brush Palette whenever you load a brush to ensure that you are seeing it as it was when it was saved. Load the brush called "Bobsled," for example, and try drawing with it. You'll soon realize why it's called "Bobsled." You might also try the one called "Fireworks," but this time select MultiCycle from the Prefs menu and Cycle from the Mode menu, and then press the Tab key before you start drawing with it. "Fireworks" comes complete with color cycling information, and is a spectacular example of the power of this feature. See Tutorial One for more demonstrations of color cycling.

ADDITIONAL FEATURES

The following are some additional features relating to custom brushes:

HANDLE: This feature, which is available from the Brush menu, allows you to specify whether your arrow cursor will sit at the center of your custom brush, or at one of its corners. In the default setting the arrow cursor sits at the center of the custom brush. When you select Corner from the Handle submenu, the brush handle moves to the lower right-hand corner of the brush. Once you have selected Corner, you can control which corner the handle will attach itself to by the manner in which you pick up your brush. For example, if you pick up your brush by dragging downward from left to right, the brush handle will attach

itself to the lower right-hand corner, whereas if you pick up the brush by dragging upward from right to left, the handle will attach itself to the top left-hand corner. The rule is simple: the brush handle attaches itself to the *ending* corner in the brush creation process. The Handle feature becomes important when you enter perspective mode (see below), because you can rotate a brush about its handle, whether the handle is at the center or on one of the corners.

PERSPECTIVE: **DeluxePaint**'s Perspective feature (available through the Effects menu) lets you rotate a custom brush about any of the three axes of three-dimensional space to define a plane of operation, and then work within that plane to create perspective effects. With a custom brush active, select Perspective and then Do from the Effects menu, or press Enter on the keypad. This turns your cursor into a 2 x 2 matrix, a rectangular frame with a cross in the middle. You can now manipulate this matrix by rotating it about its three axes, by centering it anywhere on the painting area, or by moving it closer to or further away from the observer. Once you have defined the plane of operation, moving the mouse moves the matrix along that plane, in three-dimensional space. Clicking the mouse button places a perspective version of the original brush onto the defined plane.

Perspective is the subject of the fourth tutorial in the following chapter. To get the most out of this special feature, we recommend you work through the exercises in that tutorial. You can also consult Chapter Four, the Reference section, for more information on perspective.

FAST FB: This feature, which is available from the Prefs menu, allows you to draw lines, filled shapes, or unfilled shapes with a complex brush, but with faster feedback. With Fast FB selected, when you draw a line or shape with a custom brush, all you see is a one-pixel line or outline until you finish drawing, at which point your line or shape is repainted with the custom brush. When Fast FB is selected, an asterisk appears next to it on the menu.

2 THE SCREEN

Some of **DeluxePaint**'s features affect the entire screen, while others, such as the tools and the brushes, affect the screen selectively. This section considers those features that have a screen-wide effect.

HIDING THE TOOLS AND THE MENU BAR

DeluxePaint lets you paint on the entire screen, even under the Toolbox and the Menu Bar. To clear these two items from the page, press the **F10** key. This hides them both if they are both present. Press **F10** a second time to bring them back. To hide just the Menu Bar (or to bring it back, if it's hidden), press **F9**. By using these two keys, you can selectively display or hide either the Toolbox, the Menu Bar, or both.

Note that you can still access the Menu Bar even while it's invisible. Move the cursor to the top of the screen and press the right mouse button to display the Menu Bar. You can now select any menu item in the regular fashion. You can access the tools as well, even with the Toolbox hidden, through the keyboard equivalents. See your Reference Card for a list of keyboard commands.

MAGNIFYING AND ZOOMING

You can magnify any section of your work, and view it alongside the standard-sized image. To magnify a section of your work, click the Magnify icon (the one that looks like a magnifying glass, above the Undo icon). When you move the cursor onto the page, it becomes a rectangular outline. Move the outline to the part of the image you want to magnify, and click the left button. The part of the image included in the rectangle now appears magnified on the right part of the screen. The left part of the screen shows the the image in its original, unmagnified form. You can now carry out any functions on either side of the screen using any of the tools in the Toolbox. Thus, you can draw circles and squares, fill in shapes using the Fill tool, and use any of the brushes normally available to you. You can scroll around your image using the four arrow keys; this moves the image around under the "magnifying glass" as well as moving the brush along with it. In addition, by pointing your cursor anywhere on the unmagnified

it. In addition, by pointing your cursor anywhere on the unmagnified portion of the screen and pressing the **n** key, you can magnify that part of the picture.

Once you have magnified a part of your picture, you can increase or decrease the amount of magnification by using the Zoom function (the Zoom icon is the one to the right of the Magnify icon). Click the Zoom icon with the left mouse button to increase the magnification, and click it with the right button to reduce the magnification. **DeluxePaint**'s Magnify and Zoom tools let you carry out precision work on your pictures by magnifying each pixel up to 400 times its original size.

To quit magnify mode, click the Magnify icon a second time.

GRIDS

The Grid lets you apply paint on the page in accordance with an invisible grid and also restricts your drawing tools to the grid points. To draw on a grid, click the Grid icon (directly above the Magnify icon) with the left mouse button and then click the Dotted Freehand tool. With Grid and the Dotted Freehand tool selected, you can paint only on the points of the grid, making it easy to fill the screen with a polka-dot pattern, for example (we shall see other methods for pattern design later).

You can also control the spacing between the points. Click the Grid icon with the right mouse button to bring up the Gridding Requester (see Figure 2.1). You can now set the spacing for both the X and the Y coordinates by typing in the actual spacing in the calibration boxes. Note that the spacing is calibrated in pixels. To enter a new value, click anywhere in the calibration box, Delete over the existing value, and then type in the new value. When you are satisfied with the new values, click OK. If you want to retain the old values and return to your work without making a change, click Cancel.

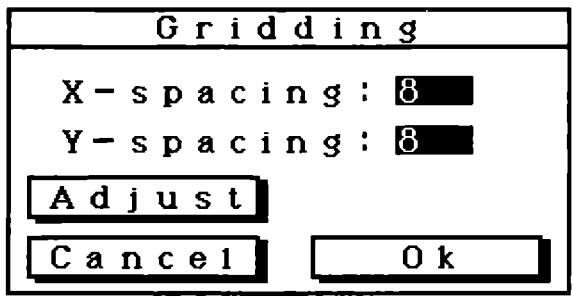


Figure 2.1. Gridding Requester

You can also recalibrate the gridding by using a visual method (as opposed to the above mathematical method). If you click Adjust in the Gridding Requester, you will return to the page with a cursor that looks like a matrix. This matrix represents the current grid values in graphic form. To change the values, press and hold down the left mouse button, drag the mouse until the matrix is the desired size and shape, and then release the button. The new grid is based on this matrix. You can also reposition the points of the grid using Adjust: move the matrix so that its cells are in the desired position and click the left button.

If you are in perspective mode and you click the grid icon with the right button, the resulting requester lets you adjust the spacing for the third dimension as well. The requester also lets you specify the angle of rotation of your brush about the three axes. See the discussion of the Grid tool in the Reference section for more information.

The Grid tool is useful for precise cursor placement within a user-definable matrix, making it easy to create repeating patterns, parallel lines, and other repetitive designs.

SYMMETRY

The Symmetry tool lets you paint symmetrically over the entire page at the same time. To paint symmetrically, click the Symmetry tool (the one to the right of the Grid tool) with the left mouse button. With symmetry selected, your brush is made up of a number of mirror

images of itself. As you move the brush around, all the mirror images move as well, producing an effect much like that of a kaleidoscope. When you paint in symmetry mode, you are laying down a number of identical mirror images about a fixed origin. In all cases except the Dotted and Continuous Freehand tools, the mirror images are drawn *after* you release the mouse button. With the Dotted and Continuous Freehand tools, all the images are drawn at the same time. The Symmetry tool provides the following default settings: Order: 6, Point, and Mirror. These are explained below.

To change the Symmetry tool's default values, click the Symmetry icon with the right mouse button. This brings up the Symmetry Requester (see Figure 2.2).

Note that the default values are highlighted. Point means that the symmetry occurs about a single central point (which is user-definable: see below). Mirror means that each brush head has a related twin that mirrors its actions. The Order gadget specifies the order of the symmetry, that is, how many times the basic image is repeated about the central point. To change the order, click in the Order gadget, Delete over the existing value, and type in the new value. You can use any order up to 40.

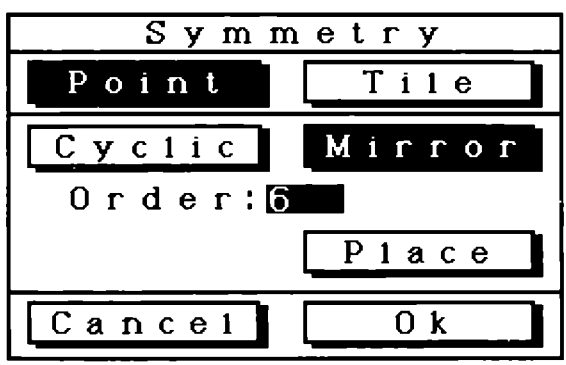


Figure 2.2. Symmetry Requester

Place lets you position the central point of your symmetrical pattern. To reposition the central point, click Place, move the large crosshair to the new location, and click the left mouse button. Subsequent symmetrical drawing will be centered on the new location.

The Symmetry Requester gives you two further options: Cyclic instead of Mirror, and Tile instead of Point.

Like Mirror, Cyclic lets you draw about a point with a number of brushes (also determined by Order), but the effect is different from the Mirror option. In Mirror, each brush has a twin: if your order is five, you have ten drawing points on the page, with the two points in each pair reflecting each other's actions. In the Cyclic mode, there are no pairs: if your order is five, there are five brushes on the page. The pattern produced by each brush is not itself symmetrical because it does not create a mirror image of itself as you draw. Try it and see.

Tile lets you draw with a number of brushes at the same time, but without mirroring them about a central point. Instead, Tile creates a number of images on a grid, making it easy to create groups of identical images in a regular pattern. To draw in tile mode, click Tile in the Symmetry Requester. You can then specify the distance in pixels between each point, for both the x-axis (width) and the y-axis (height). Whenever you select the Symmetry tool from then on (until you change it again), you will be painting with a series of regularly-spaced brushes. Because Tile lets you create an entire pattern just by drawing one of its elements, it is an ideal tool for textile designers. Together with Pattern Fill (discussed below), Tile can make a textile designer's life considerably easier.

Finally, as with any other requester, click OK to use the current setting and return to your picture, or Cancel to return to your picture without effecting any change.

THE PAGES

DeluxePaint gives you two separate and relatively independent pages to work with. You can use one of the pages for creating background images, and the other for creating foreground images. You can then move parts from one page to the other, or within each page until the composition is just right. As we shall see in a moment, the two pages are not entirely independent. For one thing, they share a common Palette, almost as if they were the same picture.

SWITCHING PAGES

When you first open a new file or load a picture from disk, **DeluxePaint** opens one of the two pages. To move from one page to the other, press the j key, or select Spare and then Swap from the Picture menu. When you do, you will notice that the Palette you were using in the first page follows you to the second page. This means that if you modify the Palette for one page and then switch to the other page, you end up modifying the second page's Palette as well. Note, however, that although the two pages share the same palette, you can have a different background color on each page. Because the background color is transparent, however, (see discussion under The Custom Brushes, above) any part of a brush consisting of background color will remain transparent even if you move it to the spare page with a different background color.

In addition, because the Toolbox is not really part of the page (but actually sits "above" it), whatever tools you had selected before you switched will still be selected after you switch pages. This way, you can retain the same tool settings, giving you continuity as you work. Note that this continuity rule does not apply to the Fix Background and Stencil commands, which do not carry over from one page to the other. See the following section for information on fixing the background, and Tutorial Three in the next chapter for exercises involving the Fix Background and Stencil features.

FIXING THE BACKGROUND

As we saw in the Guided Tour, the Fix Background command (from the Effects menu) lets you fix whatever is currently on the page as a background. When you have a picture fixed as a background you can return to it at any time just by clicking CLR in the Toolbox. This is because CLR always clears to the background (which under normal circumstances is simply the Background color), so when you have a picture fixed as a background, CLR clears to that. This means that you can try daring innovations on a fixed background, and then return to the original picture with just the click of a mouse. Or you can paint with the right button to erase anything you have added since the fix.

In addition, you can pick up any part of the recent additions to a fixed background with the Brush Selector (see Custom Brushes, above) and

reposition them anywhere on the page. Note, however, that if you fix the background and then add more paint, you can only pick up those portions of the newly-added paint that are not the same color as the current background color.

PAGE SIZE

DeluxePaint lets you work on page sizes ranging from 320 pixels wide by 200 pixels high, to 1008 pixels by 1008 pixels, depending on memory availability. In addition to the three preset page sizes (Standard: 320 x 200; Full Page: 320 x 340; Full Video: 352 x 240), **DeluxePaint** lets you specify any height and width through the Set Page Size Requester (refer to Figure 4.2). With 512K of memory, you can specify a page size up to 640 x 400, provided you are not using up available memory with a spare page or by fixing the background. If you are working on a page size larger than the screen, you can preview the entire page at any time by selecting the Show Page command from the Picture menu. You can return to your current page by clicking either mouse button.

SCREEN RESOLUTIONS

DeluxePaint gives you a total of four different screen resolutions, with the ability to switch from one to another even during a single work session. Be aware, however, that changing screen formats in the middle of a job can result in loss of information (such as your current brush, the spare page, the last requester used, etc.), so it is important to *save your work before changing screen formats.* You should develop the habit of saving your work every 15 or 20 minutes in any case, but it becomes especially important to do so if you are about to change formats. As we noted in the Guided Tour, above, you are given the opportunity to select a screen format each time you start **DeluxePaint**, through the Screen Format Requester (see Figure 2.3). In addition, you can access the Screen Format Requester at any time by selecting Screen Format from the Picture menu. Each screen format has its own limitations and memory requirements. See Appendix A: Inside DeluxePaint for more information.

The four resolution formats are described as follows:

LO-RES: This format uses a pixel array 320 wide by 200 high, and can accommodate up to 32 colors on the screen at the same time. On a standard 13-inch monitor, each pixel in Lo-Res mode will measure approximately .03 inches per side, for a total area of approximately .0009 square inches. Roughly speaking, this means that you could fit over 1000 Lo-Res pixels onto one square inch on the screen. This level of screen resolution is adequate for most graphic purposes.

MED-RES: This format uses a pixel array of 640 by 200, using pixels that are the same height as the Lo-Res ones, but only half as wide (approximately 1250 of these will fit onto one square inch on the screen). Med-Res is ideal for putting text on the screen. (See the discussion of Text mode below.) Because Med-Res uses pixels of a different size and shape, changing screen formats from Lo-Res to Med-Res will affect the shape of your images. Thus, a Lo-Res picture loaded in Med-Res mode will look skinny, while a Med-Res loaded in Lo-Res mode will look fat (and take up two screen widths). In addition, Med-Res limits the number of colors available for a single picture to 16.

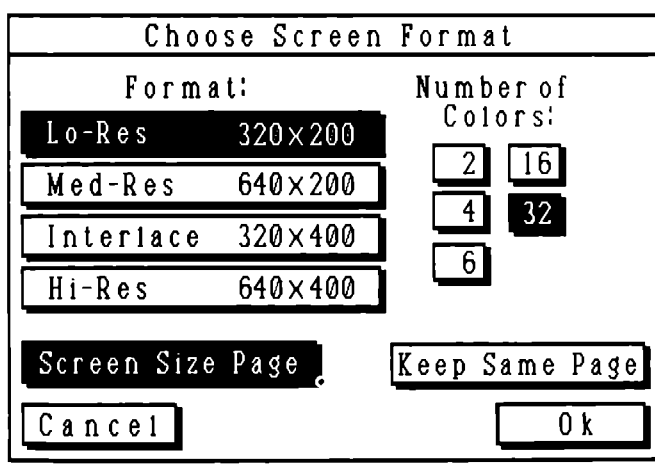


Figure 2.3. Screen Format Requester

INTERLACE: Interlace represents the middle ground between Med-Res and Hi-Res, and gives you a 320 x 400 pixel array. Interlace pixels are the same width but half as tall as Lo-Res pixels, which means that a Lo-Res picture loaded in Interlace mode will look fat. The advantage to Interlace is that it gives you the same vertical resolution as Hi-Res, while still allowing up to 32 colors. The disadvantage is that with most monitors, Interlace produces a flickering effect, because it is painting each horizontal line every 30th of a second, instead of every 60th of a second as in Lo-Res mode. You can overcome this to some extent by using special "high persistence" monitors, which cause the image to persist longer than the rate of flicker. See Appendix B for information on this and other hardware.

HI-RES: Hi-Res provides the highest resolution of the four formats (640 x 400). Because it also interlaces the image, Hi-Res is subject to the same flicker as Interlace, and it limits you to 16 colors. Hi-Res pixels have the same proportion as Lo-Res pixels, but four of them can fit in the same space occupied by one Lo-Res pixel. A Lo-Res picture loaded in Hi-Res mode will occupy only one fourth of the screen, while a Hi-Res picture loaded in Lo-Res mode will occupy four screens.

You can also use the Screen Format Requester to convert your palette to one with fewer colors. For example, if you create a picture in Lo-Res using 32 colors and you wish to convert your palette to 16 colors (to use the picture in **DeluxeVideo** or **DeluxePrint**), you can specify 16 colors from the Screen Format Requester; **DeluxePaint** will automatically convert the 32-color palette to 16, using colors that best approximate the original.

3 THE PALETTE

THE COLOR PALETTE REQUESTER

The Color Palette Requester (see Figure 2.4) lets you mix your own custom set of up to 32 colors from a universe of 4096. The 4096 figure is derived from the fact that any given color can be expressed in terms of its Red, Green, and Blue (RGB) components. With 16 possible shades in each component, the possible universe of colors comes to 16x16x16, or 4096.

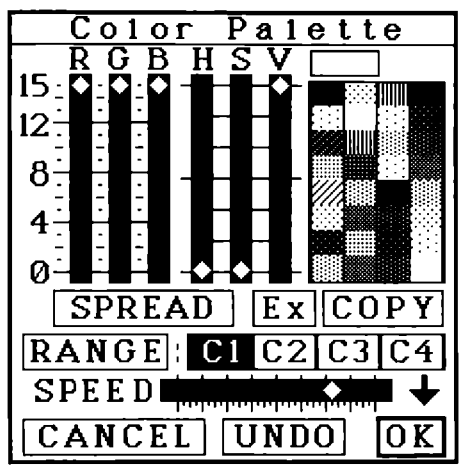


Figure 2.4. Color Palette Requester

The HSV method provides an alternative approach to color mixing, but with identical results. The HSV method breaks each color down into its Hue, Saturation, and Value. Hue simply refers to the color's position on the color spectrum or rainbow — Red, Orange, Yellow, Green, Blue, or Violet, and the various shades in between. Saturation refers to the strength of a particular hue — whether it is relatively pure (and hence highly saturated), or whether it contains some proportion of white. Thus, the more white, the less saturated. Value refers to a color's black level (and hence the amount of light it would reflect). A color with a high value would have little or no black, whereas colors with low value would contain more black. Irrespective of Hue and Saturation, a value of zero produces a pure black.

