MINDSET

4 - P o i n t

Graphics Plus

4-Point Graphics Plus by Jim Hamilton

User's Guide by Skillware Development

Information in this document is subject to change without notice and does not represent a commitment on the part of Mindset Corporation. The software described in this document is furnished under a license agreement or non-disclosure agreement. The software may be used or copied only in accordance with the terms of the agreement.

Contents

Section 4
4-Point In Depth

Section 5
4-Point and the Mindset Graphics Interface

Appendix
Setting Up the HP7475A Plotter

Section 1

Introduction

Welcome to 4-Point

Welcome to 4-Point Graphics Plus — a sophisticated presentation graphics tool for the Mindset™ Personal Computer System.

What Is 4-Point Graphics Plus?

4-Point has 16 different graphic functions, each of which you can use to create particular effects.

Selecting Cursors	Circles	Buffer Functions	Presentation Segments
Cursor Direction	Line Segments	Zooming	Adding Text
Auto-Cursor	Triangles, Arcs, and Ellipses	Screenwide Functions	Getting and Saving
Color	Framing	Texturing	Useful Tools

4-Point Graphics Plus is a *command-driven* program. This means that you tell 4-Point what to do by issuing commands from the keyboard or mouse, instead of choosing items from a menu. Once you learn the commands, you can use the keyboard and mouse quite dynamically – like a professional graphics console.

What Can You Do With 4-Point?

4-Point gives you a *rich* graphics environment. You can combine its 16 functions in literally thousands of ways to achieve interesting and – with just a little artistic creativity – dramatic effects.

You can save any image you create as a file on a diskette. Then, whenever you like, you can recall the image and incorporate it (or parts of it) into a new creation. 4-Point's most powerful function, **presentations**, lets you record sequences of effects and chain them together to create complete *self-running* information presentations.
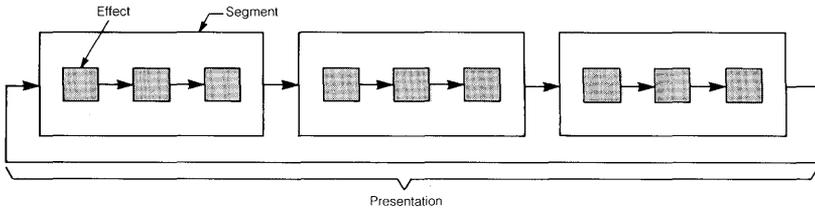
Finally your 4-Point Graphics Plus package includes the **Mindset Graphics Interface (MGI)**, a remarkable tool that lets you read files from other programs – Like WordStar, Lotus 1-2-3, Multiplan, and dozens of others – and store them *as MGI files*. Then you can use 4-Point to add to the files, enhancing them as you wish. When you're ready, MGI will print the final images on a wide variety of printers and plotters.

How This Guide Is Organized

This GUIDE TO 4-POINT GRAPHICS PLUS is organized in four main sections:

- **GETTING STARTED**, which describes what you need to use 4-Point and how to get the program up and running.

- **4-POINT BASICS**, which teaches you the fundamental techniques of 4-Point. When you complete this section, you'll have a good start on exploring the power of 4-Point.

- **4-POINT IN DEPTH**, a reference section that details all 4-Point commands and functions.

- **THE MINDSET GRAPHICS INTERFACE**, which shows you how to use the graphic interface with 4-Point to store, manage, enhance, and print any 4-Point or non-4-Point file.

Learning 4-Point

Since everybody learns in his or her own way, how you approach 4-Point is up to you.

- If you like to learn from the ground up, in a systematic way, try starting with the tutorial section, **4-POINT BASICS**.

- If you're the adventurous sort, and like to plunge in, you might want to turn immediately to the reference section, 4-POINT IN DEPTH, and start experimenting.

As with any creative tool, experimenting with 4-Point is the key to discovery. There's no way that a manual can exhaust the possibilities of a tool like 4-Point, so this guide doesn't try. Instead, it shows you how to use the primary functions of the program, and outlines some of the ways that artists have combined these functions. Finally, the guide turns you loose, to experiment creatively and produce pretty much what you can imagine.

One more thing. This guide – especially the 4-POINT IN DEPTH section – organizes all functions and commands in sections that are easy to

reference, so you won't have to struggle to memorize all of the commands. In addition, your 4-Point package includes a Quick Reference Guide that gives a condensed outline of all 4-Point functions.

So, whenever you need specific guidance, turn back to the 4-POINT IN DEPTH section. And, when you need a quick memory jogger, just refer to the Quick Reference Guide.

Section 2

Getting Started With 4-Point

What You Need

To use 4-Point Graphics Plus, you need the following items:

• A Mindset Personal Computer with at least one disk drive and 196K of memory. The instructions in this guide assume you have a two-drive system

• Your MS-DOS system diskette

• The 4-Point Graphics Plus Program Diskette

• A blank, formatted diskette (double-sided, double density) for making a backup copy of the 4-Point Program Diskette

• This guide

• You might also want to have available one or two blank formatted work diskettes on which to store the files you create with 4-Point

Backing Up the 4-Point Program Diskette

Before you start using 4-Point Graphics Plus, it's a good idea to make a backup copy. Follow these steps (see your *Introductory Guide to MS-DOS* or the *MS-DOS Reference Manual* for complete details on formatting and copying diskettes):

• Use your Mindset MS-DOS to format a blank diskette. Use the default

options – that is, type **FORMAT**, followed by a space, the disk drive
designation, and a colon. Then press   RETURN

• Use the MS-DOS DISKCOPY command to copy the 4-Point Program
  Diskette onto the newly formatted diskette. With the A> prompt on
  the screen, your original 4-Point Program Diskette in drive A, and your
  newly formatted blank diskette in drive B, type **DISKCOPY A: B:**,
  then press   RETURN   .

• Label the backup copy, and store it in a safe place.

Transferring the MS-DOS System

It's also a good idea to transfer the MS-DOS system to your 4-Point
Program Diskette. Here are the basic steps for doing this:

• Insert your Mindset MS-DOS diskette into drive A and your original
  4-Point Program Diskette into drive B.

• Type **SYS B:** and press   RETURN   .

• Type **COPY COMMAND.COM B:/V** and press   RETURN   .

For complete details on transferring the MS-DOS system to the original
Program Diskette, refer to your *MS-DOS Reference Manual.*

Using 4-Point Diskettes

If you accidentally write over any files on your original 4-Point diskette,
use the MS-DOS DISKCOPY command to copy the 4-Point files from
your backup copy back to your original diskette.

If the original Program Diskette becomes damaged, use the backup
copy. When you use the backup copy, however, *the damaged original
diskette must still be inserted into the default drive.* Then, when you load
4-Point, make sure you specify the non-default drive (e.g., if drive A is
the default drive, type **B:4POINT**.

One more thing – 4-Point signals important error conditions by beeping,
so if your system is configured with the beeper off, you'll probably want
to turn it on.

Loading 4-Point

The loading process actually loads *two* programs – the Mindset
Graphics Interface (MGI) and 4-Point Graphics Plus.

Follow these steps to load the programs:

● If you did not transfer MS-DOS to your Program Diskette, you must
  first load MS-DOS into your computer. Insert your Mindset MS-DOS
  diskette into drive A. Insert a newly formatted work diskette into drive
  B. Turn on your Mindset System Unit. When you see the familiar A>
  on the screen, remove the MS-DOS diskette and replace it with your
  4-Point Program Diskette.

  Type **4POINT**, then press the   RETURN   key.

● If you transferred MS-DOS to your Program Diskette, insert your
  Program Diskette into drive A and your newly formatted work diskette
  into drive B; then turn on your System Unit.

● Now:

  – The MGI program is loaded. You'll see a screen which tells you that
    MGI has been loaded and prepared for a Diablo C150 Series Ink
    Jet Printer.

    If you have another printer, first learn 4-Point. Then, when you're
    ready to use MGI, set up your printer according to instructions in
    the last section of this guide, 4-POINT AND THE MINDSET
    GRAPHICS INTERFACE.

  – 4-Point is loaded and you'll see the 4-Point screen.

Now you can begin exploring the 4-Point functions. 4-POINT BASICS, a
complete set of lessons in the fundamental 4-Point techniques, begins
on the next page.

Section 3

4-Point Basics

This set of eight lessons introduces the basics of 4-Point Graphics Plus. It doesn't cover every single function and combination – 4-Point is much too rich for such an approach. But it should give you a good feel for 4-Point's basic techniques and range of possibilities.

So take the time to work through this section, following all instructions as you go. Then, you can begin using 4-Point on your own, referring to the next section, 4-POINT IN DEPTH, for specific details.

Remember also that there's a Quick Reference Guide included in the 4-Point package, so you don't have to memorize what you learn in this section.

Lesson 1: The 4-Point Screen and Cursor

In this first lesson, you'll take a look at the 4-Point graphics screen, including the status line and palettes, and you'll learn three different ways to move the cursor.

Here's an important tip to keep in mind as you're learning: If you should happen to make a mistake and can't seem to correct a problem, don't worry – just press the [ESC] key once or twice and things will usually return to normal.

A: The 4-Point Screen

To begin, load 4-Point into your computer system – if you need instructions, refer to GETTING STARTED WITH 4-POINT. When you're looking at the 4-Point screen, check the main elements described below:
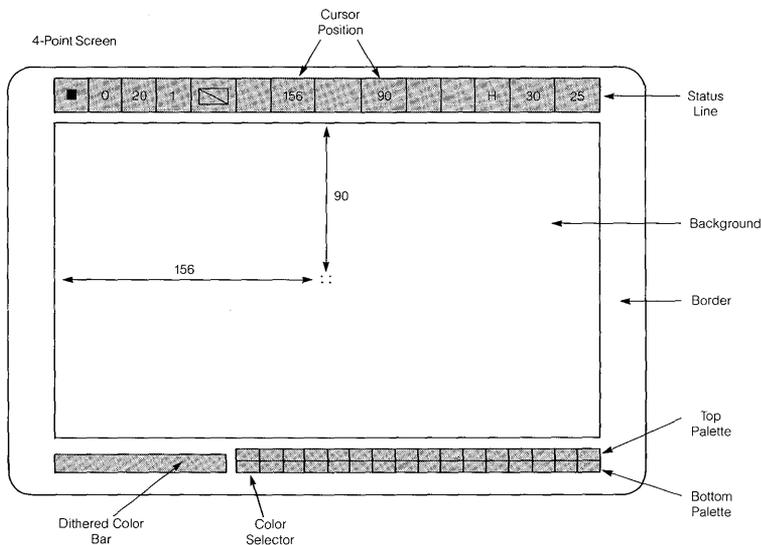
- **The cursor** is the point at which all of your drawing and painting takes place – like the point of a pen or the tip of a brush. You can position the cursor at any of 56,160 points on the screen. Each of these points is called a "pixel" (for "picture element"). The screen measures 320 pixels across and 180 down.

- **The status line** provides information about what's happening on the screen. For example, the two numbers near the center of the status

line tell you that the cursor is located 156 pixels from the right and 90 pixels from the top. The Quick Reference Guide includes a complete summary of all status line information.

● **The palette area** is where you select 4-Point colors. Notice the following:

  – There are two identical palettes – a top palette and a bottom palette.

  – At the leftmost end of each palette is a white rectangular outline that shows which color is selected. Right now, *black* is selected for each palette.

  – The long bar at the left shows a mixed or "dithered" color – the color that results from combining the top and bottom palette colors. Right now, the bar is black because black is selected on both the top and bottom palettes.

● **The border and background** can be changed to any of the palette colors.

B. Moving the Cursor

There are three ways to move the cursor:

● With the cursor direction keys at the right side of the keyboard:

Cursor Direction

Horizontal
Position

Vertical
Position

| ■ | 0 | 20 | 1 | ⬗ | | 43 | | 78 | | | H | 30 | 25 |

78

43

PG
UP

PG
DN

HOME   Δ   END

◁   ▽   ▷
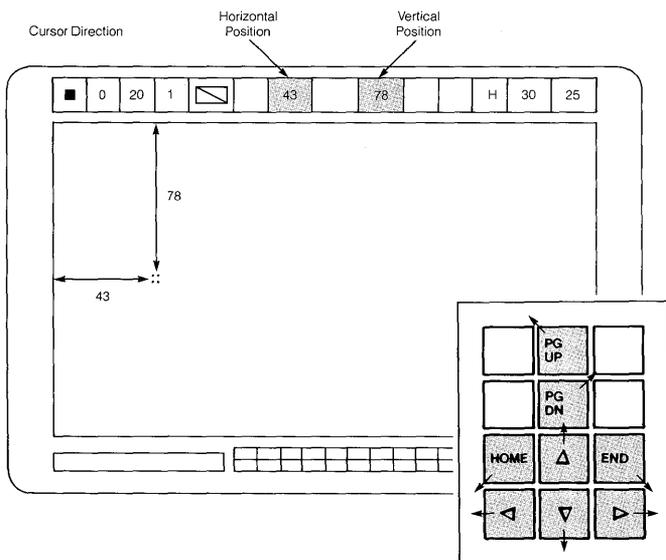
Try each one to see how it works. Note that the cursor position
information in the status line changes as the cursor moves.

You can hold down any cursor direction key to move the cursor
more quickly.

To move the cursor quickly to the edges or corners of the screen,
hold down the [SHIFT] key while pressing the appropriate
cursor key.

● With a mouse: If you're using a mouse, the cursor follows the
movements of the mouse.

If you have a mouse, press the left button to activate it. Then move it
and see how the cursor follows the movement.

● Automatically: You can set the cursor in motion by pressing the
  ⟨\|⟩ key.

Auto-Cursor
Indicator

| ■ | 0 | 20 | 1 | ◻ | ▨ | 156 | | 90 | | | H | 30 | 25 |
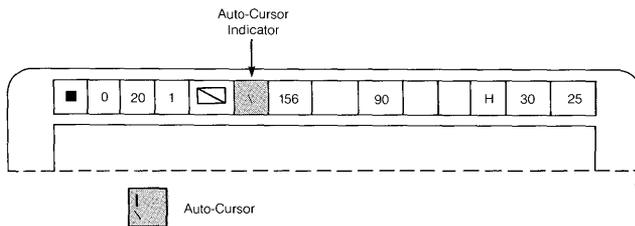
Auto-Cursor

As you'll see, this auto-cursor lets you create many dynamic graphic
effects.

To get a feel for how the auto-cursor works, press any cursor direction
key and then press the ⟨\|⟩ key. To stop the auto-cursor, press the
⟨\|⟩ key again.

The **20** in the status line tells you the speed of the cursor – 20 is
fastest and 0 is slowest. Use the ⟨,<⟩ and ⟨.>⟩ keys to change the
speed of the cursor.

Let the cursor move to the edge of the screen until it stops. Now
press ⟨0⟩ (the zero key) to turn on the *cursor wrap* function. The
cursor then "wraps" around to the opposite edge of the screen. Press
⟨0⟩ again to turn off the cursor wrap function.

C. Centering the Cursor

To move the cursor instantly back to the center of the screen, press ⟨5⟩.

Now that you know how to move the cursor, you can begin to draw
with it.

Lesson 2: Basic Drawing and Color

In this lesson, you'll learn how to create simple drawings, how to fill areas with any of 4-Point's colors, and how to erase the screen.

A. Line Drawing

To draw a line on the screen, you select a color, turn on the draw function, and move the cursor (with the cursor keys or the mouse) to create the line. Follow these steps:

- Use the [F1] and [F2] keys to select a color. Each time you press [F2] , the top palette color selector moves to the right to select a new color. Press [F1] to move the selector to the left. Select any color other than black, the background color.

- Using the cursor movement keys or the mouse, move the cursor to where you want to start drawing.

- Now press the [·-] key to turn on the draw function. The draw indicator appears in the center box of the status line to let you know that the function is on.

