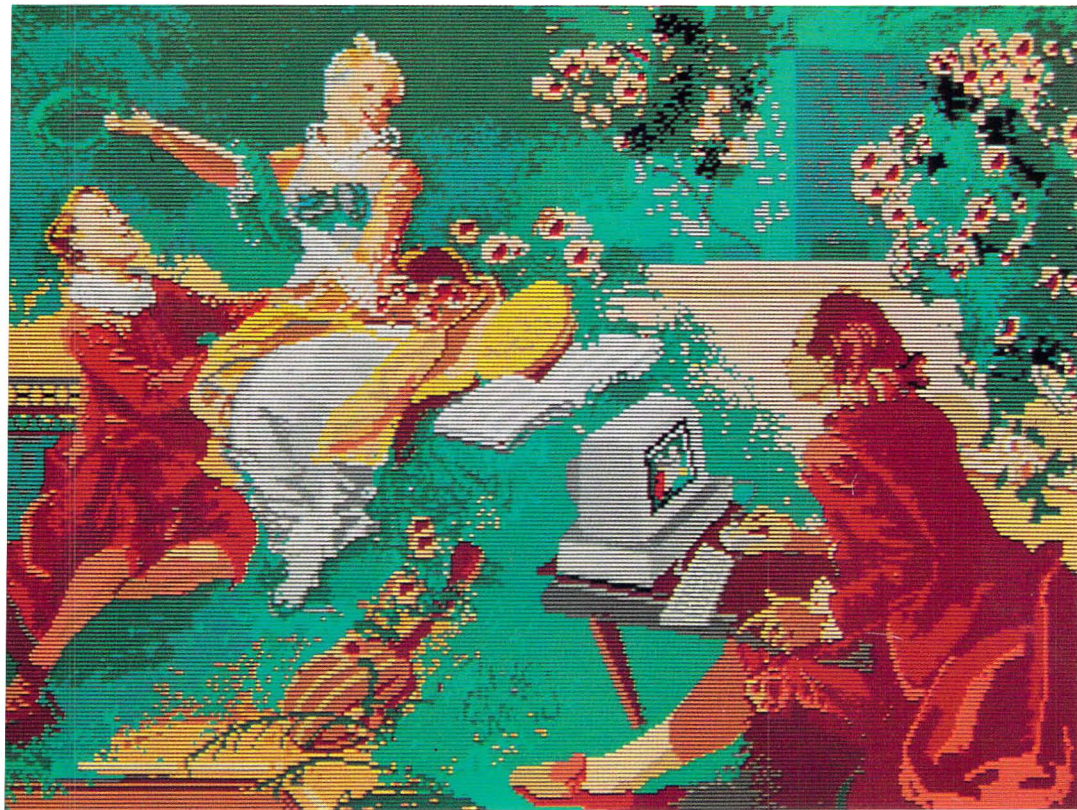
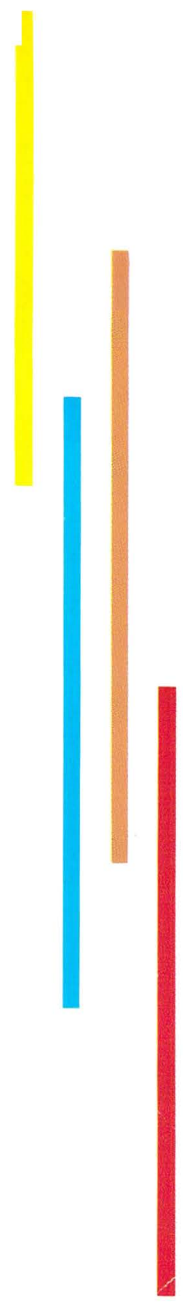


USING DELUXE PAINT



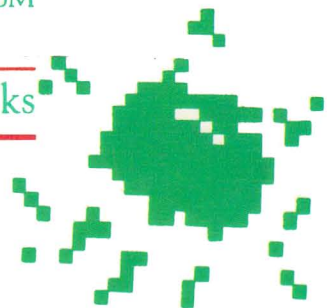
SECOND EDITION



Create the most spectacular art possible on a personal computer with this comprehensive, yet easy-to-use guide to *Deluxe Paint*. For the Amiga, Apple II, and IBM versions of *Deluxe Paint* from Electronic Arts.

STEVE ANZOVIN

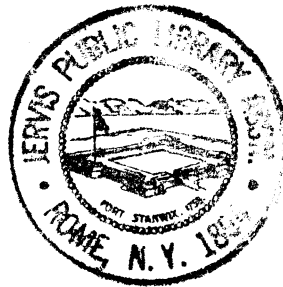
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Using *Deluxe Paint*

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Foreword

Within the Commodore Amiga, Apple IIcs, and PC compatible computers lies enormous artistic potential. The machine on your desk may look like a personal computer—complete with keyboard, monitor, disk drive, and mouse—but that’s just a disguise.

Inside that box is a superb draftsman, a subtle watercolorist, a flamboyant pastel artist, a dazzling airbrush master—all of them waiting for the right opportunity to show their stuff.

This opportunity comes in the form of a disk labeled *Deluxe Paint*. With this disk in the drive and your hand on the mouse, you can learn how to paint, sketch, shade, and draw impressive electronic art. It doesn’t matter whether you’re an accomplished artist, or haven’t picked up a paint brush since your stick-figure days—you can produce interesting and rewarding work within hours. You don’t need to have years of art training to enjoy *Deluxe Paint*’s capabilities and develop your own skills. But if you *are* artistic, trained and skillful in any number of media, you can delve into the new methods and techniques—and the new results—that computer art offers.

Learning *Deluxe Paint* is what this book is about. Completely revised and updated, *Using Deluxe Paint* now covers all versions of the program, including the PC-compatible version and *Deluxe Paint III* for the Amiga, with its impressive animation capabilities. Inside you’ll see how to create practical, workaday graphics ranging from illustrations to design. And you’ll learn how to use the software to produce art for art’s sake. Techniques are explained and demonstrated, and the results are reproduced in more than 200 figures, paintings, and drawings, including 16 full-color plates. You’ll learn how to manage basic drawing with *Deluxe Paint*, how to use one of the program’s most powerful features—custom brushes—how to use color to best effect, how to paint, and how to create text. You’ll also see how patterns and perspec-

tive are made simple with this state-of-the-art software, and how to create television-quality animations.

This guide to *Deluxe Paint* takes you beyond the manual, giving you hands-on practice and countless ideas for your own art. *Using Deluxe Paint II* is the perfect companion for any Amiga, Apple, or PC artist.

Make use of it, and become a truly deluxe artist.

Acknowledgments

One of the pleasures of writing a book like this is thanking those who have helped in its conception. At Electronic Arts, Dale Weideman, Nan Dupont, Happy Keller, Steve Peterson, Rachel Famighette, and Charlotte Taylor gave generously of their time and resources; thanks also to Electronic Arts for granting permission to reproduce clip art by EA artists. The staff at COMPUTE! Books was unfailingly helpful, especially Stephen Levy, Gregg Keizer, and Lee Noel, Jr. Several members of New York's AMUSE Amiga user's group provided examples of practical uses for *Deluxe Paint*. Discussions with Amy Slaton of *Art in America* magazine clarified matters of computer art aesthetics for me. Thanks also to Martha Steffens of Apple Computer; the staff at American Business Products of Englewood, New Jersey; and Tru-Image of New York City. I'm especially grateful to my wife, who applied her sharp eye and ear to the manuscript and made numerous suggestions for improvement. Of course, any errors contained within are mine alone.

Above all, thanks to Dan Silva for writing a superlative program.

Steven Anzovin
January 1989

Introduction

Until a few years ago, computer art was the esoteric province of large animation production houses, university research centers, and a number of hardy individuals using frustratingly low-powered equipment and custom-written programs. Today all that has changed. Low-cost computers capable of beautiful, full-color graphics are now available to everyone. Foremost among the new graphics-oriented machines are Commodore's Amiga, Apple's new IIGS, and PC compatibles equipped with EGA or VGA graphics. These graphics powerhouses have challenged software developers to create programs that fully exploit their capabilities.

In November 1985, Electronic Arts unveiled a new art program for the Amiga—*Deluxe Paint*, the flagship program in EA's Deluxe Creativity Series. *Deluxe Paint's* speed, flexibility, ease of use, and range of features gave it much of the power of custom art programs running on high-priced graphics workstations. It was an instant bestseller and won several awards. A year later an enhanced version of *Deluxe Paint* was released for the Amiga. In May 1987, a version of the program was made available for the Apple IIGS, and the next year for PC compatibles and IBM's new PS/2 line, making it the only paint program to run on all the most popular color computer systems. 1989 saw the introduction of yet another enhanced version for the Amiga, *Deluxe Paint III*, with new animation capabilities.

Combining your Amiga, Apple IIGS, or PC with *Deluxe Paint* will furnish you with a versatile system for producing sophisticated computer art. But creating art isn't merely a matter of owning the right tools. Having a set of cold chisels doesn't automatically make you a master sculptor. You need to set a goal, conceive an image that communicates an idea or emotion, and then learn the techniques necessary to create that image.

Learning *Deluxe Paint* techniques is what this book is all about. Within it you'll find information on how to use the many

features of *Deluxe Paint* for practical ends—for business graphics, desktop publishing and presentations, desktop video, illustration, design, and more—as well as for creating art purely for its own sake. *Using Deluxe Paint* will help you through the transition from *Deluxe Paint* owner to *Deluxe Paint* artist.

How to Use This Book

As you set out to become a *Deluxe Paint* artist, the first thing to do is to master the fundamentals. Knowing the basics helps you get the most out of *Using Deluxe Paint*. If you haven't done so already, carefully read the operating manual that came with your computer. *Using Deluxe Paint* assumes that you're familiar with common computer terms such as *byte*, *memory*, and *disk drive*, and that you understand the basic operations of your machine, such as starting the computer, copying disks and files, and the like.

You also should read the *Deluxe Paint* manual and work through the manual's excellent tutorials. *Using Deluxe Paint* is not a substitute for the manual, but a companion to it. This book is not meant as an attempt to cover every feature of this complex program. Instead, it focuses on ways you can use *Deluxe Paint* for personal enjoyment and, if you're a professional artist, ways you can use it as a tool for increasing your creative productivity.

The discussions of *Deluxe Paint* features generally apply to all versions. As far as graphics capabilities are concerned, the versions are nearly identical. But in some areas, mainly those relating to the hardware and operating systems of each computer, there are significant differences. These differences are spelled out in the text. The advanced capabilities of *Deluxe Paint III*, at the moment limited to the Amiga, are described in a separate chapter.

Artist Not Required

One thing that's not taken for granted in this book is that you have had previous training in art technique. *Deluxe Paint* is so easy to use that you can produce interesting and rewarding work within hours, even if you haven't drawn since grammar school. Many people who are afraid to draw or who believe they can't draw have found it easier to overcome "art anxiety" using a computer than using pencil and paper. *Deluxe Paint* takes care of the tasks that seem so daunting to beginning artists, like drawing straight lines, mixing colors, and putting pictures into perspective. And if you make a mistake or don't like what you see, you

can just clear the screen and try again without wasting a single sheet of paper or emptying expensive tubes of paint. More important than technical skill or training is a willingness to take risks and the determination to really look at the world—or the worlds of your imagination—and draw what you see there.

What's in This Book

This updated edition of *Using Deluxe Paint* is organized to serve both novices and experts. A newcomer to computer art and *Deluxe Paint* can read from front to back, progressing from the basics to advanced topics. More experienced artists can skip directly to chapters covering areas of special interest.

Chapter 1 covers the general theory and aesthetics of computer art. Chapter 2 introduces you to the *Deluxe Paint* environment and relates the program to other art tools you may have used. Chapter 3 explains basic drawing techniques. As a unit, these first three chapters provide the basic insights into *Deluxe Paint* that help you get started with your own work.

The following chapters examine in more detail the program's major features—the custom-brush tool, the color palette, the painting tools, drawing and painting aids, the text tool, pattern making, and the perspective tool. The last chapter covers all the new features of *Deluxe Paint III*. Tutorials and step-by-step examples are included to help you understand just how each feature works.

The illustrations (all created with *Deluxe Paint*, including the pictures in the new full-color section) show how each program function can be applied. You may find it helpful to work through some of the drawings step by step on your own screen, reproducing them as closely as you can. Or you may wish to try out the techniques illustrated using your own material. The more complex illustrations are offered as examples not only of technique, but also of the level of sophistication that *Deluxe Paint* graphics can achieve.

Keep in mind, however, that the text and illustrations don't even begin to cover all the visual styles and techniques—traditional and still-to-be-invented—that are possible with *Deluxe Paint*. Experiment on your own, develop your own style and method of working, and apply *Deluxe Paint's* many capabilities to your own graphic arts needs. As you work with *Deluxe Paint*, you'll discover that this program is one of the very best inspirations to graphics creativity yet devised.



CHAPTER 1

**Behind *Deluxe Paint*
Graphics**

We all have within us the desire (perhaps secret and unexpressed) to communicate in pictures. As children we love to draw; we begin drawing only a little while after we start to talk, and long before we learn to write. The two processes, writing and drawing, have a lot in common: They are ways of communicating in symbols, combining physical and mental abilities in a contest to measure your insights against the conditions of the real world. And both writing and drawing can be brought up to the level of art.

But while most people can get by with the written word, few of us grow up to be artists. The traditional ways of making art—drawing, painting, sculpture, and printmaking, not to mention practical graphic communication like drafting and graphic design—are skilled crafts, demanding time and patience to learn. Becoming good at creating art takes a long apprenticeship, an apprenticeship most of us feel we cannot afford. Many potential artists also fear they lack the talent or inspiration to make worthwhile art. Rather than fail, they don't make a start. Yet we still take pleasure in drawing and sketching when the opportunity arises—a map, a diagram, or a doodle—and wish we could do more.

You may think computer graphics is an area of art that requires especially arcane knowledge. Surprisingly, the computer offers an easy and fun way to begin making art again. Combining the right computer, such as the Commodore Amiga, the Apple IIgs, or a color graphics-equipped PC compatible with the right graphics software, such as *Deluxe Paint*, yields a new art medium that's easier to learn, more forgiving of errors, and more conducive to experimentation than any other.

Afraid to touch brush to canvas for fear of ruining the picture with your first mark? With a computer, you needn't be. No mark or action is irrevocable; you can erase what you've done at any

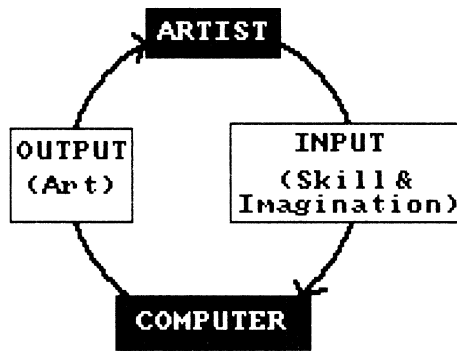
point and start afresh. Or you can save only the parts you like and delete the rest—without wasting a single piece of paper.

Lack the skill to draw a straight line? Don't worry—no person can draw a really straight line freehand, anyway. But the computer can—as well as draw perfect circles, ellipses, and squares; duplicate any shape exactly; mix colors automatically; put scenes into perspective; and much more.

Feel you don't have the necessary talent or inspiration? Don't worry about talent; if you're enthusiastic and interested, you're ready to tackle the adventure. If you do have special talent, you'll soon know it. Even if you don't (and it's unlikely that you won't discover *some* aptitude), there's still plenty of useful work you can do. Developing skills is largely a matter of determination, which can be learned. As Thomas Edison said, genius is 10 percent inspiration and 90 percent perspiration. You truly don't know what you can do until you work hard at it. The computer, by making it easier to get the picture done, releases your imagination, giving you the freedom to experiment and grow.

Remember also that not all graphic communication is fine art. There are scores of practical applications, from architectural drafting to zipper design, that are more easily and more effectively done on a computer.

Computer graphics offers special advantages to the practicing artist. You needn't feel you are "selling out" by using a computer in your work. Anything that makes your work easier, and at the same time opens new creative areas for exploration, should be welcome. It's important to view the computer not as the end point of the art-making process, but as one step on the way. For example, the computer offers a quick way to plan pictures for traditional media. You can lay out your painting, illustration, print, or advertising comp, rearranging the layout until it looks right and devising a color scheme from over 4000 readily available colors. You can build libraries of pictures to reuse whenever you need them and then can translate them into paper, photographic, or video form. You'll find that the computer, just as much as any other art tool you own, becomes part of your total system for making art (Figure 1-1). You, the artist, provide the skill and imagination; the computer helps you craft the product—the art. In turn, you look at what you've done, hone your skills and ideas accordingly, and start the process over again.

Figure 1-1. The Art System

The Synthetic Image

We all know what paintings, prints, and photographs look like, and we all have at least some idea of what goes into making them. Anyone who has been exposed to art quickly develops strong likes and dislikes. For instance, you may love Manet's work, but think Renoir's is too sugary. A whole branch of philosophy, *aesthetics*, exists to help you make and support these judgments.

Do the same familiar visual standards apply to computer art? Is computer graphics just an extension of traditional practices—another way to paint—or is it, as some artists claim, qualitatively different, a revolutionary way of making art and looking at the world? The term *synthetic image* has been applied to the new computer art, implying that graphic images created on a computer have aesthetic properties never seen before.

The jury is still out on whether all the old standards apply. The body of computer art that exists is too small, and the fund of experience gathered by computer artists is too meager to give a definitive answer to that question. The extent and limits of the field have yet to be discovered, leaving plenty of room for you to make your mark on it, if you so choose.

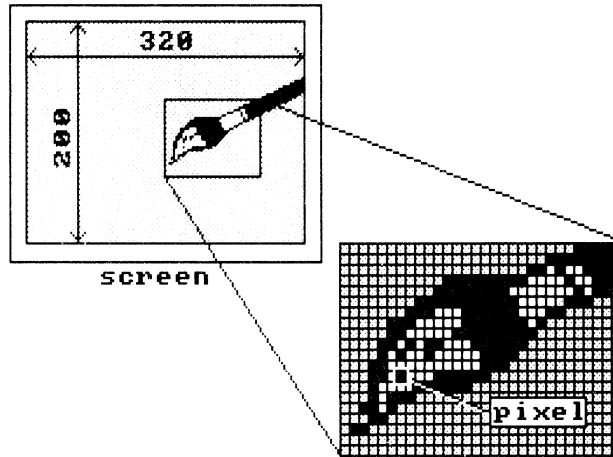
Certainly, some aspects of art making don't change, no matter what medium or technology you're using. The act of painting a landscape remains a metaphor of and communication about your artistic perception of a scene, regardless of whether it's done in *plein air* with oils or in an air-conditioned office with your computer; the picture still must meet the fundamental requirements of honest purpose, clear technique, and effective communication.

But in other aspects, the computer is having an unprecedented impact on the way the artist works—especially as sophisticated but low-cost hardware and software become available to everyone. That's because the computer is not merely another medium, like paint or pastel. It's also a set of powerful tools, a translator, and an assistant, with some amazing abilities and some notable shortcomings. The computer sets very plain limits, defined by the technology available and the "personality" of the software. For example, at the present level of personal computer technology, you can't make a picture with the subtle detail and depth of color of an oil painting or even of a good photograph. And if your graphics program lacks some essential feature, such as being able to fill any area with a pattern of your own creation, you have to do without that tool. One of the best things about the Amiga and the Apple IIGs is that they were expressly designed with graphic art in mind, and represent the most advanced art technology available in personal computers. IBM's PS/2 computers and PC compatibles with EGA or VGA cards offer some of the same capabilities. And in *Deluxe Paint*, you'll find the most comprehensive graphic toolkit, with the best-thought-out working environment, available in graphics software today.

Painting with Pixels

To gain a better understanding of the kinds of images that *Deluxe Paint* and your computer can create, let's start by looking at how your computer makes pictures.

All computer displays (that is, screen images) are composed of picture elements, called *pixels* for short. The pixel is the smallest possible dot the computer can display—the fundamental particle of computer graphics. On the screen, pixels are arrayed in a grid, usually specified as a number of pixels across by a number of pixels down. Figure 1-2 shows a screen composed of 320 pixels across by 200 down (or 320×200). The computer can make each pixel black, white, or any of various available colors in between. Computer images, such as the brush in Figure 1-2, are no more than fields of pixels shaded to look like some object. On the most basic level, when you draw on the screen, you're painting with pixels.

Figure 1-2. Pixels

Screen Formats

Just to make things complicated, most computers offer a number of *screen formats*. Each format or display mode is characterized by a predetermined number of pixels, a certain pixel size, and a maximum number of onscreen colors. For example, standard EGA mode on a PC (one of the many screen formats available on the typical PC with a good-quality EGA color graphics card) normally offers a screen of 640 pixels across and 350 down, plus 16 onscreen colors out of a possible 64. Table 1.1 summarizes the Amiga, IIGs, and PC screen formats that are accessible with *Deluxe Paint*.

With PCs, as you can see from the table, it can get confusing, since different graphics adapter cards offer different screen formats with similar pixel dimensions and available colors, while individual formats can have different pixel dimensions and different numbers of available colors. The three EGA formats are a case in point. The Amiga also offers a multiplicity of screen formats, but these at least are built into every Amiga, so you're not required to tackle the arcane intricacies of graphics adapter cards. In any case, *Deluxe Paint* lets you work in the widest number of screen formats and the widest variety of computers of any paint program, so you can choose the combination that best suits the task at hand.

Table 1-1. Screen Formats and Colors—Apple IIgs, Amiga, and PC-Compatibles

Computer	Format	Pixels	Onscreen Colors Out of Total Colors Available
Apple IIgs	Med Res	320 by 200	16 of 4096
	Hi Res	640 by 200	4 of 4096
Amiga	Lo Res	320 by 200	2,4,8,16,32 of 4096
	Interlace	320 by 400	2,4,8,16,32 of 4096
	Med Res	640 by 200	2,4,8,16 of 4096
	Hi Res	640 by 400	2,4,8,16 of 4096
	Interlace		
	Extra Halfbright*	[not used by Deluxe Paint]	
PC-Compatible	Hold and Modify	[not used by Deluxe Paint]	
	Hercules	720 by 348	monochrome
	CGA	640 by 200	monochrome
	CGA	320 by 200	4 of 16
	Tandy	320 by 200	16 of 16
	EGA	320 by 200	16 of 16
	EGA	640 by 200	16 of 16
	EGA	640 by 350	16 of 64
	MCGA	320 by 200	256 of 262,144
	MCGA	640 by 480	2 of 262,144
	VGA	320 by 200	16 of 262,144
	VGA	640 by 200	16 of 262,144
	VGA	640 by 350	16 of 262,144
VGA	640 by 480	16 of 262,144	

Note: PC-compatible screen formats require the proper graphics adapter card.

* Used by *Deluxe Paint III*—see Chapter 12.

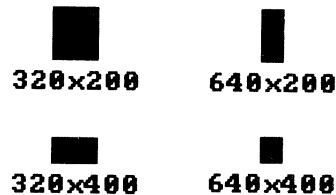
Resolution

The fewer pixels on the screen, the grainier and less detailed the image. The more pixels on the screen, the less grainy and more detailed the image. To take an example, a 640 × 200 screen format has twice as many pixels as a 320 × 200 screen format, so it can yield images with twice the detail. The Amiga's hi-res mode (640 × 400) has four times as many pixels as the lo-res mode, yielding four times the detail.

In computer graphics, the graininess of a screen or picture is

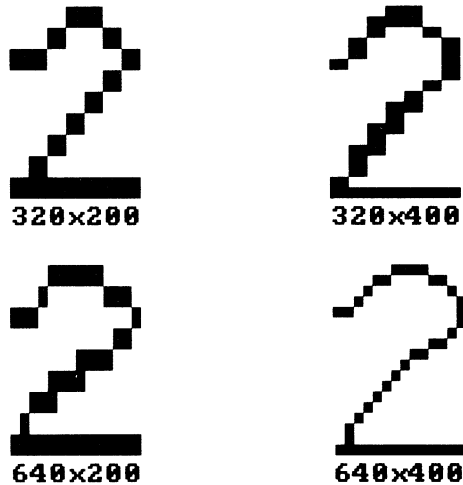
called its *resolution*. Resolution is defined by the size and shape of the smallest pixel that can be generated by the computer. In Figure 1-3, you can see the various relative pixel sizes and shapes available on the Apple IIGs, the Amiga, and several of the PC compatible graphics formats.

Figure 1-3. Pixel Sizes



The unaided human eye cannot resolve picture elements smaller than about .05 millimeter. Anything smaller than that can't be picked out as an individual object by the eye (except in certain circumstances, as when a tiny white speck can be easily seen on a solid black background). The graininess of traditional media such as paint or photographic emulsion is as fine or finer than this, so resolution isn't an issue when working with them; they can create detail far finer than the eye can resolve.









The current generation of personal computers can't produce a screen resolution even approaching the resolving limit of your eyes. Computer images look coarse and blocky—more so in the lower resolution screen formats, but are still quite noticeable in the higher ones. Diagonals and curves are particularly jagged, as you can see in Figure 1-4. This phenomenon is known as staircasing, aliasing, or simply the jaggies. This is what gives computer images that familiar digitized look.

Figure 1-4. Resolutions REVISED

Resolution modes differ not only in the size and number of pixels that can be displayed, but also in the shape of the pixel itself. The ideal pixel is square, so its proportions are constant no matter how it's rotated. (Rotating images is one of those tasks that is so difficult with traditional ways of creating art and so easy using *Deluxe Paint*.)

Square pixels make curves and diagonals look smoother. Figure 1-5 shows how a numeral drawn in the Amiga's 320 × 200 screen format changes size and shape when translated into other formats. Rotating the numeral in the 320 × 400 and 640 × 200 formats radically changes its proportions. The 320 × 200 and 640 × 400 formats create the least rotational distortion because they have nearly square pixels. The PC-compatible MCGA and VGA 640 × 480 formats have the squarest pixels of all.

Figure 1-5. Resolution Distortions

Resolution	90° Rotation
 320x200	
 320x400	
 640x200	
 640x400	

The state of the technology being what it is, you'll have to accept the low resolution and distortions of personal computer images for the time being. You're already familiar with the crisp, fine-edged look of paint, ink, and photographs, so this lack of subtlety can be difficult to get used to.

There are various ways to compensate for the limits of your computer's resolution. Some of these techniques are discussed later in this book. The best approach is to accept the currently limited nature of the computer image and make the most of it. There's an unlimited amount of useful and enjoyable work that can be done with the tools available.

A note on the Amiga resolution modes. When using the 320×400 and 640×400 modes (instructions for using them are in the next chapter), you'll notice a definite flicker on the screen, especially between adjacent contrasting areas and along horizontal lines. This is caused by *interlacing* (that is, the Amiga displays alternate horizontal lines of pixels to gain more vertical resolution). The interlaced modes are more difficult to work with when line drawing; your eye automatically tries to follow the flicker and gets tired. The flicker isn't as much of a problem when you're working with broad areas of color. If you can't stand the flicker, avoid the interlaced modes or get a special kind of monitor, called a *long-persistence* monitor, that doesn't show the flicker. These monitors, available from well-known manufacturers such as Sony,

Mitsubishi, and Electrohome, are expensive, but can be worthwhile if you must work in the interlaced modes. If you own an Amiga 2000, you can also purchase a graphics card that generates a 640×400 screen format without interlace when displayed on a multisync-type monitor.

Color

Vivid color graphics call for a program like *Deluxe Paint*. The Apple IIcs and the Amiga can both display 16 values, each of red, green, and blue—the primary colors of video (more on this in Chapter 5). These colors mix to yield a total palette of $16 \times 16 \times 16$, or 4096 colors. *Deluxe Paint* gives you complete access to this panoply of color, from pure primaries to subtle pastels and natural flesh tones.

With PC compatibles, the number of colors you can pick from depends on the graphics adapter you're using. At the bottom of the scale, the Hercules and CGA 640×200 formats allow only monochrome images with two colors, black and the text color of your monitor, which could be amber, green, or white. At the high end, MCGA and VGA formats allow you to pick from 262,144 colors—more than your eye can easily distinguish.

Using *Deluxe Paint's* palette-control features (discussed in Chapter 5), you can make any choice of colors from the palette, but because of inherent limitations of personal computers in general, you cannot display all possible colors at once. In Table 1-1 you'll find the number of colors that can actually be on the screen in any screen format. You'll notice that the number of colors tends to decrease as the resolution increases. This is because the higher resolutions require more memory to display, leaving less room for color information. Even so, you'll still have a wide selection of colors for your graphics needs.

Now that we've covered these basic computer graphics concepts, let's take a closer look at *Deluxe Paint* itself.

CHAPTER 2

**The *Deluxe Paint*
Environment**



In this chapter, you'll take a broad look at the working environment that *Deluxe Paint* creates—the type of program it is, the way you work with it, and the general characteristics of the pictures you can create with it. If you're already an experienced *Deluxe Paint* user, you may want to skip ahead to the later chapters covering special topics.

What Is *Deluxe Paint*?

Deluxe Paint is what's commonly known as a *paint program*, a general-purpose software tool for creating computer graphics of any kind. This includes fine art and most kinds of design work: fashion and theatrical design, architectural and product renderings, book and magazine illustration, business graphics, and desktop publishing.

Deluxe Paint is primarily a *bitmap editor*, meaning it creates, manipulates, and saves pictures as a grid or map of pixels. It's not a *structured drawing program* or an *object-oriented program* that creates, manipulates, and saves objects and shapes defined by mathematical formulas (that's what most computer-aided drafting and design programs do). But *Deluxe Paint*, as you'll see in the following chapters, does have some of the characteristics of a structured drawing program, and can perform many of the same tasks.

To be easy to learn and operate, a good paint program should incorporate electronic analogs of traditional painting and drawing techniques. With *Deluxe Paint*, you'll still wield brushes, draw lines, mix colors on an artist's palette, and work on a page. You'll instantly recognize the terminology that *Deluxe Paint* uses, and be able to orient yourself by familiar landmarks. But a paint program should also offer more than a mere analogy to tradition, and *Deluxe Paint* does that as well. Many *Deluxe Paint* tools and features have no real correspondence to traditional techniques.

These are the most exciting aspects of *Deluxe Paint* and are covered in depth in subsequent chapters.

The *Deluxe Paint* Canvas

At this point, make sure you've read your computer's operating manual and the first section of the *Deluxe Paint* manual. The *Deluxe Paint* manual gives clear instructions for copying your disks, organizing directories and files, and starting the program. When you feel confident that you can handle disks and drives, the *Deluxe Paint* disk, the mouse, and starting up, then move ahead.

In computer art, the monitor screen is your canvas—the field of action. Let's take a look at the *Deluxe Paint* canvas now.

- * If you're using an Amiga, load the program disk into the internal drive, double-click the *Deluxe Paint* disk icon, double-click the *Deluxe Paint* program icon in the window that opens, then choose OK from the Screen Format Box. (We'll discuss choosing a screen format later in this chapter.)
- * The Apple IIcs loads the program automatically when you insert the program disk into any drive. Or, if you are using the Finder, insert the program disk and double-click the *Deluxe Paint* icon
- * With the PC compatible version, insert the program floppy into drive A: and press Enter. (*Deluxe Paint* requires a graphics adapter card and a mouse or other pointing device; be sure your pointing device is connected and the device driver software is installed. Follow the device manufacturer's instructions.) Type *dp* at the > prompt and press Enter. Choose the appropriate screen format from the Screen Format box, press Enter, and the program loads.

In a moment you see a screen like the one in Figure 2-1 (Amiga), Figure 2-2 (Apple IIcs), or Figure 2-3 (PC compatible).

This is *Deluxe Paint*'s working area. Whenever you enter the program, you're presented with a fresh, blank page to work on. As befits a program for artists, *Deluxe Paint* lets you control many of the program's functions through a set of pictographs, called *icons*. Working with these icons is much faster than reading words and typing commands, and you'll find the *Deluxe Paint* graphics-based environment quick and easy to learn. In most cases, you work on the screen by moving a pointer around with

the mouse. To choose a tool, you simply position the pointer over an icon and click the Apple IIgs's single mouse button or the Amiga's or PC compatible's left mouse button.

Figure 2-1. Amiga *Deluxe Paint* Screen

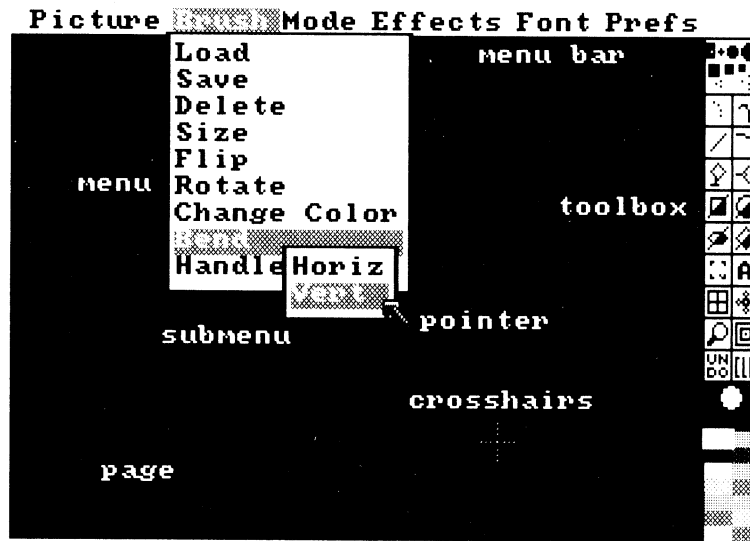


Figure 2-2. Apple IIgs *Deluxe Paint* Screen

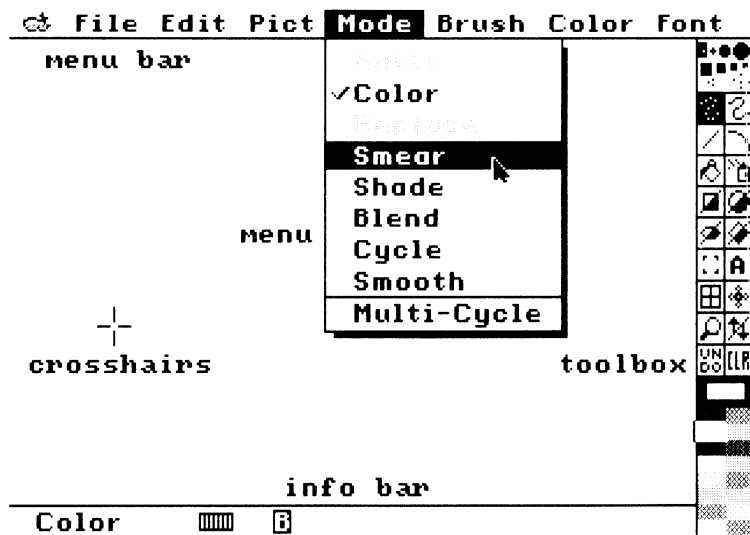
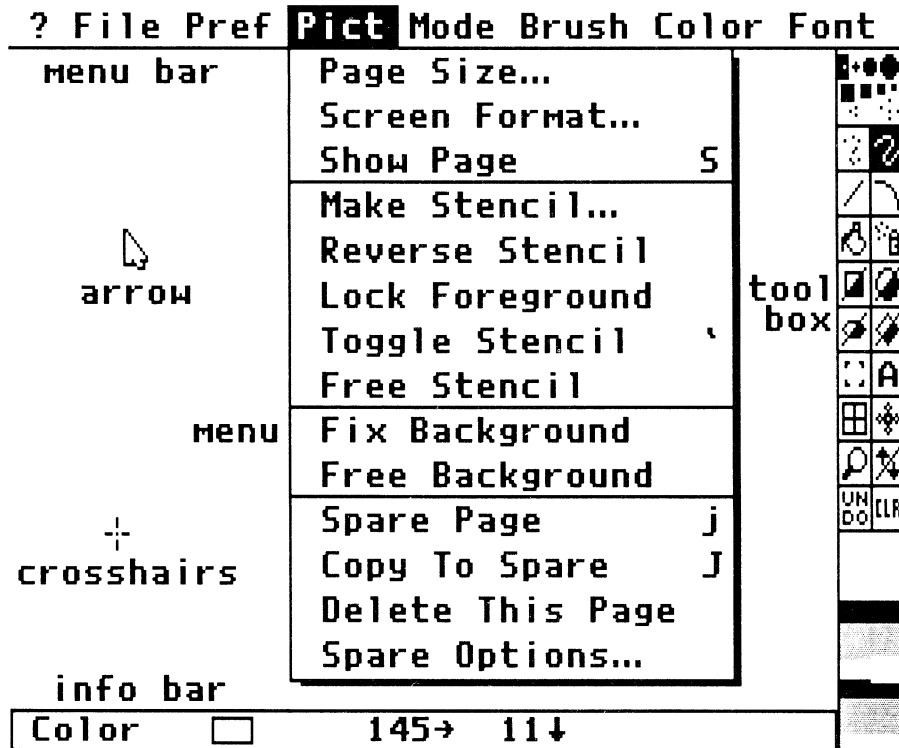


Figure 2-3. PC Compatible *Deluxe Paint* Screen NEW

Try that now. First, hold down the mouse button (the left button on the Amiga or PC compatible) and move the crosshairs around on the main drawing area—the page. You’re drawing with a one-pixel-sized brush; you can see it in the center of the crosshairs.

A brush is an image of any kind, from a pixel-sized dot to a screen-sized picture, that leaves a mark on the screen. When you load *Deluxe Paint*, it automatically provides you with a small brush and a field of black (Amiga) or white (IIGs and PC compatible) to work on. Cover the page with scribbles until you’re comfortable with the action of the brush. When you want to stop drawing, let up on the mouse button. You can then move the crosshairs to a new location without leaving a mark and start drawing again.

Now move to the right-hand border of the screen. There you

see the *Deluxe Paint* toolbox. This is where the drawing and painting tools are—the ones you use constantly in your work. As you move the crosshairs into the toolbox area, they turn into a pointer. Position the pointer over the CLR (CLEAR) box and click the mouse button. Instantly, the scribbles you made vanish, and the page is blank again. You've just experienced one of the chief pleasures of *Deluxe Paint*—the ability to effortlessly erase your work at any time.

These few simple techniques—moving a brush on the drawing page and selecting a tool from the toolbox—are the most important and the most common. Know these and you know enough to do useful work with *Deluxe Paint*.

Along the top of the screen, you'll see the *menu bar*. This gives you access to *Deluxe Paint* functions that modify a tool or that can't easily be represented by a picture. Go to the menu bar and pull down a menu now. (If you have an Amiga, use the right mouse button for menu operations; with a PC compatible, use the left mouse button.) The menu shown in Figure 2-1 is the Brush menu; Figure 2-2 shows the Mode menu; Figure 2-3 shows the Pict menu. Each menu contains a list of options for modifying aspects of the program. (Note that the Amiga has provisions for submenus, but the Apple IIgs does not.) Each menu option is highlighted as you move the pointer over it; select any menu option by clicking it.

The Amiga menu bar shows additional kinds of information relating to the *Deluxe Paint* function you're using. For example, it tells you when the stencil function is on and what kind of fill feature is currently active. (Stencils are discussed in Chapter 7; the fill function is discussed in Chapters 3 and 9.) On the IIgs and PC compatibles, this information is displayed in the Info bar along the bottom of the screen.

Now is a good time to practice selecting tools from the toolbox and to take a look at all the menu options. You'll be using most of these later, so get to know where everything is. Chapter 3 covers the basic drawing tools in more detail. And by the way, if you need more drawing room, you can turn off the toolbox and the menu bar by pressing the F10 key on the Amiga or PC compatibles, or the 0 key on the Apple IIgs. Hide the IIgs Info bar by pressing the 9 key; hide the PC compatible Info bar by pressing the F9 key.

Choosing Resolutions: Style and Flexibility

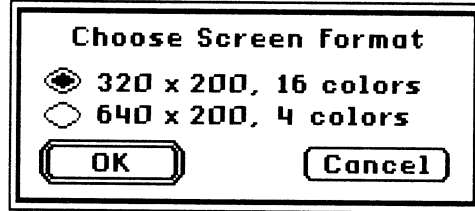
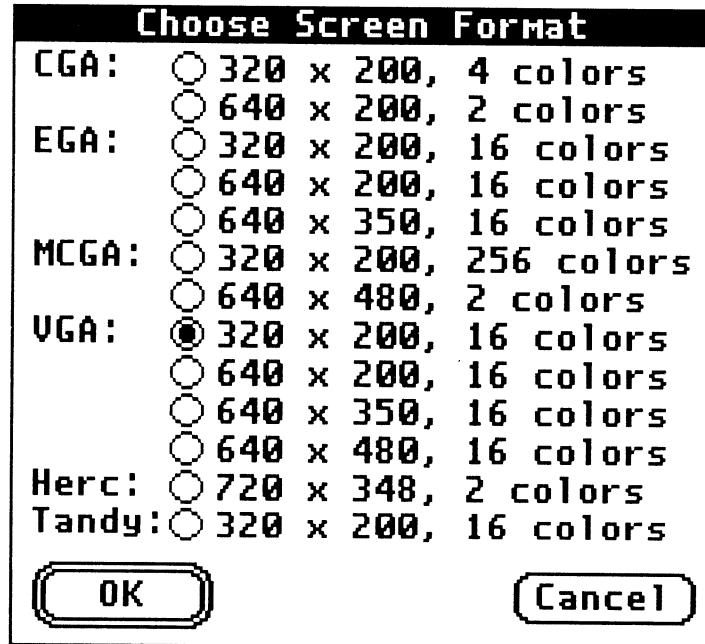
Deluxe Paint lets you choose from your computer's available resolutions by making selections from the Screen Format box. Let's return to that now by selecting the Screen Format option from the Picture menu (in the PC compatible and Apple IIGS version of *Deluxe Paint*, the Picture menu is labeled *Pict*).

If you have an Amiga, you'll see a box somewhat like the one in Figure 2-4. (The figure actually shows the box as it appears when you first boot the program. When you call the box later from the Picture menu, it looks a bit different.) Figure 2-5 shows the Apple IIGS Screen Format box; Figure 2-6, the PC compatible version. Such boxes are called *requesters* in Amiga argot, *dialog boxes* in IIGS jargon, and *windows* on the PC.

In each box, gadgets such as *buttons* and *edit boxes* let you choose among options and enter information. The Amiga's Screen Format box gives you access to the computer's available resolution modes and lets you select the number of colors you want to use. The Apple IIGS Screen Format box gives you a choice between medium and high resolution. The PC compatible box lets you choose among the formats available with your graphics adapter. Click the appropriate button to make your choices.

Figure 2-4. Amiga Screen Format Box

Choose Screen Format	
Format:	Number of Colors:
Lo-Res 320x200	2 16
Med-Res 640x200	4 32
Interlace 320x400	8
Hi-Res 640x400	
Program Loading:	
Swap	Load All
Ok	

Figure 2-5. Apple IIGs Screen Format Box**Figure 2-6. PC Compatible Screen Format Box**

With the Amiga, you can switch on the fly from one format and number of colors to another as you work. This changes the size of your picture as well. For example, switching from the 320 × 200 format to the 640 × 200 halves the width of your picture, because 640 × 200 pixels are half the width of 320 × 200 pixels. The picture looks as though it has been squeezed to the left by a hydraulic press.

If you've been using the maximum number of colors in the 320 × 200 mode, the number of colors available diminishes also, either by one-half (Amiga) or by three-quarters (Apple IIGs). *Deluxe Paint* automatically recalculates the palette as necessary,

trying to accurately correlate the original picture's colors with the new.

Similarly, if you move from 640×200 to 320×200 format, your picture doubles in width—taking up two 320×200 -size pages—and gains available colors (but the colors in the picture itself won't change).

With the IIGs, you can create pictures in either medium or high resolution; however, you can't load pictures created in medium resolution while working in high resolution, and vice versa. Likewise, the number of colors is fixed in both formats.

The PC compatible version lets you choose from any screen format your adapter supports. Before switching from one format to another, be sure to save your picture, because some information about the current state of the program is lost when you switch formats. If you switch to a format with fewer onscreen colors, *Deluxe Paint* does its best to create a new palette that comes as close as possible to the old one.

What are the advantages and disadvantages of one format over another? It's really a matter of your style, the requirements of the picture, and the flexibility you need from the program. For example, choosing the lowest resolution frees up lots of memory. You'll then be able to use more *Deluxe Paint* functions at one time, especially if you're using a computer with the minimum amount of memory required—512K for the Amiga and IIGs, 640K for PC compatibles. The trade-off for this, of course, is a more jagged-looking image. This is more than adequate, however, for diagrams or drawings that don't require fine detail.

Working in the higher resolutions limits the number of colors and uses up more memory. You'll find that some *Deluxe Paint* features are unavailable to you in the higher resolutions owing to insufficient memory. (That is, unless you've installed additional memory; *Deluxe Paint* works best with one megabyte of memory.) With the Amiga, you can also save about 40K of memory by choosing Swap from the Screen Format box when loading *Deluxe Paint* for the first time. This lets some portions of the program stay on disk rather than in memory until they're called for. The program then swaps a function in memory for the requested function.

It's good practice to pick the best resolution for the job before you begin work. Switching later to a different resolution entails

penalties such as losing your current brush (and, if you trade down in colors, your original palette).

If you're using an Amiga, there are some situations where changing resolutions in midstream is an advantage. One such situation is when you want to reduce the amount of memory you're using to take advantage of a *Deluxe Paint* feature that otherwise would be unavailable. You can simply drop down to a lower resolution to give yourself more workspace in memory. Another is to avoid working in the Amiga's interlaced modes. You can set up the framework of your picture in 640×400 resolution and then convert it to 320×200 for detailed work. The page will be four times the size of a standard 320×200 page—remember, there are four times as many pixels. You'll be able to see only one-quarter of the entire page at a time, but you won't have to stare at a flickering screen. You can always switch back to 640×400 to get the big picture.

With the Amiga or IIGs, if you don't have a need for the higher resolutions, just click OK in the Screen Format box. The default resolution is 320×200 , with 32 colors (Amiga) or 16 colors (Apple IIGs).

Sizing the Screen

As you've gathered from the previous discussion, the size of your page is not limited by the size of your screen. *Deluxe Paint* lets you set a number of sizes as measured by the number of pixels across and down. These are listed in the Set Page Size Box (Figures 2-7, 2-8, and 2-9).

Figure 2-7. Amiga Page Size Box

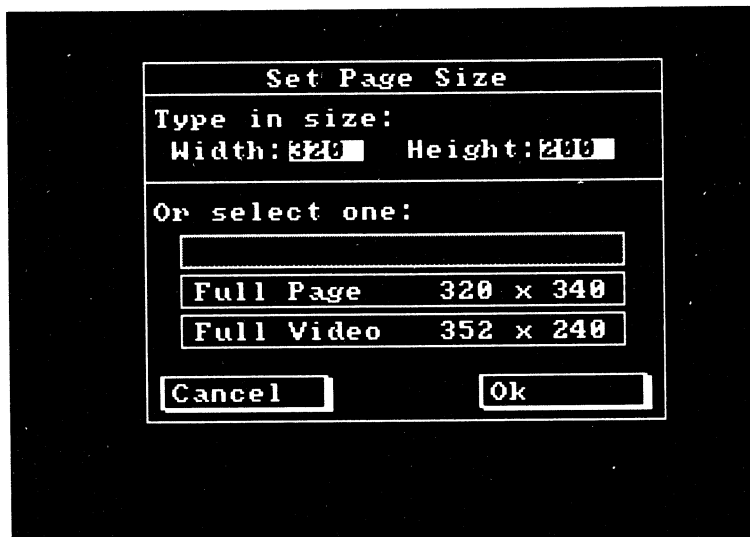


Figure 2-8. Apple IIGs Page Size Box



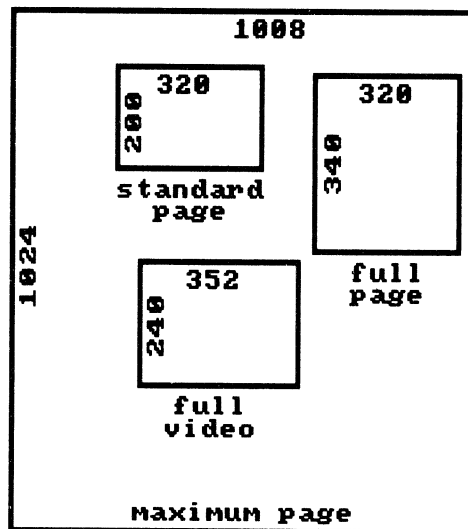
Figure 2-9. PC Compatible Page Size Box



Deluxe Paint is optimized for work with a standard-sized page. For the Amiga and IIGs, that's a 320 × 200 page size; for PCs, it depends on the screen format chosen. You'll have the memory you need for other *Deluxe Paint* features. The IIGs version also allows you to specify a custom page size up to twice the size of a standard page—in other words, 640 × 200 or 340 × 400.

With the Amiga, you have more flexibility. The Amiga version offers three sizes—standard, full page, and full video—as well as a provision for setting any size over 320 × 200 pixels that your memory holds. The maximum page size in *Deluxe Paint* is 1008 × 1024. These areas are shown in proportion in Figure 2-10.

Figure 2-10. Amiga Page Sizes



The Amiga Full Page is sized to yield an 8½ × 11-inch picture on many printers (the standard page prints out to about half of that). Full Video extends the picture into the overscan area, which is the narrow border around the edge of a standard-size page. Use a full video page when you're creating graphics to show on television—it produces a more videolike effect that appeals to people who are conditioned to full-screen television images.

With the PC version, the maximum page size is determined by the screen format. For example, the EGA 640 × 200 format al-

lows a maximum page of four times the screen size; VGA 640×480 allows a maximum page somewhat under twice the screen size. Appendix A of the *Deluxe Paint* manual lists the maximum page size for all 13 available screen formats.

The larger the page, the more memory required. A 512K Amiga won't support a full-color 320×200 -resolution page that's more than about four times standard size; you'll start running out of memory for painting tools even at smaller sizes. If you want to use an extra-large page, you need to get more memory or reduce the number of colors you're using. For the IIGs and PC compatibles, consider purchasing additional memory. *Deluxe Paint* supports the EMS 4.0 expanded memory specification for PCs.

You can move around at will in an oversize page by using the cursor keys on your keyboard. If you want to see the entire oversize page at once, select Show Page from the Picture (Pict) menu (press Shift-S on the Amiga, or Command-S on the Apple IIGs). There's more on working with oversize pages in Chapter 7.

Aspect Ratios: Landscapes and Portraits

Take another look at Figure 2-10. You see that the various pages differ not only in size, but also in proportion. Each has a different *aspect ratio*, the ratio of width to height.