DeluxePaint lets you mix colors with either method. It also lets you create color spreads to give you subtle shades of the same hue. To bring up the Color Palette Requester, click the Color Indicator with the right mouse button, press the **p** key, or select Palette from the Color Control option of the Picture menu. (These methods all produce identical results). You can learn about the Color Palette Requester by working through the tutorials in the next chapter (where you will create your own reference palette), or by reading the relevant parts of the Reference section (see Color Control in the Picture menu). For the time being, just be aware that you can modify the currently selected color on any of the six variables (R, G, B, or H, S, V) by dragging the appropriate slider up or down its range. As you do so, note that the two sets of variables are related — for example, as you move the RGB sliders, the HSV sliders respond accordingly.

The Color Palette Requester also lets you create color spreads to give you subtle shades of the same hue or equally spaced gradations across hues. To create a spread of colors, click the first color, click Spread, and then click the last color. **DeluxePaint** looks at the first and last colors in the spread and at the number of steps in between, and calculates the series of intervening shades. For example, if your first color is a highly saturated red and your last color is a pure white, with ten steps in between, you will end up with a spread of twelve colors ranging from red to white separated by varying shades of pink. Likewise, if your first color is blue and your last color is yellow, **DeluxePaint** calculates the intervening shades and hues, to give you a series of blues, blue-greens, greens, yellow-greens, and yellows. And unlike traditional color mixing, if your modifications are not to your satisfaction, you can always reverse the last change by clicking Undo, or you can cancel all the changes you made by clicking Cancel.

Ex (for "Exchange") and Copy let you swap or copy colors from one part of the Palette to another. If you click a color, click Ex, and then click a second color, the two colors will change places on the Palette. Similarly, if you click a color, click Copy, and click a second color, the first color will be copied onto the second. By letting you place colors anywhere on the Palette, these two functions make it easier to create the color spreads you need for your work.

The Color Palette Requester's Range function plays an important role in several **DeluxePaint** features, in particular, Color Cycling and Gradient Fill, both of which are treated extensively in the tutorials in Chapter Three. As its name implies, Color Cycling cycles through a defined range of colors to produce simple animation effects. You can define up to four color ranges, one for each of the four channels C1-C4,

and assign a cycling speed to each one. You define each range in the same way you create color spreads: click the first color in the range, click Range, and then click the last color in the range. See Tutorial One for detailed instructions on creating animation effects using Color Cycling.

DeluxePaint's Gradient Fill function also makes use of the Range information. The currently selected range (a range is selected when one of its members is selected) determines the colors or shades that will be used in a gradient fill. By using a gradient (as opposed to a standard solid) fill with a carefully chosen color spread, you can create shading effects that would make an airbrush artist envious. See Tutorial Two for instructions on gradient fills.

DeluxePaint also uses Range information for some of its painting modes (specifically Blend and Shade), which are available through the Mode Menu. See "Painting Modes" below for information on this feature.

THE COLOR PALETTE AND SCREEN FORMATS

As we noted above, **DeluxePaint** contains a universe of 4096 colors, from which you can use up to 32 at any given time. This is the case with the (default) Lo-Res and Interlace formats, whereas the higher resolution formats (Med-Res and Hi-Res) allow correspondingly fewer colors on the screen at one time. Depending on your memory availability, Med-Res lets you use up to 16 colors in one picture and Interlace up to 32. Hi-Res normally lets you use up to 8 colors, although with 512K of memory, you may not be able to use some of the more "memory-intensive" features, such as Fix Background, or Stencils. See "Screen Resolutions" above for information on the various screen formats. See also Appendix A: Inside DeluxePaint for more information on memory usage.

4 THE TOOLS

DeluxePaint's painting tools are available through the Toolbox, the panel on the right-hand side of the screen. As we have already seen, you can activate any tool by clicking its icon with the left mouse button. A tool remains active (and its icon highlighted) until you select another tool or, in some cases, deselect it by clicking the icon a second time. Examples of the latter kind of tool are the Grid and the Symmetry and Magnify tools, which are toggled on and off by each mouse click.

MODIFYING TOOLS

In most cases, clicking a tool icon with the right mouse button lets you modify some fundamental aspect of that tool. The following summarizes the effects of right-button mouse clicks on the tools in the Toolbox:

THE BUILT-IN BRUSHES: You can change the size of any of the built-in brushes at the top of the Toolbox by clicking a brush with the right mouse button, moving the cursor over to the painting area, and dragging diagonally while holding down the right mouse button. This applies not only to the eight solid brushes, but also to the three- and five-pixel brushes below them.

THE AIRBRUSH: The Airbrush works with any of **DeluxePaint**'s built-in brushes, or with a custom brush of your own creation. You can adjust the Airbrush's nozzle by clicking the Airbrush icon with the right mouse button, moving the cursor over to the painting area, and then pressing the left mouse button and dragging diagonally to adjust the size of the solid circle, which represents the spray area. Release the mouse button when the solid circle is the desired size.

STRAIGHT LINE AND CURVE TOOLS: A right-button click on either of these tools brings up the Spacing Requester (see Figure 2.5), allowing you to create either straight or curved dotted lines. The Spacing Requester lets you control the distance between "splats" in your dotted lines, using either a relative or an absolute measure. If you specify Absolute (by clicking that gadget), the number in the Number gadget refers to the number of pixels between the center of each splat. If you specify Relative, then the number refers to the total number of

splats in the line. For example, if you specify relative spacing with an order of 10, your line (curved or straight) will consist of 10 splats. You can turn spacing on and off by clicking the appropriate gadget in the Spacing Requester. Note that spacing also works with the Unfilled Shape Tools, even though a right button click on those icons does not bring up the Spacing Requester.

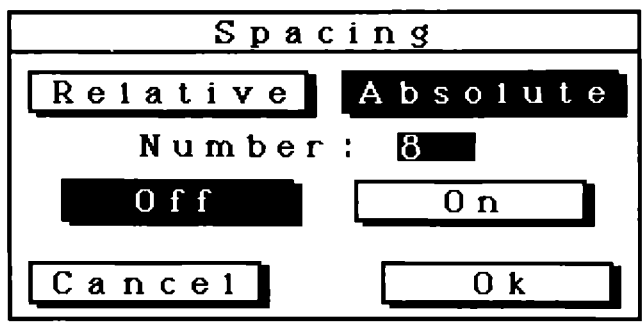


Figure 2.5. Spacing Requester

FILL AND SHAPE TOOLS: Clicking any of these icons with the right mouse button brings up the Fill Type Requester (see Figure 2.6), allowing you to specify the type of fill to be used by these tools. The Fill Type Requester is covered in both Tutorials One and Two and in the Reference section; the following is a summary of its features:

Fill type defaults to Normal, which is a solid-color fill of either the foreground or background color as determined by mouse button click (the left button fills a shape with the foreground color,the right button with the background color). By clicking Pattern, you can fill a shape with a recurring pattern of your own creation. Click From Brush to use the current brush as the recurring pattern, then click Pattern to select pattern fill.

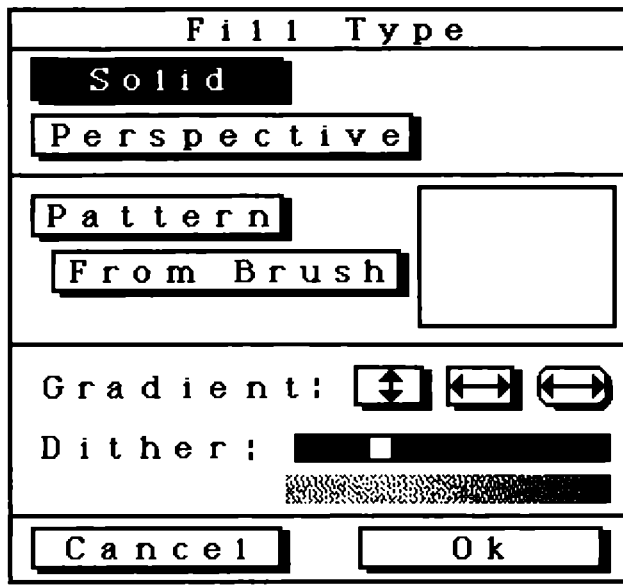


Figure 2.6. Fill Type Requester

You can also choose to fill a shape with a gradient made up of a range of shades. First, select a color in a cycle range (see Tutorial One for details on creating color ranges and using them in gradient fills). To fill a shape with a gradient going from top to bottom, click the box with the arrows pointing up and down; to fill with a gradient moving left to right, click the box to its right, with the arrows pointing left and right. The box on the far right, with the rounded corners, creates a three-dimensional effect by filling each horizontal line independently, thereby allowing the gradient to fill the contours of the shape being filled.

Whichever kind of gradient fill you choose, you can adjust its *dither*, the amount of random overlap between each shade, by dragging the dither slider left or right. You can monitor the current dither setting in the box below the slider. When you are done, click OK to use the current settings, or Cancel to return to your work without making any change.

BRUSH SELECTOR: Clicking the Brush Selector with the right mouse button restores the last custom brush. Thus, if you had created a custom brush (see Part 1 of this chapter for details) and then made some modifications, clicking the Brush Selector with the right mouse button would restore you to the previous custom brush. This feature is also useful if you create a custom brush and then select a built-in brush. Clicking the Brush Selector with the right button returns you to the custom brush.

GRID AND SYMMETRY TOOLS: Right-button clicks on these icons let you modify aspects of gridding and symmetry. See Part 2 of this chapter for a detailed description of this feature.

5 THE PAINTING MODES

Certain options in the Mode menu (Smear, Shade, Blend and Smooth) let you make subtle modifications to paint that has already been laid down. (The others — Matte, Color, Replc, and Cycle — affect the way paint is laid down in the first place by affecting the current brush. See the Reference section for more information). Of these, Shade and Blend depend on cycle ranges (see discussion on the Palette, above) for their effect. If the current foreground color is in the same cycle range as the colors on the page, Blend creates a blending effect between the colors under the brush by adding *intermediate* colors from within the same range. If the current foreground color is in a different color range, it will have no effect on the colors on the page, whereas if it does not fall within any color range, it treats the entire palette as a cycle range.

Shade is similar, except that it paints with the next higher or next lower color in the cycle range (depending on which button you press), without attempting to blend the colors under the brush. If the current foreground color is not in a cycle range, Shade treats the entire palette as the range. Use Shade to derive shading effects by adding the next higher (or lower) color in the range to the color on the page.

Smear and Smooth do not depend on cycle ranges. Smooth uses the entire palette to derive an average of the colors under the brush. Smooth works best when the palette contains subtle gradations of the colors under the brush, since it has a greater variety of colors to choose from. Use Smooth to smooth out the boundary between two contrasting colors, to obtain effects similar to those obtained with an airbrush or with the antialias option available through the Perspective submenu.

Smear takes the color under the brush and smears it onto the adjoining color, but without combining them like Blend. Use Smear to create the top of a wave as it's about to break, or foliage on a tree or bush.

The painting modes are described in greater detail in the Reference section. See the section covering the Mode menu for more information.

6 TEXT

DeluxePaint's text editor lets you place text anywhere on the page, and the Brush Selector lets you pick it up and reposition it if you didn't have it quite right the first time. **DeluxePaint** doesn't load all its fonts automatically when you start the program, thereby conserving about 5K of memory on the font directory, and about 5K to 10K on a loaded font. (It does load the Topaz font, however, so you can still apply text even without loading the font directory.) To load the font directory, select Load Font Dir from the Font menu. The next time you open the Font menu during that session, it will display all the available fonts. To select a font, drag down until the font name is highlighted, move the pointer to the right to highlight the size you want, and release the button.

To enter text on the screen, click the Text icon in the Toolbox. You can also choose to enter text in Italic, Bold or Underline, by making the appropriate choice from the Style submenu. When you move the pointer over to the painting area, it becomes a small rectangular cursor. Click either mouse button where you want the text to begin, and start typing. The text will "wrap" around to the next line when it reaches the end of the line, or you can press Return to start a new line directly below the point where you first placed the cursor. If the page size is larger than the screen, the screen will scroll to the edge of the page as you type. You can delete text by using the Backspace key. Note, however, that if after entering a portion of text you click the cursor elsewhere on the screen, or you select a tool from the Toolbox, that text becomes a bit-mapped image, and no longer behaves as text. In other words, you cannot Backspace over it as you could when it was still active as text.

Cutting and pasting text in **DeluxePaint** is particularly easy. Click the Brush Selector, and pick up the misplaced text with the right mouse button. This lifts the text right off the page, letting you reposition it anywhere you want.

In the next chapter you will learn a number of practical techniques, through a series of tutorials, to help you get the most out of **DeluxePaint**. The tutorials are simple, step-by-step exercises, designed with the assistance of professional **DeluxePaint** artists. You won't know how powerful **DeluxePaint** can be until you try it for yourself. And you don't even have to get your hands dirty.

NOTES

NOTES

The best way to learn ***DeluxePaint*** *is by doing. Manuals that teach how to drive a car or fly a plane can go only so far — at some point the student has to sit in the driver's seat and work the controls. So far we have just been sitting in the garage, examining all the instruments. Now it's time to start the engine and take the machine out for a spin. As you've probably guessed, this chapter is the "Driver Ed" part of the* ***DeluxePaint*** *manual, the place where you can really start creating impressive graphics.*

Tutorial One shows you how to create a Reference Palette to use for adjusting your color monitor and printer to give you the best possible results in your work. You will also learn how to create a custom palette for each graphics project, thus making the most of the 32 colors you have available (assuming you have at least 512K and you have selected 32 colors from the startup requester). The second tutorial deals with the creation of a business logo, starting with some relatively plain text and finishing with graphics impressive enough to go into an annual report. The third tutorial takes you through the world of stencils and friskets, and shows you how you can use traditional airbrush techniques with a new medium. Finally, the fourth tutorial introduces you to **DeluxePaint**'s perspective capabilities, a way of simulating three-dimensional space on a two-dimensional screen.

Before we begin, let's make sure that you have everything you will need for our journey. First, you'll need your **DeluxePaint** program disk. The special files and artwork you'll be using in the following tutorials are stored in the Brush or Lo-res drawers, as appropriate. Second, you'll need a supply of initialized disks for storing your work. Third, if you want to make printouts of your work, you'll need a color printer plugged in and ready to go.

1 TUTORIAL: MODIFYING THE COLOR PALETTE

Proficiency with **DeluxePaint**'s color control is one of the most important skills you can learn. Because every work of art is little more than the colors and shapes that comprise it, a carefully chosen palette is the first step to any masterpiece. In the following exercises, you will learn how to create a Reference Palette and then modify it to give you just the color selection you need for each project. When you have created your Reference Palette, you should save it onto your data disk and use it whenever you need to adjust your monitor or color printer. We'll see how to do this at the end of this exercise, but first let's create the palette.

A REFERENCE PALETTE

The Amiga can generate 4096 distinguishable colors, 32 of which are available at any one time. You can create your 32-color palette through the Color Palette Requester. Here's how:

- Bring up the Color Palette Requester by selecting Color Control and then Palette (the secondary menu item) from the Picture menu. To do this, move the cursor up to the Menu Bar and press the right mouse button. Hold the button down as you move the cursor down to Color Control, and then to the right until you highlight Palette. When you have Palette highlighted, release the button.

You can also get to the Color Palette Requester by clicking the Color Indicator (above the palette at the bottom right of the screen) with the right mouse button, or by pressing **p** on the keyboard. As you become more proficient with **DeluxePaint**, you will realize that most of **DeluxePaint**'s features are accessible through the keyboard. You can speed up your work considerably by using the keyboard equivalents. See the Reference section for a table of keyboard equivalents.

Take a moment to examine the Color Palette Requester (refer to Figure 2.4). It consists of six vertical sliders for mixing colors, a palette area with a box at the top showing the currently selected color, and a collection of command boxes. To find out more about these functions, refer to the section on the Color Palette in Chapter Two. For this exercise, you'll be using the Color Palette Requester to create your own

reference palette, which you can then use to compare against the Reference Palette in Plate II. By comparing your reference palette against the standard in Plate II, you can adjust the color settings for your monitor and (if applicable) your printer, much like a musician uses a tuning fork to tune to Concert A.

- If it isn't already black, click the first (top left) color of the palette and make it black by dragging the R (Red), G (Green), and B (Blue) sliders to the bottom. Drag each slider by positioning the pointer over it, pressing and holding down the left mouse button as you move the mouse. Release the button when the slider is just where you want it (in this case, the bottom of the scale).

Note that as you drag each slider down its track, the currently selected color in the palette changes accordingly. In addition, note that this also affects the corresponding color in the Palette at the bottom right of the screen.

- Set Color 2 (the second from the top in the left column) to white by clicking it and moving the R, G, and B sliders all the way to the top.

  Next, set Color 3 (the third from the top) to pure red by dragging the R slider all the way to the top, and the G and B sliders to the bottom. Now copy this red onto the next four colors: click Color 3, click Copy, and then click the Color 4 box. Repeat this for Colors 5, 6, and 7 — creating a total of five pure red squares in the first column.

So far you have created a basic set of reds that you'll be adjusting a little later to make a spectrum. Before you do that, however, let's set up the rest of the palette in the same way:

- Make Color 8 (the bottom one in the left column) orange by dragging the R slider to the top, the G slider to position #8 on the scale, and the B slider all the way to the bottom. Use the above procedure to copy this orange onto the next four colors. Because orange is still selected when you have finished copying it, all you need to do is click Copy and then the next color each time.

Note that you can achieve the same effect by adjusting each color individually, instead of using the Copy function. As you gain proficiency with **DeluxePaint,** you will find that it lets you achieve the same results in various ways, giving you the option of choosing the

method best suited to your working style. You can use either method as you work through this exercise.

- Make Colors 13 through 17 yellow by moving the B slider to the bottom and dragging the G and R sliders to the top.

  Make Colors 18 through 22 green: slide the R and B sliders all the way to the bottom and the G slider to the top.

  Make Colors 23 through 27 blue by moving the B slider to the top and the R and G sliders to the bottom.

  Finally, make Colors 28 through 32 violet by moving the G slider to the bottom, the B slider to the top, and the R slider halfway down.

Your palette now has black, white, and five squares each of red, orange, yellow, green, blue, and violet. Next we'll manipulate the hues, saturation levels, and color values to create variations within each color. As we noted in Chapter Two, the RGB and the HSV sliders are two different ways of looking at the same thing, and variations in one result in variations in the other. As you adjust the HSV settings in the following section, keep an eye on the RGB sliders to get an idea of the relationship between the two sets of variables.

- Select Color 3, the first red, and move the S (saturation) slider so that its bottom point aligns with the second horizontal bar from the bottom. Leave the H and V settings alone. For Color 4, the second red, set the S slider so that its bottom point rests on the halfway marker, the fourth horizontal bar from the bottom. Leave the third red as is. For Color 6, the fourth red, move the V slider so that it straddles the third bar from the top, and leave the H and S settings as they are. Finally, move the V slider for the last red (Color 7) so that its bottom point rests on the third horizontal bar from the bottom.

Repeat this same sequence of settings for each of the other colors (on some monitors, the yellows may not appear to change much), then set the palette by clicking OK. The Color Palette Requester will disappear from the screen. If you have anything showing on your page, choose white for your background color, and clear the screen.

Next, we'll use the new palette to create a color card, like the one in Plate II.