Draw Indicator
(Light Blue)

Draw ON/OFF
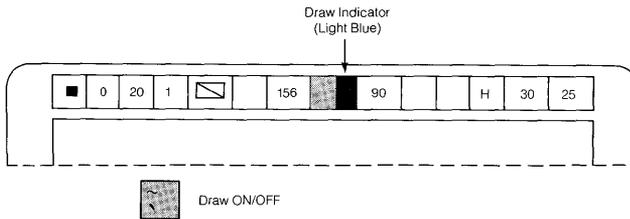
- Now draw:

  - To draw with the keyboard, press the cursor movement keys. A line follows the movement. To change the direction of the line, simply change the direction of the cursor. To stop drawing, press [·-] again.

If you're using a T.V. or a composite monitor and the colors seem a
bit uneven, don't worry – this is a common feature of your monitor.

- To draw with a mouse, press the left button and hold it down as you
  move the mouse. A line will follow the movement. Release the
  button to stop drawing.

● Select a new color (with the F1 or F2 keys) and continue to draw.

B. Auto-Cursor Drawing

You can combine the auto-cursor function with the draw function. Press
 · to turn on the draw function. Then press \| to get the cursor
moving automatically. Use the cursor movement keys to change the
direction of the moving cursor as it draws across the screen.

C. Erasing the Screen

To erase the entire screen, hold down the SHIFT key while you
press F9 .

D. Color Filling

With 4-Point, you can fill an enclosed area with any color. To fill an area,
4-Point needs to know the color to fill with as well as the border color
of the area to be filled. You set the border color on the top palette (with
 F1 and F2) and the fill color on the bottom palette (with F4
and F5).

You can fill the entire screen, too, but it's usually much faster to change
the background color – see section 4 of 4-POINT IN DEPTH for instruc-
tions on changing the background color.

Follow these steps to learn color filling.

● Select a color (with F1 and F2), turn on draw (with ·) and
  move the cursor to outline an enclosed area on the screen. Make
  sure there are no gaps in the border you create.

  Turn off the draw function (with ·). The status indicator should go
  off.

● Move the cursor into the enclosed area.

- Select a fill color from the bottom palette. The F4 key moves the bottom color selector to the left, and the F5 key moves it to the right. Make sure the fill color is different from the border color *and* different from the background color (if you fill with the border color, you won't be able to refill the area).

- Press F to fill the enclosed area. If the whole screen fills, don't worry – you probably left a gap in the border of the area you tried to fill. To start over, just erase the screen (SHIFT F9) and start over by drawing another enclosed area.

- Select a new color from the bottom palette (with F4 and F5) and press F to fill again. Note that once you've filled with the same color as the border color, you can no longer fill the area.

This is a good time to start experimenting. Draw several enclosed areas by crisscrossing lines – then fill each area with a different color. Try for a gradual blending effect by positioning similar colors next to one another.
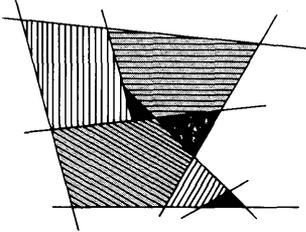
Filling Adjacent Areas

Lesson 3: Circles

In 4-Point Graphics, a circle is any enclosed, rounded shape with a horizontal or vertical axis. In other words, 4-Point circles can be tall or short – ellipses, actually – or perfectly round. 4-Point circles cannot, however, be tipped to one side. A tipped circle, in 4-Point terms, is an ellipse. You'll learn about ellipses in Lesson 4.

The Mindset executes 4-Point circle-drawing routines very quickly, allowing you to create some very startling effects.

In this lesson, you'll learn how to draw circles, how to change circle height and width, and how to draw circles filled with solid colors or dithered (mixed) colors.

A. Drawing Circles

To start this lesson, erase the screen ($\boxed{\text{SHIFT}}$ $\boxed{\text{F9}}$), then press $\boxed{5}$ to center the cursor.

Pick a color (not black) from the top palette ($\boxed{\text{F1}}$ and $\boxed{\text{F2}}$).

Now, press $\boxed{\text{C}}$ to draw a circle with the cursor at its center. The circle information in the status line tells you that the circle's horizontal radius is 30 pixels and its vertical radius is 25 pixels. In other words, the circle is 50 pixels high by 60 pixels wide. The horizontal and vertical radii are different to make up for the distortion that is common with most T.V. and monitor screens.
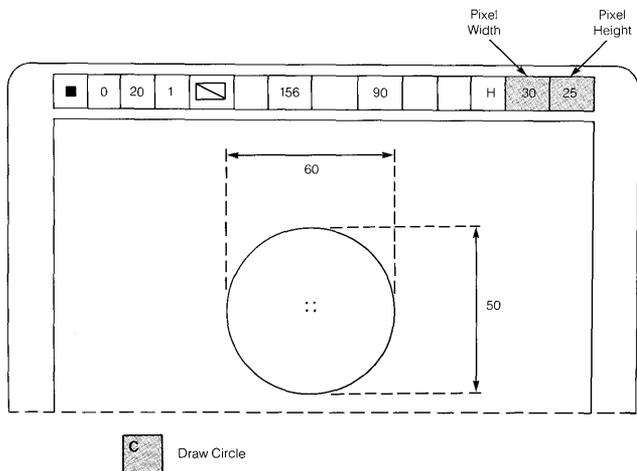
B. Changing Circle Size

Here are the keys that draw circles and control circle size. Take a look at them – then follow the steps on the next page to draw circles of different dimensions.
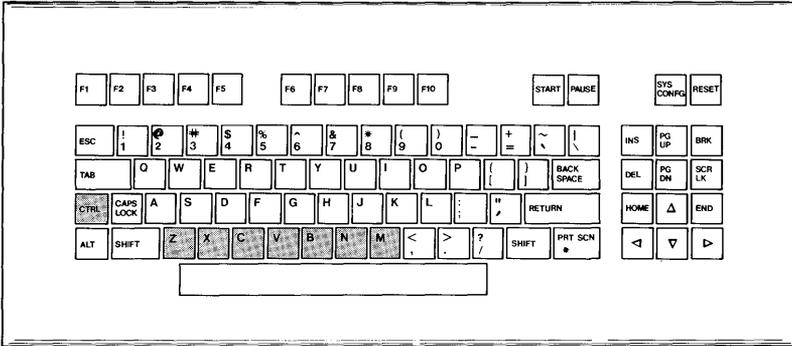
C Draw Circle

Z Increase horizontal radius

X Decrease horizontal radius

V Increase vertical radius

B Decrease vertical radius

N Auto Circle ON/OFF

M Circle hollow/filled

CTRL With Z or X: Increase/Decrease both radii at same time

4-Point Circle Functions

- Increase the circle width by pressing ⌷Z⌷. Press it about 10 times — until the horizontal radius is 40.

- Press ⌷C⌷ to draw a circle.

- Press ⌷V⌷ to increase the vertical radius to about 70.

- Press ⌷C⌷ to draw a circle.

- Change the circle values a few more times using the ⌷Z⌷, ⌷X⌷, ⌷V⌷, and ⌷B⌷ keys, and press ⌷C⌷ each time you want to draw the circle.

When you're ready to move on, press ⌷RETURN⌷ . This brings the circle radius settings to their original values.

C. Changing Circle Height and Width at the Same Time

You can change the horizontal and vertical dimensions of the circle at the same time with the key combinations ⌷CTRL⌷ ⌷Z⌷ and ⌷CTRL⌷ ⌷X⌷. In this way, you can draw circles of different sizes but of the same *proportions*.

To try this, first clear the screen (⌷SHIFT⌷ ⌷F9⌷) and reset the circle values (⌷RETURN⌷). Then follow these steps.

- Press ⌷C⌷ to draw a circle.

- Hold down the ⌷CTRL⌷ key as you press ⌷Z⌷ 10 times to increase the horizontal *and* vertical dimensions.

- Press ⌷C⌷ to draw another circle.

- Continue pressing ⌷CTRL⌷ ⌷Z⌷ 10 times, then pressing ⌷C⌷, to draw a series of concentric circles.

You can *decrease* both dimensions of the circle with ⌷CTRL⌷ ⌷X⌷.

D. Filled Circles

So far, you've been drawing hollow circles. 4-Point also lets you draw circles filled with a dithered (mixed) color. You tell 4-Point that you want circles to be filled by pressing ⎣M⎦ . When you do so, the indicator on the status line changes from **H** for **H**ollow to **F** for **F**illed.

Circle
Hollow/Filled
Indicator

M Turn on Hollow/Filled Circle
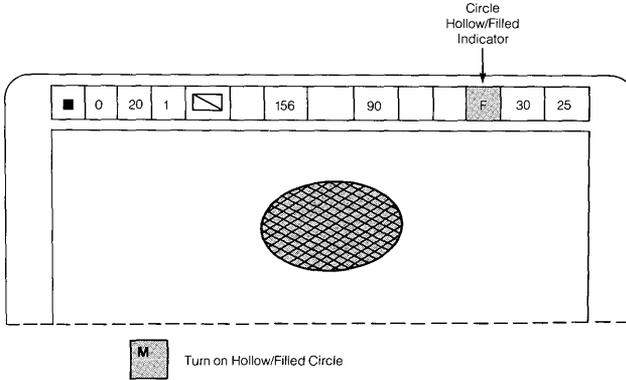
Start by clearing the screen (⎣SHIFT⎦ ⎣F9⎦) and resetting the circle values (⎣RETURN⎦).

Now follow these steps:

• Select a color from the top or bottom palette. As you make the selection, note that the dither bar (at the left of the pallette) changes to show what the color mixture looks like. If the color seems to be flickering, don't worry. It's because you're using a T.V. or composite monitor. Hold down the ⎣ALT⎦ key while you press ⎣F4⎦ and the flickering will stop.

• Press ⎣C⎦ to draw a circle filled with the dithered color.

E. Auto-Circle

Auto-circle lets you draw a circle *whenever you change a circle value*.
You turn on auto-circle by pressing $\boxed{N}$. An A appears on the status line
to let you know that the function is activated.

Auto-Circle
Indicator

| ■ | 0 | 20 | 1 | $\searrow$ | 156 | 90 | A | H | 30 | 25 |
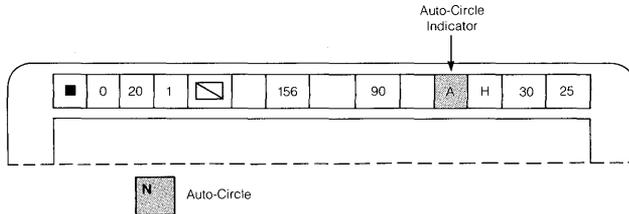
N Auto-Circle

Start by clearing the screen, resetting the circle values, and setting the
circle type to Hollow (with the $\boxed{M}$ key). Then:

- Press $\boxed{N}$ to turn on auto-circle, if necessary.

- Press $\boxed{Z}$ to change the horizontal radius. As you do, 4-Point draws
  the circle with the new radius. Continue pressing $\boxed{Z}$ until the radius
  is about 45 or 50.

- Now change the top palette color ($\boxed{F1}$ and $\boxed{F2}$) and press $\boxed{Z}$
  until the radius is about 60 or 65 (you can hold down the $\boxed{Z}$ key if
  you wish).

- Continue changing color and increasing the horizontal radius as
  you like.

- Now do the same with the vertical radius. Press $\boxed{V}$ to increase the
  vertical radius by about 15 pixels, change color, and increase the
  radius again.

F. A Spray of Circles

Now that you're familiar with several 4-Point functions, you might like to see how some of them work in combination.

For example, follow these steps to see how auto-cursor and auto-circle work together.

- Clear the screen ([SHIFT] [F9]) and press [RETURN] to center the cursor and reset the circle values.

- Press a cursor direction key. Then press [\!] to set the cursor in motion. Let it move to the edge of the screen.

- Press [0] to turn on the *cursor wrap* function – when the cursor reaches one edge of the screen, it "wraps" around and appears at the opposite edge.

- Press [N] to activate auto-circle.

- Press [Z] and hold it down to spray a series of ever-widening circles across the screen.

If you like, experiment before moving on. Change colors and make another spray of circles. Then see how holding down [X], [V], and [B] changes the effect. Finally, try holding down [CTRL] [Z] and [CTRL] [X] as the cursor moves.

Lesson 4: Lines, Triangles, Arcs, and Ellipses

In Lessons 1, 2, and 3, you used techniques involving a single point: drawing lines with a single, moving point and drawing circles around a single, central point. In other words, you've been using a *1-point cursor*. That's what the **1** in the status line means:

In this lesson, you'll learn techniques that rely on a *2-point* and a *3-point* cursor.

With the 1-point cursor on the screen, you select the 2-point cursor by holding down the [SHIFT] key while you press [TAB] . You select the 3-point cursor by pressing [SHIFT] [TAB] again. You move from 3- to 2-point and 2- to 1-point by pressing [TAB] .
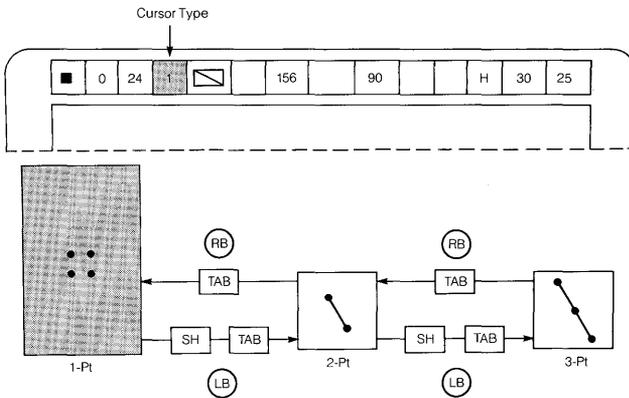
Changing to 1-, 2-, and 3-Point Cursors

The following sections give you practice in working with these cursors.

A. Drawing Lines With the 2-Point Cursor

In your graphics work, you'll often need to draw precise lines *between* two points (as when completing the third side of a triangle). 4-Point lets you do this quickly with a 2-point cursor.

Clear the screen. Then follow these steps to see how the 2-point cursor works:

• Press ⌈SHIFT⌉ ⌈TAB⌉ to select the 2-point cursor. As the cursor changes from the 1-point to the 2-point cursor, the indicator in the status line changes to **2**.

• Move the cursor to display it more clearly. The 2-point cursor is a "rubber-band" line with the points at each end of the line, one fixed and the other movable. Continue moving the movable point diagonally until the two points are about 3 inches apart.

• Now press ⌊L⌋ to draw a line between the two points. You might have to move the cursor out of the way to see the line.

• Press ⌊TAB⌋ to return to the 1-point cursor.

B. Lines End-to-End

To draw a series of connected line segments, follow these steps:

• With the 1-point cursor on the screen, press ⌈SHIFT⌉ ⌊TAB⌋ to display the 2-point cursor.

• Press ⌈·-⌉ to turn on the draw function.

• Move the 2-point cursor to the length of the first line you want to draw.

• Press ⌊Q⌋ and 4-Point quickly moves the fixed point to the movable point *as the line is drawn*.

• Now, move the movable point away in another direction and press ⌊Q⌋ to draw the next segment and bring the fixed point to the movable point.

• Continue moving the movable point and pressing ⌊Q⌋ to build a series of line segments. To break the segments, just move the cursor and turn off the draw function before you press ⌊Q⌋ .

- To return to the 1-point cursor, press [TAB] .

Use these techniques to practice drawing triangles, rectangles, and other polygons before moving on.

C. Triangles, Arcs and Ellipses

You need three points to define a triangle, arc or ellipse.
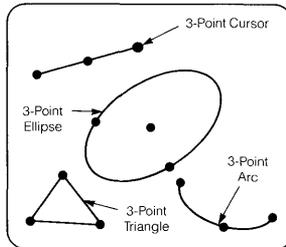
You get the three points by first using the 2-point cursor to spread two points. Then you press [SHIFT] [TAB] – a third point appears midway between the first two. This is the 3-point cursor.