A standard page is wider than it is tall, with a ratio of about four to three (the ratio of the standard television screen). A full page is taller than it is wide, roughly equivalent to the aspect of a sheet of typing paper. In the Western aesthetic tradition, a wide picture is considered to be appropriate for landscapes and a tall picture appropriate for portraits and figures, with the larger dimension often about $1\frac{1}{2}$ times the size of the smaller one. (Other art traditions use different conventions for proportions. Chinese landscapes, for example, are often very tall and narrow.) Though people accustomed to modernist and postmodernist art may think the landscape-portrait distinction no longer holds, psychologically we still look for landscape depth in a horizontal picture, and see a figurative orientation in a vertical one. Since *Deluxe Paint* gives you wide latitude to choose your page and aspect ratio, give some thought to the dimensional requirements of your picture, keeping in mind the ramifications of the aspect ratio you choose. By confounding your viewer's expectations, you can add drama

to your composition, or you can adapt a traditional format to give your picture a classic appearance.

Managing Disks and Files

Because computer memory is not permanent, but vanishes each time the computer is turned off, your computer provides a form of permanent storage in which to record your work. The Apple IIGs, Amiga, IBM PS/2, and most PC compatible laptop computers use 3½-inch floppy disks as their primary form of permanent storage; other PCs use the older 5¼-inch disks. Electronic Arts sells *Deluxe Paint* only on 3½-inch disks for the Amiga and IIGs, and supplies both 3½-inch and 5¼-inch disks for PC compatibles.

As *Deluxe Paint* takes up nearly all of its own disk, you'll be saving your work on a separate data disk. Formatted (ready-to-use) Amiga disks hold 880K bytes worth of pictures, while the Apple IIGs's disks hold 800K bytes. That's 20 or more 320 × 200 full-color pictures per disk. PC compatible 5¼-inch disks hold 360K or .7 megabytes; PC compatible 3½-inch disks hold 720K or 1.4 megabytes. A 1.4 megabyte disk can hold 40 or more pictures.

Take care of your disks with the same tender concern that you would lavish on a favorite drawing or print. Floppy disks are rugged, but not indestructible; 5¼-inch disks are notoriously fragile. Store them in a cool, dry place, in a hard box or padded case. Don't leave them in a hot car, on the kitchen table next to the peanut butter and jelly, or perched on the rim of the bathroom sink. Resist the temptation to open the sliding plate on the disk to see the disk inside; you might get something on the disk that causes it to crash (a kind of self-destruction that makes files unreadable by the computer) the next time you use it. Keep 5¼-inch floppies in their cardboard or Tyvek covers.

Do flip up the write-protect tab on 3½-inch disks or cover the write-protect notch on 5¼-inch disks when you're finished with them. *Do* conscientiously make copies of your data disks at regular intervals—when you lose your first artistic masterpiece, you'll be glad you backed up your work. *Do* carefully label and date your disks. And make sure to have plenty of fresh, formatted disks around. Graphics use up lots of disk space, and you'll fill up your disks fast. Don't get into the situation of having a wonderful picture to save and no disk to save it on—and no way to

format a disk because your computer is already tied up. (Your computer's manual explains how to format blank disks.)

Picture Files

Pictures, like any other form of work done on your computer, are stored on disk in files. The *Deluxe Paint* disk has several picture files on it. Let's load one now. Pull down the Amiga's Picture menu or the PC compatible's and Apple IIGs's File menu and choose the Load option. The Load Picture box appears on the screen. Figure 2-11 shows the Amiga Load Picture box, Figure 2-12 shows the Apple IIGs box, and Figure 2-13 shows the PC compatible box. The Load Picture box gives you access to any pictures stored on disks in any disk drive connected to your computer.

Figure 2-11. Amiga Load Picture Box

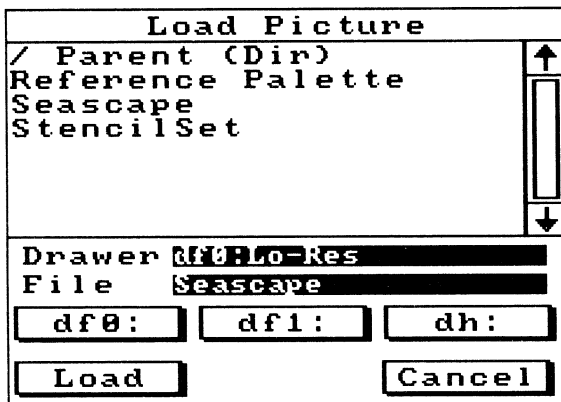


Figure 2-12. Apple IIGs Load Picture Box

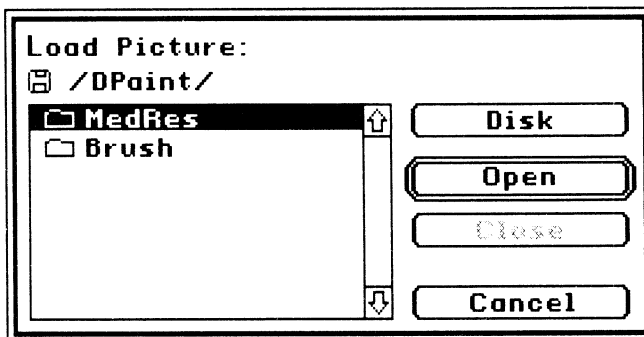
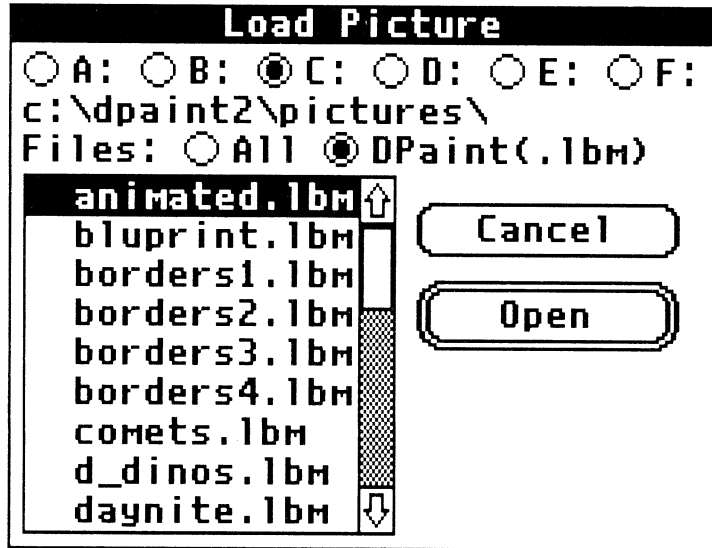


Figure 2-13. PC Compatible Load Picture Box



On the Amiga, click any picture title in the list of pictures; the title appears on the file line. Then click Load to load the picture, and after a short delay the picture appears. On the Apple IIcs and PC compatibles, click the file you wish to open, then click the Open button. Try this with all the pictures on the *Deluxe Paint* disk and the *Deluxe Paint Art Disk* if you received one. (Note that the *Deluxe Paint* PC compatible version requires pictures to have an *.LBM* filename suffix, as in the picture name *KING-TUT.LBM*. Picture files that don't have this filename suffix can't be loaded into *Deluxe Paint*. All picture files created with *Deluxe Paint* are automatically saved with the *.LBM* suffix.)

In the same menu, you'll find similar options for saving pictures (and if you're using the Amiga version, there is a Delete Picture box as well). The boxes that give you access to these functions are similar to the Load Picture box. With this system of boxes, *Deluxe Paint* gives you an easy and nearly foolproof way of managing your picture files.

Now would be a good time to format your own data disk and use the pictures on the *Deluxe Paint* disk to practice loading, saving, and deleting picture files. (To delete pictures with the Apple IIcs or PC compatible, you must exit *Deluxe Paint* and use commands in ProDOS or MS-DOS.) Remember when you delete a picture, you can't get it back again. For that reason, it's best not

to delete anything stored on your *Deluxe Paint* disk. Transfer a copy of the picture to your data disk and practice deleting it from there. Note that to save a new picture, you must first type in a filename in the Save Picture box. If you want to save more than one version of the same picture, give each version a different name.

It's worthwhile to acquire a few good habits for managing picture files. The first and most important, as mentioned earlier, is to save your picture at frequent intervals during a work session. Get into the habit of saving your work when you pause to think about the next phase of the picture or before you leave the computer for a moment. Each successive save supersedes the one before. Should the picture in memory be lost for any reason—a power outage, for example—at least you'll have a recent stage of the picture on disk; you won't have lost the whole thing. Likewise, if you go off in a false direction and don't like what you've drawn, you can backtrack by calling up the last version you saved and work forward from that again.

You may also find it useful to save more than one stage of a picture in separate files. This gives you the option of branching off into different directions from the same basic image—often the case when you are working on a series of related pictures. Give the stages names like *Horse I*, *Horse II*, and so on, and add the date if you have room. A methodical approach to naming and dating similar-looking pictures saves you time and frustration later.

File Formats

All picture files adhere to one or another *file format*, or standardized organization of file information. Amiga *Deluxe Paint* files follow a standard format developed by Electronic Arts, the Interleaved File Format (IFF). Other Electronic Arts programs in the Amiga Deluxe Creativity Series, such as *Deluxe Video Construction Set*, *Deluxe Productions*, *Deluxe Photo Lab*, and *Deluxe Print II*, can use *Deluxe Paint* IFF files. Many other Amiga programs also create and can use IFF picture files, which means you can use your *Deluxe Paint* pictures with a wide variety of other Amiga software, and use images created with other software in *Deluxe Paint*. In fact, the popularity of the IFF file format has helped make *Deluxe Paint* the bestselling Amiga paint program.

The Apple IIGS versions creates and reads files in the Apple-

developed IIGS paint file format, which most other IIGS graphics programs can use. Again, this means you can use your *Deluxe Paint* pictures with other IIGS graphics programs, and vice versa. The PC compatible version creates IFF files that aren't compatible with other PC graphics programs; however, Electronic Arts provides two utility programs, *Convert* and *Camera*, that provide some translation abilities. *Convert* turns files created in *PC Paintbrush 3.0*, *Microsoft Windows Paint*, and *MacPaint* (on the Macintosh) into *Deluxe Paint* files, and vice versa. *Camera* takes a snapshot of the screen created by these and any other programs, including all visible screen menus and icons, and creates a *Deluxe Paint* picture file.

Quitting the Program

Getting out of *Deluxe Paint* is easy—just choose *Quit* from the IIGS and PC compatible *File* menu, or the Amiga's *Picture* menu. It's not recommended to just turn off your computer while you're still in *Deluxe Paint*, although you'll probably do no harm if you do. Other programs, especially databases, can damage your data if you don't quit them in an orderly way, so it's a good habit to get into.

Input and Display—Mouse, Keyboard, and Monitor

The *Deluxe Paint* environment also encompasses the hardware you use to communicate with it. You control the program with *input* devices, the mouse and keyboard, and *Deluxe Paint* communicates via your computer's monitor.

Mouse. You've already played with the mouse a bit, and know that it's the principal tool for communicating with *Deluxe Paint*. But you may be having some trouble adapting to it as a drawing tool. Using the mouse is not like using a pencil, marker, or brush. It requires a new kind of hand-eye coordination, one that an experienced artist, curiously, may find harder to learn than the novice. One problem is that you can't see the actual point where the mouse contacts the table—the very point on which, with traditional tools, you focus all your concentration. Instead, you have to look in an entirely different direction, watching the position of the pointer or brush and ignoring what your hand is doing.

Getting good at mouse work simply takes practice. No matter

how frustrating it seems now, soon you'll be placing one-pixel brushes anywhere on the page with speed and precision. You'll find that the mouse is actually quite a good tool for drawing.

Using the mouse can be made easier by providing it with the right habitat. Give your mouse enough room to roam free—about a square foot of clear table surface. Keep your mouse clean—mechanical mice can be snapped apart and swabbed out with alcohol. A polyester-rubber or leather mouse mat to roll the mouse on increases the positive traction of the mouse ball and improves the accuracy of your movements. Optical mice generally need no maintenance, but you should use a soft cloth to clean the reflective pad the mouse rolls on.

The Amiga and Apple IIgs mice are essentially similar in operation. The main difference is that the Apple IIgs mouse has one button, while the Amiga mouse has two. There are more than a dozen mice available for PC compatibles, and all have at least two buttons. *Deluxe Paint* uses only the leftmost and rightmost buttons. For clarity, this book uses the following mouse terminology:

<i>Click</i>	Briefly pressing on the drawing button, meaning the Apple IIgs's single button or the PC's and Amiga's left button.
<i>Double-click</i>	Clicking twice in quick succession.
<i>Right-click</i>	Clicking with the PC and Amiga right button or with the Apple IIgs button while pressing the Command key.
<i>Drag</i>	Holding down the drawing button while moving the mouse.
<i>Right-drag</i>	Dragging with the PC and Amiga right button or with the Apple IIgs button while pressing the Command key.
<i>Select</i>	Choosing a tool or feature by positioning the pointer over it and clicking.

Right-select Selecting with the PC and Amiga right button or with the Apple IIgs button while pressing the Command key.

Keyboard. The keyboard has its own place as a *Deluxe Paint* input device. You can't draw with it, but you can make drawing easier. Many *Deluxe Paint* commands and features can be called up or modified by hitting a key. This helps minimize unnecessary mouse movements. When doing a complex bit of work in a far corner of the screen, it can be a real nuisance to have to jump over to the menu bar or the toolbox for a new tool. It's far easier to use your other hand to select features with the keyboard, and the mouse won't have to move at all. The experienced *Deluxe Paint* artist can have both hands working at once, with a dramatic increase in work speed. Of course, you have to learn which keys control which features. The keyboard commands for each computer are listed in Appendix B.

You also need the keyboard to add text—titles, labels, and the like—to your pictures. Chapter 8 covers the operation and use of the text tool.

Monitor. The display monitor, as mentioned before, is your canvas. If you have an Amiga, you're most likely using the 1080, 1084, or 2002 color monitor that came bundled with your machine. And if you own an Apple IIgs, you probably bought it with the AppleColor RGB monitor. These monitors are analog RGB monitors, which, for the purposes of our discussion, simply means they're optimal for displaying the full range of colors and resolutions available on both computers. Your PC compatible has a monitor that's compatible with your graphics adapter. It's possible to connect other kinds of displays—composite monitors and even ordinary color televisions—to the Amiga, Apple IIgs, and, depending on your graphics adapter, to some PCs as well. But these will not produce the same crisp and colorful images as an RGB monitor, and they're not recommended for use with *Deluxe Paint*.

These computers can accept other makes of RGB monitor, some of which are far superior to the standard monitors offered by Commodore, Apple, and the manufacturer of your PC. By all means, buy a better monitor if you can afford to do so. The best displays, like the best quality canvas cloth, provide the best

ground for your work. When shopping for a monitor, look for a low dot pitch (under .35 mm); a high bandwidth (over 15 megahertz); a flat, square screen (the Zenith FTM monitors are currently the champ here); and a full range of controls. Comparison shop, running the same *Deluxe Paint* picture on different monitors to see the colors, sharpness, and contrast of each.

Whatever monitor you have should be kept clean. Video screens attract dust. Clean yours regularly with glass cleaner. Do this first thing in the morning, before you turn on the power. Apply the cleaner to a cloth or paper towel—never spray liquids directly on the screen. Don't touch the screen either, since your fingerprints will be visible. To prevent eyestrain, position the monitor so it doesn't reflect glare from window or artificial light. Flat screen monitors reflect much less glare than other types.

Transferring Your Art Skills to *Deluxe Paint*

Painting and drawing in the *Deluxe Paint* environment differ from the traditional practices in important ways. It's worth considering these differences, and how you'll adapt to them, before you go on to the exercises in the following chapters.

If you're already an artist, you'll want to reevaluate your skills and experience. What you'll miss first when starting to work with your computer are the customary textures, smells, and sounds of making art—the physical feedback that many artists relish as part of what attracted them to art in the first place. There's no paint on your fingers or broad gestures of your painting arm; no smell of turpentine, printer's ink, or pencil shavings; no hiss of paper and felt running through an etching press. Instead you sit nearly motionless, watching a video screen, hearing its 60-cycle hum, and smelling warm electronics. Art making with *Deluxe Paint* is more a mental activity and less a physical craft, and the art that results has less of a robust, "art object" presence.

Some of your artistic skills apply in this environment, others won't. A designer who spent long hours learning how to lay down a blotchless line against a T-square with an ink pen finds that skill useless when switching to computer rendering. *Deluxe Paint* effortlessly lays down straight lines in any thickness and color. But the designer's talent for clean design and clarity of layout is still useful. Likewise, the watercolorist who knows 20 ways to vary a wash can carry over to *Deluxe Paint* an eye for subtle, carefully blended gradations of color. The airbrush artist can still

use knowledge of how to render gleaming, rounded surfaces. The more conceptual your skill, the more it applies to work with *Deluxe Paint*. The more rooted your skill in a particular art medium or craft, the less likely it will translate well to the computer realm.

For this reason, the style of your work will probably change. The relatively coarse resolution of computer graphics may push you toward a broader technique or a style more dependent on geometric shapes and less on sinuous lines or fine detail. You may, like many artists, be inspired by the very visual qualities that set computer graphics apart and exaggerate them in your work. Or you may choose to maintain stylistic continuity with the art you were creating before. *Deluxe Paint* makes this possible by providing a wide range of tools you can use to give your work the appearance of a pen-and-ink drawing, a gouache or a pastel painting, a paper collage, or even a photograph. Several of these techniques are discussed in Chapter 6. Above all, keep an open mind, and be sensitive to the computer's own characteristics.



CHAPTER 3

Basic Drawing

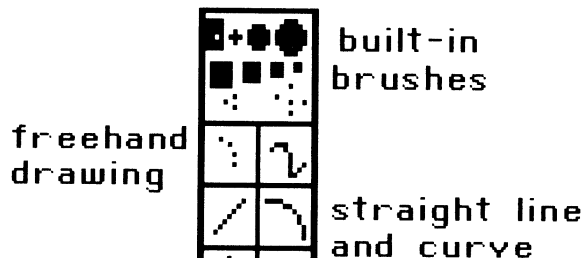


In this chapter, you'll take an in-depth look at basic drawing with *Deluxe Paint*. Load the program, grab the mouse, and let's begin.

Line Drawing

At the top of the toolbox are icons for the built-in brushes and four kinds of line-drawing tools. The Amiga icons are shown in Figure 3-1. The PC compatible and Apple IIGs icons differ slightly in appearance from those in Figure 3-1 (take a look at Figures 2-2 and 2-3), but they don't differ at all in function.

Figure 3-1. Built-in Brushes and Line Tools



Built-in Brushes. The built-in brushes come in ten basic sizes and shapes—a one-pixel brush, a small cross, two circles, four squares, and two stippling brushes. You can select one of these at any time and paint with that brush in any available color.

And you're not limited to the brush sizes the toolbox provides. To change the size of a built-in brush, right-select it and then move to the page area. You'll see brush-sizing gadgets like the ones in Figure 3-2 (the Amiga version) and Figure 3-3 (the IIGs and PC compatible version). Drag the gadget diagonally in any direction until the brush is the size you want.

Figure 3-2. Amiga Brush-Sizing Gadget

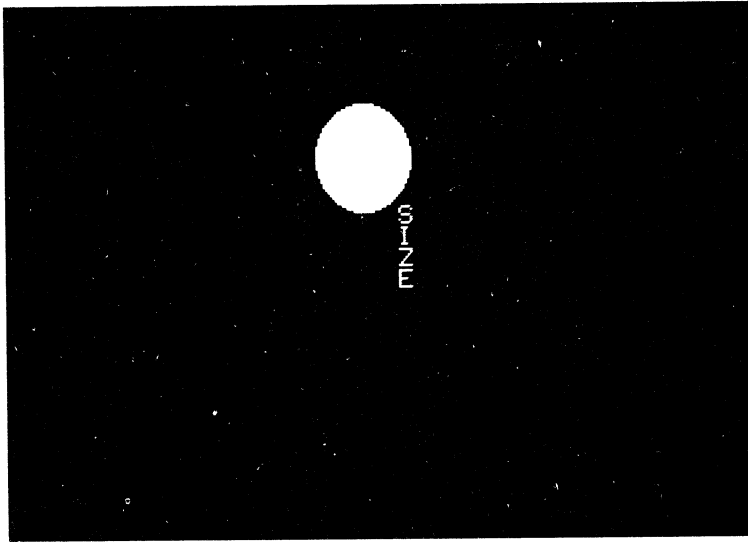


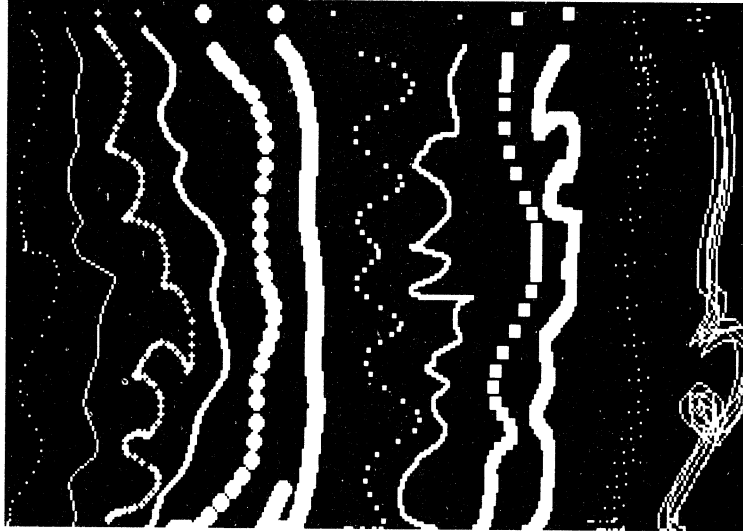
Figure 3-3. PC Compatible and Apple IIgs Brush-Sizing Gadget



Drawing tools. All brushes must work in tandem with a drawing tool. Below the built-in brushes are the freehand drawing tools—a dotted line on the left and a solid line on the right.

Use the dotted-line tool to make quick sketches and rough outlines, when you're drawing from life, for instance (yes, you can do that with a computer). Use the solid-line tool for detailed work.

Draw some practice lines with the freehand tools and the various built-in brushes. Figure 3-4 gives you an idea of how each combination looks on the page.

Figure 3-4. Freehand Drawing

Notice that all the built-in brushes can keep up with the crosshairs when you use the dotted-line tool, but the space between brush marks gets wider the faster you draw. The smaller brushes can keep up with the solid-line tool, for the most part, but larger brushes lag behind. If you move the crosshairs too fast, the brush takes a shortcut to the end of the line rather than follow the path you defined. With the solid-line tool, the bigger the brush, the slower you should draw.

After you've experimented with the freehand tools, select CLR to clear the page and restore a pristine canvas. Whenever you want a new page to work on, just CLR whatever's currently on the screen (after saving it, if you want to). When you save your new work, be sure to give it a new name.

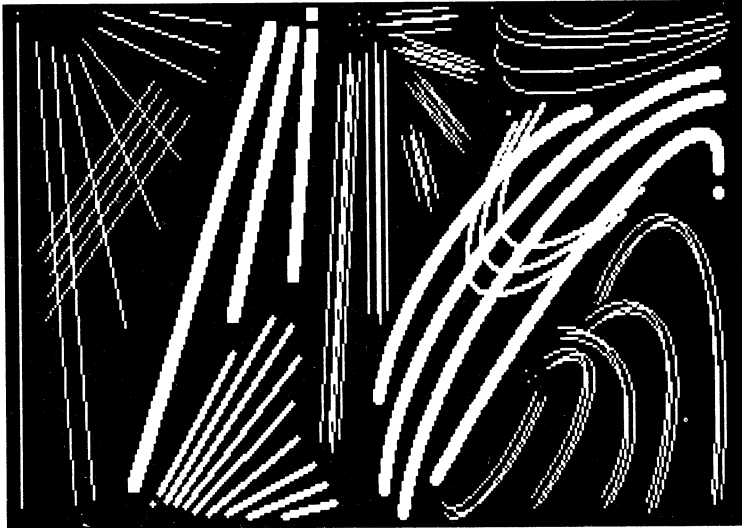
Undo. Suppose you want the picture back; you've decided to save your first effort for nostalgia's sake, to look at fondly when you've become an acknowledged *Deluxe Paint* master. *Deluxe Paint* gives you the power to recover from your mistakes. To rescue your picture from oblivion, select UNDO (next to CLR in the toolbox), and your work is restored.

UNDO is an invaluable feature, but it has its limits. It will undo your last painting action—mouse click or keypress—but *only* the last action. If you inadvertently click a button or hit a key before you select UNDO, you won't undo the mistake, only the

intervening action. Keep a cool head when you make an error, and use UNDO immediately. You can even restore your mistake if you like by selecting UNDO again—UNDO even undoes itself.

Now turn to the toolbox again. Below the freehand line tools are tools for drawing straight lines and curves. A selection of representative lines and curves is shown in Figure 3-5.

Figure 3-5. Lines and Curves



Straight lines. To draw a straight line on the page, select the straight-line tool, pick a starting point, and drag the crosshairs to an end point. As you drag, *Deluxe Paint* draws a straight line from the starting point to the crosshairs, even if you don't move in a straight line. Release the mouse button at the end point, and the line is set.

Note that the smoothness of the line depends on its angle. Vertical, horizontal, and 45-degree-angle lines look the smoothest, while lines drawn at odd angles look stairsteped and jagged. You'll soon become intimately familiar with the pattern of treads and risers that characterize any line angle, and learn to adjust your drawings to take advantage of the smoothest lines.

Curves. The curve-drawing tool provides you with the equivalent of an infinitely flexible set of French curves. It works in much the same way as the straight-line tool, but requires one additional step. Once you've moved the crosshairs from the start to

the end of the curve, the line stays “alive.” It stretches like a rubber band to include any third point you choose. Simply click on that point to set the *apex* of the curve. Try drawing several different curves now. You’ll see that the curve tool only creates *parabolic* curves, not *circular* or *elliptical* arcs.

Spacing. Now right-select the straight-line tool. The Spacing box appears. Figure 3-6 shows the Amiga Spacing box; Figure 3-7, the Apple IIGs version; Figure 3-8, the PC compatible version. This gives you the ability to create lines and shapes with any number of evenly spaced dots.

Figure 3-6. Amiga Spacing Box

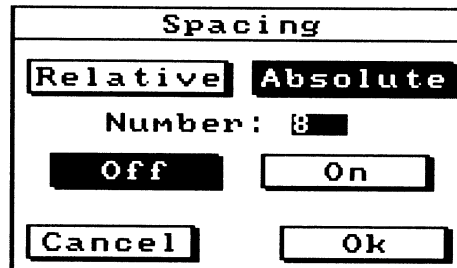


Figure 3-7. Apple IIGs Spacing Box

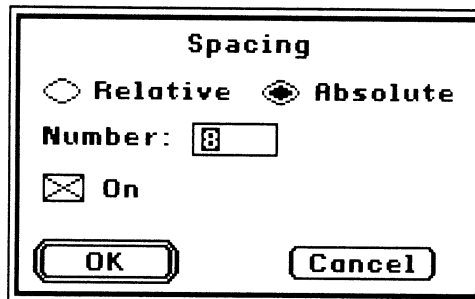
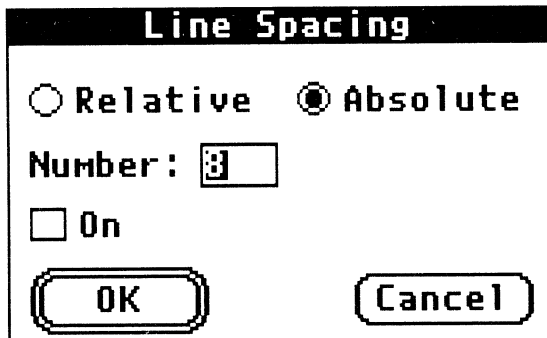
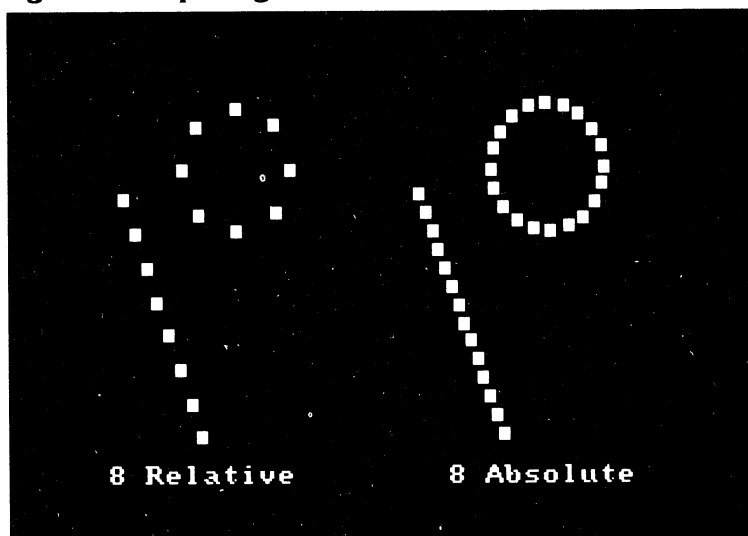


Figure 3-8. PC Compatible Spacing Box

The value in the number box, which you specify, determines how far apart the dots will be. You can choose between relative spacing, which uses the specified number of dots no matter how long the line is, and absolute spacing, which places the dots the specified number of pixels apart.

For example, if you use a relative spacing of 8, there will be eight dots on your line. An absolute spacing of 8 sets the centers of your dots eight pixels apart; there'll likely be many more than eight dots on the line, but you'll know just how far apart the dots are. The difference is demonstrated in Figure 3-9. The On option in the PC compatible and IIGs Spacing box lets you toggle spacing on and off in your line so you can compare effects.

Figure 3-9. Spacing

The Spacing feature works with the straight- and curved-line tools, as well as with the outlined-shape tools discussed below. You'll turn to this feature often if you plan to do architectural, mechanical, or cartographic design work with *Deluxe Paint*, or if you need to draw diagrams for assembling components, folding and cutting patterns, or planning football plays.

Take the time now to try a straightforward line drawing. Your nondrawing hand would be a convenient subject. Figure 3-10 (that's not the author's hand) gives you an idea of the line quality and expressiveness available to you in *Deluxe Paint*.

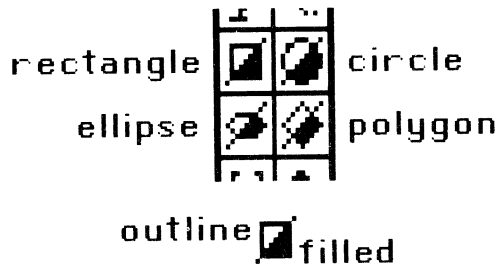
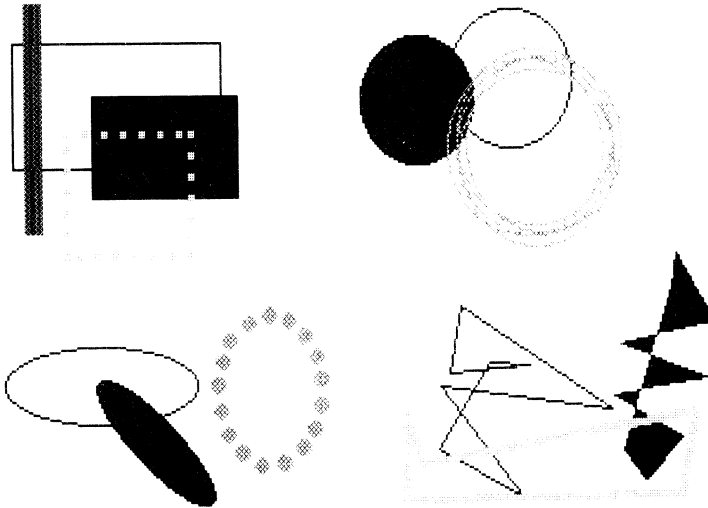
Figure 3-10. Hand



Note: If you're using an Amiga, you'll still be drawing with a white brush on a black screen—the default colors. If you want to draw in color on a white background, first read the section in this chapter on choosing and altering colors with the toolbox palette.

The Shape Tools

Below the line tools are tools for drawing geometrical shapes (see Figure 3-11). With the shape tools you can make perfect rectangles, circles, ellipses, and polygons (closed, many-sided shapes), either outlined or filled. Figure 3-12 gives a few examples of possible shapes.

Figure 3-11. Shape Tools**Figure 3-12. Making Shapes**

Rectangles. To draw a hollow rectangle, select the upper left half of the rectangle icon; then choose a brush. When you move out to the page, the crosshairs become the center of a large *reticle* (a special set of crosshairs) that helps you position the rectangle and determine its dimensions. Pick a location for a starting corner (as a reader of English, you'll probably usually choose the upper left) and then drag diagonally until you have the rectangle you want. Release the mouse button to fix the rectangle. Use the same process to make a filled rectangle, but select the lower right half of the icon instead.

To leave traces as you draw the rectangle, press the Control key as you drag. Try this to get a feel for how it works; you can create interesting corridor-like effects. To make a square, press

the SHIFT key (which acts as a constraining key) as you drag. The sides of squares may appear slightly unequal due to the rectangularity of pixels in some screen formats, such as the 320×200 format (see the discussion in Chapter 2). You can compensate for this by choosing Be Square from the Amiga's Preferences menu or Square Aspect from the PC compatible's Pref menu or the IIGs's Edit menu.

Circles. Circles are drawn by putting the crosshairs where you want the circle's center to be and then dragging outward until you get the right diameter. Be Square/Square Aspect also works to counteract the aspect-ratio distortion in circles, making them more circular.

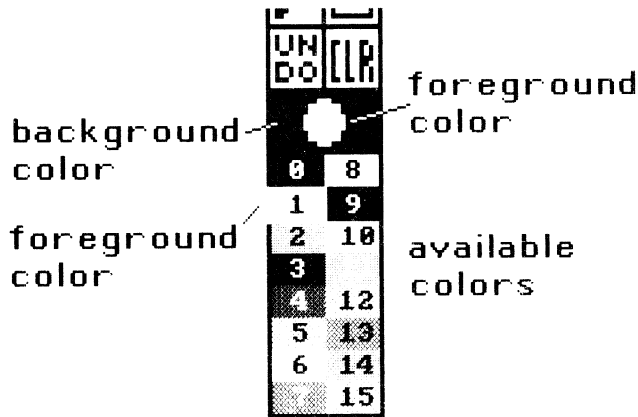
Ellipses. Ellipses are created much like circles. Set the ellipses' center, and drag diagonally to set the short and long axes. When you release the mouse button, the ellipse tool is still active—at this point you can change the angle of the ellipse (rotate it by dragging in a circle and then releasing) or readjust the axes (click again to confirm the shape). Use the circle and ellipse tools to create circular and elliptical arcs, which the curve tool can't handle; just draw an appropriately sized circle or ellipse and erase the part you don't need. (See below for more on erasing.)

Polygons. Drawing a polygon is like drawing a succession of connected straight lines to form a closed shape. At the end of each leg of the polygon, click the mouse button and you stretch out a new side. The polygon is complete when you connect the end of the last side with the beginning of the first. As a shortcut, you can press the space bar, which completes the last side of the polygon for you.

Try drawing using the different shape tools with various brushes and spacings. Practice making a row of boxes that are the same size, a series of concentric circles, ellipses angled at increments of 45 degrees, an equilateral triangle, and a triad of five-pointed polygonal stars. These exercises help you develop your eye for exact placement of the brush.

The Toolbox Palette

Now you're ready to begin work with color. The toolbox provides a palette (the Amiga version is shown in Figure 3-12) that gives you access to all the available colors.

Figure 3-13. Amiga Toolbox Palette

Foreground/Background. At the top of the palette is the color indicator box. The circle (if you have an Amiga) or the rectangle (if you have a PC compatible or Apple IIcs) in the center shows the *foreground* color—the color of your current brush. The color around it is the *background* color—the color of your canvas.

Think of the background color as being underneath the foreground colors, like the colored ground that oil painters often paint on fresh canvas before starting the painting proper. Understanding the distinction between foreground and background color is crucial, because there are a number of techniques that depend on switching background and foreground colors, painting with background over foreground, and so on.

The palette. Below the color indicator is the palette itself. In Figure 3-13, 16 available colors are shown, numbered 0–15. Select any foreground color in the palette. Your built-in brushes and filled shapes now paint in that color. Notice that the selected foreground color is highlighted by a border. Choose any background color by right-selecting it. Right-drag your brushes and tools to paint in that color. Painting with the background color in essence erases whatever's underneath. (See below for more on erasing techniques.)

Clear the page and try drawing with different foreground colors. If you want to change to another background color, pick the new color and then clear the page. *Deluxe Paint* always clears to the current background color. From now on, use white as the background color. (Remember to clear the page to white before beginning any of the projects in this book.)

Take a look at the selection of colors in the toolbox palette. The range of colors you see are the ones *Deluxe Paint* presents whenever you open the program. For many kinds of graphics, this *default* palette is all you'll need; it has black and white, the primary colors, a selection of pastels, and a range of gray tones. Sooner or later, however, you'll need to define your own palettes. Chapter 5 describes *Deluxe Paint's* powerful palette-creation features. If you like, you can skip ahead to read that chapter now.

A note on PC compatible palettes: Depending on your graphics adapter, you may have anywhere between 2 and 256 onscreen colors. This obviously affects the appearance of the Toolbox palette. Two-color formats have a default palette of black and white (or amber or green). In 256-color MCGA format, only 64 colors are shown on the palette at any time. To see the rest of the colors, click the small arrows at the bottom of the palette; these cycle through the available colors in 64-color sets.

The Fill Tool

You've seen how easy it is to create filled geometric shapes with the shape tools. But how can you fill irregular areas drawn with the other tools? It's simple—use *Deluxe Paint's* fill tool to fill any shape or area with any color.

To fill the area, select the fill tool from the toolbox (it's right above the rectangle-shape tool). As you move out to the page, the pointer turns into an icon that looks like a can spilling paint. At the very bottom of the "spill" is a one-pixel gap. Place that gap in any bounded area and click to fill with the foreground color. (Right-click to fill with the background color.)

Draw some closed shapes and try filling them with color. Note that the fill tool fills a bounded area of any color even if that color was laid down in patches at different times. Also note that if there's a gap in the boundary of the area to be filled, the color spills through the breach and invades the adjacent areas. If this happens, undo the fill and close the gap with a small brush in the outline color.

Another common problem occurs when you're working in a small area and accidentally fill the wrong area. Undo this too—don't try to fill the area again with the original color. You may have lost the area's original boundary.

Deluxe Paint provides other area-filling and shape-filling options. Right-click the fill tool to bring up the Fill Type box. The

Amiga Fill Type Box is shown in Figure 3-14, the Apple IIGs Fill Type box in Figure 3-15, and the PC compatible box in Figure 3-16. You can select not only the usual solid color fill, but also pattern fill from a custom brush, pattern fill in perspective, and a range of gradient fills (fills that blend a selection of colors to produce a smooth, graded effect). Several of these options are illustrated in Figure 3-17.

Figure 3-14. Amiga Fill Type Box

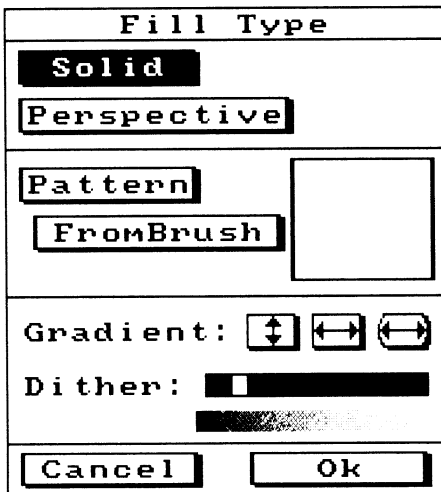


Figure 3-15. Apple IIGs Fill Type Box

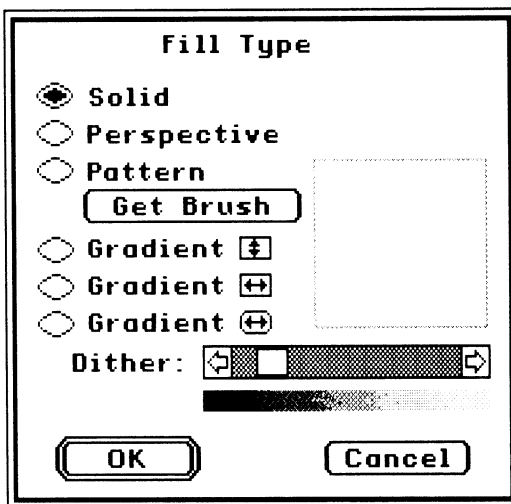


Figure 3-16. PC Compatible Fill Box

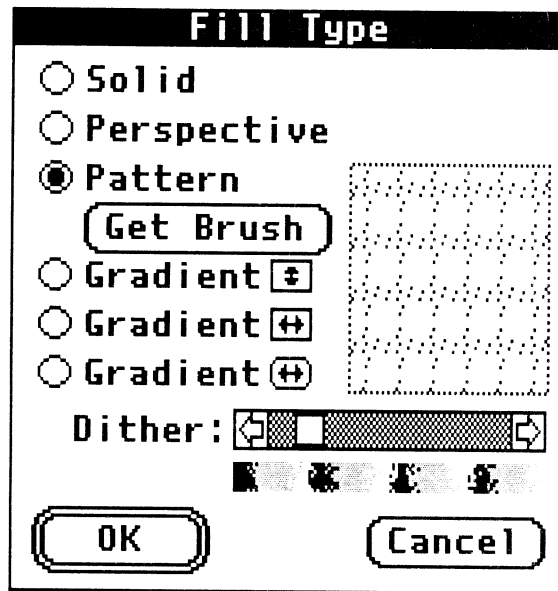
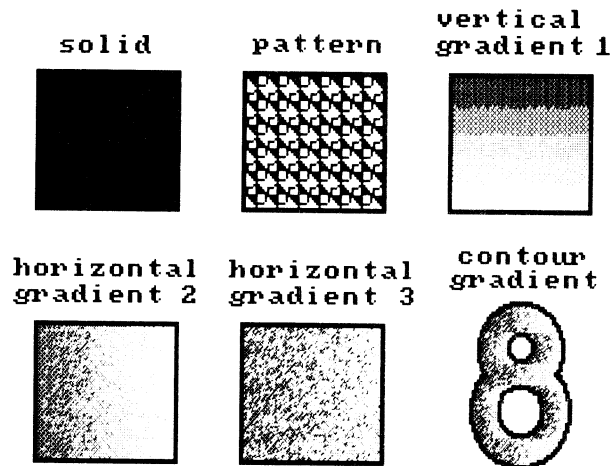


Figure 3-17. Filling Shapes



You'll learn more about the fill types in later chapters. Chapter 9 covers filling with custom-brush patterns, perspective fills are discussed in Chapter 10, and there's more on gradient use in Chapter 6.

Erasing

To err is human, but to erase can be devilish, at least with traditional media. *Deluxe Paint* banishes that demon. You already know about CLR and UNDO, but there'll be plenty of times when you won't want to erase your whole picture, or when it's already too late to undo what you want to erase.

Deluxe Paint does not have an eraser tool per se, but it does provide several ways to quickly erase large and small areas, as you can see in Figure 3-18.

Erasing techniques involve painting over the area to be erased with the current background color. (Remember that you can paint with the background color by right-dragging a brush or shape tool.) The simplest way to erase is to right-drag over the area with your current brush—the option shown at the upper left of Figure 3-18.

Figure 3-18. Erasing



This can get laborious when the area is large and the brush is small. A second option is to paint a solid shape over the area. At the upper right of Figure 3-18, a square is obliterating the circle.

You can also create a shape that's the same size as the one being erased, superimpose it over the area, and right-click. That's what is about to happen to the bottom circle—it's being eclipsed by a custom-sized built-in brush. Erase a straight line with a straight-line eraser, a hollow ellipse with a hollow-ellipse eraser, and so on. You can also erase solid areas by filling them with the background color.

There are other ways to tailor shapes for precise erasure of

complicated areas (by using the custom brush tool, described in the next chapter), but they all involve the same principle of over-painting with the background color.

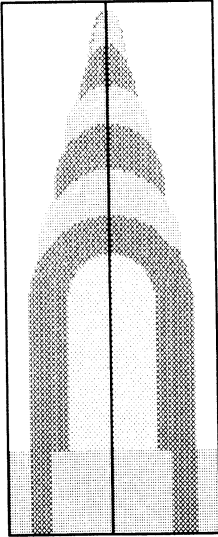
Composing a Picture with the Basic Tools

You've got the basic tools down pat. Now you're ready for a challenge. Let's use what you know so far to create a picture of that Art Deco masterpiece, the top of the Chrysler Building (Figures 3-19 through 3-22). You'll be working with the built-in brushes, the freehand-, straight-, and curved-line tools, the filled-rectangle, -circle, and -polygon tools, the solid-fill tool, and the toolbox palette. Use any colors you like for this exercise as long as you include a range of lights and darks.

- * First, draw a box to define where the drawing will be. For this drawing, you'll use the full height of the page, but only about a third of the width. Run a straight line down the center of the box to help align the centers of the shapes you'll draw inside. Now block out the spire with the curve tool and the solid-circle and solid-rectangle tools.

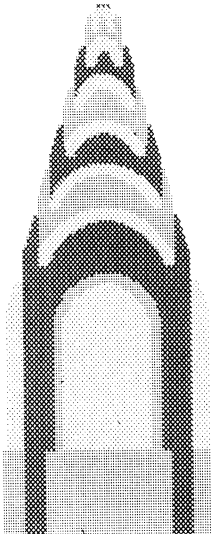
The two top levels of the "ziggurat" are made with the curve tool and then filled with the fill tool; the levels below that are made with overlapping solid circles in alternating colors. Start from the top and work down, superimposing each successively larger shape over the one above. Then extend the lowest circles with the solid-rectangle tool. Redraw the center line as necessary; you can use other temporary scaffolding lines as you need them, and then erase them when they're no longer necessary.

Figure 3-19. Chrysler 1



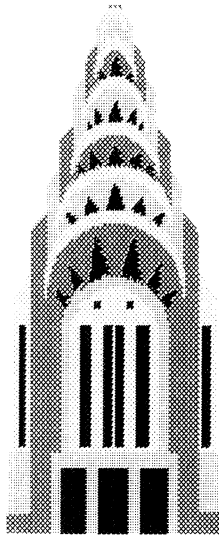
* You can now erase the box and center line if you want, or leave them there for future reference. Use the curve tool with a fat built-in brush to paint in the sloping steps of the ziggurat. Study the way the sides of the sloping area are treated; the sloping steps are seen on edge at each side. Draw them carefully with the filled-polygon tool.

Figure 3-20. Chrysler 2



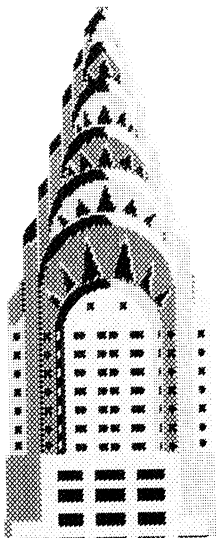
- * Smooth out the sloping steps with the curve tool and a one-pixel brush; then clean up the curves with the freehand line tool. Now add the small triangles with the filled-polygon tool. These may be hard to get just right—it helps to start from the center and work out to each end. Redraw the center line if you need it. Also block in the windowed areas with the straight-line tool and the fat, square, built-in brushes. The wide window blocks are made with the solid-rectangle tool. To get the windows correctly spaced and centered, you'll have to count pixels—difficult, but a useful trick to practice.

Figure 3-21. Chrysler 3



- * Now add the finishing touches. Selectively fill parts of the left-hand side of the spire with darker colors to show that the light is coming from the right. Add a light-colored edge to the right side of the triangles with the straight-line tool to make them “pop out” from the side of the building. Define the steps of the ziggurat with narrow straight lines as well. Use carefully spaced straight lines to finish the windows. Adjust the proportions of the bottom with the solid-rectangle tool, clean up any ragged areas with small brushes and erasers, and the drawing is complete.

Figure 3-22. Chrysler 4

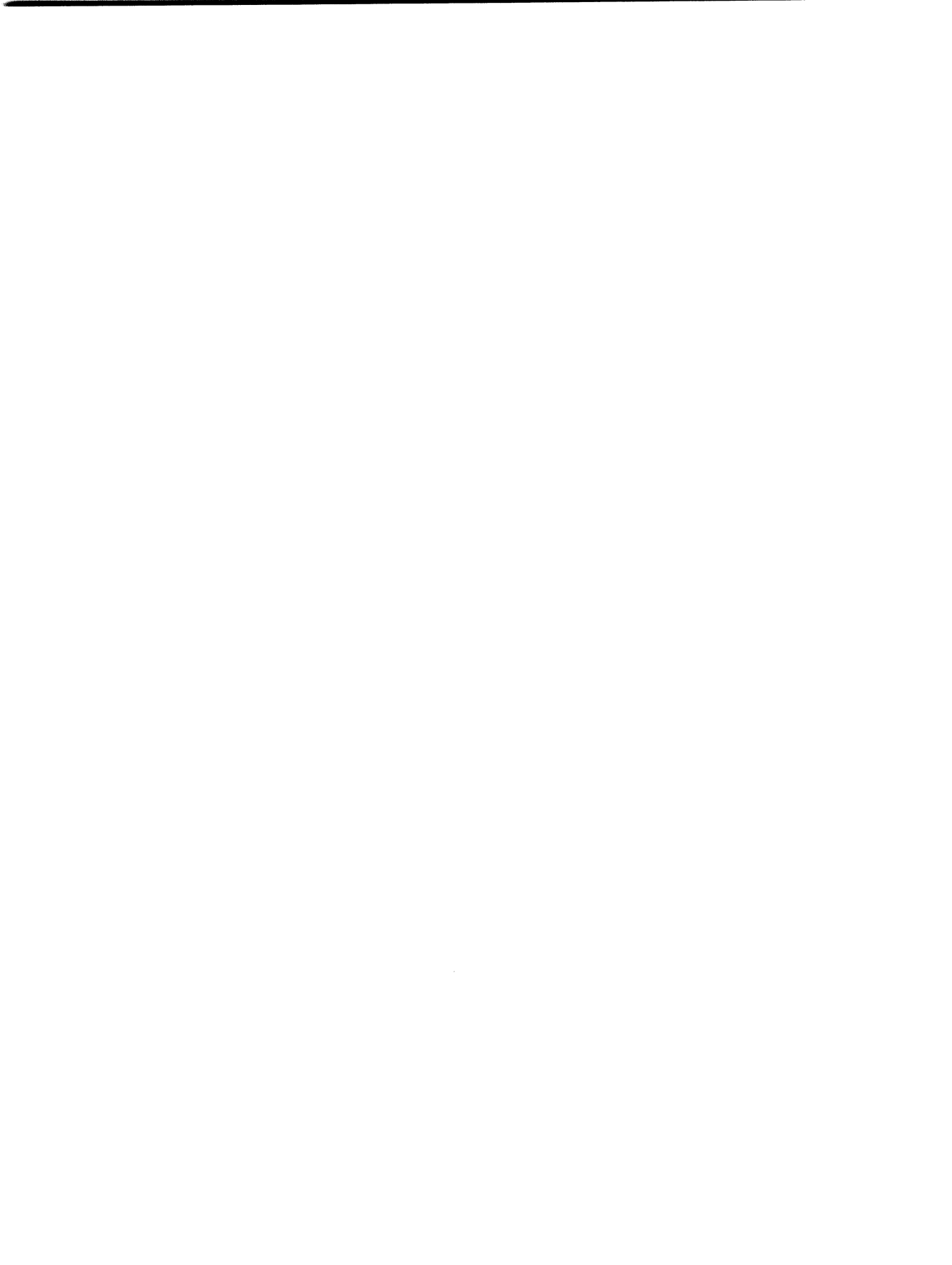


Don't be discouraged if you found this drawing difficult in places. Tackling difficult tasks is the best and most satisfying way to learn.