- Select the Filled Rectangle tool and draw a square about the size of a postage stamp. Click the Brush Selector with the left mouse button, and pick up the newly-created square with the right mouse button. Select Color from the Mode menu to tell **DeluxePaint** that you want to select a brush color from the palette, and then click Color 3, the lightest red, for your first brush color. Now move your brush towards the upper left corner of the screen and click with the left button to place a square there.

  Select Color 4, and place a second square just below the first, leaving about two pixels between them. Place squares of the remaining three reds below these two, near the left edge of the screen, again leaving about two pixels between each square.

You now have a column of reds, ranging from an unsaturated pastel red to a deep red with a mid-range Value. Now do the same thing with the oranges: place a square of Color 8, the lightest orange, about two pixels to the right of the first red square, and arrange the remaining oranges, from lightest to darkest, in a column under it. Start new columns for the yellows, greens, blues, and violets. When you're done, you will have a grid just like the one in Plate II, showing a complete tonal range for each color.

Next, let's label the color card for easy reference:

- Select the Text tool by clicking the Text icon (to the right of the Brush Selector), move the rectangular cursor to the top of the first column and click the left button. Making sure you have black selected as your foreground color, use the keyboard to label the columns from left to right as follows:

  R O Y G B V

  If any of the letters don't line up exactly, just lift each one up with the Brush Selector (using the right button to lift up the letter) and reposition it.

  Next, label the rows from top to bottom as follows:

  LOW SATURATION
  MEDIUM SATURATION
  PURE COLOR
  MEDIUM VALUE
  LOW VALUE

If you like, you can dress up your color grid by putting a one-pixel black border around it (select the one-pixel brush and the Unfilled Rectangle and describe a rectangle around the grid), and, if you really want to get fancy, a drop shadow. (See Tutorial Two for information on drop shadows). Save your Reference Palette under the name "Color Reference." Turn to Plate II and adjust your monitor until the colors on the screen match the ones in the plate. Use your Reference Palette to check against Plate II any time you want to adjust your monitor. In addition, if you are using a color printer, print out a copy of the Reference Palette and use the printout for tuning your onscreen palette so that it will match your printer's output.

CREATING COLOR SPREADS AND RANGES

As you have probably realized by now, **DeluxePaint** has many advantages over most standard media. Variable magnification, instant "undoing," and the vast power of **DeluxePaint**'s brushes have no counterpart in the world of paper, paint, and ink. For example, where once a smooth, gradual fade from one color to another required laborious work with an airbrush, **DeluxePaint**'s Gradient Fill does it all in seconds. Some of these more advanced features, however, require that you set up your color palette in a certain way to achieve maximum effect. This exercise will teach you how to get the most out of the Spread and Range commands to arrange your palette. In addition, you will create a new palette for the following exercise, "Animation with Color Cycling."

First, clear the screen, and then select Default Palette from the Color Control option of the Picture menu. Bring up the Palette Requester by clicking the Color Indicator with the right button or by typing **p** on the keyboard. Now make the following modifications to the palette:

- Click the first color and set it to black either by moving the V slider to the bottom, or by moving each of the R, G, and B sliders to the bottom. Next, with the first color still selected, click with the left button on Copy and then click the last color in that column (Color 8).

You have just copied the first color onto the last color in that column. This means that both the first and the last colors in the first column are black. Next we'll make Colors 3 through 8 black:

- Click Copy, and then click Color 3 to make Color 3 black. Now click Spread and then click Color 8.

You have just turned all the colors in the first column black except Color 2. If you were to turn Color 2 black as well, you would lose your Color Palette Requester, because **DeluxePaint** uses Colors 1 and 2 for painting its menus and requesters. Although **DeluxePaint** gives you the freedom to modify any of the colors in the palette, you should be particularly careful when modifying Colors 1 and 2 for this reason. If you ever make Colors 1 and 2 the same color, and you lose your Color Palette Requester (it will still be there, but you won't be able to see it), press the **u** (for Undo) key to reinstate the previous condition. Alternatively, you can press Help (under the Backspace key) to return Colors 1 and 2 to their default values.

- Select Color 2 and make it pure white by moving all three R, G, and B sliders to the top. Now click Spread with the left button, and then click on Color 8, at the bottom of the first column, to create a spectrum that starts with white at the top and ranges through grey to black at the bottom.

  Select Color 9 (at the top of the second column), and set it to pure red by setting the R slider at the top, and the G and B sliders at the bottom. Next, make Color 14 yellow (maximum R and G, no B) and Color 19 blue (maximum B, zero R and G). Finally, set Color 24 (the one at the bottom of third row) to the same pure red you started with.

The pure red, yellow, and blue colors define the range of hues that will be included in your palette. Now let's fill in the intermediate colors:

- Click Color 9 (the first red, at the top of second column), click Spread, and then click Color 14 (yellow).

The four colors between pure red and pure yellow are now a range of oranges. Repeat this procedure, this time starting with Color 14 and ending at Color 19 (blue), to give you a range of greens and blue-greens. One more spread, from Color 19 to the last red (Color 24, at the bottom of the third column) gives you shades ranging from blue through violet, and back to red.

Now you have a full rainbow of colors for your palette, as well as a selection of greys in the first column. Next we'll see how to get more subtle tints and shadings of a specific color:

- Set Color 25 (at the top of the last column) to pure white. Four colors down the column, at Color 29, create pure blue (B slider all the way to the top, R and G at zero). Select the white at the top of the column, click Spread, and then select the blue. Finally, set Color 32 to black, and create a spread from Color 29 to Color 32 to give you a set of blues varying in saturation and value.

You can use this same technique to create tonal ranges for different colors. Try creating sample tonal ranges for reds and greens. When you create a palette for your pictures, you might consider reserving the last column for tonal ranges involving a single hue, and the first column for shades of grey.

We've just seen how to set up our color palette using the Spread command. However, to use Gradient Fill and Color Cycling (as well as Shade and Blend, see The Painting Modes, in Chapter Two), you have to define color *ranges*, to let **DeluxePaint** know which set of colors to use. You can define up-to four ranges at one time, one in each of four *channels*. Here's how:

- Click C1 to define the first color channel. Select Color 2 (white), click Range, and then select Color 8 (the black at the bottom of the first column). A thin white line identifies your newly-defined color range.

  Now click C2, select Color 9, click Range, and select Color 24, at the bottom of the third column. Click C3, select Color 25, click Range, and then select Color 32.

You have now defined three color ranges:

C1: Seven shades from Color 2 to Color 8
C2: Sixteen shades from Color 9 to Color 24
C3: Eight shades from Color 25 to Color 32

As you click on C1, C2, or C3, you can see each range bordered by a thin white line next to its set of colors.

Now that you've defined a set of ranges, let's try an experiment with **DeluxePaint**'s Gradient Fill feature. Gradient Fill lets you fill any outline with a range of colors that gradually fade from one to the next. Here's how:

- Click OK to leave the Color Palette Requester. Now bring up the Fill Type Requester (refer to Figure 2.6) by clicking on the Rectangle tool with the right button. Select Vertical Fill (the square-cornered box with the vertical arrows, to the right of the word "Gradient"), set the Dither slider all the way to the left, and click OK to return to the painting area. (Dither is the amount of mixing that occurs between the colors in the range.) Now click the Filled Rectangle tool (click the bottom right part of the icon) with the left mouse button, and select any color in the first range (Colors 2 through 8).

Note that as soon as you click a color in one of your three ranges, the small rectangle on the Menu Bar gives you a preview of the gradient fill. Try clicking colors within the different ranges and watch it change. As soon as you are ready to move on, click one of the colors in the first range.

- Draw a rectangle using the left mouse button. Note that the shape gradually fills with a banded, metallic shading effect. Bring up the Fill Type Requester again and set the Dither slider about halfway on the scale. Click OK and then draw a second rectangle. This time you'll see the shades of grey blend from one to the other, without clear lines between them.

Now that you have the basics down, try experimenting with different settings. Bring up the Fill Type Requester again and set it to Horizontal Fill by clicking the middle of the three Gradient boxes. Draw some circles with this kind of gradient fill. Now try Horizontal Line Fill (the box on the far right with rounded corners), and make a series of realistic spheres. Horizontal Line Fill calculates the distance between the left and right borders of a figure and fills each horizontal line independently, so that each line receives the full complement of the gradient fill. Try drawing diamond shapes with the Filled Polygon tool using both types of horizontal fill, and see how it makes a difference. And don't forget that you have two other ranges to play with. Select a color from one of the other ranges you created and experiment with ovals, rectangles, and polygons. Note that you can change the order of the gradient fill by clicking the cycling direction arrow at the bottom right of the Color Palette Requester (refer to Figure 2.4).

ANIMATION WITH COLOR CYCLING

Most animation effects are created by displaying a series of drawings in rapid sequence. Animation with color cycling uses a slightly different technique: the illusion of motion is created not by changing images, but by rapidly changing the colors within a static image.

Load the six animation brushes, Anim1 through Anim6, and stamp a copy of each one (click the left mouse button) around the page. You will find these brushes in the Brush drawer. Select Use Brush Palette from the Color Control option of the Picture menu to use the same palette the brushes were created with.

☛ Press **F10** to hide the Menu Bar and the Toolbox. (You can bring them back later by pressing **F10** a second time). Activate color cycling by selecting Cycle from the Color Control option of the Picture menu, or by pressing the Tab key. Pressing Tab a second time stops the animation. Here's how each animation works:

1. THE GLOWING BALLS: The first ball was drawn in white, the second in grey, and the third in black. As the colors cycle, the balls change color from white through grey to black, and then start as white again. Because each ball started off at a different color in the range, the balls are out of synch.

2. THE COLOR WHEEL: The wheel was drawn with lines radiating out from the center. Each line's color is one shade away from the lines next to it. As the colors cycle, the wheel appears to spin.

3. THE BOUNCING BALL: Each position of the ball was drawn in a different color from the third range. Because five of the six colors in this range are black, only one frame shows at a time, as the remaining five are invisible against the black background. Change the black colors in this range to any non-black color to see all the frames.

4. THE RUNNING MAN: This was done in exactly the same way as the Bouncing Ball. Notice how the frames overlap slightly.

5. FALLING SNOW: This was done in the same way as 3 and 4 above.

6. MARQUEE: This effect was created with only the 2 colors from range 4. In fact, the "lightbulbs" are only flashing on and off. The viewer imagines the motion, just as he does with a real movie marquee.

Bring up the Color Palette Requester, and play with the animation speed of each range by first clicking each of the four channels, and then moving the slider under the channel selectors. To the left is slower, and to the right is faster. If you hold down the mouse button on the slider, you can get a preview of the cycling speed on the screen. You can also change the direction of the cycling by clicking the arrow at the lower right of the requester.

2 TUTORIAL: LOGOS UNLIMITED

In this series of tutorials we will take a relatively plain corporate logo and spice it up with some of **DeluxePaint**'s tools. We have provided the original logo for you so you won't need to start from scratch. All you need to do is embellish it by following the step-by-step instructions. First, however, you will need to load the original logo, which has been saved as a brush in the Brush drawer of your **DeluxePaint** disk. From the Brush menu, select Load; select the file Archbrush, and click Load. When the brush has finished loading, select Use Brush Palette from the Color Control option of the Picture menu to use the same palette the brush was created with. Finally, to provide some contrast to the logo, select a light shade (white or grey) with the right mouse button and click CLR.

Plate III shows the original logo as well as the embellished versions we will be creating in the following exercises. Let's see how easy it is to spice up the standard logo:

ITALICIZE

Let's begin by italicizing the logo. **DeluxePaint** lets you tilt any image, whether text or graphics, just by making a menu selection. Here's how:

- From the Brush menu, select Shear from the Rotate submenu. Now move the brush onto the screen, and, while holding the left mouse button down, move the mouse horizontally across the screen. When you are satisfied with the slope of the letters, release the button.

As you can see, Shear anchors the top part of any image, thereby allowing you to stretch the bottom part horizontally in either direction (see Plate III). If you are doing this with text (as we did above), you can italicize letters to any angle you wish. Click the left mouse button to place a copy of this new brush on the screen. If you want to save the new brush (remember, it's a brush, not just an image on the screen), select Save from the Brush menu, specify the drawer and filename (make sure you don't give it the same name as the original), and then click Save. Make sure you specify the correct drive — df1: if you are using an external drive, and df0: if you are using the internal drive alone.

BEND

This time, we'll bend the logo either vertically or horizontally. Although you are free to compound these effects (that is, you can bend an image that has already been italicized), let's start with the original brush again so we can see what effect bending has by itself. To restore the original brush, click the Brush Selector icon in the Toolbox with the right button. This restores the brush to its immediately preceding state. (If you modify a brush more than once, you cannot restore it to its *original* state using this technique — you would need to load the brush again.) Now bend the brush as follows:

- From the Brush menu, select Bend, and then Horiz from the secondary menu. Move the brush (which now has a rectangle around it) to the center of the screen and, while holding the left button down, drag horizontally to the left or right. When you release the button, you will see that the brush now has a new shape. Click the left button to place an image of the new brush on the screen.

Try this technique again, this time using the Vert option. With this option you will need to drag the mouse up or down as you bend the brush. Restore the brush to its previous state by clicking the Brush Selector icon with the right mouse button. When you are satisfied with the new shape, click the left mouse button to place an image on the screen. If you like, you can save the new brush alongside the original one. Just follow the instructions outlined above.

RESIZE

In this exercise we'll resize the brush, stretching or shrinking it to a different size. Reload the original brush and then follow these steps:

- From the Brush menu, select Size and then Stretch from the secondary menu. Now as you move the brush back onto the screen, you will notice that your cursor has changed to the word SIZE. While holding down the left mouse button, drag the mouse diagonally. Drag it down and to the right to stretch it, and up and to the left shrink it. When you are satisfied with the new size, release the button.

You should note two things about this technique. First, you may have noticed a "Z" next to Stretch in the secondary menu. This is the keyboard equivalent, and allows you to select this feature just by pressing the Z key. Because the Z is shown capitalized, you will need to press **Shift-Z**. (See the Reference section for a table of keyboard equivalents.) Second, if you want to resize the brush in proportion to the original — that is, keeping the original ratio of height to width — press the Shift key before you start dragging the mouse, and hold it down as you drag. By constraining the change in this way, you can resize the image in direct proportion to the original. Note, also, that if you try to make a brush larger than the available memory can handle, the brush will snap back to its starting size and shape.

CHANGING COLORS

In this exercise, we will change the colors of the original brush — red and grey on a black background — to a new set of colors. After reloading the brush, click with the left mouse button to place an image of the brush on the page. Here's how to change the brush's colors:

- Select a medium blue shade from the Palette with the left mouse button. This is your new foreground color, soon to be the new brush color.

  Next, select the red of the original brush as the background color. You can do this using either of two techniques. First, you can select the red by clicking the right mouse button on that color in the Palette. Alternatively, you can click inside the Color Indicator with the left mouse button to change your cursor into a pointer with the word PICK attached to it. Now when you click on any screen color with the right mouse button, that color will become the new background color.

Because it can convert your entire painting area into a palette, this technique of clicking the Color Indicator to select any screen color as the new foreground or background color is particularly useful. Note that it works with either the left or the right mouse button. Click the Color Indicator, and then click any onscreen color with either mouse button. Whatever color you click with the left button becomes the foreground color, and whatever color you click with the right button becomes the background color. (You may find the keyboard equivalent even more useful: press the **comma** key to change your cursor into a PICK pointer, and then click on any of the screen colors as before.)

The next step is to switch the foreground and background colors, so that every pixel of the current background color (red) in the brush will change to the current foreground color (blue):

- From the Brush menu, select Change Color from the primary menu and Bg -> Fg from the secondary menu.

Notice that selecting Bg -> Fg changed the red parts of the brush to blue. If you had an original brush that contained both red and blue, you could make the changes work in both directions by selecting Bg <-> Fg. This would change all the red parts of the brush to blue, and all the blue parts of the brush to red.

Now that you've seen how easy it is to change colors, you might want to try changing colors on all the brushes you'll be creating in this tutorial. Plate III shows a selection of completed brushes variously colored.

PATTERN FILL

Reload the original brush by selecting Load from the Brush menu. When the brush has loaded, place an image of it on the screen by clicking with the left mouse button.

In this exercise, you'll be coloring the brush image with a pattern rather than a solid color. Here's how:

- Load Pattern1 from the Brush drawer. Your new brush will be a small square with horizontal blue stripes. Now click the Fill tool icon (the paintcan) with the right mouse button to bring up the Fill Type Requester. Click From Brush. This last action places a copy of the current brush pattern (the one we just loaded) in the requester. Click Pattern, and then OK.

The next step is to use this pattern fill to spice up our logo:

- Click the Fill tool icon with the left mouse button, place the paintcan's spout on the arch graphic, and click with the left mouse button. Repeat until the arch is completely filled with the pattern (two applications should do it).

You might want to do the same thing with the lettering, but this time try creating your own pattern. Using the Straight Line tool and the second round brush from the left, draw a series of horizontal deep-blue lines, equally spaced from each other (about one pixel apart should work fine). Now click the Brush Selector with the left mouse button and pick up some of the pattern as a brush. Make sure you pick up a representative part of the brush, one that will give you a recurring pattern. Click the Fill tool icon with the right mouse button to bring up the Fill Type Requester, and select Pattern and From Brush as before. If the pattern in the box does not look right (e.g., if it has an extra white line somewhere), go back to the pattern on the screen and pick it up again, this time making sure you don't pick up too much or too little. When you are satisfied, go back to the Fill Type Requester and click From Brush and then OK to complete the transaction. Now when you click the Fill tool icon with the left mouse button, the paintcan will be filled with the pattern you created. As you click on each letter of the name, it will fill with the new pattern.

DROP SHADOWS

In this exercise we will give our logo a professional touch by adding a *drop shadow*. A drop shadow creates an illusion of depth by putting a dark shadow under an object. First, load your standard Archbrush, and then select the color you want to use for the shadow with the left mouse button (making it the foreground color). Black and brown are the most appropriate shadow colors, although you can use any color you like. Then do the following:

☛ Select Color from the Mode menu (or press the **F2** key).

The Color command turns a multicolored brush into a solid color, the currently selected foreground color. This is a way of selecting brush color from the Palette, just as we did when we created the Reference Palette in Tutorial One. When you are in Color mode, **DeluxePaint** uses just the outline of the brush, and colors it the current foreground color.

☛ Position the new (solid-colored) brush on the screen and click the left mouse button to place an image of it there.

You have just placed a copy of the logo's shadow on the screen. Now you need to revert to the standard brush so you can place a copy of the logo over the shadow.

- Select Matte from the Mode menu (or press **F1**) and position the standard brush over the shadow. Offset the standard brush slightly so you can see the shadow underneath it and press the left mouse button.

You have just created a logo with a drop shadow to create the illusion of the logo hovering slightly above the page. You might want to save it as part of your library of Arch logos. Remember to give it a different name before you save it; otherwise you will lose the original brush.

OUTLINING THE LOGO

In this exercise, we will put a different-colored outline around the logo. As before, begin by reloading the standard Archbrush and then select as your foreground color the color you want to use for the outline. Choose a color that is not already represented in the logo, as this will make it easier to change it later without affecting the rest of the logo.

- Select Color from the Mode menu (or press **F2**).

As before, this turns your multicolored brush into a solid color, the one you chose as your foreground color.

