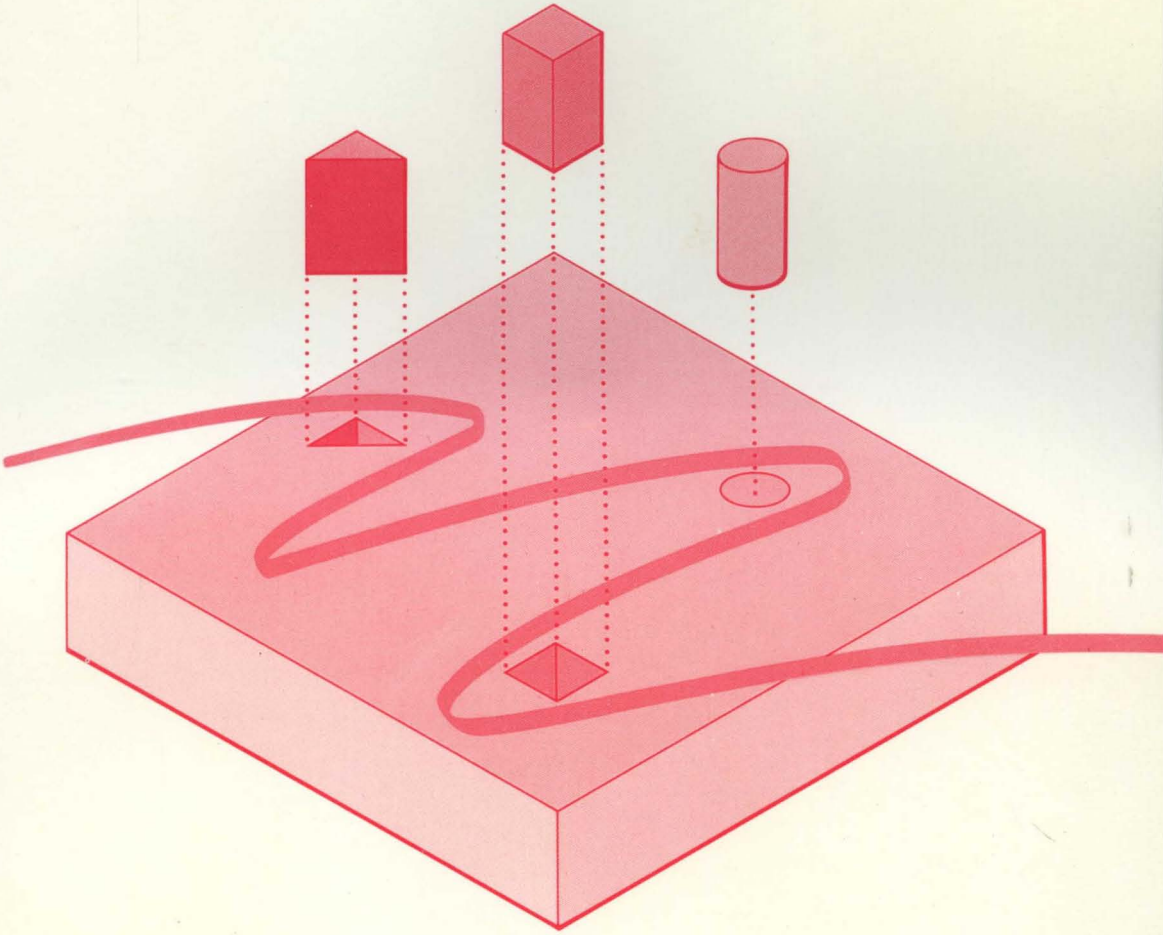
GEM® Draw Plus™



DIGITAL RESEARCH®

GEM Draw Plus

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Foreword

Welcome to GEM Draw™ Plus -- the electronic drawing package for your personal computer.

This guide explains concepts and procedures to help you use GEM Draw Plus. It is divided into the following sections:

- Section 1 describes preliminary steps you must complete before using GEM Draw Plus on your computer. It also shows how to start the program.
- Section 2 takes you on a brief tour of the GEM Draw Plus screen. It explains how, why, and when to use the various drawing tools and discusses concepts that help you use the software.
- Section 3 is a tutorial that walks you through the basic steps of using GEM Draw Plus.
- Sections 4 and 5 contain reference information. They explain in detail the menus, commands, and picture elements you use with GEM Draw Plus.

In addition to the GEM Draw Plus software, your distribution disks contain pictures created by Digital Research® using GEM Draw Plus. You can use these images in other pictures you create. You can also examine the pictures to see how you might achieve similar effects.

The artwork in this book was created using GEM Draw Plus and GEM Paint™.

This version of GEM Draw Plus is designed for use with the version 2.0 or higher GEM Desktop.

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Getting Started

This section is designed to help you get started using GEM Draw Plus. It is divided into two topics.

The first shows you how to install GEM Draw Plus on your computer. The installation process organizes the GEM Draw Plus program on your floppy disks or hard disk. It is a simple procedure and only requires a few minutes to complete. You will not be able to use GEM Draw Plus until you install it.

The second shows how to start GEM Draw Plus on your computer.

Please read and follow the instructions in this section before you use GEM Draw Plus.

PRELIMINARY STEPS

Before you do anything else, make copies of the disks you received with the GEM Draw Plus package. Fill out two labels as shown below and attach them to the appropriate copies:

GEM Draw Plus Application Disk BACKUP COPY
GEM Draw Plus Library Disk BACKUP COPY

Store your original disks in a safe place and use your copies to complete the installation procedures.

Your DOS manual explains how to format and copy floppy disks using the DISKCOPY command. (Do not use COPY.) Refer to it now if you need to. If you have not read your GEM Desktop™ guide and completed the introductory section, you should do that also before continuing. Many of the concepts and procedures you use in GEM Draw Plus are explained there. You can also use the GEM Desktop to copy disks.

INSTALLING GEM DRAW PLUS

The steps required to install GEM Draw Plus on floppy disks are slightly different from those required to install it on a hard disk. Follow the instructions that apply to your particular installation.

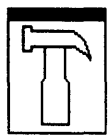
Installing on Floppy Disks

You need three blank floppy disks to complete these procedures. Format the disks, fill out labels as shown below, and attach them to the disks. These will become your regular working copies of GEM Draw Plus.

GEM Draw Plus APPLICATION Disk -- Working Copy
GEM Draw Plus PICTURES Disk -- Working Copy
GEM Draw Plus LIBRARY Disk -- Working Copy

Set the disks aside, and then do the following:

1. Start the GEM Desktop.
2. Remove the GEM DESKTOP Disk from drive A and replace it with the disk you have labeled "GEM Draw Plus Application Disk BACKUP COPY."
3. Double-click on the drive A icon to open its window. If the window is already open, press the Esc key to update the window with the contents of the disk now in that drive.
4. Locate the icon labeled INSTALL.APP in the window.



5. Double-click on the INSTALL.APP icon to start the installation program.

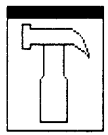
6. Dialogs appear on your screen asking you for information and telling you when to change disks. Follow the instructions until you see a dialog telling you the installation is complete. GEM Draw Plus is ready to use from your floppy disks.

Skip ahead to "Results of Installing GEM Draw Plus" on page 1-4.

Installing on a Hard Disk

This process creates two folders (named GEMAPPS and LIBRARY) in your hard disk root directory and copies the GEM Draw Plus files into them. If you have an earlier version of GEM Draw installed and want to save it, copy the files DRAW.APP and DRAW.RSC from the existing GEMAPPS folder to a different folder before installing GEM Draw Plus.

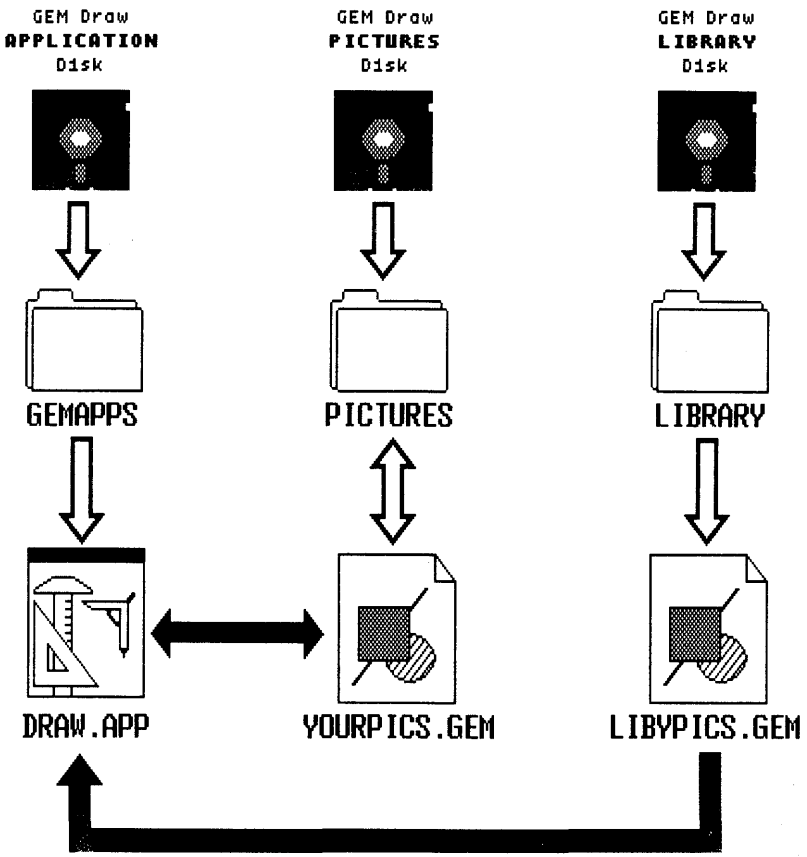
1. Start the GEM Desktop.
2. Insert "GEM Draw Plus Application Disk BACKUP COPY" in drive A.
3. Double-click on the drive A icon to open its directory in this window. If the window already contains the root directory for Drive A, press the Esc key to update the window with the contents of the disk now in that drive.
4. Locate the icon labeled INSTALL.APP in the window.



5. Double-click on the INSTALL.APP icon to start that program.
6. Dialogs appear on your screen asking you for information and telling you when to change disks. Follow the instructions until you see a dialog telling you the installation is complete. GEM Draw Plus is ready to use from your hard disk.

RESULTS OF INSTALLING GEM DRAW PLUS

The figure below shows what your hard disk or "working copy" floppy disks contain after you install GEM Draw Plus.



Results of Running INSTALL.APP

When you install GEM Draw Plus, DRAW.APP is placed in a folder named GEMAPPS in the root directory of either your "GEM Draw Plus APPLICATION Disk" or your hard disk. The PICTURES and LIBRARY folders are created to store pictures.

DRAW.APP

The GEM Draw Plus software program.

Resource files (DRAW.RSC not shown) contain icons and other objects you see on your screen when you are using GEM Draw Plus.

PICTURES

The PICTURES folder is for the pictures you create with GEM Draw Plus, so it is initially empty. Unless you instruct otherwise, GEM Draw Plus stores your pictures in this folder when you save them on disk.

LIBRARY

The LIBRARY folder contains pictures provided with GEM Draw Plus. You can use these pictures (or parts of them) in other pictures you create. You'll learn how to do this in later sections of this guide.

If you installed GEM Draw Plus on floppy disks, the PICTURES folder is in the root directory of the disk labeled "GEM Draw Plus PICTURES Disk" and the LIBRARY folder is in the root directory of the disk labeled "GEM Draw Plus LIBRARY Disk." If you installed GEM Draw Plus on a hard disk, all folders are in the root directory.

STARTING GEM DRAW PLUS

To start GEM Draw Plus, follow these steps:

1. Start the GEM Desktop if it isn't already running.
2. If you're running GEM Draw Plus from floppy disks, place your GEM Draw Plus APPLICATION Disk Working Copy in drive A and your GEM Draw Plus PICTURES Disk in drive B.
3. Double-click on the disk icon where your GEMAPPS folder is stored to open its directory window.

   If you're running from floppy disks, the GEMAPPS folder is on the disk in drive A. If you're running from a hard disk, the GEMAPPS folder is on that drive (normally drive C).
4. Open the GEMAPPS folder by double-clicking on its icon.
5. Locate the DRAW.APP icon inside the directory window.

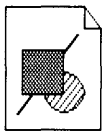
6. Double-click on the DRAW.APP icon to start GEM Draw Plus.

Note: Running GEM Draw Plus from Drive A may bring up a "Can't write to disk..." alert on your screen. Click on CANCEL to proceed.

Another way you can start GEM Draw Plus is described on the following page.

Starting with a Specific Picture

There may be times when you want to start GEM Draw Plus and have a specific picture appear immediately on your screen. This section explains how to start GEM Draw Plus this way.


EXAMPLE.GEM

All GEM Draw Plus pictures are represented by an icon like the one shown at the left. The name of your picture appears in place of "EXAMPLE."

1. With the GEM Desktop on your screen, locate the PICTURES folder.
2. Double-click on the PICTURES folder to display its contents.
3. Locate the icon for the picture you want to use.
4. Double-click on the picture's icon. GEM Draw Plus starts with that picture on your screen.

Note: If you run out of data space while working on a picture, save your picture immediately. This may free up some data space for you to continue working.

End of Section 1

GEM Draw Plus Screen and Concepts

This section explains what you see on the screen when using GEM Draw Plus and discusses other concepts that help you use the program. You might want to try some of the features of GEM Draw Plus right away. If, while drawing, you want to clear the screen and start over, display the File Menu and choose the **New** or the **Abandon** command. Click on Yes when prompted to confirm. The screen will be cleared of all figures.

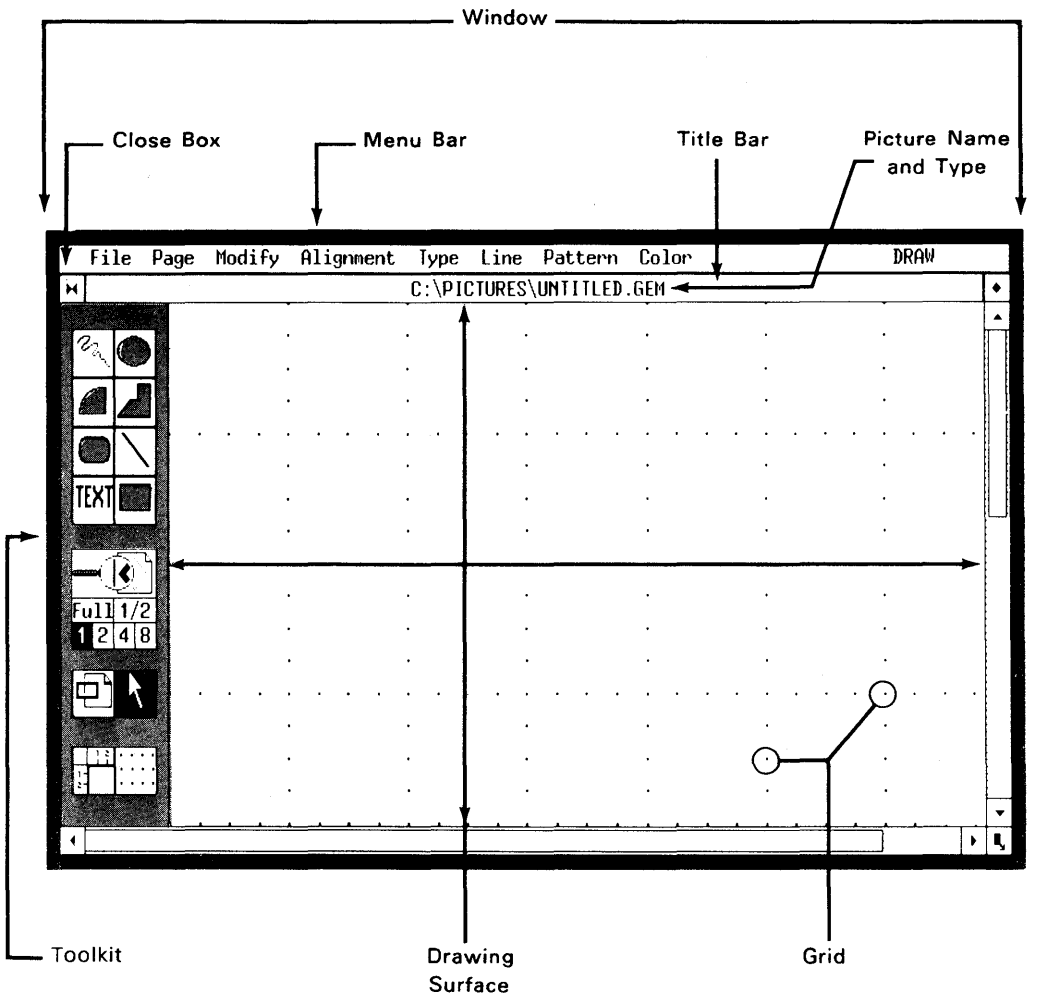
GEM DRAW PLUS SCREEN

The GEM Draw Plus screen and some of the features of the GEM Draw Plus working area are shown on the next page.