Deluxe Paint has many advanced features that make the creation of complex pictures easier. You'll look at one of the most powerful, the custom-brush tool, in the next chapter.

CHAPTER 4

Custom Brushes



With *Deluxe Paint's* custom-brush tool, the parts of your painting can have lives of their own. You can take any part of your work and draw with it, erase it, resize it, stretch it, rotate it, warp it, skew it, change its colors, make it transparent, outline it, and make a shadow for it. You can draw individual objects and save them in separate files, all to be assembled later like a collage. Or you can break apart a finished picture into its components, and then use those components in other pictures.

Creating Custom Brushes

With the assistance of a Mr. Arnolfini (and apologies to Jan van Eyck), let's put the custom-brush tool through its paces.

First, load any picture onto the page. Find the custom-brush-tool icon in the toolbox, just underneath the ellipse tool. Select it and then move out onto the page. You'll see a reticle (large cross-hairs) like the one for the rectangle tool. Drag a box to enclose any area you'd like to make into a custom brush and then release the button. You now have the original area and an exact copy (as in Figure 4-1). Move the copy anywhere on the page just like a built-in brush.

Figure 4-1. Creating a Custom Brush



Right-drag the custom-brush box to pick the brush area right up, just as if you were peeling a decal or sticker from its backing. If the brush were painted onto an area of foreground color, a “hole” showing the background color will be left behind.

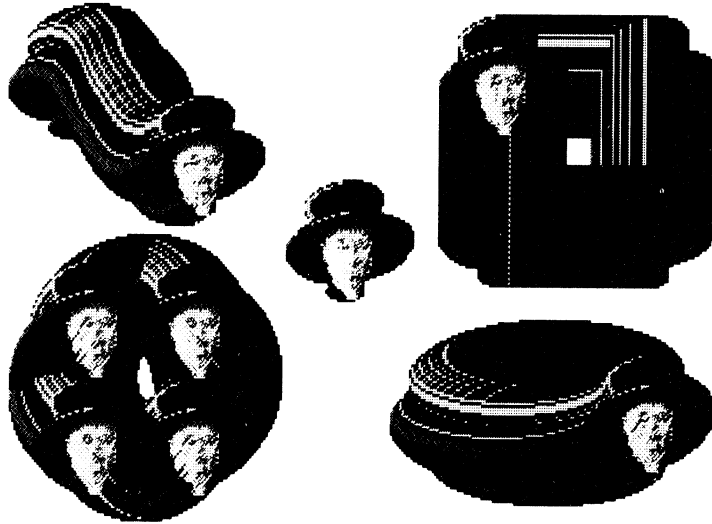
You can also capture areas that aren’t rectangular. Double-click on the custom-brush tool to activate the polygon custom brush. Now you can draw a polygon around any area and pick up that polygon as a brush (Figure 4-2). As with the polygon-shape tool, you complete a polygon brush by pressing the space bar.

Figure 4-2. Making a Polygon Brush



What can you do with a custom brush? Everything you can do with the built-in brushes, and much more.

Click—and stamp a clone of the brush anywhere on the screen. Drag the brush to paint with it. Right-drag to paint in the background color. Use the brush in tandem with the spacing feature, the line tools, the shape tools, and the pattern-fill feature. Our friend Arnolfini demonstrates several of the options in Figure 4-3.

Figure 4-3. Drawing with the Brush

Try these with your own brush. Painting with a multi-colored brush is like painting with a rainbow. In fact, you can make a rainbow quite easily by creating a thin vertical brush with all the colors of the spectrum (red, orange, yellow, green, blue, and violet) and then turning on the curve tool to paint a great arc across the page.

You can see that any areas in your custom brush that were in the background color when you made the brush are now transparent. They'll stay transparent even if you change the background color later. If you look at Arnolfini's face in Figure 4-3, you'll notice that brush smears are visible through the parts of the face that are white (the background color when the brush was created).

Objects with a complicated outline can be painted on blocks of background color, then picked up as a custom brush, and transferred to the picture proper. Only the object itself is visible, not the surrounding area of background color.

Normally, custom brushes can be any size or proportion. The only size limits are imposed by your computer's available memory. With a 512K or 640K machine, you may have difficulty picking up a custom brush that approaches the standard page size. *Deluxe Paint* shows you an outline of the brush rather than the brush itself if you're reaching your computer's memory limit. And if you try to grab too big a brush, *Deluxe Paint* simply refuses to

do it. Solution: Pick up half the brush at a time and work with each half separately. You can always reassemble the pieces at the end.

The Brush Menu

Custom brushes can be modified with the Brush menu. Pull it down now to view the various options. If you have an Amiga, you'll notice options for loading, saving, and deleting brushes in files. Brush management is accomplished through a system of boxes similar to the ones for managing picture files. The PC compatible and Apple IIGs brush file options are in the File menu.

Brush files generally take up much less disk space than picture files so you can fit scores of them on a disk. For that reason, it's worthwhile to save parts of your work as brushes, even if you don't have any immediate need for them. You'll find lots of unanticipated uses for those brushes in other pictures.

Sizing Brushes

Try choosing each of the size options to see how they affect your brush. As shown in Figure 4-4, you can double and halve your brush size, and change its aspect ratio, making it wide and squat, or tall and thin. Notice that when you shrink a brush, it loses detail (gets smaller by dropping every other pixel), while enlarging a brush adds no detail, but simply doubles the brush's height and width.

Figure 4-4. Brush Sizing



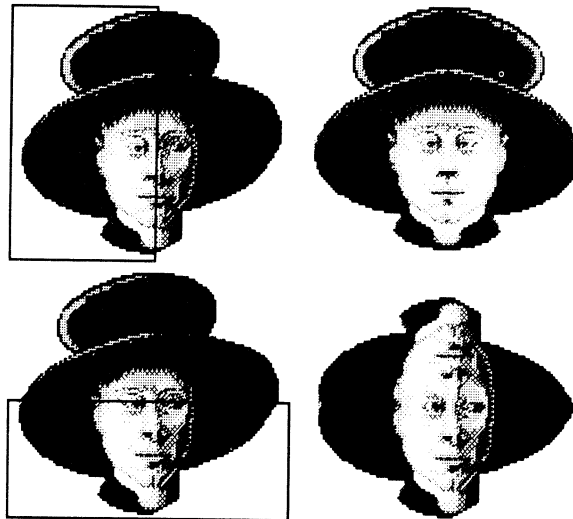
Use the stretch option to make your brush any size or aspect. Choose Stretch from the Brush menu and then drag the box until you've reached the size you need. Don't be surprised, though, if a radically stretched brush looks ragged and distorted. Try stretching a few brushes to see why. Text is particularly averse to being stretched—even slight irregularities in type grate on the eye. *Antialiasing* can help (see Chapter 10). To maintain the brush's proportions while it's being stretched, press the Shift key.

Flipping Brushes

Choosing the appropriate flip option from the Brush menu lets you flip a brush horizontally and vertically. Using the flip options is an easy way to create bilateral symmetries and mirror images of the sort that have always fascinated artists.

To draw a perfectly symmetrical object, first draw half of it; then pick that up as a brush, flip it, and join it to its mirror twin. This can have curious results when you're working with faces (Figure 4-5).

Figure 4-5. Flip a Brush



Another way to use the flip feature is to take an existing drawing and flip it to check for proportion problems. You'll often notice something out of proportion in a flipped drawing that wasn't readily apparent in the original orientation. It's especially worthwhile to check drawings of faces and figures in this way.

Sometimes the brush just looks better flipped one way or the other. You can fall into the rut of always having the focus of your painting be to the right or left, but the flip feature gives you an easy way out of that.

Rotating Brushes

Rotating brushes is nearly as easy as flipping them. Rotate your brush in 90-degree increments by choosing the appropriate option from the Brush menu. To rotate the brush to any angle, choose that option and then, when the rotate box appears, drag it in a circle by its lower right corner. Keep an eye on the stairstepping of the box's sides to get an idea of your angle. Rotating your brush at an odd angle may leave it looking ragged around the edges, as in the Arnolfini at the upper left in Figure 4-6. Anti-aliasing helps here too (again, see Chapter 10).

Figure 4-6. Distortions



Skewing and Bending

Figure 4-6 also shows *Deluxe Paint*'s fun-house custom-brush options. The long-suffering Arnolfini is being skewed and bent horizontally and vertically. The skew and bend features are amusing, but they do have serious uses, as when a custom brush must appear to be lying on an oblique plane or wrapped on a cylindrical surface—for example, lettering on the label of a champagne bottle

(see Chapter 8). (In fact, you'll probably find yourself using these options with text more than with other kinds of images.)

By applying a combination of vertical and horizontal bending, you can give a brush the appearance of being reflected in a silver ball (Figure 4-7), an ever-popular subject for computer artists. Here are some tips on how to accomplish this.

Figure 4-7. Ball Reflection



- * First, pick up your brush and bend it horizontally. You must then stamp down the bent brush and pick it up again before you can bend it vertically.
- * When you have what looks like a suitably spherical distortion, stamp the brush down again. Draw a circle around it for the sphere's outline, then erase any part of the brush outside the outline.
- * Finally, add shading and highlights. Copy the shading in Figure 4-7, or better yet, study a marble under different kinds of lighting to get an idea of how to shade a shiny sphere. If you like, collect balls of various surface textures, colors, and degrees of reflectivity (an orange, a golf ball, a rubber ball, a ping-pong ball, a billiard ball, a ball bearing, and a clear marble) and try to render each kind of surface alone and with a brush warped onto it.

Brush Handle

One other menu option affecting the use of the brush is Handle, found in the Amiga's Brush menu, the PC compatible's Pref menu, and the Apple IIGs's Edit menu. This lets you choose where you "hold" the brush—in the center (the default setting)

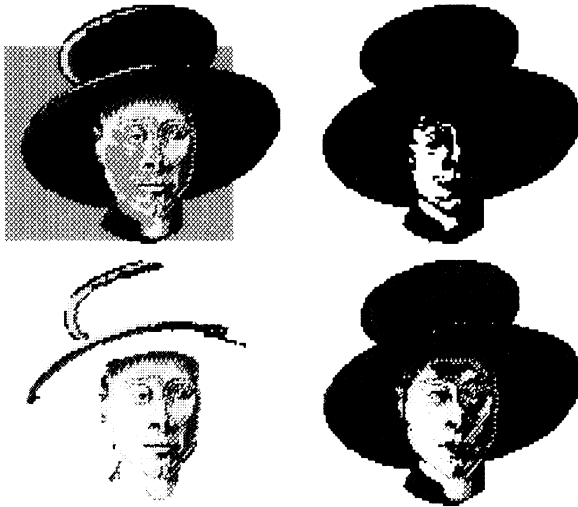
or at any corner. Try picking up and moving brushes using each option to see the difference.

Using a corner handle has some definite advantages. For one thing, when you first make your custom brush, it doesn't suddenly pop out of place to center itself under the pointer, as it does with a center handle. It stays put, making slight repositioning of the brush easier. Also, you can move the brush completely off the page on the sides opposite the handle. You've probably already discovered that you can't do that with a center handle. You'll be using a corner brush handle a lot when you work with *Deluxe Paint's* perspective feature, so be aware of how the brush handle affects brush manipulation.

Brush Color

There are several ways to quickly change the colors of your brush without making changes in the palette itself. One simple way to convert any area in your brush that's in the background color (that is transparent) into any other color is by stamping the brush over a field of that color. This is shown by the upper left image in Figure 4-8 and color plate 1.

Figure 4-8. Brush Color



Now take a look at the Mode menu next to Brush. You've probably noticed that this is set to Matte whenever you use a custom brush. That's *Deluxe Paint's* default custom-brush mode.

Color/Replace. Pick up a custom brush and try selecting Color. The brush now paints only in the current foreground color, as in the upper right image of Figure 4-8 and color plate 1. Picking Replace (on the Amiga it's spelled *Replc*) from the Mode menu eliminates the transparency of any background color in your brush; the brush now floats in an opaque block of the background color current when you created the brush. Try Replace with any custom brush to see how it works.

Bg->Fg and Bg<->Fg. Two other brush-color manipulations are available: *Bg->Fg*, which allows you to change the color of any part of the brush in the current background color to the current foreground color; and *Bg<->Fg*, which lets you swap the current foreground and background colors (in the brush only). These options are found in the Amiga's Brush menu, and in the Apple IIGS's Color menu. In the PC compatible's Color menu, they're called *Back -> Fore Brush* and *Back <-> Fore Brush*.

Use *Bg->Fg* to eliminate transparent areas in the brush, and use *Bg<->Fg* for quick color changes (negative to positive, and vice versa) or to make new areas transparent. Sample *Bg->Fg* and *Bg<->Fg* effects are shown at the bottom left and right of Figure 4-8 and color plate 1.

Custom Brushes and Another Palette

Custom brushes created while painting a picture use the same palette as the picture itself. What happens, however, when you want to use a brush created with a different palette? If you load it unaltered, it takes on the colors of your current palette, and these may look rather odd.

There are three ways of dealing with this situation. One is to convert your picture palette to the original brush palette. This can be done with a menu option called Use Brush Palette, found in the Amiga's Picture menu and in the PC compatible's and Apple IIGS's Color menu. But if you've already been drawing with the picture palette, this may not work for you.

The second way is to *remap* the colors of your brush to make them fit the current palette. The Remap Brush option (in the Amiga's Brush menu and the PC compatible's and IIGS's Color menu) tries to match the original brush colors with similar colors in the current palette. This often does the trick.

But before you change your palette or remap your brush, take one more look at your oddly colored brush. It's not unlikely

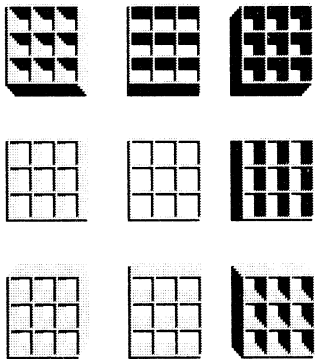
that the brush packs more impact in its new colors. Avoid being too conservative in your use of color. Try working with some oddly hued brushes, and you may discover new color possibilities.

Note: The various color manipulations discussed above (foreground and background color switching and remapping) can be performed on entire pictures as well as on brushes. See the appropriate options in the Color menu of Apple IIcs and PC compatible computers, and the Color submenu of the Amiga's Picture menu.

Brush Techniques

A picture can have dozens or hundreds of layers of brushes. There's simply no limit to the complexity of the pictures you can create with custom brushes. However, some of the most interesting and useful effects are made with relatively simple brushes. Let's use one such simple brush to create the divided boxes in Figure 4-9.

Figure 4-9. Boxes



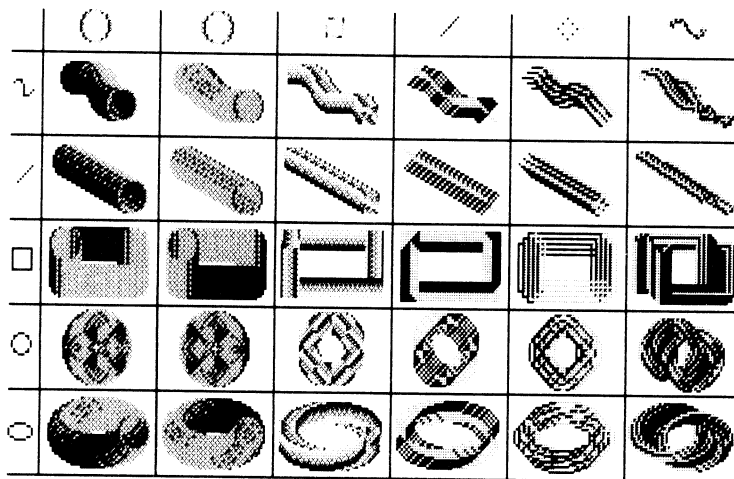
- * Start by drawing a square with the one-pixel brush and the rectangle tool. Press the Shift key while you draw to create a perfect square.
- * Make a custom brush from the square and stamp down eight more squares to create a 3×3 matrix. Align the squares so their sides overlap those of adjacent squares.
- * Pick up the matrix as a brush and select Color from the Mode menu. Stamp down a copy of the brush in a dark color; then

stamp down another copy over the first, offset by one pixel up and to the right, in a lighter color.

- * Now pick up the matrix as a brush and choose the straight-line tool. Drag the matrix in a straight line at 45-degree-angle increments to create the “three-dimensional” divided boxes. There are eight possible views: three seen from below, three seen from above, and one each to the right and left. Notice how the shading of the boxes changes according to the view. These divided boxes would be time-consuming (and boring) to render by hand, but are quick and easy to make with a simple custom brush.

Figure 4-10 shows just a few of the thousands of other shapes you can make with the drawing tools and simple custom brushes. These include such three-dimensional forms as worm-holes, tubes, hollow beams, chutes, wire boxes, rosettes, toruses (donuts), and all kinds of ogees, half-rounds, and other decorative trim. To add instant shading to your brush, give it a dark side and a light one, or highlight bevels and angle changes with a contrasting color. Leave holes of the current background color in a simple brush to show the background through it, or use a dotted brush to produce a wireframed effect. Complex knotted forms can be made with a sine-curved (*S-shaped*) brush. Try making some of the shapes in Figure 4-10 and then do some experimenting on your own. The possibilities are limitless.

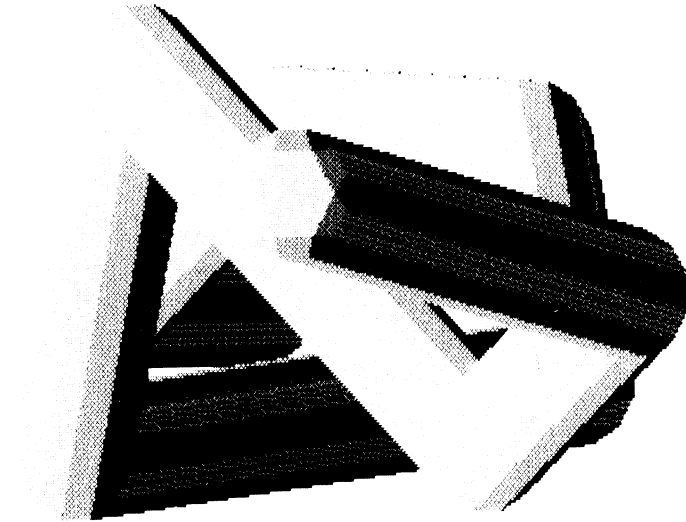
Figure 4-10. More Brush Forms



Brush Abstractions

Two of the many ways to create abstract images with custom brushes are illustrated in Figures 4-11 and 4-12.

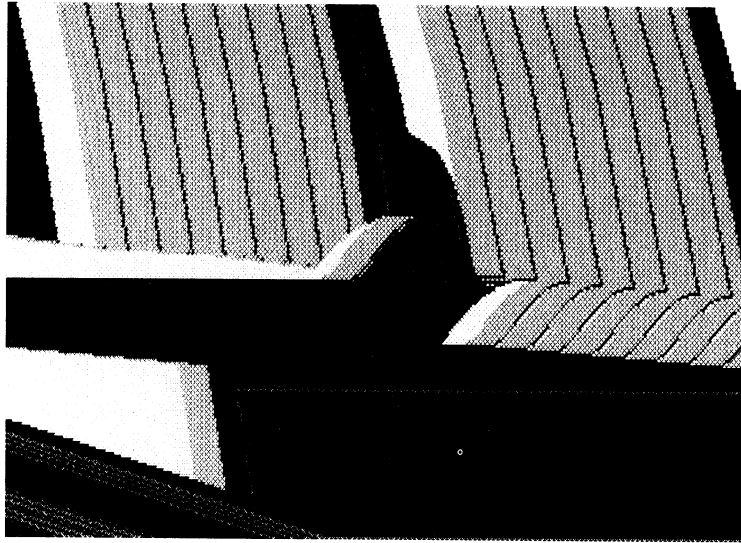
Figure 4-11. Polyhedral Form



- * To make this sculptural form, first draw a polyhedral shape like the one in the upper center of Figure 4-11. This is your brush. (Or use any other simple shape with at least one light and one dark side.)
- * Now pick up the polyhedron as a brush and turn on the straight-line tool. Begin drawing at the rearmost part of your sculpture and work toward the front. You can copy the twists and turns of the form in Figure 4-11, or create your own sculpture. To give the form the appearance of weightiness, as though it were cast in bronze, try to imagine it sitting on a ground plane (you can draw in a ground plane if you like and erase it later). Make sure the form appears to rest on the ground, with several points of contact for stability. If you want the form to float in air, avoid giving it any points of contact with an imaginary ground.
- * You have a rendering of a modern sculpture that would look at home on the grounds of Apple, IBM, or Commodore corporate headquarters. But let's jump to another level. Make sure you have enough available memory to pick up a nearly screen-sized

brush. Then pick up the entire sculpture as a brush and draw with it using the straight-line or freehand-line tool. Draw slowly, because a brush of that size lags well behind the cross-hairs. Figure 4-12 is just one of the many interesting compositions you can create in this way. You'll undoubtedly find one you like better.

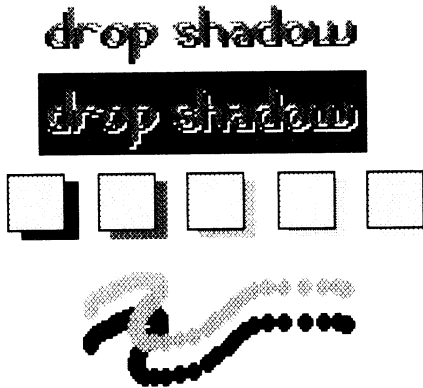
Figure 4-12. Poly Abstract



And you needn't stop there. You can keep jumping to higher levels of abstraction, creating new brushes out of the previous drawing and using them to create the next drawing. Use the same kind of manipulation at each level, or try something different. In this way, you can proceed from the microcosmic to the infinite.

Drop Shadows

The ever-popular drop shadow is much used in graphic design and lettering. Add a drop shadow to your brush and the brush appears to float above the page. A few examples can be seen in Figure 4-13.

Figure 4-13. Drop Shadows

Creating drop shadows with *Deluxe Paint* is child's play. You can always create a drop shadow of your custom brush in the background color by right-clicking, then moving your brush slightly, and clicking to stamp it down again in the regular brush colors. This works well if the background color is dark and the foreground field is light. Remember, though, that the shadow is transparent if you plan to pick up both the brush and its shadow as a new brush to move to another location. Make an opaque shadow in the current foreground color by choosing Color from the Modes menu, then stamping down the brush, and finally choosing Matte to restore the brush's original colors. (This was done with the line of boxes in Figure 4-13.) With this technique, you can make multiple shadows in different colors for a single brush.

As you experiment with drop shadows, you'll notice that the relative distance between the shadow and the object determines how far off the page the object seems to float. Make them too far apart, and the shadow may not read as a shadow anymore, but as a separate object. Offsetting the shadow creates the illusion of a light source coming from the opposite direction. For example, a shadow cast down and to the left implies a light source toward the upper right.

Drop shadows have their place, but use them sparingly. Often they confuse the image more than they clarify it. Reserve drop shadows for special occasions.

Brush Libraries

Many drawing and painting tasks require the repeated use of a few visual elements in different combinations. These tasks can be made far easier with brush libraries. Draw all the parts you need and save them on disk as brushes. Then, as you need them, load them from disk—you'll never have to draw them again.

Who can use brush libraries? The answer is, anyone who does art or illustration involving the repetition of picture parts. For example:

- * Architects can create libraries of architectural drafting symbols and rendered objects—trees; bushes; clouds; and brick, concrete, and stone textures.
- * Advertising artists can mock-up ad layouts, comps, and color brochures using predrawn product and logo art, container designs, labels, gradient backgrounds, and zing words like *new!* and *improved!*
- * Comic-strip artists can store panel boxes, dialog balloons, spaceship parts, explosions, “zaps,” “whams,” and “booms.”
- * Educators can use brush libraries to quickly make new illustrations for classroom use.
- * Fashion designers can build files of fabric patterns, garment designs, faces, figures, jewelry, and accessories.
- * Mechanical designers can save mechanical-drafting symbols and renderings of product parts: screws, gears, moldings, housings, wheels, handles, and controls.
- * Scientific and medical illustrators can store libraries of renderings in their specialty, from planets to plastic surgery.
- * Set designers can use predrawn backdrops, curtains, figures, and costumes to sketch out new designs.

Figure 4-14 and 4-15 give just two examples of the use of brush libraries. In Figure 4-14, four shaded balls representing four different kinds of atoms are combined into a picture of the active site of an enzyme. The molecule balls are slightly overlapped and squashed together to show molecular bonds. Using different combinations of size, color, and shape, you could make a brush representing each element and then construct a two-dimensional model of any molecule.

Figure 4-14. Molecule

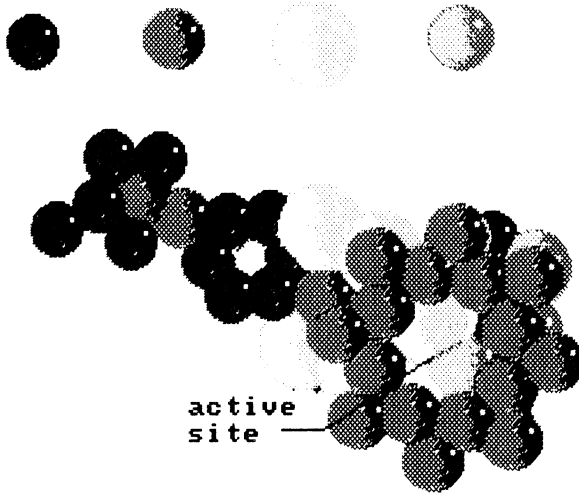
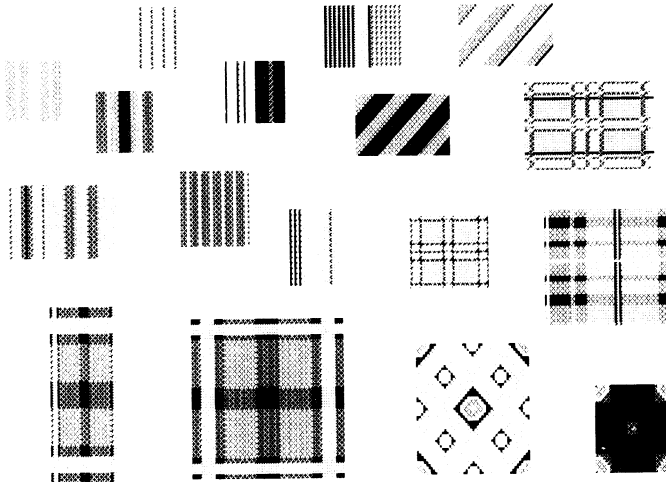


Figure 4-15 is part of a library of fabric patterns, with stripes, plaids, and foulards. These can be picked up and used to fill the outline of a shirt or dress, letting you see what pattern works best with your design.

Figure 4-15. Fabric Pattern Library



For more on using *Deluxe Paint* to create libraries of patterns, turn to Chapter 9.

Clip Art

Artists and designers in a hurry often make use of *clip art*, ready-made images that can be used in a variety of designs and art. For example, those cartoons of happy shoppers that appear on every supermarket circular are clip art.

Several disks of *Deluxe Paint* clip art, including some useful brush libraries, are already available for the Amiga, and should soon be available for the Apple IIGs. Much of this art is distributed by Electronic Arts, but more can be found in public domain software collections. Make use of clip art as you need it, but remember that clip art lacks your personal touch and inspiration. It's also good form to give credit to the artist whose work you are using.

You'll be using custom brushes in every project in this book, and constantly as you travel on toward *Deluxe Paint* mastery. Other *Deluxe Paint* features you'll use regularly are the palette controls, discussed in the next chapter.



CHAPTER 5
Using Color



Though we rarely think about color in an analytical way, we're profoundly affected by it. We depend on the information colors give us to make our way in the world. In our visual memory, color is the key to emotional reactions based on experience and expectation. A ripe red apple, for example, if it were dyed bright blue, would be unpalatable to most people. Colors help us estimate how near or far any object is and whether it is warm or cool to the touch. The colors of the landscape tell us the season, the climate and weather, the time of day, even our latitude. In our faces, we see colors as indicators of age, health, and emotion. The colors of a painting disturb us or give us pleasure, according to the artist's intention and level of skill.

As an artist, you can use color to set the psychological tone of your painting, making it intimate or aloof, soothing or angry. The adroit use of color can give the appearance of great depth to a flat canvas, can make shapes seem to jump, vibrate, and swim; or can create an image that hits the viewer with the force of a blow.

Take one common example, illustrated in Figures 5-1 and 5-2 and in color plates 2 and 3. These figures show the same riverine landscape, shaded in different ways. In Figure 5-1 and color plate 2, the colors are deep and strong in the foreground, pale in the background. This progression is one way to create the illusion of depth in a picture. Psychologically, we expect deep colors to be nearer and faded colors to be farther away because the atmosphere tends to filter and soften distant objects. The illusion is enhanced if the nearer colors are warm—shades of red, orange, yellow—and the farther colors are cool—pale pastels of blue, brown, and green.

These color expectations can be turned on their heads, as they are in Figure 5-2 and color plate 3. Now the foreground is pale and cool, the background dark and warm. This landscape seems to have less depth than the first one. The lighting is differ-

ent, too; the foreground appears to be illuminated by a strong, bleaching light, while the far mountains appear to be in shadow, perhaps under clouds. Both approaches are valid, for each creates a different space and feeling within the picture.

Figure 5-1. Landscape 1

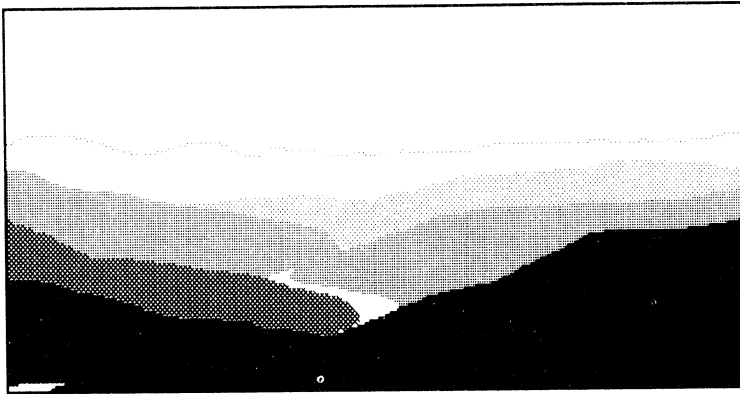
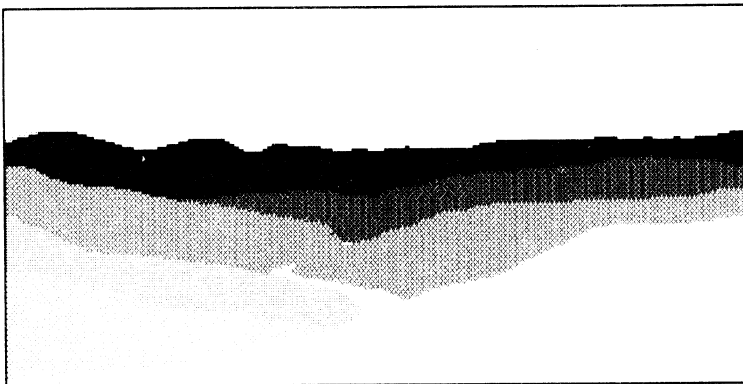


Figure 5-2. Landscape 2



The Palette Box

Deluxe Paint gives you access to the world of color—assuming you are using it on a color system—through its palette-creation features. Right-click on the color indicator in the toolbox palette, choose Palette from the Picture or Color menu, or press the *P* key to bring up the Color Palette box. Figure 5-3 illustrates the Amiga Palette box, and Figure 5-4 shows the IIGS version.

Figure 5-3. Amiga Palette Box

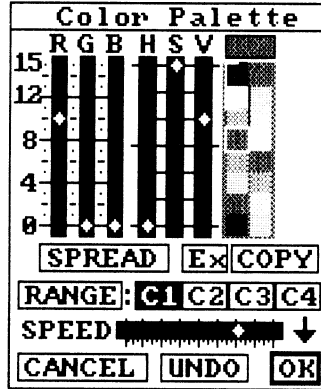
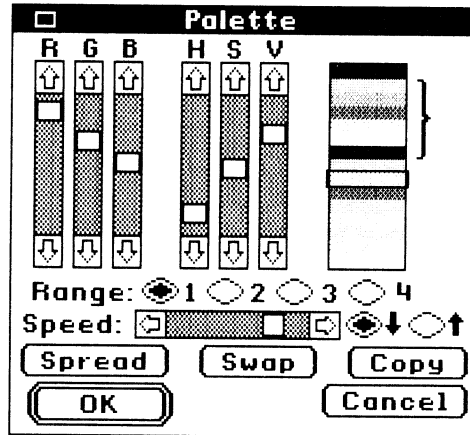


Figure 5-4. IIGs Palette Box



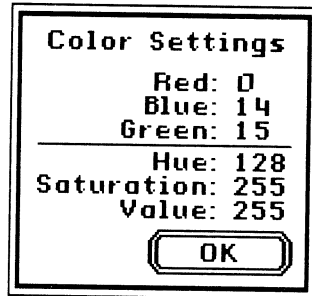
On PC compatibles, the palette box changes in appearance depending on the screen format you're using, so a representative version is not shown. Not only does the number of available colors change from format to format, but some color setting and color mixing features may not be available. For example, in all CGA and most EGA formats you have to set colors with buttons rather than sliders; and in most formats, you cannot create color spreads (see below). Appendix B of the *Deluxe Paint* manual gives complete information on the palette box and color features of each PC screen format. The MCGA 256-color and all VGA formats provide the closest match to the palette box features of the Amiga and IIGs.

The palette box contains *Deluxe Paint's* most complicated set of controls, so let's examine it in detail.

At the top right is a copy of the toolbox palette showing all the current colors. Select colors from it in the usual way. The selected color is highlighted and also shown in the wider box at the top. The colors are numbered starting from zero (in the Amiga palette box, the numbering begins at upper left and runs down each row, although the Palette box doesn't show this). Actually, it's the color positions that are numbered, not the colors themselves. When the *Deluxe Paint* manual talks about "color 11," it means the color at position 11.

Note that colors 1 and 2 in the Amiga, and 1 and 16 in the IIGs (default setting: black and off-white) are the colors *Deluxe Paint* uses to create the toolbox, menus, and the various boxes, including the Palette box. In PC compatibles, these colors are the first and last in the palette. Setting these colors to the same shade renders invisible the menus, boxes, and so on. Try it for yourself. Unless you like groping about blindly, click Undo or Cancel if you can find them, or hit the *U* key to restore the default settings. In all PC compatible versions, you'll find that *Deluxe Paint* won't let you set the first and last colors to the same shade. At the top left are two sets of sliding controls (scroll boxes in IIGs jargon) for setting and changing colors. One set of controls lets you set the amount of red (R), green (G), and blue (B) in the selected color. The other set of controls specifies the hue (H), saturation (S), and value (V) of the selected color. (As noted above, in PC screen formats that offer little in the way of color variations, the sliding controls are replaced by buttons. These buttons let you make broad changes in the current color's R, G, or B value, and its intensity. HSV controls are available only in the MCGA and VGA formats.)

The hue slider lets you stroll through the spectrum from violet to red. The saturation slider adds white to the color. The value slider adds black. In the Amiga version, each sliding scale is calibrated in 16 increments, from 0 to 15. Any color can be described by three numbers in the HSV scales. For example, the selected color (a red) in Figure 5-3 is 10-0-0 on the RGB scales and 0-15-0 on the HSV scales. The IIGs and PC compatibles display color numerical values for the current color in a color settings box (Figure 5-5), summoned by pressing the *N* key.

Figure 5-5. Color Settings Box

Why do you need numerical settings for colors? For most purposes, you don't—you can mix a palette of colors by eye and paint with it just as if you were mixing real paints. But suppose you want to duplicate a particular color or palette for another work? You can't really trust your memory to do it, since your color perception can change according to any number of factors, and there are millions of possible colors. Traditional painters struggle with this problem all the time—that's why most of them have devised some system, usually numerical, for accurate duplication of mixed colors. On the computer screen, when you're working with 4,096 or 256,000 colors, it's a real boon to have a precise way of duplicating any shade. Just take a look at the palette whose colors you want to duplicate and jot down the color settings you need, then set the new palette to those settings.

Take a moment to experiment with each set of controls. Pick any color and turn it to spruce green, sky blue, and lemon yellow. Watch how moving the RGB sliders affects not only the color, but the positions of the sliders in the HSV controls, and vice versa.

Now load any picture (if you don't have one onscreen already). Notice that the colors in the picture change as you play with the palette controls. You can make global changes—that is, changes that affect the entire picture—in the color of your work at any time, even after the painting is "finished." (In fact, no *Deluxe Paint* work is ever really finished, in the sense of being unalterable. You can go back and fiddle with old pictures to your heart's content, secure in the knowledge that no change is permanent if you don't save it.)

Figures 5-6 and 5-7 help you understand how the RGB sys-

tem of color mixing works. Figure 5-6 shows the color-mixing system everyone learned in grammar school, the one used when mixing paint. In this system, red, yellow, and blue are the primary colors from which all other colors are made. To make medium green, for instance, you mix yellow and blue in equal proportions.

Figure 5-6. Red-Yellow-Blue Color Wheel

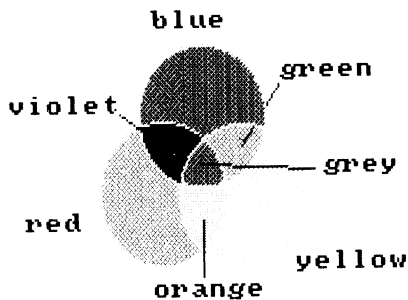
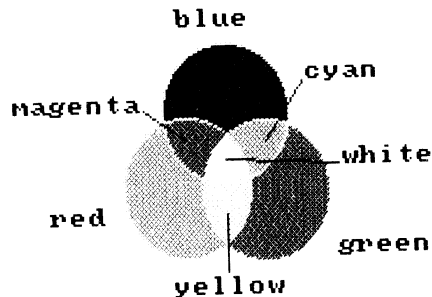


Figure 5-7. Red-Green-Blue Color Wheel



In *Deluxe Paint* (and in all video and computer graphics), things are different. As you can see from Figure 5-7, the primary colors of *Deluxe Paint* are red, green, and blue. Yellow is made by mixing green and red. (Check it yourself with the RGB controls, if your screen format allows). This system is counterintuitive to most people when they first encounter it. Until you learn the RGB system, you may feel more at home using the HSV controls (again, if your screen format supplies them). Forget your color preconceptions, however, and you'll soon find that the RGB system becomes just as natural to use as the RYB system.

Other Palette Controls

The palette box of the Amiga, IIGs, and most PC screen formats also contains controls for moving colors around in the palette and for creating special groups of colors.

The Amiga's Ex feature and Swap in the IIGs and PC compatible palette boxes exchange one color with another. Select any color, click Ex or Swap, select the second color, and the positions of the two colors are reversed. Use Copy in the same way to copy the selected color to another position.

Spreads

Spread is perhaps the most useful of the special palette commands. (It's available in all Amiga and IIGs screen formats, but only in the 256-color MCGA format and all VGA formats for PC compatibles. Hercules, CGA, and EGA users might as well skip ahead to the section on Ranges.) Using Spread, you can choose two different colors and create a bridge of intermediate shades between them. For example, to make a spread of flesh tones, first create two colors that represent the extremes of the spread—say, a dark brown and a light pink. The number of position between these end colors determine how many colors will be in between. The fewer positions, the more the transition between the colors in the spread. More positions yield a spread of gently graduated colors.

Try setting the brown and pink colors ten positions apart. Now select one end color, click the Spread button, and select the other end color. Instantly you have a smooth series of 12 flesh tones. Creating the same precisely graded colors with oil paint would take an hour or so of calculation, mixing, and experimentation—not to mention considerable experience.

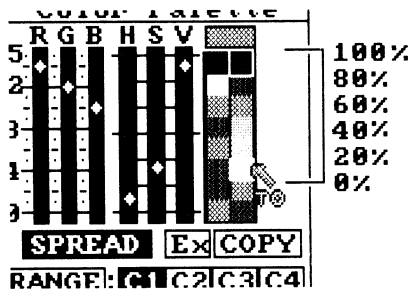
Here's a challenging exercise that makes use of the palette controls and Spread. Find good quality reproductions of the work of three of your favorite painters—say, Rembrandt, Pierre Bonnard, and Stuart Davis—who use very different color schemes in their work. See how closely you can reproduce these artists' palettes with *Deluxe Paint*.

In many paintings there are only a few key colors, with intermediate shades grouped around them. Once you've identified and mixed the key colors, you can use them to create spreads. (You'll find it convenient to use a system of key colors and spreads when creating your own palettes, as well.) Although you

won't be able to match the artist's palette exactly (even in a 256-color screen format, you don't have as many colors to work with) you can get remarkably close. Take a look at color plate 11 for a tongue-in-cheek attempt at this, using Fragonard's *The Lover Crown'd* as a model. If you like, you can try to copy the model painting with the *Deluxe Paint* palette you created, noting how the artist used color to model shapes and to create links and tensions among various parts of the picture.

Another use of Spread is to automatically make precise percentages of colors. As shown in Figure 5-8 (the Amiga palette is pictured), it's easy to get gray tones in increments of 20 percent by creating a four-position spread between black (100 percent) and white (0 percent). A spread with 11 positions (including black and white) yields grays in 10 percent increments. The same applies to any color spread. A three-position spread between pure red and pure blue, with no admixture of green, yields five colors—red (100 percent red, 0 percent blue), red-violet (75 percent red, 25 percent blue), violet (50 percent red, 50 percent blue), blue-violet (25 percent red, 75 percent blue) and blue (0 percent red, 100 percent blue).

Figure 5-8. A Spread of Grays



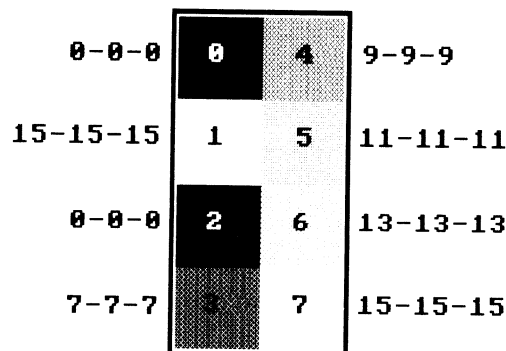
This capability is very helpful when you must prepare illustrations or comps for reproduction. With a good monitor and a little effort, you can match rather closely the gray and color values commonly used for printer's inks. Telling a printer that a particular color is 50 percent blue, 25 percent red, and 10 percent green makes more sense than supplying RGB or HSV numbers, which only have meaning for use in *Deluxe Paint*.

The halftone illustrations for this book were created using a special spread, shown in Figure 5-9. Each figure was transferred

from an Amiga or PC compatible to an ATEX typesetting system. The ATEX is capable of generating a limited number of gray tones by using a pattern of dots, as you can see by looking closely at Figure 5-9 (use a magnifying glass if you need to) or any other figure in this book.

A spread of four *Deluxe Paint* gray tones corresponds to printable ATEX dot patterns—RGB settings 0-0-0 (black), 7-7-7, 9-9-9, 11-11-11, 13-13-13, and 15-15-15 (white). It was necessary to set this palette only once for a blank template picture stored in a separate file. Each figure in the book was begun by loading the template, with its palette ready-made, and saving the finished figure in a numbered file. (The color plates, by contrast, were not transferred directly to a typesetting picture, but were converted directly to photographic slides with a film printer, then turned into stats and printed with a standard four-color process. See more on film printers and the problems of creating color art for illustration in Appendix A.)

Figure 5-9. Gray Spread for this Book



Ranges

Ranges are colors grouped together for a special purpose. Unlike spreads, ranges need not be composed of related colors. To define a range on the Amiga, select the first color in the range, click the Range button, in the Palette box click the last color in the range, then click one of the C settings after Range. A bracket appears, enclosing the range.

To define a range on the IIGs and PC compatibles, click one of the radio buttons after Range and then drag the bracket that appears next to the colors so all the colors you want in the range

are included. Up to four range “channels” can coexist at any time (except in the two-color PC compatible formats, where, logically, only one range is possible), and the channels can share any number of colors. Activate a range from the toolbox palette by selecting any color in that range. Change the range direction—that is, whether the range begins at the first color or the last—by clicking the up or down arrow buttons to the right of the Speed slider (see below). The Amiga palette box has a single range direction arrow that flips up or down when clicked.

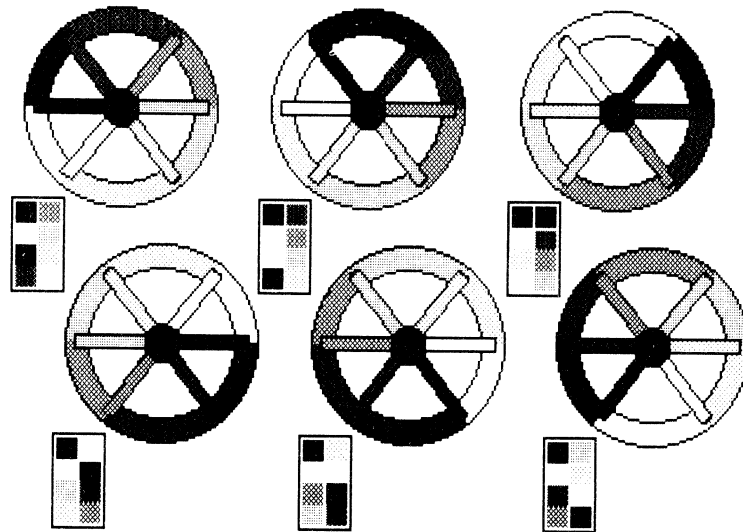
What are ranges used for? Several of *Deluxe Paint*’s more impressive features require you to specify a range, including gradient fill; the blend, shade, and cycle draw options in the Mode menu; and color cycling. These features all use only the colors in the current range. You’ll learn more about gradients and the painting modes in the next chapter.

Color Cycling

An extensive tutorial in the *Deluxe Paint* manual covers the basics of color cycling—the ability to repeatedly flash a series of colors on the screen. (Color cycling is not available in any 2-color PC compatible screen format.) You’ve probably already tried the color cycling brushes on the *Deluxe Paint* disk, but if not, try them now. Load a brush, select any color in the current range from the toolbox palette, then choose Cycle from the Picture (Amiga) or Color (ILCS, PC) menu, or just press the Tab key. The colors in the brushes (and in any other part of the page using the range colors) now automatically step through their ranges.

Cycling speed is adjusted with the Speed slider in the Palette box—left for slow, right for fast. As the speed increases, the brushes begin to pulse and move. The highest speed setting generates a strobe effect that can be a little disconcerting. You can change the cycle direction by clicking the range direction arrow(s). To cycle all the range channels through their ranges at once, choose MultiCycle from the Amiga’s Prefs menu or the ILCS and PC compatibles’ Mode menu.

Color cycling can be used to create simple repetitive animations. Figure 5-10 shows one way to make a spoked wheel turn.

Figure 5-10. Turning Wheel

- * First, set the palette. Create a spread of six colors from dark to light, and then make the spread a range on channel 1.
- * Draw the wheel using the circle and straight-line tools. The wheel has six wheel sections and six spokes. Fill in the sections with successive colors in the range. Each spoke is attached to a wheel section of the same color. The hub is filled with a color not in the range, so it won't cycle.
- * Hit the Tab key to start cycling. The wheel appears to turn. Figure 5-10 shows the six stages in the cycle, with the small palettes indicating how the colors move through the cycle at each stage. Adjust the Speed slider to make the wheel turn faster or slower. Flip the cycle direction arrow up or down, or choose the up or down arrow button, to reverse the direction of spin.

You can use this technique to animate the wheels of a wagon, car, or locomotive. Other simple animations can also be brought to life with color cycling, such as making water run, a crankshaft turn, wings flap, rockets blast, signs flash, dials flicker, rain or snow fall, dust rise, lightning flash, eyes blink, or leaves tremble. Because different ranges can cycle at the same time (using multicycling), several kinds of movement can happen at once. For example, you could paint a night scene with stars twinkling and the wind rustling through the grass, or an arctic landscape

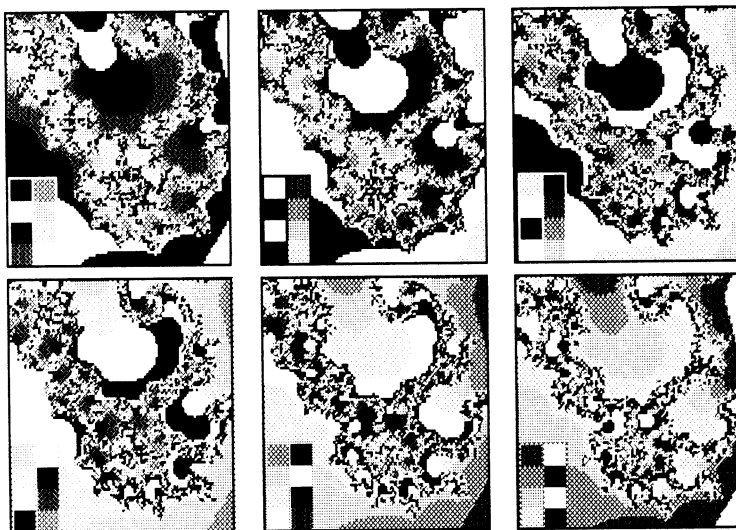
with the aurora borealis pulsing overhead, sending gleams off the ice.

Color Cycling can also be helpful in understanding the structures of complex images imported from other programs. Figure 5-11 illustrates a case in point. The six boxes show a color-cycled detail of the Mandelbrot set, a mathematical entity first described by IBM geometer Benoit Mandelbrot. You may know these images by their more common name of *fractals*.