Clear the screen, center the cursor, and follow these steps to draw triangles, arcs and ellipses.

- Press [SHIFT] [TAB] to select the 2-point cursor.

- Position the movable point about an inch or so to the right.

- Press [SHIFT] [TAB] again to select the 3-point cursor. A point appears midway between the first two and the status indicator changes to **3**. You may have to move the cursor slightly in order to see the third point.

  Now the first two points are fixed and this third point is movable.

- Move the third point down about an inch or so.

- Press [T] to draw a triangle (you might have to move the cursor a bit in order to see the triangle). If there is no triangle, you may have drawn it in black. Change color and try again.

● Move the third point down about an inch more. This defines the
pathway for an arc.

● Press ⎡A⎤ – 4-Point draws the arc.

● Press ⎡E⎤ – 4-Point uses the same three points to define an ellipse.
The third point is at the center of the ellipse.

Before moving on to the next lesson, experiment with the 2- and 3-point
cursors by constructing cylindrical objects like the one shown here:
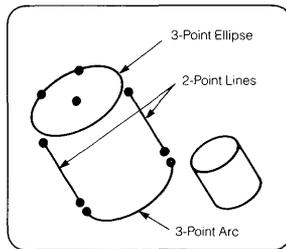
Cylinder with 2- and 3-Point Cursors

Lesson 5: Framed Areas and Framed Images

4-Point's framing functions are a powerful set of tools that let you put a frame around any part of the screen (including the entire screen) and then manipulate the area or images inside the frame.

To define a frame, you need 4 points, so in this lesson you'll learn how to use the 4-point cursor to:

- Draw rectangles

- Wash framed areas with a dithered color

- Enlarge, reduce, rotate, and move framed images

- Capture and save framed images in a temporary buffer

- Move a captured image

- Use a captured image as a paint brush

With the 1-point cursor on the screen, you select the 4-point cursor by pressing [TAB]. You press [TAB] again to return to the 1-point cursor from the 4-point cursor. With a mouse, press the right button to change from a 1-point cursor to a 4-point cursor and back again.
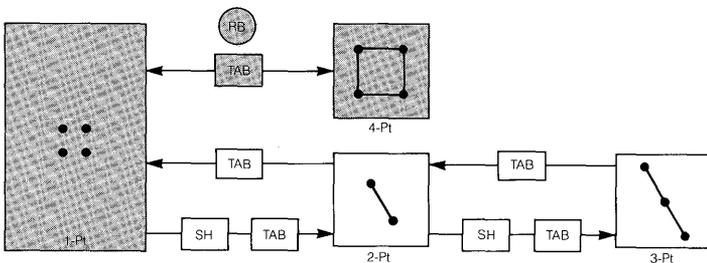
Changing to 1- and 4-Point Cursors

A. Drawing Rectangles with the 4-Point Cursor

First, clear the screen and center the cursor. Then follow these instructions:

● Press ⌊TAB⌋ to select the 4-point cursor – immediately, the cursor changes from the 1-point to the 4-point cursor.

● Move the cursor *diagonally down and to the right* to display it more clearly. The 4-point cursor is a "rubber-band" rectangle with the points at the corners. As you move the cursor, the points spread in the direction of movement. Move the 4-point cursor until the rectangle is about 2 or 3 inches square.

● Press ⌊L⌋ to draw the rectangle. You might have to move the 4-point cursor a little in order to see the rectangle clearly.

● Press ⌊TAB⌋ to return to the 1-point cursor.

B. Washing Framed Areas

By pressing ⌊ALT⌋ ⌊W⌋ , you can **W**ash the area inside a 4-point frame with a dithered color (remember – a dithered color is a combination of top and bottom palette colors).

● Press ⌊TAB⌋ to select the 4-point cursor.

● Move the cursor and spread the points to a 2-inch square.

● Use ⌊F1⌋ and ⌊F2⌋ , and ⌊F4⌋ and ⌊F5⌋ to select a pleasing dithered color (the bar at the left of the palette shows the selected dithered color).

● Press ⌊W⌋ – the framed area is immediately washed with the dithered color.

● Press ⌊TAB⌋ to return to the 1-point cursor.

C. Framing an Image

When you put a frame around any portion of the screen, you can manipulate the enclosed image in various ways.

● Clear the screen.

• Follow these steps to draw a series of nested rectangles:

— Press ⌊TAB⌋ to select the 4-point cursor.

— Move the cursor to produce a ½ inch square – press ⌊L⌋ to draw
  a rectangle.

— Move the cursor a bit more to define a 1 inch square – press ⌊L⌋
  again to draw another rectangle.

— Continue moving the cursor and pressing ⌊L⌋ until you have an
  image that looks something like the following:

Nested
Rectangles
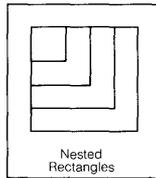
• Press ⌊TAB⌋ to select the 1-point cursor.

• Press ⌊Q⌋ to move the cursor to the upper left corner of your image.

• Press ⌊TAB⌋ to select the 4-point cursor.

• Press ⌊Q⌋ again – the 4-point cursor frames the image automatically.

Framing an Image
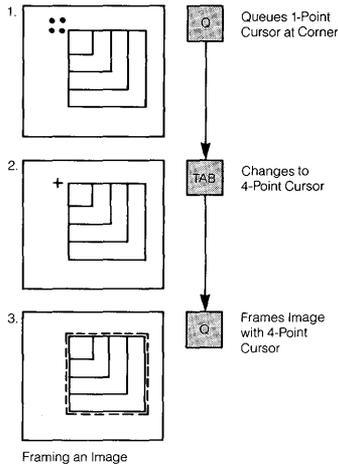
D. Manipulating a Framed Image

Now that your image is framed, you can manipulate it by pressing keys for specific effects. Try each key to see the effect (don't erase the screen, though – you'll need it for the next exercise):

KEY	EFFECT
U	Turn the image upside down
I	Reverse the image right to left
O	Rotate 90 degrees clockwise
P	Rotate 90 degrees counter clockwise
R	Reduce the image vertically
ALT R	Reduce the image horizontally

A particularly useful technique is to "texture" the entire screen with the framed image. To do this, just frame an image and press [CTRL] [BACKSPACE].

E. Moving an Image Within a Frame

You can move the image within a frame's boundaries. However, any part
of the image that crosses an edge of the frame will be erased.

● To give your image room to move, position the 1-point cursor well
   above and to the left of the image.

● Press [TAB] to select the 4-point cursor.

● Move the cursor so that the border of the frame surrounds the image
   with lots of room to spare.

● Now use these keys to move the image within the frame, remem-
   bering that any part of the image that crosses an edge will be erased.

KEY	EFFECT
CTRL ◄	Move image left
CTRL ►	Move image right
CTRL HOME	Move image up
CTRL END	Move image down

F. Capturing a Framed Image

Several spectacular graphic effects rely on 4-Point's image capturing
function. With this function, you frame an image and, by pressing the
BACKSPACE key, capture it in a temporary storage area called a *buffer.*

You can reproduce the buffered image anywhere on the screen. You
can also save the buffered image on your work diskette.

To start, make sure that you still have the nested rectangles on the
screen – if you've erased them, just redraw them.

- Position the cursor in each rectangle section, select a pleasing fill color, and press ⌐F⌐ to fill each section of the image with a different color:

Filled
Nested
Rectangles
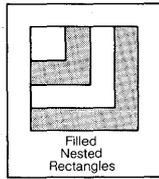
- Press ⌐Q⌐ to move the 1-point cursor to the upper left corner of the image.

- Press ⌐TAB⌐ to select the 4-point cursor.

- Press ⌐Q⌐ to frame the image.

- Press ⌐ BACKSPACE ⌐ (or the left mouse button) – the contents of the frame are immediately captured in the image buffer. The center box of the status line lights up to tell you that the image is being captured.

- Press ⌐TAB⌐ to select the 1-point cursor.

- Now, to put the captured image back on the screen, move the cursor to another part of the screen and press ⌐ BACKSPACE ⌐ – the captured image appears. You can reproduce the image at as many different points as you like around the screen.

G. Painting With a Captured Image

To use a captured image as a paint brush follow these steps:

- Make sure the 1-point cursor is selected.

- Press the ⌐= +⌐ key to turn on the *buffer draw* function. An indicator near the center of the status line appears to let you know that the function is activated.

Buffer Draw
Indicator
(Orange)

| ■ | 0 | 20 | 1 | ◸ | | 156 | | 90 | | | H | 30 | 25 |

Buffer Draw ON/OFF
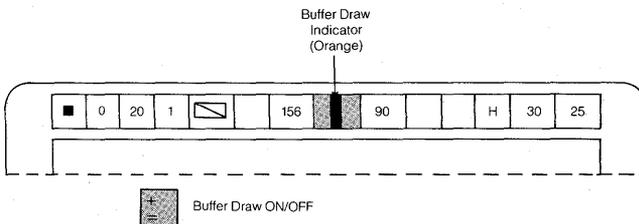
● Move the cursor. The buffer image follows the cursor, leaving a trail
  of color. Note that the color of the trail depends on the color of the
  pixels at the *edge* of the image. That is, the edge of the image does
  the drawing.

Before moving on, turn on the auto-cursor with the [⟍!] key and
experiment with a paintbrush that moves automatically. Don't erase the
screen, though, because in the next lesson, you'll learn how to save the
image on a diskette.

Lesson 6: Saving and Getting Diskette Files

As you work with 4-Point, you'll probably want to save images and use them again in other pictures. You can also create a presentation which gets a picture from a diskette and modifies it.

A. Saving Files

Follow these steps to save the image on your screen. If you've erased the screen, use the techniques you've learned to create a picture that you can save.

- With the 1-point cursor on the screen, press ⎡S⎤ to tell 4-Point that you want to **S**ave the screen – the palette will be replaced by 4-Point's file name area (where you specify a file in which to save an image), and the status line displays an **S** to tell you that the function is on.

Cursor

File Naming Area
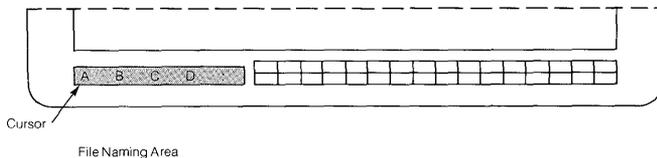
The letters A through D refer to disk drives. Note that a cursor is blinking to the left of the letter A.

- Select the default drive by pressing ⎡RETURN⎤ . If you want to select a different drive, just use the right and left cursor direction keys to position the cursor over the appropriate letter before you press ⎡RETURN⎤ .

- Enter **IMAGE1** for the file name. If you make a mistake, use the ⎡◄⎤ key to back up and correct your file name.

- Press ⎡RETURN⎤ . The screen is saved on the diskette in drive A under the name **IMAGE1**. Note that the center area of the status line flashes red as the image is saved.

Note that you can save a framed image as well as an entire screen. To save a framed image, all you have to do is frame the image with the 4-point cursor. Then press ⎡S⎤ to name and save the image, as usual.

B. Getting Diskette Files

Now retrieve your file from the diskette. Before you start, erase the
screen ([SHIFT] [F9]).

● Press [G] – once again, the palette is replaced by a file name area
and a **G** appears in the status line.

● Use the left and right cursor direction keys to position the cursor over
the appropriate drive. You can also select the default drive simply by
pressing [RETURN] .

● Enter **IMAGE1** and press [RETURN] . 4-Point gets the image from the
diskette and puts it *into the buffer.*

● Move the cursor to the upper left corner of the screen.

● Put the image on the screen as usual – with the 1-point cursor on the
screen, press [BACKSPACE] .

C. Looking at Diskette Directories

To look at a diskette directory:

● Select the 1-point cursor and press [D] .

● When you see the file name area, select a drive: Use the left and right
cursor direction keys to position the cursor over the appropriate
drive. You can also select the default drive simply by pressing
[RETURN] . The first file name will appear in the file name area.

● You can browse through the file names with the [▲] and [▼] keys.
You can display the file status of each file at the right side of the file
name area by pressing [▶] . The letter to the left of the < symbol is
the file type:

– I = Image file
– I = Font file
– A = Segment file

The letter to the right of the < symbol tells whether the file is write-
protected or not:

– W = Write-protected
– A = Unprotected

- Return to the normal drawing screen by pressing   [ESC] .

- In Depth section 13 says a lot more about manipulating files while reviewing the directory.

Lesson 7: Zooming For Precision

4-Point's zooming functions let you edit images on your screen pixel by pixel. In this lesson, you'll learn how.

A. Turning On the Zoom Function

When you turn on 4-Point's zoom function, the normal drawing screen is replaced by a magnified version of the area in the vicinity of the cursor. Follow these steps:

● Make sure the 1-Point cursor is on the screen.

● Clear the screen ([SHIFT] [F9]) and draw a circle ([C]).

● Position the cursor directly over the edge of the circle.

● Change the level of magnification with the [F8] key. Watch the box at the extreme left of the status line as you press [F8] several times – each press changes the size of the box. Choose the largest box (the highest magnification).

● Turn on the zoom function by pressing [* PRT SCN] . After a brief pause, the magnified image will appear. Each pixel is represented as a large colored block. The cursor is a small cross.

B. Editing a Magnified Image

Now you can edit the magnified image:

● Select a color from the top palette.

● Move the cursor as usual using the cursor direction keys.

● Press [INS] to color the pixel at the cursor position.

● Press [DEL] to remove whatever color is at the cursor position.

You can edit the magnified image more quickly by turning on the draw function (with [· ·]) while zoomed in. With the draw function on, you'll leave a trail of colored pixels wherever you move the cursor. You can erase pixels quickly by selecting the background color and turning on the draw function before you move the cursor.

C. Turning Off Zoom

There are three ways to turn off zoom. Try each one before moving on to
the next lesson:

● To return the normal screen and keep all the changes you made while
zoomed in, simply press ⎡* PRT SCN⎤ (if you have a mouse, you can
also press the right button).

● To return to the normal screen without keeping any of the changes
you made while zoomed in, press ⎡RETURN⎤ .

● To make your zoomed image into a new drawing screen, press ⎡CTRL⎤
⎡* PRT SCN⎤ . Be careful here, though – placing the zoomed image on
the drawing screen *erases* whatever is on the drawing screen.

Lesson 8: Creating Presentations

Now that you're familiar with most of 4-Point's fundamental concepts, try creating your first self-running presentation. When you turn on the *create segment* function, 4-Point will record all subsequent commands in the sequence that you enter them.

You can create a presentation of several segments by chaining them together. You can even build a segment library and then create different presentations by chaining segments together in different orders.

A. Starting the Presentation

● Press ALT   A – a **C** appears in the status line to let you know that you're ready to create a segment. In addition, the palette area disappears and is replaced by the familiar file naming area.

● Press RETURN to enter **A** (the default drive) as the drive name.

● Type **SEG1** for the file name and press RETURN . 4-Point reserves space for the segment on the diskette in drive A. The palette reappears and you're ready to create your segment.

B. Recording Your Segment

To create a segment, you can use 4-Point's functions (except for auto-cursor) as usual. The only difference you might notice is an occasional whirring as your commands are stored on the diskette. Try these effects:

● Set the top palette to red (with F1 and F2) and the bottom palette to yellow (with F4 and F5).

● Press M to select filled circles.

● Press C to draw a dithered red-yellow circle in the middle of the screen.

● Press Q to place the cursor at the upper left corner of the circle.

● Press TAB to select the 4-point cursor.

● Press Q to frame the image.

● Press BACKSPACE to capture the image in the buffer.

- Press ⌈TAB⌉ to select the 1-point cursor.

- Press ⌈= +⌉ to turn on the buffer draw function.

- Use the cursor direction keys, the auto-cursor (⌈\!⌉), or the mouse (if you have one) to move the image around the screen.

- Press ⌈G⌉ to get a file from the diskette.