- Select either the Unfilled Rectangle tool (for a squared-off outline) or the Unfilled Circle (for a rounded outline). Move the crosshair back to the screen and, holding the left mouse button down, drag diagonally up or down. Each pixel you drag the mouse increases the thickness of the outline by that amount. Release the button.

As you have probably noted, the Rectangle and Circle drawing tools paint with the current brush, whether it is a built-in or a custom brush. This lets you create an accurate outline of any shape, just by dragging it the required distance.

- Select Matte from the Mode menu (or press **F1**), or click with the right mouse button to revert to the original multicolored brush. Position the original brush over the outline and click the left mouse button to deposit an image there.
  You can now pick up your new logo as a brush, and then repeat the same procedure to produce multiple outlines.

GRADIENT FILL

One of **DeluxePaint**'s most powerful features is its ability to fill a shape with multicolored gradients as well as with solid colors. In this exercise, we'll see how easy it is to create a gradient pattern and fill our logo with it. As before, restore or reload the standard Archbrush, and place a copy of it on the screen by clicking the left mouse button. Before we fill the logo, we will need to connect all its letters to make it a single shape. This allows you to fill the whole logo with a consistent gradient, rather than a different gradient for each letter. Do this by selecting the smallest (one-pixel) brush and the Straight Line tool, and then connecting the letters along the top. You will be removing this temporary line later, so lay the line above the top of the letters and keep track of where it begins and ends. You might want the line to extend past the logo, so it will be easier to find its extremities. The next step is to define your gradient range:

- Bring up the Color Palette Requester by clicking with the right button on the Color Indicator, or by pressing **p** from the keyboard. From the Color Palette Requester, create the color range you wish to use for your gradient fill. (For creating a color range, see Tutorial One). When you've defined your ranges, click OK to return to the painting screen.

We have now created a color range to use as a gradient fill. Now when you fill a shape with a gradient fill, it will use that color range. First, however, you need to select one of the colors in the range by clicking it with the left mouse button. Next, you need to tell **DeluxePaint** to use that color range as a fill pattern. Here's how:

- Click the Fill tool icon with the right mouse button.

This tells **DeluxePaint** that you want to customize the icon's effect, and brings up the Fill Type Requester. Remember, clicking the drawing tools with the right button lets you customize the respective effects; see The Tools, in Chapter Two, above. Now you need to select the variables you want to use for your gradient fill:

- Click Vertical for fill type, and then drag the Dither slider left or right to create the desired amount of dithering in the gradient. Click OK to complete the transaction. When you return to the painting area, click the Fill tool with the left button to select it, and then click on any of the letters on the logo, and on the arch symbol to fill it with the gradient.

To finish the job, you need to carefully erase the connecting line you added back at the beginning of this exercise (remember, it was only temporary), and then touch up any stray pixels with the appropriate color.

You have just seen how to take a relatively plain logo and embellish it with some of **DeluxePaint**'s tools. In the next tutorial, we will explore the uses of stencils and friskets.

3 TUTORIAL: THE WORLD OF STENCILS

In the following set of exercises you will learn how to create and use stencils within **DeluxePaint**. Although stencils are primarily used for producing quick, uniform lettering by amateur signwriters, they have uses that go far beyond that. Airbrush artists, for example, use stencils (called *friskets*) to cover certain areas of their work while they airbrush other areas. In fact, for an airbrush artist the creation of friskets is probably the single most important part of a job, because the final image can be only as good as the friskets that define the boundaries between its various areas.

DeluxePaint makes it easy to create a stencil for any part of an image, without the need to redraw the image. All you need to do is specify the colors that make up the stencil, and **DeluxePaint** does the rest, even if the image is highly intricate. By contrast, an airbrush artist has to create his image twice — once when he draws the original design, and again when he cuts out the friskets.

Here's how it works: when you make a stencil for a particular set of colors, you are locking (and thus protecting) any parts of the picture that are made up of those colors, making them impervious to any overspray. This means that when you have a stencil for a particular set of colors, you cannot paint over those colors until you turn the stencil off. It also means that you can essentially paint a picture backwards, from the foreground to the background, because you can use stencils to mask any foreground objects from the colors you are using for the background objects.

The following exercises explore various aspects of stencils in **DeluxePaint**. Before you begin, go to the Picture menu and load the picture called Stencilset from the Lo-Res drawer.

DISTANT SNOWCAPS

The left part of the Stencilset picture shows a distant mountain range behind a green field and under a colorful sky (see Plate IV). (If you followed the preceding tutorial, you'll realize that both the sky and the field were created with a Gradient Fill, in a fraction of the time it would take using more traditional techniques. See the Gradient Fill exercise above.) Note that the mountain range is actually made up of

several ranges, with the more distant ones painted in lighter shades than the nearer ones. In this exercise, we will put a snowcap on the most distant range without disturbing any other parts of the picture. This would be a tall order for any other graphic medium, but is surprisingly easy with **DeluxePaint**. For example, if you were to do this using a standard airbrush, you would need to cut out friskets to cover every part of the image *except* the distant mountain range, and then spray the picture, all the while hoping that none of the snow color will bleed under the friskets. Let's see how **DeluxePaint** does it:

- From the Effects menu, select Stencil and then Make from the secondary menu to bring up the Stencil Requester (see Figure 3.1). Click Clear, click on Color 9 (the one at the top of the second column), click Invert, and then click Make.

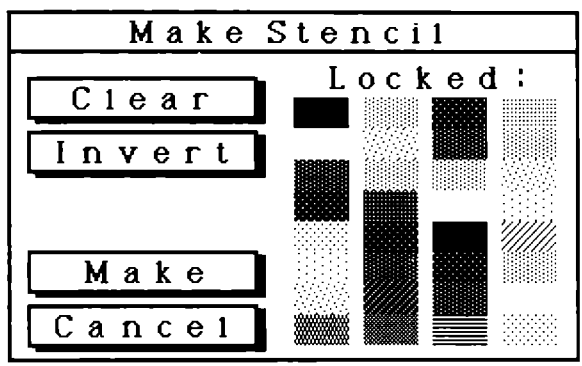


Figure 3.1. Stencil Requester

With four simple clicks of the mouse you have created a stencil that locks every color in the picture except Color 9, the color of the most distant mountain range. The first click cleared the picture of any stencils, the second selected the stencil color, the third click inverted the stencil configuration (making everything except Color 9 a stencil), and the fourth made the stencil. To let you know that you have a stencil active, an "S" appears on the Menu Bar.

Note that clicking Invert simply inverts the current stencil configuration, saving you the trouble of clicking all the colors except

the one you want to paint on. This is useful if you want to paint on one or two selected colors to the exclusion of the rest; if you want to create a stencil to lock only one or a few colors, then use the direct approach. The next step is to paint the snow on the distant mountain range:

- Select white as the foreground color by clicking Color 2 (second from the top on the left) with the left mouse button, and then select the one-pixel brush and the Airbrush tool. Move the cursor over to the distant mountain range and spray a snowcap on it.

Because every color except that of the mountain range has been locked, you can spray without fear of contaminating any adjoining colors. Note that although the white you are spraying on the mountain range is one of the locked colors, it is not itself locked while you are applying it. This means that you can paint over it with another color (such as the original color of the mountain, if you don't like the look of the snowcap) just as though it were unlocked. To lock a recently applied color, just select Remake from the Stencil submenu. You don't need to bring up the Stencil Requester again, because the configuration is still as you want it.

This also means that you can use the "Again" key (**a**) to update your stencil, if Remake was your last menu command. (The Again rule is simple: press **a** whenever you want to repeat the immediately preceding menu command, to save you moving the mouse up to the Menu Bar and through menu and submenu options. If your last menu command produced a requester, then pressing **a** will produce that same requester, without the need for menu selections.)

SUNRISE IN THE ROCKIES

In this exercise, we will make the sun rise *behind* the mountains, and so we need to lock every color except the sky. Here's how:

- Bring up the Stencil Requester, click Color 9 (the distant mountain color) to lock it, and then click Colors 1 (black) and 13 through 18 (the sky colors) to unlock them. (Color 13 is halfway down the second column, and Color 18 is the second from the top of the third column.) Click Make.

You have now locked every color in the landscape except the sky colors. Now let's make the sun rise:

- Click the Brush Selector with the left mouse button, move the large crosshair over to the sun image (on the far right of the screen) and pick it up with the left mouse button. Move the brush over to the mountain range.

Did you see the sun move *behind* the mountains and then peek through? This is because every color — except the sky colors and the background— is locked, and so will not accommodate the sun brush. When you are satisfied with the placement of the sun, click the left mouse button to stamp an image of it there.

CUTTING SOME Z'S

In this exercise we will explore further aspects of **DeluxePaint**'s powerful stencil editor. In particular, you will see how to turn stencil colors on and off from any part of your picture, not just from the Stencil Requester.

- Bring up the Stencil Requester, and click Clear to clear all the stencils. Now move the cursor outside the requester and click the large Z shape with the left mouse button. Click Invert and then click Make to return to the painting screen.

Did you notice that when you clicked the Z the Stencil Requester responded by locking that color? This means that you can lock and unlock colors directly from your image just by clicking them. Note that each click of the mouse toggles the locking function on and off, just as it does in the requester. And to make it easy to find the colors you want to lock or unlock, you can move the requester to any part of the screen just by moving the cursor to the top of the requester, pressing the left mouse button, and dragging it to its new position.

Now let's see what we can do with the stencil we just created:

- Click the Brush Selector and pick up the textured area to the right of the Z. Move the cursor over to the Z and watch what happens.

Did you see the textured brush appear behind the Z? Because all the colors except the Z are locked, it looks like you are viewing the textured brush through a Z-shaped window. Now, when you place the textured brush behind the Z and click the left mouse button, you will fill the Z with the textured pattern.

THE EYES HAVE IT

You may have trouble finding a practical application for this next exercise, but it's fun nonetheless.

- Open the Stencil Requester, click Clear, and then click the following colors: 7, 8, 24, 28, 29, 30, and 31. Click Make to complete the transaction. Now pick up the two blue circles at the lower right and move them over to the face.

Because all the colors in the face are now locked, the two circles appear to move behind it. When the circles are directly behind the eyes, you can make the eyes appear to move around just by moving the cursor around. You can set the eyes in any postion you like just by clicking the left mouse button. If you don't like it, click Undo and try again.

FIXING THE BACKGROUND

By using a combination of stencils and fixing the background, you can define a stencil by area rather than color. This lets you confine a stencil to a particular area of the page, without forcing you to lock every instance of a particular color. Let's take a closer look:

- Pick up the small clump of pine trees from the right-hand side of the page (above the blue circles). From the Effects menu, select Background from the primary menu and Fix from the secondary menu.

You have just fixed the picture to the background (the "B" in the Menu Bar tells you so), which means you can always return to that picture by clicking CLR. Thus, you can stamp pine trees all over the landscape and then return to the original picture at any time. You can also fix the background successively, updating the picture from the previous "fix." (As we saw earlier, you can use the "Again" key (**a**) to repeat the immediately preceding menu command.) For the purpose of this exercise, go ahead and stamp a few clumps of pine trees in front of the closest mountain range. Now let's turn that collection of pine trees into a stencil:

- From the Stencil submenu, select Lock FG.

This last action turned the foreground (i.e., everything you added to the picture since fixing the background) into a stencil, but without affecting any other part of the picture that uses those same colors. Try it and see. Move your pine-tree brush over to the pine forest and you'll see that your brush goes behind the forest but in front of everything else. You can remove this stencil either by turning the stencil off (selecting On/Off from the Stencil submenu) or making a stencil by locking colors. (The color and area methods are mutually exclusive, so using one method automatically negates the other). And as is the case with regular stencils, clicking CLR does not clear the stenciled area — it is protected until you turn it off, just like the fixed background.

4 TUTORIAL: PUTTING THINGS IN PERSPECTIVE

In this tutorial we will be examining the rotation and manipulation of brushes about the three spatial axes to produce perspective effects without the need for technical drafting tools. With **DeluxePaint**'s perspective options you can place the perspective center (the point level with the viewer's eye) anywhere on the page. You can then rotate a custom brush about its x, y, and/or z axes to define a plane of operation for the brush, and move the brush along that newly-defined plane. In addition, by selectively fixing any one of the three axes, you can make your brush change size as it moves up and down the page, letting you create objects that recede into the distance. Here's how:

AN AREA RUG

In this exercise, we will examine two different methods of rotating the image of an area rug to change its perspective.

- From the Brush menu, select Load, and then load the brush named Dolphin. Select Use Brush Palette from the Picture menu's Color Control submenu.

Our first job is to define the perspective center. This is simply the viewer's eye level. For the purposes of this discussion, let's assume that there is a horizontal plane (the *view plane*) passing through that point.

- From the Effects menu, select Perspective and then Center. Your cursor will change into a large crosshair; move the crosshair to a point about one inch below the Menu Bar and about halfway across the page. Click either mouse button.

This will be the perspective center until we set a different one. Note that when you selected Center, a small crosshair was already on the page. This was the existing (default) perspective center that you replaced by defining the new center. Now let's put the brush into perspective mode so we can rotate it.

- From the Effects menu, select Perspective and then Do, or press **Enter** on the keypad. This changes the cursor into a four-cell matrix, representing the outline of your brush.

As we noted earlier, you can rotate your brush about any of the three axes, x, y, and z. The x-axis is horizontal, moving left and right across the screen; the y-axis is vertical, moving up and down the screen; and the z-axis is perpendicular to the screen, moving from the front to the back of the monitor. When you first enter perspective mode, your brush and the screen share the same axes; that is, the brush's y-axis corresponds to the screen's y-axis, and so on. When you rotate the brush, however, mouse movement still translates into movement along the x- and y-axes, but these axes are now relative to the brush's orientation, rather than to the screen. If you would like to read more about **DeluxePaint**'s perspective features, see the discussion under the Effects menu in the Reference section. However, it's a lot easier to understand how perspective works by trying a few examples, so you might find it more profitable to work through this tutorial. Let's start with a few simple exercises.

- Move the brush outline so that its center coincides with the perspective center we set earlier (about one inch from the top of the page); hold down the Shift key and press **Keypad 8**.

You have just rotated the brush 90 degrees about its x-axis. However, because the center of your brush corresponds to the perspective center, you are viewing the brush edge on, which explains why it is difficult to see. Note that the brush's y-axis is now perpendicular to the screen, and that the z-axis is now vertical, which means the rug is lying flat. You can always tell the current state of rotation in degrees (relative to the screen) from the coordinates at the right of the Menu Bar. At the moment, it shows 90, 0, 0, to indicate that the x-axis has been rotated 90 degrees, with zero rotation for the y- and z-axes.

In the next step, we will shift the brush down its z-axis (the screen's y-axis), effectively changing your viewpoint.

- Hold down the Shift key and press the ' (apostrophe) key three times.

You have just shifted the brush down its z-axis, so that it is now below eye level. Move the mouse back and forth and see how the brush outline moves along the plane we just defined.

When used in conjunction with the other keys that affect brush orientation, the Shift key increases the increments of rotation or movement along an axis. By using the Shift key when you pressed the **Keypad 8**, for example, you were able to rotate the brush 90 degrees

with a single movement. You could have achieved the same result by pressing the un-Shifted 8, but you would have had to do so 90 times (since each keypress rotates the brush one degree). The same principle applies to the Shifted and un-Shifted apostrophe and semi-colon keys. Note that 90 degrees is the default rotation value. You can enter a new value by clicking the Grid icon with the right button while in perspective mode.

Let's place the area rug on the floor.

☛ Move the brush outline so that its base is near the bottom of the screen, and click the left mouse button.

To illustrate an important rule of perspective, let's create the same effect using a more direct method. In the previous exercise we placed the brush outline so that its center coincided with the perspective center, and then pressed **Shift Keypad 8**. This required a subsequent shift of the brush plane using the apostrophe key. This time we'll define the brush plane *before* rotating the brush. We'll do this by placing the brush outline further down the page before rotating it.

☛ Press **Keypad 0** to reset all three axes to zero. Position the brush outline so that its center is about one third of the way down the page. Press **Shift Keypad 8**.

By positioning the brush outline so that it is below the perspective center, we set its x,y plane parallel to but below the view plane, and we did so without using the apostrophe key. This illustrates the first important rule of perspective:

The location of the brush outline at the time you rotate the brush determines the position of the brush plane relative to the view plane.

Of course, the apostrophe and semi-colon keys still shift the brush plane along its z-axis, but now you only need to use them to fine-tune the position of the brush plane.

Whichever method you use, the result is a view of a rug as it might appear from normal eye level. You can "clean up" the image by selecting one of the Anti-alias settings from the Perspective submenu before you place an image of it on the page. If you want to save your image, select Save from the Picture menu. Click CLR to get a fresh page.

A RUG ON THE CEILING

In this exercise, we'll rotate the brush to provide us with a view of the rug as it would appear if it were mounted on the ceiling. This time we need to use the opposite procedure:

- Press **Keypad 0** to set all axes to zero. Select Center from the Perspective submenu or press the **Decimal Point** key on the keypad. Move the large crosshair to the center of the page and about one inch from the bottom and click either mouse button. Move the brush outline so that its center is about a third of the way up the page, and press **Shift Keypad 7** to rotate the top of the brush 90 degrees towards you.

We have already seen that **Keypad 8** controls rotation about the brush's x-axis, and that **Shift Keypad 8** rotates the brush 90 degrees at a time. The same applies to **Keypad 7**, except that it rotates the brush in the opposite direction about its x-axis. (Note that the coordinates on the Menu Bar now show -90, 0, 0). **Keypad 9** resets the x-axis to zero rotation. This means that all x-axis rotation is controlled by the *top* row of keys on the keypad. In like fashion, all y-axis rotation is controlled by the middle row of keys on the keypad, and z-axis rotation by the bottom row. Thus, to rotate the brush about the y-axis, press the **Keypad 4** or **5** keys, and to reset the y-axis to zero, press the **Keypad 6** key. To reset all three axes to zero, press **Keypad 0** or select Reset from the Perspective submenu. By now you have the fundamentals of perspective at your fingertips, so you should feel free to experiment with different brush rotations. However, let's try one more exercise before moving on to the concept of fixed axes.

A ROW OF STATELY HOMES

For this exercise, load the brush called "Building" and select Use Brush Palette from the Color Control submenu. Reenter perspective mode by pressing **Enter**. We will be rotating the brush about its y-axis to provide a view of a building from the side. In addition, we'll be resetting the perspective center to provide a "street-level" view.

- Press **Keypad 0** to reset all three axes to zero, and then select Center from the Perspective submenu (or press the **Decimal Point** key). Move the large crosshair to about one inch from the bottom and about one inch from right-hand edge of the page (near the Palette) and click either button.

Now we'll rotate the brush about its y-axis:

- Position the brush outline so that its center coincides approximately with the center of the page. Press **Shift Keypad 5** to rotate the brush's y-axis 90 degrees. Move the brush to the left-hand side of the page. When you can just see the left-hand edge of the brush outline (i.e., just before it disappears off the left-hand side of the page), click the left mouse button.

You have just built the first of a row of buildings. To complete the row, move your brush so that its left edge coincides with the first building's right edge and place an image there. Continue this process until you have completed the whole row. As before, you may want to clean up the jagged edges a little, and "turn off" some of the lights by painting them a different color. You're the architect. You can even turn your buildings into highrises if you like. Just add a second layer on top of the first.