Fractals are forms similar in structure at any level of magnification. A typical example of a fractal in nature is a coastline, which has much the same kind of ragged, seemingly random edge whether seen from space, from an airplane, or from six feet above the ground.

Commercial and public-domain programs that create fractal imagery are available for all three types of computers. Amiga and IIGS programs usually save pictures in the Amiga IFF or Apple picture file formats; use the Camera utility that comes with the PC compatible version of *Deluxe Paint* to take snapshots of fractals made with PC compatible programs. Figure 5-11 was created with Mandelbrot Explorer, an Amiga public-domain program by Thomas Wilcox.

Figure 5-11. Mandelbrot Cycling



Fractals are fascinating to investigate for their own sake, but they are intricate, and it's often difficult to see exactly what's going on in them. Color cycling can help to reveal their swirling internal patterns. Reading the six stages of Figure 5-11 left to right by row, you can see large and small cyclones throughout the image. These rotations are much more apparent when you see them with the motion imparted by color cycling than when you see them as static patterns.

Fractals can be the source of striking *Deluxe Paint* images. Use them as vividly colored backgrounds to simulate distant landscape features or microscopic environments, or pick them up as brushes and multiply them all over the page. Figures 7-1, 7-2, and 8-13 use fractal patterns as planet surfaces.

Using Color Effectively

The aesthetics and psychology of color is a vast subject, well beyond the scope of this book. But the few guidelines below may come in handy, especially if you're just starting out.

Don't use color randomly. Some colors go well together, and others don't. Colors that fight each other will probably work against your picture as well. For example, putting certain primary colors, such as red and green, next to each other creates a color vibration along the border between them. Unless your work falls into the op-art/psychedelic poster category, this vibration is likely to be more distracting than interesting.

Likewise, the border between two colors of very similar value is rather hard to see. This is good when you want to make a subtle color transition, but not so good when you want your viewers to discern the outlines of your image. Be especially concerned about contrast and edge definition when you're dealing with text and color, a point even the art directors of slick magazines sometimes forget. A recent issue of a computer monthly had the entire lead of an article printed in small yellow letters over a light gray background—and the text was completely unreadable. Be alert for similar problems.

Use a varied palette. The exclusive use of light pastels makes for dull, wishy-washy pictures. Work entirely in bright primaries tends to look simple-minded. Of course, there are exceptions to every rule. Mondrian painted entirely with primaries, white, and

black, and his work can't be described as simpleminded (even if it is no longer very surprising).

Understand the psychological connotations of color. Saturated colors are bold and dramatic and tend to sit "up front" on the picture plane. Bright yellow, in particular, stands out a mile and should be used sparingly or in the service of a particular image (sunflowers, for example). Cold blues, greens, and grays give your picture a distant, melancholy feel. Colors go through fads as well. In the 1960s, day-glo colors were the rage, and they are making a reappearance today, mainly due to the influence of the highly saturated colors possible with computer graphics. In the 1970s and early 1980s, "hi-tech" colors—grays, black, metallic shades, Ferrari red—were popular with artists and designers. The appropriate color set can give your picture a period look.

Avoid the obvious. Everybody knows that grass is green—but is it? Look closely and you'll see that different kinds of grasses are different colors of green. That grass in the shade is a different color than grass in the sun. Grass near a red flower picks up some of that red. Grass in the distance can be blue, yellow, or brown. Look at the Impressionists for clues on using colors in unconventional but convincing ways.

Use the minimum colors necessary to convey the information. For practical graphics, such as technical drawings, charts, graphs, and maps, use the minimum colors you need to get the message across. Extra colors add complexity to a picture as well as complicate your message. Use colors that are easy to distinguish from each other, and that have the right connotations—don't use green to create a graphic that tells someone to "Stop."

Don't forget to break the rules. These suggestions on color, and any others you may come across, can be helpful, but there will be plenty of times when they'll be dead wrong. Always following the rules can result in work that's safe and correct, but also hackneyed and unexciting. When in doubt, trust your instincts and learn by your own experience. If you make a mistake, changing colors in a *Deluxe Paint* picture is child's play.

With the basics of drawing, brushes, and colors under your belt, you're ready to explore *Deluxe Paint's* more advanced painting tools. We'll look at these in the next chapter.

CHAPTER 6

Painting Tools and Techniques



Each graphic medium has its own character. An oil painting possesses a rich, velvety surface and deep, glowing colors. In contrast, an acrylic painting looks brash and flat. Watercolor, with its subtle washes and transparent color, lends itself to soft textures and atmospheric effects. The smooth gradations of shading and color possible with an airbrush give an airbrushed picture a slick, mechanical look, suitable for rendering man-made forms. An ink drawing combines a hard line with watercolor subtlety, while charcoal and pastel chalk possess a rough, appealing texture.

Deluxe Paint contains a wide assortment of painting tools that make it possible to achieve the visual effects of many traditional media. You can create paintings with the look of acrylics, watercolors, airbrush work, pastels, charcoal, and pen-and-ink wash. And you can combine the appearance of different media in one image.

Airbrush Techniques

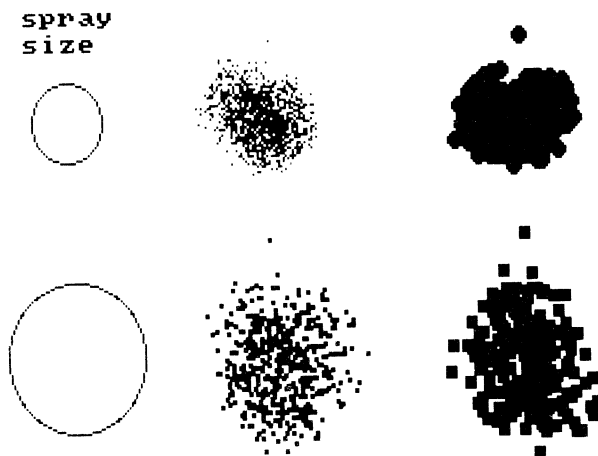
Deluxe Paint's airbrush is a versatile tool capable of a variety of effects. Most commonly you'll use it for the same tasks you'd use a real airbrush for—creating the gradual transitions between colors that are characteristic of rounded, smooth, and shiny surfaces. In fact, unlike the "spray" tools of other paint programs, *Deluxe Paint's* airbrush works very much like a real airbrush—airbrush artists will feel completely at home with it. But *Deluxe Paint's* airbrush can also do things that a real airbrush cannot, such as quickly spray multiples of any complex image across the page. And the airbrush can be used to simulate the look of unsprayed media, notably charcoal and pastel drawing.

You'll find the airbrush-tool icon next to the fill-tool icon in the toolbox. To use the airbrush, select it, and then select any built-in brush and color. As you paint with it, the airbrush deposits a random spray of brush blots under the crosshairs. The

longer you hold down the mouse button, the more blots are deposited. If you hold the airbrush stationary, it eventually fills up the area under the crosshairs. As with other *Deluxe Paint* painting tools, left-drag the airbrush to paint with the foreground color, right-drag to paint with the background color.

You can adjust the diameter of the spray, just as you can with a real airbrush. Right-select the airbrush tool to call up the airbrush spray size gadget. This looks and works just like the built-in brush size gadget. Drag the circle until it's the size you want. Figure 6-1 gives you an idea of the difference between a small-diameter spray and a large-diameter spray.

Figure 6-1. Airbrush Sprays

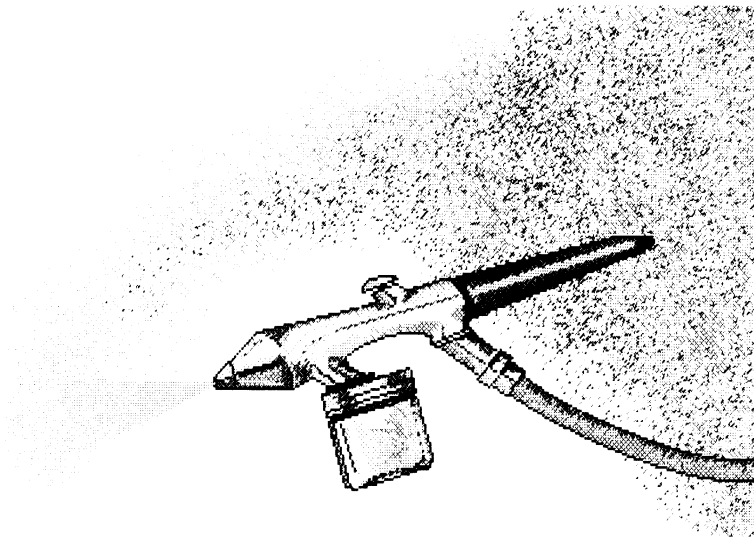


Although the airbrush sprays out blots of paint rapidly (and at a rate that's not adjustable), the spray as a whole moves rather slowly across the page, lagging behind the crosshairs as you drag. It's a bit of an art to move the airbrush fast enough to lay down an even spray along the brush path, but slow enough that the brush won't take any shortcuts to keep up with the crosshairs. Some practice now with various sprays and brush sizes will pay off in better control later.

The kind of blended area you can create with the airbrush is shown in Figure 6-2. Such areas make good neutral backgrounds; you can subtly vary the lightness and darkness in any part of the background while maintaining a generally smooth texture over the whole area. This degree of control is one reason to use the

airbrush for neutral backgrounds rather than the gradient-fill feature, which gives somewhat similar results. (We'll be covering gradients later in this chapter.) Gradient-filled backgrounds are perfectly uniform and lacking in character, while an airbrushed background can be tailored to the individual needs of the picture. You can, for example, shade subtly around the outline of a foreground object. The tradeoff is that creating a large, smoothly airbrushed area isn't that easy. Try to make one now, and you'll see why. It's difficult not to overpaint in one part and underpaint in another. Remember that you can always erase an airbrushed area by painting with the background color.

Figure 6-2. Airbrushing



Most of the shading and shiny highlights on the “old-fashioned” airbrush depicted in Figure 6-2 have been painted with the airbrush set to a small diameter, using a one-pixel brush. Since the placement of individual blots by the airbrush is random within the spray diameter, it's easy to spray paint into areas where you don't want it to go, especially when working in tight corners. You'll often have to take a small eraser and clean up after the airbrush. (*Deluxe Paint's* stencil features help you confine the airbrush spray only to the areas you want to paint. See Chapter 7 for a discussion of stenciling.)

The airbrush is not restricted to using the built-in brushes—any custom brush can be airbrushed, too. The small polyhedron in Figure 6-3 has been fed through a small-diameter airbrush. This effect is useful for building up layers of small images—for example, clumps of leaves on a tree, sprays of roses on a rosebush, or rising bubbles in a champagne glass.

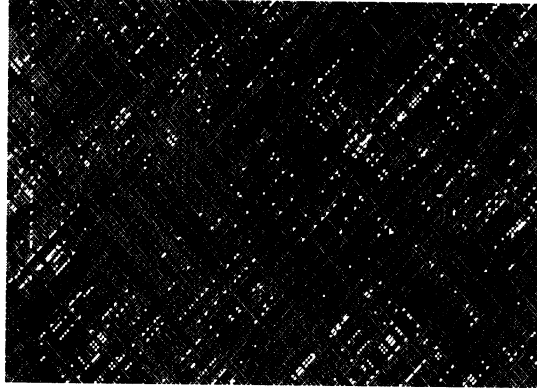
Try drawing a small leaf, picking it up as a brush, and airbrushing leaf clusters on a tree trunk. A relatively narrow-diameter airbrush works best for this. After you've airbrushed in the leaves, go back into the picture and change some of the leaves to make them look less uniform and more organic. You can also use the airbrush to pile leaf upon leaf in a massive pile, or set the airbrush to a wide spray and quickly click to scatter a few yellow leaves in an autumn scene.

Figure 6-3. Airbrushed Polyhedrons



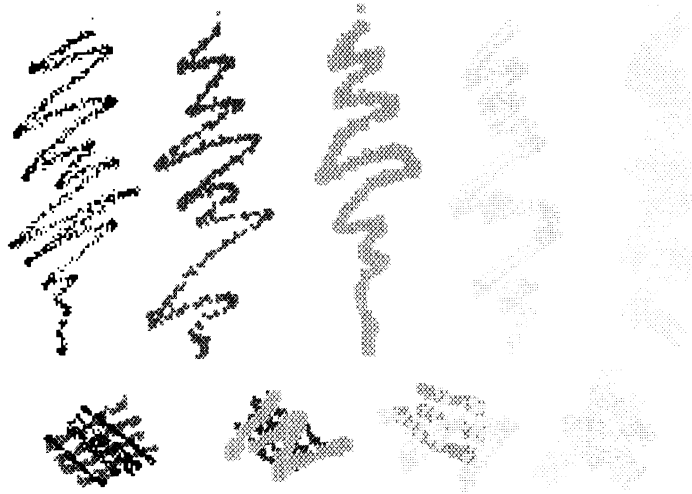
Thatched, crisscross patterns like the one in Figure 6-4 are simple to create with the airbrush. The brush used is a straight line at a 45-degree angle. Successive layers are built up by airbrushing the line in light and dark colors (use Color in the Mode menu to change a brush to the current foreground color) and flipping it alternately to the left and to the right. Extremely complex, multilevel abstractions can be built in this way.

Figure 6-4. Thatch



Set the airbrush to small diameters to simulate the stroke of a broad piece of charcoal or pastel chalk. Figure 6-5 shows some sample chalk strokes.

Figure 6-5. Sample Chalk Strokes

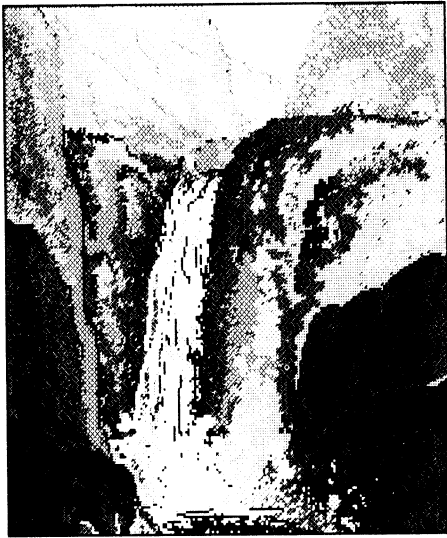


Try some chalkstrokes for yourself. Use highly saturated colors and fluid mouse movements to give your picture the appealing spontaneity of a pastel.

To achieve the appearance of a charcoal drawing, use a range of grays, as in the waterfall in Figure 6-6. The waterfall and cliffs

are rendered with a narrow-diameter airbrush spraying a one-pixel, built-in brush—a few lines with the freehand drawing tool help to define the rocks and add ripples to the pool below. A little smearing with a built-in brush in Smear or Blend mode (see below) simulates rubbing with a gum eraser or finger.

Figure 6-6. Waterfall



Gradients

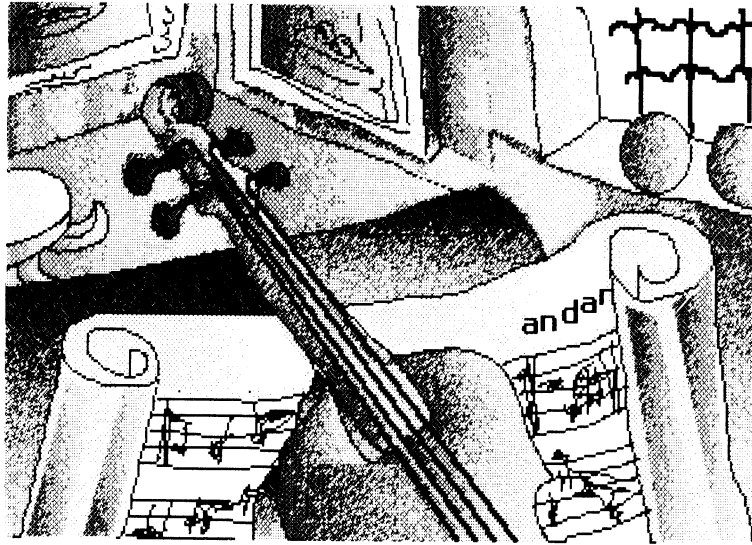
Gradient fill is a fill-tool option, as you'll recall from Chapter 3. Gradient fill, in essence, provides you with an automatic way to create perfectly shaded areas. While it's difficult to paint a perfectly uniform color or value transition over a large area with the airbrush, the same task is easy with gradient fill. In that sense, gradient fill is a supplement to the airbrush.

Let's do some experimenting with a few gradient effects. Set a range of colors with the palette controls and then choose one color in the range. Right-select the fill tool to call up the fill requester. Set the gradient feature to vertical or horizontal gradient; then click OK.

Try drawing a few boxes and other solid shapes. They'll fill with the range of colors you've selected. Drag the gradient slider to the left for a layered look, or to the right for a blend with no discernable transition between colors. Flip the range arrow up and down to vary the direction of the gradient.

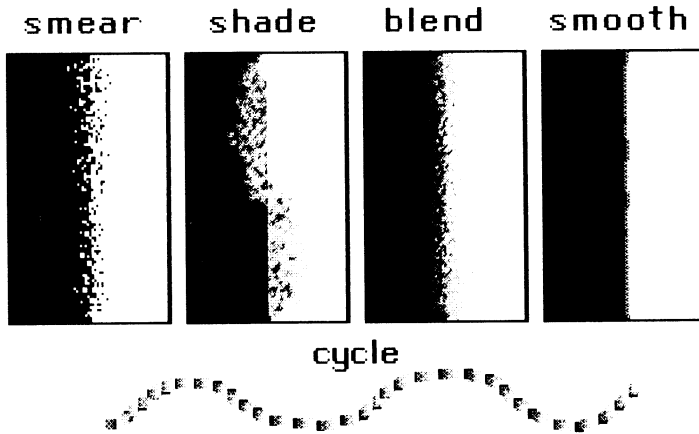
Another use of gradients is seen in the still life in Figure 6-7. Here the gradient areas, mostly filled polygons, look almost like cutouts superimposed over the basic drawing. The painting as a whole subtly resembles a paper collage. Note the relaxed character of the drawing. Computer art does not have to be tight and photorealistic.

Figure 6-7. Violin



The Painting Modes

Deluxe Paint's most painterly effects are available from the Mode menu. You've already used three of its options—Matte, Color, and Replace—in the custom-brush exercises in Chapter 4. The other painting modes are Smear, Shade, Blend, Cycle Draw, and Smooth. Figure 6-8 illustrates what each mode does.

Figure 6-8. Painting Modes

Smear

Smear lets you smudge two color areas together, as though you were rubbing a chalk drawing with your finger or mixing together two wet areas of paint. It's easy to use. Select the Smear option and then any size built-in or custom brush. When you drag the brush over the boundary between two colors, say from red into blue, the brush pulls some red into the blue area. Pass back from blue to red, and some blue is pulled along with the brush. Drag back and forth along the boundary to completely smudge it.

A small fine brush leaves a narrow smear, while a wide brush leaves a broad, coarse smear. You can use Smear to help in achieving a pastel effect, to aid in modeling dull-surfaced objects, to feather the edges of nebulous subjects like clouds, mist, and distant foliage, and to render rough surfaces like rust.

Shade

The Shade mode is more complicated to use. It requires that you specify a color range. When you paint with shade over an area in a color that belongs to the range, your brush deposits the range color above (by dragging) or below (by right-dragging) it. Select a foreground color outside the range, and Shade uses the entire palette as a range.

Shade has no effect in any PC-compatible 2-color screen format.

Blend

Blend also uses colors in a range. Passing a Blend brush over a color boundary will soften it by adding intermediate colors from the range. As with Shade, select a foreground color outside the range to use the entire palette as a range. Blend creates beautiful watercolor-like transitions and washes, especially if you choose a large brush (including a custom brush) to paint a wide blended swath. Blend is not an option in the PC compatible version of the program.

Cycle Draw

Cycle Draw causes your brush to cycle through the current range (if the foreground color is in that range). This is shown at the bottom of Figure 6-8. You can cycle draw with all the colors in a custom brush by selecting MultiCycle.

Smooth

Smooth yields the subtlest transition across color boundaries. It looks at the whole palette to find the closest average between the boundary colors under the brush. Smooth lays down a thin line of three intermediate colors along that border to create a very smooth transition, perfect for rendering slick, shiny surfaces and for ink or watercolor washes. Smooth also tends to average out ragged irregular outlines, and thus is useful for combating pronounced staircasing. Smoothing a slanted edge, such as that of an airplane wing, makes the edge look straighter, if less sharp.

Like Shade, Smooth has no effect in any PC compatible two-color screen format.

Using the Painting Modes

The following figures show just a few of the many painterly effects you can achieve with the painting modes.

The space scenes in Figure 6-9 and color plates 5 and 6 demonstrate the use of Smear and Shade. The earth and clouds were smeared with a large circular built-in brush to achieve a textured look and then were smeared again with a smaller brush to fray the coastlines and the edges of the clouds. In Figure 6-9 and color plate 6, Smear was also used to model the astronaut's helmet and shoulder. The landscape colors were translated up and down with Shade to create other subtle variations in shading. Some

areas in the spaceplane and the astronaut's visor were rendered with the Smooth feature.

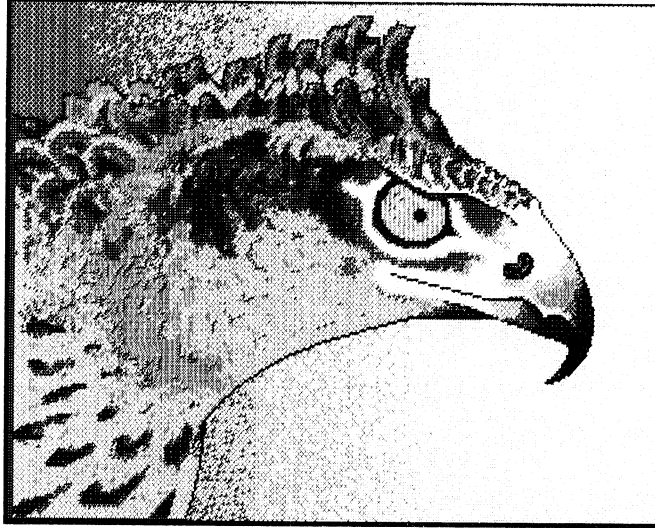
Figure 6-9. Astronaut



Combining Smear and Blend with a supple black line, as in Figure 6-10, yields the look of an ink drawing made with pen and brush. To re-create this painting of a hawk, first draw the outline of the hawk and some details of the plumage with small built-in-brushes; then fill the outline with the main colors.

The individual feathers are first drawn with built-in brushes and then are smeared and blended for a soft appearance. Notice the different kinds of feathers—upright and curled on the crest, fine and closely layered on the head and neck, coarser and with curved markings on the breast. A horizontal gradient adds interest to the background and brings out the forward thrust of the head and beak.

The 16-color Amiga version of this painting (see color plate 4) uses the following colors: black (RGB 0-0-0); white (RGB 15-15-15); a spread of medium grays for the gradient background (RGB 7-7-7 to RGB 13-13-13); bright yellow for the eye (RGB 15-14-0); a light beige for the beak (RGB 15-12-10); a spread of browns (RGB 12-8-4 to RGB 4-3-0) for the darker plumage and the breast; and a spread of red-browns (RGB 15-9-5 to RGB 12-0-0) for the crest, forebeak, and a ring around the neck.

Figure 6-10. Hawk

The delicate watercolor-like shading of the dogwood blossom in Figure 6-11 is created with Blend and Smooth. The striations on the petals are achieved by running a small built-in brush along them with the Blend feature on. For realistic coloring, the Amiga version uses a spread of pinks (RGB 13-4-4 to RGB 15-13-12) plus a dark and light green for the center (RGB 0-6-0 and RGB 6-12-8) and dark brown for the stem (RGB 3-1-0).

The flying ribbon in Figure 6-12 is easy to make with Cycle and MultiCycle. A single custom brush is used—a short vertical line with six colors, with a black “cap” at each end. You can see the brush in the middle of the right-hand border. The six colors (but not the black caps) are a cycle range.

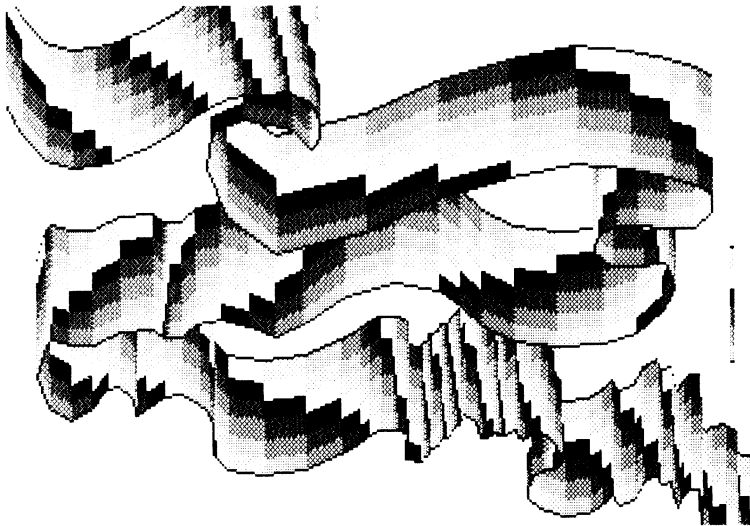
To draw the ribbon, pick up the brush, select Cycle and MultiCycle, and then the freehand-line tool. As you move the brush, each color cycles independently throughout the range. Note that this extra calculation makes the brush lag behind the crosshairs when you move quickly. Paint slowly for closely spaced cycle intervals, or paint quickly for widely spaced ones.

Try this for yourself with this brush and other multicolored simple brushes. The results are fascinating. Note that with the PC compatible and IIGs version of *Deluxe Paint*, you can't restore the brush's original colors after using MultiCycle; make sure to save the brush before you paint.

Figure 6-11. Dogwood



Figure 6-12. Cycle Ribbon



Other Painting Techniques

Two more painting techniques are worth mentioning. One is the use of brushes to create the illusion of motion, as in Figure 6-13 (and, with slight variations, color plate 7). Here the basketball player is roughly drawn with a combination of built-in brushes, airbrush chalk strokes, and smearing. Then the entire figure is picked up as a brush and dragged from lower right to midpage. The trails left by the brush are reminiscent of a long-exposure photograph of a body in motion, and lead the eye to the focus of action—the player's hand tipping the ball toward the hoop. The picture's broad, flat areas of color have some of the feeling of

acrylic paint, often used by sports illustrators for their bright colors and ease of application.

Figure 6-13. Basketball Player

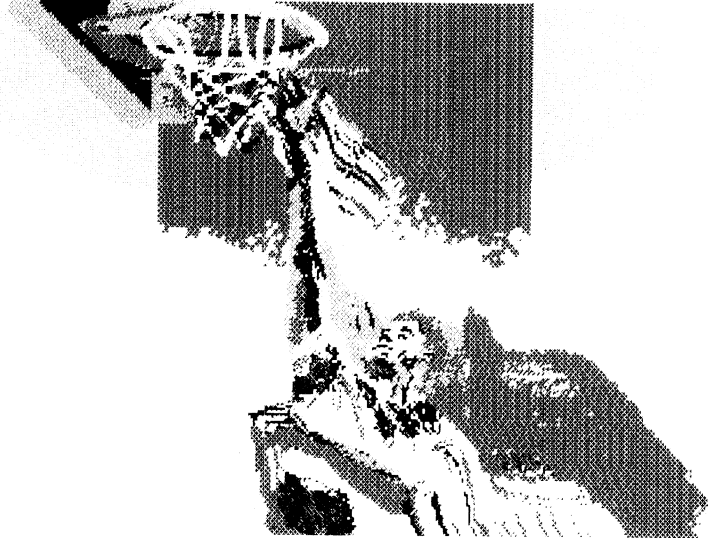
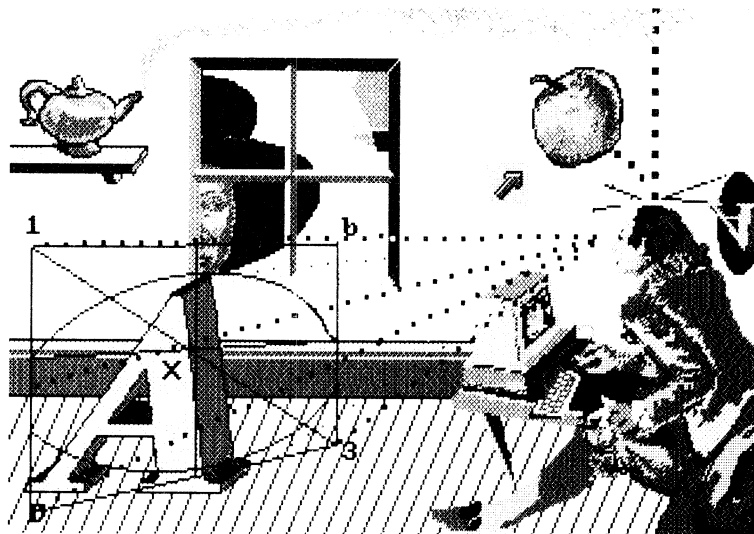


Figure 6-14. Vision



Brushes can also be used to create image “collages.” You can clip images out of old work—as well as from clip art libraries and other noncopyrighted sources—and store them in a separate file for possible future use. This is analogous to the collage artist’s clipping and filing potentially useful magazine photos, old prints, wallpaper patterns, newspaper articles, and the like. Figure 6-14 incorporates pieces of several pictures found elsewhere in this book. (The meaning of the correspondences among the various images is left for the viewer to decipher.)

A similar trick is done in color plate 12, in which a small part of color plate 11 is blown up and made the focus of a new picture. It’s a revitalizing exercise to trot out old parts of drawings and recombine them in new ways—a trick artists have always turned to, but one made far easier with *Deluxe Paint*.

CHAPTER 7

Graphic Aids

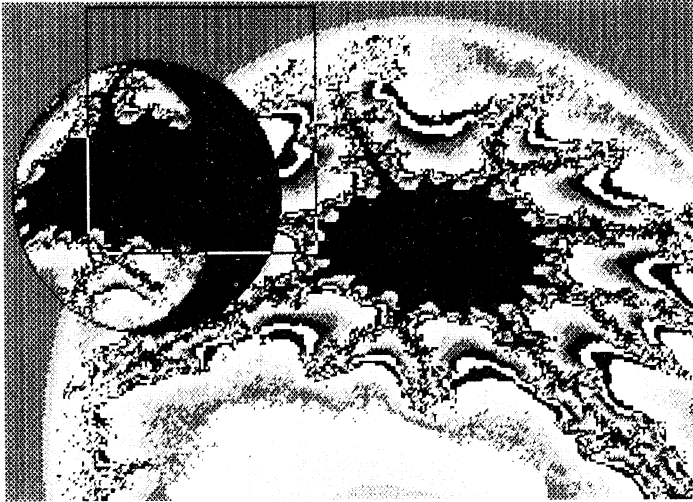


One of the best reasons to use *Deluxe Paint* is that it has many helpful features that can make graphic creation faster, easier, and more sure of success. *Deluxe Paint* has a built-in magnifying glass to augment your own eyes, a drafting machine to help you make perfectly aligned and proportioned technical drawings, a stenciler to prevent you from painting over an area you want to keep intact, an ever-ready scratchpad, and an expandable work surface for expansive visions. Used separately or together, these aids can cut hours off your work time and save you considerable frustration.

Magnify and Zoom

Deluxe Paint's magnify and zoom features—its magnifying glass—are indispensable for detailed work, especially in the higher resolutions. The Magnify feature allows you to enlarge any area under the crosshairs by a factor of two or more. The Zoom feature functions like the zoom lens on a camera, making it possible to move in on your subject with a high magnification (about 30× in the Amiga, 16× in PC compatibles and the IIGs) or pull back to a low magnification (about 2×) to see more of the picture. Best of all, Magnify and Zoom can be used in conjunction with any other *Deluxe Paint* feature, so you can do any necessary work right in the magnified area without having to toggle back and forth between a normal and a magnified view.

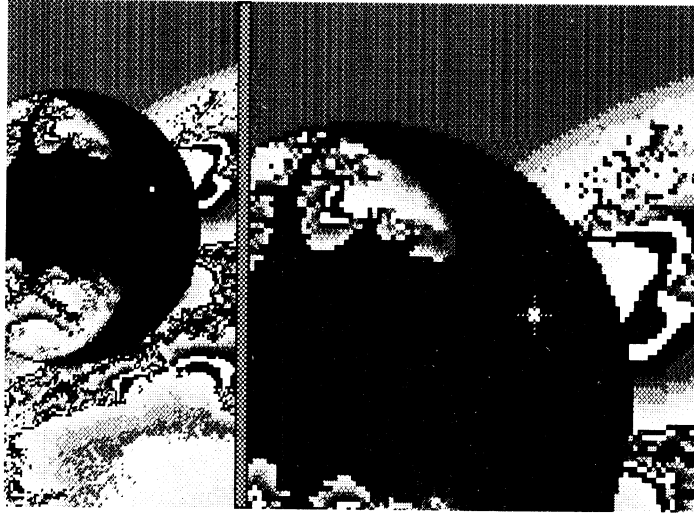
Figures 7-1 and 7-2 show how Magnify operates. Put your own picture on the page and follow along.

Figure 7-1. Magnify 1

The Magnify toolbox icon is the magnifying glass above Undo. Select it and then move out onto the page. A Magnify selector box appears that can be placed anywhere over the image. You can size the Magnify selector box with the Zoom tool, which is next to the magnify tool. Click the Amiga Zoom tool to increase the magnification (the box gets smaller), or right-click to decrease the magnification (the box gets bigger). Click the up arrow of PC compatible and IIGS Zoom tool to increase magnification; click the down arrow to decrease magnification.

Another way to magnify is to place the crosshairs over the area to be worked on and hit the M key. The area is magnified to the current zoom level without the intermediate step of positioning the Magnify selector box.

Once the box is positioned, clicking the mouse (or pressing the M key) gives you a screen like the one in Figure 7-2. The magnified area is displayed on the right two-thirds of the page, separated by a band from the left-hand part of the screen, which shows a normal-sized view of the same area.

Figure 7-2. Magnify

You can use the arrow keys to scroll around on the right side of the page, just as you would move a slide around under a microscope to see different parts of it. This lets you put every part of your picture under magnification without having to switch off the Magnify feature, select a new area, and turn Magnify back on. Another way to move around the screen is to move the crosshairs to the area you want to work on and press the N key, which moves that area to the center of the magnified screen. Note that at high magnifications you have unerring placement of any pixel, but you have to do a lot of tedious scrolling to work across a large area. You'll save time by using the lowest magnification that lets you get the job done.

Look at the unmagnified part of the screen to see the effect of the changes you're making. Any action you take in the magnified area is also shown in the unmagnified area. And you can cross the checkered band at will to work in either area. It doesn't matter which side you work on—the effects are immediately shown in both. When you're finished, click the Magnify tool again to exit the Magnify mode.

The Grid

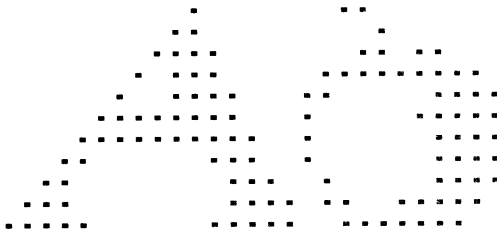
Deluxe Paint's grid tool is an invaluable aid for any task that requires precise spacing of lines or brushes, such as drafting, designing, business graphics, and patterning. You'll find it above

the Magnify tool in the toolbox. Switching on the grid creates an invisible grid on the page. The grid affects most of the drawing tools—brushes can be placed only on the grid intersections, lines snap to align with those intersections, and the shape tools center or corner on them.

For example, the freehand dotted-line tool deposits brush blots only on the grid intersections, leaving a polka-dot pattern like the one in Figure 7-3.

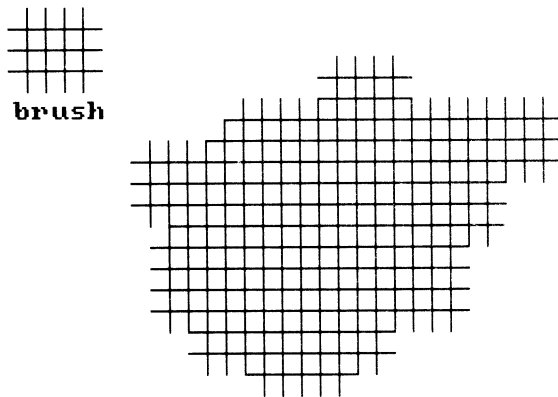
All the tools are constrained by the grid except for the freehand line tool and the airbrush.

Figure 7-3. Dotted-Line Tool on a Grid



Making the grid visible helps you see how it works. The process is illustrated in Figure 7-4 and described below.

Figure 7-4. Visible Grid



- * Select the grid tool, and then the straight-line tool, a one-pixel brush, and a light color.
- * Draw four short, parallel vertical lines. The grid makes drawing parallel lines easy—the lines snap to exact positions without

- trial and error on your part. Now draw three horizontal parallel lines intersecting the vertical lines.
- * Pick up as a brush the little grid you've drawn. The dotted-line tool automatically turns on. Start painting with the grid brush; it paints over only the invisible grid lines. Fill up the page and you'll be able to see all of the grid.

Leave the visible grid on the page and try some of the other drawing tools to see how they work. The endpoints and apex of a curve drawn with the curved-line tool snap to the grid intersections, as do the corners of rectangles and polygons. Circles and ellipses center on them, and so does any custom brush painted with the dotted-line tool.

Adjusting the Grid

Use the Gridding box to adjust grid spacing—that is, the distance between grid intersections. Figure 7-5 shows the Amiga Gridding box and Figure 7-6 shows the Apple IIGs Gridding box. The PC compatible version, called the Grid window, is functionally identical to the IIGs version.

Figure 7-5. Amiga Gridding Box

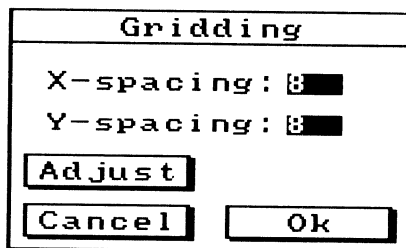
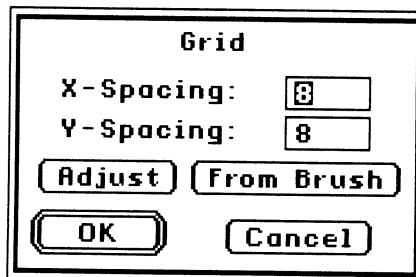


Figure 7-6. Apple IIGs Gridding Box



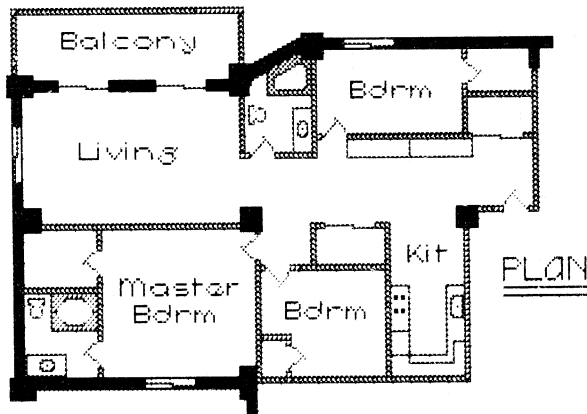
You can enter whatever values (in pixels) you like in the X- and Y-spacing gadgets. Large values make for a coarse grid, small values for a fine one. Or you can select Adjust, which calls up a ghost grid that can be moved onscreen and stretched with a sizing gadget. The ghost grid can be centered and sized to match an existing image so the grid conforms to your picture rather than the other way around. After you've set a new size with the ghost grid, click to confirm the revised grid settings.

The IIGs and PC compatible versions of *Deluxe Paint* offer the additional option of using the dimensions of the current brush as the X- and Y-coordinates of the grid—useful if you want to make a grid-based pattern from the current brush.

Practical Design with the Grid

The grid is indispensable for doing technical drawings, including architectural and mechanical drafting. Two examples of practical design with the grid are illustrated in Figures 7-7 and 7-8.

Figure 7-7. Floor Plan



This floor plan for an apartment is laid out on a grid of eight pixels by eight pixels (the default grid values). You can also set the grid to represent an exact scale—say, one grid square equaling a square foot or square meter. The architectural symbols (walls, doors, windows, and fixtures) were loaded one by one from a brush library available from Electronic Arts. They're easy

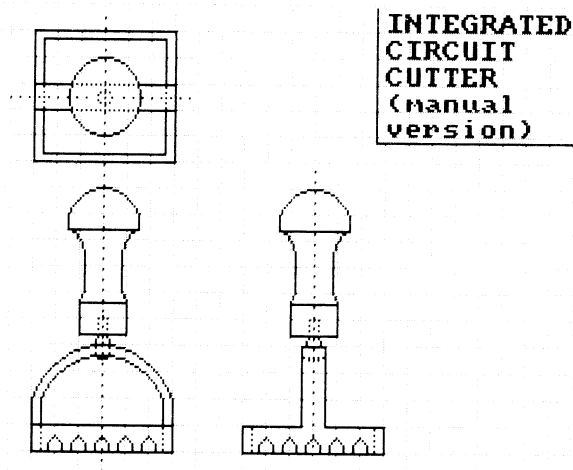
to position because they snap to the grid intersections. If the grid is too confining, it can be turned off temporarily and elements can be positioned by hand.

Creating plans, elevations, and other architectural drawings in this way has many advantages. Layouts are quick, accurate, and simple to revise. Creating and maintaining a brush library of often-used symbols relieves you of the need to redraw objects repeatedly. In most cases, you can develop a new design in a fraction of the time it would take to draw one with pen and paper.

Once you've settled on the basic design, you can draft the final blueprint by hand or with computer-aided design (CAD) software. Your *Deluxe Paint* design drawing can also be used as the basis for a full-color rendering. In the case of the Amiga and IIGs, you can import drawings from popular CAD programs as *Deluxe Paint*-compatible pictures as the basis for renderings. Use the Camera utility that comes with the PC version to accomplish the same thing.

Use the grid for mechanical design drafting as well. The "manual integrated-circuit cutter" in Figure 7-8 was drawn on the same grid as the floor plan in Figure 7-7.

Figure 7-8. An Orthographic Projection



This type of mechanical drawing is called an *orthographic projection*. It describes the drawn object fully by showing the top, front, and right-side view. (More complex objects, for example,

objects with interior cutouts, may require more views.) Notice that the grid makes it simple to align the three views exactly. Hidden areas and center lines are indicated by dotted lines.

Beyond architectural and mechanical drafting, the grid tool is useful for drawing maps, graphs, tables, bar and flow charts, block, project, and assembly diagrams, and a wide variety of other practical graphics. The use of the grid to create an unlimited number of abstract patterns is covered in Chapter 9.

Coordinates

Another tool you'll find useful for making exact drawings is the coordinates feature. This is an option in the Amiga's Prefs menu, the PC compatible's Pref menu, and the Apple IIcs's Edit menu. When Coords is selected, *Deluxe Paint* treats the entire page as a Cartesian plane.

A pair of numbers—an x-axis (horizontal) value and a y-axis (vertical) value—is assigned to every pixel location. The x-axis coordinates read from the left-hand margin of the page to the right, starting from 0, while the y-axis coordinates read from top to bottom, and also begin with 0. These numbers are displayed on the Amiga's menu bar and the PC compatibles' and IIcs's Info bar. They give a running fix on the location of the crosshairs as you move them on the page. For example, a one-pixel brush at the exact middle of a 320×200 page would display the coordinates $x = 159, y = 99$.

The beauty of coordinates is that they give a precise and absolute way of locating objects on the page. When you center your brush on $x = 66, y = 112$, you know it will always be in the same spot on the page, regardless of how the background may have changed. This is an important aid when you're doing a series of drawings in which some elements change position while others must remain stationary—for example, when you're using *Deluxe Paint* to create frame-by-frame video animation. (Animation techniques are discussed in Appendix A.) You can also set the grid to specific coordinates by turning on the coordinates, choosing Adjust from the Gridding box, and moving the ghost grid to the desired location.

Stencils

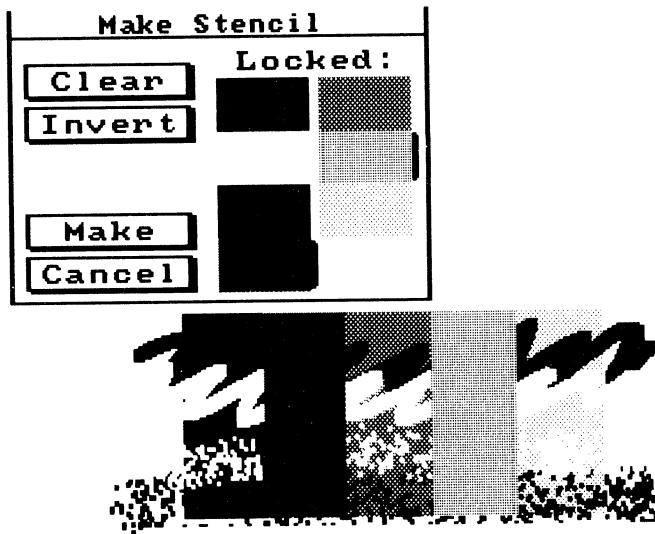
Remember those letter and animal stencils you used as a child? They let you color in shapes without worrying about coloring

over their outlines. *Deluxe Paint's* stencil feature does the same thing, but with far more sophistication. Here are some of the many things you can do with stencils:

- * Paint around and behind an image without disturbing it.
- * Replace one background with another without disturbing the foreground.
- * Quickly replace one color with another in the entire picture or just one area, without changing the palette settings.
- * Make *friskets* (special stencils) for containing the spray of the airbrush.

Your *Deluxe Paint* manual contains a thorough discussion of the stencil feature. It's definitely worth reading. Work through the tutorial as well. In this section, we'll touch on a few of the ways to use stencils.

Figure 7-9 shows the basic operation of the stencil. You can call up the Stencil box (the Amiga version is at the upper left, but the IIGS and PC versions are essentially identical) by selecting Make Stencil from the Amiga's Effects menu, the PC's Pict menu, or the Apple IIGS's Picture menu. Locking a color displayed in the Stencil box (by clicking it) prevents you from painting over any area in that color. As you can see in the figure, the two locked vertical strips of color were left untouched as various brushes were moved across the page.

Figure 7-9. Using Stencil

Alternatively, you can create stencils keyed to an object's location rather than to its color. Here's how:

- * Paint in the background, and then lock it with the Fix Background option in the Amiga's Effects menu, the PC's Pict menu, or the Apple IIGs's Picture menu. Once the background is fixed, you can paint over it, but it remains intact and unaffected underneath. Note that Fix Background requires a lot of memory and may not always be available; the MCGA 256-color screen format can only use Fix Background when you have expanded memory (over 640K).
- * Draw the object you want to make into a stencil and then lock the foreground with the Lock Foreground option. The object is now protected from overpainting no matter what colors are in it. The same colors outside the boundary of the object can be painted over, however.
- * You can lock the foreground as many times as you like or turn off the lock to make alterations in the foreground. If you paint over the locked background, and then unlock and relock it, the painted-over areas are incorporated into the new locked background. You should keep in mind that locking the background and foreground uses memory; you may not have enough left for other *Deluxe Paint* features like the spare page (see below).

A simple use for the stencil feature is demonstrated in Figures 7-10 and 7-11. In this application, an architectural firm is developing two proposals for the site of X Corp's new corporate headquarters. As often happens, X Corp is not sure what corporate image the new building should project—stern and monolithic, as in Figure 7-10, or sprawling and relaxed, as in Figure 7-11.

To help X Corp make up its mind, the architects have prepared a drawing of the site. By careful stenciling of colors, the buildings (drawn separately and stored as brushes) can be inserted among the trees. The X Corp planning committee can thus get an accurate idea of how each proposed building will look, while the architects save the trouble of making two separate complete drawings.

Figure 7-10. X Corp Plan A



Figure 7-11. X Corp Plan B

X CORP HQ--PLAN B

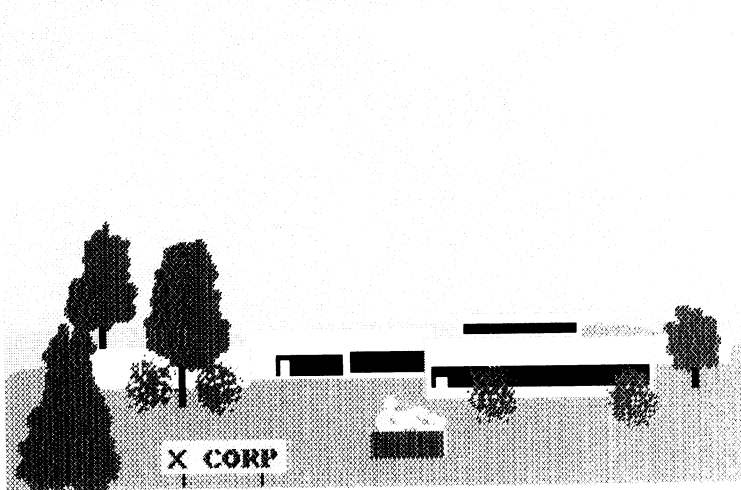
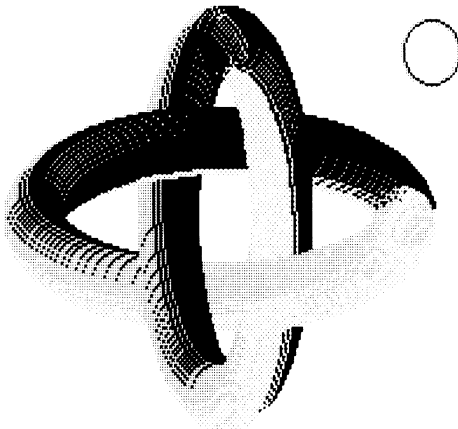


Figure 7-12 illustrates a different use of stencil. This curious figure is made of two impossibly interlinked toruses, each created with the ellipse tool and circular brush at upper right in the figure. With some clever stenciling, the vertical torus can be drawn over the horizontal torus in one pass. Can you figure out how? Hint: Two identical sets of colors are required.

Figure 7-12. Toruses



Friskets

The spray of *Deluxe Paint's* airbrush is somewhat unpredictable, and it's hard to keep the spray within an outline. Artists using the mechanical variety of airbrush face the same problem, and so apply *friskets* (cut-out paper or mylar stencils) to mask off areas that must be kept free of paint. In fact, the cutting, fitting, and care of friskets takes up as much or more time of an airbrush artist's day as the actual application of paint. In *Deluxe Paint*, you can use the stencil feature as a frisket to confine the airbrush spray. Simply lock all the colors but the one you want to paint on and spray away.