This section describes these features so that you will be prepared for the tutorial in Section 3. The GEM Draw Plus screen contains many of the same components you see on the GEM Desktop screen, such as:

- Menu Bar
- Close Box
- Title Bar
- Full Box
- Scroll Bars, Sliders, and Arrows

These components work much the same as on the GEM Desktop.



GEM Draw Plus Screen

MULTIPLE WINDOWS

With GEM Draw Plus you can have two windows open on your screen at the same time and copy all or part of a picture from one window to another. This is a powerful function of GEM Draw Plus. You will learn how to use it when you read about the **Open** command in Section 4.

The "active window" is the one in which you are working. When two windows are open on your screen, only one can be active. (The folder and picture names are dimmed in the title bar of the inactive window.) To make a window active, place the pointer inside the window and click.

SIZE BOX

You can change the size of the active window by dragging the size box. When you drag, you see a shadowy outline. When the outline is the size and shape you want for your window, release the mouse button. Resizing windows is something you do when you have two windows open at the same time and are copying between them. It is also useful when using desk accessories, since they can end up "behind" windows.

TITLE BAR

Inside the title bar is folder (directory) information and your picture's name and type. See your GEM Desktop guide or operating system manual for information about folder or path names.

You can also use the title bar to move a window on your screen. Place

the pointer inside the title bar and drag the window to the position you want.

Moving windows is something you often do when you have two windows on the screen at the same time, especially when copying between them.

Picture Name and Type

The picture name reads "untitled" until you save your picture on disk and give it a name. Thereafter, the name you provide and the GEM type appear in the title bar along with the name of the folder the picture has been saved in.

Appendix B describes picture names and types.

CLOSE BOX

Click on the close box to close your active window and remove it from the screen. The close box works the same way as the **Close** command (see page 4-14).

MENU BAR

The menu bar contains the titles of the GEM Draw Plus menus. These menus contain commands you use to create or manipulate your pictures. Although the menu titles are different from those on the GEM Desktop, the menus work the same way. Section 4 describes the GEM Draw Plus menus and commands.

DRAWING SURFACE

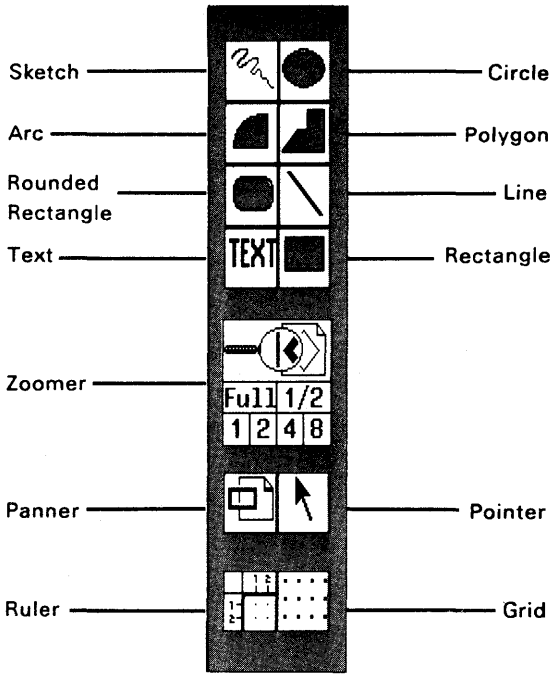
The drawing surface is your work area, the part of the screen where you create pictures.

The drawing surface is like a sheet of drawing paper. There are many ways you can control the size, format, and your view of the drawing surface. You will learn about these functions later.

If you use a drawing surface larger than 8 1/2 x 11", your output will be spread over several pages. If you want to keep your output within an 8 1/2 x 11" drawing surface, choose the "Best Fit" printer option in the Preferences Menu of the OUTPUT Application.

TOOLKIT

At the left of the GEM Draw Plus work area is the toolkit. The tool icons are labeled in the figure below.



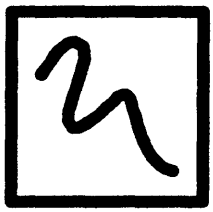
GEM Draw Plus Toolkit

When you click on a tool icon in the toolkit, GEM Draw Plus highlights it to indicate your current selection.

THE TOOLS

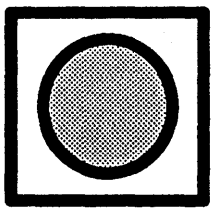
The GEM Draw Plus tools are icons showing the type of picture element that each can create. They are described as they are presented in the toolkit, left to right, top to bottom.

Sketch



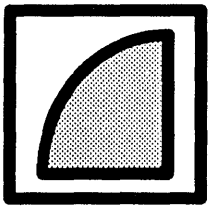
Use this icon to draw free hand on the drawing surface. The width and style of line created is determined by the current setting in the Line Menu. You can also specify the line end style (square, rounded, or arrow) in the End Styles dialog in the Line Menu.

Circle



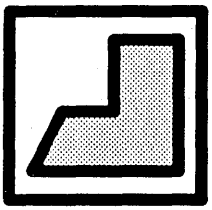
Use this icon to create circles and ellipses. The thickness and style of the line is determined by settings in the Line Menu. If a pattern has been selected in the Pattern Menu, the figure is automatically filled with that pattern when it is completed.

Arc



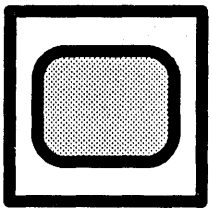
Use this icon to create figures that are one quarter of a circle (or ellipse). The line and line end styles are determined by the selections in the Line Menu. If a pattern has been selected, a "pie slice" is created; if not, only an arc.

Polygon



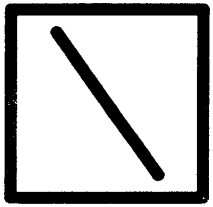
Use this icon to create many-sided objects with straight sides. The style and thickness of the sides are determined by the settings in the Line Menu. If a pattern is selected, the object is filled with that pattern when completed.

Rounded Rectangle



Use this icon to create rectangles (or squares) with rounded corners. When completed, each is filled with the selected pattern, if any, from the Pattern Menu. The rectangle's borders will be the current selection in the Line Menu.

Line

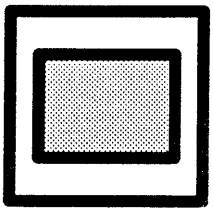


Use this icon to create straight lines on the drawing surface. The kind of line and its end style is determined by the current settings in the Line Menu. A polygon created with this tool cannot be filled.

Text

Use this icon to add text to your figures. The Type Menu controls the style, size, and font of the text created. Placement is controlled by locating the text cursor where the text is to appear.

Rectangle



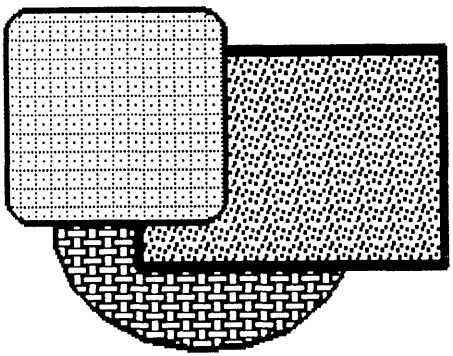
Use this icon to create squares or rectangles on the drawing surface. As they are completed, they are filled with the currently selected pattern, if any. The rectangle's outline is the current selection in the Line Menu.

ELEMENTS

Elements such as rectangles, lines, polygons, circles, and text are the basic building blocks you use to create pictures with GEM Draw Plus. The icons in the toolkit are the "tools" that you use to create these elements. This section describes general rules that apply to picture elements. See Section 5 for detailed descriptions of each element.

When you draw with GEM Draw Plus, you can "layer" the picture elements one atop another. To understand this concept, think of the elements you use to draw pictures as paper cutouts. For example, you might draw a circle and then lay a rectangle on top of the circle. Even though the rectangle might completely hide the circle from view, the circle is still part of the picture, as the illustration below demonstrates.

Note: Pictures that are to be sent to a plotter should not have "layered" elements. Plotters will overprint any such areas in a picture.



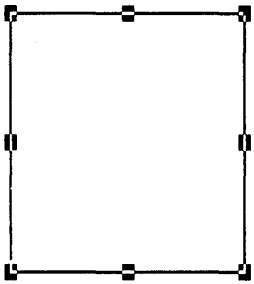
Layered Elements

Current Element

The term "current element" refers to the element or elements GEM Draw Plus acts upon when you do something. For example, if your picture contains three different elements and you choose the **Delete** command from the Modify menu, GEM Draw Plus deletes only the current element.

Element Extents

GEM Draw Plus identifies the current element by placing "extents" around it. Extents are the small black boxes connected by lines that surround the element, as the figure shows.



Element Extents

When you add a new element to a picture, it is automatically the current element. You can also make existing picture elements current using the various methods described next.

Selecting Elements

To make an element current, go to the toolkit and click on the pointer icon (described later in this section). Then, place the pointer on the element or anywhere within its extents and click.

You can make any number of elements all current using one of the following methods:

Shift-click	Click on the pointer icon. Hold down the Shift key as you click on all the elements you want to make current.
Rubber-Rectangle	Click on the pointer. Place the pointer at one corner of the group of elements you want to select and drag in any direction. When you drag, a "rubber rectangle" appears. When the rubber rectangle encloses all of the elements you want to select, release the mouse button.
Select all Command	Display the Modify Menu and choose the **Select all** command. GEM Draw Plus makes all elements in your picture current.

Selecting Through Layers

Because you can layer elements directly on top of one another, you sometimes need a way to select through layers to make a specific layered element current. To do this, hold down the **Ctrl** key while you click on an element. (This technique is also helpful when nesting elements. See "Grouping Elements" later in this section.)

De-selecting Elements

If you don't want any elements in your picture to be current, click on the pointer icon, place the pointer in an open area of your drawing surface, and click again.

If multiple elements are current and you want to de-select one or more of them, click on the pointer, then hold down the Shift key while you click on the element or elements you want to de-select.

Moving Elements

To move the current element or elements to another location, select the element(s). Click on the pointer icon and then place the pointer well within the element's extents. As you drag the pointer, an outline of the extents follows. Release the mouse button when the extents are where you want the element.

Grouping Elements

Because pictures often consist of many elements, you sometimes need to combine elements so you can treat them as a single entity.

For example, suppose you draw a picture of the American flag and want to scale it down to a smaller size. If you form the flag's elements into a group, you can quickly reduce the scale of the drawing. Without grouping, you would have to rescale and reposition each element in the flag individually, a tedious and time-consuming task.

Grouping is a powerful and useful feature of GEM Draw Plus. However, any action you take on a group affects every element within it. For example, if you change the color of the flag in the preceding example after forming it into a group, GEM Draw Plus changes the color of every element in the group. Consequently, you would end up with a colored rectangle rather than a picture of the American flag.

To work around this situation, GEM Draw Plus gives you a way to break a group after forming it. For example, to change the color of the stripes in your flag picture, you can break the group, change the colors of the individual stripes, and then reform the original group.

Grouping allows you to size multiple elements while maintaining their proportions; it also allows you to move or copy elements while maintaining their relative positions. For more information about groups, see the **Make group** and **Break group** descriptions in Section 4.

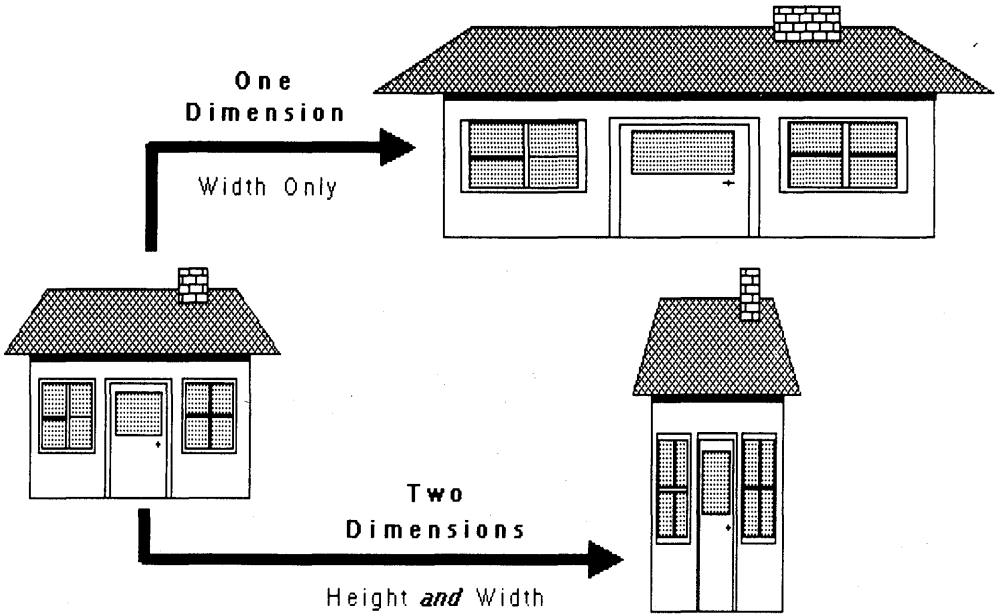
Scaling Elements

You can change an element's size or proportions by using the eight small black boxes located on the extents. You can only rescale one element at a time, however.

To change the scale of a current element, begin by clicking on the pointer icon. Then place the pointer on one of the black boxes and drag. The extents stretch or contract like a rubber rectangle. The rubber rectangle marks the area within which GEM Draw Plus will rescale the element when you release the mouse button.

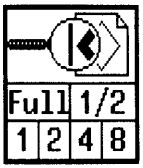
Use the black boxes on the corners for two-dimensional scaling, that is, to change both the height and width of an element in one operation. Use the boxes at the midpoint of the sides to scale in one dimension, that is, to change either the height or width of the element, but not both. The figure shows examples of one- and two-dimensional scaling.

Note: You cannot rescale text using the methods described here. See "Point Sizes" on page 4-23 for details.



Examples of Element Scaling

Zoomer

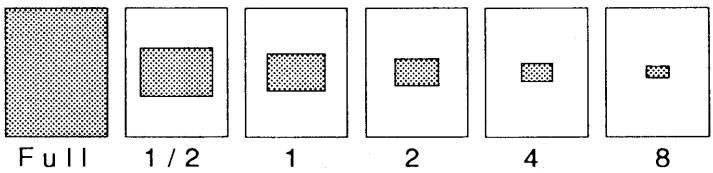


The zoomer provides a way to magnify a portion of your picture. This does not change the size or proportions of its elements, it only makes them appear larger.

Working in the magnified state is an excellent way to add fine detail and small elements to your pictures.

The zoomer contains boxes labeled **Full**, **1/2**, **1**, **2**, **4**, and **8**. Click on one of these boxes to change magnification states. Double-click on a box to automatically invoke the panner (described on page 2-17).

Each successive state magnifies your picture by a factor of two -- every element appears twice as large (in each dimension) as in the previous state. For example, if your picture is in the **1** state and you click on **2**, you only see one quarter of your picture on the drawing surface, but every element appears twice as large (in height and width.) Similarly, the **1/2** state shows an overall view larger than **1** shows. The **Full** box shows you the entire page reduced to fit on your screen. The figure below shows the approximate area of your picture you see in each magnification state. (Not all views are available for all page sizes.)