ANOTHER POINT OF VIEW

When we built our row of homes we placed the perspective center (the viewer's eye level) toward the bottom right-hand corner of the page. This resulted in a row of homes as they would appear from street level. We could have placed the perspective center near the top of the page and created a row of buildings viewed from a higher plane. As an exercise for yourself, go back and recreate the row of buildings, but this time place the perspective center about one inch from the top of the page rather than the bottom. Press **Keypad 0** to reset the axes, move the brush outline to the center of the page as before, and press **Shift Keypad 5** to rotate the y-axis 90 degrees. This time the buildings will appear to be viewed from above.

FIXING AXES AND OTHER MYSTERIES

We have already seen how mouse movement translates into movement along the brush's x- and y-axes, and that this continues to be the case after the brush is rotated. We have also seen how to position a brush on its z-axis by controlling the position of the brush when you rotate it

and by using the apostrophe and semi-colon keys to fine-tune that position. Now it's time to examine these concepts a little more closely.

The reason movement along a brush's z-axis is controlled by brush position at the moment of rotation (and by the apostrophe and semi-colon keys after rotation) is simply that the mouse is only capable of two-dimensional movement. Lifting the mouse off the table (the third dimension) does not have any effect onscreen, so it is necessary to fix one axis with respect to mouse movement. When you first enter perspective mode, the z-axis is fixed, which means that mouse movement controls movement only along the brush's x- and y-axes. This, however, is only the default mode; you can selectively fix any one of the three axes, and allow mouse movement to control the other two. And as you might expect, brush placement (and the apostrophe and semi-colon keys) controls movement along the fixed axis, whichever one that might be, just as it did when the z-axis was fixed. To see how this works in practice, try the following simple exercises:

- Place the perspective center at the center of the page. Reset the brush rotation to zero by pressing **Keypad 0**, and move the brush outline so that its center coincides with the perspective center. Then fix the x-axis by pressing **Shift Keypad 9** (remember, the top row of the keypad controls the x-axis).

Now when you move the mouse, your brush will move along the y- and z-axes. Try it and see. As you move the mouse from side to side, the brush will change size, because side-to-side movement now controls movement along the brush's z-axis, the one perpendicular to the screen. On the other hand, moving the mouse backward and forward (toward you and away from you) has no effect on brush size, because this simply moves the brush along its y-axis. As you've probably guessed by now, this is an easy way to resize a brush: fix the x-axis, move the brush horizontally until it is the right size, and then click the button. Similarly, you can rotate a brush simply by rotating it about its z-axis (the bottom row of the keypad).

Press **Keypad 0** to reset the axes and to refix the z-axis. Now try fixing the y-axis (**Shift Keypad 6**) and doing the same thing. This time, backward-and-forward mouse movement controls movement along the brush's z-axis, while side-to-side movement controls movement along the x-axis. To fix the z-axis again, press **Shift Keypad 3**.

CITY PLANNING

Let's try our new axis-fixing skills on some city planning, and create an entire city with a single brush. Here's how:

- Reset all axes to zero (**Keypad 0**) and place the perspective center at the center of the page and about one inch from the top. Move the brush outline so that its top coincides with the perspective center (i.e., about one inch from the top). Press **Shift Keypad 6** to fix the y-axis.

By fixing the y-axis, backward-and-forward mouse movement now controls movement along the brush's z-axis. You can now stamp buildings all over the page, and they will vary in size in accordance with their location on the screen's vertical axis. Note, however, that as you stamp buildings on the page, their tops stay at approximately the same height on the page. This is because the top of the brush coincided with the perspective center when you fixed the y-axis. You can change this now by shifting the brush along its y-axis, as follows:

- Hold down the Shift key and press the ' (apostrophe) key six times. This moves the brush six large increments along its (fixed) y-axis, moving it down below eye level.

Now as you move the brush up and down the page, the top of the brush moves up and down as well. Thus, by using the apostrophe key, you can fine-tune the brush's location on its fixed axis, changing its position relative to the viewer's point of view.

Note, however, that you can control this effect another way, just as we did when we rotated the brush in the first exercise. When you fixed the y-axis above, the top of the brush outline was level with the perspective center. If the brush outline had been towards the bottom of the page when you fixed the y-axis, the result would have been different. Try it. Reset all the axes to zero, move the brush to the bottom of the page and fix the y-axis. Now as you move the brush up and down, its top moves as well. This illustrates the second important rule of perspective:

The location of the brush outline at the time you fix an axis determines the position of the brush on its fixed axis relative to the view plane.

Try the following as an exercise for yourself: reset the perspective center to a point about two thirds down the page, and then fix the y-axis in a way that allows the *bottom* of the buildings to be approximately level, providing more of a street-level perspective. (Hint: the same principle applies that applied in the previous exercise when we fixed the tops of the buildings).

CUBISM REVISITED

In this final exercise, we will see how easy it is to create cubes in any orientation in three-dimensional space. Let's start by creating a new brush:

- Turn on the Grid by clicking the Grid icon with the left mouse button. Select the Filled Rectangle tool and a foreground color that contrasts with the current background color. With the Shift key held down (to constrain the rectangle to a square) draw a square about three inches wide. Select a new foreground color and draw a second square just inside the first, one grid unit (eight pixels) in from the edge.

Now let's pick up the square as a brush and move it into perspective mode:

- Click the Brush Selector with the left button and pick up the square. If you picked it up with the left button, click CLR to clear the screen. From the Brush menu, select Handle and then Corner to move the arrow cursor to the lower right corner of the brush. Press **Enter** to enter perspective.

Our first job in perspective is to reset all axes to zero and to redefine the perspective center:

- Press **Keypad 0** to reset the axes, and then set the perspective center at the center of the page and about one third of the way down.

When the grid is on in perspective mode, the size of the grid defaults to the brush dimensions, i.e., the grid's x and y dimensions correspond to the brush's x and y dimensions. In addition, the grid's z dimension corresponds to its y dimension. You can change these settings by clicking the Grid icon with the right button while you are in

perspective mode, but for this exercise we want to use them just as they are, because that is the best setting for creating cubes.

☛ Move the brush outline to the bottom left side of the screen and click the left mouse button to place an image there.

You have just created the left side of the cube. Next, we need to rotate the brush about its y-axis to create the right side of the cube:

☛ Press **Shift Keypad 4** to rotate the left side of the brush back. Without moving the brush, click the left mouse button to place an image there. Press **Shift Keypad 5** to rotate back.

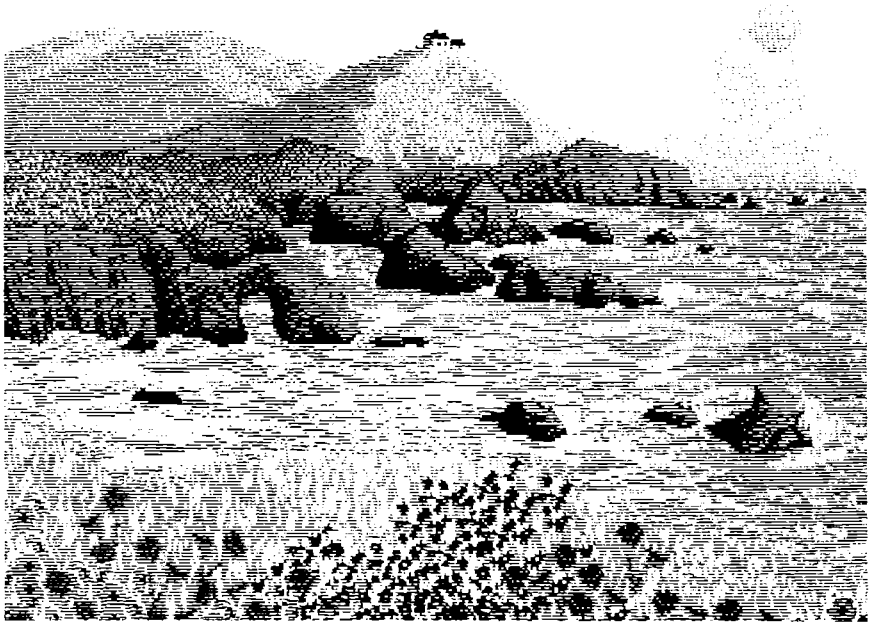
We have just built two sides of the cube. All that's left is to put a top on it:

☛ Without moving the brush left or right, slide it up one notch, and press **Shift Keypad 8** to rotate it about its x-axis. Click the left mouse button to put a top on the cube.

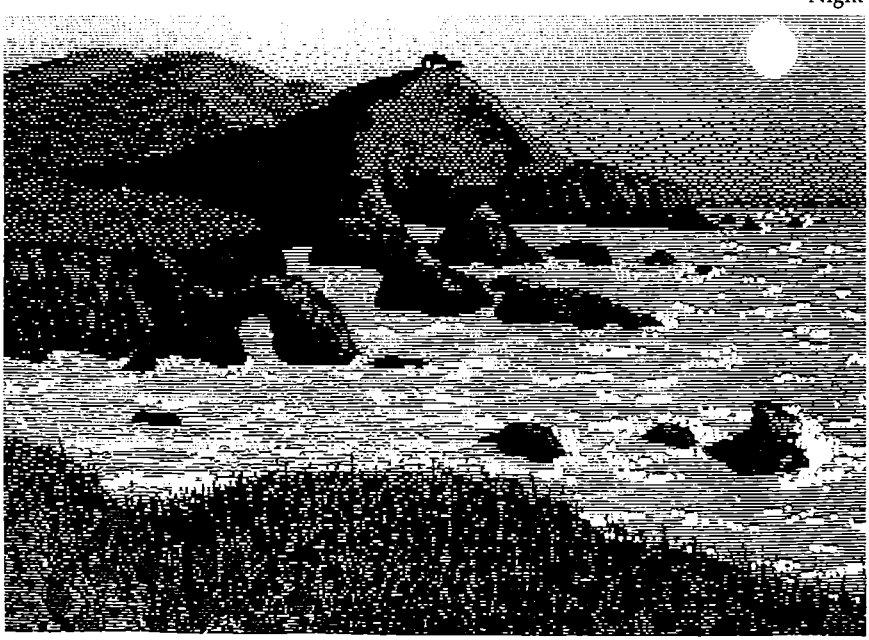
You probably noticed that the above construction involved minimal mouse movement. This is because with Grid turned on and the handle at the lower right corner of the brush, you only need to move the mouse two or three times. All rotations are about the brush handle, which automatically places the sides of the cube in their correct positions. Now that you have the rudiments down, try stacking cubes on top of each other, or stacking them side by side. Because you are in three-dimensional space, the possibilities are almost endless.

Congratulations! You have just completed a series of tutorials designed to make you a **DeluxePaint** power user. But while the preceding tutorials cover most of **DeluxePaint**'s important features, they couldn't cover everything. If you need information on any feature not covered in the tutorials or any of the preceding sections, you can look it up in the following chapter, the Reference section.

Day



Night



3.35

Plate I: Night and Day

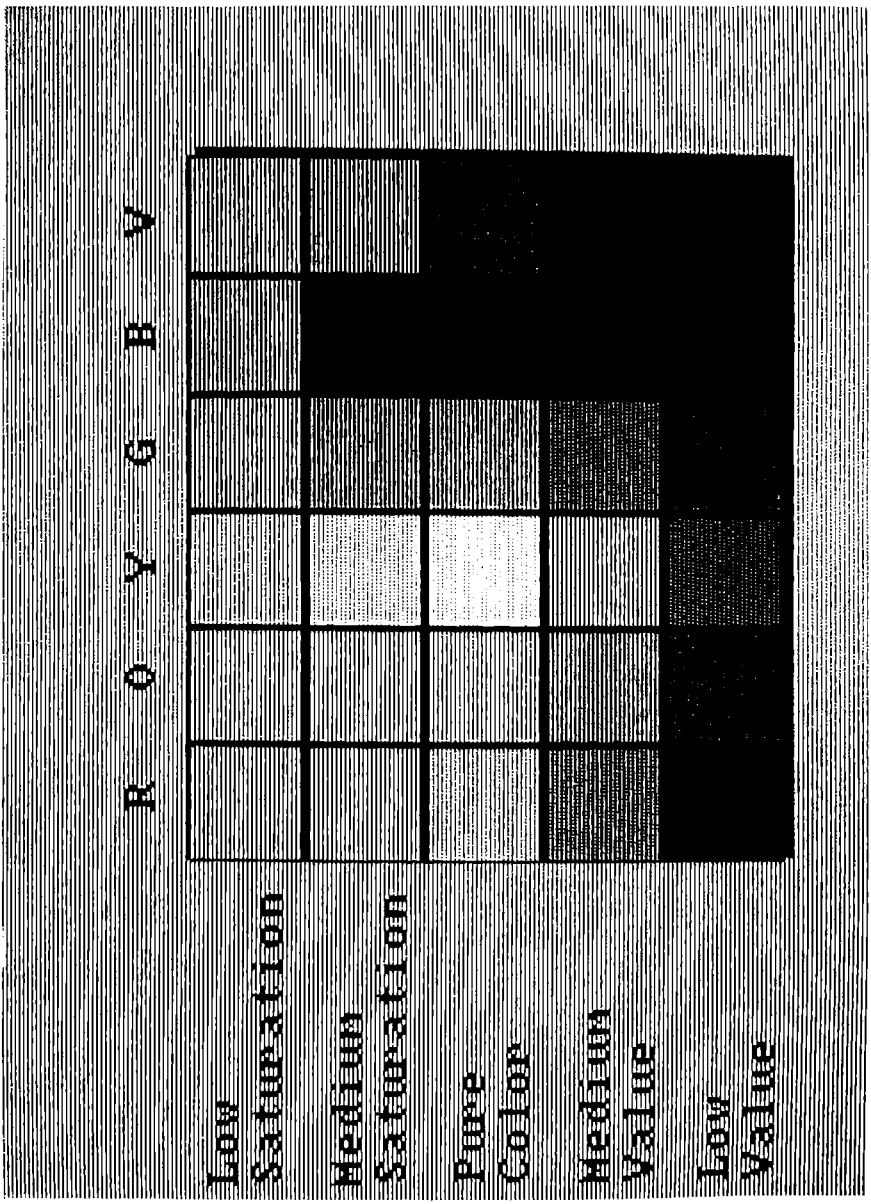


Plate II: Reference Palette

Plate III: Arch Logos

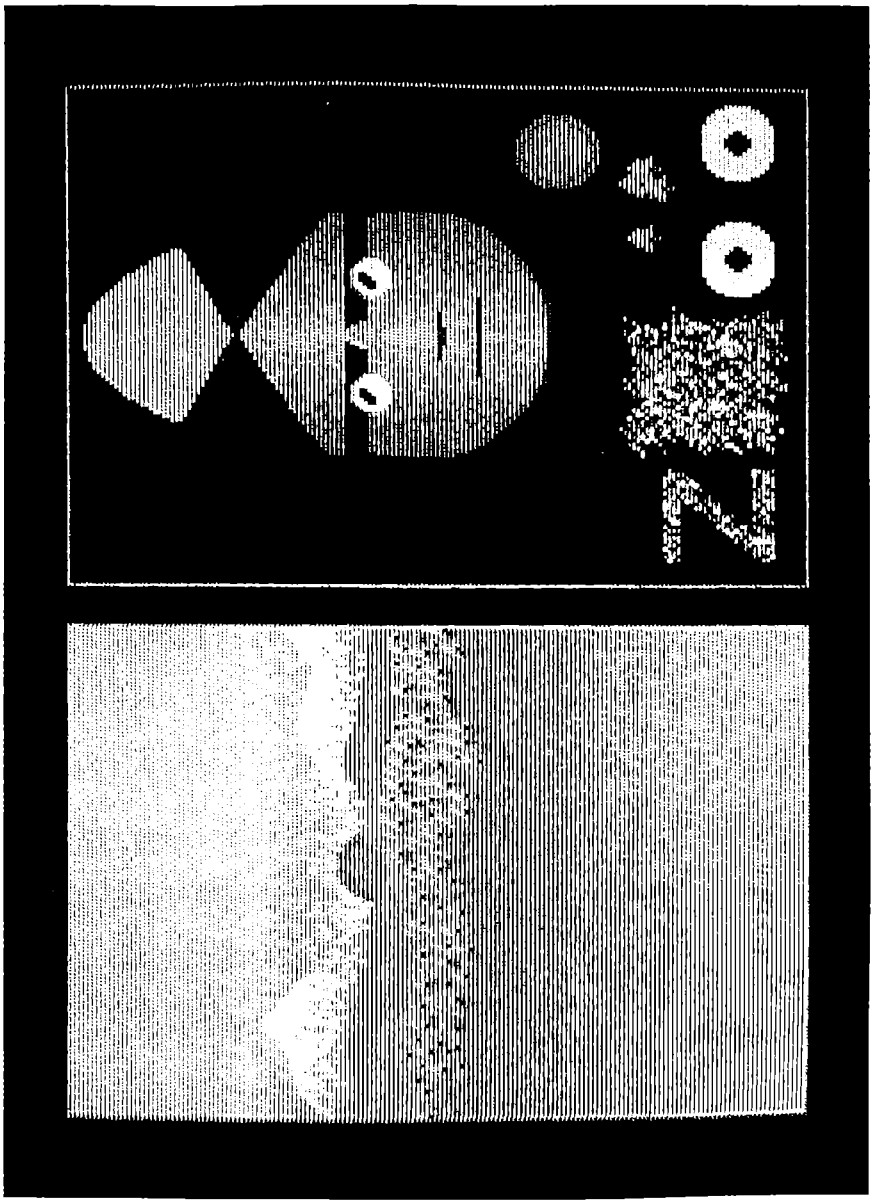


Plate IV: Stencil Set

NOTES

1 MENU ITEMS

DeluxePaint's menu items remain hidden until you move the cursor to the top of the screen and press the right mouse button. This is the case even if the Menu Bar is currently hidden. As you move the cursor horizontally across the Menu Bar, one after another of the menus drops down to reveal its selection of options. Moving the cursor down the selection of options highlights each one. Releasing the mouse button when a menu option is highlighted selects that option. Some options reveal secondary menus to their right. To select a secondary menu item, move the cursor to the right (while continuing to hold the button down) to highlight the secondary menu item, and then release the button.

In many cases, you can select a menu item by using its keyboard equivalent. Keyboard equivalents, where available, are shown next to the corresponding item in the menus and in the descriptions that follow. You can find a table of keyboard equivalents at the end of the Reference Section and in your Reference Card. Before you use a keyboard equivalent, make sure the cursor is not pointing at the Menu Bar or the Toolbox or Palette, or your keystroke will have no effect. One keyboard equivalent deserves special mention: **a**, the "Again" key invokes your last menu command, whatever it may have been. For example, if your last menu command produced a requester (e.g., a save or load requester), then pressing **a** produces the same requester.

The menus, reading from left to right across the Menu Bar, are as follows:

PICTURE MENU

The Picture menu lets you save, load, and print your pictures, as well as allowing you to make various global changes to the color palette, to screen resolution, and to the page format. The Picture menu contains the following menu items:

LOAD

Brings up the Load Picture Requester (refer to Figure 1.3). Point to the name of the file you want to load, click with the left button, and then click Load. If you click a subdirectory name you will see all the files in

that subdirectory. Clicking the Parent (DIR) moves you into the parent directory in which the current subdirectory resides, or back to the root directory. You can change to the external drive or to a hard disk by clicking df1: or hd:, as appropriate. If you swap disks while the Load Picture Requester is displayed, **DeluxePaint** reads and displays the new disk's directory. If there are more items in the directory than there is room in the window, you can scroll through the directory by clicking the up and down arrow keys, as appropriate, or by dragging the "elevator" up and down. Click OK to load the selected file, or Cancel if you change your mind.