This approach is no good when you can't lock off all the colors in the area you want to protect because the area includes the same color as the one you want to paint over. You can try locking the foreground, but if you haven't locked the background recently you probably won't be able to lock the exact foreground area you want to protect.

One method to try is the following.

- * Make a brush of the area you want to protect.
- * Stamp down the brush in an unused part of the page (or on the spare page, see below). Trim away any excess material to leave just the part you want to protect.
- * Pick it up as a brush and lock the background. Stamp down the brush in its original spot and lock the foreground. You can now airbrush and paint around the area without painting over it.

The Spare Page

Deluxe Paint has a built-in scratch pad, the spare page. You can doodle, experiment, and store parts of drawings on the spare page, then pick them up, switch to the main picture, and add them there. The spare and main pages are in fact identical in every way (except for what you draw on them). All the tools and features work in each, and they share the same palette. The only thing you can't do is have two oversized pages at once. The spare page is not available in MCGA 256-color format.

Access to the spare page is through the Amiga's Picture menu and the IIGS's and PC's Pict menu. You can also toggle instantly between the two pages by hitting the *J* key. There are sev-

eral spare-page options, including deleting the page and merging it with the main page. Later we'll try a project that requires the use of the spare page.

Merging Foreground and Background

Often you'll want to work on foreground and background in isolation from each other. This has several advantages. Working on a foreground object by itself allows you to concentrate on it without being distracted by busy background detail. And painting the background on its own enables you to paint and repaint without worry about damage to the foreground object and without the need to make and remake stencils.

One disadvantage to working this way is that when the separately created foreground and background are merged, they just may not work together. You can avoid this problem by merging the foreground and background temporarily at several stages in the development of the picture to make sure everything works as it should. It saves work and trouble to make compositional and other major changes at an early stage rather than doing them later, although of course you can make any change at any time in a *Deluxe Paint* picture.

There are several ways to merge foreground and background. One way is simply to load the foreground object as a custom brush and position it on the background. Another way is to fix the background and paint the foreground over it, but that doesn't give you the advantage of working on each in isolation. The third method, available in the Amiga version of *Deluxe Paint*, is to paint the background on the main page and the foreground on the spare page (or vice versa) and merge them together using the Merge in Front and Merge in Back options.

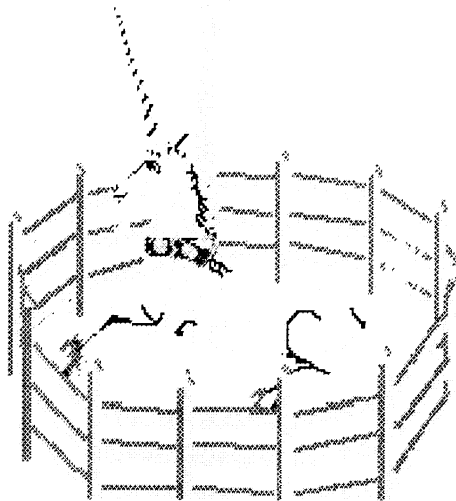
The "Captive Unicorn" (Figures 7-13, 7-14, and 7-15) makes use of the spare-page Merge options. (If you're using a IIGS and would like to duplicate this picture, use one of the other merging techniques, such as picking up the foreground as a brush and superimposing it on the background.) To re-create the unicorn, take the following steps.

- * Draw a rectangle 240 pixels wide and 200 pixels high to define the boundary of the picture. Pick up that rectangle as a brush, create a spare page, and stamp down the rectangle in the same place on the spare screen. Toggle back and forth between

screens to make sure the two rectangles are in perfect alignment.

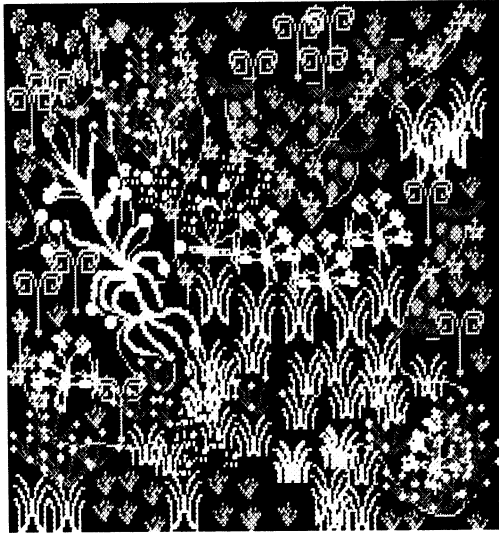
- * Begin work on the foreground image (in this case, the unicorn, fence, and tree, as shown in Figure 7-13) on the spare page. You'll need white for the background color, orange and orange-brown for the fence, beige and brown for the tree, a range of grays and black for the unicorn, and dark green and gold for his collar. Leave the area around the unicorn, the tree, and the fence in the background color white.

Figure 7-13. Unicorn Foreground



- * At the same time, you can begin work on the background (Figure 7-14) on the main page. The main background color is a deep forest green. The floral pattern is created with several small brushes of different plant shapes, repeated here and there over the picture. You'll need a light and dark green, as well as bright blue, red, and pink for the blossoms.

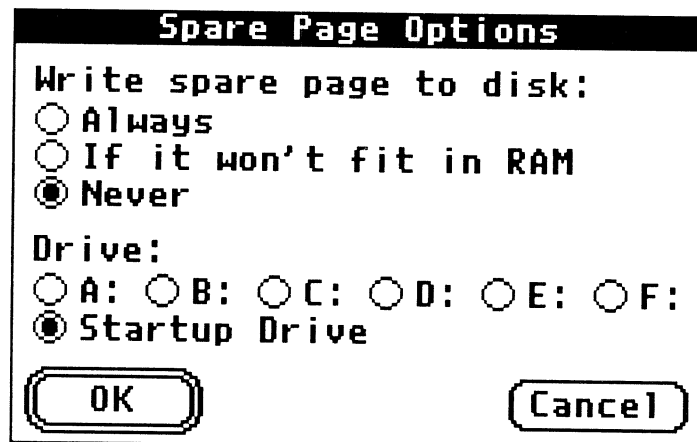
Figure 7-14. Unicorn Background



- * As you work on foreground and background, make sure to save each to a separate file. Toggle back and forth between the two pages as needed.
- * When you're reasonably pleased with both pages, try merging them by selecting the Merge in Front menu option. The spare page (the unicorn) is automatically superimposed on the main page (the floral background). Any areas painted on the spare page in the background color are transparent.
- * If you're not satisfied with the result, undo the merge and fix the problem. Remerge as necessary until you're satisfied. Then you can add the final details like the foliage in front of the unicorn and the chain. The completed version is shown in Figure 7-15 and color plate 8.

Figure 7-15. Unicorn Merged

While the PC compatible version of *Deluxe Paint* doesn't allow you to merge pages, it does provide the ability to save the spare page automatically to disk, thus conserving RAM for operations on the primary page. Figure 7-16 shows the Spare Page Options box.

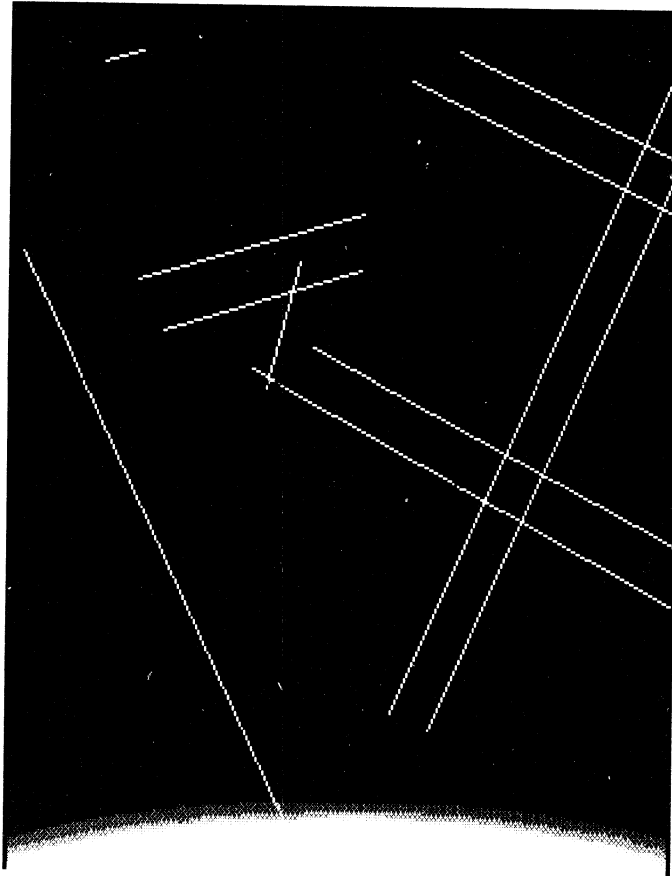
Figure 7-16. Spare Page Options Box

Note that you can choose to save the spare page always, sometimes, or never, and that you can specify any RAM disk, floppy drive, or hard disk. Be aware that, although saving memory by putting the spare page on disk lets you do more memory-intensive operations on the primary page, it also slows down your access to the spare page by a moderate amount (if you are saving to a hard disk) or by a lot (if you're saving to a floppy). In any case, you switch to the spare page in the same way, by choosing Spare Page from the Pict menu or pressing the J key.

Using Oversize Pages

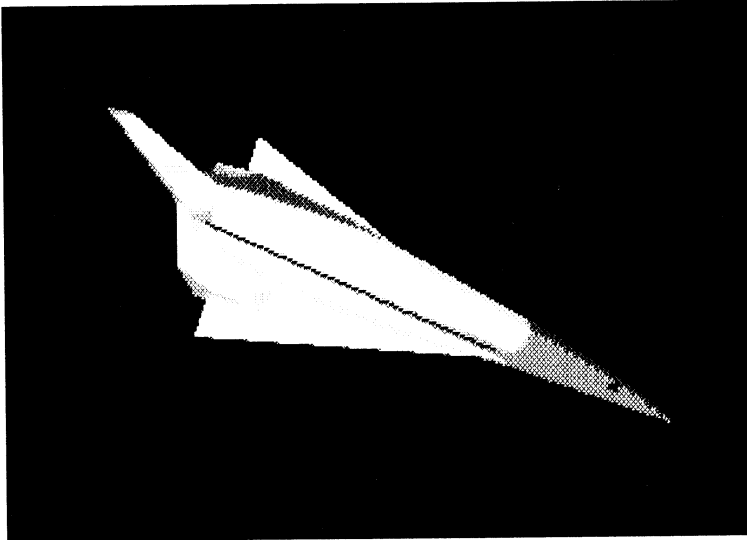
As you'll recall from Chapter 2, *Deluxe Paint* allows you to work with many different page sizes (except in the PC MCGA 256-color format). It's wonderful not to be constrained by the size of your screen, but working with oversize pages also presents some unusual problems. The most serious problem is that you can't see or work on the entire oversize page at one time, but must scroll within it using the cursor keys. This makes it difficult to compose pictures. Careful planning is necessary to insure that all the parts of an oversize picture fit together at the end. Techniques for working with oversize pages are incorporated in the next project, an artist's conception of NASA's planned space station and national space plane (Figures 7-17 through 7-21).

Figure 7-17 is the planning picture. It defines the page size, 320 pixels wide by 340 pixels high. The actual picture is only 280 pixels wide. A box is drawn to enclose the picture area. To draw the box, use the straight-line tool and begin at the upper part of the picture. Draw the top and sides of the box; then scroll down to the lower part of the picture and finish the box. The diagonal lines show where the various elements of the finished picture will be. It's best to make compositional decisions now, because they'll be harder to change later. At the bottom is Earth.

Figure 7-17. Space Station—Planning and Composition

The space plane (Figure 7-18) is drawn on the spare page. Smoothing is used on some of the plane's contours to give it a sleek, streamlined look. It will be rotated 90 degrees for the main picture. The plane is saved as a brush to clear the spare page for the next task.

Figure 7-18. Space Station—Spaceplane



Parts of the space station are drawn on the newly cleared spare page (Figure 7-19). These are picked up as brushes and used to assemble the complete space station. In the final picture, some of the parts were modified to suit the look of the rest of the picture.

Figure 7-19. Space Station—Parts

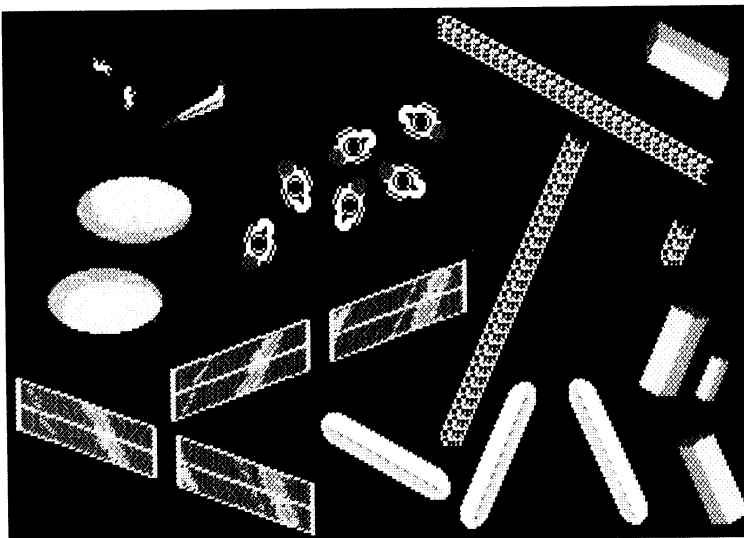
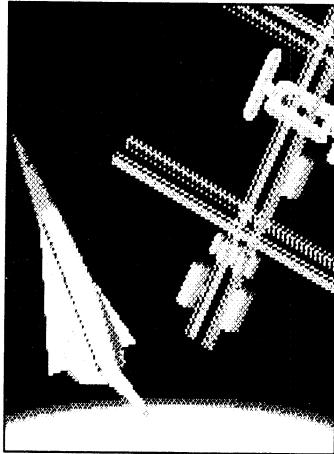


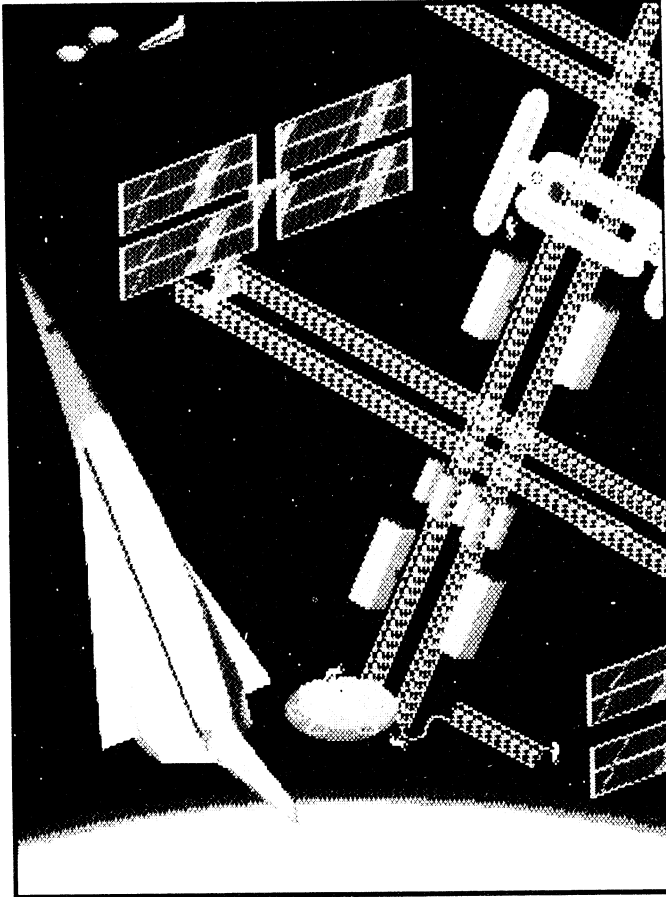
Figure 7-20 demonstrates the use of *Deluxe Paint*'s Show Page feature. Activate Show Page by selecting it from the Picture menu. The entire oversize page (shown here at a fairly late stage of development) is condensed to fit on a standard page (by dropping at least every other pixel) so you can see the whole composition. Remember that you can't work on the picture or display it simultaneously with the oversize page in Show Page mode.

Figure 7-20. Space Station—Show Page



The completed picture is shown in Figure 7-21. The space plane, which in its vertical version is taller than the maximum active workspace (320 by 200 pixels), has to be stamped down in two operations. Place the lower half of the spaceplane brush in its proper position (the upper half of the plane is off the active workspace) and then stamp it down. Scroll to the upper part of the page, align the upper part of the spaceplane with the part already painted, and stamp it down. Add a sprinkling of stars and the picture is complete.

Figure 7-21. Space Station—Completed



CHAPTER 8

Text




All kinds of graphic communication, from business graphs to comic strips, require text to make them intelligible. This chapter covers *Deluxe Paint's* text tool, a basic word processor you can use to place titles, labels, and blocks of text in any picture. You'll also learn how to create your own typefaces and incorporate them into graphics for business and personal use.

The Text Tool

The text tool is located in the toolbox, next to the custom-brush tool. It's simple to use. Click it and move to the page; the pointer turns into a blinking text box. Click the mouse button to fix the box in position and then type the word using the keyboard. The text box moves to the right, leaving behind letters in the foreground color, as you can see in Figure 8-1.

Figure 8-1. Text Tool

Text  The text tool is what is known in word processing jargon as a *line editor*. With it, you can:

- * Type any text in your keyboard's basic character set.
- * Use all of your computer's standard fonts.
- * Type text in the foreground color.
- * Edit the line you're currently typing by backspacing (or deleting, if you're using an Apple IIGS) from the current position of the text box.
- * Start a new line of left-justified text by hitting the Return key.
- * Set a left-hand margin anywhere you position the text box.

The text function has some limitations, however, and will not:

- * Let you set a right-hand margin.
- * In the Amiga version, prevent you from typing off the side of the page.
- * In the Amiga version, do word-wrap—that is, automatically start a new line as you approach a right-hand margin.
- * Enable you to edit text on lines other than the one you're currently typing.
- * Let you use most of the keyboard command equivalents while the text tool is active.

Try typing a sample paragraph on the *Deluxe Paint* page to get a feel for how the text tool works. You'll quickly discover that it's not designed for heavy-duty text entry, but it's quite capable of handling most picture-related tasks.

Fonts

A *font*, also called a *typeface*, is a complete set of letters and other characters in one type style and size. Ten-point Times Roman, for example, is a font often used in newspapers and books. There are many fonts, ranging from the utilitarian to the exclusively decorative. The Amiga and the Apple IIGs provide a selection of built-in (system) fonts. These are illustrated in Figures 8-2 and 8-3.

Figure 8-2. Amiga Fonts

Topaz 8	Opal 9
Topaz 9	Opal 12
Topaz 11	
Ruby 8	emerald 17
Ruby 12	emerald 20
Ruby 15	Garnet 9
Diamond 12	Garnet 16
Diamond 20	Sapphire 14
	Sapphire 20

Figure 8-3. Apple IIgs Fonts

Courier 8
Geneva 10
Helvetica 12
Shaston 12
Times 14
Venice 16

The PC compatible version comes with its own custom fonts. Clicking the Choose Font option in the Font menu or right-clicking the Text tool brings up the Choose Font box, shown in Figure 8-4. Figure 8-5 illustrates the PC compatible version fonts.

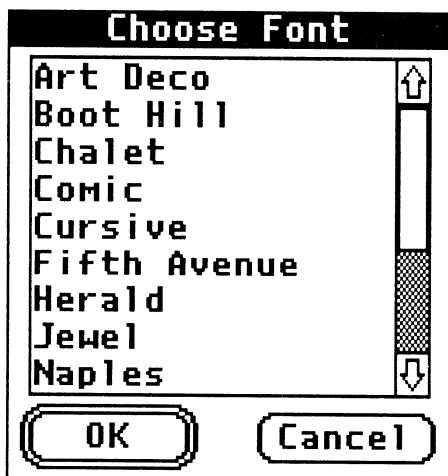
Figure 8-4. PC Compatible Choose Font Box

Figure 8-5. PC Compatible Fonts

Fonts come in various sizes, measured by points (there are 72 points in an inch). The numbers after each font name in the figures above indicate the font's size in points. As you can see, a smaller point number means a smaller font, and a larger number means a larger font. The IIGS offers fonts in 8-, 10-, 12-, 14-, and 16-point sizes (not all fonts are available in all those sizes, however). The PC version contains fonts in sizes from 8 to 24 points; after choosing a font, select the font size from the Font menu. The Amiga has fewer sizes for each font, but note that the larger fonts are not blown-up copies of the smaller versions; the larger letters are actually redrawn with more detail.

In addition to choosing a font size, you can specify whether letters are plain, bold, italic, underlined, or any combination of these, as shown in Figure 8-6. These options are available from the Font menu.

Figure 8-6. Styles

Plain
Bold
Italic
Underline
All Styles
Outline

Italics are not a menu option in the IIGS version; you have to create them. This can be easily done by picking up the text as a brush and using the Shear option to slant the letter to the desired degree.

Outlined text is not a menu option in the Amiga or PC compatible versions; you have to create it using the custom brush tool. Here's how.

- * Type in the text in any color, using the text tool.
- * Pick up the text as a brush.
- * Turn on the hollow-rectangle tool. Use the brush to draw a box by moving it two pixels down and two pixels to the right (you can be sure of the number of pixels moved if you choose Coords from the Prefs menu). The result looks like a very thick version of the brush.
- * Turn on the freehand tool. Switch your custom brush to a different color using the Color option in the Mode menu. Stamp down the brush in the center of the box you drew.
- * If you want a shadow-style effect instead of an outline, stamp down the brush in the box a bit off-center.
- * To make multiple outlines, simply pick up the outlined text as a new brush and repeat the process.

Text size can be changed by picking up the text as a brush and using the brush-sizing menu options. You can always make a built-in font larger this way. Trying to make a font smaller, however, often doesn't work. When shrunk, the letters lose too many pixels and sometimes become unreadable. At best, you'll have to redraw many of the individual letters by hand.

the space between them, and, if there will be more than one line of text, the space between lines.

The curves, straight sections, and other parts of any letters you create can be saved as separate brushes, then combined to make other letters. The word *Stardust* in Figure 8-8 is made with only ten different brushes, shown in the upper half of the figure. Nearly all the other letters in the font can be made with the same brushes. The brushes can be sized and rotated as necessary with the Brush menu options.

Figure 8-8. Stardust



Custom fonts can be as plain or as decorative as you like. Decorative fonts are generally used as display type, that is, for headlines or labels meant to stand out from the body of the page. Figures 8-9 and 8-10 show two variations on a decorative theme.

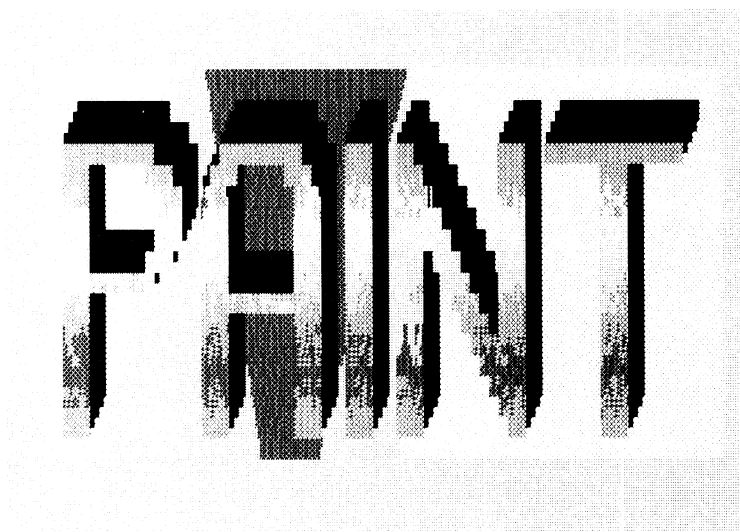
To create Figure 8-9's *DELUXE*, which looks like it was roughly cut out of shiny metal, first type the word in one of the sans-serif, built-in fonts. Pick it up as a brush and enlarge it to four times normal size. Add the rough texture to each letter by hand. Then pick up the word as a brush again, shear it sharply to the left, and give it thickness by dragging it with the straight-line tool.

Figure 8-9. Metal DELUXE



The word *PAINT* in Figure 8-10 also starts out with the word typed in a sans-serif, built-in font. Pick it up as a brush, enlarge it to four times normal size, and then fill it with a gradient. In the color version of this illustration, the gradient runs from deep red at the top through orange and yellow to deep salmon at bottom. Pick up the word as a brush again, double its height, and give it thickness by dragging it in a straight line in Color mode with black as the foreground color. Switch back to Matte mode and stamp down the gradient word on top of the black version. Finally, paint some colorful polygons behind the word using the stencil feature to protect it.

Figure 8-10. Gradient PAINT



Infinite variations on these and other elaborate fonts are possible. Experiment with resizing and recoloring built-in and custom fonts, flipping, rotating, and bending them, adding thickness, drop shadows, and multiple outlines. One factor to keep in mind is that as the font becomes more elaborate, it's likely to become less readable and less suitable for displaying more than one or two words at a time. Keep custom fonts simple when clear and direct communication is called for, and use fancy fonts for display type when you want to catch the eye and stimulate the imagination of your audience.

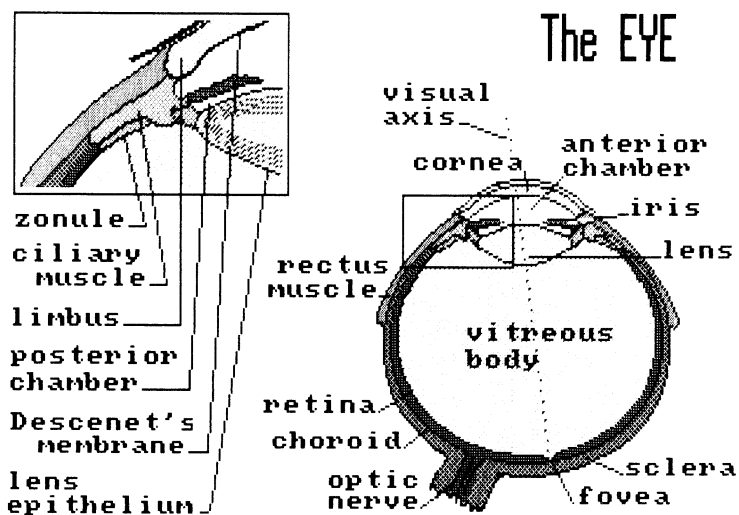
Mixing Art and Text

How can you use text to complement your pictures? Here are several examples to consider.

Diagrams

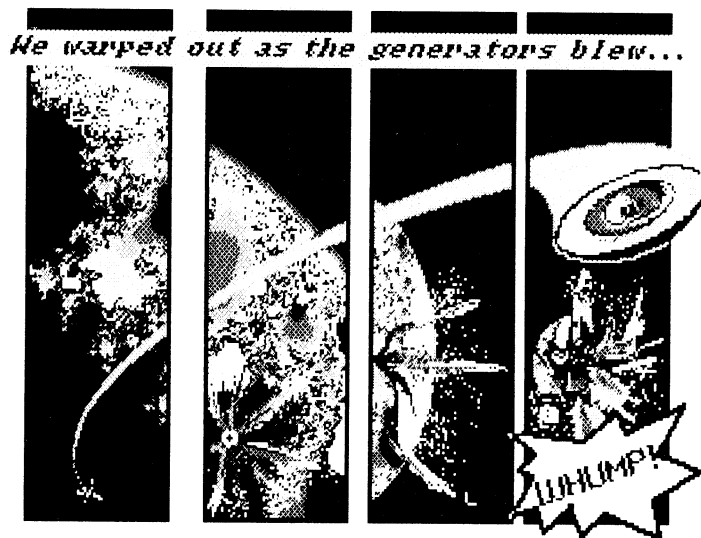
Figure 8-11 shows two typical arrangements for labeling a diagram. The cutaway view of the complete eye is surrounded by labels identifying its main parts. The labels are placed in or near the parts they describe, with connecting lines to aid in quick location. The magnified inset, too small to contain text itself, has its labels stacked below.

Figure 8-11. The Eye



Invitations

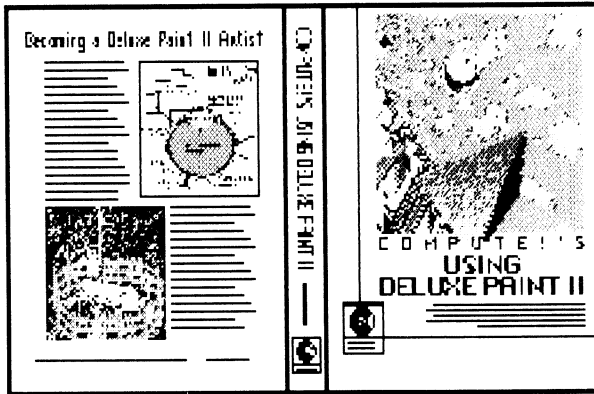
Informal invitations call for a handmade look and some imaginative graphics. The main lettering in this invitation (Figure 8-12) to a night of classic samurai video is a custom font meant to look like it was drawn with a brush. The text reads vertically in imitation of Japanese writing.

Figure 8-13. Comic Strip Panel

Book, Magazine, and Newsletter Covers

Designs for book, magazine, and newsletter covers, mastheads, and posters can be mocked up quickly with *Deluxe Paint*. This book cover design (Figure 8-14) contains an enlarged built-in font—letters made with a simple custom brush and the drawing tools—and a standard-size, built-in font in italics. All the text has drop shadows.

In a design of this kind, the differently sized and shaped text elements can be positioned to create an overall balance in the composition. You could create equally well an engaging unbalanced composition by moving the elements all to one side. It's worth rearranging a composition several times (by picking up the elements as custom brushes) to check out all the possibilities. You may find more than one arrangement that you like.

Figure 8-14. Book Cover

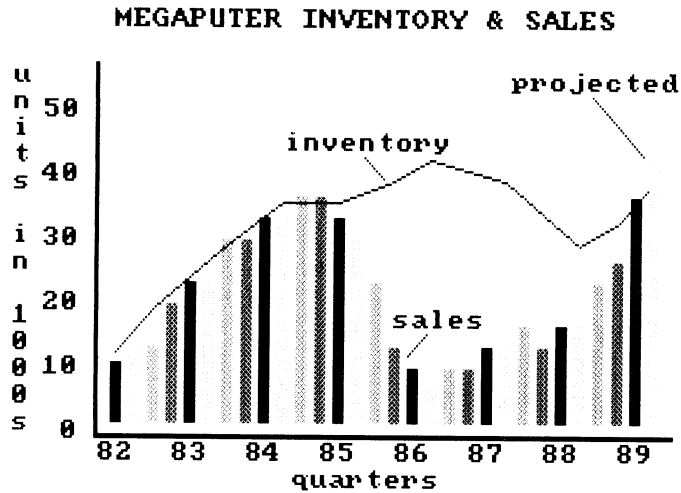
Business Graphics

The personal computer has brought with it a revolution in business communication, especially in the use of business graphics. It's now accepted wisdom in the business world that graphics are the most efficient way to present all kinds of data. In fact, today it's hard to imagine a manager preparing a report without including the requisite bar, pie, and scatter charts, all generated by computer.

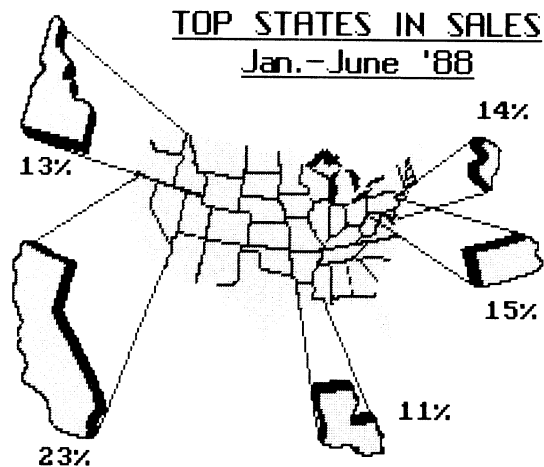
Deluxe Paint can help you create charts and graphs with pizzazz. But that's not all it can do. The boom in business graphics is part of a larger movement toward *desktop publishing*, the production of finished text-and-graphics documents using a personal computer. *Deluxe Paint's* range of graphic tools enables you to create sophisticated designs for your organization's business stationery, newsletter, catalog, and advertisements.

Charts and Maps

Deluxe Paint's many graphic tools make drawing bar (and other) charts easy. Figure 8-15 shows a typical bar chart displaying the up-and-down-and-up fortunes of a computer manufacturer. When making your own chart, turn on the grid to help you set exact spacing for numbers, bars, and lines, and use the spare page to store labels and titles until you need them.

Figure 8-15. Bar Chart

Custom maps, like the sales map in Figure 8-16, are easy to make with clip art available from Electronic Arts. This map clearly emphasizes which states were tops in sales volume for the year.

Figure 8-16. Custom Map

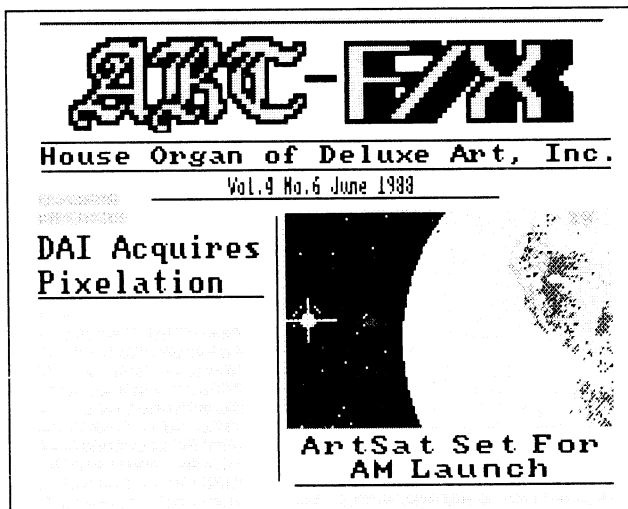
Charts, graphs, and maps can make the complex relationships among bits of data much easier to understand—that is, if the chart is easy to understand. Resist the temptation to create “3-D” charts when the data you’re displaying only has two di-

mensions. Don't adorn your graphics with lots of decorations, vibrating patterns, extraneous gridlines, and other "chartjunk," especially in the area in which data is displayed. Subtle colors, a subdued background pattern, and simple, clean layout are enough to give your graphic class and presence. You can even animate your graphic with color cycling, although this too should be used with restraint.

Newsletters

Deluxe Paint can be used to create graphics and design elements for your organization's newsletter or reports. An example is shown in Figure 8-17. All desktop publishing programs for the Amiga enable you to use *Deluxe Paint* graphics in your documents; the same ability should soon be available for the Apple IIGS. As yet, page makeup programs on PC compatibles can't make use of *Deluxe Paint* picture files, but there are a variety of public domain and inexpensive commercial utilities that let you capture screens from any program, including *Deluxe Paint*, and save the screens in a variety of graphic file formats.

Figure 8-17. Newsletter



Business Stationery

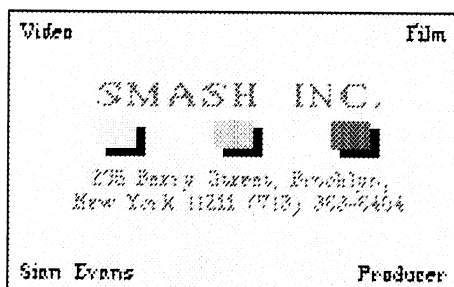
Design your letterhead and business cards with *Deluxe Paint*. As your business changes, you can easily change the design. A logo

like the three floating boxes in Figures 8-18 and 8-19 helps to make your stationery memorable. Once you've obtained a high-quality printout of your design, you can take it to a print shop for offset reproduction. Or, if you want, you can take the design to a professional graphic artist—he or she can instantly see what you want in the finished product.

Figure 8-18. Letterhead



Figure 8-19. Business Card



Advertisements

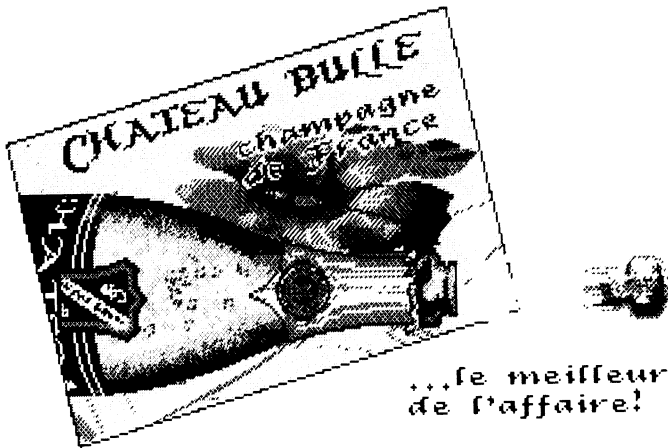
Use *Deluxe Paint* to lay out and test advertising designs for you or your clients. Because design changes are so easy to make, you can alter the concept as often as necessary to get it right. And you'll save money by settling on the design before going to expensive processes like photography for the final product. (Photographic imagery can be digitized and incorporated into your *Deluxe Paint* designs—see Appendix A.)

In Figure 8-20, an ad comp for imported champagne, a few text tricks are used. The text, in one of the built-in Amiga fonts, was rotated to match the tilted box, then cleaned up with small brushes and erasers to remove the raggedness that rotating causes. The text on the label was rotated 90 degrees and then bent horizontally to match the curvature of the bottle. The text at

the bottom was placed to emphasize the frothily popping cork—one image that no champagne ad can do without.

See color plate 10 for another version of this picture.

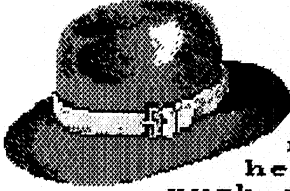
Figure 8-20. Champagne Ad



Catalog Copy

Mail-order catalogs are another area in which *Deluxe Paint* can be very useful. Once you build up a *Deluxe Paint* library of product drawings and text descriptions, you can lay out a new catalog as often as you like. With the trend in mail-order catalogs toward intriguing copy and artful renderings of products, you may want to include product descriptions like the one in Figure 8-21.

Figure 8-21. Catalog Copy



**Waxed Cotton
Monsoon Hat**

In the East Indies, wrote Conrad, the rains fall with "the heavy, uninterrupted rush of a sweeping flood." Lord Jim could have used our Monsoon Hat. Made of waxed Egyptian cotton, it is completely waterproof, a claim no felt hat can make. This is the hat to keep your thoughts dry and your courage up when braving the monsoons of Malaysia or the drizzles of New Jersey.

#1987 MONSOON HAT \$39

Television Graphics

The Amiga and the Apple IIGs both output composite video signals which can be recorded by a VCR or fed directly into a cable or broadcasting system. Some PC compatible graphics adapter cards also provide this capability. So any graphic you create with *Deluxe Paint* can be used on television. Small cable companies and TV stations can use *Deluxe Paint* to generate low-cost, high-quality video graphics (see Figure 8-22).

Figure 8-22. World News Update



There are a few rules to follow when creating graphics for video. The most important is: **Keep it simple.**

Use large letters, simple fonts, and short words. Most people's television sets are not nearly as sharp and clear as the RGB monitor you're probably using. Text has to be large to be readable.

Keep text in the center part of the screen. The curved corners and edges of TV screens distort text and make it hard to read.

Use graphic symbols that anyone can grasp—a world map for an international news bulletin, for example.

Avoid intense reds and oranges; these bleed and blur on most color TVs. Greens, blues, yellows, and grays show up best. Don't use thin vertical lines that contrast against the background, such as black lines on white.

CHAPTER 9

Patterning



Patterning, the creation of regularly repeating designs, has always been an essential aspect of art making. Patterns have prominent functions in religious forms of art, from Islamic architecture to medieval manuscript illuminations to modern Amish quilts. Other patterns have more practical uses—for example, Formica tabletops add visual interest to an otherwise featureless area and hide minor spills and stains. And some patterns, such as those denoting various kinds of terrain in a topographical map, are designed to carry significant information.

With traditional media, the creation of detailed patterns is usually tedious. Painting or drawing the same little shape or squiggle hundreds of times in exactly the same way is, understandably, a less-than-appealing task for many artists, who therefore don't take advantage of the rich decorative possibilities that patterns provide. Doing the same thing over and over again is just what computers are best at, however, and patterning is one area in which computer graphics has traditional artistic methods beaten. With *Deluxe Paint's* wide assortment of patterning tools, you can explore the world of patterns and the techniques of pattern making while letting the computer do all the hard work.

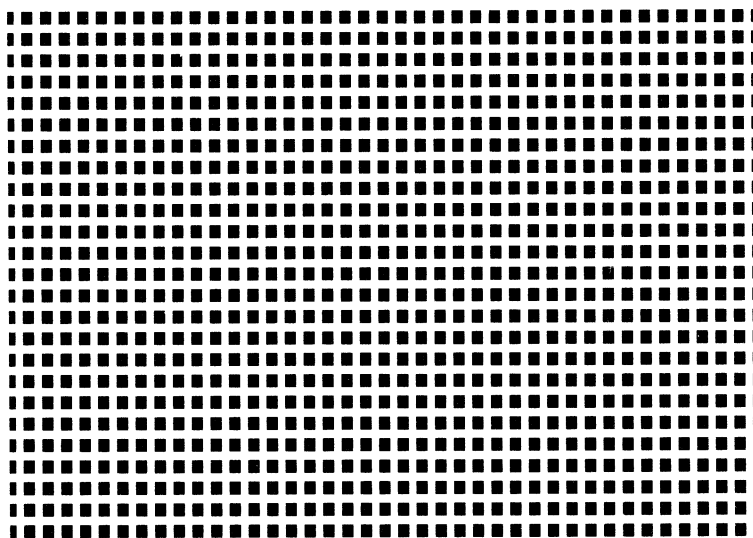
Patterning with the Grid

The grid tool provides an easy way to make patterns on a rectangular matrix. One of the simplest is shown in Figure 9-1. This block pattern is created with the dotted freehand line tool, a square black built-in brush, and the grid. To make it yourself, turn on the grid (it automatically sets to an 8×8 -pixel grid, the default size) and start drawing over the page with the dotted-line tool and the square brush. Because the brush paints only on the grid intersections, you can make a perfectly regular pattern simply by painting over the entire page. This takes a little effort, but absolutely no skill.

Note the “mirage” squares that seem to be visible on the

white paths between the black squares. Optical illusions like these are easily produced with grid-based patterns—imagine how long it took the op-art painters of the 1960s to achieve the same effect.

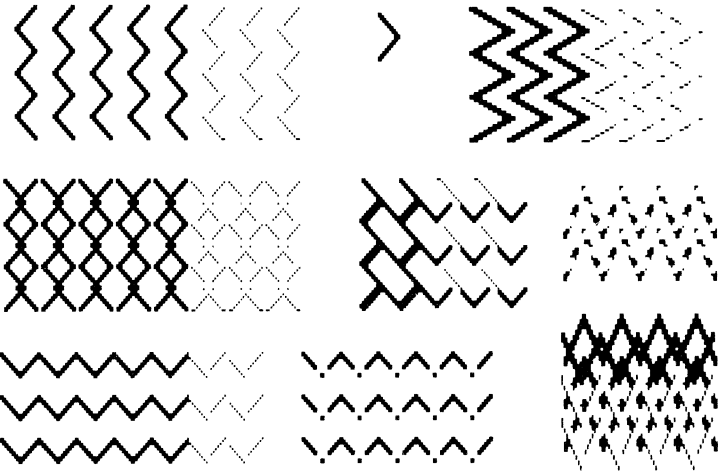
Figure 9-1. Block Pattern



You can multiply any other shape across the page in the same way. Try drawing some simple custom brushes and applying them over the grid, using different settings and flipping the brushes in various directions. Even a simple shape can yield many different patterns. Take a look at Figure 9-2. The angled line at top center is the basis for all the other patterns. Draw the same angle and try to re-create the patterns.

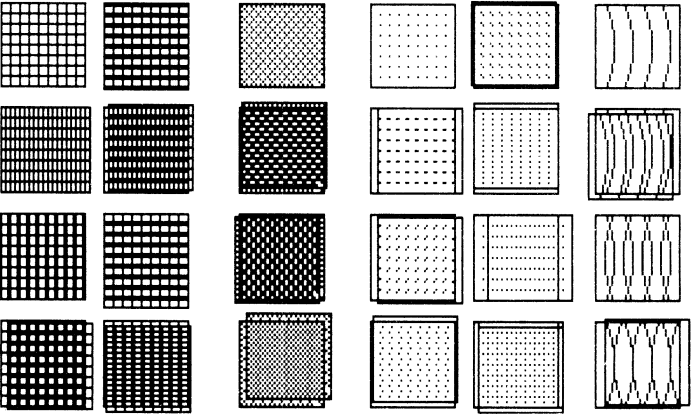
The white, shadowed patterns are made by painting the angle in the background color (white) over the same patterns in black; the angle is offset by one pixel to leave the black shadowing.

Figure 9-2. Angle Patterns



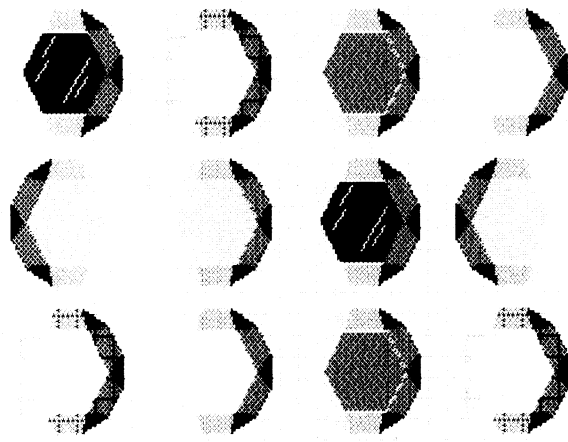
Moire patterns can be made by superimposing one simple pattern over itself or over another pattern. Figure 9-3 demonstrates this with four different “mother” patterns: a rectangular matrix, a diagonal crisscross pattern, a dot pattern, and a pattern of curved lines. Each is shown at the top or upper left of the four series in the figure. The patterns are picked up as brushes and then superimposed over themselves to make the other patterns in each series. Different effects are created by offsetting the top brush by one or more pixels in any direction. Multiple layers of brushes can be applied in different colors to make rich and varied moires.

Figure 9-3. Moire Patterns



The grid also assists you in making patterns from more complex brushes. In Figure 9-4, 12 solid and translucent polyhedrons are ordered in a perfect array with the help of the grid. Try this with some of your own brushes. Interesting effects can be achieved by overlapping brushes. For example, you can create an entire regimental parade from just one soldier, each figure as precisely in step as any drill sergeant could wish. Remember to work from the farthest part of the parade to the nearest.

Figure 9-4. Polyhedron Array



Symmetry Patterns

Deluxe Paint has, through its symmetry feature, the ability to create patterns that are circular or radial, not based on a matrix of rows and columns. Since symmetry hasn't been discussed yet, let's look at it in detail now.

The symmetry tool is located in the toolbox, next to the grid. Click it and move the pointer to the page. With a little experimental doodling, you'll find that *Deluxe Paint* draws mirror multiples of every mark you make. Draw a line, and *Deluxe Paint* quickly draws 11 more lines, arranged symmetrically around a central point. You can use all the tools and menu options with symmetry except the text tool and the freehand line tool. Custom brushes work, too.

Now right-click on the symmetry tool to display the Symmetry box. The Amiga Symmetry box is shown in Figure 9-5, while

the Apple IIGS Symmetry box is shown in Figure 9-6. The PC compatible version is functionally identical to the IIGS Symmetry box, so refer to Figure 9-6 if you're using a PC. The box presents the various symmetry options. You can choose between *point* symmetry (symmetry around a central point) and *tile* symmetry (symmetry in rows and columns, like a tile floor).

Figure 9-5. Amiga Symmetry Box

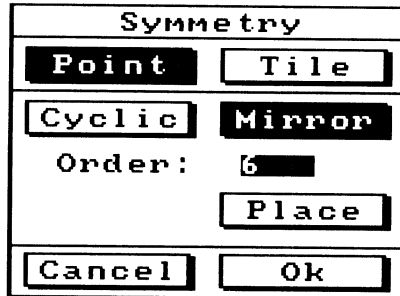
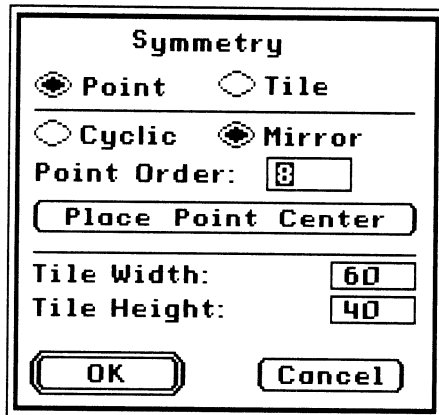


Figure 9-6. Apple IIGS Symmetry Box



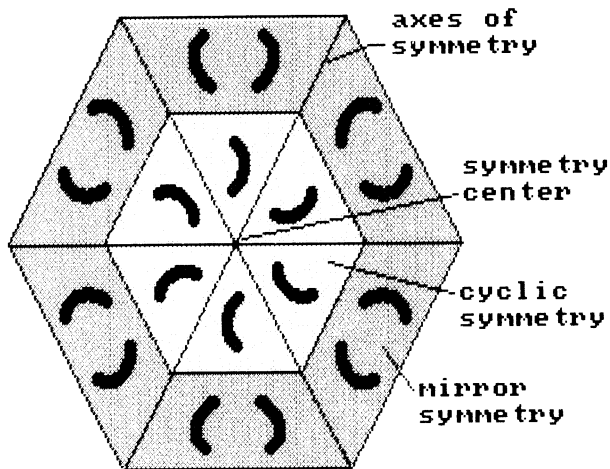
Mirror and Cyclic Symmetry

If you choose point symmetry, you have the further option of selecting between two kinds of point symmetry: *mirror* or *cyclic*. The difference is illustrated in Figure 9-7. In mirror symmetry, your brush has a mirror twin along every axis of symmetry, while in cyclic symmetry, the brush is repeated in a rotational manner—it looks as if it's orbiting or spiraling around the symmetry center.

Set the order, or number of axes of symmetry, by entering a

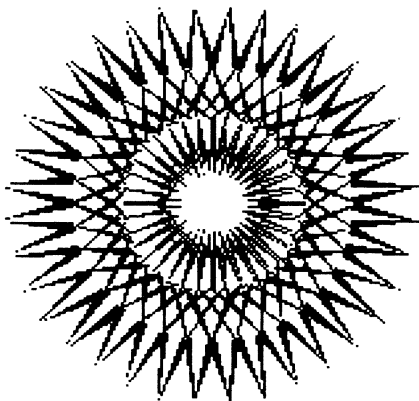
value of 40 or less in the Symmetry box's order gadget. An order of 6, as in Figure 9-7, yields 6 repetitions of the brush in cyclic symmetry, and 12 repetitions (six mirrored pairs) in mirror symmetry. The symmetry center can be located anywhere on the page by selecting the place gadget in the Symmetry box, moving the crosshairs to a new location, and clicking to confirm the new center.