Relative Magnification States

True Picture State

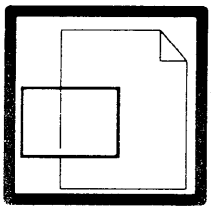
Click on zoomer state **1** to display your picture in its "true" state. In the true state, text and line elements appear in their correct proportions. (For example, 72 pt. text is actually 1 inch high. See Point Sizes on page 4-23.)

SELECTOR ICONS

The key things you do with the selector icons are the following:

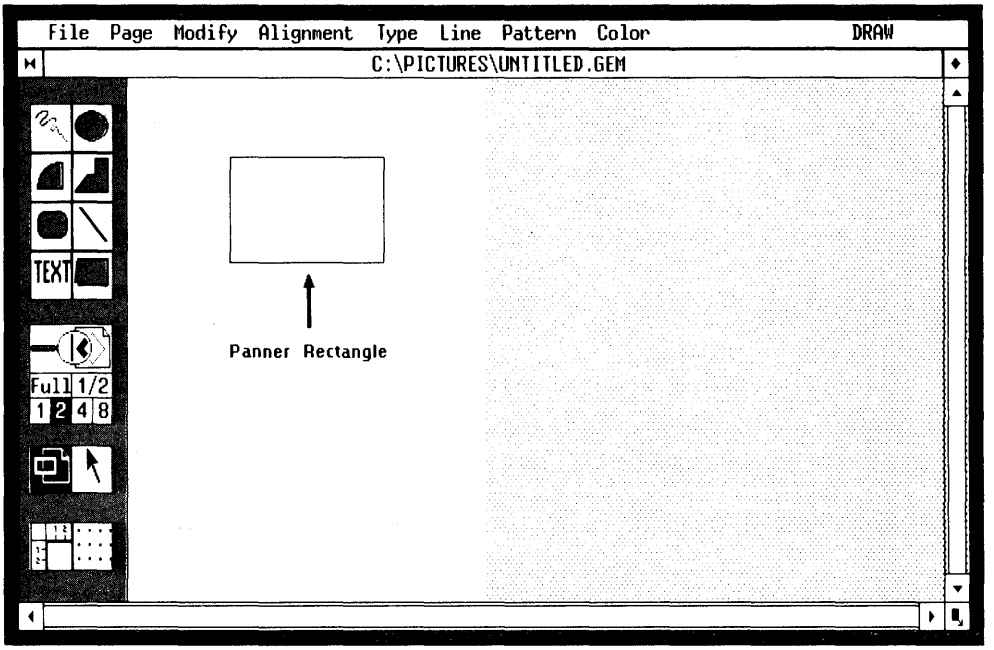
- select an area of your picture where you want to work
- make an element or elements current
- change the attributes used to draw new or existing elements

Panner



Use the panner to display different parts of your picture on the drawing surface.

When you click on the panner icon, you see a full view of your picture. You also see the panner rectangle, as the figure on the next page shows. The panner rectangle encloses the area of your picture you were viewing before you clicked on the panner icon.



Panner Rectangle

Drag the panner rectangle so it encloses the area of your picture you want to see on your drawing surface. When you release the mouse button, that area appears inside your window.

The panner works like the scroll bars and sliders except that the panner gives you a full view of the picture and lets you go directly where you want to go with one movement.

You automatically invoke the panner when you double-click on a magnification state in the zoomer.

Pointer

The pointer icon is the tool you use to make elements current. It puts the pointer into "select mode". Two important ways you use it are described below.

Selecting the attributes used to draw picture elements.

GEM Draw Plus draws all elements with the line, pattern, color and type attributes currently set. Use the pointer to choose from the menus those attributes you want GEM Draw Plus to use.

Keep the following important concepts in mind when you use the pointer:

- You change element attributes by choosing those you want from the Type, Line, Pattern, and Color menus and the Line End Styles dialog.
- If any elements are current when you choose an attribute from a menu or dialog, that attribute applies only to the current element or elements.
- If NO element or elements are current when you choose an attribute from a menu or dialog, your choice applies to all elements you draw from then on. Small markers indicate the current choices in each menu and in the Line End Styles dialog.

Changing picture elements AFTER drawing them.

For example, you can move an element, group it with others, delete it from your picture, change its dimensions or attributes, and so forth. Use the pointer to choose an element and then make these or other changes to it.

DRAWING AIDS

GEM Draw Plus has several aids to help you create drawings more precise than would normally be possible on a plain drawing surface.

Grid

If the drawing surface is like a sheet of drawing paper, the grid (the dots on your drawing surface) transforms this drawing paper into graph paper.

The grid helps you align the different parts (elements) of your picture. These dots never appear when you reproduce a picture on a printer, plotter, screen, tablet, or camera.

The grid is optional. Click once on the grid icon to turn the grid on or off. Double-click on the grid icon to display a dialog box that lets you set the ruler size (how close the dots are to each other) Click once on the adjacent ruler icon to turn the ruler on or off.

Auto Grid

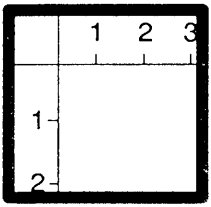
Auto grid is another optional feature. You turn the Auto grid on and off by choosing the **Auto grid On/Off** command from the Page menu.

When the Auto grid is on, GEM Draw Plus "snaps" your figure to the nearest grid point on the drawing surface. This ensures precise alignment of picture elements when you need it. (**Note:** The grid does not have to be visible for the Auto grid feature to take effect.)

When Auto grid is turned off, GEM Draw Plus places picture elements at the exact spot you select on the drawing surface.

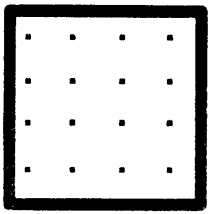
When using the Auto Grid feature of GEM Draw Plus, you should use only the top four line styles in the Line Menu during the preliminary phase of your drawing. When you finish altering your design, you can replace thin lines with thicker ones where appropriate. If you use the thicker lines at first, it may be difficult to move them around the screen as you complete your design.

Ruler Icon



Click on this icon to display (or hide) horizontal and vertical rulers on your drawing surface. Double-click on the icon to invoke the **Page size** command.

Grid Icon



Click on this icon to display (or hide) the grid points on your drawing surface. Remember, displaying or hiding the grid points has no effect on the Auto grid described earlier. Double-click on the icon to invoke the **Ruler spacing** command.

End of Section 2

Tutorial

This section teaches the basics of using GEM Draw Plus. Because GEM Draw Plus is such a versatile and powerful tool, the tutorial is limited to teaching you fundamental concepts and procedures; it does not teach you the art of drawing.

- While using the tutorial, you can start over at any time by choosing the **New** command from the File Menu.
- If you want to remove an element from your picture, choose the **Delete** command from the Modify Menu while the element is current.
- To stop GEM Draw Plus and return to the GEM Desktop, choose the **Quit** command from the File Menu.

After you have used GEM Draw Plus for a while and feel comfortable with the tools and commands, you may want to examine the pictures provided in the GEM Draw Plus Library. Take the pictures apart by ungrouping them to see how the various elements were combined to create images and effects. If you do this, however, you may want to make copies of the library pictures before you make changes to them.

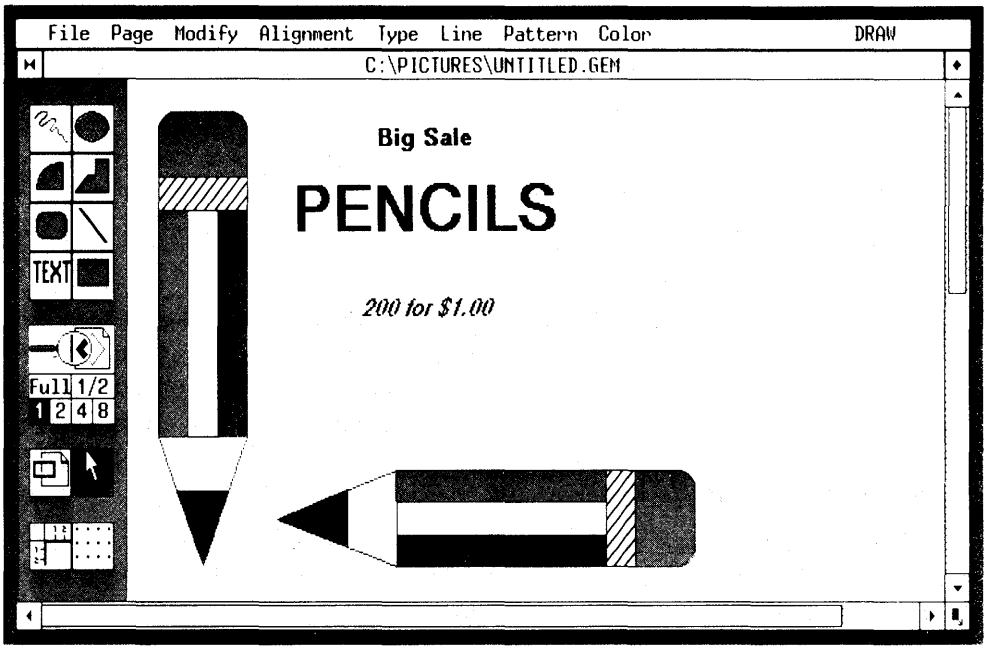
The best way to learn GEM Draw Plus is to experiment. Try new things. Let your imagination be your guide. You'll find the learning experience fun, and the whole process ultimately rewarding.

Note: If you're using a graphics tablet in place of a mouse as your pointing device, be sure to read Appendix D before you begin the tutorial.

STARTING GEM DRAW PLUS

Start GEM Draw Plus according to the instructions in Section 1.

Here is the design you'll create with this tutorial.

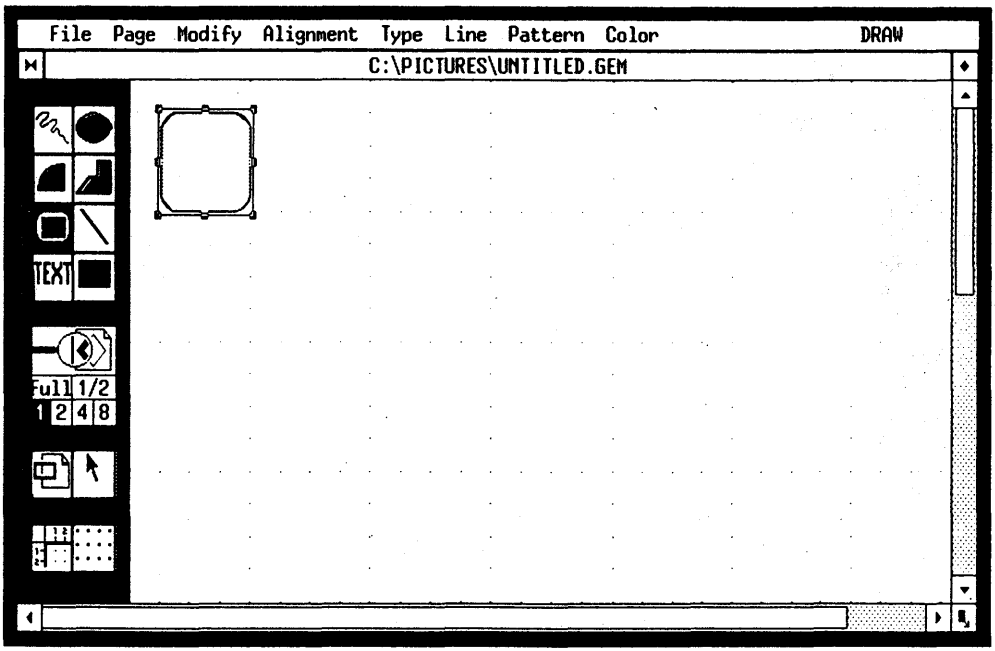


Objective of Tutorial

DRAW PENCIL ERASER

The first element we will draw is an eraser for the top of the upright pencil. Follow these steps:

1. Click on the rounded rectangle in the toolkit.
2. Move the cross hair onto the drawing surface near the top left.
3. Drag 3 units down and 3 to the right. (Recall that dragging means hold down the button while moving the mouse.) When you drag, a "rubber rectangle" previews the shape and size of the rounded rectangle you are drawing. When the rubber rectangle is 3 grid units wide by 3 units high, release the mouse button. The screen should now look like the one below.

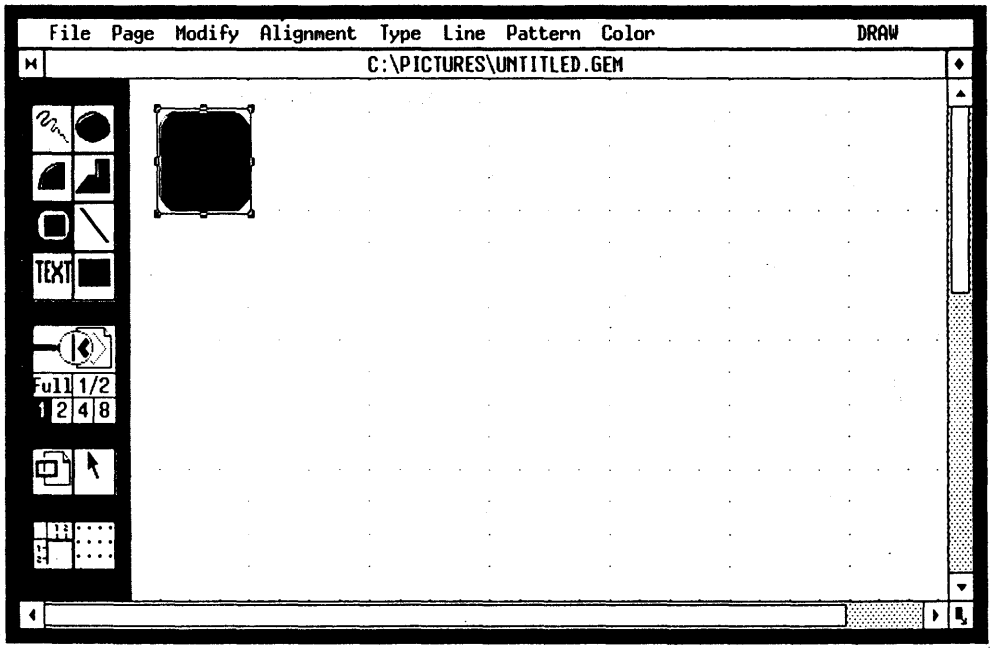


Draw Pencil Eraser

SELECT ERASER'S PATTERN

To select the eraser's pattern (to give it some texture), follow these steps:

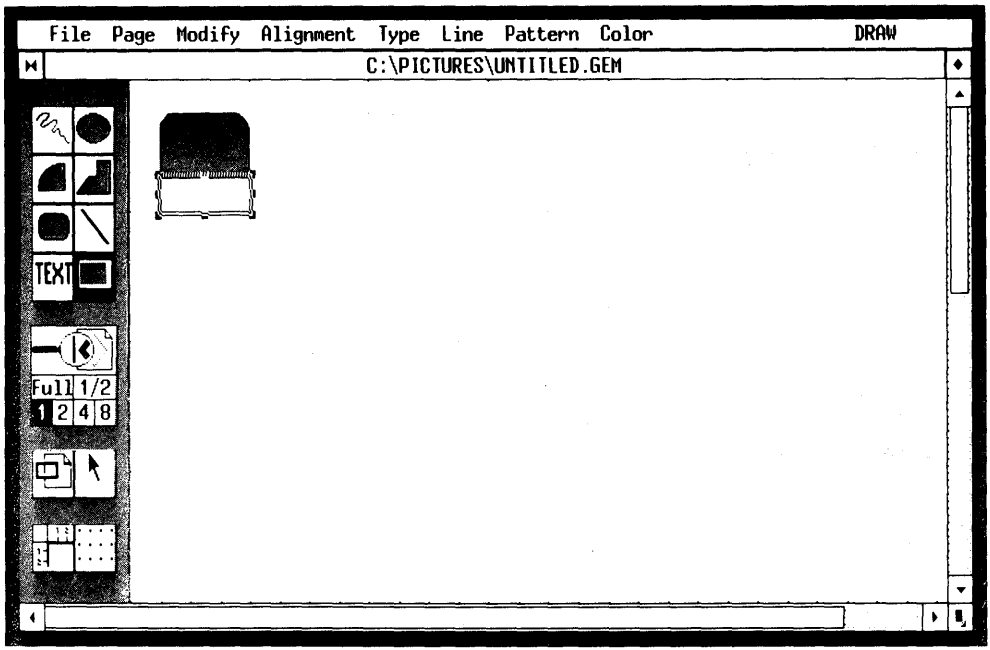
1. Move the pointer up to the menu bar and touch the word **Pattern**. The Pattern Menu appears.
2. Move the pointer through the menu to highlight and select (click on) the 50% grey pattern. The screen should now look like the one below.