- Enter the drive letter and type **IMAGE1**, the file name of the image you stored during Lesson 6.

- Press ⌈= +⌉ to turn on the buffer draw function. Use the cursor direction keys, the auto cursor (⌈\!⌉), or the mouse (if you have one) to move the image around the screen. Note that the upper left corner of the image is at the cursor location.

- Change the screen mode (⌈F9⌉ and ⌈F10⌉) to different values and move the image some more. See In Depth section 4, Color, for details on screen display mode.

- Experiment. Use the techniques you've learned to add to the presentation segment.

- When you're satisfied, press ⌈CTRL⌉   ⌈F10⌉ to turn off the segment create function.

C. Running Your Segment
Running your segment is easy.

- Press ⌈A⌉ to turn on the run segment function. The usual file naming area appears at the bottom of the screen.

- Select the proper drive, type **SEG1**, and press ⌈RETURN⌉ . Your segment will start immediately.

- You can control several characteristics of the presentation while it's running. You can –

  – change the border color as usual (⌈F6⌉ and ⌈F7⌉);

  – increase or decrease the play speed (⌈ , <⌉ and ⌈ . >⌉ ;

- turn the status line and the palette on and off ([/?]); and

- turn the cursor on or off ([SHIFT] [3]).

● The segment will continue to run until you press [ESC] .

Much more can be done with 4-Point's presentation functions, so when you're ready to extend your knowledge, refer to 4-POINT IN DEPTH for complete details.

Before You Go . . .

Now that you've learned the fundamentals of 4-Point Graphics Plus, you can start creating your own graphics and presentations.

But remember – the lessons you've gone through in 4-POINT BASICS cover only some of the uses of 4-Point's many powerful functions. All of 4-Point's functions are presented in detail in the next section, 4-POINT IN DEPTH, which you should use for reference as you work.

As you get more familiar with the range of 4-Point capabilities, remember to refer to the Quick Reference Guide when you need a quick memory jogger.

Section 4

4-Point In Depth

Introduction

This section presents all functions of 4-Point Graphics Plus in a reference format. Use this section when:

- you have a question about a specific 4-point function, or

- you want to experiment by browsing through the 4-Point functions and trying out the ones that catch your interest.

For a tutorial introduction to the fundamentals of 4-Point Graphics Plus, work through the preceding section, 4-POINT BASICS.

Organization of 4-Point In Depth
Each section of 4-Point In Depth describes a 4-Point function by presenting:

- A Keyboard map which shows the keys associated with the function

- A function table which gives the keypresses or mouse button presses for each desired effect

- Additional details on each function

General Conventions

4-Point In Depth uses these notation conventions:

RB   right mouse button
LB   left mouse button
1, 2, 3, 4   1-, 2-, 3-, and 4-point cursors

1. Selecting Cursors

Cursor Type
(1-4)
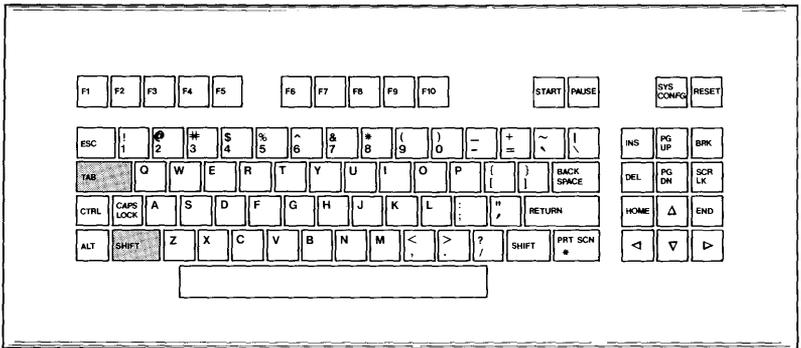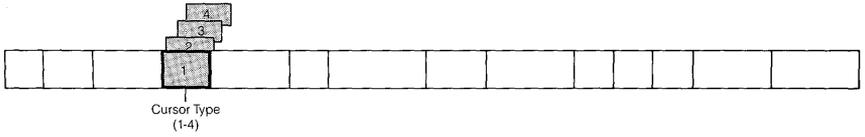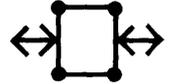
To Select This Cursor	With This Cursor on Screen	Press		With Mouse Press
1-point	4-point	TAB		RB
	2-point	TAB		RB
2-point	1-point	SHIFT	TAB	LB
	3-point	TAB		RB
3-point	2-point	SHIFT	TAB	LB
4-point	1-point	TAB		RB

More on Selecting Cursors

4-Point performs a variety of graphic manipulations with four types of cursor. For example, to do a freehand line drawing, select the 1-point cursor. To draw ellipses, select the 3-point cursor.

2. Directing the Cursor

Cursor Position

Cursor Step Size
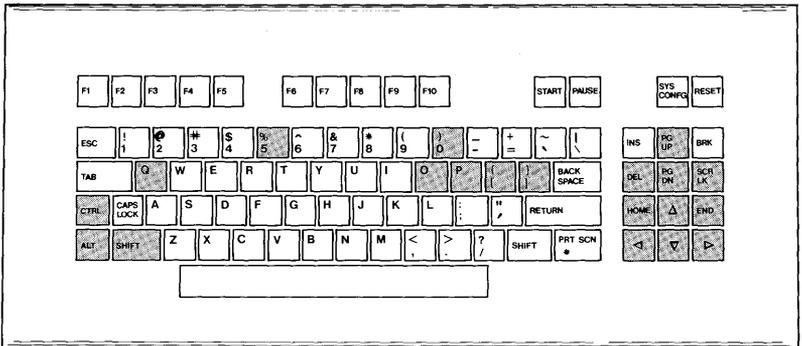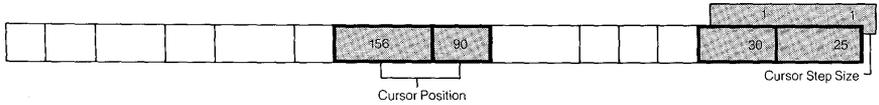
	With This Cursor on Screen	Press
Left, right, up, down	1, 2, 3, 4	◄ ► ▲ ▼
Diagonally up left	1, 2, 3, 4	PG UP
Diagonally up right	1, 2, 3, 4	PG DOWN
Diagonally down left	1, 2, 3, 4	HOME
Diagonally down right	1, 2, 3, 4	END
To edges and corners	1, 2, 3, 4	SHIFT (with above keys)
Mark cursor location	1	ALT Q
Move to marked location	1	CTRL Q
Fixed point to movable point	2	Q
Move to center of screen	1	5
Movable point to fixed point	2	5
Center movable point	3	5
Cursor wrap	1	0
Increase horizontal increment	1	O
Decrease horizontal increment	1	p
Increase vertical increment	1	[
Decrease vertical increment	1	]

More on Directing the Cursor

Basic Cursor Direction: Use the cursor movement keys to move any of the four cursors *1* pixel left, right, up, and down. These keys are particularly useful for very precise movement. If you press $\boxed{0}$, you can move the cursor beyond the edge of the screen so that it wraps around to the opposite edge.

Moving to Edges and Corners: To move any of the four cursors quickly to the edges and corners of the screen, use the cursor direction keys with the $\boxed{\text{SHIFT}}$ key. For example, $\boxed{\text{PG UP}}$ moves the cursor one pixel up and to the left. $\boxed{\text{SHIFT}}$ $\boxed{\text{PG UP}}$ moves the cursor to the upper left corner of the screen.

Marking Cursor Position: You can mark the position of the 1-Point cursor with $\boxed{\text{ALT}}$ $\boxed{\text{Q}}$. To move the cursor to the marked location, press $\boxed{\text{CTRL}}$ $\boxed{\text{Q}}$.

Changing Cursor Movement Increments: You can change the vertical and horizontal cursor movement increments with the $\boxed{\text{O}}$, $\boxed{\text{P}}$, $\boxed{\text{[}}$ and $\boxed{\text{]}}$ keys. For example, if you increase the horizontal increment to 10 (with the $\boxed{\text{O}}$ key), then each press of the $\boxed{\blacktriangleleft}$ or $\boxed{\blacktriangleright}$ key will move the cursor 10 pixels to the left or right.

Returning the Cursor to Its Original Position: Press $\boxed{5}$ to return the cursor to its original position. With the 1-point cursor, $\boxed{5}$ returns the cursor to the center of the screen. With the 2-point cursor, $\boxed{5}$ moves the movable point back to the fixed point. With the 3-point cursor, $\boxed{5}$ returns the movable point to a point between the two fixed points.

Moving the Cursor With a Mouse: If you have a mouse attached, then the cursor will follow the movement of the mouse. Use the mouse for fast cursor movement. Use the cursor keys for more precise movement.

3. Automatic Cursor

Cursor Speed
(20-1)

Auto Cursor
On

| F1 | F2 | F3 | F4 | F5 | | F6 | F7 | F8 | F9 | F10 | | START | PAUSE | | SYS CONFIG | RESET |
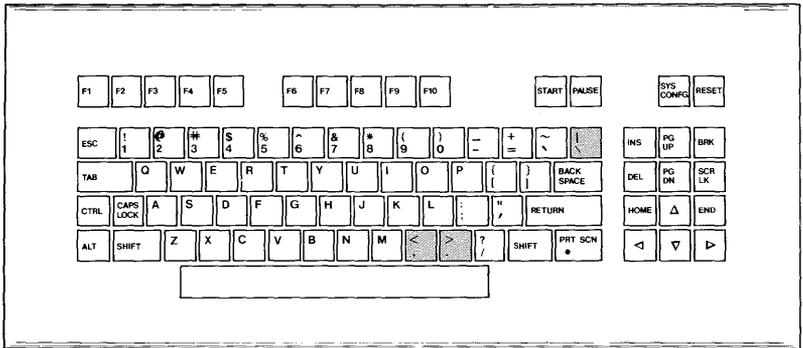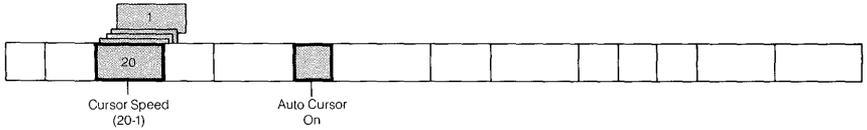
	With This Cursor on Screen	Press
Auto-cursor on/off	1, 2, 3, 4	\ I
Auto-cursor speed increase	1, 2, 3, 4	. >
Auto-cursor speed decrease	1, 2, 3, 4	, <

More on the Automatic Cursor

Many interesting effects can be developed by operating on a cursor which you set in motion with the [\I] key. Note that you can change the direction of the automatic cursor with the cursor direction keys while the cursor is moving.

Adjusting Cursor Speed: You adjust the cursor speed with the [.<] and [.>] keys. The current cursor speed (from 0 to 20) is displayed on the status line. When you turn 4-Point on, the auto cursor is set at maximum speed (20).

Increasing the Cursor Increment: You can increase the apparent speed of the cursor by increasing the cursor increment (see 2, DIRECTING THE CURSOR).

4. Color

Screen Mode
(0-7)

Draw On
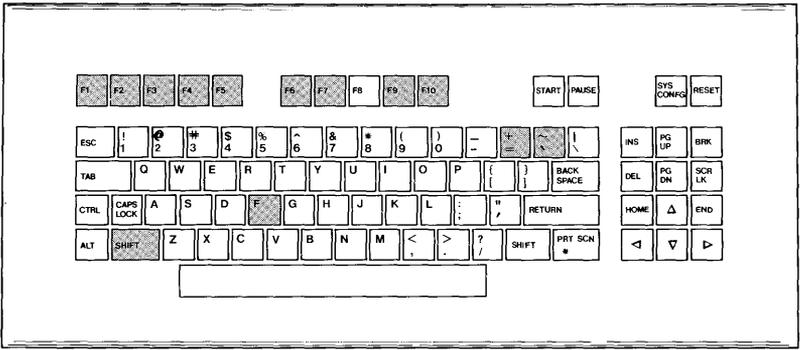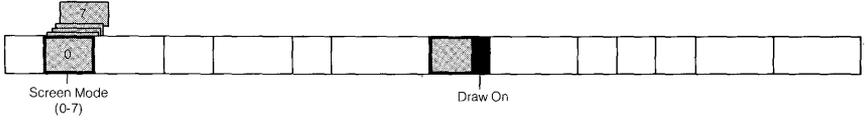
	With This Cursor on Screen	Press	
Top palette left	1, 2, 3, 4	F1	
Top palette right	1, 2, 3, 4	F2	
Bottom palette to top value	1, 2, 3, 4	F3	
Bottom palette left	1, 2, 3, 4	F4	
Bottom palette right	1, 2, 3, 4	F5	
Border color left	1, 2, 3, 4	F6	
Border color right	1, 2, 3, 4	F7	
Background color left	1, 2, 3, 4	SHIFT	F1
Background color right	1, 2, 3, 4	SHIFT	F2
Draw on/off	1, 2, 3, 4	` ~	
Convert top color to bottom color	1	SHIFT	+ =
Fill enclosed area with color	1	F	
Decrement screen mode	1, 2, 3, 4	F9	
Increment screen mode	1, 2, 3, 4	F10	

More on Color

Top Palette: The top palette color is the color used for 1-point freehand and circle drawing, for 2-point line drawing, for 3-point arc and ellipse drawing, and for 4-point rectangle drawing. The top palette color combines with the bottom palette color to produce the dithered color shown in the long bar to the left of the palette area.

Bottom Palette: The bottom palette color is the color you fill with by pressing ⎡F⎤ with the 1-point cursor on the screen.

Changing Background and Border Color: You change the border and background colors in the sequence that the colors appear on the palette. Here are two examples:

● The light yellow palette color indicator is 13 positions to the right of the black color indicator. Therefore, to change the background color from black to light yellow, press ⎡SHIFT⎤ ⎡F2⎤ 13 times.

● The black color indicator is two positions to the left of the blue color indicator, so to change the border color from blue to black, press F6 twice.

Drawing: When you press ⎡˙˙⎤ to turn on the draw function, a light blue indicator appears in the center box of the status line. While the draw function is on:

● with the 1-point cursor, you can draw a line of color by moving the cursor. Select the draw color from the top palette (with ⎡F1⎤ and ⎡F2⎤).

● with the 2-point cursor, you can draw connected line segments. The procedure is presented in 6, DRAWING LINE SEGMENTS).

Color Converting: Any color on the screen can be converted to any other color. Set the top palette to the color you want to change, and the bottom palette to the color you want to end up with. Then press ⎡SHIFT⎤ ⎡= +⎤ to perform the conversion.

Color Filling: Before it can be filled, an area must have a uniform border color and must be completely enclosed. Attempts to fill open areas or areas with a non-uniform border color will meet with unpredictable (and possibly undesirable) results. To fill, set the border color of the area to be filled on the top palette, and the fill color on the bottom palette. Once you've filled an area with the same color as the border, you cannot fill it again.

Screen Mode: 4-Point has eight different screen modes (modes 0 through 7). The screen mode determines the way colors interact when they're displayed over one another. Different modes interact in unpredictable ways (sometimes pleasantly so). The best way to determine the effects of mode changes is to experiment. For example, in screen mode 0, a yellow color will remain yellow no matter what color it's displayed over. In screen mode 6, yellow will appear blue, unless it's displayed over yellow, in which case it will appear white. A status indicator tells which of the eight modes is selected.