SAVE

Brings up the Save Picture Requester (refer to Figure 1.2). You can save in a particular subdirectory by clicking in the Drawer gadget and typing in the subdirectory name, or by clicking the subdirectory name directly from the displayed file names. If you are typing in the subdirectory name, you can erase the existing name by clicking at the end of the existing name and Backspacing, or by clicking at the beginning of the name and Deleting. You can move over the name without deleting it by using the arrow keys. You can save a picture under an existing filename by clicking that filename directly, or you can enter a new filename (up to 29 characters long) by clicking the File box and typing the name. Whenever you save a picture under an existing name, **DeluxePaint** automatically renames the existing file Backup.Pic and saves the new file under the existing name. Pictures are saved and reloaded with all their attributes, such as palettes, stencils and perspective information. Click OK to save the selected file, or Cancel if you change your mind.

DELETE

Brings up the Delete Picture Requester, allowing you to delete a picture from the disk without leaving the program. This function is useful if you find that your data disk is full and you need to delete a file before you can save your work. The Delete Picture Requester works just like the Load and Save Requesters described above. You can enter a filename by clicking that name in the requester window, or by typing the name directly into the File gadget. Click Delete to go ahead with the deletion, or Cancel if you change your mind.

PRINT

Prints your current picture. Make sure you have selected the correct printer driver from Preferences, and that your printer is connected and turned on. See your Amiga Users Guide for information on printer preferences. Selecting Print brings up the Print Picture Requester (see Fig. 4.1).

The Print Picture Requester provides the following options:

ORIENTATION: This lets you specify the orientation of the picture on the paper, either Normal, the default, or Sideways. Click the appropriate gadget to make your selection.

SHADE: This lets you specify whether the printout will be in color, in shades of grey, or in black and white. Make sure the setting is appropriate for your printer. If you are using a single-color ribbon, click B & W, or, if you want to translate your image's colors into shades of grey, use the Grey setting. To print in full color, click Color.

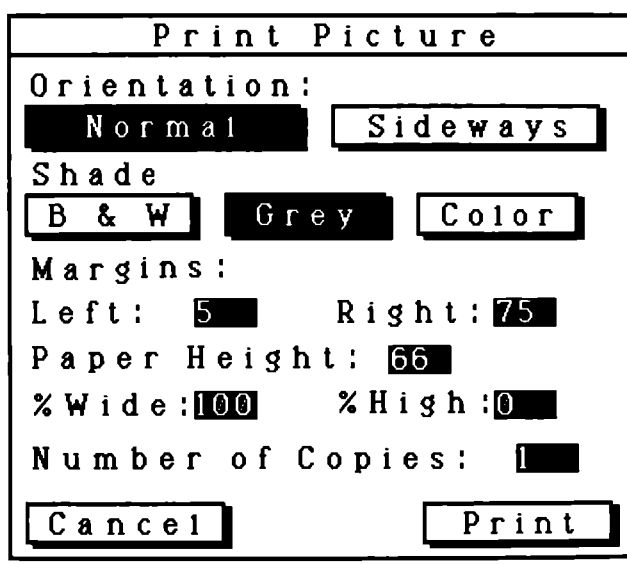


Figure 4.1. Print Picture Requester

MARGINS: Lets you set the width of the printout by specifying the left and right margins in characters. The width of the printout is the numerical difference between the left and right margins. Note that the margin settings are for setting the width of the printout only, and do not affect the physical locations of the margins. To change the default values, click the appropriate gadget, Backspace or Delete over the existing value, and type in the new one.

PAPER HEIGHT: Lets you set the correct paper size by specifying the number of lines from top to bottom. To change the default value, click the gadget, Backspace or Delete over the existing value, and type in the new one.

% WIDE AND % HIGH: These let you change the *aspect ratio* (the ratio of height to width) of the picture by setting the percentages for each. The default values are 100% Wide and 0% High. 0% is a special case and tells the printer to maintain the same aspect ratio as the screen version of the picture. To change the aspect ratio, leave the % Wide at 100 and enter a new % High value. You can use this feature to compensate for elongated squares and circles that result when you change screen formats. If you just want to shrink the picture while maintaining the same aspect ratio, change the % Wide value and leave the % High value at 0. To change either value, click the appropriate gadget, Backspace or Delete over the existing value, and type in the new one.

Click **Print** to print the current picture, or **Cancel** if you change your mind. Once you start printing, you can stop at any time by pressing the Stop button that appears while printing is in progress.

COLOR CONTROL

The following secondary menu items are available under the Color Control option:

PALETTE (Keyboard Equivalent: **p**)
Brings up the Color Palette Requester (refer to Figure 2.4). You can also bring up the Color Palette Requester by clicking the Color Indicator (between the palette and the Toolbox) with the right mouse button. This is the master color control panel. To select a color, use the left mouse button to click the color either in the requester or anywhere on the page (including the Palette at the bottom right of the screen). The selected color will be displayed in

the small box above the Color Requester Palette, in the upper right of the requester. Use the RGB (for Red, Green, and Blue) or HSV (for Hue, Saturation, and Value) sliders to change the color.

To copy a color from one position to another, click the first color, click Copy, then click the position you want to copy it to. To swap the position of two colors, click the first color, click Ex (for Exchange), and then click the second color. If you use this to rearrange colors in your Palette and the resulting screen image looks scrambled, use the Remap option to undo the damage (see Remap, below). To create a spread of shades between two colors, click the first color, click Spread, and then click the second color. **DeluxePaint** creates a uniform spread of colors, taking into account the beginning and ending shades and the number of colors in between.

Color cycling, gradient fill and Shade and Blend are controlled through the four color ranges: C1, C2, C3, and C4. The colors in each range are defined through the Range command. Click the color at one end of the range, click Range, then click the color at the other end of the range. Once you have defined a range of colors, selecting any of the colors in the range selects the entire range.

You can control the speed of the color cycling for each range by dragging the Speed slider to the left (slower) or to the right (faster). By holding the button down on the slider you can monitor the color cycling right on the page, even if Color Cycling is turned off. You can control the cycle direction for each range by clicking on the Cycle Direction Arrow at the bottom right of the Color Palette Requester while that range is selected.

You can reverse the last change you made in the Color Palette Requester by clicking Undo. To use your changes and return to your painting, click OK. If you don't wish to use any of the changes you've made, click Cancel to return to the page as you left it. You can move the Color Palette Requester by pointing to the bar at its top, pressing the left mouse button, and dragging it to the new location.

USE BRUSH PALETTE

When you load a brush, **DeluxePaint** continues to use the current picture palette, even though it may be different from the one the brush was created with. Use Brush Palette switches to the brush palette, and includes any information about color cycling that was saved with the brush. If the newly loaded brush uses more colors

than the current picture, Use Brush Palette switches to the brush palette while reducing the number of colors to that of the picture palette. It does so by recomputing the palette to match the original but with fewer colors. After making the change, you can revert to the original picture palette by using the Restore Palette command (see below). Remap from the Brush menu, below, lets you keep the current picture palette, but maps the brush to the picture palette for a best fit.

RESTORE PALETTE
This returns you to the palette you were using before the current palette. Thus, if you load a picture with a different palette, Restore Palette reverts to the palette in effect before the load. See Use Brush Palette, above, and Default Palette below.

DEFAULT PALETTE
The default palette is the one **DeluxePaint** always uses when you first start the program. The Default Palette command replaces the current palette with the default palette.

CYCLE (Keyboard Equivalent: **Tab**)
Toggles color cycling on/off (see Palette, above).

BG-> FG
Changes the color currently designated as the background color to that currently designated as the foreground color. This provides an easy method of changing colors globally — all pixels in the current background color in the picture are changed to the current foreground color. The change occurs onscreen only and does not affect the order of colors in the color palette. Undo does not undo this global change.

BG <-> FG
Swaps all pixels in the current background color with the current foreground color. This is similar to the Bg -> Fg option above, except that the change occurs in both directions. The change occurs onscreen only and does not affect the order of colors in the color palette. Like Bg -> Fg, above, Undo does not undo this global change.

REMAP
When you create a picture, **DeluxePaint** "remembers" each color on the screen by remembering its location in the palette. If a picture on the screen was created with a palette other than the current palette (for example, if you have modified the palette since

loading the picture), Remap finds the locations in the current palette of the colors it used in the original palette and "tells" the picture to look there for its colors. Bg -> Fg and Bg <-> Fg, above, are special cases of Remap. See also Remap in the Brush Menu, below.

SPARE

The following secondary options are available under the Spare option:

SWAP(Keyboard Equivalent: j)
Displays the spare page. Because you have two pages to work with, you can create brushes in one and import them to the other for final placement against a background. When you first call it up, the spare page is the standard sceen size. If you wish to use a larger page size on the spare page, you will need to make the appropriate selection from the Page Size option (see below). Note, however, that you can increase the size of a page only if you have sufficient memory available. Note also that a spare page uses up memory, even if there is nothing on it.

COPY TO SPARE
Copies the picture on the current page to the spare page. This lets you experiment with your picture on the spare page without fear of losing anything. If you do not have sufficient memory for a spare page, save the image to disk if you wish to experiment with it.

MERGE IN FRONT
Merges the spare page in front of the current page. When the spare page is brought forward, all pixels matching its current background color will appear transparent, allowing images on the current page to show through.

MERGE IN BACK
Merges the spare page in back of the current page. When the spare page is put behind the current one, all pixels which match the current page's background color will appear transparent, allowing images on the spare page to show through.

DELETE THIS PAGE
If you no longer wish to have memory allocated for a second page, use the Delete this Page command to delete the current page (the one currently showing on the screen) and to deallocate the memory set aside for it. Be sure you have saved a copy of the picture you

are deleting if you think you may need it later. When you select Delete this Page, **DeluxePaint** asks you to confirm the deletion, and then switches you to the other page.

PAGE SIZE

Brings up the Page Size Requester (see Figure 4.2). You can select the page size (in pixels) you wish to work on. Standard is the normal Amiga display size for the selected resolution.

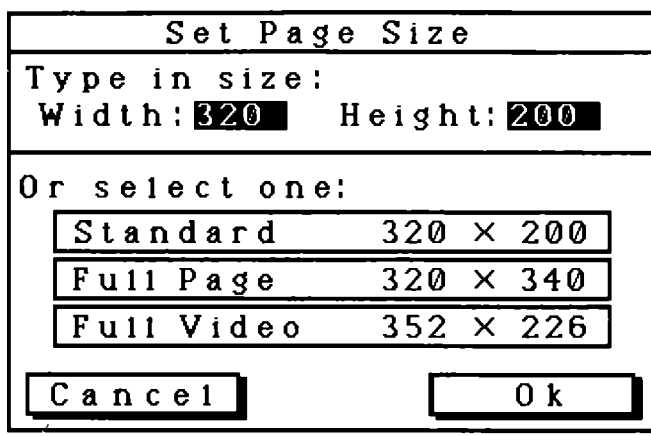


Figure 4.2. Page Size Requester

Full Page gives you a full printed page image (8 1/2 by 11 inches) on most printers. Full Video gives you a full-screen display, thereby letting you create pictures that fill the entire screen. This is particularly useful if you wish to videotape your images. In order to paint on the edges of a full video screen, you need to scroll the image around using the cursor keys. However, you can view the entire screen by selecting Show Page (see below).

Clicking one of the three settings automatically sets the height and width in the corresponding gadgets. You can also type in any other size you wish by clicking the appropriate gadget, Backspacing or Deleting over the existing value, and typing in the new one. Although **DeluxePaint** will recognize page sizes up to 1008 x 1024, you would need

to reduce the number of colors in your palette. For example, with 512K of memory, you would need to reduce your palette to two colors in order to specify a page size of 1008 x 1024.

SHOW PAGE(Keyboard Equivalent: **Shift-S**)

Displays your current page in its entirety in a reduced format — for example, in 640 x 400 page size in Lo-Res, it shows only every other pixel. Pressing any key or either mouse button returns you to the current page.

SCREEN FORMAT

This brings up the Screen Format Requester (Refer to Figure 2.3). If you select a number of colors that will exceed your available memory, **DeluxePaint** will retain the format you have selected but use fewer colors. Be sure to save a copy of your current screen before changing screen formats, because once you have reduced the number of colors the original color information is lost. In addition, note that changing formats eliminates most items from memory, including the Font Directory. The Screen Format Requester gives you the following options:

LO-RES: This is the default setting, giving you a pixel array of 320 x 200. With 512K of memory, Lo-Res lets you have up to 32 colors on the screen.

MED-RES: Uses a pixel array of 640 x 200. Pixels in Med-Res format are tall and narrow compared to the other screen formats. This means that if you switch between Lo-Res and Med-Res, objects will become flattened or elongated because of the different pixel shape used by each format. You can compensate for this by using the Double Horiz and Double Vert options from the Brush menu (see below). Med-Res allows up to 16 colors.

INTERLACE: Uses interlace techniques to double the number of horizontal lines. This produces a flicker that can be avoided by using a high-persistence monitor. The Interlace pixel is wider than it is tall, so moving from Lo-Res or Med-Res to Interlace will flatten images, while moving in the other direction will elongate them. Interlace format allows up to 32 colors on the screen.

HI-RES: Uses a pixel array of 640 x 400. Because Hi-Res also interlaces the horizontal lines, it is subject to the same flicker as the Interlace format. Pixel shape in Hi-Res format is the same as

that of Lo-Res. Hi-Res format allows up to 16 colors on the screen with memory expansion. See **Appendix A** for more information on memory requirements by the different formats.

The Screen Format Requester also gives you the option of retaining the same page size or changing your current screen to the new screen size.

Example #1: Screen Size Page — If you start in 320 x 200 screen format and move to 640 x 400 format, your image will fill only one quarter of the screen. If you go from 640 x 400 to 320 x 200, you will only retain the upper left quarter of your image.

Example #2: Keep Same Page — If you start in 640 x 400 format and move to 320 x 200 format, you will retain the entire image but you will need to scroll the screen to see all of it.

QUIT

Exit **DeluxePaint**.

BRUSH MENU

LOAD

Brings up the Load Brush Requester. This is identical in function to the Load Picture Requester (see above), except that you are loading brushes rather than pictures. If you load a brush that has a palette different from that of the current picture, the picture palette will retain control. Nonetheless, the brush palette information is loaded along with the brush; you can change to the brush's palette at any time by selecting Use Brush Palette from the Color Control option of the Picture menu (see above). If you wish to revert to the previous palette, use Restore Palette from the Color Control option (see above).

SAVE

Brings up the Save Brush Requester. It is identical in function to the Save Picture Requester (see above). Brushes are saved with their palettes, which includes color cycling information.

DELETE

Brings up the Delete Brush Requester, allowing you to delete a brush from the disk without leaving the program. The Delete Requester works just like the Load and Save Requesters described above. You can enter a filename by clicking that name in the requester window, or by typing the name directly into the File gadget. Click Delete to go ahead with the deletion, or Cancel if you change your mind.

SIZE

The Size option lets you resize the current brush. The following secondary menu items are available under the Size option:

STRETCH (Keyboard Equivalent: **Shift-Z**)
Lets you stretch your brush in any direction to any size, larger or smaller than the original. Hold the left mouse button down and drag the mouse in any direction to stretch the brush. You can constrain the stretching so that the ratio of height to width remains the same by holding down the Shift key as you stretch. Stretching a brush uses up memory; if you try to stretch a brush to a size bigger than the available memory can accommodate, the brush will snap back to its original size.

HALVE (Keyboard Equivalent: **h**)
Reduces the size of your brush by 50% in both dimensions.

DOUBLE (Keyboard Equivalent: **Shift-H**)
Doubles the size of your brush in both dimensions, for a quadrupling of the total area.

DOUBLE HORIZ
Doubles the size of your brush in the horizontal dimension. Useful for reproportioning images created in Lo-Res and then moved to Med-Res.

DOUBLE VERT
Doubles the size of your brush in the vertical dimension. Useful for reproportioning images created in Med-Res and then moved to Lo-Res.

FLIP

As its name implies, Flip lets you flip a brush along its x- or y-axis. The following secondary menu items are available under the Flip option:

HORIZ (Keyboard Equivalent: x)
Flips the current brush along the horizontal or x-axis.

VERT (Keyboard Equivalent: y)
Flips the current brush along the vertical or y-axis.

ROTATE

The following secondary menu items are available under the Rotate option:

90 DEGREES (Keyboard Equivalent: z)
Rotates the current brush clockwise 90 degrees.

ANY ANGLE
Lets you rotate the current brush any number of degrees. Hold the left button down and drag the rectangular outline about its bottom left corner and then release the button at the desired orientation. If you select this option more than once, your brush will revert to its original orientation before you rotate it again.

SHEAR
For controlled distortion of the current brush. The top part of the brush is anchored, and you can drag the bottom of the brush in either direction.

CHANGE COLOR

Use this option to modify the current brush colors. The following secondary menu items are available under the Change Color option:

BG -> FG
Changes all pixels in the brush of the color currently designated as the background color into that currently designated as the foreground color. This provides an easy method of making a global color change — all instances of the background color in the brush are changed to the current foreground color. You can select any color in the brush as either the foreground or the background color at any time, thereby letting you make intricate color changes easily. The change affects the brush colors only and does not affect the picture or the order of colors in the palette.

BG <-> FG
Swaps the current background color in the brush with the current foreground color. This is similar to the Bg -> Fg option above, except that the change occurs in both directions. The change affects the brush colors only and does not affect the picture or the order of colors in the palette.

REMAP
Use Remap when you load a brush that uses a palette different from the current palette. Remap looks at the colors used in the brush and tries to find the closest fit within the current palette. Different from Use Brush Palette, because it does not change the palette, but only the palette locations the brush looks in for its colors.

BEND

Use this option to bend a brush horizontally or vertically:

HORIZ
Lets you bend the current brush in a horizontal direction. With the left mouse button held down, drag the brush outline left or right until it is the desired shape and release the button. Dragging the cursor up or down determines where the bending occurs.

VERT
Lets you bend the current brush in a vertical direction. With the left mouse button held down, drag the brush outline up or down until it is the desired shape and release the button. Dragging the cursor left or right determines where the bending occurs.

HANDLE

Lets you specify whether to hold a user-defined brush by its center (the default) or by one of its four corners:

CENTER
The arrow cursor is at the center of the brush.

CORNER
The arrow cursor is at one of the four corners of the brush. If you have a custom brush, selecting Corner moves the arrow cursor to the lower right corner of the brush. The location of the arrow cursor the next time you pick up a brush depends on the direction you drag the mouse when you pick up the brush. If you drag down and to the right, the cursor will remain at the lower right. If you drag up and to the left, the cursor will move to the top left. The same principle applies if you drag down and to the left or up and to the right. In other words, the corner you drag *to* is the one the arrow cursor will attach to. Corner is particularly useful in perspective mode (see Effects menu, below).