Select Eraser's Pattern

DRAW ERASER HOLDER

1. Click on the rectangle in the toolkit.
2. Move the crosshair onto the drawing surface and draw a rectangle 3 grid units wide by 1 unit high (overlapping the bottom of the eraser) like the one below. (The drawing action is the same you used to draw the rounded rectangle for the eraser.)

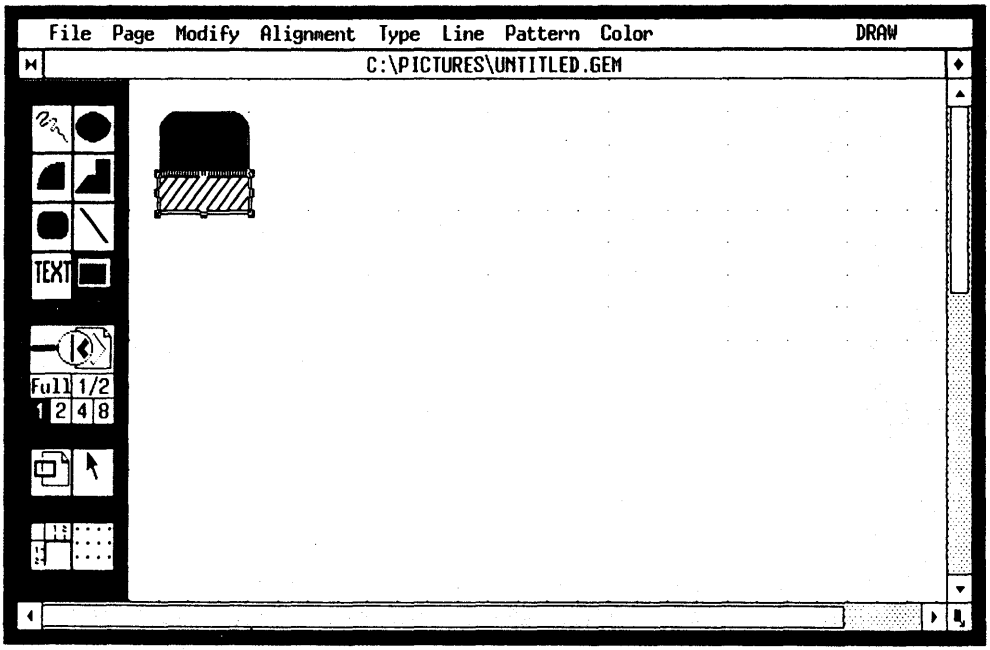


Draw Eraser Holder

SELECT ERASER HOLDER'S PATTERN

Select the eraser holder's pattern the same way you did with the eraser. Here are the steps again:

1. Display the Pattern Menu.
2. Select the pattern you want to use. Use the one shown in the figure below, or any one you like.



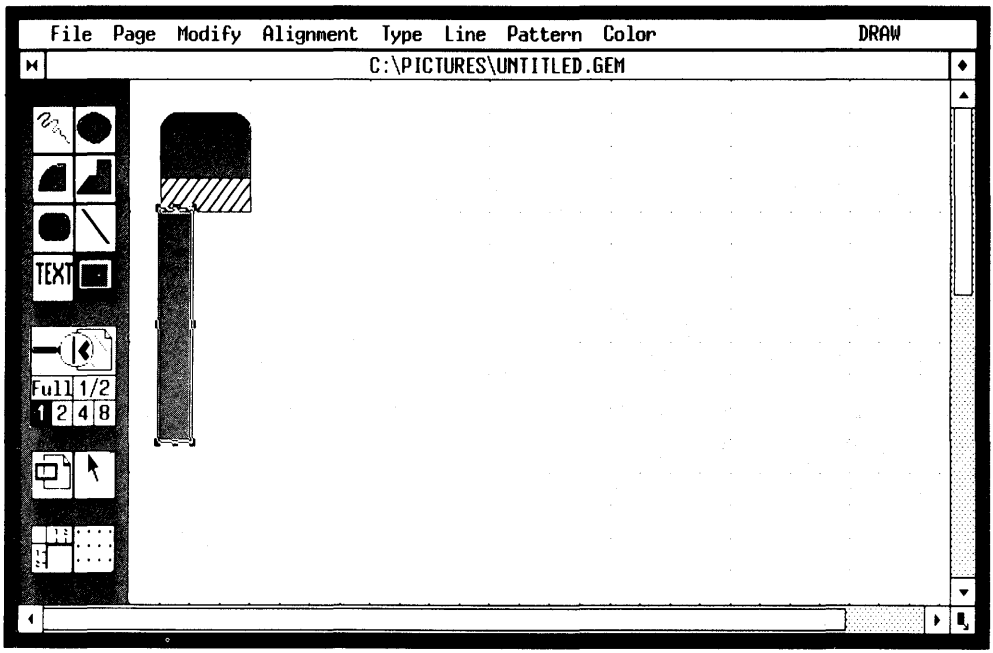
Select Eraser Holder's Pattern

DRAW PENCIL BARREL

The pencil barrel consists of three separate but similar rectangles.

If the rectangle is still highlighted in the toolkit, you don't have to select it again.

Starting at the bottom left corner of the eraser holder, draw a rectangle 1 grid unit wide by 7 units high, like the one below.



Draw Pencil Barrel

MAKE COPIES OF RECTANGLE

Now make two copies of the rectangle.

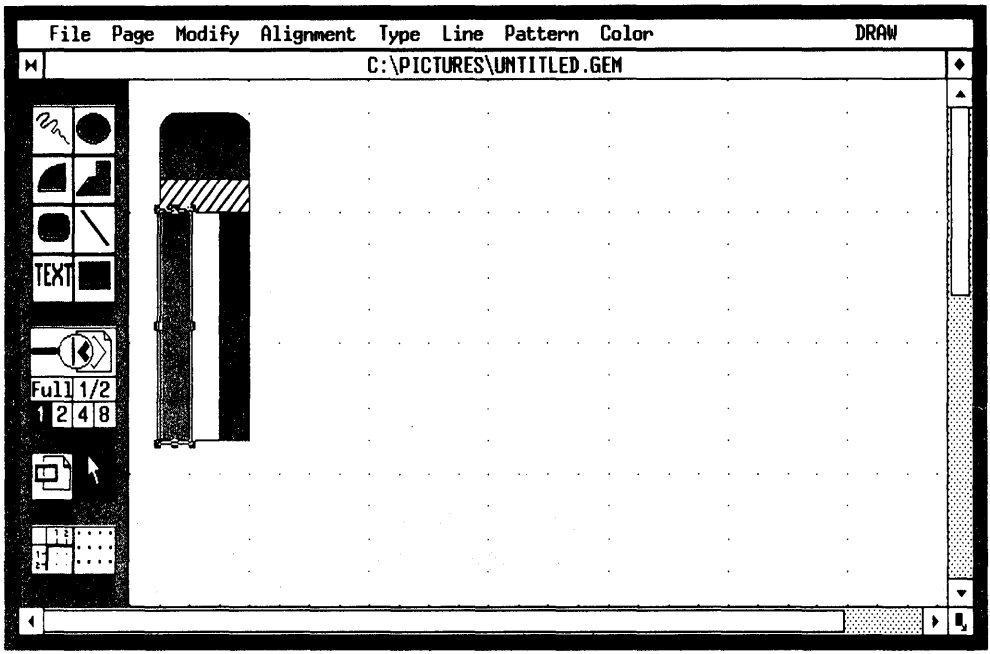
1. Choose the **Make copy** command from the Modify Menu. This makes the first copy.
2. Hold down the **Alt** key (on the keyboard) while you type the letter **C**. This makes the second copy.

Note that both techniques make a copy of the current element. You now have the three rectangles you need to form the pencil barrel.

SELECT PATTERNS AND ALIGN ELEMENTS

Look at the figure on the next page and then do the following steps.

1. Choose the solid black pattern from the Pattern Menu.
2. Click on the pointer icon in the toolkit.
3. Place the pointer inside the solid black rectangle's extents and drag the rectangle up two grid units.
4. Click on the first copy of the rectangle to make it current.
5. Place the pointer inside the extents and drag the rectangle up one grid unit.
6. Click on the first (leftmost) rectangle in the pencil barrel to make it current.
7. Choose the 50% grey pattern from the Pattern Menu.



The Pencil Barrel

DRAW THE PENCIL POINT

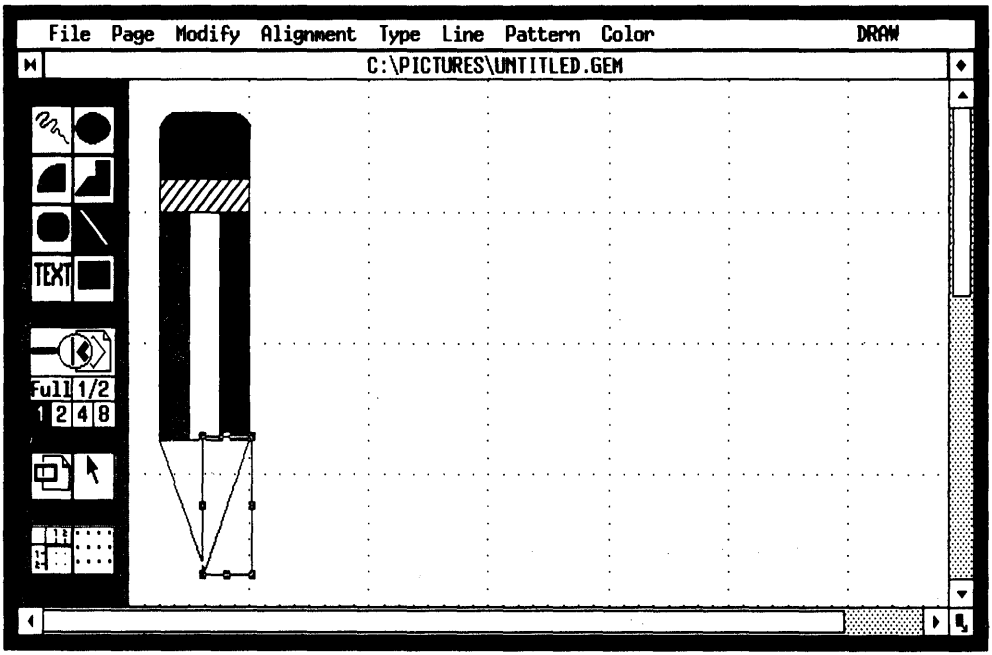
Use two lines and one polygon to form the pencil point. Follow these steps to draw the lines:

1. Choose the **Ruler spacing** command from the Page Menu. When the dialog appears, click on the **1/8** button and then on the **OK** button.

   Note that there are now twice as many grid points on the drawing surface and they are half as far apart. You take this step so you can locate the tip of the pencil point at the exact center of the pencil barrel. With the ruler spacing set at 1/4", you couldn't have done that.

2. Click on the line icon in the toolkit.
3. Place the cross hair at the bottom left corner of the pencil barrel. Drag it three grid units (3/8") to the right and then straight down seven grid units (1"). Release the mouse button to draw the first side of the pencil point.
4. Draw the other side of the pencil point in a similar manner.

The picture should now look like the one on the next page.

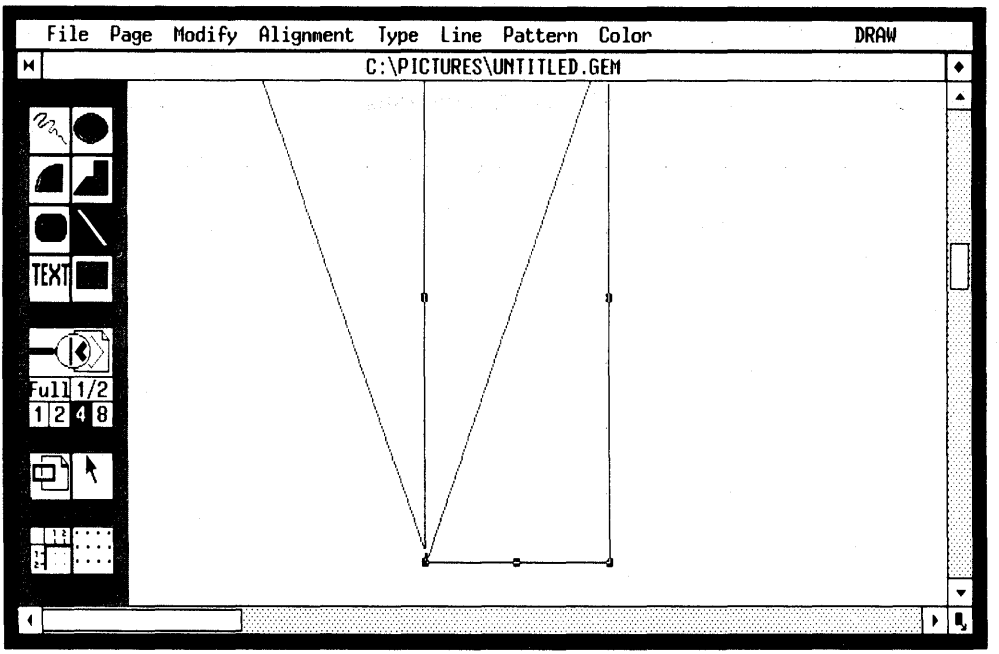


Pencil Point

DRAW THE PENCIL LEAD

It is easier to draw the lead for the pencil point while in a magnified state. Here's how to magnify the picture:

1. Double-click on the **4** in the zoomer. You see your picture in full view and you also see the panner rectangle.
2. Place the pointer inside the panner rectangle and drag it to surround the tip of the pencil point, if it doesn't do so already. When you release the mouse button, the screen should look like the one below. (If your view of the drawing surface isn't satisfactory, click on the panner in the toolkit and repeat this step.)



Magnified View of Pencil Point

DRAW A POLYGON FOR THE PENCIL LEAD

Look at the figure on the following page. It shows the polygon (in this case a triangle) you will draw by following the steps below.

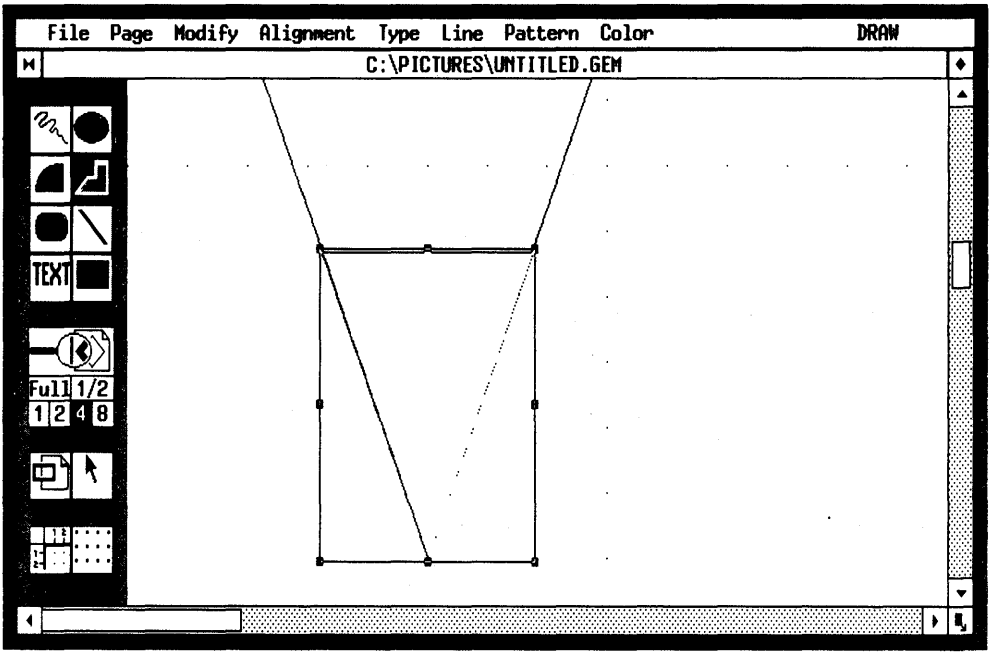
1. Choose the **Auto grid Off** command from the Page Menu.