5. Drawing Circles

Auto Circle On ⌐   Hollow/   Width   Height
                    Filled
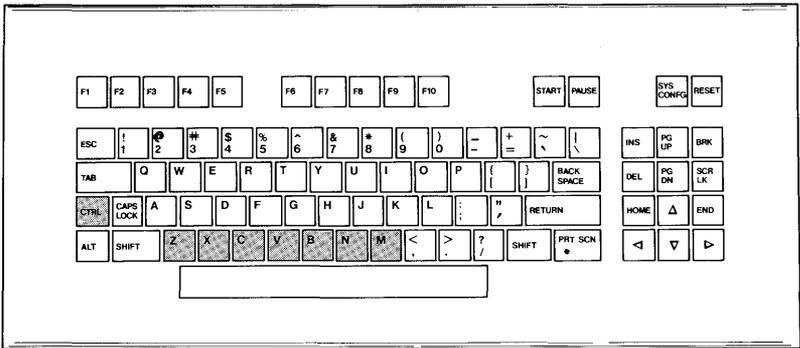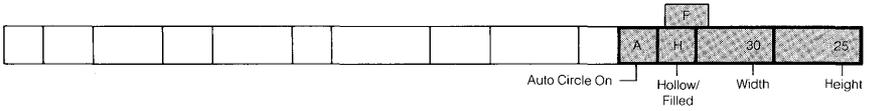
	With This Cursor on Screen	Press	
Draw circle	1, 2, 3	C	
Circle hollow/filled	1, 2, 3	M	
Auto-circle on/off	1	N	
Change circle size			
● Increase height	1	Z	
● Decrease height	1	X	
● Increase width	1	V	
● Decrease width	1	B	
● Increase height *and* width	1	CTRL	Z
● Decrease height *and* width	1	CTRL	X

More On Circles

Drawing Circles: In 4-point, a circle is any closed-curved shape with horizontal and vertical axes. Draw a circle by pressing C with the 1-, 2-, or 3-point cursors. The techniques for setting the size and shape of a circle – and the effects you get – depend on the type of cursor:

● With the 1-point cursor, you can change the horizontal and vertical radii (the width and height) with the ⌷Z⌷, ⌷X⌷, ⌷V⌷, and ⌷B⌷ keys. The two numbers at the right side of the status line give the current settings (in pixels) for the horizontal and vertical radii.

● With the 2-point cursor, a circle appears to have equal horizontal and vertical radii – that is, it's round. The fixed point marks the center of the circle, and the distance between the two points is the radius of the circle. Use this cursor for fast, round concentric circles.

● With the 3-point cursor, the movable point is always at the center of the circle. The shape of the circle depends on the location of the movable point in relation to the midpoint between the two fixed points. Experiment with this cursor to see the many interesting results you can achieve with it.

Combining these techniques with the auto-cursor function can result in some very interesting effects.

Drawing Filled Circles: Each time you press the ⌷M⌷ key, the circle draw function switches between hollow and filled circles, as shown by the H or F indicator in the status line. The fill color is always dithered – that is, a combination of the top and bottom palette color selections.

Auto-circle: If you turn on auto-circle by pressing ⌷N⌷, you'll draw a circle *whenever you change circle dimensions* with the ⌷Z⌷, ⌷X⌷, ⌷V⌷, or ⌷B⌷ keys. Auto-circle can produce interesting 3-D effects by spraying circles across the screen in constantly changing sizes.

6. Drawing Line Segments ●◀━━━▶●

	With This Cursor on Screen	Press
Draw line between points	2	L
Fill left	2	J
Fill right	2	K
Draw connected segments	2	Q

More on Drawing Line Segments

Drawing Line Segments: You draw line segments with the 2-point cursor. The fixed point marks one end of the line and the movable point the other.

Drawing Connected Segments: You draw connected segments with the keyboard. Turn on the draw function (with ⌈·⌉) move the movable point to where you want the end of the first segment to be. Press ⌈Q⌉ to draw the line *and* move the fixed point to the movable point. Continue to move the cursor and press ⌈Q⌉ to draw the connected segments.

2-Point Filling: The 2-point cursor defines the diagonal of a rectangle. You can fill this rectangle to the left of the diagonal by pressing ⌈J⌉ . Fill the rectangle to the right of the diagonal by pressing ⌈K⌉ .

7. Drawing Triangles, Arcs, and Ellipses
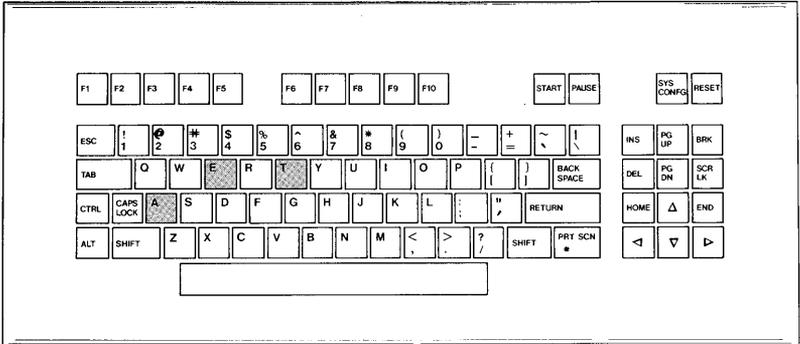
	With This Cursor on Screen	Press
Draw triangle	3	T
Draw arc	3	A
Draw ellipse	3	E

More On Arcs and Ellipses

Drawing Triangles: Define a triangle with the three points of the 3-Point cursor. Draw the triangle by pressing [T] .

Drawing Arcs: Define an arc with the three points of the 3-point cursor. You can draw the arc by pressing [A] .

Drawing Ellipses: The three points of the 3-point cursor define an ellipse with the movable point at the center. To draw the ellipse, press [E] .

8. Using Frames
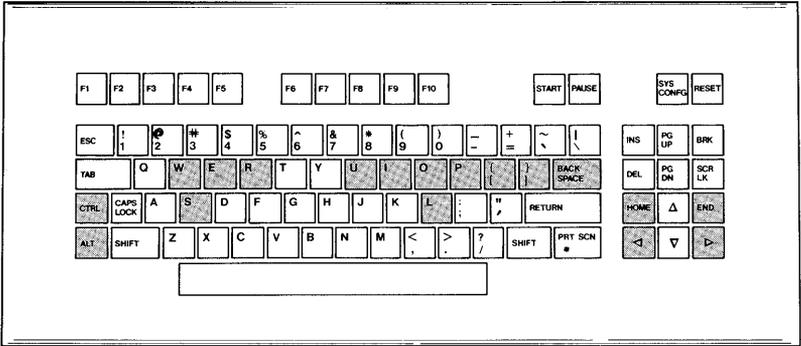
	With This Cursor on Screen	Press	
Draw frame	4	L	
Fill framed area (dithered)	4	W	
Erase contents of frame	4	[	
Erase area outside frame	4	]	
Manipulate framed image			
● Enlarge vertically	4	E	
● Enlarge horizontally	4	ALT	E
● Reduce vertically	4	R	
● Reduce horizontally	4	ALT	R
● Reverse vertically	4	U	
● Reverse horizontally	4	I	
● Rotate left 90 degrees	4	O	
● Rotate right 90 degrees	4	P	
● Move image left	4	CTRL	◄
● Move image right	4	CTRL	►
● Move image up	4	CTRL	HOME
● Move image down	4	CTRL	END
Texture screen with framed image	4	CTRL	BACKSPACE
Save framed image on diskette	4	S	

More On Frames

Using Frames: You can spread the points of the 4-point cursor so that they frame an area of the screen. Once you've framed a part of the screen, you can operate on whatever is in the frame.

Moving Framed Images: Use the ⌈CTRL⌉ key with the cursor direction keys to move the image inside the frame. Notice that when a portion of the framed image crosses the frame edge, that portion is erased. To move an image across the screen, first frame the entire screen.

Texture With the Framed Image: You can texture the entire screen with the image in a frame by pressing ⌈CTRL⌉ ⌈BACKSPACE⌉ . You can achieve interesting effects with repeated presses of ⌈CTRL⌉ ⌈BACKSPACE⌉ .

Saving Framed Images: By pressing ⌈S⌉ with the 4-point cursor selected, you can save the contents of a frame on a diskette. Refer to 16, STORING AND RETRIEVING IMAGE FILES for specific instructions.

Reducing the Image: 4-Point reduces by removing every other pixel, so when you reduce a textured or dithered image, you may notice a color change.

9. Using the Buffer

In/Out

Capture
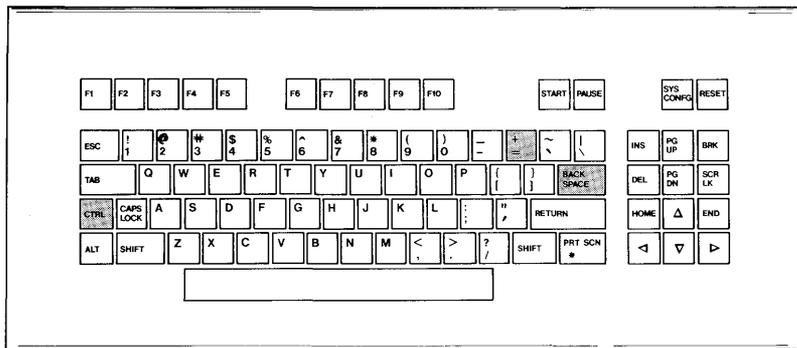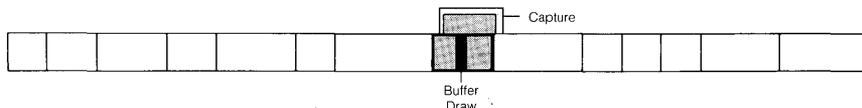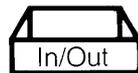
Buffer
Draw

	With This Cursor on Screen	Press	Mouse
● Capture image to buffer	4	BACKSP	LB
● Capture screen to buffer	1	CTRL BACKSP	
● Put captured image on screen	1	BACKSP	LB
● Draw with captured image	1	= +	

More On Using the Buffer

The Buffer: The buffer is an area of computer memory where 4-Point images – including entire screens – can be temporarily stored. Once an image is "captured" in the buffer, you can place it anywhere on the screen, or you can draw with it.

Capturing Images: Any image framed by the 4-point cursor can be captured by pressing [BACKSPACE] (or the mouse left button). With the 1-point cursor on the screen, the entire screen can be captured. The center square of the status line flickers as the image is being transferred to the buffer. Many of the effects that can be created with a captured image depend on whether the framed image includes any of the surrounding background (see *Drawing With or Moving the Captured Image*, below).

Putting the Captured Image on the Screen: With an image in the
buffer and the 1-point cursor selected, press [BACKSPACE] (or
the mouse left button) to display the buffered image at the cursor
location. Try moving the cursor to random locations and pressing
[BACKSPACE]   to create an interesting texturing effect.

Drawing With or Moving a Captured Image: When the buffer draw
function is turned on (with the [= +] key), 4-point displays the
captured image whenever the cursor changes position. If the captured
image includes some surrounding background, the image will appear
to move across the screen. If the edge of the captured image includes
pixels of a color different from the background, the moving cursor will
leave a trail of color. Combining the buffer draw function with the auto-
cursor function can produce interesting effects. Note that when the
buffer draw function is on, a status indicator appears in the center box
of the status line.

10. Zooming

Zoom
Level

Zoom On
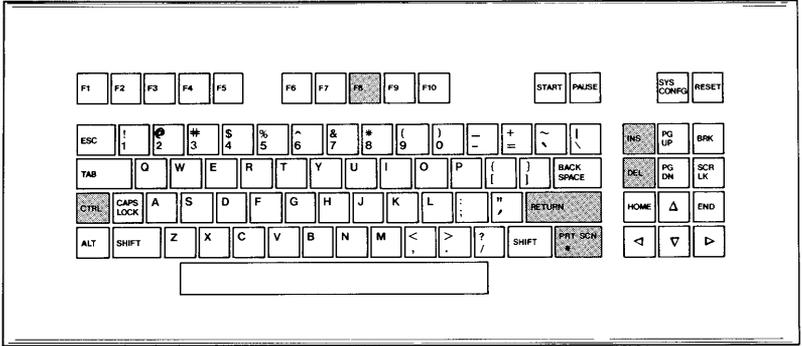
	With This Cursor on Screen	Press	With Mouse Press
Set zoom magnification	1, 2, 3, 4	F8	
Zoom on	1	* PRT SCN	
Insert pixel of current color		INS	LB
Delete pixel		DEL	
Terminate zoom			
• Retain all changes		* PRT SCN	RB
• Abort all zoom changes		RETURN	
• Blown up image to screen		CTRL * PRT SCN	

More On Zooming

Setting Zoom Magnification: 4-Point gives you three levels of zoom magnification. You set and change the level of magnification with successive presses of the [F8] key. The level of magnification is indicated by a box at the extreme left of the status line: a large box for high magnification, a medium box for medium magnification, and a small box for low magnification. Since you must have the 1- point cursor on the screen to set zoom magnification, you must terminate zoom in order to reset the magnification level.

Turning On Zoom: When you turn on zoom (with [* PRT SCN]), the screen displays a blowup of the area around the cursor. At low magnification, the area shown is 39 by 30 pixels. At medium magnification, the area shown is 26 by 20 pixels. At high magnification, the area shown is 13 by 10 pixels.

Editing While Zoomed In: While zoomed in, you can insert or delete any pixel of any color. To edit, position the cursor (a cross) over the pixel you want to change. Press the [INS] key to insert a pixel of the currently selected top palette color; press the [DEL] key to delete the pixel – that is, to change the pixel to the background color.

With a mouse, press the left button to insert a pixel of the currently selected top palette color.

When you edit with the draw function on, a colored pixel is inserted wherever you move the cursor.

Terminating Zoom: When you terminate the zoom function, you return to the normal screen with the 1-point cursor. You have three options for terminating:

● [* PRT SCN] (or the right mouse button) terminates zoom with *all the changes reflected on the normal screen.*

● [RETURN] terminates zoom with *no changes reflected on the normal screen.*

● [CTRL] [* PRT SCN] terminates zoom and *replaces the normal screen with the zoomed image.*

11. Operating On the Entire Screen
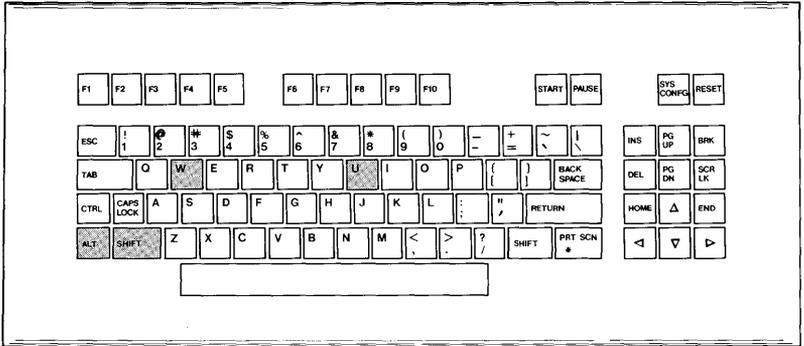
	With This Cursor on Screen	Press
Erase screen	1, 2, 3, 4	SHIFT F9
Fill screen with color (dithered)	1	ALT W
Turn screen upside-down (mirror)	1	U

More On Screenwide Functions

Operating on the Entire Screen: Note that erasing the screen or filling the screen with a dithered color destroys whatever is on the screen (unless you first turn on the test function with ⎅).