Figure 9-7. Mirror and Cyclic Symmetry



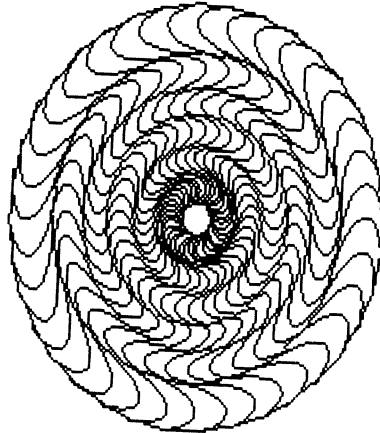
The symmetry modes are fun to play with. Here are a few experiments to try.

Figure 9-8. Sunburst

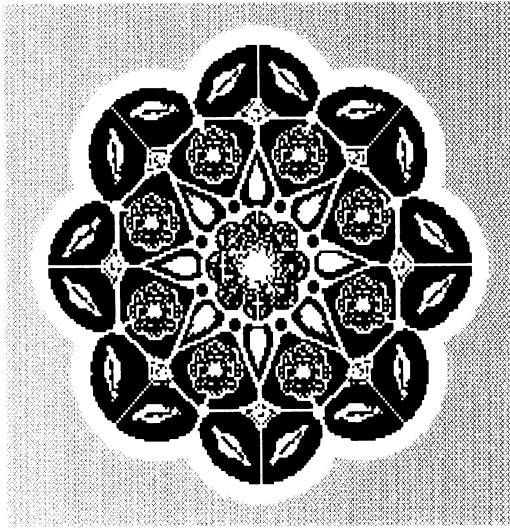


- * Draw a snowflake, with symmetry at the default settings of point, mirror, and order 6.
- * Use a wedge-shaped brush to make a sunburst like the one in Figure 9-8. What symmetry type and order were used to make this figure?
- * Try drawing a hexagon (six sides), octagon (eight sides), and nonagon (nine sides) using just one line. What symmetry type works best for this? How should the line be positioned on the page for the best results?
- * Create a spiraling pattern like the one in Figure 9-9 using cyclic symmetry, a high order, and the curved-line tool. What happens when you fill one of the spaces?

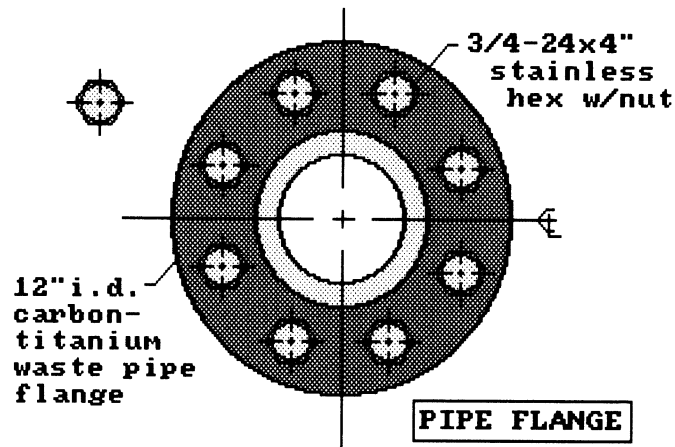
Figure 9-9. Cyclic Rosette



The medallion in Figure 9-10 (color version on plate 13) uses both kinds of point symmetry. The eightfold shape and inner structure are created with mirror symmetry. The eight small medallions surrounding the center are actually the large medallion picked up as a brush, shrunk with the stretch option, and placed with cyclic symmetry. The complex pattern in the very center of the medallion is random scribbling with mirror symmetry. The double leaflets in the outer lobes had to be placed individually by hand; try using an angled brush with the point symmetry options, and you'll see why.

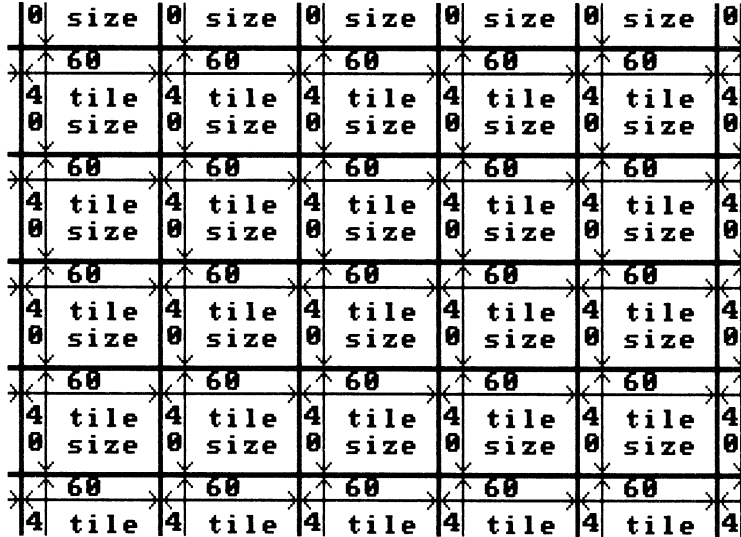
Figure 9-10. Medallion

The symmetry tool has its practical applications. With it, you can quickly draw any regular polygon, as you did above. And you can use it to space identical objects precisely around a center. This is a task that always comes up in mechanical drawings. Figure 9-11 shows an example. To make a similar drawing on paper, you'd have to lay down guidelines and centerlines for each bolt and then draw them one at a time. With *Deluxe Paint*, you can draw the bolt head once, pick it up as a brush, and then use cyclic symmetry to automatically position the bolt at its eight locations on the pipe flange.

Figure 9-11. Pipe Flange

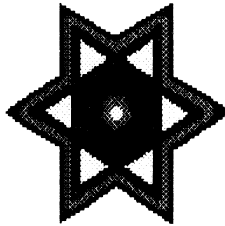
Tiling

The tile option in the Symmetry box divides the page into rectangular sections and places an identical copy of your brush in each one. If you are using an Amiga, select the tile gadget in the Symmetry box to bring up the Tile box, which shows the tiling information. Note that you can specify the size of the tile in pixels. The default tile values are 60 pixels wide and 40 pixels high. Click OK to leave that setting for now, and load any brush. Instantly you'll see the brush repeated in tiles like those in Figure 9-12, which shows the size of the default tile. Note that when you move the brush, all the tiles move too. To stamp down a tiled image, click the mouse button.

Figure 9-12. Tile Size

If your brush is larger than the default size, only part of the brush is displayed. To show all of the brush, resize the tiles by changing the height and width values in the Tile box until all of the brush is shown.

Here's how to make a tile pattern like the one in Figure 9-15 (an ancient design adapted for architectural ornamentation by the eleventh-century Seljuk Turks).

Figure 9-13. Seljuk Star

- * Draw the star in Figure 9-13. Use cyclic symmetry to draw the outline. The Seljuks favored a color scheme of lapis lazuli (deep blue-turquoise), pale green, ivory, and gold.
- * Pick up the star as a brush and stamp down four clones around it, as in Figure 9-14. Make sure the star centers are perfectly aligned—use scaffolding and center lines if you need them.

- * Now pick up a new brush exactly the size of the rectangle in Figure 9-14. The corners of the brush must coincide exactly with the centers of the four outer stars.
- * For the tiling to work properly with this brush, you've got to know the brush's exact dimensions in pixels. Turn on the coordinates and carefully measure the brush. The brush in Figure 9-14 is 140 pixels wide and 80 pixels high on a 320 x 200 pixel screen.
- * Clear the screen and turn on tile symmetry. Enter the brush dimensions in the Tile box. Click OK, and the page should fill with a seamless tile pattern. If there are extraneous lines in the tile, adjust the values in the Tile box until they disappear. To give the pattern thickness, like a metal screen, drag the brush with the freehand line tool. All the tiles will move with it. The completed pattern is shown in Figure 9-15.

Figure 9-14. Seljuk Brush

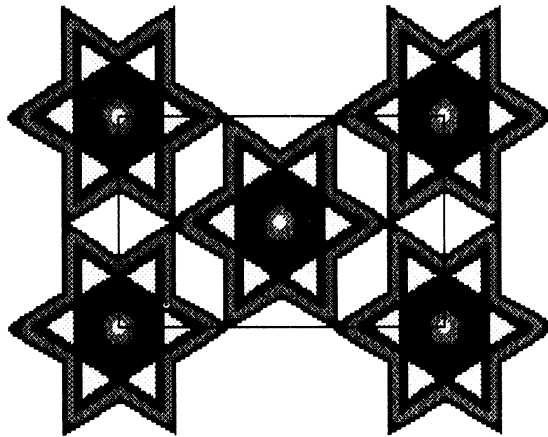
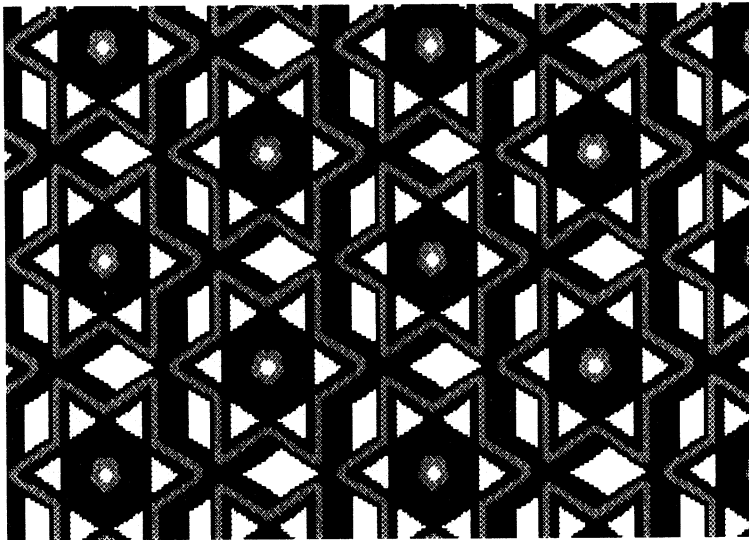


Figure 9-15. Seljuk Screen

Pattern Fill

Deluxe Paint's pattern-fill feature allows any brush to be the basis for a pattern that can be used to fill any enclosed area anywhere on the page.

Using pattern fill is much like using the other fill features. Pick up your brush, call up the Fill Type box (see Chapter 3 for an illustration), then click Pattern and FromBrush. The preview gadget in the Fill Type box shows you how the pattern looks. Click OK—from then on, the fill tool and the solid-shape tools fill with that pattern until you select another fill option. A small box in the menu bar tells you what fill option is currently selected.

Try drawing a few random shapes, then creating a fill pattern with a brush, and filling those shapes. The only hard part is constructing and picking up your brush to get a seamless pattern. If the brush has an extra line on one or more sides, that line is incorporated into the pattern (in fact, it will be doubled), even if the extra line was invisible when you picked up the brush because it was in the background color. You must pick up precisely the image you want to repeat, no more and no less.

Note that when you're creating a custom brush, the pixels under the brush-selection box are included in the brush. *Deluxe Paint* offers a special option, Excl Brush (in the IIGs and PC Brush menu, and in the Amiga's Prefs menu) that eliminates a one-pixel

wide border along the right and bottom edges of a custom brush, making it easier to create seamless patterns.

Many patterns require that each repeating element link up to the next in some way—for example, by sharing an area of color. You'll need to pay close attention to how your brush is constructed to get the pattern you want.

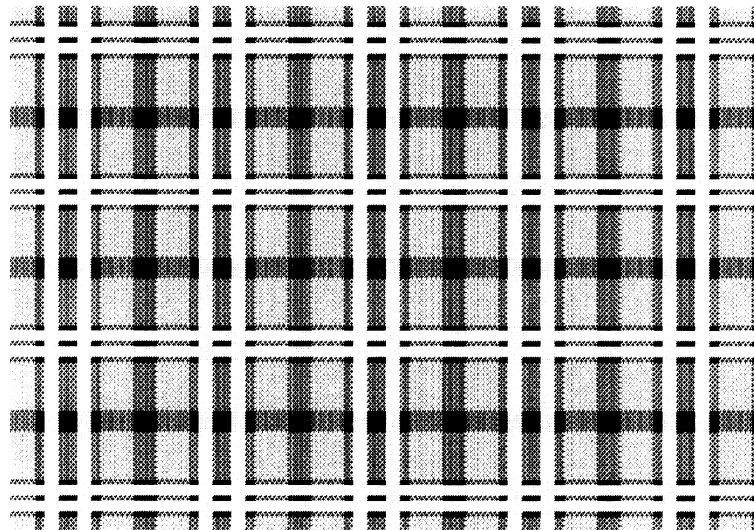
Look again at Figure 9-14, the Seljuk star brush. How would the tile pattern be different if just the central star were used as the basis for the tile? Try both and see. The same principle applies to brushes created for pattern fill.

Using Pattern Fill

You'll find an infinite number of ways to use pattern fill. Just a few applications are shown below.

Figure 9-16 is a plaid pattern. The original can be seen in Figure 4-15; note how the plaid is constructed to link with itself in a pattern. To get a sense of how a wide swatch of cloth would look in that plaid, an entire page is covered using pattern fill. At this stage, a textile designer could make fine adjustments in color to the plaid, or perhaps add an overplaid or other pattern on top.

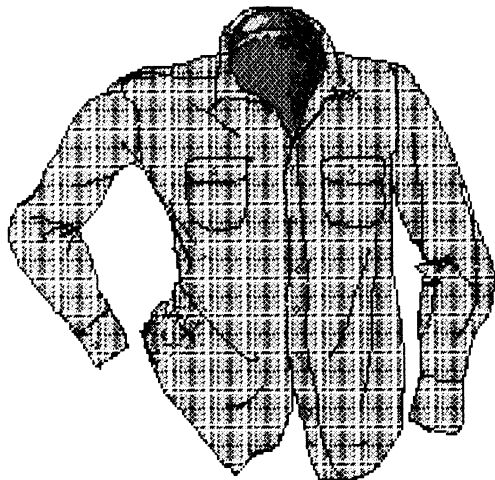
Figure 9-16. Plaid



A garment designer could then take the plaid, shrink it, and fill the outline of a shirt (as in Figure 9-17) to see how it would

look as part of a finished product. Notice that the plaid fills every area of the shirt, but it doesn't follow the shirt's contours, as a pattern on real cloth would.

Figure 9-17. Plaid Shirt

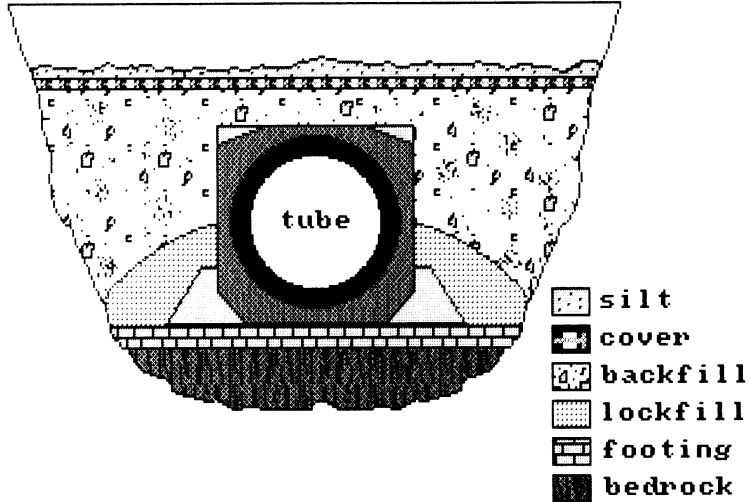


The geisha in Figure 9-18 (color plate 14) is wearing several layers of silk, each with its own pattern. All the patterns were added with pattern fill except for the floral pattern. This pattern was drawn in by hand with a flower brush so it would follow the contour of her robe. Mixing filled and hand-drawn patterns is a good way to add pattern variety. The snowy background was created with a simple fill pattern also.

Figure 9-18. Geisha Patterns

Another application for pattern filling is to differentiate areas in a technical drawing. The patterns chosen should relate to the materials they represent: a fill pattern to represent concrete should look like a sandy, stony aggregate; a brick pattern should indicate brick; and so on. Many materials have standard fill patterns already widely accepted for use in technical drawings; you can copy these for your own work.

In Figure 9-19, the undersea tube and its related structures are filled with different patterns. The patterns are keyed to a legend explaining their use.

Figure 9-19. Undersea Tube

There's one more pattern-fill type that hasn't been discussed yet—the perspective-fill feature. That's covered, as well as *Deluxe Paint's* other perspective effects, in the next chapter.

CHAPTER 10

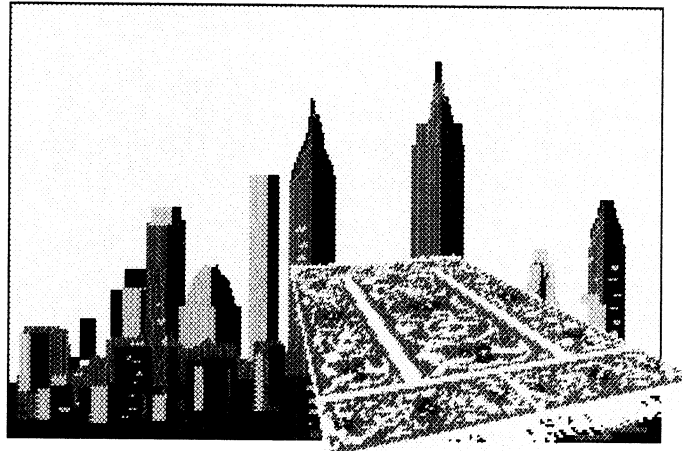
Perspective



The universe is three-dimensional, but canvas and computer displays are two-dimensional. Thus, artists seeking to present realistic imagery have developed systems of *perspective*, pictorial methods for representing spatial depth on a flat surface. There are several systems of perspective, but the best known and most geometrically complex is *linear perspective*.

In linear perspective, objects are drawn so they mimic the apparent decrease in size from foreground to background of real three-dimensional objects, just as the flying carpet does in Figure 10-1.

Figure 10-1. Flying Carpet



While the skyline looks flat (without depth), you perceive the carpet as existing in three-dimensional space, one end farther from you than the other. Linear cues like the convergence of the sides of the carpet, and other cues like the increasing compression of the carpet's design toward the narrower end, help you see

the carpet as an object in space, even though it's really just as flat as the background.

This kind of perspective, which was not perfected until the fifteenth century, is not easy to use, especially with complex, nonlinear imagery. It would take considerable skill and a taste for geometry to paint the floral pattern on the rug by hand so it receded convincingly into space. For this reason, most artists rarely use perspective in a rigorous way. But *Deluxe Paint's* perspective feature can put a rug and any other flat plane into perspective quickly and with a minimum of effort and skill on your part.

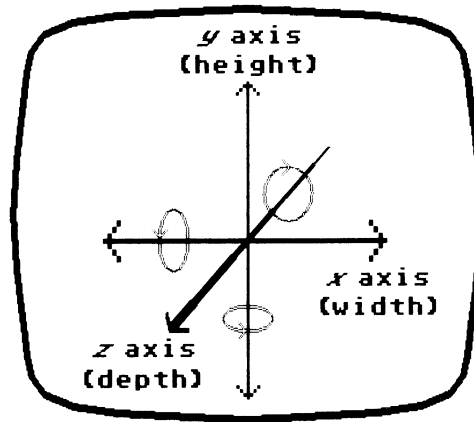
In this chapter you'll review the basics of perspective theory and learn several ways to create perspective views. Before you read on, you should work through the tutorial on perspective in Chapter 3 of your *Deluxe Paint* manual and scan the reference section on perspective in the manual's Chapter 4. Try the perspective exercises in the manual, such as creating cubes and making a row of homes, and make sure you're familiar with the menu and keyboard perspective controls. Note that perspective is the one major *Deluxe Paint* feature controlled mainly from the keyboard.

Perspective Theory

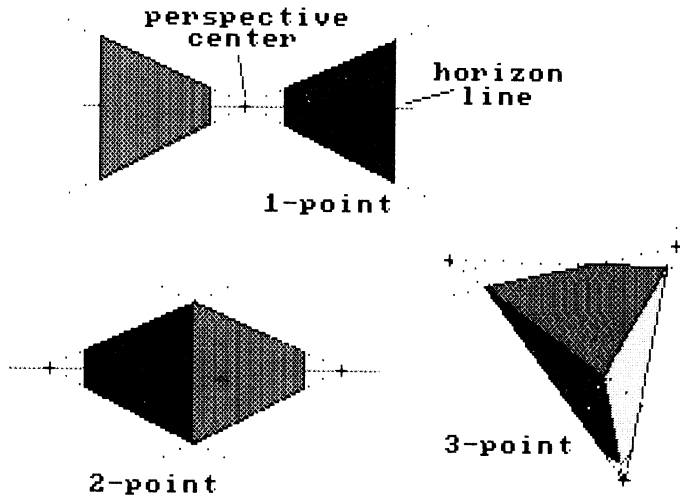
Linear perspective is really a matter of arranging lines to create the illusion of depth. Before drawing anything, however, you must establish a framework for describing location and movement in space. *Deluxe Paint* uses the x , y , and z coordinate system diagrammed in Figure 10-2.

Movement of an object along the x -axis is movement from side to side of the computer screen; an object rotated along the x -axis flips head over heels. Y -axis movement is along the vertical dimension of the screen; an object rotating on its y -axis spins like a top. Movement in depth—from close to the viewer to far away—is measured along the z -axis.

Z -axis rotation is like that of a windmill seen from the front. All rotations in *Deluxe Paint* are measured in angle degrees, and are displayed on the Amiga's menu bar and the PC compatible and IIGs Info bar when you're in Perspective mode.

Figure 10-2. X, Y, and Z Axes

Basic to linear perspective is the concept of the *horizon line*, which indicates the viewer's eye level, and the *vanishing point*, called in *Deluxe Paint* the *perspective center*. In one-point perspective, shown at the top in Figure 10-3, lines along the z-axis (that is, lines that directly indicate the object's depth) converge on a single perspective center. All objects appear to recede toward this point. Horizontal and vertical (x- and y-axis) lines also are affected by perspective, but indirectly; they don't converge on the perspective center, but they do bunch up as they get closer to the perspective center. Think of a line of telephone poles receding into the distance—the poles nearest to you appear to be far apart, but the ones approaching the horizon appear to be close together or even overlapping, although the space between them doesn't really change.

Figure 10-3. Perspective Types

Another type of perspective is two-point perspective (bottom left in Figure 10-3), also called *angular* or *oblique* perspective. This employs two perspective centers instead of one. This is the type of perspective used when you're drawing the corner of a building or other object seen at an angle. Three-point perspective (bottom right) is especially useful when the viewer is not at ground level but is above or below a three-dimensional object. For example, you would use three-point perspective to draw a skyscraper as seen from a helicopter flying over it.

One-point perspective is the standard mode in *Deluxe Paint*. You can set a perspective center anywhere on the page (or, if you're using an oversize page, anywhere on the page's visible area), and planes rotated at an angle automatically seem to recede toward it. Most two-point perspective views are possible as well—an edge-on view of a rectangular object like the one in Figure 10-3 can be made simply by drawing one side and then rotating it 90 degrees to make the other. Color plate 9 gives another example of this.

Creating true three-point perspective with *Deluxe Paint* is impossible, however. Each plane of an object in three-point perspective recedes toward two perspective centers at once, but only one *Deluxe Paint* perspective center can be active at a time.

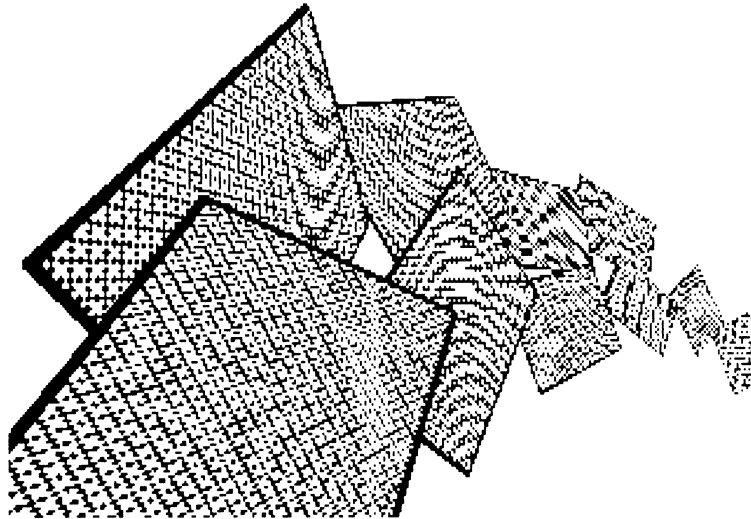
If you need to draw an object in three-point perspective, you'll have to do it manually by picking the three perspective

centers, drawing lines from them with the straight-line tool, and so on. That's what was done in Figure 10-3.

Wild Cards

Let's practice manipulating planes in space by creating a pack of flying cards like the one in Figure 10-4. Here's how.

Figure 10-4. Wild Cards



- * Find a playing card with a geometrical pattern on the back and draw the back of the card. Or create any pattern of your own and use it to fill a rectangle that's about twice as high as it is wide.
- * Pick up the card as a brush (make sure the brush-selection box coincides exactly with the outline of the card) and enter Perspective mode by pressing the Enter key on the numeric keypad (or the Ins key on PC compatibles). The brush is replaced by a four-part matrix. Set the perspective center about one inch from the right-hand side of the page and about two inches from the bottom. Now make sure all the axes are set to zero by pressing 0 on the keypad, or 7 on the main keyboard for the PC version.
- * Since the cards overlap, nearer in front of farther, you must start with the farthest card (farthest along the z-axis) and work out to the nearest card (the one at lower left). Move the matrix

to the right, and then use the shifted ' (apostrophe) key to move into the picture until the matrix is quite small. Click to paint the first card.

- * Now you can paint the rest of the cards. Move the matrix a bit to the left and toward the viewer (with the shifted ; [semicolon] key), then rotate each card along its *x*, *y*, and *z* axes (using the numeric keys on the keypad if you are using an Amiga or IIGs, the number keys on the main keyboard if you are using a PC compatible) to give the appearance of random tumbling. Note that the brush rotates around its brush handle. The final card should look as if it's flying right under the viewer's nose. If you need to touch up your work, you can exit perspective by selecting any other drawing tool and brush.

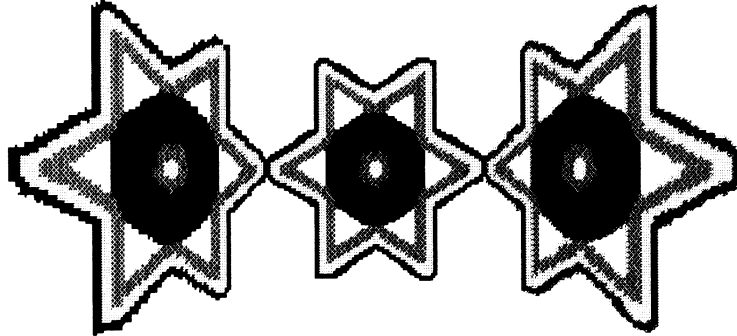
Antialiasing

You've probably noticed that the diagonal pattern on the back of the cards in Figure 10-4 is subject to a moire-type distortion. Try this experiment: turn on the grid, draw a patch of gridding with the straight-line tool, pick it up as a brush, enter the Perspective mode, and rotate the grid brush 45 degrees along the *y*-axis.

What happens to the grid when it's painted in perspective?

This distortion is an artifact of the way *Deluxe Paint* plots perspective, and there's not too much you can do about it. You can exit perspective and fix it by hand, or simply avoid using grids and diagonal patterns in perspective. In general, the effect is less noticeable in higher-resolution screen formats (640 × 400 or 640 × 480). Square pixels are less affected than rectangular ones.

Another kind of distortion occurs when brushes are put into perspective. They acquire staircased or *aliased* edges, just as if they were rotated at an odd angle. There *is* something you can do about this. *Deluxe Paint* contains an *antialiasing* feature, a process that automatically smooths out the entire image, including ragged edges, in much the same way the Smooth feature in the Mode menu does. Antialiasing works as shown in Figure 10-5. The star on the left is not antialiased, but the one on the right is. The right star is noticeably smoother than the one on the left.

Figure 10-5. Antialiasing

You can antialias any brush by first choosing the appropriate option in the Amiga's Perspective submenu, the PC compatible's Brush menu, or the IIG's Perspective Options box, then entering Perspective mode, and finally stamping down a copy of the brush. Two levels of antialiasing, low and high, are available. Both slow down the painting of a brush considerably. Another tradeoff is that antialiased images lose some of their sharpness. If clean lines and color transitions are important for your image, it may be better not to antialias the whole brush, but to clean it up with small brushes set to Smooth.

Perspective Text

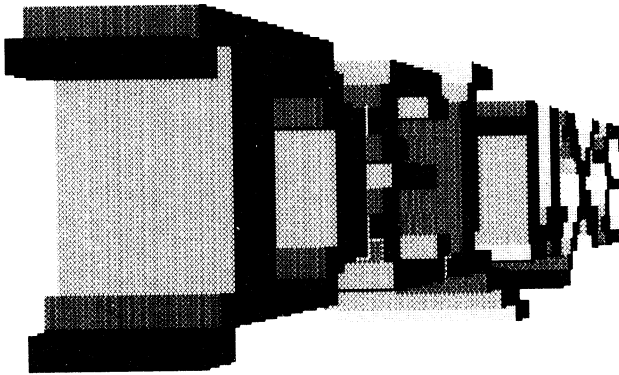
Some interesting and relatively easy tricks can be done with text put into perspective. Try this:

- * Set the background color to black, and type a paragraph or two of text—say, the Gettysburg Address—in gold letters on a black background.
- * On the spare page, draw a star field. Set the airbrush to a wide diameter and use a one-pixel brush to create clusters of stars.
- * Return to the first page, pick up the text as a brush, and enter Perspective mode. Rotate the brush along the *x*-axis until its top seems to recede into the upper middle distance.
- * Stamp down the text over the star field on the spare page. You now have a facsimile of the titling effect used in some very well-known science fiction films.

Figure 10-6 illustrates another use of text in perspective. The original word *DELUXE* was typed, using one of the Amiga's

built-in fonts, then expanded to several times normal size. The letters were outlined in various colors, with each stairstep in the letters given its own color. The word was then picked up as a brush and rotated in perspective along the y -axis. Finally, perspective was turned off, and the word was picked up as a brush again and dragged to the right with the straight-line tool. The result has both monumentality and three-dimensionality. See color plate 9 for another example of perspective text.

Figure 10-6. Perspective *DELUXE*



Using the Grid in Perspective

As you may already have discovered, it's not easy to position brushes in perspective with precision, especially if you want to put two or more brushes together at different perspective angles or space them exact distances apart. The grid tool, which is active in Perspective mode, can be very helpful for this.

Enter the Perspective mode and right-click on the grid tool to bring up the Perspective Grid box. The Amiga version is shown in Figure 10-7 and the Apple IIGS version in Figure 10-8. PC compatible users should refer to Figure 10-8, as the PC version is functionally identical to the IIGS version.

Figure 10-7. Amiga Perspective Grid Box

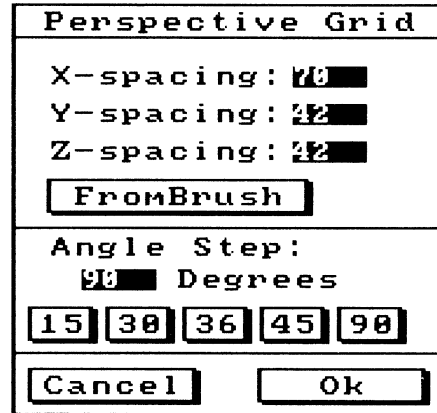
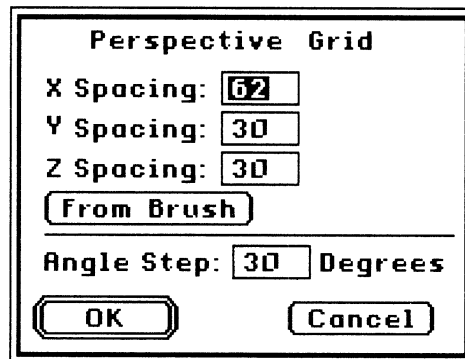


Figure 10-8. Apple IIGs Perspective Grid Box



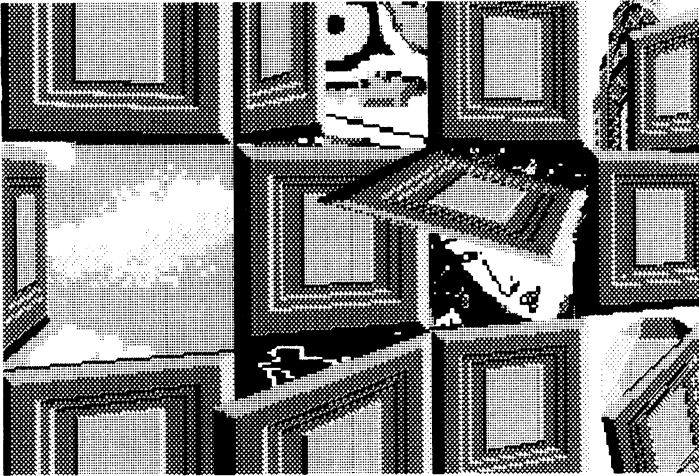
The Perspective Grid box lets you set the spacing of the grid along all three axes, either by typing a value (in pixels) in the spacing gadgets or by taking the spacing directly from the brush dimensions. Unless you specify otherwise, the z value defaults to the y value.

You can also set increments of brush rotation in perspective. These apply when you use the axis-rotation keys on the numeric keypad while pressing the Shift key. Normally your brush rotates 90 degrees (the default value), but you can specify any other increment of rotation in degrees.

A basic application of the use of the grid in perspective is illustrated in Figure 10-9. Arranging the panels to line up exactly, even when rotated, is a task made far easier with the grid. For

this picture, the grid spacing is set to the brush size (the panel is a square, but any other shape can be used) with 15 degrees as the selected increment of rotation. The perspective center is set at the center of the page. The panel brush is grabbed by the lower right corner (in general, you should pick up any brush by the corner when you're planning to use perspective) and rotated 15 degrees on the y -axis.

Figure 10-9. Panels



Once the grid is on, the brush snaps to the grid no matter how it is rotated, and the grid always conforms to the spatial orientation of the brush. You can't paint the brush in one orientation, and then change the perspective of the brush while keeping the grid orientation the same as it was before.

The open panels are made by rotating the panel brush more than 15 degrees around the y -axis, or by rotating it along the x and z axes as well. To get them to open along different edges, you must change the corner the brush handle is on. You can do this by rotating or flipping the brush with the Brush menu, but that makes the brush look upside down or inverted. With the panels in Figure 10-9, it's not a big problem, since they're square and nearly symmetrical. Other brushes, however, may not look right in a different orientation. The geisha, hawk, and other pictures in Figure 10-9 can be slipped in behind the panels using the Stencil tool.

Using Perspective for Architectural Rendering

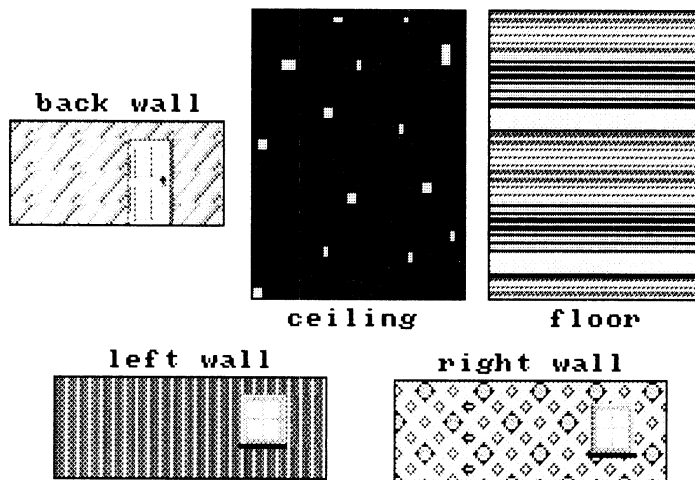
The Renaissance painters developed linear perspective to help them render architecture with maximum fidelity to its actual appearance. Today, that's still its main application. The next two exercises use *Deluxe Paint's* perspective tool to create an interior and an exterior scene.

A Patterned Interior

Let's use perspective to create the inside of a room.

- * First, you need drawings of the room's five visible walls: left and right walls, back wall, ceiling, and floor. The sixth wall is behind the viewer and thus invisible. The walls are shown in Figure 10-10.

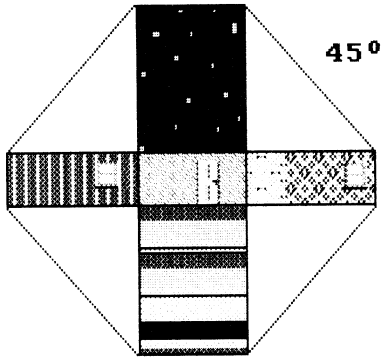
Figure 10-10. Interior 1



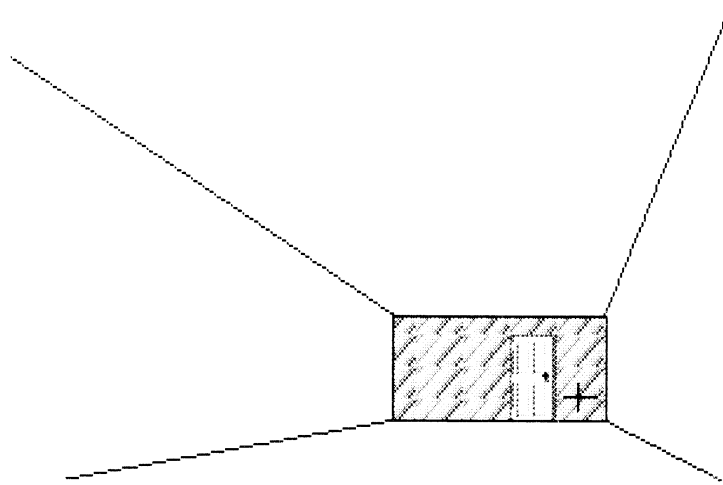
- * To fit together properly, walls, floor, and ceiling have to be in the correct proportions. Think of the room as an open-ended box. If you cut open and flatten out such a box, you'd see something like Figure 10-11. The left and right walls are the same size, as are the ceiling and floor. The height of the floor and ceiling must be the same as the width of the left and right walls. The back wall is the width of the floor and ceiling and the height of the left and right walls. Draw a line at a 45-degree

angle to check the accuracy of your drawing, as you see in Figure 10-11.

Figure 10-11. Interior 2

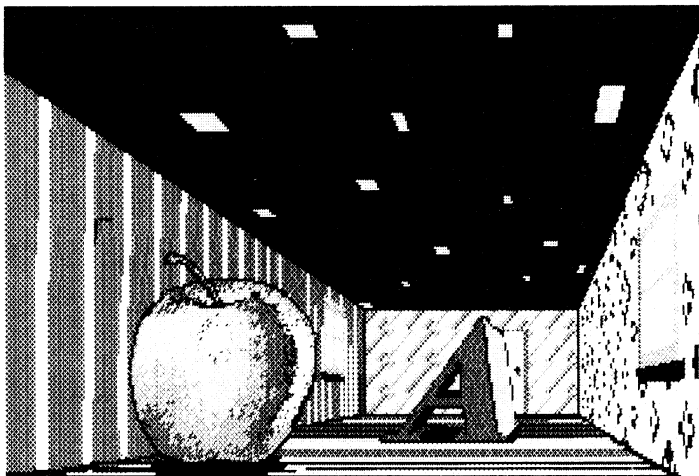


- * Set up an outline of the room to see how it will look. Paint in the back wall and pick a location for the perspective center. (Don't actually place the center yet.) Draw lines that originate at the perspective center and intersect the four corners of the back wall, as in Figure 10-12. These lines represent the intersection of the ceiling, floor, and left and right walls. To change the view, relocate the back wall and the perspective center, then draw new lines until you're satisfied with the effect. If objects are going to be in the room, make sure the perspective of the room and the perspectives of the objects correspond.

Figure 10-12. Interior 3

- * Now enter Perspective mode, set the perspective center, and paint in the panels of the room, right over the drawing with the outlines. Pick up the left wall with the brush handle at the right-hand corner and line up the right edge with the left edge of the back wall. Rotate the wall counterclockwise along the y -axis until it fills the outline. Do the same for the right wall, but pick it up with the brush handle at the lower left corner, line it up with the right edge of the back wall, and rotate it clockwise. The ceiling and floor are aligned with the upper and lower edges of the back wall and then rotated along the x -axis. Finally, use small brushes and erasers to clean up any areas along the wall intersections that look a bit ragged. The result is a perspective interior like the one in Figure 10-13.

Figure 10-13. Interior 4

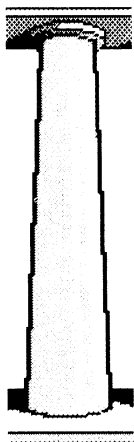


An Abandoned Temple

You can use perspective to make all kinds of exterior scenes. Here's how to make a perspective picture of an abandoned Greek temple:

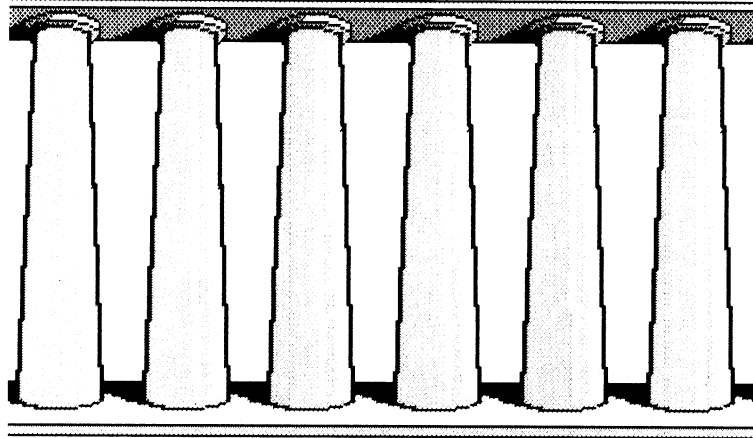
- * Start by drawing a column, as in Figure 10-14. It should have a minimum of vertical lines—that means no fluting—because *Deluxe Paint's* perspective feature distorts parallel vertical lines more than others. Give the column a capital (top), a base, some shading, and shadows.

Figure 10-14. Columns 1



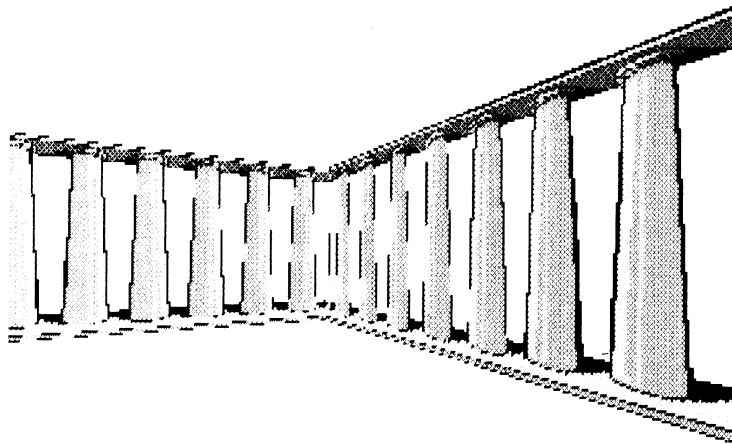
- * Pick up the column as a brush and make a colonnade the width of the page (see Figure 10-15). Note that the shadows on each of the columns fit together with the shadows on either side.

Figure 10-15. Columns 2



* Pick up the colonnade as a brush with the handle at lower right. Enter Perspective mode. Set the perspective center just to the left of the center of the page. Move the perspective matrix back along the z-axis until it appears to be some distance away. Rotate the left edge forward along the y-axis about 15 degrees, so it looks like the farther wall in Figure 10-16. Stamp down that brush. Now, without moving the mouse at all, rotate the matrix counterclockwise 90 degrees along the y-axis and stamp it down. You should now have the two walls of Figure 10-16. (Note that the shading and shadows of the right-hand colonnade are all reversed.)

Figure 10-16. Columns 3



- * To create the nearest wall, move the matrix toward the right-hand side of the page until its left edge coincides with the right edge of the right-hand colonnade. Without moving the mouse any further, rotate the matrix clockwise on the y -axis about 80 degrees. Stamp that brush down. Figure 10-17 shows how this should look—a rectangular colonnade enclosing an empty interior space.

Figure 10-17. Columns 4



- * Now for the final touches. First, use the fill tool and some small built-in brushes (you can exit the Perspective mode) to reverse the shading on the second colonnade you made. Change the direction of the shadows on that colonnade as well.
- * Paint in a background. Make a stencil from the colors of the colonnade so you can paint behind the temple, which should appear to be situated on a mountaintop.
- * The columns will cast shadows, so some can be added to the ground within the temple. Use the angle of the shadows on the colonnades to help you gauge the angles of the shadows on the ground. In Figure 10-18 the lighting comes from upper right. The shadows help give the abandoned temple an air of desolation.

Figure 10-18. Columns 5

One thing you'll have noticed in creating this temple is that the colonnades stay resolutely flat—they look like paper cutouts of columns in perspective, rather than real, round columns. Keep in mind that *Deluxe Paint* deals with planes only, not three-dimensional objects. Anything *Deluxe Paint* shows in perspective will look flat as a pancake.

Filling with Perspective

Deluxe Paint gives you the option of filling enclosed areas with patterns in perspective with the perspective-fill feature (selectable from the Fill Type box). The Amiga and PC compatible versions also offer a Fillscreen menu option that fills the entire page. Both fills use the current brush at its current perspective.

Figure 10-19 demonstrates the Amiga/PC compatible Fillscreen feature. It was made by rotating a six-panel brush (with the Chrysler Building at upper left and the polyhedron at lower right) along the x - and z -axes, and then choosing the fillscreen feature.

Deluxe Paint automatically (and slowly) fills the entire page with a pattern from the brush. Try this with one or more of your own brushes at various angles of rotation. This feature is an encouragement to create all kinds of surreal science fiction-like vistas with objects endlessly repeating into infinite space.

Figure 10-19. Fillscreen

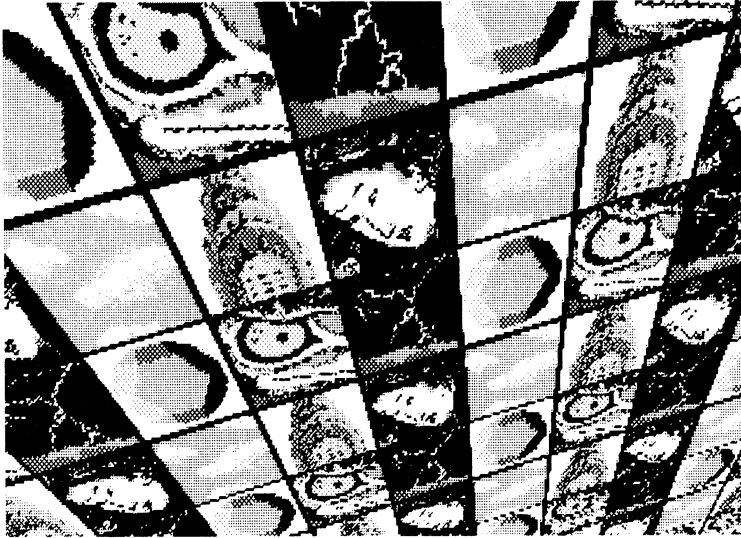
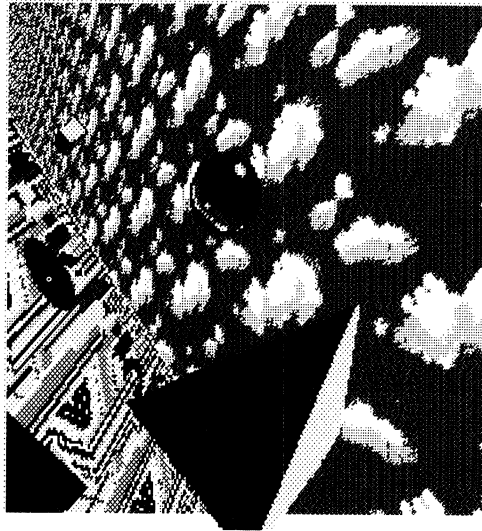


Figure 10-20 shows a case in point. The cloudscape area is filled with perspective fill, as is the slanted plane of electronic circuitry (one side of a pyramid). Orbiting around the pyramid are Electronic Arts' geometrical mascots—the cube, sphere, and tetrahedron.

See color plate 15 for a variation on this theme.

Figure 10-20. We See Farther

Perspective is *Deluxe Paint's* most complex feature, one that even the program's creator, Dan Silva, says he hasn't explored to its fullest. The few projects presented here only scratch the surface of perspective's possibilities. In the next chapter we'll tackle a final project that involves not only perspective, but the rest of *Deluxe Paint's* amazing tools as well.



CHAPTER 11

**Creating a *Deluxe*
Paint Picture**



By now, you've seen what *Deluxe Paint* can do. Its tools are impressive, and its flexibility is nearly infinite. But, even though *Using Deluxe Paint* has shown you many examples of art and graphics created with the program, you have yet to see the *process* of art with *Deluxe Paint*.

This chapter is a step-by-step guide to applying *Deluxe Paint's* computer-age tools to a very traditional graphic project—a landscape. In this case, it's a landscape of Ponte Vecchio, a bridge over the River Arno in Florence, Italy. You'll need to use the basic drawing tools: the custom-brush tool, the palette controls, various painting modes, magnify, stencil, the spare screen, pattern creation and filling, and perspective.

Set the Palette

Before you begin, set up your palette. (You can modify it later, of course.) This project has been designed with 16 colors. If you have an Amiga or are using the 256-color MCGA screen format, you can add more colors in between or in addition to the ones defined below.

The Tuscan landscape is famously luminous, so you'll want to use glowing, saturated colors: cream, salmon, pale gold, and brick red for the bridge and other buildings; deep blue-greens for the waters of the Arno; green-golds for the distant hills; and cerulean, white, and light gray for the sky and clouds. White (Amiga RGB 15-15-15) serves as the background color. Here's a table that gives the suggested palette settings in Amiga RGB format.