   (You must turn off the Auto grid or you won't be able to draw the polygon in the required shape.)

2. Click on the Polygon icon in the toolkit.
3. Place the cross hair at the tip of the pencil point and click. This marks the beginning point for the polygon.
4. To form the first side of the polygon, move the cross hair about half way up the line forming the left side of the pencil point and click again.

   (If you click at the wrong point while drawing a polygon, press the Backspace key to back up to any previous point, and resume drawing from there.)

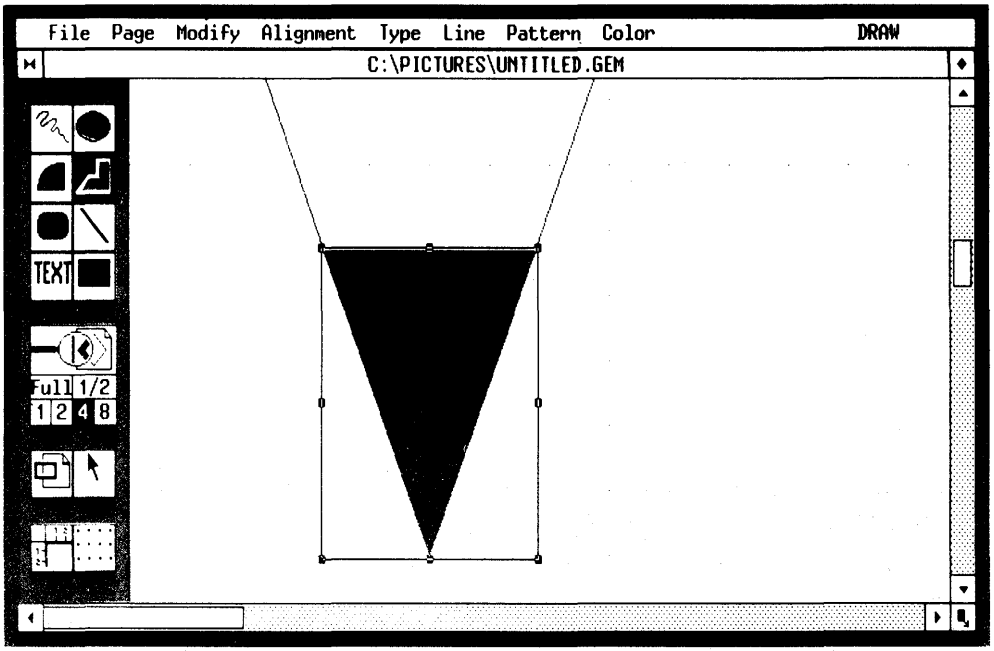
5. Move the cross hair straight to the right until it intersects the line forming the right side of the pencil point. Click again.
6. Return the cross hair to the tip of the pencil point and double-click. (You must double-click to stop drawing a polygon.) The polygon, an inverted triangle, is complete.
7. Choose the **Auto grid On** command from the Page Menu to turn this feature on again.



Drawing the Pencil Lead

SELECT THE LEAD'S PATTERN

Choose the solid black pattern from the Pattern Menu to make the pencil lead look more realistic.



Selecting the Lead's Pattern

ZOOM OUT TO TRUE STATE

You can now return to the true state to see all of the pencil. Here's how:

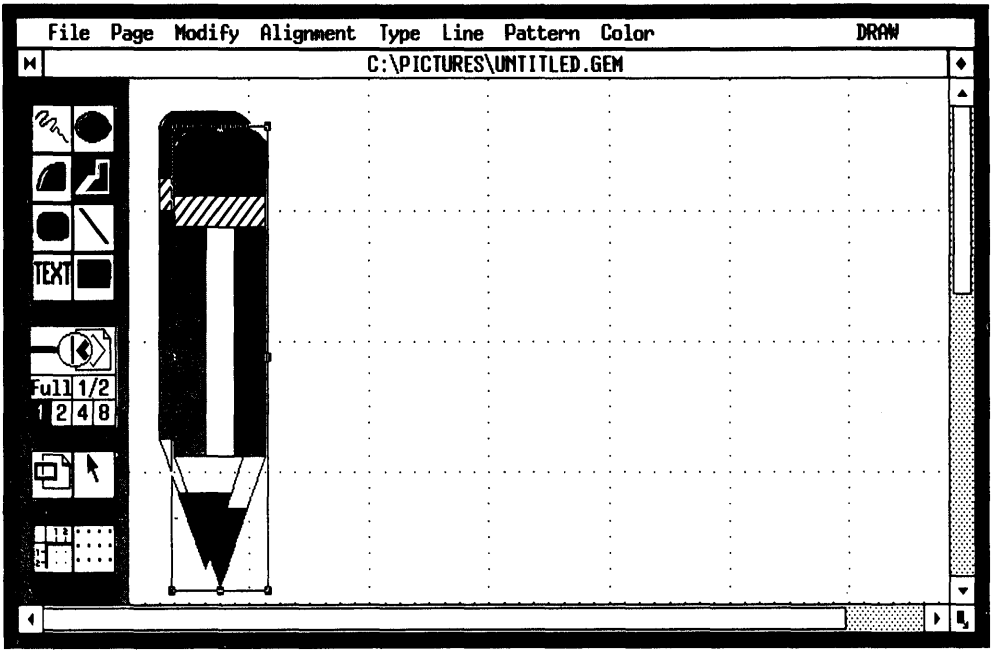
1. Click on the **1** in the zoomer. Recall that this tells GEM Draw Plus to show a picture in the true state.
2. Click on the panner in the toolkit.
3. Drag the panner rectangle so the pencil is fully inside and at the left edge. When you release the mouse button, you see all of your pencil on the left side of the drawing surface.

GROUP AND COPY PENCIL

The next step is to make the pencil elements into a group and then create a copy.

1. Choose the **Select all** command from the Modify Menu. Extents appear around every element in the pencil.
2. Choose the **Make group** command from the Alignment Menu. A single extent now encloses the pencil.
3. Choose the **Make copy** command from the Modify Menu. GEM Draw Plus makes a copy of the pencil, and extents now appear around the copy.

The screen should look like the illustration on the next page.



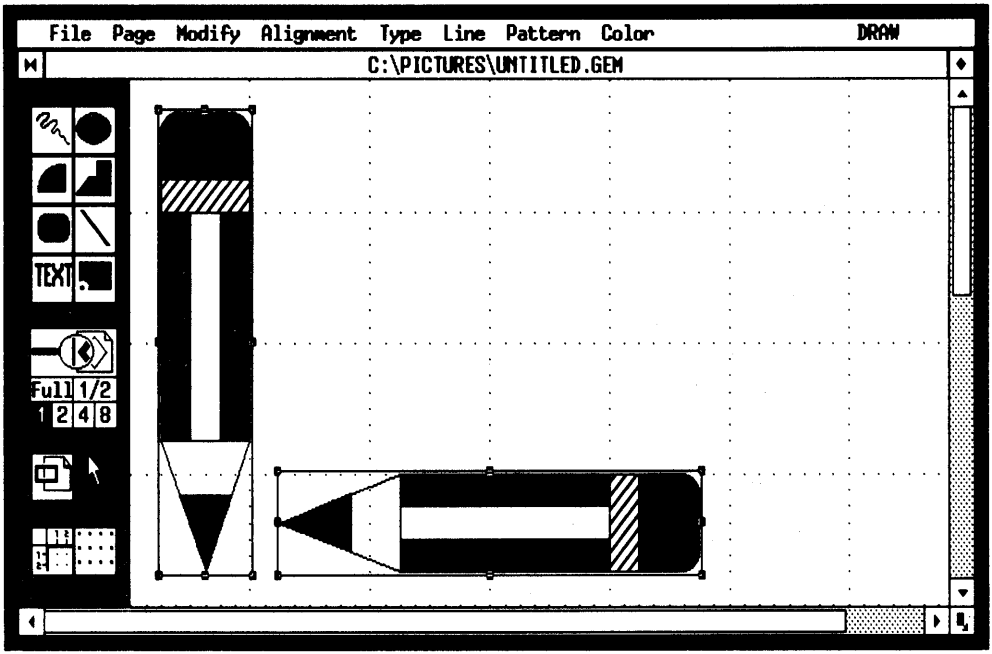
Making a Copy of Your Pencil

REPOSITION AND ALIGN PENCILS

As you complete the steps below, part of the pencil may disappear off the edge of the drawing surface. This is normal, so don't be alarmed if it happens.

1. Choose the **Rotate** command from the Modify Menu. The second pencil rotates counterclockwise 90 degrees.
2. Repeat the preceding step two more times to rotate the pencil counterclockwise a total of 270 degrees.
3. If the pointer icon is not highlighted in the toolkit, click on it now.
4. Place the pointer inside the pencil's extents and drag it until the left end of the pencil is two grid squares to the right of the vertical pencil.
5. Choose the **Select all** command from the Modify Menu. Both pencils are now current elements.
6. Choose the **Align bottom** command from the Alignment Menu.

The screen should look like the illustration on the next page.



Aligning the Pencils

ENTER TEXT

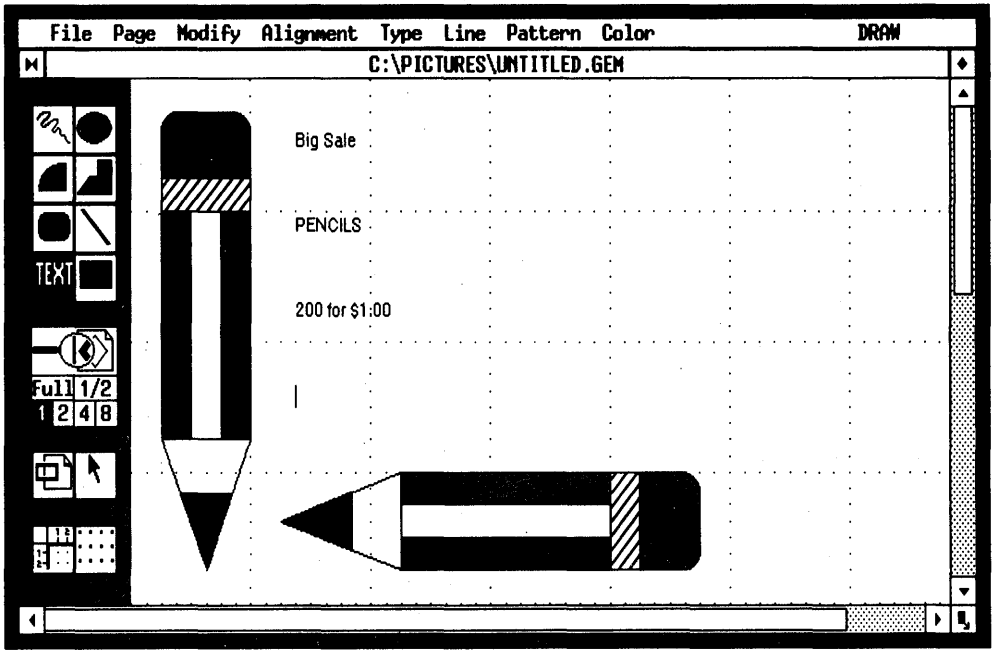
1. Click on the TEXT icon in the toolkit.
2. Place the cross hair three grid units to the right and two units below the top of the vertical pencil. Click the mouse button and move the cross hair to see the text cursor, a vertical bar.
3. Type the three lines of text shown below. When you reach the end of a line, press Enter four times for spacing between lines. If you make a typing error, use the Backspace or Del key to erase individual characters. Use the Esc key to erase all characters to the left of the cursor.

   Big Sale

   PENCILS

   200 for $1.00

The picture should look like the illustration on the opposite page.

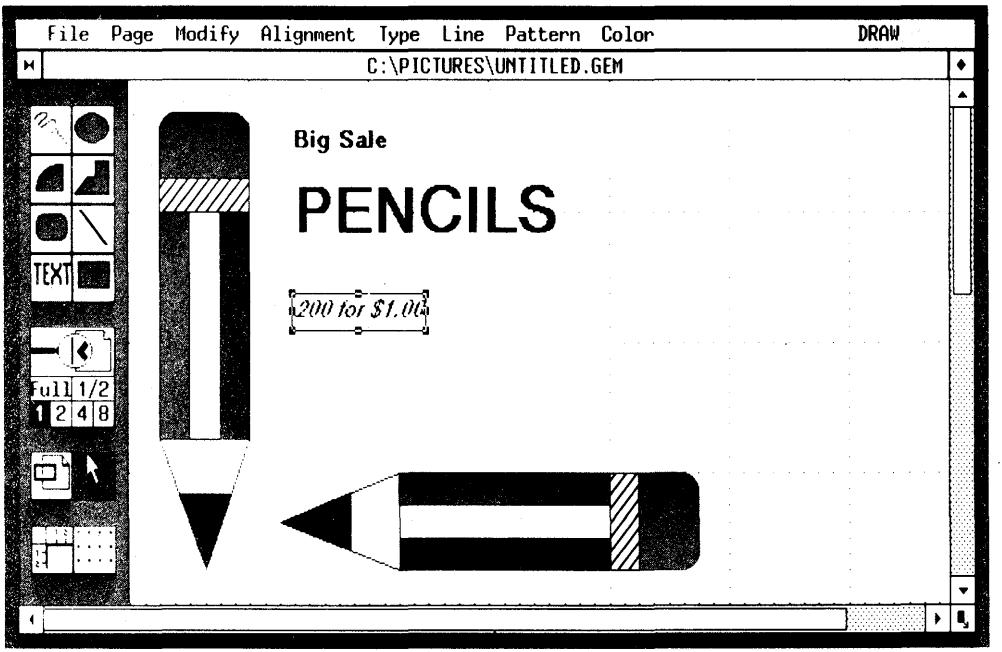


Entering the Text

CHANGE TYPE STYLE AND SIZE

1. If the pointer icon is not highlighted in the toolkit, click on it now.
2. Place the pointer on "Big Sale" and click.
3. Choose the **Bold** option from the Type Menu.
4. Click on "PENCILS".
5. Display the Type Menu two more times: the first time, choose the **Bold** option, the second time choose the **36 point** option.
6. Select "200 for $1.00" and change it to **Italic**.

The picture is nearly complete and should look like the one below.



Changing Type Style and Size

ALIGN TEXT ELEMENTS

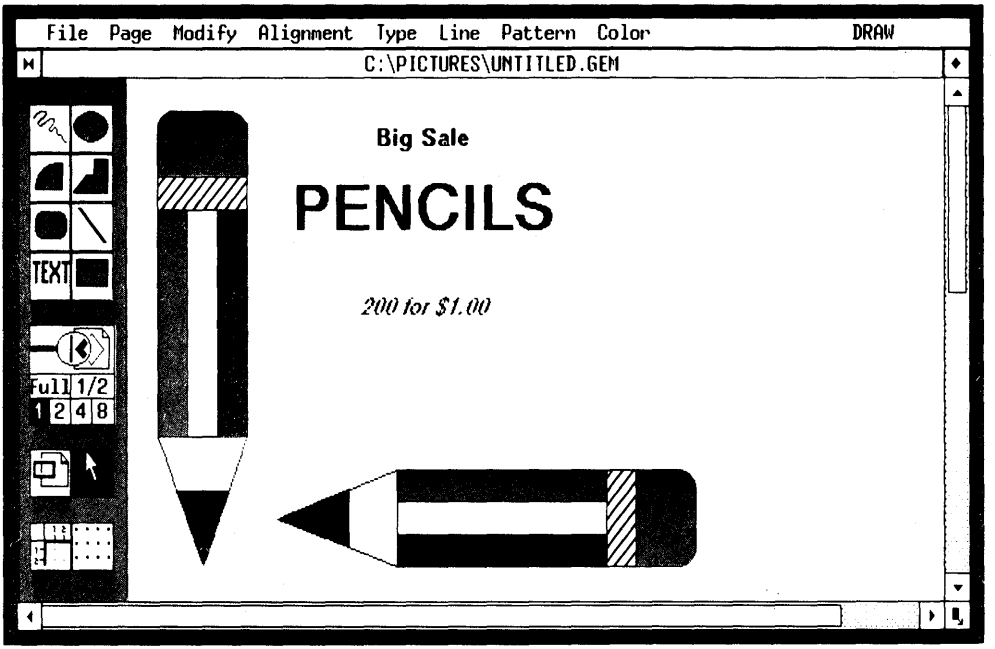
1. If the pointer icon is not highlighted in the toolkit, click on it now.
2. Place the pointer above and to the left of the "Big Sale" text element and drag down and to the right. When the "rubber rectangle" encloses all three text elements, release the mouse button. Extents appear around the text elements.