12. Texturing
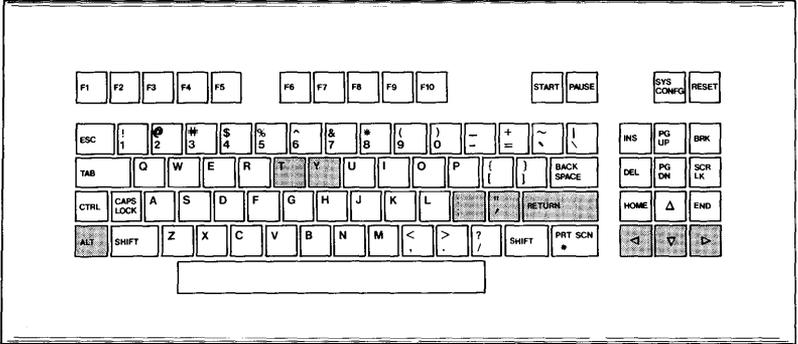
	With This Cursor on Screen	Press
Defining Textures		
● Display texture scheme 1	1, 2, 3, 4	' "
● Display texture scheme 2	1, 2, 3, 4	; :
● Select color box left	1, 2, 3, 4	◄
● Select color box right	1, 2, 3, 4	►
● Put top palette color in box	1, 2, 3, 4	▼
● Store texture scheme 1		' " or RETURN
● Store texture scheme 2		; : or RETURN
Texturing		
● Texture screen with texture 1	1	ALT Y
● Texture screen with texture 2	1	ALT T
● Texture framed area (texture 1)	4	Y
● Texture framed area (texture 2)	4	T

More On Texturing

Defining Textures: You can use 4-Point textures to color an area with up to four repeating color bars.
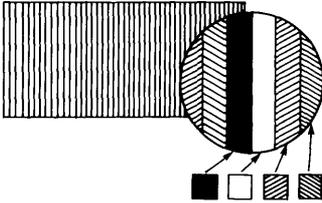
4-Point lets you define two texture schemes, as follows:

- Press ⬚ to define scheme 1 or ⬚ to define scheme 2. 4-Point replaces the dithered color bar with 4 color blocks – initially black for scheme 1 and white for scheme 2.

- Select a color for the first bar with the top palette color selection keys (F1 and F2), then press ▼ to insert the color in the first block.

- Press ► to position the cursor over the next block, select a color from the palette and press ▼ to insert the color in the block.

- Continue inserting colors this way until the blocks are filled with the colors you want.

- Press. ⬚ (or RETURN) to store texture scheme 1. Press ⬚ (or RETURN) to store texture scheme 2.

Texturing: You can texture an area framed with the 4-point cursor, or you can texture the entire screen with the 1-point cursor. With texture 2, the results you get will depend on the screen mode you're using (see 4, COLOR), so experiment with different mode settings as you try out the texturing functions.

13. Creating Presentation Segments

Cursor On/Off   Create/Play
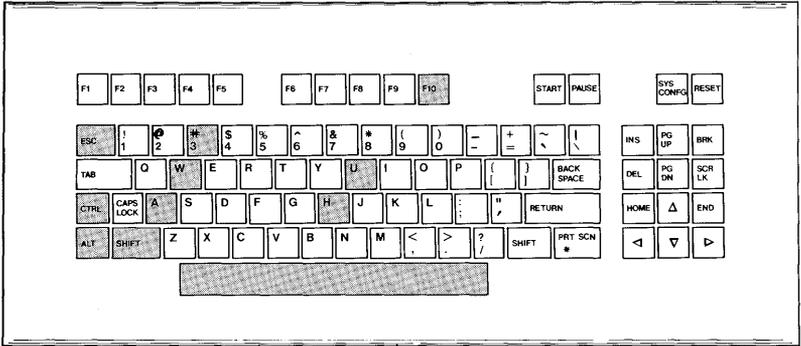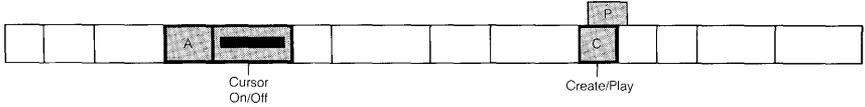
	With This Cursor on Screen	Press
Cursor on/off	1	SHIFT 3
Play back presentation	1	A
Append new effects (after specifying playback)		ALT A
Create segment	1	ALT A
Insert pause in segment	1	ALT H
Terminate presentation creation		CTRL F10
Interrupt segment for editing		ALT A
Specify segment to chain to		CTRL A
Write-protect segment		CTRL W
Remove write-protection		CTRL U
End presentation playback		ESC
Freeze/unfreeze presentation		SPACEBAR

More On Presentation Segments

Presentation Segments: A presentation segment is a sequence of
4-Point operations that is saved on a diskette and played back auto-
matically. A presentation can be made up of one or more segments
chained together to play automatically in sequence. You can link up to
99 segments in this way. Most of the presentation segment functions
require you to *specify a file*. The procedures for specifying a file are
covered in 15, "Storing and Retrieving Files".

Creating Segments: When you press ALT A , a **C** appears in the
status line and 4-point asks for a segment file specification. When you
specify a segment file, all subsequent 4-Point commands will be saved
in the specified file until you press CTRL F10 to end the segment.
When you're creating a segment:

● images captured in the buffer before you began creating will have
been lost;

● when you draw with the mouse, the image or line may jump slightly
while 4-Point is sending information to the diskette;

● you may not change the border color;

● the auto-cursor does not function.

Chaining Segments: To chain two segments together:

● Press A as if to play back a segment.

● Enter the name of the first segment in the pair that you want to chain
together – *do not press* RETURN .

● Press CTRL A and then enter the file specification for the second
pair that you want to chain together.

● Press RETURN and the pairs are chained together.

You can chain the second of a pair of segments to a third segment with
this procedure. Up to 99 segments can be chained together. To create a
self-looping presentation, make sure you chain the last segment in the
presentation to the first segment.

Protecting and Unprotecting Segments: Press ⬜A and specify a
segment file without pressing ⬜RETURN . Press ⬜CTRL ⬜W to **W**rite-
protect it from being edited. To remove the write-protection, press
⬜CTRL ⬜U (to **U**nprotect) after naming the segment file.

Inserting Pauses: When the segment create function is on, you can
insert 1-second pauses in the segment by pressing ⬜ALT ⬜H for
each pause.

Playing Presentations: To play back a presentation, press ⬜A ,
specify the first segment file in the presentation, and press ⬜RETURN .
The presentation will loop through all the segments you specified when
you created the presentation.

Getting an Image During Playback: When creating a segment, you
can press ⬜G to get an image file from a diskette. On playback, 4-Point
will seek the same named file *from the drive specified when you created
the segment.* Therefore, when playing back a segment that **G**ets a file,
take care to insert the diskette with the file in the appropriate drive.

Cursor On or Off: With ⬜SHIFT ⬜3 , you can choose to keep the
cursor visible or invisible during presentation playback. The
presentation runs faster with the cursor invisible.

Stopping a Presentation: ⬜ESC stops a presentation, clears the
screen, and displays the 1-point cursor.

Editing a Segment: You can edit a segment by interrupting it and
adding effects. To edit a segment, first play it back. When the segment
reaches the point where you want to start editing, press ⬜ALT ⬜A to
interrupt the playback function and turn on the create function. *Note that*
⬜ALT   ⬜A *erases everything in the segment that follows the interruption
up to, but not including any specifications for a file to be chained to.*
When the presentation stops, you can add new or revised effects. You
might find it helpful to slow down the segment with ⬜.> so you can
interrupt it precisely.

Appending New Effects: To add new effects to the end of a segment,
begin playback as usual (press ⬜A , and enter a file specification).
When the file specification is entered, press ⬜ALT ⬜A (instead of
 ⬜RETURN) – 4-Point will play the segment to the end, stop, and turn on
the create segment function. When the segment stops, you can add
new effects.

Operating on a Segment Named in the Directory Line: You can
perform many of the operations in this section on a segment file name
that you display in the directory line. For displaying file names in a
directory line, see section 15.

14. Adding Text

TEXT

Text On

Text Spacing

With This Cursor on Screen	Press
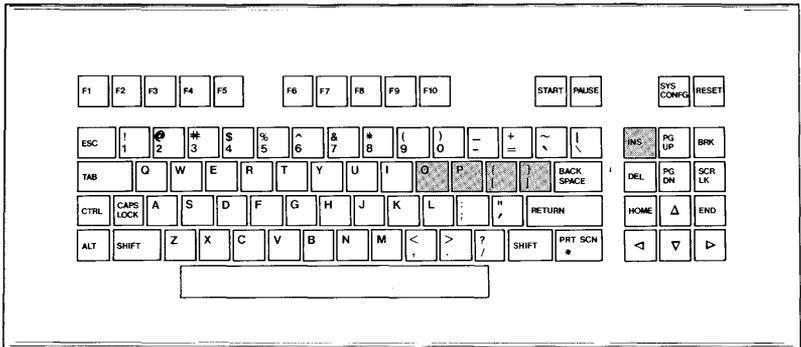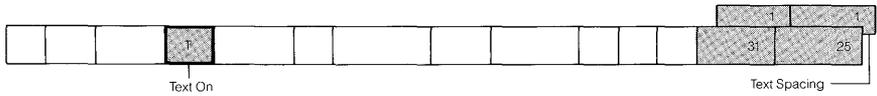
	With This Cursor on Screen	Press
Increase character spacing	1	O
Decrease character spacing	1	P
Increase line spacing	1	[
Decrease line spacing	1	]
Text function on	1	INS
Text function off		INS

More On Adding Text

The Text Function: With the 1-point cursor on the screen, you turn on the text function by pressing INS – a **T** appears in the status line. Thereafter, until you press INS again, any character you type will be displayed on the screen. Note that some of the little-used nonalphabetic characters (like "˜") cannot be displayed.

Margins: When you turn on the text function, the position of the cursor determines the left margin. When you press RETURN , the cursor skips to the next line and returns to the left margin. The right screen edge is the right margin.

Text Color: You can set and change text colors at any time, before or after you turn on the function. Set the top palette ([F1] and [F2]) to the color you want for the text characters. Set the bottom palette ([F4] and [F5]) to the color of the immediate background on which the text is displayed. If you want the text displayed on the normal screen background, then, set the bottom palette to the screen background color. Note that text will not display in screen modes 1 and 5.

Text Spacing: You can adjust spacing with the cursor step function *before you turn on the text function.* The horizontal step size ([O] and [P]) changes the spacing between characters. The vertical step size ([ ] and[ ]) determines the spacing between text lines.

Manipulating Text: Once you've added text and turned off the text function, you can frame text and manipulate it as you would any other graphic image. For example, you can –

● move text,

● enlarge it for titles,

● texture the screen with it, or

● capture and draw with it.

15. Storing and Retrieving Image Files
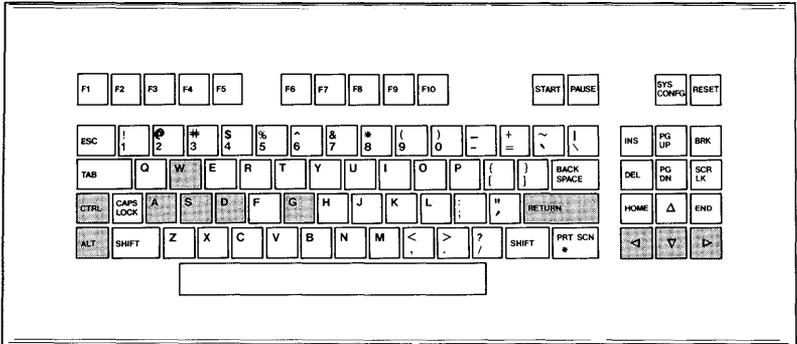
	With This Cursor on Screen	Press
Save file on diskette	1, 4	S
Get file from diskette	1	G
Drive specification		
● Move cursor right		▶
● Move cursor left		◀
● Enter drive spec		RETURN
Enter file spec		RETURN
Display diskette directory	1	D
● Scroll forward		▼
● Scroll backward		▲
● Display file status		▶
● Load named image file		6
● Load named font file		ALT F
● Run named segment file		A
● Write-protect named file		CTRL W
● Unprotect named file		CTRL U
● Chain named file		CTRL A
● Delete named file		ALT D
● Append to named file		ALT A

More On Storing and Retrieving Image Files

Specifying files: When you perform a function that refers to a diskette file, 4-Point replaces the palette with a file specification area. Specify the file as follows:

- Specify the drive: To specify the default drive, press [RETURN] . Otherwise, use the right and left cursor direction keys to position the cursor over the appropriate drive letter, then press [RETURN] to enter the drive specification.

- Name the file: Type the name of the file. A file name can have up to eight characters. If you wish, you can add a period followed by a three-character extension (SEGMENT1.4PT is an example of a valid file name). For more details on file specification, refer to your *Introductory Guide to MS-DOS,* or *the MS-DOS Reference Manual.*

- Press [RETURN] to enter the specification.

Saving Files: When you press [S] , 4-Point asks you to specify a diskette file in which to save an image. With the 1-point cursor on the screen, you can save the entire screen. With the 4-point cursor on the screen, you can save any framed image (including the whole screen). The Mindset beeps 4 times if there is no room on the diskette to store your image.

Getting Files: When you press [G] , 4-Point asks you to specify the diskette file to *load into the buffer.* When the file is loaded into the buffer, you can work with it as you would any 4-point image.

Displaying Directories: Press [D] with the 1-point cursor on the screen, and specify the drive for which you want to see the directory. The directory appears one line at a time. To scroll forward in the directory, press [▼] ; to scroll backward, press [▲] .

Displaying File Status: Pressing ▶ while there is a file named on the directory line displays that file's status at the right of the directory line. Interpret the character to the left of the < symbol as follows:

    I = Image file
    F = Font file
    A = Segment file

Interpret the character to the right of the < symbol as follows:

    W = Write-protected file
    U = Unprotected file

Operating on a Directory Line: You may perform several operations on a file name that appears on the directory line. For example, if you press ⌐ALT⌐ ⌐A⌐ when there is a segment file named on the directory line, the segment will run to the end and then stop, letting you append new effects.

16. Useful Tools

Cursor Box/Line
On/Off

Test On
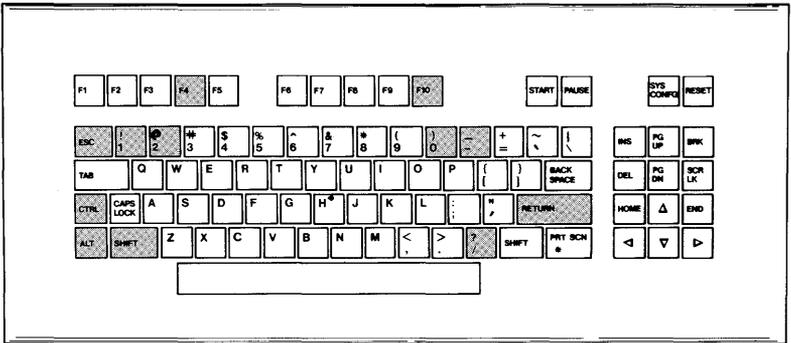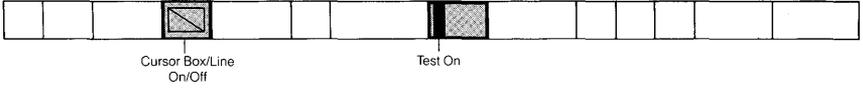
	With This Cursor on Screen	Press		With Mouse Press
Rubber band line cursor on/off	1	SHIFT	1	
Rubber band box cursor on/off	1	SHIFT	2	
Status line on/off	1, 2, 3, 4	/ ?		
Test mode on/off	1, 2, 3, 4	−_		
Remove cursor	1	SHIFT	−_	
Blink cursor on/off	1	SHIFT	0)	
Cancel last command	1, 2, 3, 4	ESC		
Reset circle defaults	1	RETURN		
Exit 4-Point program	1, 2, 3, 4	CTRL	F10	
Stabilize screen	1	ALT	F4	
Activate Mouse				LB

More On Useful Tools

Turning the Rubber Bands On and Off: You might find that the rubber band line and box are distracting during some operations. If so, turn them off with [SHIFT] [1] and [SHIFT] [2].

Turning the Status Line On and Off: Press [/?] to turn off the status line while a presentation is running. Note that a presentation will run somewhat faster with the status line turned off.

Using Test Mode: The test mode lets you try a function without putting the effect permanently on the screen. When you press − _ , a test indicator appears in the center box of the status line. With the test function on, 4-Point displays the effect of any function for one second, then the effect disappears.