Table 11-1. Palette Settings

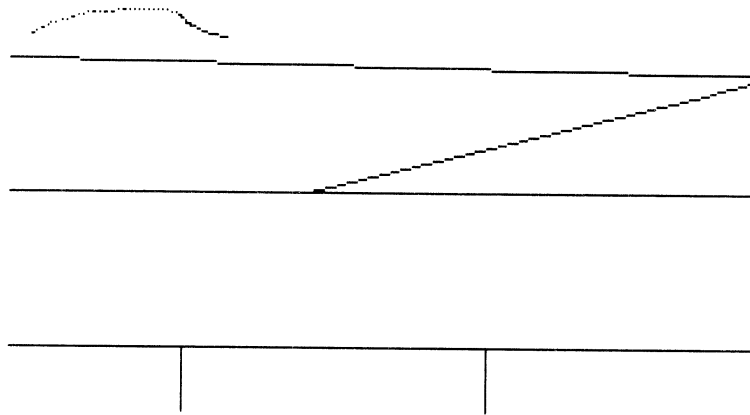
Color #	R	G	B
0	0	0	0
1	15	15	15
2	15	13	13
3	15	14	12
4	13	11	7
5	7	0	0
6	0	7	9
7	0	5	6
8	0	3	4
9	10	10	5
10	9	5	0
11	7	9	4
12	3	5	0
13	12	14	15
14	9	14	15
15	12	12	12

One

As with any complex picture, first plan your composition. You can use scaffolding lines as in Figure 11-1, recognizing that these are just guidelines, not instructions carved in stone. The solid horizontal parallel lines outline the bridge itself, and the dashed receding lines define the riverbank, the roof line of the buildings along the bank, and an indication of distant hills. Although there's no visual indication yet, assume the light is coming from the upper left and that it's a typical sunny day.

It's good practice to save a copy of your composition plan as a separate file so you can refer to it later and draw over it in different stages.

Figure 11-1. Outlines

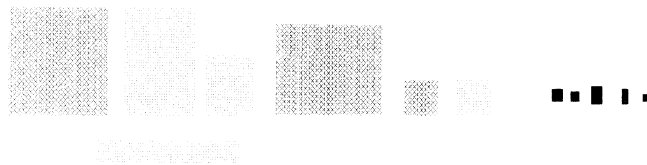


Two

It's usually best to start with the more distant or background areas of the picture and work toward the foreground. Begin with the riverbank buildings since these will be partly obscured by the bridge itself. As you work, you may want to fix the background periodically (if this option is available to you) so it's protected from mistakes you may make in the foreground.

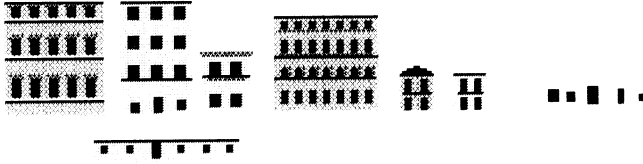
First, block out some building façades with the filled-rectangle tool. The small black rectangles are windows made with built-in brushes.

Figure 11-2. Buildings 1

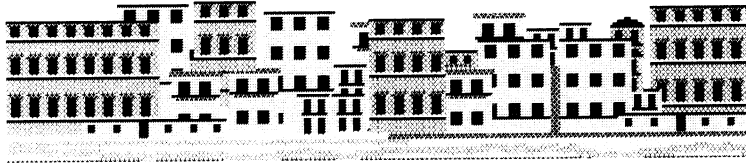


Three

Note the characteristic size and placement of the windows and other details. Leave off the roofs for now—you'll put them in by hand later.

Figure 11-3. Buildings 2**Four**

Create a row of buildings by picking up the façades you've created as custom brushes. Mix sizes and heights, working right to left (making sure buildings only overlap the structures to their right) and back to front. Add an embankment at the bottom.

Figure 11-4. Buildings 3**Five**

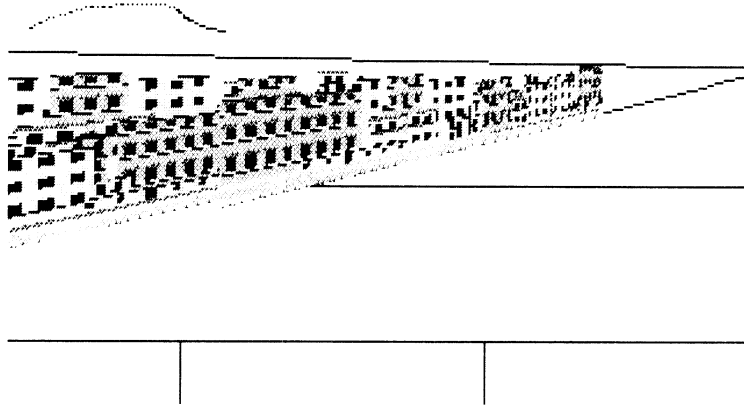
Use the row of buildings to create a skyline in perspective.

- * Load your composition outline onto the spare page.
- * Return to the other page and pick up the row of buildings by the lower left corner (use the Corner Brush option).
- * Enter perspective mode. Move the perspective center to the upper right corner.
- * Position the perspective matrix in the middle of the page within the diagonal converging lines.
- * Set the y -axis rotation to about 70 degrees (the Menu/Info bar display should read 0, 70, 0).
- * Use the semicolon and apostrophe keys to move the brush toward or away from you until it fits within the lines. Click to paint.
- * Return to the other screen and pick up the central part of the row of buildings, this time by the right-hand corner.
- * Switch to the main picture, reenter Perspective, and, using the same angle of rotation, paint this brush to the left of the first brush so the row extends to the left margin of the screen.

Let's put some buildings behind the row on the screen now. Without leaving perspective, turn on the stencil tool and lock all the colors except background white. Now you can slip a partial row behind the existing buildings. The result should look like Figure 11-5. Don't worry too much if the building angles and edges don't align perfectly—your eye expects complexity in a scene like this.

Also keep in mind that while the rest of the picture will also be in perspective, you, not *Deluxe Paint's* perspective tool, have to supply the illusion of depth. Make sure any lines along the z-axis (that is, lines that travel from foreground to background) appear to recede toward the perspective center (the vanishing point) you set above.

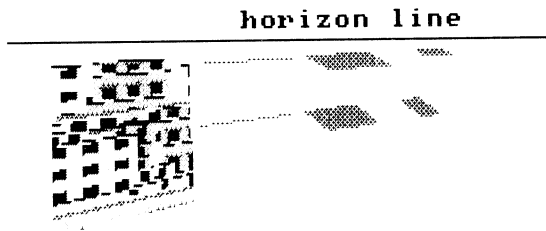
Figure 11-5. Buildings 4



Six

Add roofs and sides to the buildings. Roofs are easily made by drawing a short line (in brick red), picking it up as a brush, switching on the straight-line tool, and drawing a short polygon. See Figure 11-6. Note that the angle of the roof becomes more horizontal as you approach the horizon line.

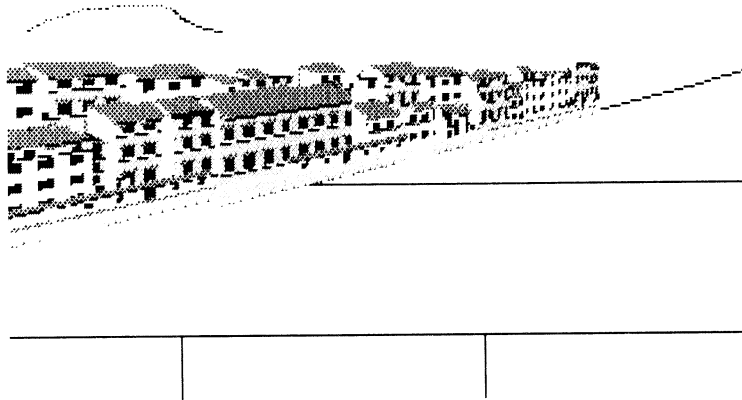
Figure 11-6. Roof Angles



Seven

Once the roofs are on, the buildings become more well-defined. Give them individuality and three-dimensionality by adding sides in white or very light cream (remember the sun is coming from the upper left). Draw these sides with lines and small built-in brushes.

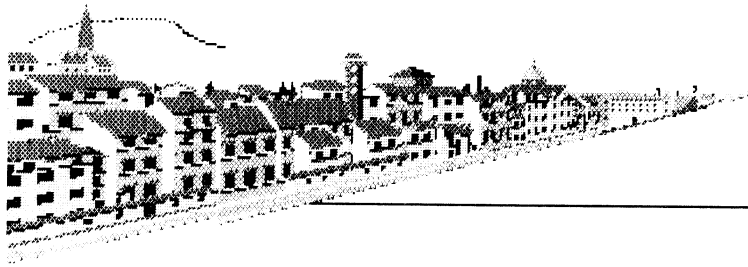
Figure 11-7. Adding Roofs and Sides



Eight

Landmarks are needed to make the cityscape uniquely Florentine. Add church spires, bell towers, and domes, sprinkle in chimneys and treetops, and extend the buildings to the vanishing point at the right margin of the page.

Figure 11-8. Landmarks



Nine

Paint in the hills in the background. Create a stencil of the building colors so what you've done so far won't be disturbed in this and the next step. Erase the old guideline for the hills and remodel it as shown. Use the Smear option to soften the shading on the right side of the hills.

Figure 11-9. Hills



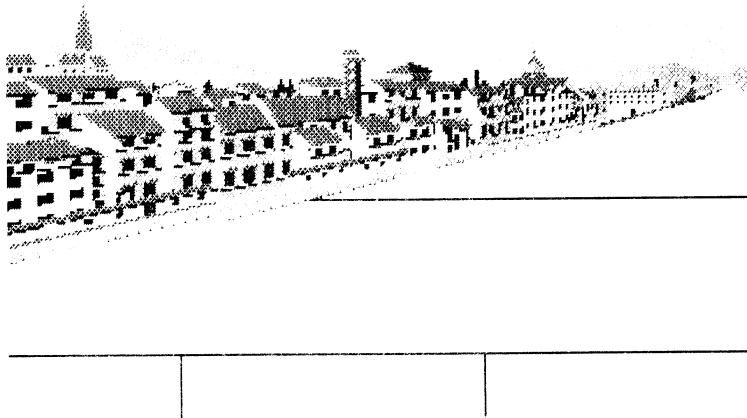
Ten

The sky can be added next. Create a range of sky blues (there are two in the suggested palette) and then fill the upper area of the picture with a blue horizontal gradient, shading from darker at

the top to lighter at the horizon (the black-and-white illustration doesn't show this). Be sure to set the gradient mix so the color transition is spread over a wide area.

Or you can simply fill in the sky with a solid color, like the lighter sky blue. Paint in the clouds with a round built-in brush and the dotted-line tool or use the airbrush set to a narrow nozzle; then use Smear and Blend to fluff them up. If you like, give the clouds body with a little gray on the undersides.

Figure 11-10. Sky

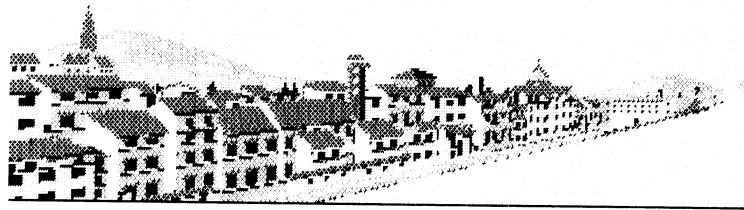


Eleven

Use the darker blue-greens to paint in the river. Use the solid-fill tool to add a darker shade at the bottom and a lighter shade at the top. You'll add detail to the water's surface later.

You can also block out the main bridge shape now, obscuring part of the row of buildings. First, however, turn off the stencil you made earlier.

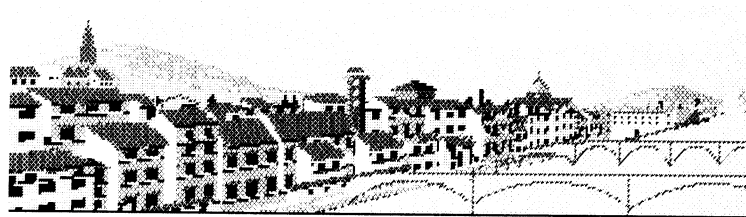
Figure 11-11. Water



Twelve

There are several other bridges over the Arno. Let's put them in now. First, position them with some scaffolding lines. Draw the arches with the curve tool.

Figure 11-12. Bridges 1

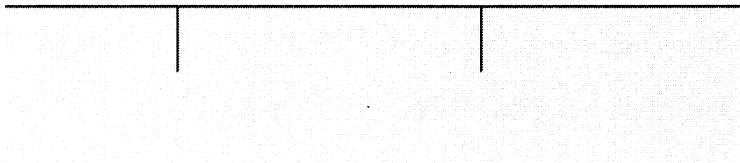


Thirteen

Use browns and gray to model the bridges. The more distant bridge should be generally lighter in color. Use Magnify to help you work on these small structures.

In the far distance, add another bridge using just lines.

Figure 11-13. Bridges 2



Fourteen

At last you can work on the Ponte Vecchio itself. First, create a pattern for the tiles on the roof of the bridge. Use black lines over brick red.

Draw a brick-red solid rectangle and then draw some horizontal and vertical lines over it. These should be roughly parallel, but a little ragged—not at all gridlike. Pick this up as a brush and shear it to about a 60-degree angle (shown at 2× magnification).

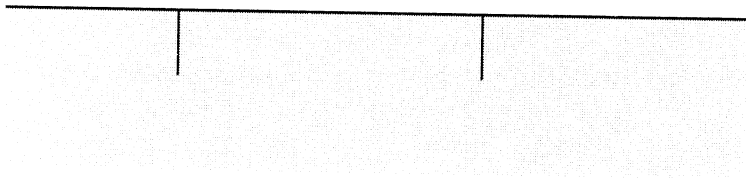
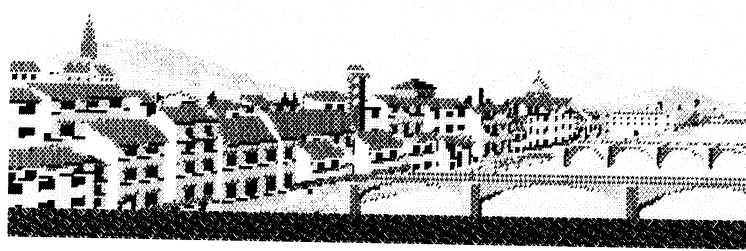
Figure 11-14. Roof Tile Pattern



Fifteen

Pick up a rectangular section of the pattern as a custom brush. Select Pattern Fill/From Brush from the Fill Type box. With the filled-rectangle tool, draw a long rectangle along the upper edge of the bridge area to create an instant tiled roof.

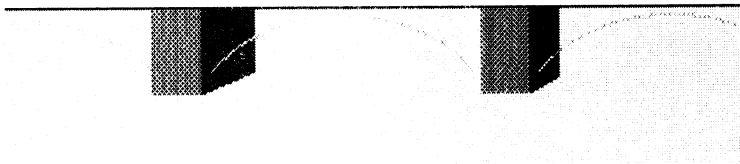
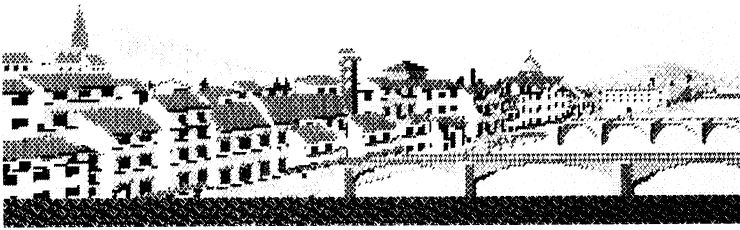
Figure 11-15. Ponte Vecchio Roof



Sixteen

Flesh out the bridge supports with solid rectangles and polygons. Draw the arches with the curve tool.

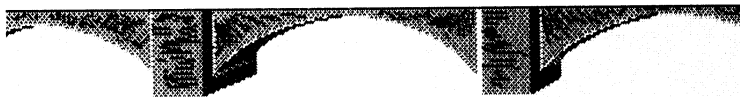
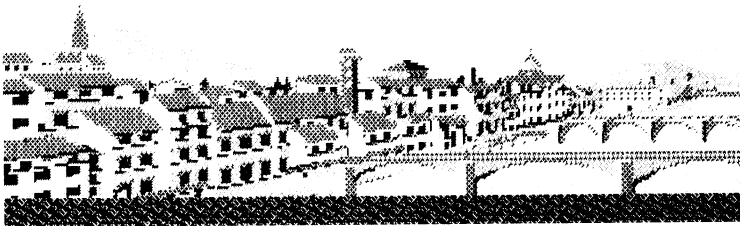
Figure 11-16. Ponte Vecchio Pilings 1



Seventeen

The finished pilings have lines on them to give the effect of stone blocks.

Figure 11-17. Ponte Vecchio Pilings 2



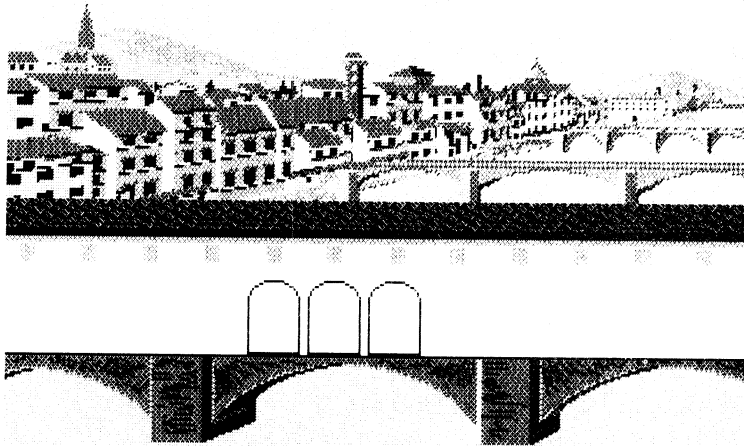
Eighteen

Now for the covered part of the bridge.

Add a shadow line just below the tiled roof with the straight-line tool. Use a thick line of black, then one of gray or brown. Smooth the lower edge of the shadow with a medium, square, built-in brush set to the Smooth mode.

Create an archway; then clone it twice with the custom-brush tool and position the three as shown. Paint in a row of windows just below the roofline; note that the windows are aligned with the middle of the archways.

Figure 11-18. Ponte Vecchio Façade 1



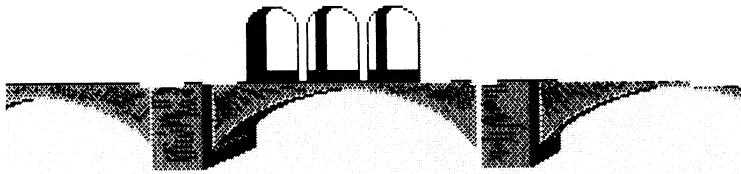
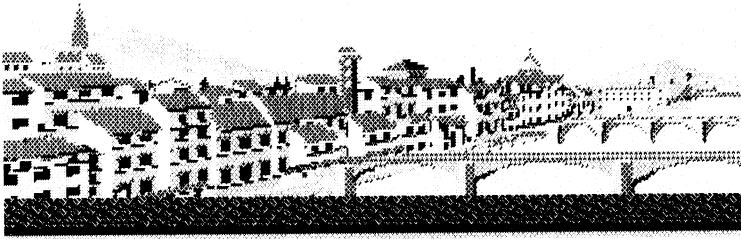
Nineteen

The archways are open, so you have to show the other side.

Make a brush of the three arches and then add a temporary tint to the bridge face (gray is fine) with the solid-fill tool. Don't fill the inside of the arches. Make a stencil of all the colors except background white; then slip the arches brush behind the already painted ones as shown in the figure. Turn off the stencil, take away the temporary tint by filling with the background color, and fill the bridge interior with black.

At this time you can also start blocking in additional structures.

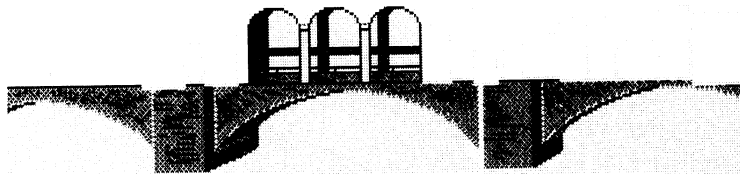
Figure 11-19. Ponte Vècchio Façade 2



Twenty

Additional work on the arches brings out detail in the walkway, railings, and pillars of the archway. Water can now be seen through the openings.

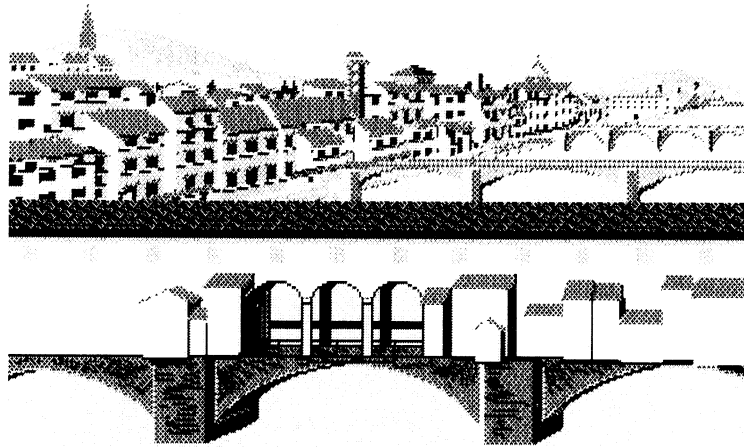
Figure 11-20. Ponte Vècchio Façade 3



Twenty-One

Paint in roofs and sides of the buildings on the bridge, just as you did with the riverbank buildings.

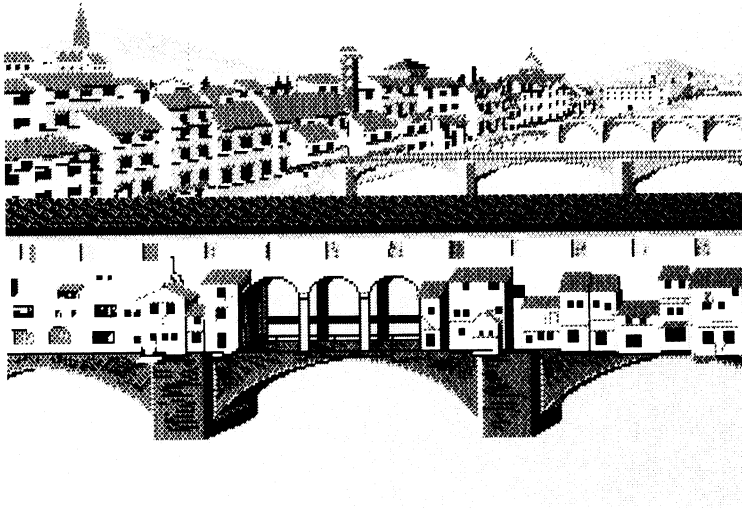
Figure 11-21. Ponte Vècchio Façade 4



Twenty-Two

Windows and fine details of shading complete the bridge. To add texture, lightly sprinkle it in a neutral color with the airbrush set to a one-pixel brush and a wide spray.

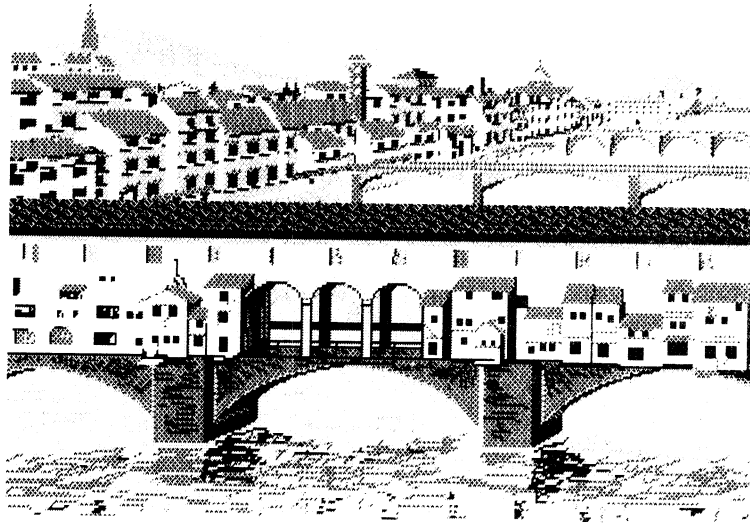
Figure 11-22. Ponte Vècchio Façade 5



Twenty-Three

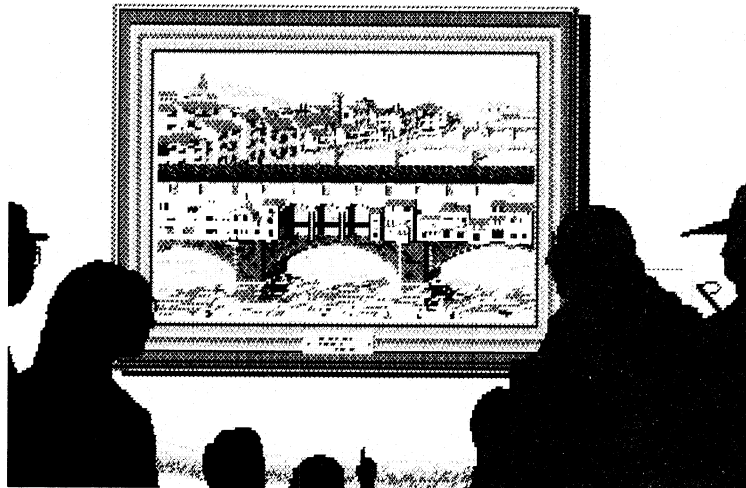
In the final step, add reflections and a rippled surface to the water. Quick sketching motions of the mouse with a one-pixel brush produce credible ripples and watery reflections. When working on reflections, include colors from the structure that's being reflected. Refer to color plate 16 for the full-color version of this picture.

Figure 11-23. The Finished Ponte Vécchio



Of course, you needn't stop there. Frame your painting and put it in a salon, with any number of admirers.

Figure 11-24. In the Gallery



In Conclusion

With this project you've pulled together the basic *Deluxe Paint* techniques discussed in this book. But you've only scratched the surface of what is possible with this powerful program. With so many tools and features at your disposal, it's unlikely that you'll ever exhaust the technical means that *Deluxe Paint* offers. There is unlimited opportunity to make discoveries on your own. If you're a novice artist, your study of *Deluxe Paint* techniques will give you a congenial way to educate yourself about art techniques in general.

Most of the techniques discussed in how-to books on drawing, painting, and design apply to art created with *Deluxe Paint*. More valuable is the examination of existing works of art to learn how other artists solved problems: how the Renaissance painters modeled the figure and used perspective; how the Impressionists depicted the effects of light and color; how the medieval Persian miniaturists used patterns to enclose and enhance their illustrations; how the Chinese developed atmospheric perspective to its highest level; and how modern design illustrators render gleaming surfaces and use text to enhance their images. Copy what you see; then develop variations and hybrids as you move toward your own visual style. This will likely turn into a lifelong journey.

You'll need to use all your vision, sensibility, determination, and courage. If you do, *Deluxe Paint* can help you to a new understanding of art and of yourself as an artist.

CHAPTER 12

***Deluxe Paint III* for
the Amiga**



Dan Silva and company at Electronic Arts have not been content to rest on their laurels with *Deluxe Paint II*. Early 1989 saw the release of *Deluxe Paint III* for the Amiga. This enhanced version has many new features that *Deluxe Paint II* users have been asking for, and some that are entirely unexpected. In this chapter we'll look at these evolutionary and revolutionary changes.

Menu Changes

Most of *Deluxe Paint III's* menus and options remain unchanged. However, there are two important differences. First, the Font menu has been removed entirely. Font characteristics are now set with an options box that appears when you right-click on the Text tool in the toolbox. New text features are covered below. Second, a new menu, Anim, contains the options for animation; animation is discussed in the last section in this chapter.

Loading, Saving, and Deleting Files

The Load, Save, and Delete boxes for pictures and brushes now ask you to specify which drive you want to work with, rather than automatically displaying the current directory. They also include an option for saving pictures to the Amiga's RAM disk. (A RAM disk is a designated section of memory that acts like a disk drive; Amigas running under *Workbench* version 1.2 or greater automatically create a RAM disk on startup.) The RAM disk is much faster to load from and save to than a floppy disk. However, because RAM is volatile rather than permanent storage, you run the risk of losing your picture if there's a power outage, a system crash, or, most likely, you just forget to save the picture to a floppy disk before turning off your machine. If you need the speed that a RAM disk offers, and you are using *Workbench* version 1.3 or greater, use RAD:, the Amiga's recoverable RAM disk. The contents of RAD: will be saved even if you have to do a "warm reboot" of your system (that is, reset the computer with-

out actually turning it off). Also, the size of a RAM disk is limited by the amount of memory in your Amiga. Unless you have more than one megabyte of memory, you won't be able to create a RAM disk with the same capacity (880K) as an Amiga floppy disk. It's quite possible to create oversized, hi-res pictures and animations (see below) that won't fit on the maximum RAM disk you can make.

Printing

Appendix A covers general information about printing pictures, but *Deluxe Paint III* has enhanced printing capabilities that deserve mention here. In addition to printing in color, black-and-white, or shades of gray, you can now create a "negative" image with colors and shades the opposite of what you see on the screen. You can also adjust the aspect and orientation of the printout, either in pixels or relative to the size and dimensions of the paper, and set margins. Figure 12-1 shows the Amiga Print Picture box.

Figure 12-1. *Deluxe Paint III* Print Picture Box

Print Picture	
Aspect: <input type="button" value="↑"/> <input type="button" value="←"/>	Image: <input type="button" value="+"/> <input type="button" value="-"/>
Shade: <input type="button" value="B & W"/> <input checked="" type="button" value="Grey"/> <input type="button" value="Color"/>	
<input checked="" type="button" value="Rel"/> <input type="button" value="Abs"/>	Margins: <input type="text" value="1"/> : <input type="text" value="75"/>
%Wide: <input type="text" value="110"/>	%High: <input type="text" value="0"/>
Paper Height: <input type="text" value="66"/>	Copies: <input type="text" value="1"/>
<input type="button" value="Cancel"/>	<input type="button" value="Print"/>

Screen Formats

Deluxe Paint III's Screen Format Box clues you in to two new capabilities—halfbrite and overscan. Figure 12-2 shows the box in its new incarnation.

Figure 12-2. Deluxe Paint III Screen Format Box

Choose Screen Format	
Format:	Number of Colors:
Lo-Res 320x200	2 16
Med-Res 640x200	4 32
Interlace 320x400	8 64
Hi-Res 640x400	
OverScan	
Screen Size Page	Keep Same Page
Cancel	Ok

Halfbrite

Newer Amigas, including all A500s and A2000s, as well as A1000s manufactured after mid-1986, offer an additional screen format called *extra halfbrite*, or just *halfbrite*. With halfbrite, you can use an additional 32 colors in the 320 by 200 or 320 × 400 resolutions, allowing a total of 64 possible onscreen colors. The Screen Format box has a new button that lets you choose 64 colors, in effect turning on halfbrite mode.

Turn on the halfbrite option and look at the *Deluxe Paint III* page, and you'll see an additional 32 colors forming the two right-hand columns of the toolbox palette. These are the halfbrite colors. You can draw and paint with them just as you can with the 32 "normal" colors that form the leftmost two columns. But that's where the resemblance stops. The 32 halfbrite colors are really the "dark twins" of the normal 32 colors. For example, color 32, the first halfbrite color, has the same hue and saturation as color 0, the first standard color, but color 32 has only half the value of color 0. Or, in other words, it's half as bright as color 0. This relationship is fixed. No matter how you change color 0 with the Palette box controls, color 32 will match it in hue and saturation but will be half as bright. It doesn't work the other way around, though—in fact, you can't change color 32 with the palette controls at all, since the halfbrite colors don't even appear in the Palette box.

Try this experiment and you'll see how halfbrite works. Paint two filled rectangles on the page, one in any normal color and the

other in its halfbrite twin. Now open the Palette box and try to adjust the color of the normal color rectangle so it matches that of the halfbrite rectangle. What happens? When painting in halfbrite mode, remember that anytime you modify a normal color, its halfbrite twin will change too.

Having 32 extra colors, even dark ones, is an obvious boon. The more colors at your disposal, the more freedom of choice you have. More colors generally mean more realism for carefully rendered objects. In many cases, you no longer need to include darker colors in spreads of normal colors because these will be created automatically in halfbrite colors. This frees up normal colors for new shades you wouldn't have had room to use before. You can now define two additional ranges (for a total of six) to take into account the additional colors.

Incidentally, you'll notice that the color patches in the toolbox palette are smaller in halfbrite mode, and thus a little harder to select. A minor improvement has been added that helps with color selection; you can now drag the pointer over the colors, and the color selection box will follow along. You don't have to keep clicking on individual colors as was necessary in the Amiga version of *Deluxe Paint II*.

Overscan Support

In *Deluxe Paint II* it was possible to create pictures in the full video page size that extended into the overscan area of your monitor (see Chapter 2), but it wasn't possible to actually see the picture in that area. You had to use the arrow keys to scroll around in the picture to view all of it. Now you can paint in the overscan area and see what you're doing where you're doing it. Choose Overscan from the Screen Format box to activate this option. The toolbox and menu bar will move to the edges of the screen, and the full area of the screen will be available for painting. Left-click in the menu bar to push the menu bar lower so you can see it better; this may cut off the bottom of the toolbox palette. Hit the F10 key twice to restore the overscan positions.

Overscan is the mode to choose if you're creating graphics for desktop video; it does use more memory than the standard page size, though. You should also be aware that not all IFF-compatible desktop video programs use the same size overscan as *Deluxe Paint III*. And, on some monitors you may see a very thin

black area at the bottom of the screen where the *Deluxe Paint III* picture ends.

Screen Format and Page Size Conversions

Moving from one screen format to another is now neater and easier. Remember that the size and aspect ratio of your image (and the page) often change if you change screen formats. With *Deluxe Paint II*, if you wanted to keep the image approximately the same size and shape, you had to pick it up as a brush and resize it with the options in the Brush menu. Now when you change from one resolution to another, a system message will pop up, asking if you want to stretch or shrink your image to fit the new resolution. Click on yes and the operation will be performed smoothly and flawlessly. When switching to overscan mode, the image is always centered.

Page Flip

Chapter 4 mentions picking up an entire page as a custom brush and flipping it horizontally or vertically to check for disproportionate compositions. A Flip option in the Picture menu lets you flip the page along X or Y without having to first pick it up as a brush.

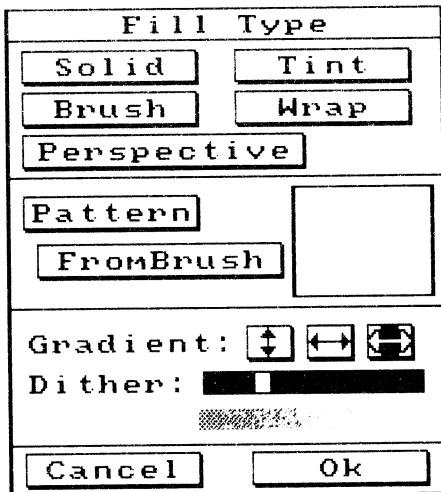
Toolbox Changes

The freehand solid line tool and the fill tool have new features. Clicking on the bottom right of the freehand solid line icon lets you draw closed curves that fill instantly with the current fill setting. Try this out now:

- * Set a range in the Palette box and pick a color in that range.
- * Right-click on the freehand solid line icon. This now calls up the Fill Type box. Choose a gradient option and set the degree of dithering with the slider, then click on OK.
- * Click on the lower right of the freehand solid line icon.
- * Whip out a few freehand shapes. Try simple closed curves, and also complex curves that intersect at several places—these won't always fill the way you expect, especially if there are abrupt angle changes in the outline. Note that if you don't connect the beginning and ending points of the curve, *Deluxe Paint III* will do it for you anyway. Figure 12-3 is one example of the way the freehand line fill works.

Figure 12-3. Freehand Hand

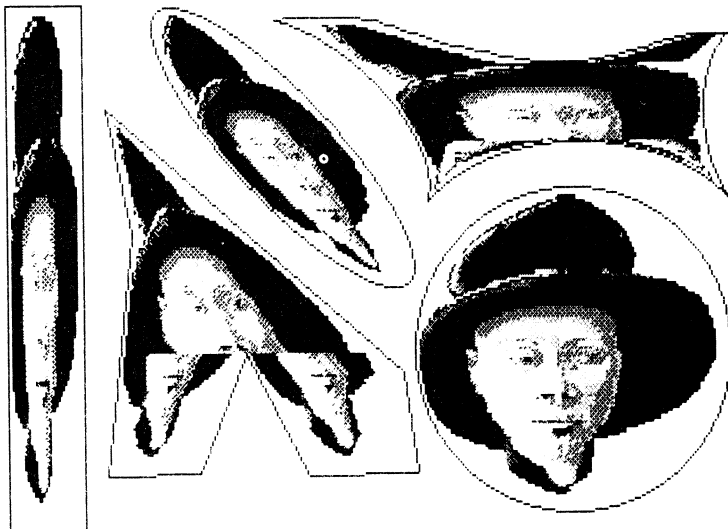
The Fill Type box (Figure 12-4) has new options, Tint, Wrap, and H-B, that work with all the shape tools, the fill tool, and the new freehand solid line fill tool. The H-B button turns halfbrite on and off for use in gradients. Don't use halfbrite colors in a gradient if you think you may be translating a 64-color picture to a 32-color picture. Gradients, by the way, now will fill the same shape in exactly the same way every time. This is helpful when creating animations (see below).

Figure 12-4. Deluxe Paint III Fill Type Box

Tint fill adds a translucent layer of the current color over any other colors already drawn: The hue and saturation settings of any existing colors in the area to be tinted (except the background color, which tint fill doesn't change) are replaced with the hue and saturation settings of the current foreground color, but the value of the existing colors is unaffected. This is easier to see than to describe. Try this:

- * Draw several overlapping shapes on the page in different colors. Fill some with gradients.
- * Right-click on the bottom-right half of the rectangle shape tool icon to bring up the Fill Type box. Click on the Tint button.
- * Pick a foreground color different from any you used in the overlapping shapes. Draw a series of thin filled rectangles over the shapes. Notice how the tint color interacts with the existing colors. Especially, notice how you can instantly change all the colors in a gradient—something that was difficult to do in *Deluxe Paint II*.

Wrap fill takes the current custom brush and warps it to fit the shape that's being filled. You can make brushes look like they're wrapped onto the surface of any shape, including amorphous blobs. (Brush wrap provides a much easier way of making a brush appear to be wrapped around a sphere than the method described in Chapter 4.) Figure 12-5 shows some of the fantastic ways wrap fill can be used.

Figure 12-5. Brush Wraps

It's now easy to fill a shape composed of several colors, including gradients:

- * Make the color you want to be the boundary for the shape into the background color.
- * Choose the Fill tool.
- * Click in the area to be filled while pressing the Alt key.
- * The area fills completely with the background color.

Brush Enhancements

The built-in brushes have gained two new painting modes: tint and halfbrite. A tint brush works just like tint fill, changing the hue and saturation, but not the value, of any color you paint over to that of the current foreground color. Good uses for tint brushes are to create colored shadows and reflections, render layers of tinted glass or plastic, or design plaid patterns (like the ones in Chapter 4). The halfbrite mode is like the color mode, but lets you paint in the halfbrite version of the current color (assuming you're in the halfbrite format).

You can now double a brush horizontally and vertically by pressing Shift-X and Shift-Y. Hold down the Shift key while selecting a custom brush to constrain the brush selection box to a

square (choose Be Square from the Prefs menu to make the box look really square).

New effects can be achieved with options in the Brush menu. In the Edge submenu, choosing Outline (keyboard equivalent: O) puts a one-pixel-thick outline in the current foreground color around the edges of your brush. You can invoke this repeatedly with different foreground colors to make multicolored outlines; this works especially well around text. The inverse operation is Trim (Shift-O). This strips away the outer layer of pixels from your brush. Use Trim repeatedly and your brush will shrink to nothing. This is useful primarily for taking away outlines you don't want. Change Transp, in the Change Color submenu, changes the transparent color in your brush to the current background color.

Changing the brush handle position can be accomplished with more flexibility. There are two ways to do this. You can still use Center and Corner in the Brush Handle submenu. Choosing Corner repeatedly will cycle the brush handle through each corner. Or you can press Alt-X and Alt-Y to switch the handle from the left or right corners and the top or bottom corner. A combination of these commands will put you at any corner. Alt-C puts the brush handle back in the center of the brush. Choose Place to put the brush handle anywhere on the screen, not just in the brush area; drag the arrow to the desired location. These keyboard commands make it easier to position brushes in perspective and animation modes (see below for more on animation).

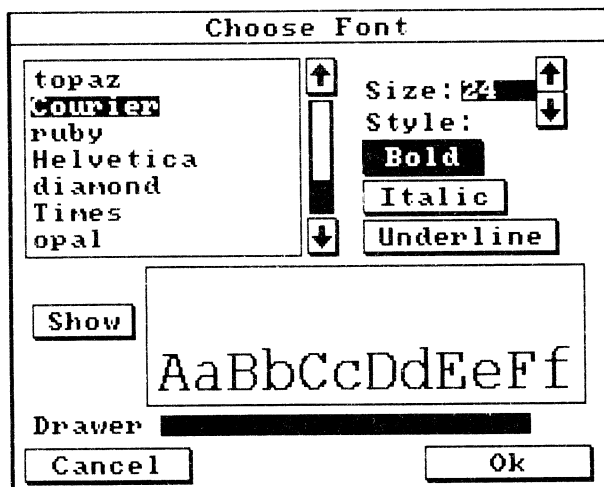
Over in the Prefs menu, you can now choose an option called Autotransp. When Autotransp is switched on, *Deluxe Paint III* determines what brush color should be transparent by looking at the corners of the brush. If the corners are all the same color, that color will be transparent in the brush, *whether or not it is the current background color*. This saves having to change the background color when picking up brushes of different colors. Colors that are locked with the stencil will be transparent in a custom brush picked up after the creation of the stencil (another change that affects brush color).

Text

Make changes in fonts and styles with the new Choose Font box, shown in Figure 12-6. Right-click on the text tool to bring it up. Note that all available fonts, including three new ones (Courier,

Times, and Helvetica, added in *Workbench* 1.3 for laser-printer owners), are in a scroll box on the left. You can also choose point sizes and type styles. A window on the bottom of the box shows an example of the font and styles you've chosen.

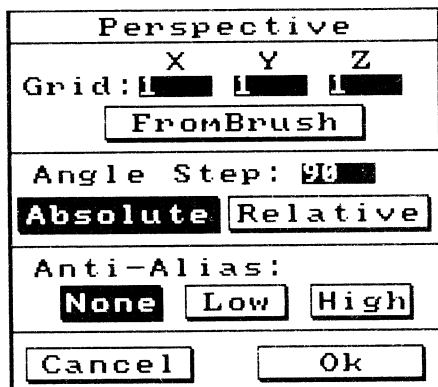
Figure 12-6. Deluxe Paint III Choose Font Box



Perspective

Some of the features found in the Perspective submenu in *Deluxe Paint II* are now consolidated in a Perspective Settings box, shown in Figure 12-7. This contains tools for settings aspects of the perspective grid and the degree of antialiasing, all covered in Chapter 10.

Figure 12-7. Perspective Settings Box



Animation

The refinements and enhancements discussed up to now add greatly to the usefulness of *Deluxe Paint III*, but are not really revolutionary for Amiga paint programs. However, *Deluxe Paint III* does have an entirely new capability: the power to paint in the fourth dimension—time. Using *Deluxe Paint III*'s animation tools, you can create moving demonstrations, presentations, and simulations—not to mention *Roger Rabbit*-style cartoons. While there are other animation programs for the Amiga, *Deluxe Paint III* is the only one that incorporates a full range of painting tools. And, in keeping with *Deluxe Paint III*'s general ease of use, the program offers the simplest method of creating animations yet seen on any computer.

Note: You won't be able to create animations with only 512K of memory. Animation requires at least 1 megabyte of RAM, and more is highly recommended. Nor can you create animations using oversized pages. More general aspects of desktop video and animation with other versions of *Deluxe Paint* are covered in Appendix A.

Animation Theory and Design

How does *Deluxe Paint III* create animations? By a process called *page flipping*. In page flipping animation, a series of pictures is created by the animator using *Deluxe Paint III*'s standard painting tools. Each picture is incrementally different than the previous one; for example, a square could move from the left of the screen to the right in equal increments spread across 30 pictures. When the sequence is finished, it's stored in memory or on disk as a series of pages, called *frames*. To run the animation, the animator instructs the program to load all the frames into memory and display them in sequence at a predetermined rate. If the rate is fast enough, any incremental changes in the image will give the appearance of smooth motion—the square will look like it's sailing across the screen. If you've ever buzzed through the pages of an animation flip book, you'll understand the concept behind page flipping.

Deluxe Paint III's standard rate of frame display is 30 frames per second (fps). That's 30 *different* pictures every second, or 1800 per minute—a lot of art. This provides enough frames per second to produce the illusion of smooth animation, and also matches

the standard television frame rate. Luckily, *Deluxe Paint III* automates much of the frame-creation process for you.

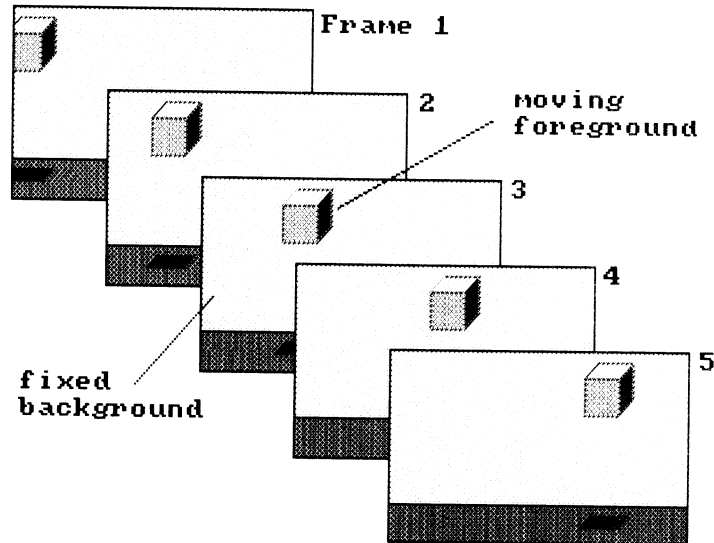
In *Deluxe Paint III*, all animation frames must exist in memory at the same time. It follows that the amount of memory in your computer sets an absolute limit to the number of frames, thus limiting the length of your animation as well. To maximize the number of frames that can be stored in memory, *Deluxe Paint III* uses a method of frame compression that stores only the picture changes from frame to frame, making it possible to store 30, 40, or more frames of 64-color, low-res, overscan frames in memory—a second or more of animation at 30 fps. (You must choose the Compressed option in the Memory Method submenu in the Anim menu for frame compression to take place. You can also choose to use Expanded, or noncompressed, frames, but you'll only be able to fit between six and ten frames in memory that way.)

Due to frame compression, the number of frames you can store is a function of the complexity of your animation. If most of the picture changes from frame to frame, there is more information to store, and fewer frames will fit in memory. For example, if your animation shows a landscape as it is seen by a fighter pilot swooping past at low altitude, virtually every pixel in every frame will change, and fewer frames will fit in memory. A simpler animation with few changes, such as a bouncing ball against a plain background, entails fewer changes from frame to frame, so you'll be able to fit more frames in memory. You can always check the available memory by pressing Control-A.

You'll want to design your animations with this in mind. One efficient way to design animations is to have animated shapes move across an unchanging background, as in Figure 12-8. Only the changes in the shapes will need to be stored, yielding more available frames. This approach is quite satisfactory for animated business graphics, moving text, simple cartoon characters, and any animation in which the background is merely a setting for foreground action that carries the "message" of the piece. For more elaborate animations, you may want to change all or part of the background as well. The trick is to paint a background that incorporates everything you think won't change, and leaves out what will change. This is really a matter of convenience—you're never locked into a particular background design, because you can paint over it in any frame, but you want to save as much work and as much memory as possible. When you wish to create

an entire animated world to envelope your viewers, however, you'll probably need to hand-craft every frame, background as well as foreground—but you won't be able to fit as many frames in RAM.

Figure 12-8. Foreground Animation



There are other ways to expand the number of possible frames. You can add external memory, which is costly, or create frames that use less of the memory you already have, which imposes some artistic limits. Two easy ways to reduce the amount of storage required per frame are to use a lower resolution screen format or one with fewer colors. Each time you halve the number of available onscreen colors, the maximum number of frames approximately doubles. The two-color lo-res (320×200) screen format lets you fit the most frames into memory—up to ten seconds worth at 30 fps—and can be perfectly adequate for animated text or “pencil tests,” rough sketches of animations to be fleshed out later in color. If you plan to videotape the animation and show it on TV, you should work in the overscan interlaced (320×400) screen format, but if not, save additional memory by using the standard lo-res format. It's also possible to display fewer frames per second, using the Set Rate box from the Control submenu in the Anim menu, but the result will look less smooth.

Animation Commands

The Anim menu contains options for loading and saving animations, creating, copying, and deleting frames, setting animation speed, moving from frame to frame, playing an animation, setting up automated brush moves in perspective, and creating animated brushes. There are also new keyboard commands for animation, which you'll need to know before creating your own. These are listed in Table 12-1. Many of them do not have menu equivalents.

Table 12-1. Animation Keyboard Commands

Command	Key
Previous Frame	1
First Frame	Shift-1
Next Frame	2
Last Frame	Shift-2
Display Go To Frame Box	3
Play Endless Loop	4
Play Endless Loop Reverse	Shift-4
Play Once	5
Play Once Reverse	Shift-5
Play "Ping-Pong-" Loop	6
Prev Animbrush Frame	7
First Animbrush Frame	Shift-7
Display Clear Frame Box	Shift-K
Display Move Box	Shift-M
Next Animbrush Frame	8
Last Animbrush Frame	Shift-8
Reverse Play (in any play mode)	R
Enter Anipaint Mode	Left Amiga or Commodore Key While Painting
Play Slower	Left Arrow
Play Faster	Right Arrow
Stop Play	Spacebar

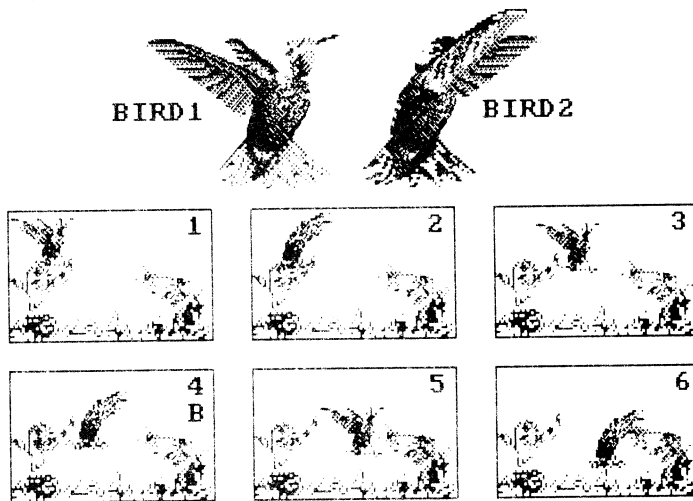
The Animation Process

Let's look more specifically at how an animation is created. First, you need to do a bit of planning as to what the animation will show, how long it needs to be, how many colors you need, whether it will be shown on the computer display or on a stan-

dard TV, and so on. The more planning you do, the less likely you are to need to make changes in each frame of the animation after you've created 30 or 40 frames. A storyboard—a series of thumbnail sketches of each frame or each major action in an animation—will help you to visualize just what the action will be. A flip book is better at displaying movement, but may be more trouble to make than is called for by a simple animation. Here we'll create a simple animation of a hummingbird flying from one flower to another.