MODE MENU

MATTE (Keyboard Equivalent: **F1**)

Uses a custom brush in its original form. Those areas of the brush matching the background color in effect when the brush was first created are transparent. This is the default mode when you create a custom brush using the Brush Selector.

COLOR (Keyboard Equivalent: **F2**)

Uses the shape of the brush and fills it with the current foreground color. Those areas of the brush matching the background color in effect when the brush was created remain transparent.

REPLC (Keyboard Equivalent: **F3**)

Uses the brush in its original form (i.e., Matte, see above), except that no colors are transparent.

SMEAR (Keyboard Equivalent: **F4**)

With Smear selected, you can smear any colors on the page by dragging a brush over them. This is like smearing a wet watercolor with your fingers, so the bigger the brush, the more pronounced the effect. Smear uses only the colors under the brush, and does not add any new colors. Current brush color is irrelevant.

SHADE (Keyboard Equivalent: **F5**)

With Shade selected, you can create subtle shading effects on those colors in your picture that are in a cycle range. Like Smear (above), Shade ignores the current brush color but uses its shape. By dragging the brush over those colors in your picture that are in a currently selected cycle range, you can paint over each color with the next color in the range. You can paint with the next-higher color by using the left mouse button, and the next-lower color by using the right mouse button. "Higher" and "lower" are relative to the color under the brush at the time. If the current foreground color is in a cycle range, Shade has no effect on colors outside that range. If the current foreground color is not in a cycle range, Shade treats the entire palette as a cycle range. A range is selected if one of its members is selected as the foreground color. A color that is a member of two ranges selects the first of those two ranges.

BLEND (Keyboard Equivalent: **F6**)

Like Smear, above, Blend affects the colors under the brush by running them together. Unlike Smear, however, Blend uses additional shades by averaging the blended colors, whereas Smear uses only the colors under the brush. Thus, when you Blend two shades by painting over them, you are selecting a third shade from the palette, the closest one the program can find to the average of the two original shades. If you select a foreground color outside of a cycle range, Blend treats the entire palette as a cycle range. If you select a color within a cycle range, Blend only affects those colors on the screen that are within that range.

CYCLE (Keyboard Equivalent: **F7**)

Uses the current brush shape and cycles through all the colors in the currently selected range as you draw. A range is selected if one of its members is selected. If a color is a member of two ranges, selecting it selects the first of those two ranges. If your current brush color is not within a cycle range, it paints with that color only. Use Multicycle (in the Prefs menu) to achieve the same effect with a multicolored brush, where each color in the brush cycles through its range independently of the others.

SMOOTH

Reduces the contrast between two adjoining areas. **DeluxePaint** finds colors in the palette between the two bordering colors and paints the boundary in intermediate shades. Smooth looks at the current palette and finds the colors closest to the ones under the brush. Thus if the palette contains a wide selection of colors close to the ones under the brush (e.g., the selection of greys in the default palette), it will have more colors to draw from to create its weighted averages. Useful for creating airbrush effects by smoothing out contrasting boundaries, or for eliminating jagged edges.

EFFECTS MENU

The Effects menu lets you create stencils, "freeze" the background, and define planes for the purposes of perspective drawing.

STENCIL

You create a stencil of an image by "locking" the colors that comprise that image. This allows you to paint around the image without painting on it, as though it were protected by a stencil or frisket.

MAKE
This brings up the Stencil Requester (see Figure 3.1). Click the colors to use in creating the stencil with the left mouse button. You can select colors by clicking in the palette display in the requester or by clicking the colors onscreen (including the onscreen palette). You can reposition the requester anywhere on the screen by dragging it by the bar at its top. Clear the current selections by clicking Clear. Reverse the current settings by clicking Invert. The colors you select define a mask that protects an area from being painted. The shape of the stencil is what is created and saved, not the color information, which means you can change the colors of a "stenciled" shape, and still retain the stencil. When you have clicked all the colors you wish to protect, click Make. You can tell when you have a stencil active by the "S" in the Menu Bar.

REMAKE
When you have a stencil active and you apply colors onto your picture, the colors you apply are not protected, even though they may be locked in the Stencil Requester. You can lock newly-applied colors by bringing up the Stencil Requester and clicking Make, or by selecting Remake from the Stencil submenu.

LOCK FG
The Stencil Requester lets you create stencils based on colors in the palette. By locking a color, you are making it impossible to paint on, *wherever it may be on the page*. By using a combination of Fix Background (see below) and Lock FG, however, you can define a stencil by area rather than color. When you select Lock FG you define as a stencil those areas on the page that you have painted since fixing the background, regardless of the color of those areas.

REVERSE
Has the same effect as clicking Invert in the Stencil Requester (see Make, above).

ON/OFF (Keyboard Equivalent: ~, directly below the ESC key)
Toggles the stencil on and off. This maintains the stencil but turns it off temporarily so you can paint on the protected colors.

FREE
Creating a stencil uses memory, even though you may have it turned off (see On/Off, above). Free deletes the stencil and deallocates the memory it was using.

LOAD
Stencils can be loaded (and saved, see below) as separate items. They are full screen only, and can be loaded only to the position they occupied when they were created. The Load Requester is identical to all other Load Requesters (see Picture Menu, above).

SAVE
You can save (and load, see above) stencils just as you can any other file, such as pictures or brushes. The Save Requester for stencils is identical to those for other types of files.

DELETE
Allows you to delete saved stencils without quitting the program. The Delete Stencil Requester is identical to the Delete Picture Requester discussed in the Picture menu above.

BACKGROUND

FIX
Fixes the background by "locking" the current picture, while allowing you to draw on top of it. You can erase any work you have done since fixing the background by clicking CLR or by painting with the right button, without fear of losing any of the background. Fixing the background uses additional memory. Note that when the background is fixed you cannot pick up any colors that match the current background color.

OFF
This "unlocks" the background, so that clicking CLR will clear the entire picture. It also frees up the memory that was allocated to saving the background.

PERSPECTIVE

This operates only when you have a custom brush currently active. When you select Perspective and then Do (or press Enter on the keypad), your brush temporarily changes into a four-square matrix, representing the boundaries of your brush. You can then rotate this matrix about any or all of its three axes x, y, and z. The amount of rotation for each of the three axes x, y, and z is given in degrees at the right-hand side of the menu bar. You can paint an image of the rotated brush at any time by clicking the left mouse button.

SETTING THE CENTER: To set the perspective center (which corresponds to the viewer's eye level), select Center from the Perspective submenu, or press the Decimal Point key on the keypad. Your cursor changes into a large crosshair. The stationary crosshair on the screen denotes the existing center. Move the center of the crosshair to the new perspective center and press either button.

Once you have set the perspective center, the position of the unrotated brush relative to that center determines the brush's position on the fixed axis (see below) upon rotation. For example, with the z-axis fixed (the default), the position of the brush matrix relative to the perspective center when the brush is rotated determines the rotated brush's position on its z-axis. The greater the distance above or below eye level on the z-axis, the less pronounced the perspective effect.

AXIS ROTATION: All x-axis manipulations are controlled through the top row of the keypad. To rotate the brush about its x-axis so that the top of the brush moves away from you, press **Keypad 8** for each degree of rotation. To rotate the brush about the x-axis in the opposite direction (so that the top of the brush moves towards you), press **Keypad 7**. To return to zero rotation for that axis, press **Keypad 9**.

All y-axis manipulations are controlled by the middle row of the keypad. To rotate the brush about the y-axis so that the right side of the brush moves away from you, press **Keypad 5**. Press **Keypad 4** to rotate the brush in the opposite direction, and press **Keypad 6** to return to zero rotation for that axis.

All z-axis manipulations are controlled by the bottom row of the keypad. To rotate the brush clockwise about the z-axis, press **Keypad 1**. Press **Keypad 2** to rotate the brush counterclockwise about the z-axis, and press **Keypad 3** to return to zero rotation.

To rotate about an axis through a larger increment, hold down the Shift key as you press the appropriate number. This increment defaults to 90 degrees, but you can set it to any other angle by calling up the Gridding Requester when in perspective mode. To do this, click the Grid icon with the right mouse button. See discussion below under The Toolbox. Pressing **Keypad 0** resets all three axes to zero and fixes the z-axis (see below), but retains the apparent distance settings. Pressing **Keypad 0** in conjunction with the **Shift** key resets all perspective values to the default (boot-up) state, including resetting the perspective center.

The ; and ' keys move the brush plane forward or back along its fixed axis (see below) without changing its orientation, moving it in a direction perpendicular to the brush plane. This is the same effect described in the above discussion on brush position prior to rotation. Thus, with the z-axis fixed, brush position relative to the perspective center at the moment of rotation determines the brush's distance above or below eye level. You can achieve the same effect after the brush is rotated by using the ; and ' keys to move it forward or back along its z-axis. Pressing these keys with the Shift key held down results in larger increments of movement. In addition, you can modify the apparent distance from the observer by pressing the < and > keys (i.e., the Shifted "," and "." keys). Thus, when the apparent distance is great, the perspective foreshortening is at a minimum, becoming greater as apparent distance decreases.

FIXING AXES: Whenever you start in perspective mode, the z-axis (the one perpendicular to the screen) is "fixed," that is, the mouse does not move the brush through that axis. You can selectively fix any axis, as follows:

To fix the x-axis, press **Shift-Keypad 9**
To fix the y-axis, press **Shift-Keypad 6**
To fix the z-axis, press **Shift-Keypad 3**

As noted above, you can move along the axis that is currently fixed by using the Shifted or un-Shifted ; and ' keys (use the Shifted keys for larger increments).

The position of the brush matrix at the moment you fix an axis is also important. For example, if the center of the brush matrix corresponds exactly to the perspective center at the moment you fix the y-axis (which causes backward-and-forward (toward you and away from you) mouse movement to translate into movement along the screen's z-axis), then movement along the z-axis will be at eye level, so the

brush matrix will simply become bigger or smaller as you move the mouse back and forth. On the other hand, if the top of the brush matrix is below eye level at the moment you fix the y-axis, then movement along the z-axis will be on a plane below eye level.

Once you have rotated the matrix to the desired orientation, you can place a copy of the modified brush on the page by clicking with the left mouse button. The other brush commands work in perspective mode as well, including the options available through the Brush menu (see above). For example, if you want to hold your brush matrix by the corner rather than the center, you can select Corner from the Handle option. This moves the arrow cursor to the lower right corner of the brush. When you rotate a brush about an axis, it is rotated about the arrow cursor, so its location is important when you are in perspective mode.

You can also fill any enclosed space with the perspective brush. Click the Fill tool with the right button to bring up the Fill Type Requester (refer to Figure 3.1, above) and select Perspective. From that point on (until you turn it off by clicking another Fill mode), any fill operation (using either the Fill tool or the filled shape tools) will use perspective fill.

To exit perspective mode, click one of the drawing tools, such as the continuous or dotted line tool.

The following is a summary of the keyboard commands available in perspective mode:

Keypad 7 and **8**:	Rotate about the x-axis.
Shift Keypad 7 and **8**:	Rotate x-axis 90 degrees (default).
Keypad 9:	Reset x-axis to zero.
Keypad 4 and **5**:	Rotate about the y-axis.
Shift Keypad 4 and **5**:	Rotate y-axis 90 degrees (default).
Keypad 6:	Reset y-axis to zero.
Keypad 1 and **2**:	Rotate about the z-axis.
Shift Keypad 1 and **2**:	Rotate z-axis 90 degrees (default).
Keypad 3:	Reset z-axis to zero.
Keypad 0	Reset all axes to zero.
Enter:	Enter perspective mode.
Shift Keypad 9:	Fix x-axis.
Shift Keypad 6:	Fix y-axis.
Shift Keypad 3:	Fix z-axis.
Keypad "-" (Minus):	Fill the screen with the current brush at the current perspective.

Keypad "." (Period):	Reset Center.
; and **'** keys:	Moves the brush along its fixed axis in a direction perpendicular to its plane.
Shift ; and **'** keys (**:** and **"**):	Same as **;** and **'** keys but with greater increment.
< (**Shift .**) and **>** (**Shift ,**):	Modify observer distance from screen.

The following is a summary of the Perspective submenu:

DO (Keyboard Equivalent: **Keypad Enter**)
Puts you into perspective mode. Your brush is represented by a four-cell matrix which you can manipulate through the above keypad commands.

FILLSCREEN (Keyboard Equivalent: **Keypad Minus**)
Fills the screen with the current brush, in its current state of rotation.

RESET (Keyboard Equivalent: **Keypad 0**)
Resets the brush to its original state before rotation.

CENTER (Keyboard Equivalent: **Keypad Period**)
Allows you to set the perspective center or horizon in your perspective "landscape." When you select Center, your cursor changes into a large crosshair. Move the crosshair to the new center for both horizontal and vertical axes and click either mouse button.

ANTI-ALIAS

None: Default mode; anti-aliasing is off.

Low: Lets you eliminate some of the jagged outline on your perspective brush. Jagged lines are most noticeable when an image has been rotated and/or shrunk. The cost of removing jagged lines is painting speed, but it is still faster than smoothing out an image by hand. To use anti-aliasing, select either Low or High (see below) before you lay down the brush image. Anti-aliasing is most effective when you have reduced the size of your original brush (for example, by moving it back along the z-axis).

High: This is similar to Low (see above) but with a much more pronounced effect. The trade-off is painting speed.

ROTATION

Absolute: Default mode; uses x, y, z Euler method, measures all three angles of rotation from absolute zero. Angles of rotation are displayed on Menu Bar.

Relative: Rotates angles relative to the current brush rotation. Angles of rotation are not displayed on Menu Bar.

FONT MENU

STYLE (Submenu Items)

BOLD
Toggles boldface type on/off. When on, it paints the current font in boldface. Selecting Bold a second time turns it off.

ITALIC
Toggles italic type on/off. When on, it paints the current font in italics. Selecting Italic a second time turns it off.

UNDERLN
Toggles underlined type on/off. When on, it paints the current font underlined. Selecting Underln a second time turns it off.

LOAD FONT DIR

Loads the directory of fonts installed on your **DeluxePaint** disk. Once the font directory is loaded, the Font menu will display them, together with the corresponding font sizes as secondary menu items. To select a font, drag the cursor down the menu until it is highlighted, and then drag to the right and select the desired size from the secondary menu. Release the mouse button.

To create text, click the text icon ("**A**") in the Toolbox or type **t**, the keyboard equivalent. Click the mouse button (left or right) where you want the text to begin, and type your text from the keyboard. The text will automatically wrap around the right edge of the page and restart at the left margin, in alignment with the initial cursor position. Pressing Return starts a new line, in alignment with the original cursor position. If your page size is larger than the screen, the page scrolls as you type off the edge of the screen. Note, however, that you cannot backspace over typed characters if the screen scrolls. To exit text mode, select another drawing tool.

PREFS MENU

COORDS

Turns on the coordinate display in the upper right-hand portion of the Menu Bar. Moving the mouse without holding a button down displays the current position of the cursor, with the origin (0, 0) set to the upper left-hand corner of the screen. Pressing and holding down either mouse button temporarily resets the origin to the current cursor position and displays the displacement value from that temporary origin as you move around the screen. The readout is scaled in pixels.

FAST FB

Fast feedback. Use this when working with large or complicated brushes while using the line or unfilled shape tools. Fast FB lets you draw your lines or shapes using the smallest (one-pixel) brush for feedback, and then completes the design using the currently selected brush. This increases response speed while you are drawing, but does not affect the final image. Toggle it off by selecting it a second time.

MULTICYCLE

Use this in conjunction with the Cycle paint mode in the Mode menu (see above). With Multicycle turned off (the default state), using the Cycle paint mode with a multicolored brush treats the brush as though it were a single color (the current foreground color). With Multicycle turned on, painting with a multicolored brush in Cycle mode cycles each color in the brush, provided the color is in a cycle range.

BE SQUARE

Because the Amiga's pixels are not perfectly square, circles and squares drawn with the shape tools are not perfectly round or square. To draw "true" circles or squares, select Be Square from the Prefs menu. This will square all the built-in brushes, the appropriate shape tools, and symmetry. Be Square does not square gridding or perspective.

WORKBENCH

To conserve memory, **DeluxePaint** keeps the Workbench turned off. You can toggle it on by selecting Workbench. When the Workbench is visible, you can either toggle it off (by selecting the item a second time), or you can slide it down or layer it behind the painting screen.

EXCLBRUSH

With **Exclbrush** (and the Grid) selected, any brush you pick up will exclude the bottom and right-hand sides of the brush's one-pixel border. This way, a pattern created from the brush will have the same one-pixel border as the brush itself. Otherwise, any different-colored one-pixel border in the brush ends up twice as wide in a pattern created from that brush. **ExclBrush** avoids this.

USER FEEDBACK IN MENU BAR

PAINTING MODE: Displays the current painting mode (Matte, Color, Replc, Smear, Shade, Blend, Cycle, Smooth) at the center of the Menu Bar. See Mode menu, above, for information on painting modes.

COLOR FILL BOX: This box (to the right of center on the Menu Bar) displays the currently selected fill pattern, or perspective fill or gradient fill. The Color Fill Box previews the pattern or gradient you will get when you fill a shape. The Color Fill Box is absent if fill mode is set to normal. See discussion under Fill tool, below, for more information on the Fill Type Requester.

S: This notation appears to the right of center on the Menu Bar when a stencil is active.

B: This notation appears to the right of center on the Menu Bar when the background is fixed.

AXIS ROTATION: When you are in Perspective mode, the amount of rotation about each axis (x, y, and z, respectively) appears at the top right of the Menu Bar.

COORDINATES: When Coords (Prefs menu) is selected, the coordinates of the cursor position are displayed at the top right of the Menu Bar. See Coords, above. The coordinates are not superseded by the Axis Rotation information when in Perspective mode.

VERSION#/MEMORY AVAILABILITY: Press the CTRL key and **a** at the same time for the following information, reading left to right: **DeluxePaint** Version #; Fast memory/Chip memory. See **Appendix A** for information on **DeluxePaint**'s memory usage.

2 TOOLBOX (refer to Figure 1.1)

Like some of the menu items above, most of the tools in the Toolbox are available through keyboard equivalents. As you become proficient with **DeluxePaint**, you will find it more efficient to use these equivalents, using one hand for the mouse and the other hand for the keyboard. Where appropriate, the following descriptions of the tools include the keyboard equivalents. And to help you learn these, we have suggested a mnemonic for each one.

BUILT-IN BRUSHES

The Toolbox contains ten built-in brushes at the top. Click a brush with the left button to select it. Clicking a brush with the right button invokes the size option: drag the mouse while holding down either mouse button to increase or decrease the size of the selected brush.

DOTTED FREEHAND TOOL

(Keyboard Equivalent: **s**; Mnemonic: **sketch**)

Draws a series of "splats" of the current brush shape. Spacing between splats is a function of the speed with which you move the mouse.

CONTINOUS FREEHAND TOOL

(Keyboard Equivalent: **d**; Mnemonic: **draw**)

Draws a continuous freehand line.

STRAIGHT LINE TOOL

(Keyboard Equivalent: **v**; Mnemonic: **vector**)

Draws a straight line using either the current foreground color (left button) or the current background color (right button). Press and hold the button while you drag the mouse to the line's end position and then release the button. Clicking the icon with the right button brings up the Spacing Requester (refer to Figure 2.5). The Spacing Requester lets you specify the the space between the paint "splats" deposited by the brush. Absolute spacing sets the number of pixels between each "splat" of the brush. Relative spacing defines the total number of "splats" that will occur along the line. You can define the number of "splats" by

clicking the Number gadget, backspacing or deleting over the existing value and typing in the new value. Click On if you wish to have spacing on, and Off to turn it off. When Spacing is on it is also used by the Curve Tool.