Removing the Cursor: When you press [SHIFT] − _ , the cursor disappears from the screen. This function can be useful, for example, when you want to photograph or print the screen without the cursor. The cursor will return when you enter another command.

Using the Blinking Cursor: The blinking cursor can help if you're having trouble locating the cursor on a crowded screen. Turn on the blinking cursor with [SHIFT] [0].

Canceling Last Command: [ESC] is especially helpful when you change your mind about getting or saving a diskette file.

Resetting Defaults: Press [RETURN] to change circle size and cursor movement increments to their start-up values.

Exiting 4-Point: When you exit 4-Point by pressing [CTRL] [F10] everything on the 4-Point screen is erased.

Stabilizing a TV screen: If you're using a TV or a composite monitor, you might notice that dithered colors flicker slightly. Press [ALT] [4] to eliminate the flicker.

Section 5

4-Point And The Mindset Graphics Interface

Introduction

With the Mindset Graphics Interface (MGI) you can take screens from many other software programs that run on the Mindset Personal Computer, edit them with 4-Point Graphics Plus, and then save and print them as you wish.

What makes MGI so powerful is that you can use it with a variety of files generated under Mindset MS-DOS. For example, you can write a page of text using WordStar, bring the page to the 4-Point screen and add color illustrations, and then print the page in black and white or color. Or, you can create a pie chart with PFS:GRAPH, put the graph on the 4-Point screen, add enlarged titles and fill the pie segments with color, and then print the chart, enlarged to five times its original size.

What Can You Do With MGI?

Here's a general rundown of what you can do with the Mindset Graphics Interface:

- Print any 4-Point screen, or a subsection of any screen –

    – in black and white textures or in color,

    – normal or sideways,

— enlarged or reduced from 1 inch by 1 inch to 24¾ inches by 24¾ inches, and

— with a left margin that you specify.

● Manage files by —

— creating a screen with almost any program and then saving it as an MGI Graphics file;

— restoring it to the screen *while you are running 4-Point* (or many other graphics programs); and

— using 4-Point to edit the restored screen, and MGI to print the screen.

An Example

Here's an example of the steps you might follow to enhance a Lotus 1-2-3 graph:

1. Load MGI into the Mindset. The MGI program waits in the computer's memory until you call on it.
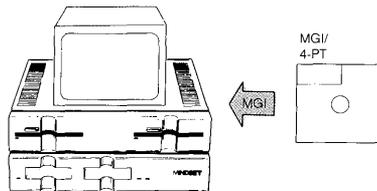
2. Load Lotus 1-2-3 and display a graph that you'd like to enhance.
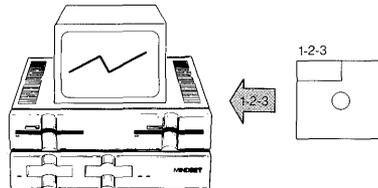
3. Call MGI, then save the Lotus graph as an MGI file.
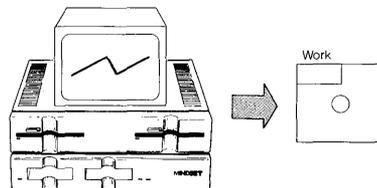
4. Terminate Lotus and
   load 4-Point.
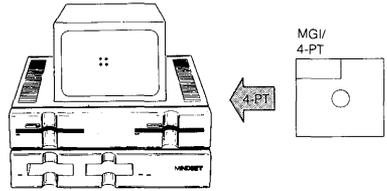
5. Call MGI again and
   restore the graph. Now
   the graph appears on
   the 4-Point screen.
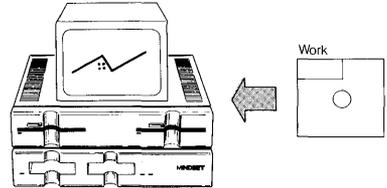
6. Enhance the graph with
   any of 4-Point's
   functions. Add color,
   enlarged text, or other
   enhancements.
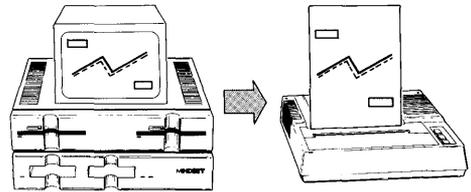
Using MGI With 4-Point

Here are the main steps for using MGI:

● Set up your printer or plotter.

● Load MGI and then load and use another program.

● Call MGI when you need to print, save, or restore a screen.

● Enter MGI commands to print save, or restore, as you wish. When
  MGI has completed its task, you are returned to the program you
  were using.

The following sections describe each of these in detail.

Setting Up Your Printer

To set up a printer for MGI you simply tell MGI what kind of printer you have. MGI then prepares a file called MGI.EXE that contains all of the programming necessary for your Mindset to save, restore, and print MGI graphics files on your printer.

You only need to set up your printer once – the first time you use it with MGI.

You do not have to set up your printer if your printer is a Diablo C150 Series Ink Jet printer.

Setting up an HP7475A Plotter is rather complicated, so these procedures are presented in an appendix to this guide.

To set up your printer, follow these steps:

● Load MS-DOS. When the A> prompt is on the screen, you're ready to continue.

● Insert your 4-Point Program Diskette into drive A, type **SETPRINT**, and press [RETURN] . This menu appears:

```
 MGI  Install  (C)1984  ZSoft  Corp.
┌──────────────────────────────────────────┐
│   Printer  Type  Selection    I           │
└──────────────────────────────────────────┘

 0.  Other printer menu          .
 1.  Epson FX-80,100 Printer
 2.  Epson MX-80,100 Printer
 3.  IDS Non-Color Printer
 4.  IDS Prism Color Printer
 5.  NEC 8023 or C-Itoh 8510 Printer
 6.  Okidata 8x or 9x series
 7.  Radio Shack CGP-220
 8.  Quadram Quadjet Ink-jet
 9.  Transtar Color Printer
 A.  PrintaColor TC1040
 B.  HP7475A Plotter
 C.  Diablo C150 Ink jet
 D.  Tektronix 4695 Ink Jet
Please pick one: ■
```

Press Esc to Exit

● Type the number or letter that corresponds to your printer. If your printer is not listed, type the letter for **OTHER** and additional options will be displayed. The **OTHER** option is reserved for printer drivers that Mindset will be releasing in the future.

When the installation process is complete, the familiar A> appears on your screen.

You'll need to perform this setup procedure whenever you switch to a new printer or plotter.

Loading MGI

If you're using MGI with a program *other than* 4-Point, or if you have just changed the printer setup, then you need to load it with these steps (if you're using MGI with 4-Point, MGI loads automatically – when you load 4-Point):

● Load Mindset MS-DOS with your MS-DOS diskette. When the A> prompt is on the screen, you're ready to proceed.

● Insert your 4-Point Program Diskette in drive A.

● Type **MGI** and press ⌷RETURN⌷ . This screen appears to tell you that MGI is loaded:

```
A>mgi

   ┌─────────────────────────────────┐
   │  Mindset Graphics Interface      │
   │  ------- -------- ---------      │
   │          for the                 │
   │  Mindset Personal Computer       │
   │     Version 1.02m                │
   │                                  │
   │  IMSI Software Publishers        │
   │  ┌──────────────────────┐        │
   │  │(c)1984  ZSoft Corp.  │        │
   │  └──────────────────────┘        │
   └─────────────────────────────────┘

   Printer = Diablo C150

   REPLACED MGI SPECIFICATIONS
   ---------------------------

A>_
```

The A> prompt at the bottom of the screen means that DOS is waiting for you to run a program.

Once MGI is loaded, it remains in your Mindset's memory, undisturbed by most other programs you might use. To use MGI, just *call* it as described in the next section.

Calling MGI

When you want to print, save, or restore a screen, call MGI by pressing
[SHIFT]   [* PRT SCN]   .

This MGI prompt line appears at the top of your screen:

MGI – A,H,M,PP,R,S,W,4, =

Each character in the prompt line stands for an MGI command:

A   Add
H   Height
M   Margin
P   Print
R   Restore
S   Save
W   Width
4   Viewport

Don't worry if the prompt line seems to erase part of your screen. The line disappears when you enter a command.

Using MGI to Print a Screen

Follow these steps to print a screen with MGI:

● Display the screen that you want to print.

● Press [SHIFT]   [* PRT SCN] to call MGI – the MGI prompt line appears.

● Press [P] for Print. The prompt line changes to:

MGI – Print N,S =

- Enter ⬚N or ⬚S :

  - N produces a Normal printing.

  - S produces a Sideways printing – that is, the printed image is rotate 90 degrees.

- Press ⬚RETURN – MGI prints the screen.

- To interrupt printing at any time, press ⬚ESC .

Each printed screen will be 5½ inches by 7½ inches, unless you reset the height and width as described in the next section.

On a black and white printer, each color is printed in a different texture. You can change the textures assigned to any or all colors by remapping the textures; for more details, see SETTING AND SAVING NEW DEFAULTS.

Enlarging and Reducing

You can enlarge or reduce the printed image, in ¼ inch increments by resetting MGI's height and width values after calling MGI and *before pressing P to print*.

To reset the height and width values, follow these steps. (Note that you cannot enlarge or reduce in this manner with the HP 7475A Plotter.):

- Press ⬚H to set Height or ⬚W to set Width. One of these prompts appears:

MGI – Print height (¼″) =

or

MGI – Print width (¼″) =

- Type the number of quarter inches you want for the height or width of your printed picture. For example, if you want the printed image to be 5 inches high, type ⬚H then type the height value of 20 (20 X ¼ inch = 5 inches). Note that when printing Sideways, the H value refers to the horizontal measurement on the paper, and W to the vertical measurement.

● Press ⌈RETURN⌉ — MGI accepts the values.

Each time you load MGI, the height and width values are initially set at 22 and 30 respectively (5½ by 7½ inches). You can change these settings by following the steps described in SETTING AND SAVING NEW DEFAULTS.

Setting the Left Margin

You can use MGI's M command to set the left margin of your printed pictures in ¼-inch increments. Here's the procedure:

● Press ⌈M⌋ — this prompt appears:

MGI — Left Margin (¼″) =

● Type the number of quarter inches that you want for the left margin. For example, if you want the left margin to be 3 inches, type 12 (12 X ¼ inch = 3 inches).

● Press ⌈RETURN⌉ — MGI accepts the values.

Until you change the margin value (or turn off your Mindset System Unit) all printed screens will reflect the last margin value set.

Saving a Screen as an MGI Graphic File

You can save any screen (including the cursor, if you have not removed it) as an MGI graphics file, then restore it to the screen later for editing or printing.

To save a screen:

● Press ⌈SHIFT⌋ ⌈*PRT SCN⌋ to call MGI. The usual MGI prompt line appears at the top of the screen.

● Press ⌈S⌋ — MGI displays this prompt, asking you to enter the specification for a file in which to save the screen.

● Type **A:** or **B:** (depending on which drive contains your work diskette) followed by name of the file (up to eight characters. You might want to add **.MGI** as an extender to distinguish the file from non-MGI files.

● Press ⌈RETURN⌉ — the screen is saved under the file name you specified.

Restoring an MGI File to Your Screen

You can restore, or display, any MGI graphics file on the screen and edit it with 4-Point or any other Mindset graphics program. To restore a screen:

● Press ⎣SHIFT⎦ ⎣* PRT SCN⎦ to call MGI. The usual MGI prompt line appears at the top of the screen.

● Press ⎣R⎦ — MGI displays this prompt, asking you to enter the name of a file to restore to the screen:

MGI — Restore to =

● Type the specification for the file, using drive letters (**A:** or **B:**) as appropriate. Refer to the previous section for more details on file specifications.

● Press ⎣RETURN⎦ — The file you specified is retrieved from the diskette and displayed on the screen for you to edit or print.

If you restore a full screen to the 4-Point screen, the restored screen will cover the 4-Point status line and palette.

MGI's Viewport

With MGI's viewport, you can define *subsections* of the screen for saving or printing. For example, you can isolate a specific detail of a screen and then, by setting the height and width values, print an enlarged or reduced version of whatever is in the viewport.

You can also use the viewport to save subsections of a screen with MGI's S command.

Because of the display methods used by some programs (such as Lotus 1-2-3) the viewport may not function, though you can still print the entire screen.

To set the viewport, follow these steps:

● Press ⎣SHIFT⎦ ⎣* PRT SCN⎦ to call MGI. The usual MGI prompt line appears at the top of the screen.

● Press ⎣4⎦. MGI displays the viewport as a white outline bordering the screen.

- Set the upper left corner of the viewport:

  - You can use the cursor direction keys to move the upper left corner of the viewport. To move the corner faster, hold down the [SHIFT] key as you press a cursor direction key.

  - If you have a mouse, hold down the left button and move the mouse to set the upper left corner of the viewport.

- Set the lower right corner of the viewport:

  - Press [TAB] . Now you can use the cursor direction keys to set the lower right corner. Use the [SHIFT] key with the cursor direction keys to move the corner faster. To regain control of the upper left corner of the viewport, press [SHIFT] [TAB] .

  - If you have a mouse, hold down the right button and move the mouse to set the lower right corner of the viewport.

- Press [RETURN] – MGI accepts the viewport setting. Note that the white viewport outline disappears, but the settings remain.

Once the viewport is set, all S (Save) and P (Print) commands will refer only to the *viewport contents*. Note that when you restore a file that you saved from a viewport, the image is always restored to the upper left corner of the viewport, no matter where the image was located when you saved it.

MGI's Add Function

MGI's Add function determines how restored screens overlay, that is, are added to, existing screens. There are four add modes:

- R – the restored screen replaces the existing screen. R is the default setting, which means that unless you reset the Add value, all restored screens will replace existing screens.

- O – the restored screen is ORed with the existing screen.

- X – the restored screen is XORed with the existing screen. XORing turns each color into its complement. If you restore the same screen *twice*, with the Add value set to X each time, the original screen colors will be unchanged.

- A – the restored screen is ANDed with the existing screen. Any color in common between the two screens is erased.

To set or reset the Add value:

- Press ⎡SHIFT⎤ ⎡* PRT SCN⎤ to call MGI. The usual MGI prompt line appears at the top of the screen.

- Press ⎣A⎦ – MGI displays this prompt, asking you to enter a letter that stands for the add mode you want.

MGI – Add: A,O,R,X =

- Press ⎣A⎦ , ⎣O⎦ , ⎣R⎦, or ⎣X⎦ and then press ⎡RETURN⎤ – MGI accepts the value.

All subsequent screens that you restore (with ⎣R⎦) will overlay the screen according to the Add mode you set. The Add mode settings control some complex relationships in your Mindset, so you might want to experiment with different settings to see the effects you can achieve.

Setting And Saving New Defaults

When you first load MGI, it's automatically set to certain values – called *defaults* – height and width, colors and textures. This section shows how to change these initial default values and save the new values.

Setting Height and Width Defaults

The default height value is 22 (5½ inches) and the default width values is 30 (7½ inches). Of course, you can change these values any time while using MGI by pressing ⎣H⎦ and ⎣W⎦ (the section "Enlarging and Reducing" describes the procedures). If, however, you want to set different *default* height and width values, you can change them with this procedure:

- With the A> prompt on the screen, type **MGI** and press ⎡RETURN⎤ .

- With the A> prompt on the screen, type **SETCOLOR** and press
  [RETURN] . MGI's *Color/Pattern Selection* screen appears:

```
 MGI  Install  (C)1984  ZSoft  Corp.
┌──────────────────────────────────────┐
│     Color/Pattern  Selection          │
└──────────────────────────────────────┘


      A.  Set  new  sizes
      B.  Set  new  color  correspondence
      C.  Refresh  the  screen
      D.  Save  settings  as  default
  Pick  one:█


              Color  Map
  -->  0   1   2   3   4   5   6   7
       0   1   2   3   4   5   6   7
  -->  8   9  10  11  12  13  14  15
       8   9  10  11  12  13  14  15
══Current  sizes:  H= 22   W= 30 ══
            Press  Esc  to  Exit
```

- Press [A] to indicate that you want to set new sizes. MGI asks for a
  default height value.