The first step in creating this animation is to paint a background picture. In this example, the flowers are drawn on the background picture. The hummingbird, painted in the foreground on every new frame, would be the only element changing throughout the animation.

Once you've settled on a background, you need to create the foreground elements—the parts that will move. One way to do this is to create a custom brush library of foreground elements (either on disk or on the spare page) and stamp them down as you need them. In the hummingbird and flower example above, there are two versions of the bird, each with the wings in a different position; we'll call these brushes Bird1 and Bird2. Alternating the two versions in successive frames will give the illusion that the wings are vibrating rapidly back and forth, while moving the versions from the left of the screen to the right a little at a time on each frame makes the bird appear to be flying along a path from flower to flower when the animation is played back at "normal" speed. Figure 12-9 illustrates the interaction of foreground and background across a number of frames.

Figure 12-9. Hummingbird and Flower

With the graphic elements ready, it's time to set up the animation.

- * Make sure the current picture is the background. Put your foreground elements on the spare screen.
- * Choose Set # Frames from the Frame submenu of the Anim menu. A Set Frame Count box will ask for the number of frames you want the animation to contain. Type in 60 (for a two-second animation) and click OK. This puts *Deluxe Paint III* into animation mode and creates the specified number of frames, each identical to the picture currently on the screen.
- * Note the numbers on the left of the menu bar. These tell you 1) the number of the current frame; and 2) the maximum number of frames in the animation. You should be at frame number 1.
- * Switch to the spare page and pick up Bird1 as a brush. Switch to the main page and stamp Bird1 down at the upper left of the screen. Choose Next Frame from the Frames submenu or press the 2 key to step to the next frame. On the new frame, stamp down Bird2 just slightly below and to the right of the position of Bird1 in the previous frame. To check your position, switch back to the previous frame by choosing Prev Frame or pressing the 1 key.
- * Repeat this process with every frame, moving the brush incrementally each time. When you've gotten to the last frame, choose Play Once in the Control submenu or press 5 to see the

animation. Press the spacebar to stop playing. If you don't like what you've done, step to the problem frame and repaint it, or clear all the frames (with the Discard All option in the Frames submenu) and try again.

Anipainting

Deluxe Paint III provides a unique way to streamline the animation process. Using the anipainting feature (accessible by pressing the left Amiga or Commodore key), frames are stepped automatically as you press the mouse button to perform a paint operation. It works like this:

- * Set up the animation, creating a background, foreground brushes, and the desired number of frames.
- * Start at frame 1. Pick up a brush and press the Alt key. Paint with the brush while the key is still down. *Deluxe Paint III* cycles through the frames as you paint with the brush.
- * When you reach the last frame (watch the numbers on the menubar to see where you are), release the mouse button and left Amiga or Commodore key. Play the animation to check the results.

You needn't stop at the last frame, though; *Deluxe Paint III* will keep painting through the frames as long as you care to click the button. This opens up some interesting possibilities for creating endless loops of identical objects—schools of fish, swarms of bees, red corpuscles racing through capillaries, snowflakes falling, gas molecules bouncing around inside a container, and so on. Now try the exercise above, but keep painting with the left Amiga or Commodore key down. *Deluxe Paint III* will start to cycle through the frames at the speed you've specified in the Set Rate box. While you can't achieve fine control at this speed, it's fun to try it. Complex, swirling patterns can be created with little effort. To add even more motion to the mix, turn on color cycling. If you can synchronize the cycling speed with the frame speed, you may get some truly eye-popping abstractions. Asynchronous cycling makes for unpleasant strobe effects, though.

Perspective Animation

One of the slickest features of *Deluxe Paint III* is that the program can accomplish many difficult moves for you automatically. This includes smooth movements of an object across the background

in the plane of the screen; zooms in and out along the z-axis; and complicated turns, swoops, spins, and orbits in any combination of the three spatial dimensions. You can make a brush do stunts that would make Chuck Yeager turn green, and encourage network executives to throw away their ADOs. The key to these tricks is the integration of *Deluxe Paint III's* perspective and animation tools through the Move box in the Anim menu (see Figure 12-10).

Figure 12-10. *Deluxe Paint III* Move Box

Move			
Dist: 0	X	0	Y
0		0	Z
Angle: 0		0	
		0	
Clear		Go Back	
Ease-Out: 0	Direction:		
Ease-In: 0	Move Record		
Count: 10	→		←
Preview	Trails	Fill	Draw
Cancel		Exit	

Here's how the Move box works:

- * First, create a solid-color background and copy it to 30 animation frames. Make sure you're on frame 1.
- * Use the text tool to type *MOVE TEST* on the page, then pick it up as a brush by its center.
- * Enter perspective mode (see Chapter 10 for more on perspective). Press the Shift-semi-colon keys to bring the brush close enough along the z-axis to nearly fill the screen. Stamp down the brush toward the bottom center of the page.
- * The settings in the upper part of the Move box refer to the direction and angle of motion of the brush along the x-, y-, or z-axis. Enter figures in pixels in the Dist (Distance) row to make the brush move horizontally, vertically, or into and out of the screen along one or more axes. Rotate the brush along the axis of the brush handle by entering degree values in the Angle column. In this case, enter 100 in Move-Y, 500 in Move-Z, and 360 (a complete turn) in Angle-Y. (Entering a negative number in any of these boxes, such as -500, yields a movement in the

opposite direction.) Also enter 50 into the Ease-Out box, which slows the start of the animation.

- * Set the Count to 30.
- * The Move arrow icons select whether the animation will be recorded beginning at the current frame or ending at the current frame. Click on the Go From icon (the one on the left); this will record the animation forward, starting from the current frame. The Come To arrow (on the right) backs up the animation so it *ends* at the current frame (if, for example, you know the end position you want to get to, but not the beginning). Start from the last frame when you use the second icon. The VCR-type forward, pause, and reverse buttons specify whether the animation will be painted forward, on the current frame only, or backward. Forward is the default, and the one you should choose now.
- * Click on Preview. You'll see a wireframe rendition of the move you've programmed. If you like it, click on Draw, and the sequence will automatically be painted while you go get a sandwich. You can then play it back like any other animation. The letters *MOVE TEST* will swoop smoothly up and in toward the center of the screen while making a full turn around the *y*-axis.

The animation resembles the kind of flying text, so popular on television, that costs thousands of dollars to produce at video special effects studios. This feature alone opens up opportunities for using *Deluxe Paint III* to generate animated titles and logos for desktop video.

That's just a taste of the things that the Move box can do. Other options let you move the brush along relative axes (that is, axes that move as the brush moves); start the move at any frame; slow the end as well as the beginning of the move; leave trails behind the moving brush, and more. There are many more permutations than can be described here; the best way to learn all the ins and outs is to experiment with various values in each of the boxes, clicking on each button in turn and running the animation to see the result. Interesting effects can be achieved by:

- * Using moves relative to the brush axes, rather than *Deluxe Paint III's* absolute coordinate system (by clicking on the Brush buttons next to the coordinate boxes in the Move box).

- * Starting the animation from the end rather than the beginning, or midway in any selected frame.
- * Changing the position of the brush handle.
- * Setting a stencil or locking the foreground so animated objects appear to move behind other objects.
- * Moving different brushes at different speeds and directions in a single animation. (Remember, the most recently animated brush will paint on top of earlier ones unless you create a stencil to prevent it.)
- * Using color cycling at the same time.
- * Painting additional imagery by hand on top of selected frames.
- * Varying the replay speed by setting a new frame rate or by pressing the cursor arrow keys.

Try these exercises:

- * Animate a bar graph with three bars that rise at different rates.
- * Create a spinning earth and orbit a satellite around it.
- * Have a single line of text split into three versions in contrasting colors that spin away in different directions.
- * Open a succession of doors in a long hallway while a ball rolls down the hall.

Hint: You'll need to use the Stencil tool as well as animation for each of these.

The *Deluxe Paint III* manual has several other good tutorials to try, but they only begin to suggest the possibilities.

Animbrushes

Not only can you paint while you animate, you can use brushes as small animations. Here's how:

- * Use the Move box to animate a brush with the techniques described in the section above.
- * Choose Animbrush and Pick Up from the Anim menu. A brush selection reticle appears
- * Select the brush. You must enclose not only the current image of the brush, but all of the page in which the brush moves during the course of the animation. You'll see *Deluxe Paint III* pick up the state of the brush on each frame.
- * Try painting with the animbrush. As you drag with the left

mouse button, the animbrush paints all its states on the current frame or page (this works even if you haven't created any animation frames). Vary the drag speed and direction to alter the path of the animbrush.

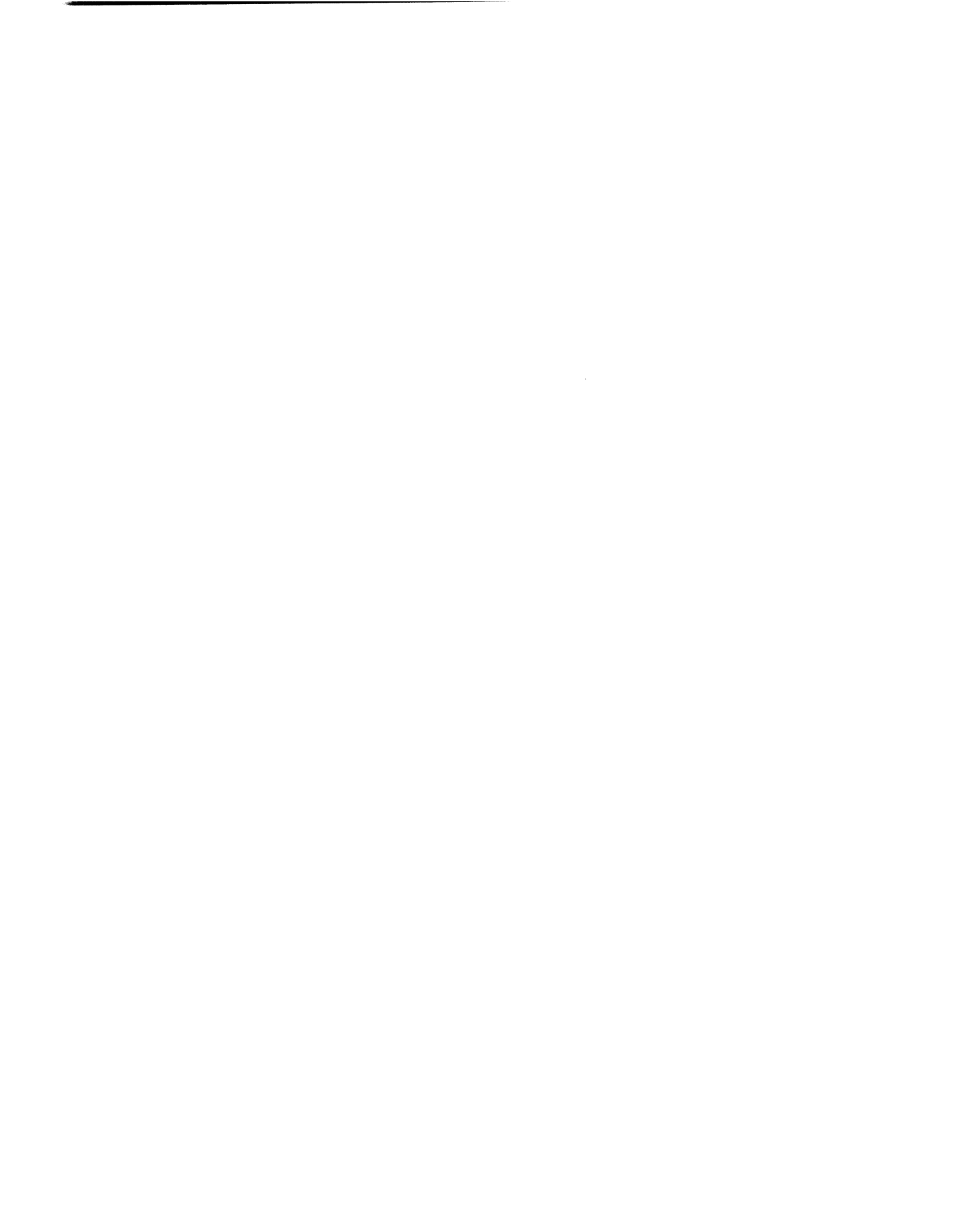
- * Make sure you're still in animation mode. Turn on the *anipainting* feature. Now the animbrush paints one state per frame instead of all states on one frame. Thus, you can stamp down multiples of a single animbrush just as you can stamp down copies of an ordinary custom brush. This works best if the number of available frames is the same as the number of states in the animbrush.

Save animbrushes in an animbrush library for future use; they can be pasted into any animation you create.

Animation File Formats

The animations created by *Deluxe Paint III* conform to the Aegis-Sparta ANIM file format. ANIM is rapidly becoming the standard Amiga file format for animation, just as IFF is for still graphics. You can load and play *Deluxe Paint III* animations with PLAY-ANIM utility programs, such as the Player included with *Videoscape 3-D* (Aegis Development); similar public-domain programs are available on bulletin boards and from user groups. An animation player utility is included with *Deluxe Paint III*.

A Final Note: This chapter was written using a prerelease version of *Deluxe Paint III*. There may be some minor differences between the features discussed here and those of the final, released version of the program.



APPENDIX A

**From New to Old:
Using *Deluxe Paint*
with Other Media**



Once you've created your *Deluxe* masterpiece, what can you do with it? Here are some tips and suggestions for translating *Deluxe Paint* works into other visual media.

Printing

Perhaps the most obvious thing to do is print your picture on paper. Your computer can be connected to any of a large number of black-and-white and color printers that can do this on command. Boxes containing printing options and specifications for *Deluxe Paint* picture files can be called from the Amiga's Picture menu and the IIGS and PC compatible File menu. The options are fairly straightforward and are fully covered in the *Deluxe Paint* manual.

You'll want to make sure your printer is compatible with one of the available software drivers, either in the Amiga's *Workbench* Preferences printer screen or in the Choose Printer box in the PC compatible version. IIGS users are probably using an Apple ImageWriter or a serial printer compatible with it since that's the only printer supported by Apple. Consult your printer's instruction manual for more specific information on printing, recommended papers, and so on.

A detailed discussion of personal computer printers is beyond the scope of this book, but there are a few points to keep in mind. One is that no printer can match the clarity, color, and sharpness of detail of the image you see on your monitor, whether the printout is black-and-white or color. This is especially true of currently available color printers. No color printer can exactly match the colors your computer can generate, although the inkjet, thermal-transfer, and color xerographic types give the best color fidelity and saturation. The glossy surface of thermal printouts is particularly attractive, and you can create exceptional transparencies with them as well. Dot-matrix color printers give relatively poor results and are not recommended.

If you are using a IIGS, you're stuck with an ImageWriter (a

9-pin dot-matrix type), which can accept color ribbons for low-quality color printing.

With a few exceptions, color printers tend to be expensive and troublesome to maintain, especially the ink-jet type, so be sure you need color printing capabilities before you buy one. It may be possible to find a user group or service company that will print your pictures on a high-quality color printer for a set fee per picture.

If you're a professional artist (and even if you're not), you may be concerned with the type, quality, and longevity of the paper your image is printed on. At present, no color printer gives good results when printing on a high-quality art paper like Arches or Rives. In fact, most of these papers are too thick and inflexible to even fit in the printer. No one knows much about the longevity and colorfastness of images printed on typical computer paper, which has at best a 25-percent rag content and is quite acidic. If this is a concern, try to find a non-acid paper with a high rag content and a smooth surface that will work with your printer. You may need to contact paper manufacturers directly for more information; a computer-supplies retailer is unlikely to be of much help. You also have the option with some printers of printing on acetate or mylar for transparencies. Both of these materials tend to yellow and become brittle over time.

Once you've made your printout, you can use it in many other processes. Printouts can be drawn on and painted on by hand, collaged with other materials, embossed by running through an etching or woodcut press (make sure your paper is strong enough to hold together before you try it), cut, folded, and assembled to make sculptures, and pieced together with other printouts to create large multipanel works. Some printing utilities enable you to make poster-sized printouts of single pictures. You can even run the printout through the printer more than once and overprint multiple images.

Photography

Printouts can be made directly in photographic form, with greater clarity, resolution, and color fidelity than is possible with paper printing. There are two ways to do this.

Film printers. A film printer takes the video output from your computer and converts it directly to a finished slide or instant photograph of the screen image. Currently, film printers

start at \$2000 and go up from there. If you need to make lots of slides or film prints of your *Deluxe Paint* work, however, it may be worth the investment. Again, you may find it more cost-efficient to take your files to a service bureau that makes slides for you on equipment you couldn't afford yourself. You should know that many film printers cannot handle oversized images—the film printer software either prints only what's on the screen, or it simply refuses to print the picture. For oversized pictures, consider dividing the picture into two or more sections and creating prints of each one, then piecing the prints together by hand afterward—not an ideal solution, but it may work for your application.

Photographing the screen. If you can't afford a film printer but want photographs of your work, you can always photograph your monitor screen. Here are a few tips for taking successful screen shots.

- * For best results, use a 35mm single-lens reflex camera with a built-in light meter and manual shutter and aperture, a 70–100mm short telephoto lens, fast daylight color print or slide film, and a sturdy tripod. Flat-screen monitors, like Zenith's FTM series, give the clearest and least-distorted images.
- * Clean the monitor screen with a glass cleaner. Turn off the lights and mask the windows, or shoot at night.
- * Position the tripod and adjust the camera so the center of the lens is level with the center of the display. The display should fill the camera's viewfinder. Remember to hide the menu and Info bars, the toolbox, and the crosshairs unless you want them to show in the shot. Of course, only the visible part of an oversized picture—the part that shows on the screen—can be photographed in one shot.
- * Use a shutter speed of one or two seconds. This should eliminate any scanlines. Take a couple of shots of each picture, bracketing the suggested f-stop one-half stop above and below. At least one shot of each *Deluxe Paint* picture should be clear and properly exposed.

The slides or photographs can then be used in photographic reproduction, photoetching and photolithography, in slide shows, for posters, and so on. Painters can project a slide or transparency of a *Deluxe Paint* image onto canvas to use as a guide for painting.

Desktop Video

Desktop video, the use of computers and low-cost video equipment to produce high-quality video programming, is a fast-growing field, especially on the Amiga. *Deluxe Paint* is a perfect video paint system for video artists, small TV and cable stations, corporate television departments, and home videophiles.

VCRs. The Amiga 1000 and IIcs output a composite video signal that can be recorded on any VCR. Transferring your *Deluxe Paint* images to tape is simple, and since there are many more VCRs than Amigas or Apple IIcs, it's a good way to carry your work around for display. Few PC compatibles offer this capability out of the box. You can buy a graphics adapter board that outputs a composite signal, however.

When recording video, it's worth using the best VCR you can find. There are several VCR formats; in general, the wider the tape, the higher the image quality. The one-inch format is the highest quality, but is only available in television studios and high-priced video production houses. The three-quarter-inch format is more affordable and available and is a good choice for work that will be broadcast or shown to industrial clients. The half-inch Betamax and VHS formats and the 8mm format are not quite professional quality, but are fine for home use. The new S-VHS and ED-Beta formats are near-broadcast quality, but less expensive than three-quarter-inch. Always buy the best videotape stock you can afford—the top-grade stock in each format is usually labeled “professional grade.”

Video animation. Some VCRs offer a feature called *single-frame recording*. This lets you record one clean frame of video every 1/30 second. A special video component called a frame grabber lets you do the same thing. With single-frame VCR or frame grabber, your computer, and *Deluxe Paint*, you can create high-quality computer animations. In a process akin to the cell animation system used by film animators, you draw a series of pictures, each incrementally different from the one before, and record them frame by frame, in sequence, on the VCR. When the tape is played back, the pictures run together, creating the illusion of motion. *If you are using Deluxe Paint III on the Amiga, you can also create animations with the animate tools (see Chapter 12) without the need for a single-frame recorder.*

Techniques for desktop frame-by-frame animation with paint

programs like *Deluxe Paint* are still relatively undeveloped. Here are a few things to keep in mind.

- * Frame-by-frame animation is hard work. You'll need to record at least 12 different pictures per second, the minimum needed to maintain the illusion of smooth motion. In a three-minute animation sequence, that's 2160 pictures. Start with very short pieces and build up to longer works as you gain experience.
- * Storyboard your work. Sketch out the plot and work out details of the background and character motions before you begin making the actual art for animation. Fine-tuning your concept before you start saves you time and frustration later.
- * Create, store, and move backgrounds and brushes separately. To move an object across a background, load and lock the background; then load a brush and stamp it down in its first position. Record one frame, then pick up the brush, move it slightly in the direction you want to go, record another frame, and so on.
- * Remember to switch off the menu and Info bars, toolbox, and crosshairs, or they'll record too. If you're using the Amiga version, use a full video page to eliminate the black border around the standard page.
- * You need to redraw only the parts of a brush or background that move. For example, a walking figure needs only four or five positions for each arm and leg. Draw these positions as separate brushes and tack them onto a brush of the body. After you've created the various stages of the walking figure, save each stage as a brush and load them in sequence, repeating the cycle as often as necessary to get the figure from one point to another.
- * Backgrounds can be larger than the screen. An oversize page can be scrolled to reveal new areas. With careful attention to the position of your brushes (use the coordinates for exact placement) you can even move the background while your brushes appear to be stationary.
- * You can change palettes in a frame-by-frame animation sequence as often as you like—even in every frame. Remember that your brushes may reflect any palette changes.

Video digitizers and genlockers. Video images can be fed into your computer as well as output from it. Video digitizers

(hardware/software systems designed for this purpose) let you take an individual frame from a video camera or a VCR and store it in the *Deluxe Paint* file format. Thus, you can point your video camera at anything and incorporate an image of it into your *Deluxe Paint* pictures. A digitizer is particularly useful for creating realistic backgrounds for frame-by-frame animation.

A genlocker is a piece of hardware that makes it possible for computer graphics to be superimposed over another video source, such as the output of a camera or a VCR. Video is fed through the genlocker into the computer, where it is overlaid with graphics, text, or animation. The combined output can then be recorded on a VCR or routed to another video device. Several companies market inexpensive (\$300) genlockers for use with the Amiga. With these you can, for example, use *Deluxe Paint* to add titles to your home videos or overlay wild graphics on an old copy of *Casablanca*.

A Final Suggestion

No matter how you use your *Deluxe Paint* pictures, they look best on your computer's monitor and are most easily stored on disk. As computer art becomes more widespread, art that exists only for display on a computer will become more common as well. You may choose to ignore traditional media entirely and distribute your work on disk. If you want to donate your work to the public domain, you can add your disks to the public domain collections, or post your art on bulletin board systems.

APPENDIX B

Deluxe Paint

**Keyboard Command
Equivalents**



Many *Deluxe Paint* commands and options can be called from the keyboard. The keyboard command equivalents for the Amiga, IIGS, and PC compatible versions are listed in the tables below. Note that keyboard commands are assumed to be lowercase (not Shifted) unless otherwise specified.

Amiga Basic Drawing Tools

Function	Key
Circle, outline	C
Circle, filled	Shift-C
Clear	Shift-K
Curve	Q
Ellipse, outline	E
Ellipse, filled	Shift-E
Fill	F
Fill box	Shift-F
Freehand dotted line	S
Freehand dotted line, 1-pixel brush	. (period)
Freehand line	D
Freehand line, 1-pixel brush	Shift-D
Palette box	P
PICK tool	, (comma)
Rectangle, outline	R
Rectangle, filled	Shift-R
Text	T
Straight line	V
Undo	U

Brush Commands

Function	Key
Brush tool	B
Brush tool, polygon brush	BB
Brush tool, complete outline of polygon brush	Spacebar
Brush tool, last brush	Shift-B
Brush, make smaller	- (hyphen)
Brush, make larger	= (equals)
Double brush size	Shift-H
Flip horizontal	X
Flip vertical	Y
Halve brush size	H
Rotate 90 degrees	Z
Stretch	Shift-Z

Painting Modes

Function	Key
Blend	F6
Color	F2
Cycle	F7
Cycle on/off	Tab
Cycle through range	[] (square brackets)
Matte	F1
Replc	F3
Shade	F5
Smear	F4

Graphic Aids

Function	Key
Grid tool	G
Grid set to brush position	Shift-G
Magnify area under crosshairs	M
Magnify, center area under crosshairs	N
Magnify, zoom in	>
Magnify, zoom out	<
Scroll page in magnified and oversize pages	Arrow keys
Show page	S
Spare page	J

Stencil on/off	'
Symmetry tool on/off	/ (slash)

Perspective (Note: Number and operation keys are in the numeric keypad.)

Function	Key
Enter perspective mode	Enter
Fillscreen	- (minus)
Move closer along fixed axis	;
Move farther along fixed axis	'
Move closer along fixed axis, greater increment	:
Move farther along fixed axis, greater increment	''
Move observer closer (in perspective mode only)	<
Move observer farther (in perspective mode only)	>
Reset center	. (decimal)
Set all axes to 0	0
X-axis, rotate clockwise	7
X-axis, rotate 90 degrees clockwise	Shift-7
X-axis, rotate counterclockwise	8
X-axis, rotate 90 degrees counterclockwise	Shift-8
X-axis, set to 0	9
X-axis, fix axis	Shift-9
Y-axis, rotate clockwise	4
Y-axis, rotate 90 degrees clockwise	Shift-4
Y-axis, rotate counterclockwise	5
Y-axis, rotate 90 degrees counterclockwise	Shift-5
Y-axis, set to 0	6
Y-axis, fix axis	Shift-6
Z-axis, rotate clockwise	1
Z-axis, rotate 90 degrees clockwise	Shift-1
Z-axis, rotate counterclockwise	2
Z-axis, rotate 90 degrees counterclockwise	Shift-2
Z-axis, set to 0	3
Z-axis, fix axis	Shift-3

Other Keyboard Commands

Function	Key
Abort current command	Spacebar
Constrain drawing or shape tool	Shift-drag
Cursor On/Off	F8
Last menu selection	A
Leave traces with drawing or shape tool	Control-drag
Memory check	Control-A
Menu bar on/off	F9
Toolbox and menu bar on/off	F10

Apple IIgs**Basic Drawing Tools**

Function	Key
Circle, outline	C
Circle, filled	Shift-C
Clear	Shift-K
Color settings box	N
Curve	Q
Ellipse, outline	E
Ellipse, filled	Shift-E
Fill	F
Fill box	Shift-F
Freehand dotted line	S
Freehand dotted line, 1-pixel brush	. (period)
Freehand line	D
Freehand line, 1-pixel brush	Shift-D
Palette box	P
Rectangle, outline	R
Rectangle, filled	Shift-R
Straight line	V
Text	T
Undo	U

Brush Commands

Function	Key
Brush tool	B

Brush tool, polygon brush	BB
Brush tool, complete outline of polygon brush	Spacebar
Brush tool, last brush	Shift-B
Double brush size	Shift-H
Double horizontal brush size	Shift-X
Double vertical brush size	Shift-Y
Flip horizontal	X
Flip vertical	Y
Halve brush size	H
Rotate 90 degrees	Z
Stretch	Shift-Z

Painting Modes

Function	Key
Blend	6
Color	2
Cycle	7
Cycle on/off	Tab
Matte	1
Replc	3
Shade	5
Smear	4
Smooth	8

Graphic Aids

Function	Key
Grid tool	G
Grid set to brush position	Shift-G
Magnify area under crosshairs	M
Magnify, center area under crosshairs	N
Magnify, zoom in	>
Magnify, zoom out	<
Scroll page in magnified and oversize pages	Arrow keys
Show page	S
Spare page	J
Stencil on/off	'

Perspective (Note: Number and operation keys are in the numeric keypad.)

Function	Key
Enter perspective mode	Enter
Move closer along fixed axis	;
Move farther along fixed axis	'
Move closer along fixed axis, greater increment	:
Move farther along fixed axis, greater increment	"
Move observer closer (in perspective mode only)	<
Move observer farther (in perspective mode only)	>
Reset center	. (decimal)
Set all axes to 0	0
X-axis, rotate clockwise	7
X-axis, rotate 90 degrees clockwise	Shift-7
X-axis, rotate counterclockwise	8
X-axis, rotate 90 degrees counterclockwise	Shift-8
X-axis, set to 0	9
X-axis, fix axis	Shift-9
Y-axis, rotate clockwise	4
Y-axis, rotate 90 degrees clockwise	Shift-4
Y-axis, rotate counterclockwise	5
Y-axis, rotate 90 degrees counterclockwise	Shift-5
Y-axis, set to 0	6
Y-axis, fix axis	Shift-6
Z-axis, rotate clockwise	1
Z-axis, rotate 90 degrees clockwise	Shift-1
Z-axis, rotate counterclockwise	2
Z-axis, rotate 90 degrees counterclockwise	Shift-2
Z-axis, set to 0	3
Z-axis, fix axis	Shift-3

Other Keyboard Commands

Function	Key
Abort current command	Spacebar

Constrain drawing or shape tool	Shift-drag
Info bar On/Off	9
Last menu selection	A
Leave traces with drawing or shape tool	Control-drag
Memory check	Control-A
Mouse functions	Command-click/drag
Toolbox and menu bar on/off	0 (zero)

PC Compatible

Basic Drawing Tools

Function	Key
Circle, outline	C
Circle, filled	Shift-C
Clear	Shift-K
Curve	Q
Ellipse, outline	E
Ellipse, filled	Shift-E
Fill	F
Fill box	Shift-F
Freehand dotted line	S
Freehand dotted line, 1-pixel brush	. (period)
Freehand line	D
Freehand line, 1-pixel brush	Shift-D
Load Picture box	I
Move foreground color selector up Toolbox palette	[
Move foreground color selector down Toolbox palette]
Move background color selector up Toolbox palette	{
Move background color selector down Toolbox palette	}
Move cursor in text mode	Enter
Palette box	P
Palette, set default colors	Shift-P
Quit	Shift-Q
Text	T
Text, exit mode	Esc

Rectangle, outline	R
Rectangle, filled	Shift-R
Straight line	V
Undo	U

Brush Commands

Function	Key
Brush tool	B
Brush tool, polygon brush	BB
Brush tool, complete outline of polygon brush	Spacebar
Brush tool, last brush	Shift-B
Brush, make smaller	- (hyphen)
Brush, make twice as small as	Shift (Shift-hyphen)
Brush, make larger	= (equals)
Brush, make twice as large as	Shift= (Shift-equals)
Double brush size	Shift-H
Double horizontal size	Shift-X
Double vertical size	Shift-Y
Flip horizontal	X
Flip vertical	Y
Halve brush size	H
Rotate 90 degrees	Z
Stretch	Shift-Z

Painting Modes

Function	Key
Color	F2
Cycle	F6
Cycle on/off	Tab
Matte	F1
MultiCycle on/off	Shift-M
Replace	F3
Shade	F5
Smear	F4
Smooth	F7

Graphic Aids

Function	Key
Grid tool	G

Grid set to brush position	Shift-G
Magnify area under crosshairs	M
Magnify, center area under crosshairs	N
Magnify, zoom in	>
Magnify, zoom out	<
Scroll page in magnified and oversize pages	Arrow keys
Show page	S
Spare page	J
Spare page, copy main page to	Shift-J
Stencil on/off	'
Symmetry tool on/off	/

Perspective

Function	Key
Enter perspective mode	Ins
Fillscreen	;
Move closer along fixed axis	'
Move farther along fixed axis	:
Move closer along fixed axis, greater increment	“
Move farther along fixed axis, greater increment	”
Move observer closer (in perspective mode only)	<
Move observer farther (in perspective mode only)	>
Reset center	8
Set all axes to 0	7
Set all axes to zero, center to default position	Shift-7
X-axis, rotate clockwise	1
X-axis, rotate 90 degrees clockwise	Shift-1
X-axis, rotate counterclockwise	2
X-axis, rotate 90 degrees counterclockwise	Shift-2
X-axis, set to 0	Alt-1
X-axis, fix axis	Alt-2
Y-axis, rotate clockwise	3
Y-axis, rotate 90 degrees clockwise	Shift-3
Y-axis, rotate counterclockwise	4

Y-axis, rotate 90 degrees counter-clockwise	Shift-4
Y-axis, set to 0	Alt-3
Y-axis, fix axis	Alt-4
Z-axis, rotate clockwise	5
Z-axis, rotate 90 degrees clockwise	Shift-5
Z-axis, rotate counterclockwise	6
Z-axis, rotate 90 degrees counter-clockwise	Shift-6
Z-axis, set to 0	Alt-5
Z-axis, fix axis	Alt-6

Window, Box, and Button Commands

Function	Key
Cancel	Esc
Select default button	Enter
No	N
Yes	Y
Edit box, move cursor left	Left arrow
Edit box, move cursor right	Right arrow
Edit box, move to first item	Home
Edit box, move to last item	End
Edit box, move to next	Tab
Edit box, move up list window	Up arrow
List window, move down list	Down arrow
List window, move to first item in list	Home
List window, move to last item in list	End
Load box, move back one directory	Backspace
Toggle <i>DPaintII</i> files/all files in load and save boxes	Tab
Palette box, color setting box	N
Palette box, undo color change	U
Palette box, select ranges	1,2,3,4
Palette box, move foreground color selector up	[
Palette box, move foreground color selector down]
Palette box, move background color selector up	{

Palette box, move background color selector down	}
Palette box, move top of range bracket up	Left arrow
Palette box, move top of range bracket down	Right arrow
Palette box, move bottom of range bracket up	Up arrow
Palette box, move bottom of range bracket down	Down arrow

Other Keyboard Commands

Function	Key
Abort current command	Spacebar
Constrain drawing or shape tool	Shift-drag
Cursor On/Off	F8
Info bar on/off	F9
Last menu selection	A
Leave traces with drawing or shape tool	Control-drag
Memory check	Control-A
Toolbox and menu bar on/off	F10

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Plate 1 Brush Color



Plate 2 Landscape 1

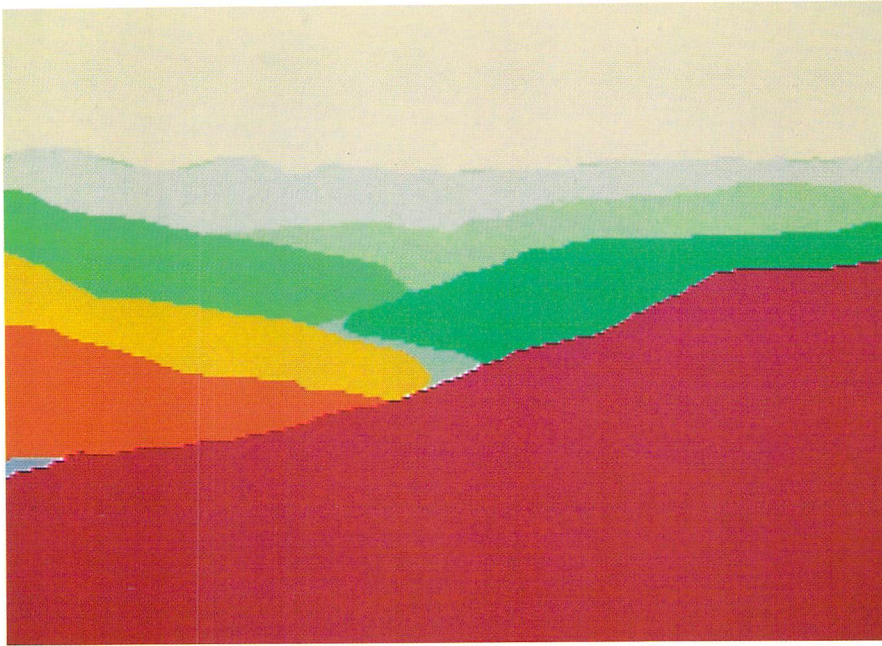


Plate 3 Landscape 2

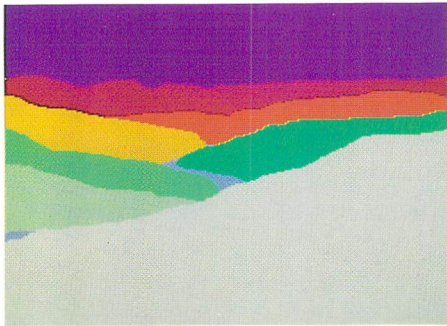


Plate 4 Hawk



Plate 5 Earth

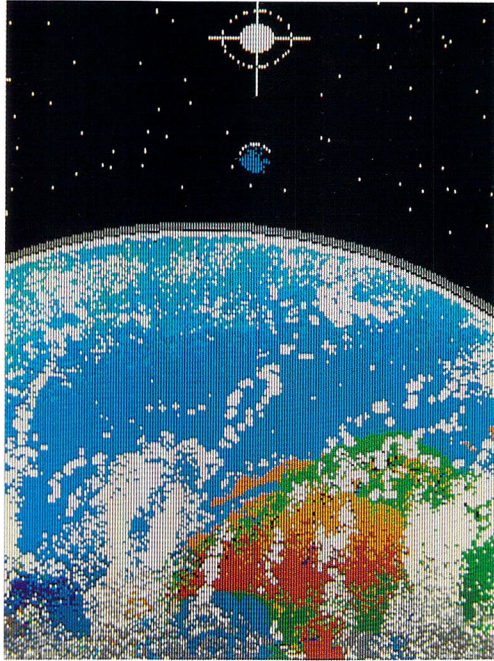


Plate 6 Astronaut

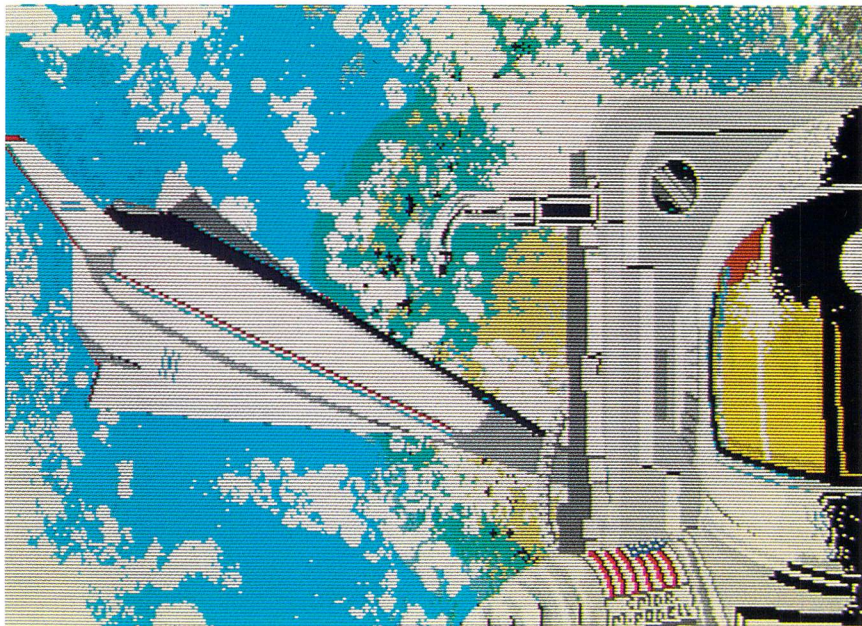


Plate 7 Basket



Plate 8 Unicorn



Plate 9 Cereal Comp



Plate 10 Champagne II

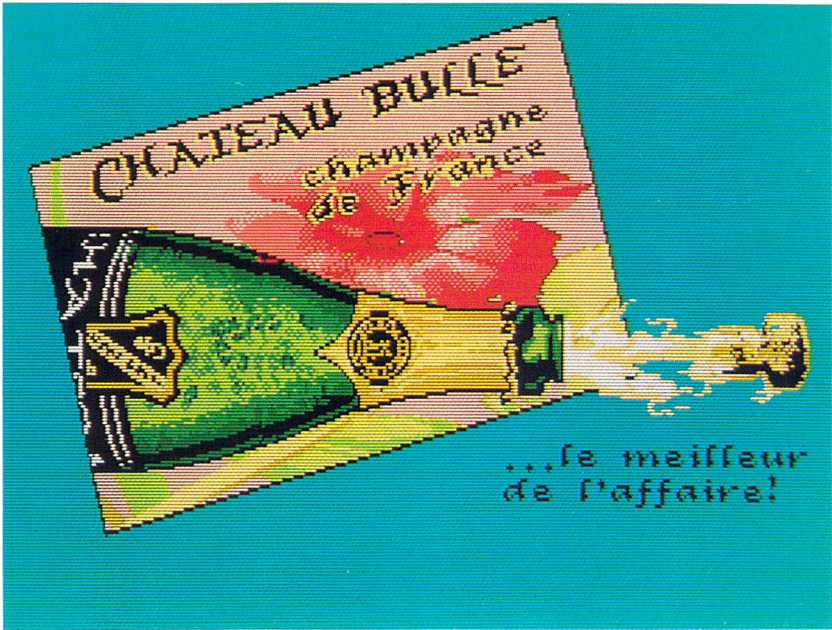


Plate 11 The Lover Computed

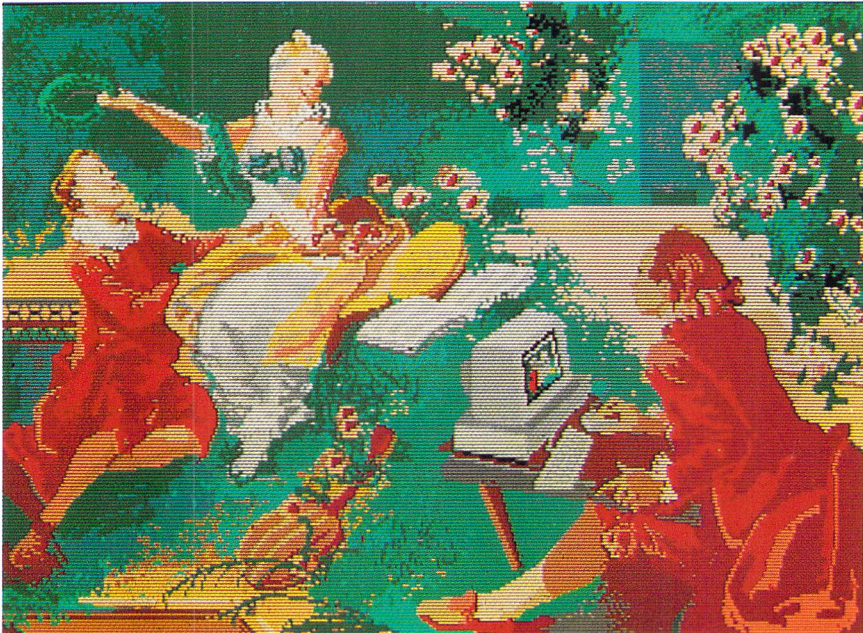


Plate 12 Painting

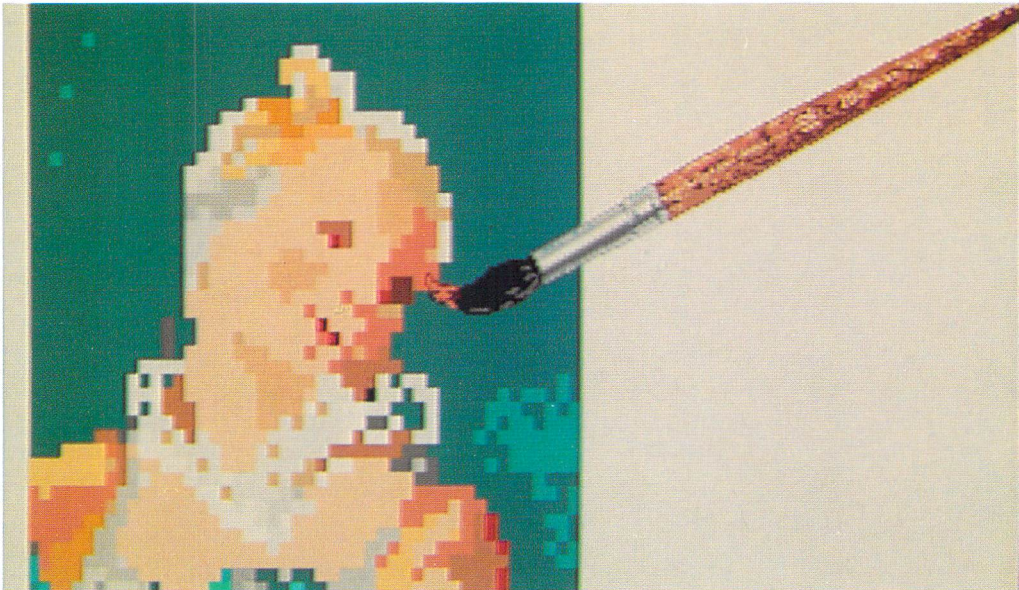


Plate 13 Medallion

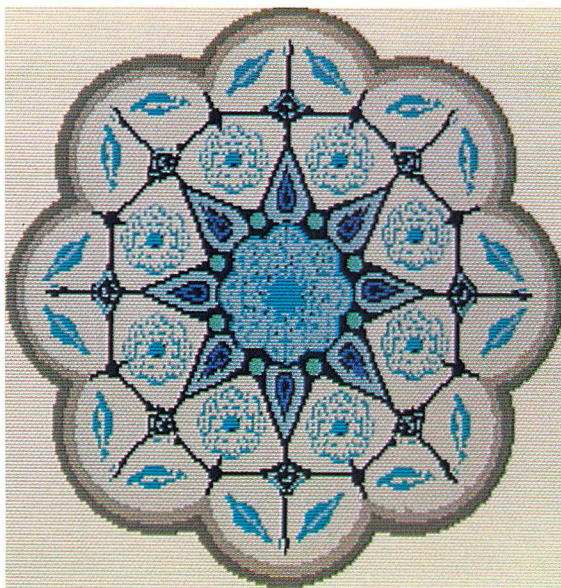


Plate 14 Floating World



Plate 15 We See Farther II

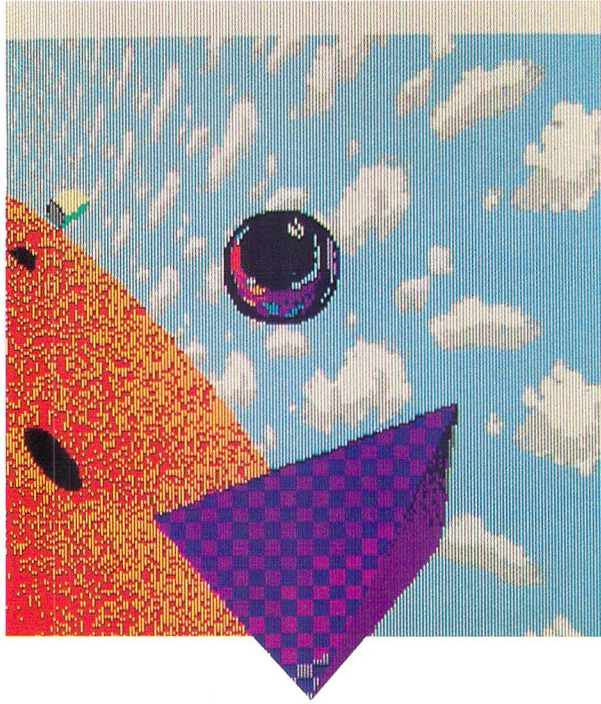
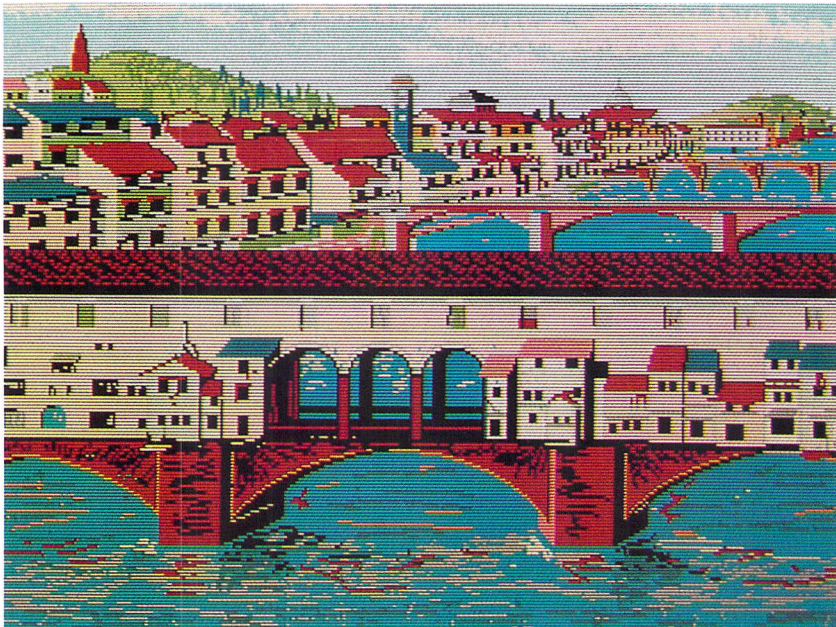


Plate 16 Ponte Vecchio



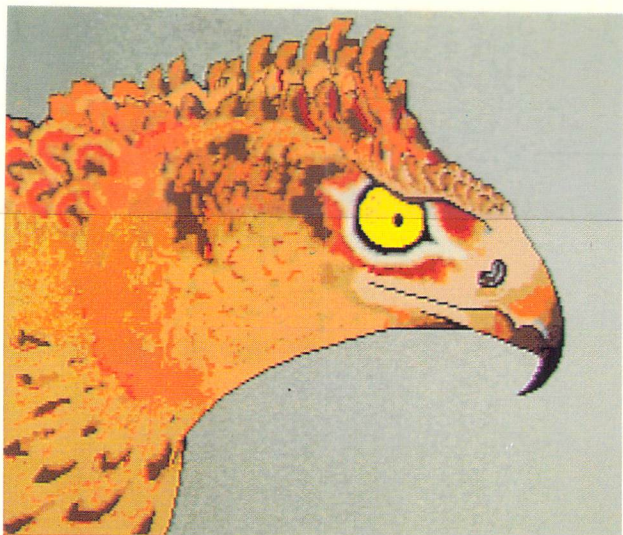
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