CURVE TOOL
(Keyboard Equivalent: **q**; Mnemonic: **qurve**)

Draws an arc. Draw a line between the beginning and ending points of the arc as though you were using the Straight Line Tool (see above) and release the mouse button. Then drag the line until the arc is the right shape, and click the button. Clicking the icon with the right button brings up the Spacing Requester (see above).

FILL TOOL
(Keyboard Equivalent: **f**; **Shift F**: Fill Requester; Mnemonic: **fill**)

Select the Fill tool by clicking the icon with the left mouse button. The spout of the Fill tool is the one pixel opening at the bottom of the "splash." The Fill tool fills an enclosed area with the current color or pattern. Clicking the icon with the right button brings up the Fill Type Requester (refer to Figure 3.1). **Solid** fills with the current color; **Perspective** fills with the current brush in the current perspective setting (see Perspective under the Effects menu, above); **Pattern** fills with a pattern made from the current brush; **From Brush** uses the current brush to create a pattern.

Gradient fills with a spread of colors from the cycle range of the current foreground color. Select one of the three options by clicking it with the left mouse button: **Horizontal** fill lays the gradient horizontally from top to bottom. **Vertical** fill lays the gradient vertically from left to right with an even distribution. **Horizontal Line** fill lays the gradient left to right one line at a time, adjusting the gradient on each line so that it follows the contours of the shape being filled. You can specify the direction of the gradient fill (that is, which colors in the cycle range it begins filling with) by clicking the Cycle Direction Arrow in the Color Palette Requester.

Dither controls the degree of mixing of colors in the gradient fill. Move the Dither slider by sliding it left or right with the left mouse button. Setting Dither all the way to the left gives you no overlap between each shade. Moving the Dither slide to the right increases the amount of "noise" between the color boundaries. When you return to the painting screen the current gradient (or pattern, if Pattern or perspective is selected) and its orientation are shown in the Color Fill box (see User Feedback in Menu Bar, above).

AIRBUSH TOOL

Sprays with the current brush. Clicking the icon with the right button brings up the size control, allowing you to define the nozzle size and hence the spray area. Drag with either button to resize the brush.

> *Note:* The following Filled Shape tools all fill in accordance with the current settings in the Fill Requester. See discussion under the Fill tool, above.

UNFILLED/FILLED RECTANGLE TOOL

(Keyboard Equivalent: **r** — Unfilled; **R** — Filled; Mnemonic: **rectangle**)

Click the upper left part of the icon to select Unfilled Rectangle and the lower right to select Filled Rectangle. Clicking with the right button brings up the Fill Type Requester (see above). Draw a rectangle by dragging diagonally on the page.

UNFILLED/FILLED CIRCLE TOOL

(Keyboard Equivalent: **c** — Unfilled; **C** — Filled; Mnemonic: **circle**)

Click the upper left of the icon to select Unfilled Circle and the lower right to select Filled Circle. Clicking with the **right** button brings up the Fill Type Requester (see above). Draw a circle by dragging diagonally on the page.

UNFILLED/FILLED ELLIPSE TOOL

(Keyboard Equivalent: **e** — Unfilled; **E** — Filled; Mnemonic: **ellipse**)

Click the upper left of the icon to select Unfilled Ellipse and the lower right to select Filled Ellipse. Press and drag to define the size and shape of the ellipse, release and then press and drag again to define the rotation of the ellipse. Release to draw. Clicking with the right button brings up the Fill Type Requester (see above).

UNFILLED/FILLED POLYGON TOOL

Click the upper left of the icon to select Unfilled Polygon and the lower right to select Filled Polygon. Click and drag to "tack" each point of the polygon down. Meeting the Polygon's point of origin completes it. You can complete a polygon without having to search for the point of origin by pressing the Spacebar. Clicking with the right button brings up the Fill Type Requester (see above).

> *Note:* Unfilled Tools use the current brush shape. Holding down the CTRL key while using these tools causes them to leave traces as you draw. Holding down the Shift key constrains the shapes you draw, so that drawing with the Rectangle Tool draws Squares.

BRUSH SELECTOR

(Keyboard Equivalent: **b** for new brush, **B** for previous brush; Mnemonic: **brush**)

Allows you to create a brush of your own choice from whatever is on the page. Hold down the mouse button as you drag diagonally on the page. Use the left button to copy the selected section, and the right button to lift it off the background. Any colors in the brush that match the current background color will be transparent. When you use the right button to lift a brush the space left behind will fill with the current background color. If you want to select a brush from a complex background without picking up any of the background, click the Brush Selector twice. This lets you draw a "corral" around your object, as if you were using the Polygon Tool (see above). You can recall your most recent brush by clicking the Brush Selector with the right button or pressing **Shift-B**.

TEXT

(Keyboard Equivalent: **t**; Mnemonic: **text**)

Clicking with either button selects Text mode. Position the text cursor by clicking with either button. Use the Font Menu to load fonts and then select from the loaded font directory. Select Bold, Italic and Underln from the Style submenu. Text is entered in the current Foreground color. Use the Backspace key to erase, and Return to begin a new line. Press ESC or click a drawing tool to exit Text mode. For more information, see discussion under Font menu.

GRID
(Keyboard Equivalents: **g** — grid on; **Shift-G** — grid on and snaps to brush location; Mnemonic: **grid**)

Grid constrains the action of the drawing tools. Clicking the Grid icon with the right button brings up the Gridding Requester (refer to Figure 2.1). Use the Gridding Requester to adjust the x and y spacing of the grid. You can specify the grid values in pixels by deleting or backspacing over the existing values and typing in the new ones. Alternatively, you can click the Adjust box, which lets you visually place and adjust the grid. Position the grid and drag with either button to adjust the size. If you use **Shift-G** to turn the grid on while using a brush, the grid will use the current brush position as one of its points.

If you bring up the Gridding Requester while you are in perspective mode, you will be able to specify the spacing on all three axes x, y and z, in the same manner. Alternatively, you can click From Brush to set the x and y spacing to the current brush dimensions. (z defaults to the same value as y). In addition, you can set the angle of rotation of your brush by specifying the new angle in the requester. Thus, you can change the default value of 90 degree rotation (which is effected by **Shift Keypad 8**, **5** or **2**, see discussion on perspective under the Effects menu, above) to any other angle between 2 and 89. Three-dimensional gridding and incremental rotation makes it easy to create solid figures, such as cubes and other polyhedrons.

SYMMETRY
(Keyboard Equivalent: /)

Symmetry works with all tools except Text and Brush Selection. Clicking with the right button brings up the Symmetry Requester (refer to Figure 2.2). You can choose from two symmetry modes: Point and Tile. Point Symmetry works around a central symmetry point in either Mirror (mirror image duplication of each point) or Cyclic (duplication at each symmetry point). In Point Symmetry you can select the number of symmetry points (up to 40) and the location of the symmetry center. Use Tile Symmetry to create 'tile' patterns. You can set the horizontal and vertical dimensions (in pixels) of the tile size. Tile is useful in creating fill patterns. Always start with a fresh page when using Tile Symmetry.

MAGNIFY
(Keyboard Equivalent: **m**; Mnemonic: **magnify**)

Click the icon with either button to select the tool. Position the Magnify box over the part of the image you want to enlarge and click with either button. To change the magnification scale click the Zoom icon, to the right of the Magnify Tool: left button enlarges, right button shrinks. You can scroll around in the magnification window using the arrow keys or the **n** key, which centers the area under the cursor. All other tools work in Magnify Mode.

ZOOM
(Keyboard Equivalent: > enlarge; < shrink)

Changes the scale in Magnify Mode (see Magnify Tool, above). Click the Zoom icon with the left mouse button to enlarge the image and with the right button to shrink it.

UNDO
(Keyboard Equivalent: **u**; Mnemonic: **undo**)

Reverses the last drawing action provided there has not been an intervening mouse click.

CLR
(Keyboard Equivalent: **Shift-K**; Mnemonic: **Klear**)

Clears the screen to the currently selected background color.

COLOR INDICATOR

Indicates the current foreground and background colors. Clicking with the left button (or pressing the comma "," from the keyboard) selects the PICK tool. This lets you select a new foreground or background color by clicking a color onscreen. Click the onscreen color with the left button to select a new foreground color, and with the right button to select a new background color. Clicking the Color Indicator with the right button brings up the Color Palette Requester (refer to Figure 2.4).

PALETTE

Clicking a color in the Palette selects that color. Click with the left button to select a new foreground color and with the right button to select a new background color.

3 KEYBOARD COMMAND SUMMARY

BRUSH COMMANDS

F1	Matte
F2	Color
F3	Replc
F4	Smear
F5	Shade
F6	Blend
F7	Cycle
-	Brush smaller
=	Brush larger
Z	Stretch
h	Halve
H	Double
x	Flip horizontal
y	Flip vertical
z	90 Degree rotate

In addition, see the list of perspective keyboard commands in the discussion on perspective under the Effects menu, above.

TOOLBOX COMMANDS

b	Brush Selector
B	Restore last custom brush
c	Unfilled Circle Tool
C	Filled Circle Tool
d	Continuous Freehand Tool
D	Continuous Freehand Tool w/ 1-pixel brush
e	Unfilled Ellipse Tool
E	Filled Ellipse Tool
f	Fill tool
F	Brings up Fill requester
g	Grid
G	Grid to current brush position
j	Spare page

K	CLR
m	Magnify Tool
p	Palette Requester
q	Curve Tool
r	Unfilled Rectangle Tool
R	Filled Rectangle Tool
s	Dotted Freehand Tool
t	Text
u	Undo
v	Straight Line Tool
>	Zoom in
<	Zoom out
,	PICK Tool
.	One-pixel brush
[,]	Cycle through colors in selected cycle range
/	Toggle Symmetry on/off

SPECIAL KEYS

F8	Toggle cursor arrow on/off
F9	Toggle Menu Bar on/off
F10	Toggle Control Panel and Menu Bar on/off
Alt-Open Amiga (right side)	Right Mouse Button
Alt-Closed Amiga (left side)	Left Mouse Button
Cursor keys	Scroll Page (except in text mode)
n	Centers area under the cursor
Shift	Constrain with line or shape tools
Ctrl	Leave traces with line or shape tools
Ctrl a	Memory check
Tab	Toggle color cycle on/off
S	Show page
Tilde (~)	Toggle Stencil
a	Again key - repeats last menu command
Spacebar	Aborts current command

NOTES

APPENDIX A: INSIDE DELUXEPAINT

THE TELEVISION LEGACY

Video displays owe much of their parentage to television. Television displays are made up of two video fields, each displaying half of the total lines of the image. These two fields are then interlaced to create a display with a greater number of lines, increasing the resulting resolution. Because television images are continually moving, with few high contrast edges in immediate proximity to each other, the inherent flicker caused by interlacing the two video fields is rarely apparent.

This is not the case with all video displays. With the Amiga, for example, if you display static images in sharp contrast to the background, the flicker in interlace modes becomes apparent. You can alleviate this problem by using low contrast colors, purchasing a high persistence monitor (which might retain the image, but might also cause smearing of moving images), or avoiding the interlace modes altogether. With some monitors you may be able to reduce the flicker by turning down the Brightness and Picture (or Contrast) settings.

COMPUTER DISPLAYS

A typical computer display consists of a number of *pixels* (for *pic*ture *el*ements), the fundamental units of graphic information. Because a pixel can either be on or off at any given moment, it provides one *bit* of information. An array of pixels provides as many bits of information (and requires as much memory) as it has pixels in the array. An array that can display up to two colors is known as a single *bit plane*. Additional bit planes can display more colors, up to a maximum which is limited partly by the software and partly by the amount of available memory.

For example, a single bit plane in a 320 x 200 pixel array requires 8K of memory (320 x 200 is equivalent to 64,000 bits, or 8 kilobytes). Additional bit planes allow additional colors in accordance with an exponential function. Thus, two bit planes allow up to four colors (2^2 or 2 x 2), three bit planes allow up to eight colors (2^3 or 2 x 2 x 2) and so on. **DeluxePaint** can accommodate up to five bit planes in the 320 x 200 mode, for a maximum of 32 colors on the screen at the one time. A 320 x

200 display using five bit planes requires a minimum 40K of memory (5 x 8K) for the picture.

In Hi-Res (640 x 400) mode a bit plane requires 32K of memory (640 x 400/8). Because Hi-Res mode can accommodate a maximum of four bit planes, a 16-color screen requires 128K of memory (4 x 32K). A page size larger than the screen (see below) requires even more memory. Of course, all this is in addition to the memory required by the program itself (about 200K).

SCREEN FORMAT AND PAGE SIZE

Page Size controls the number of horizontal and vertical pixels in the work space in memory. You can select a work space larger than the screen, but you will need to scroll the screen to access all the work space you have defined.

Screen Format defines the pixel array that is displayed on the screen. In **DeluxePaint** this value ranges from 320 x 200 to 640 x 400. When you select a Screen Format you have the option of selecting Same Page Size, or of setting the Page Size to the Screen Format size. If you are selecting a Screen Format with less resolution than the Page Size, you are at risk of losing some of your image.

This is an area where you need to use your own judgment to protect yourself. When you select Screen Formats and Page Sizes larger than your current one, and you have an image in memory, **DeluxePaint** will try to accommodate your request for a higher resolution display, or a larger page size, but it may do so at the cost of color resolution. For example, if you move a 32-color Lo-Res (320 x 200) image into Med-Res (640 X 200) mode, **DeluxePaint** will remap your image into a 16-color palette (the maximum available at that resolution). Once your image has been remapped, you can never regain the previous color palette data, so it's always a good idea to save an image to disk before changing Screen Format and Page Size.

MEMORY MANAGEMENT AND DANGER ZONES

With 512K of RAM, 100K is allocated to Intuition and 200K to **DeluxePaint**, leaving about 200K free. Because this does not take into account the memory required to create the display, you will generally

have a little less memory available as you work. As we saw above, the default 320 x 200 by 32 color display uses 40K of memory, leaving you with about 160K to work with. In addition, an external disk drive uses an extra 20K. You can measure available memory by using **CTRL a** any time you need a memory check. Most of the time **DeluxePaint** will warn you when you have insufficient memory to accomplish a task, or when you run the risk of losing data.

Memory shortage can manifest itself in various ways. For example, if you are at the limits of available memory and you select a large brush, **DeluxePaint** conserves memory by displaying just the outline of the brush, rather than the brush itself. When you paint with the brush the image will appear on the screen in the normal fashion, even though it may not be visible as you move the brush around the screen. When this happens, consider it a sign that available memory is low. In that case, you should take some action to reallocate memory (for example, by deleting the spare page or by removing any stencils, see below), or at least to save your current image to disk.

Here are some of the ways **DeluxePaint** consumes memory:

An active spare page, even if cleared of an image, uses up as much memory as the first page. You can regain the memory used by the spare page (40K or more) by selecting **Delete This Page** from the **Picture** menu.

Creating a stencil uses up one bit plane. The exact amount of memory depends on the screen format and page size you have selected. Fixing the background has a much larger overhead, similar to that required by a spare page. The disk directory cache uses 2 - 5K, loading the system fonts uses 5K, and creating a fill pattern from a brush uses 1 - 2K. Creating and holding a large brush uses memory.

MEMORY EXPANSION

Using expansion memory with **DeluxePaint** can result in a considerable gain in available memory and workspace. The first 512K of memory on the Amiga (known as *chip memory*) has to contain all the graphics, music, and data. Expansion memory beyond 512K (known as "fast memory") does not increase the available chip memory. However, **DeluxePaint** looks for the presence of fast memory and locates as much of itself there as possible, freeing up about 170K of usable chip

memory. This allows you to use memory-intensive features (such as stencils, fixed background, etc) that may have been otherwise unavailable.

Note, however, that even with large amounts of expansion memory, you might not have access to every function in 640 x 400 mode. With 16 colors in use you have about 130K of memory left for other uses. This means you cannot Fix the Background in this mode. All other functions will work including Spare Page (with no loss of usable memory as it is stored out in fast memory and swapped in when needed).

The best strategy is to always save to disk before you try something new. If you expect to push the edge, use **CTRL a** to see how much memory you have available at any given time.

APPENDIX B: HARDWARE CONSIDERATIONS

EXTENDED MEMORY

Many of **DeluxePaint**'s advanced features use up so much memory that you may not be able to use some features in Hi-Res mode without more than 512K memory in your Amiga. (See discussion in Appendix A, above). In particular, Fix Background, Stencil, Size, Swap Screen, and operations with very large brushes will not work well (if at all) in Hi-Res without extended memory. (Extended or high memory is any amount of RAM after 512K). Extended memory allows **DeluxePaint** to put the program in the memory space above 512K, leaving some of the "bottom" 512K available for pictures. (Due to the nature of the Amiga, only the first 512K of memory can be used for screen display information. Additional video information may, however, be "paged" in from high memory.) If you want to work in Hi-Res, extended memory is highly recommended. **DeluxePaint** only needs to use 1 megabyte of memory or less at maximum demand.

DIGITIZERS

An effective way to shortcut the process of painting an object with **DeluxePaint** is to use a video digitizer. Such a device uses a video camera hooked up to some special hardware, software, and an Amiga to "digitize" any image received by the camera. A digitized image can be recorded as an IFF file and then used as a normal **DeluxePaint** image.

HIGH PERSISTENCE MONITORS

If you use **DeluxePaint** in the Hi-Res or Interlace mode, you may have noticed that screen seems to flicker. This is because the Amiga is using a technique called "interlace" to get 400 lines of vertical resolution on the screen. Every time the computer updates the image you see on the screen, it first paints 200 vertical lines, then goes back to the top of the screen and paints another 200 lines interlaced between the first 200 lines. Because the phosphors illuminated in the first 200 lines have already started to fade by this time, you see a flicker. A monitor with special "high-persistence" phosphors will not flicker in this fashion,

which is much easier on the eyes. However, images will remain painted on the screen for a fraction of a second after the computer stops generating them, which creates annoying blurs in programs with animated graphics. In **DeluxePaint**, you will notice the menus fading out for a fraction of a second instead of disappearing instantly, and brushes leaving a "trail"as you move them across the page. Several brands of high-persistence monitors are available, though the cost is much higher than for a standard Amiga monitor.

GRAPHICS TABLETS

Drawing with **DeluxePaint** may take some getting used to if you're not familiar with a mouse. Traditional pencil and paper artists may find graphics tablets easier to use, especially when tracing existing drawings.

Some graphics tablets let you use either the mouse or a special pen attached to the tablet. Locations on the tablet correspond to screen locations. Pressing the pen down is equivalent to using the left mouse button, so you draw by pressing down on the graphics tablet. Function keys at the top of the tablet can be programmed to duplicate keyboard functions.

Other graphics tablets let you use an ordinary pencil instead of a special pen hooked into the tablet. The tablet responds to pressure, so you just need to lay down a sheet of paper and start drawing (or tracing). In most cases, the left and right mouse buttons are activated by pressing buttons on the tablet.

See your Amiga dealer for information on compatible hardware.

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