- Enter a new height value (if you don't want to change the height
  value, enter the old value), then press [RETURN] — MGI asks for a
  new width value.

- Enter a new width value (if you don't want to change the width value,
  enter the old value) then press [RETURN] .

- Press [ESC] to return to DOS. The A> prompt appears on the
  screen.

To save the new default values so that they'll be set when you next load
MGI see "Saving Default Settings".

Mapping Textures for a Black and White Printer

When MGI prints a 4-Point screen on a black and white printer, it prints each color as a different *texture*. In other words, each of the 16 4-Point colors is assigned to a specific texture. The specific textures will be different for different printers.

This diagram shows the color-texture assignments for the IBM and Epson MX printers:

	0	1	2	3	4	5	6	7
Color	Black	Blue	Green	Cyan	Dk Red	Magenta	Mustard	Lt Grey

	8	9	10	11	12	13	14	15
Color	Dk Grey	Lt Blue	Lt Green	Lt Cyan	Red	Pink	Yellow	White
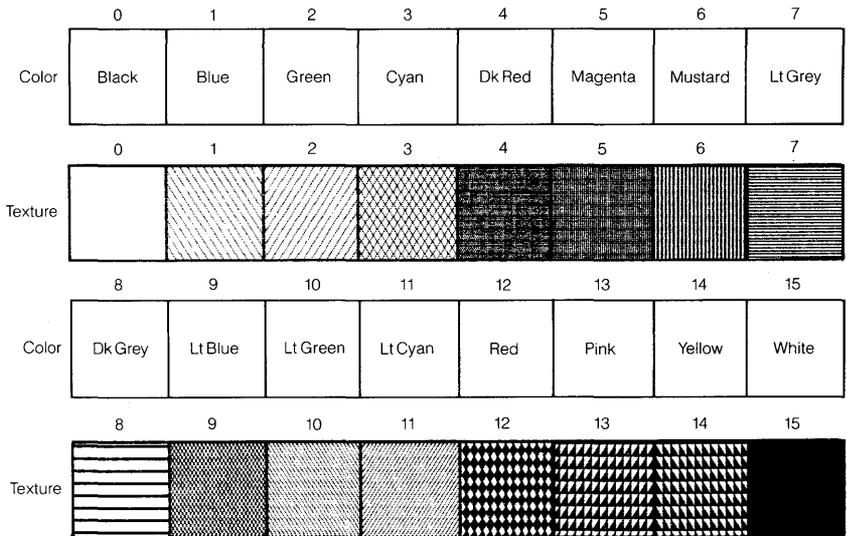
As you can see, dark red is printed as a diamond pattern. Black is printed with no texture. White is printed as black.

You can change the defaults, assigning any texture to any color. Use this procedure:

● Load MGI, type **SETCOLOR** and press ⌐RETURN¬ to display the *Color/Pattern Selection* screen. Note that the color map shows two rows of numbers. The top row stands for the 4-Point palette colors and the bottom row stands for the black and white textures.

● Use the diagram above to determine which texture you want to assign to which color. For example, you might want to have all cyan areas printed as a fine horizontal texture (texture 14.)

- Press ⎡2⎤ to tell MGI that you want to reassign the values. MGI then asks you to enter the number of the color that you want to assign a new texture.

- Enter the number of the color that want to assign a new texture, then press ⎡RETURN⎤ . To change the texture for the color cyan, you'd enter ⎡4⎤. MGI then asks for the number of the texture that you want to assign to the color.

- Enter the number of the texture that you want to assign to the color, then press ⎡RETURN⎤ . For the example above, you would enter 14. As soon as you press ⎡RETURN⎤ , the new assignment is made.

- To make more assignments, repeat the procedure, pressing ⎡2⎤ and then entering two numbers – one for the color and one for the texture.

- Check your color map values by using MGI to Restore and print a screen called **PALETTE** which is on your original 4-Point diskette.

- Make sure you save the new color-texture assignments so that they'll be set automatically when you next load MGI. The procedure for saving is described under, "Saving Default Values."

Mapping colors for a Color Printer

When you set up a color printer, MGI automatically maps the printer to 4-Point palette so that the colors printed are similar to those displayed on the screen. You can remap the printer by assigning new print colors on the *Color/Pattern Selection* screen:

```
MGI  Install  (C)1984  ZSoft  Corp.

      Color/Pattern  Selection


      A.  Set  new  sizes
      B.  Set  new  color  correspondence
      C.  Refresh  the  screen
      D.  Save  settings  as  default
   Pick  one:█


                   Color  Map
  -->   0    1    2    3    4    5    6    7
        0   55   33   11   66   44   22   80
  -->   8    9   10   11   12   13   14   15
       80   55   33   11   66   44   22   88
  Current  sizes:  H=  22   W=  30
                 Press  Esc  to  Exit
```

This screen shows the codes for each of the 16 Mindset screen colors (indicated by the arrows) as well as the print color codes assigned to each screen color.

In general, you remap colors by looking up the code for the screen color you want to remap and the code for the color you want to print. Then you assign the print color code to the screen color code.

1. Load MS-DOS. When you see the A> prompt on the screen, type **MGI** and press ⌐RETURN⌐ to load MGI.

2. Type **SETCOLOR** and press ⌐RETURN⌐ – soon you'll see the *Color/ Pattern Selection* screen.

3. Type ⌊B⌋ to tell MGI that you want to set new color codes. MGI asks you to enter the code for the screen color that you want to change — the Color Map appears. Suppose you want to print all *light green* screen colors as *yellow-green*.

4. Look in the Table of Screen Color Codes for the screen color you want to change — the code for light green is 10. Type the code and press ⌈RETURN⌉ . Next MGI asks you to enter a code for the print color — for this example that means the code for yellow-green.

5. Look up the code for the first print color (*yellow*) in the Table of Basic Print Color Codes — the decimal code is 2. MGI requires a *hexadecimal* code, so look up the hex code for 2 in the Table of Hex Codes — the hex code for 2 is 2. (Note: for Quadjet printers, do not use these hex codes. Instead refer to your printer manual for the codes to enter.).

6. Look for *green* in the Table of Basic Print Color Codes. It's not there, but you can "mix" green by combining cyan (1), and yellow (2). Add the codes together to determine a decimal code — 3 for green. Look up the hex code in the Table of Hex Codes — the hex code for 3 is 3.

7. Join the yellow and green codes together for a combined code of 23 — this is the code for yellow-green. Type 23 and press ⌈RETURN⌉ — MGI assigns the new code and asks you to choose another option.

8. Now that the colors are remapped, you must *save* the new values with the procedure in the next section, "Saving Default Values". If you don't save them they will be automatically reset to their initial values when you type **4POINT**.

9. You can check your color map values by using MGI to **R**estore and print a screen called **PALETTE** which is on your orignial 4-Point diskette.

10. When you've saved the new values, press ⌊ESC⌋ , followed by any key and you'll return to the familiar A>.

Screen Color Codes Table

Screen Color	Code	Screen Color	Code
black	0	dark gray	8
blue	1	light blue	9
green	2	light green	10
cyan	3	light cyan	11
red	4	light red	12
magenta	5	light magenta	13
brown	6	yellow	14
light grey	7	white	15

Table of Hex Digits

Decimal	Hex	Decimal	Hex
0	0	8	8
1	1	9	9
2	2	10	A
3	3	11	B
4	4	12	C
5	5	13	D
6	6	14	E
7	7	15	F

Basic Print Color Codes Table

Print Color	Decimal Code
white	0
cyan	1
yellow	2
magenta	4
black	8

Saving Default Values

You can save your new default values for size and color mapping on the diskette in drive A. Then, each time you load MGI, your default values will be set. To start, make sure MS-DOS is loaded and that the A> is on the screen. Then follow these steps:

● Insert your 4-Point Program Diskette into drive A and type **MGI** to load MGI.

● Type **SETCOLOR** and press ⌷RETURN⌷ to display the *Color/Pattern Selection* screen.

• Set the size and color mapping values to the default values that you want to save.

• Type ⌈D⌉ and MGI saves the values on your Program Diskette.

MGI Error Messages

MGI issues a series of beeps when it encounters an error. The number of beeps indicates the particular error, as follows:

Number of Beeps	Error
2	Save or restore attempted after loading MS-DOS, but before loading a program. To avoid this problem, do not call MGI while the A> prompt is on the screen.
3	Function not allowed in character mode.
4	Printer fault. Check printer connections.
5	Disk error. MGI probably could not find the named file.
6	Disk error. Diskette may be damaged or out of storage space.
7	Resolution mismatch.

Appendix:

Setting Up the HP7475A Plotter

To use the HP 7475A Plotter with MGI, you must consider the interface module, the cable, the plotter switch settings, the mode setting, and color mapping. These considerations are described in this appendix. If you are not thoroughly familiar with procedures for interfacing hardware devices to your Mindset, you should seek the services of a qualified technician.

The Interface Module

In order to attach the HP7475A Plotter to your Mindset, you must first install an RS-232 Serial Module.

The Cable

Use the HP17255B cable (or an equivalent) to attach the plotter to the Mindset's RS-232 Serial Module. The cable must be wired as shown in this diagram:

Plotter (Male Connector)   Computer (Male Connector)
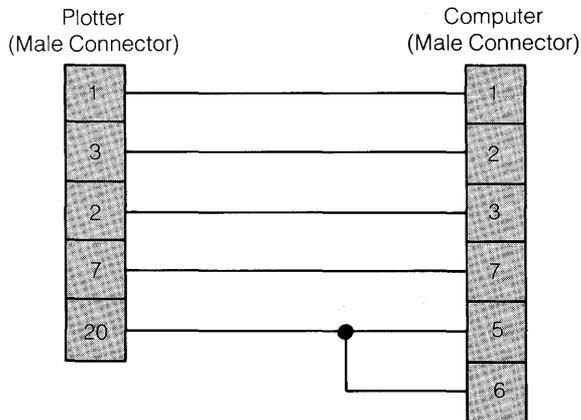
Note that cable pins 2 and 3 are cross-connected. Pin 20 at the plotter connector is connected to pins 5 and 6 at the computer connector.

Plotter Switch Settings

Set the plotter switches (next to the cable connector) as shown in this diagram:
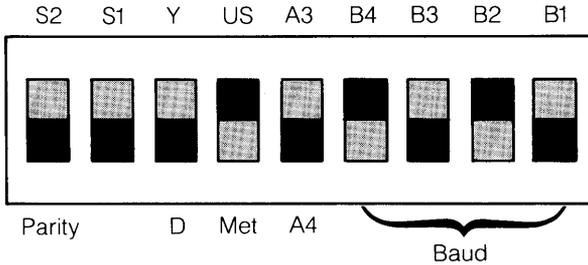
These settings, incidentally, are for no parity and a transmission rate of 9600 baud.

The Mode Values

Before you load MGI for use with the HP7475A Plotter, set Mindset's MODE values. Follow this procedure *each* time you load MGI for use with the HP7475A Plotter.

● Load MS-DOS – when the A> prompt is on the screen, you're ready to continue.

● Type

MODE COM1:9600,N,8,1,P

and press ⎡RETURN⎤ .

● Type

MODE LPT1:=COM1

and press ⎣RETURN⎤ .

Now that you've set the MODE values, you may load MGI and proceed as usual.

Color Mapping

While the HP7475A Plotter can plot six different colors, it cannot mix colors like an ink jet printer. When you remap the colors with the **SETCOLOR** program, therefore, only the first six screen color codes can be reassigned.

Test Plotting

Since the plotting process takes a long time, you can get a quick test plot by reducing the plot density. Here's how:

• Call MGI with [SHIFT]   [*PRT SCN] .

• Type H and then type a number from 1 to 6 – 1 will give a sparse plot and 7 will give a dense plot – then, press [RETURN] .

Print as usual. If you are satisfied with the quick plot, reset the density to 7 and print again.

4-POINT GRAPHICS PLUS   MINDSET

by IMSI   Version 1.02

Update

Described here are some changes and enhancements made to 4-Point Graphics Plus since the *User's Guide* and *Quick Reference Guide* were printed. It's a good idea to review these items before you begin using 4-Point, even if you're unfamiliar with computer graphics programs and may not understand all the terms and details discussed.

Each item is listed by topic and page references to the *User's Guide* – you may wish to note some of them on the appropriate pages of your guide. Keep in mind that some may also apply to your *Quick Reference Guide.*

What You Need 2-1	To run 4-Point Graphics Plus, your Mindset Personal Computer must have at least 192K, not 196K, of memory.
Transferring the MS-DOS System 2-2	When typing the command to copy the COMMAND.COM file onto the 4-Point Program Diskette, don't forget the spaces, as shown here:
	COPY COMMAND.COM B: /V [RETURN]
Using 4-Point Diskettes 2-2	*Do not* put a write-protect tab on your 4-Point Program Diskette. The program must be able to write information onto the diskette while loading.
Looking at Diskette Directories 3-27	*F* (not I) indicates a font file. *U* (not A) indicates an unprotected file.
Recording Your Segment 3-31 – 3-32	The auto-cursor function does not operate when you're creating a presentation segment.

Selecting Cursors 4-3	To select the 2-point cursor with the 1-point cursor on the screen, first make sure the draw function is turned off.
Cursor Increment and Circle Values 4-5 – 4-6; 4-14	The last two boxes on the status line display either the cursor increment (step size) values or the circle values – whichever you used last. Here's how to display the values not currently shown: To display the circle values, press a circle value key (for example, Z or X); to display the cursor increment values, press a cursor increment key (for example, O or P).
Screen Mode 4-11	In screen modes 1 and 5, some functions (such as placing a buffered image on the screen) may have no apparent effect – especially if tried with an all-black or all-white background.
Drawing Circles 4-13	Press Z and X to increase and decrease circle *width* (not height); press V and B to increase and decrease circle *height* (not width).
Washing with a dithered color 4-19; 4-25	Before using W or ALT W to wash all or part of the screen with a dithered color, make sure that all the color blocks in texture scheme 1 are defined as *white* (see pages 4-27 – 4-28 and next item).
Texturing 4-28	Initially, the color blocks used to define texture scheme 1 are white, and those used to define texture scheme 2 are black.
Creating Presentation Segments 4-29 – 4-32	When you turn on the create segment function, 4-Point does not clear the screen. However, any image already on your screen when you turn on the function will *not* be recorded as a part of the segment. If you want to begin a segment with an image you've already created, be sure to save the image first (see pages 4-35 – 4-37), then turn on the create segment function and retrieve the image to begin your segment. In any case, always be sure to save any image you want to preserve *before* you start to create a segment. You may not record cursor speed changes in a presentation segment.

Playing Presentations 4-31	Since you do not specify segments to chain to when creating a presentation, the second sentence under "Playing Presentations" on page 4-31 should read "The presentation will loop through all the segments you've chained together."
Storing and Retrieving Image Files 4-35	To load a named image file, press G (not 6).
Protecting Files 4-35 – 4-37	*Do not* write-protect any file other than a presentation segment.
Saving Files 4-36	Two beeps (not four) indicate that there's not enough room on a diskette to store an image.
Useful Tools: Test Mode 4-39 – 4-40	You cannot test the draw function or the clear screen function.
Enlarging and Reducing 5-7 – 5-8	Be careful not to enter a width value that exceeds the maximum horizontal distance traveled by your printer's print head.
Restoring an MGI File to Your Screen 5-9	You may use MGI to print a screen created in 80-column mode. However, any screen saved with MGI in 80-column mode will be restored in 40-column mode, and information in columns 41 through 80 will be lost.
Mapping Textures for a Black and White Printer 5-13 – 5-14	As shown in the diagram, the color code for cyan is *3* (not 4). Two color-texture assignments in the diagram have been revised: black (code 0) prints as black; white (code 15) prints as white.

MINDSET