   (If you didn't get all three text elements, repeat this step and leave a wider margin around the elements.)
3. Choose the **Align center** command from the Alignment Menu.

Your design is now complete and should look like the one on the following page. Click on the grid icon in the toolkit to see the picture without the grid points. De-select the text to see it without extents.

If you want to save the design you created, click on the **Save as** command in the File Menu. The Item Selector will come on the screen. As you type in the name of your picture, it will appear in the space labeled "Selection". (Use the Backspace key to edit the picture name.) When you are ready to save the picture to disk, click on the OK button.

To learn more about saving pictures, refer to the description of the **Save as** command.



When you're ready to stop the tutorial and return to the GEM Desktop, choose the **Quit** command from the File Menu.

End of Section 3

GEM Draw Plus Menus and Commands

You'll find a picture of each GEM Draw Plus menu in the following pages with a brief description of its commands or options. When a command needs a more detailed description, a page reference shows where to find the additional information.

Setting and Saving Preferences

Note the triangular markers in the Type, Line, Pattern, and Color menus. They mark the current choice in each menu. When you draw picture elements, GEM Draw Plus uses these choices for the elements' attributes. The markers move when you select an attribute option while there are no selected elements in your picture. (This same concept applies in the line **End styles** dialog described on page 4-25.)

You can save the settings (such as page size, ruler spacing, type style and size, pattern, etc.) and have them preset as defaults whenever you start GEM Draw Plus. To do this, select **Save Preferences** in the Page Menu. The triangular markers will now point to the new type, line, and pattern selections when you restart GEM Draw Plus. (To restore the original settings, delete the file called DRAW.INF.)

Keyboard Shortcuts

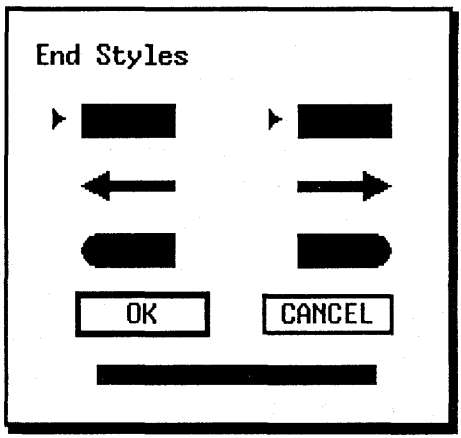
Note also the letters and symbols at the right side of many of the menus. These represent keyboard alternatives for entering commands. Pressing certain combinations of keys is the same as clicking on commands in a menu. The diamond shape (♦) represents the Alt Key; the caret (^) indicates the Ctrl key. These must be held down while the key indicated next to the symbol is pressed.

For instance, instead of choosing the **Delete** command in the Modify Menu, press Alt-D to delete an element you have selected. Similarly, instead of clicking on the **Abandon** command in the File Menu, press Ctrl-A to abandon a picture. In the Page Menu, you can display the **Page size** dialog by simply pressing the F2 function key.

These shortcuts are only available when no menus are displayed. Also, when desktop accessories (such as the Calculator) are on the screen, these shortcuts are unavailable.

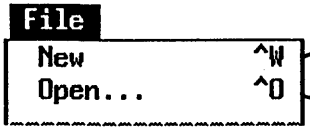
Dialogs

When a menu command is followed by three dots, as in **Save as...** (File Menu) or **End Styles...** (Line Menu), choosing the command displays a dialog presenting options. Select an option by clicking on it. You put your selections into effect by clicking on OK. You are usually given the choice to cancel the dialog and return to where you were.



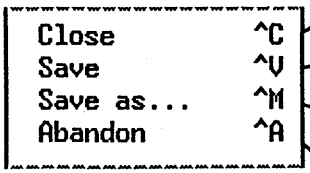
Sample Dialog

FILE MENU



Clears the active window so you can start a new picture. If a window is not open, places a new one on the screen. [Ctrl-W].

Selects an existing picture for you to work on [Ctrl-O] (page 4-10).

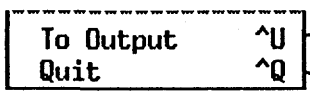


Closes the active window. Also saves the picture on disk if you made changes to it [Ctrl-C] (page 4-14).

Saves the picture in the active window under the name shown in the window's title bar [Ctrl-V] (page 4-14).

Names a picture and saves it on disk [Ctrl-M] (page 4-15).

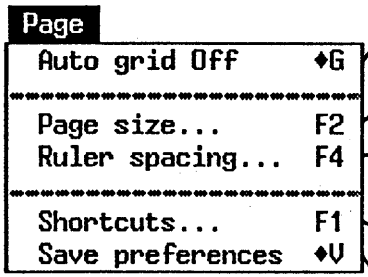
Abandons changes made to a picture since the last time saved. The original picture stays in the window [Ctrl-A].



Starts GEM Output so you can send one or more pictures to a printer, plotter, screen, or camera. See "GEM Output" in the GEM Desktop guide [Ctrl-U].

Stops GEM Draw Plus [Ctrl-Q].

PAGE MENU



Alternately turns the Auto grid off and on [Alt-G] (page 2-20).

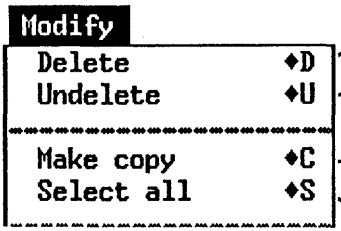
Displays a dialog you can use to specify a size and format for a picture [Function Key 2] (page 4-15).

Displays a dialog you can use to set the unit of measure in the drawing surface rulers [Function Key 4] (page 4-15).

Displays a dialog explaining the shortcut methods available in GEM Draw Plus. [Function Key 1] Also see Appendix C.

Saves the current settings so they will be preset when you next use GEM Draw Plus [Alt-V].

MODIFY MENU



Deletes the current element or elements from a picture [Alt-D].

Restores the last element (or elements) deleted from a picture [Alt-U].

Creates a copy of the current element or elements. The copy becomes the "top layer" in the picture [Alt-C].

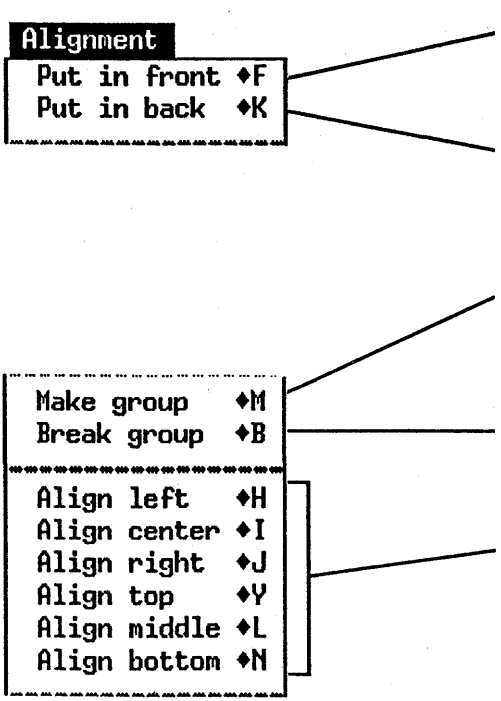
Displays the extents for all elements in a picture and makes every element current [Alt-S] (page 2-12).

Rotates an element 90 degrees counter-clockwise [Alt-R] (page 4-17).

Turns the current element 180 degrees on its horizontal axis [Alt-Z] (page 4-18).

Turns the current element 180 degrees on its vertical axis [Alt-T] (page 4-18).

ALIGNMENT MENU



Moves the current element to the top layer in a picture [Alt-F] (page 4-20).

Moves the current element to the bottom layer in a picture [Alt-K] (page 4-21).

Groups current elements so you can treat them as one element [Alt-M] (page 4-21).

Breaks a group so that each element can be selected individually [Alt-B] (page 4-21).

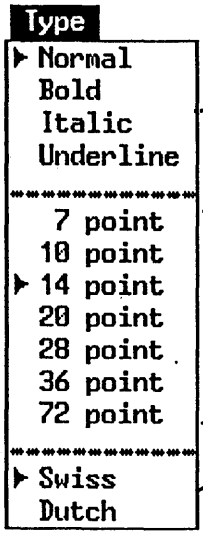
Aligns current elements at designated boundaries: (page 4-22)

- Left [Alt-H].
- Center [Alt-I].
- Right [Alt-J].
- Top [Alt-Y].
- Middle [Alt-L].
- Bottom [Alt-N].

Centers current element(s) on page [Alt-P] (page 4-22).

Provides equal vertical distance between the current elements [Alt-E] (page 4-23).

TYPE MENU

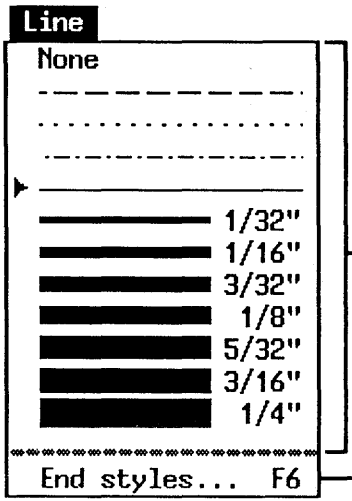


Chooses a type style for the selected type font. The choice of fonts is listed at the bottom of the menu. You can combine different type styles.

The text point size determines the size of the individual characters in a text element (page 4-23).

Chooses a type font for your text elements (page 4-24).

LINE MENU



Chooses a line style or line width for elements in your picture (page 4-24).

Displays a dialog so you can specify how the ends of lines should look [Function Key 6] (page 4-25).

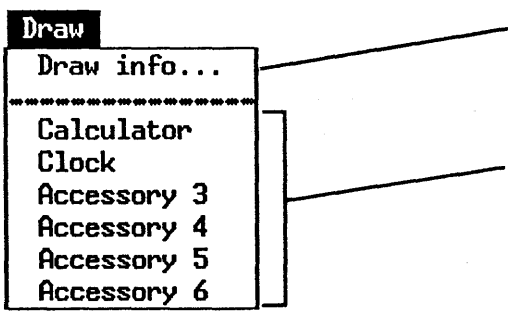
PATTERN MENU

See page 4-25 for a description of the patterns in this menu.

COLOR MENU

See page 4-26 for a description of the colors and color codes in this menu.

DRAW MENU



Displays information about GEM Draw and the percent of "drawing space" available (page 4-28).

Lists desk accessories available on your computer. You start one by choosing it from this menu.

NOTE: If you do not have sufficient Random Access Memory (RAM), your desk accessories do not appear in the DRAW Menu and cannot run.

FILE MENU COMMANDS

Open Command

Use the **Open** command to do the following:

- Bring an existing picture into the GEM Draw Plus work area.
- Place a second picture in a second window on the screen.

The Item Selector appears when you choose this command. (Instructions for using the Item Selector are in Appendix A.) Use the Item Selector to select the picture you want GEM Draw Plus to display on the screen.

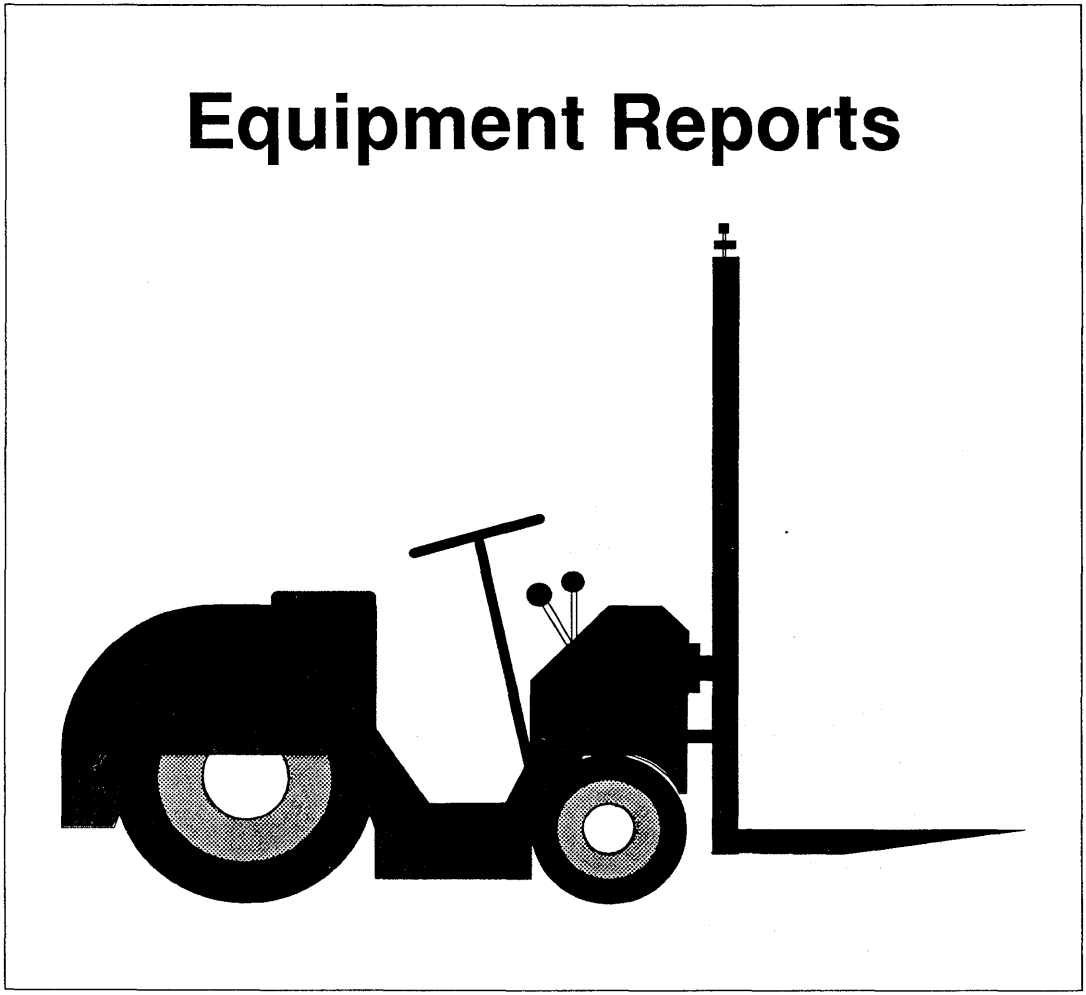
If you have not made any changes to the current window, or if you have saved any changes you have made, GEM Draw Plus replaces the current picture with the new one you selected.

If you have unsaved changes in the current window, GEM Draw Plus automatically opens a second window to display the picture you selected. If you want to be sure this picture is placed in the current window, choose the **New** command before choosing **Open**.

Using Multiple Windows

When two windows are open on the screen at the same time, you can copy all or part of either picture between the two windows, space permitting. If the picture you are trying to copy is too big (or complex) for the window that is to receive it, an alert box appears.

This multi-window capability is the way to copy all or part of a picture from the GEM Draw Plus Library (or any other GEM Draw Plus picture) into one you are creating. Following is a step-by-step example explaining how to include a picture of a forklift (from your GEM Draw Plus Library) in a report cover titled "Equipment Reports". A sample of the report cover appears on the next page.



Sample Report Cover

If you wish to complete the steps in the following example, you must use the Item Selector. See Appendix A for instructions.

1. Choose the **New** command from the File Menu. This clears the drawing surface in the active window so you can start a new picture. Note that the picture name and type in the title bar reads "untitled".
2. Click on the TEXT icon in the toolkit.
3. Move the pointer onto the drawing surface near the top left and click. Move the cross hair to see the text cursor, a vertical bar.
4. Type "Equipment Reports" for the report title.
5. Click on the pointer icon and then on the "Equipment Reports" text element to make it current.
6. Display the Type Menu twice. The first time, choose the **36 point** option; the second time, choose the **Bold** option. The size of the characters in the title appear significantly larger and in boldface.
7. Choose the **Page center** command from the Alignment Menu to center the title between the left and right margins.
8. Click on the word **Full** in the zoomer to see a full view of the picture. (In many cases, it is easier to work with multiple pictures in the full state.)
9. Use the size box to reduce the size of your window so it occupies approximately the left half of the screen.
10. If you are running GEM Draw Plus from floppy disks, remove the PICTURES disk from drive B and replace it with the LIBRARY disk.
11. Choose the **Open** command from the File Menu (the Item Selector appears.
12. Use the Item Selector to open the LIBRARY folder and display its contents in the directory window.

13. Double-click on "FORKLIFT.GEM". The Item Selector disappears from the screen and, after a moment, a second window opens, displaying the picture of the forklift. The newly opened window is the active one.

14. Click on "Full" in the Zoomer. If necessary, reposition the windows so you can see both pictures on the screen at the same time, as illustrated on the following page.

15. Click on the pointer icon in the active window. Place the pointer on the forklift picture and click again. Extents appear around the forklift.

16. Drag the forklift picture to the "untitled" window. When you drag, an outline of the forklift's extents moves with the pointer. When the pointer (a hand) is well inside the boundaries of the "untitled" window, release the mouse button. Once the forklift is part of your report cover, you can rescale, move, or change it any way you wish. Therefore, it doesn't really matter where you place it initially.

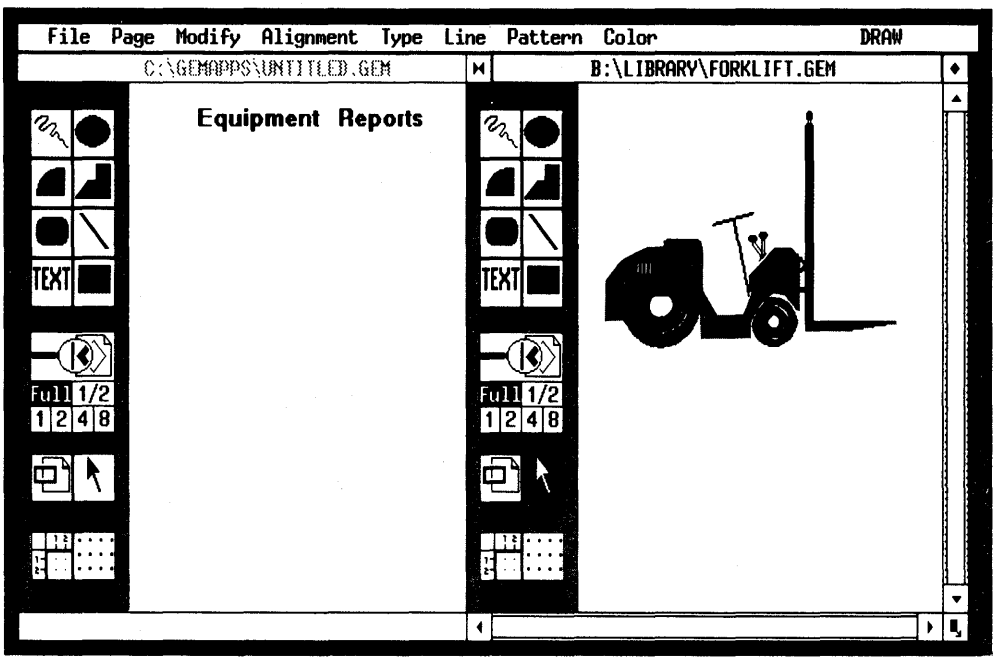
17. Click on the close box in the FORKLIFT.GEM window. GEM Draw Plus closes the window and removes it from the screen. After closing the FORKLIFT.GEM window, GEM Draw Plus makes the remaining window active.

18. If you are running GEM Draw Plus from floppy disks, remove the LIBRARY disk from drive B and replace it with the PICTURES disk.

19. Choose the **Save as** command from the File Menu.

20. When the Item Selector appears, click on the close box in the directory window until you reach the root directory. Click on the PICTURES folder to open it and display its contents in the directory window.

21. Type "RPTCOVER" and press Enter. GEM Draw Plus stores your report cover in the PICTURES folder under the name RPTCOVER.GEM. Your report cover is finished.



Multiple Windows

Close Command

This command removes the active window from the screen. If you made any changes to the drawing surface in the window, GEM Draw Plus asks if you want to save the picture before closing the window.

The **Close** command and the window's close box (described in Section 2) work exactly the same way.

Save Command

The **Save** command stores the picture in the active window under its existing name, as shown in the window's title bar. The picture remains in the window and you can continue working on it if you wish.

If the picture doesn't have a name, the **Save** command is dimmed in the menu. (Use the **Save as** command to store a new picture and give it a name.)

Use the **Save** command often while working on your pictures. This ensures that you won't lose your work in the event of a power failure, computer malfunction, or other error.

Save as Command

Use the **Save as** command in the following situations:

- the first time you save a new picture on disk and want to give it a name
- when you want to save a revised version of a picture under a different name. The original and revised pictures are both available on disk under their individual names.

When you click on this command, the Item Selector appears. Type in a name for the picture and click on OK. The picture is then saved. After you save the picture, it remains in your window.

PAGE MENU COMMANDS

Ruler spacing... Command

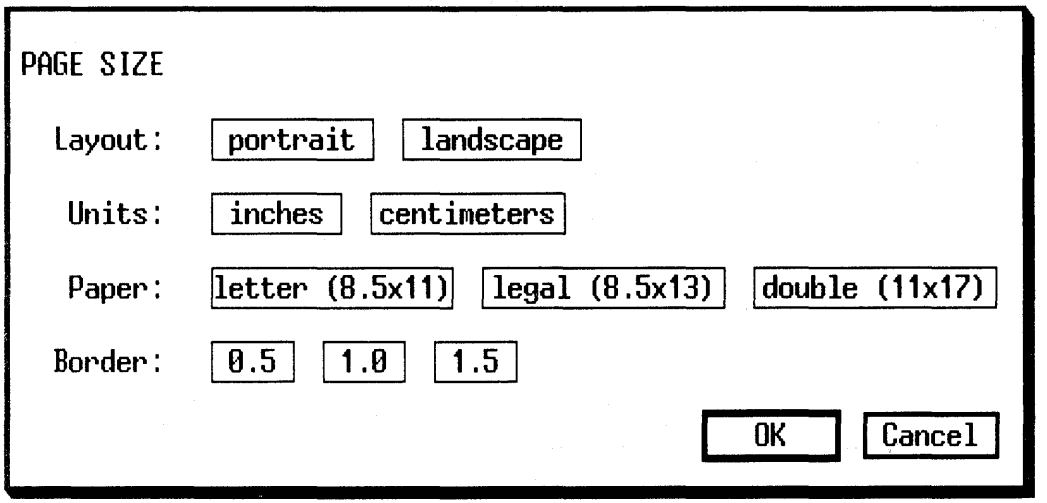
Use this command to set the unit of measure in your drawing surface rulers. Recall that you turn the rulers on and off by clicking on the ruler icon in the toolkit (see page 2-21).

The units of measure are either centimeters or inches, depending on options you choose with the **Page size** command, described next.

Page size Command

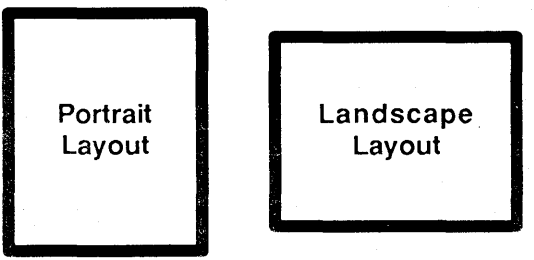
Use this command to control your picture's layout, paper size, and border width.

You see the dialog shown on the next page when you choose this command. Explanations of the layout, paper size, and border options follow.



Page Size Dialog

The next figure illustrates Portrait and Landscape layouts.



Portrait and Landscape Layouts

If you change the layout of an existing picture, you may find that the new layout has cut off some elements that were visible in the original layout. You should choose your layout carefully before you begin drawing your picture.

Paper

You can choose from the sizes shown in the dialog. Sizes other than 8.5 x 11 are printed in four sections that must be cut and pasted together.

You can also choose whether you want the unit of measure to be inches or centimeters. Your choice also determines the following:

- the options you see in the dialog when you choose the **Ruler spacing** command described earlier in this section
- the units of measure you see in the Line Menu

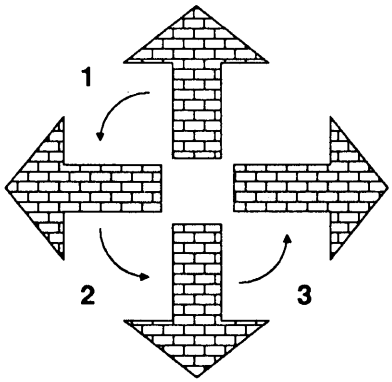
Border

Select one of the sizes to set a border width for the four sides of your picture. You cannot draw in the area you set aside for the border, so GEM Draw Plus doesn't show it on your screen.

MODIFY MENU COMMANDS

Rotate Command

The figure below shows the effect of using the **Rotate** command on a polygon three successive times. Each time the command is used, it rotates the polygon 90-degrees counterclockwise. Note, however, that the pattern inside the polygon does not rotate.

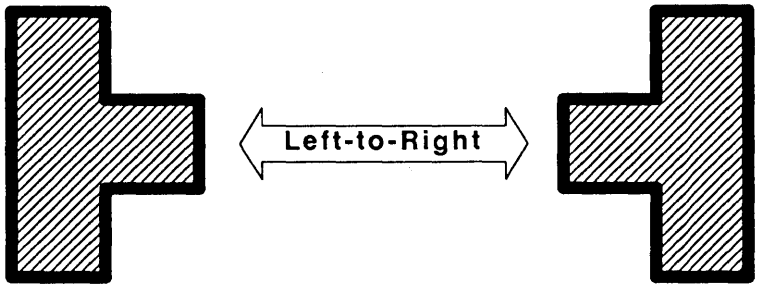


Rotate Command

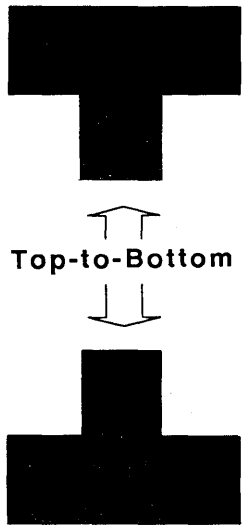
Flip horizontal/Flip vertical Commands

The **Flip horizontal** and **Flip vertical** commands allow you to change whether a figure faces left or right, top or bottom. These commands have no effect on circles, rectangles, or rounded rectangles, (unless they are grouped) because these figures look the same when flipped.

Also, you cannot flip a text element. However, if you flip a group that contains one or more text elements, GEM Draw Plus realigns the text within the group to retain correct spacing.



Flip horizontal



Flip vertical

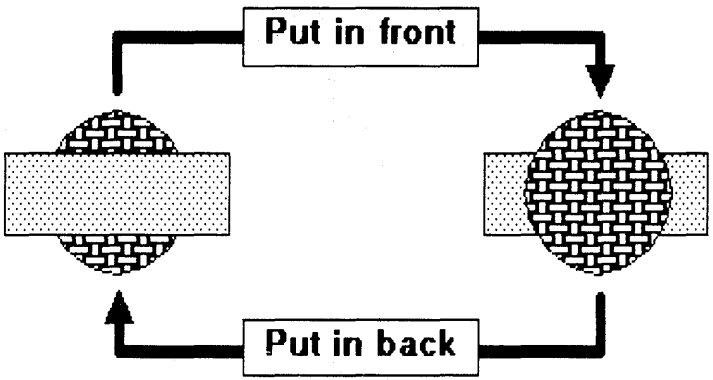
ALIGNMENT MENU COMMANDS

Put in front Command

As described earlier in this guide, you create GEM Draw Plus pictures by "layering" elements. That is, each new element you draw becomes the top layer in your picture.

Put in front changes the order in which elements are layered. It makes the current element the most recent one drawn; that is, it becomes the element on the top layer of your picture.

The figure below shows the effect of the **Put in front** command. In the illustration, the circle is the current element. When it is put in front, it appears in front of the rectangle.



Put in front / Put in back

Put in back Command

This command is the opposite of **Put in front**. It makes the current element the first one drawn; that is, it becomes the element on the bottom layer of your picture.

The preceding figure also shows the effect of the **Put in back** command. When the circle is put in back, it appears behind the rectangle.

Make group Command

This command puts all current elements into a group. You can then treat the group as a single element.

First, make those elements you want included in the group current, either by Shift-clicking on them or by surrounding them with a "rubber rectangle." (See "Current Element" in Section 2 for instructions on selecting multiple elements.) Then, choose the **Make group** command from the Alignment Menu. A single extent appears, enclosing all elements in the group.

When you make a group, GEM Draw Plus sees it as a new element and makes it the top layer in your picture.

Remember, any action you take on a group affects every element within it. For example, if a group contains three rectangles and you choose a new line width for the group, GEM Draw Plus changes the line width of all three rectangles. You can use the **Break group** command to break up the group, change the line width of the rectangles you want, and then remake the group afterward.

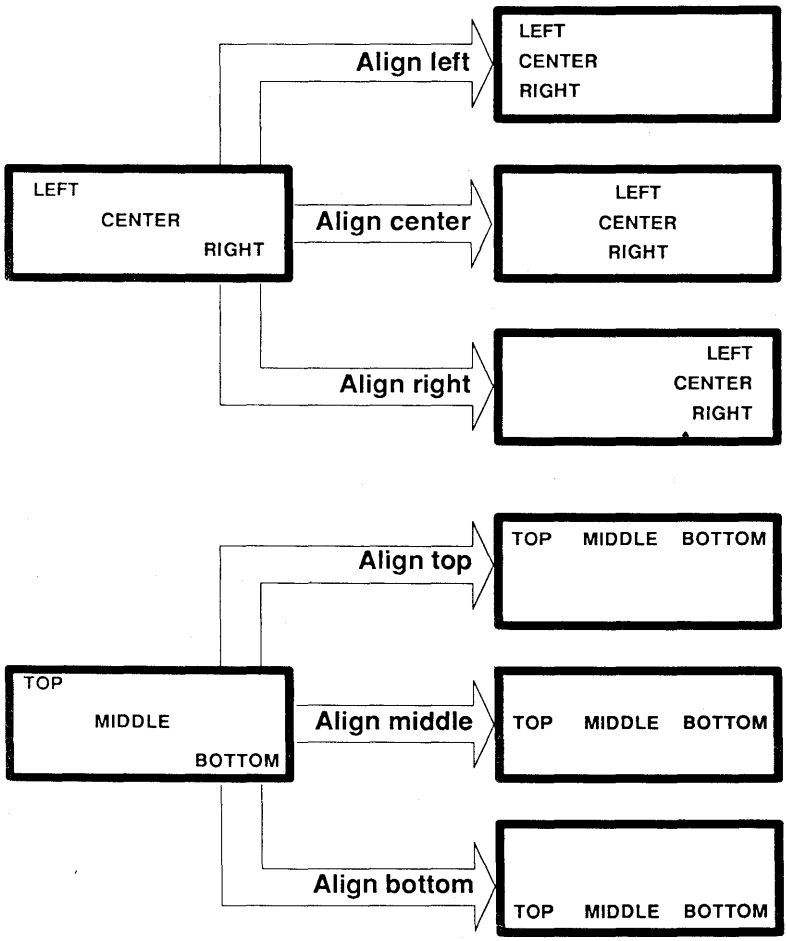
Break group Command

This command breaks up the current group and returns all elements in the group to their individual states.

The group or groups you want to break up must be current when you choose the **Break group** command.

Align Commands

The six alignment commands help you align current elements on specific boundaries. The following figure shows examples of how these commands work. In the examples, the text elements are current; the rectangle enclosing them is not. Element extents have been omitted for clarity.



Examples of Align Commands

Even spacing

This command provides equal vertical spacing between all currently selected elements.

When you choose the Even spacing command, the top and bottom current elements do not move, but GEM Draw Plus repositions all elements in between so that they are spaced equally. (The Even spacing command only moves these elements vertically; it does not move them horizontally.)

Click on the pointer icon in your toolkit and then select the elements you want to space.

TYPE MENU OPTIONS

Point Sizes

The point sizes determine the size (height and width) of characters in a text element. The higher the point size value, the larger the characters.

In traditional typography, 72-point text is one-inch high, 36-point text one half-inch high, 18-point one-quarter inch high, and so forth. However, you cannot always predict text size accurately because printers, plotters, screens and cameras reproduce text differently.

We recommend you experiment with the output devices you intend to use if text size is a critical factor in your pictures. You can create a picture that uses all of the different point sizes for each typeface and type style in the Type Menu. Reproduce the picture on each output device to determine exact text measurements.

GEM Draw Plus can only display text in the point sizes listed in the Type Menu. Therefore, you cannot rescale text the way you can other elements; you can only change its point size.

When you choose magnification factor 1 in the zoomer, GEM Draw Plus displays text elements in their correct proportional size. This is often the preferred view state when your pictures contain text elements. At other view states, text element sizes are only approximate.

Type Font Options

The available type fonts are listed in the lower part of the Type Menu. What you see listed here depends on the following:

- the type fonts available on your computer
- the amount of RAM (Random Access Memory) installed in your computer

Use GEMSETUP to install or remove fonts. GEMSETUP is provided with the GEM Desktop. If you do not have enough RAM, you may have to remove a font before installing another one.

LINE MENU OPTIONS

Line Style and Line Width Options

You can choose various line styles or line widths from the Line Menu. Note, however, that wide lines can only be solid lines.

To the right of the wide lines you see measurements, such as 1/32" or 0.8mm, and so forth. They indicate the exact width of a line when you reproduce your picture on a printer, plotter, or camera. However, when you display your picture on a monitor screen, actual line widths vary depending on the monitor's resolution.

The measurements you see for the wide lines might be in inch or centimeter units depending on the paper size you specify with the **Page size** command (page 4-15).

End styles Command

When you choose this command a dialog appears so you can specify how you want the ends of lines to look. Triangle markers indicate your current choice of line end styles in the dialog. See "Pointer" in Section 2 to learn how to change your choices.

Line end styles apply only to the following types of elements:

- Lines
- Sketches
- Polygons
- Arcs with no fill pattern

PATTERN MENU OPTIONS

With the exception of line and text elements, you can choose a pattern from the Pattern Menu for any element in your picture.

The **None** and **Shadow** options are special cases.

None

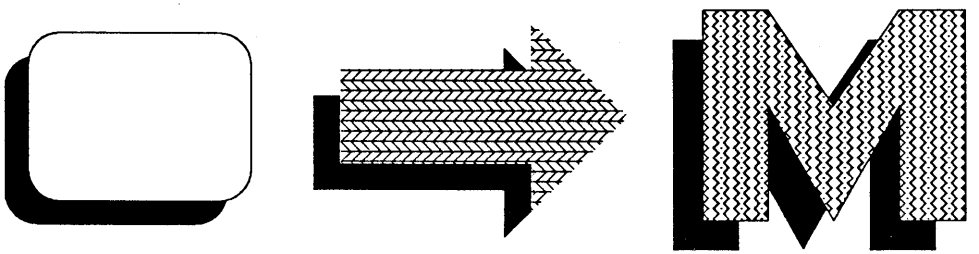
This is the absence of a fill pattern. You can also think of it as a transparent pattern.

Shadow

This option produces a "drop-shadow" below and slightly to the left of the element, as pictured in the following examples. The precise location of the shadow is based on a percentage of the element's size.

You can use **Shadow** in combination with any pattern.

To remove a shadow, choose **Shadow** again while the element (or elements) is current.



Shadow Pattern

COLOR MENU OPTIONS

If your computer can display colors with GEM software, you see colors in the Color Menu; otherwise, the bars in the Color Menu are black.

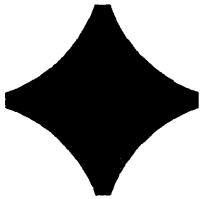
Color Codes

In the Color Menu, each of the sixteen available colors is assigned a color code (0 through 15). You can use the color codes to assign colors to your picture's elements even if you are drawing the picture on a monochrome screen.

When you reproduce a picture on a color output device, the device translates each code to a color it can create. Not all devices are able to produce sixteen colors; some, such as a camera, may be able to produce more. In short, colors are a function of the printer, plotter, screen, or camera you use to reproduce the picture and are not controlled by GEM Draw Plus. All devices translate color code zero as the background color.

Color Code 0 (Zero)

If you make an element the same color as the background, the element blends into the background and seems to "disappear," although it is still there. Use this feature to achieve special effects, as shown below.

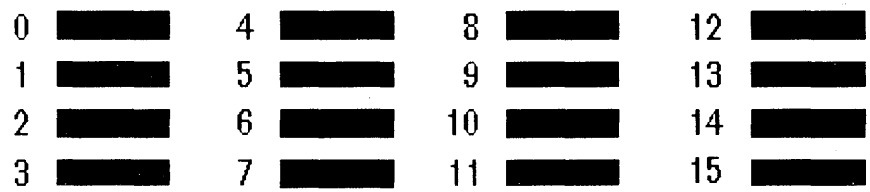


Using Color Code Zero

In the above figure, a rectangle with a solid black pattern was drawn first. Arcs were then drawn over each corner of the rectangle. The arcs were drawn with an opaque pattern and color code zero.

Testing a Device's Color Capabilities

To find out how a particular output device translates the sixteen color codes, create a picture similar to the one below.



Color Test Picture

Note that the rectangles in the color test picture are numbered 0 through 15. Assign the corresponding color code from the Color Menu to its associated rectangle.

When you reproduce the color test picture on an output device, your results tell you how that particular device translates each color code.

Where possible you should label each reproduction to show the device that created it. Store the reproductions for later reference.

DRAW MENU COMMANDS

Draw info Command

The percentage shown in the dialog indicates how much "drawing space" you have available in the picture in your active window. The total amount of available space depends on:

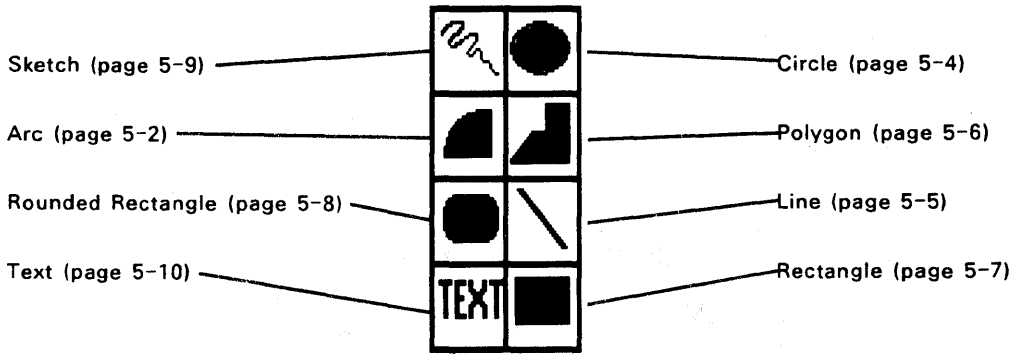
- the amount of RAM (Random Access Memory) installed in your computer
- the number of picture elements used
- the type of picture elements used
- the complexity of the picture elements (for example, the number of sides in a polygon)

End of Section 4

Picture Elements

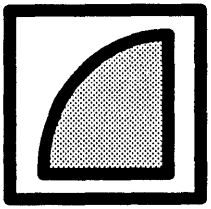
This section describes GEM Draw Plus picture elements. Also be sure to read "Elements" in Section 2 to learn about concepts that apply to all of the elements.

The figure below shows the icons in the toolkit that you use to draw the elements. Each icon is labeled with its name and the page in this section where the element is described. The descriptions are arranged in this section alphabetically by element name.



Element Icons

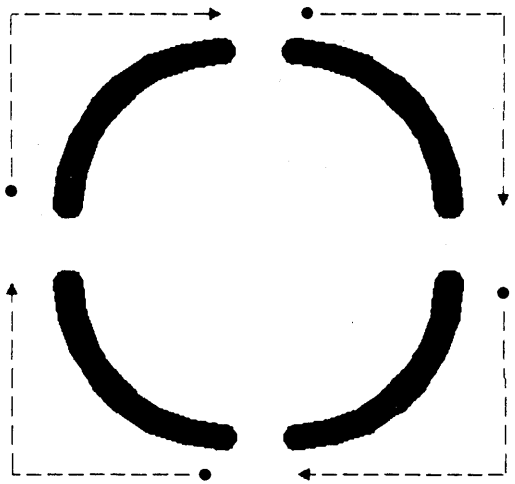
Arc Element



An arc is up to one-quarter of a circle or ellipse. It can be a curved line (with different line styles or line widths), or a solid pie section (with or without a pattern). A pie section is created if you have a pattern selected. To draw a curved line, go to the Pattern Menu and select "None."

To draw an arc, select the Arc icon. The pointer changes to a cross hair when it enters the drawing surface. Drag the cross hair to form an arc. When the arc is the size and shape you want, release the mouse button.

The initial movement of the cross hair (after pressing the mouse button) determines the shape of arc you draw. This is illustrated in the next figure. Start at any dot and follow the broken line to the connecting arrowhead to form the arc shown.



Arc Shapes and Mouse Movements

It may require a little practice to get the "feel" of drawing arcs the way you want them to appear.

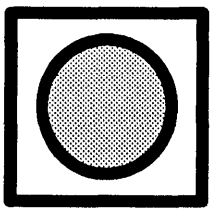
GEM Draw Plus draws arcs using:

- the line style or line width marked in the Line Menu
- the pattern marked in the Pattern Menu
- the color marked in the Color Menu
- the line end styles marked in the **End styles** dialog. (Note that the arrowhead line end style only applies if you draw a curved line arc using no pattern.)

To form an arc that is larger than a quarter circle, combine multiple arcs. You can then form the arcs into a group using the **Make group** command.

You can draw arcs most precisely with the Auto grid turned on.

Circle Element



You can draw circles or ellipses using the circle element.

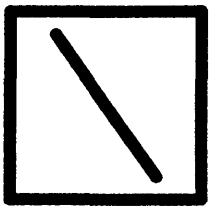
To draw a circle or ellipse, click on the circle icon in the toolkit and move to the drawing surface. As you drag the cross hair, a "rubber circle" previews the size and shape of the circle. When the circle looks the way you want, release the mouse button.

GEM Draw Plus draws circles and ellipses using:

- the line style or line width marked in the Line Menu
- the pattern marked in the Pattern Menu
- the color marked in the Color Menu

You can draw circles and ellipses most precisely with the Auto grid turned on.

Line Element



A line element is a single straight line connecting any two points on the drawing surface.

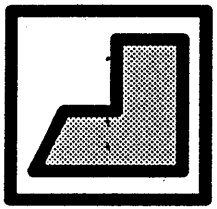
To draw a line, select the line icon from the toolkit and move to the drawing surface. As you drag the cross hair, a "rubber band" line moves with the cross hair to preview your line. Release the mouse button when the line is the length and direction you want.

GEM Draw Plus draws the line using:

- the line style or width marked in the Line Menu
- the line end styles marked in the **End styles** dialog
- the color marked in the Color Menu

Note: An area enclosed by these single line elements cannot be filled with a pattern.

Polygon Element



A polygon is a multi-sided element with straight sides.

To draw a polygon, follow these steps:

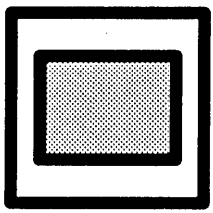
1. Select the polygon icon from the toolkit and move to part of the drawing surface where you want the polygon to begin.
2. Click the mouse button and move the cross hair in any direction to form the first side of the polygon.
3. When the first side of the polygon is the length and direction you want, click the mouse button again.
4. To form the second and subsequent sides of the polygon, continue to move the cross hair and click the mouse button as you did for the first side. (Lines can cross each other.)
5. When the polygon is the size and shape you want, you can either (1) connect the polygon's end point to its starting point, or (2) double-click to signal you are finished. If you have not connected the end point to the starting point, the polygon will have an "open" side, that is, without a border.

If you make a mistake when drawing the polygon, press the Backspace key to to de-select the incorrect points. Continue drawing when ready.

GEM Draw Plus draws polygons using:

- the line style or line width marked in the Line Menu
- the pattern marked in the Pattern Menu
- the color marked in the Color Menu
- the line end styles marked in the **End styles** dialog

Rectangle Element



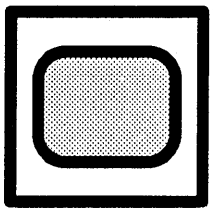
A rectangle is a four-sided element with straight sides formed at 90-degree angles. A square is a rectangle.

To draw a rectangle, select the rectangle icon from the toolkit and move to the drawing surface. As you drag the cross hair diagonally, a "rubber rectangle" previews the size and shape of the rectangle. When it is the size and shape you want, release the mouse button.

GEM Draw Plus draws rectangles using:

- the line style or line width marked in the Line Menu
- the pattern marked in the Pattern Menu
- the color marked in the Color Menu

Rounded Rectangle Element



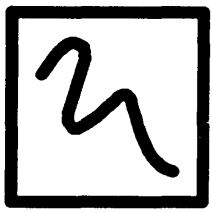
A rounded rectangle is a rectangular shape with rounded corners.

To draw a rounded rectangle, select the rounded rectangle icon from the toolkit and move to the drawing surface. As you drag the cross hair diagonally, a "rubber rectangle" previews the size and shape of the rounded rectangle. When it is the size and shape you want, release the mouse button.

GEM Draw Plus draws rounded rectangles using:

- the line style or line width marked in the Line Menu
- the pattern marked in the Pattern Menu
- the color marked in the Color Menu

Sketch Element



Sketch is a free-form line. "Free-form" means the line can be straight, curved, angular, or any combination of these. Thus, drawing with the sketch element is like drawing with a pencil.

To draw with sketch, select the sketch icon from the toolkit and move to the drawing surface. Drag in any direction to draw. When your sketch is complete, release the mouse button.

When you draw with the sketch element, GEM Draw Plus plots each point in the line that deviates from a straight line. GEM Draw Plus can only plot a finite number of such points, so there is a limit on line length. The straighter the line, the longer it can be; conversely, the more crooked the line, the shorter it will be. However, you can connect several such lines by drawing them end-to-end, so this should not pose any serious limitations. If GEM Draw Plus stops sketching while you are drawing a line, simply start another line where that one left off.

GEM Draw Plus draws sketches using:

- the line style or line width marked in the Line Menu
- the color marked in the Color Menu
- the line end styles marked in the **End styles** dialog

Text Element

You use the TEXT element to add text to your picture. Select a style, size, and type font for the text from the Type Menu.

To add text, select the TEXT icon from the toolkit, move to the drawing surface, and click the mouse button where you want the text to begin. The text cursor (a vertical bar) appears beneath the cross hair. Type in your text with the keyboard.

When you reach the end of a line, press Enter. The text cursor moves to the beginning of the next line. Add text on the current and subsequent lines by typing the characters and pressing Enter.

Press Enter repeatedly to insert double, triple, or more spacing between lines.

If you want to add more text at a different location on the drawing surface, move the cross hair to that location, click the mouse button, and proceed as described above.

If you start typing at the keyboard without selecting the TEXT icon, GEM Draw Plus puts this text wherever the cross hair is located at the time. You can drag this text to a new location at any time.

As you enter text, it appears in the type style, point size, and type font marked in the Type Menu and in the color marked in the Color Menu.

If you make an error while typing, use the Backspace or Del key to erase characters, and then retype them. Use the Esc key to erase all characters in a line to the left of the cursor.

As discussed under "Point Sizes" (page 4-23), you cannot rescale text the same way you do other elements. To change the scale of a selected text element, choose a different point size from the Type Menu.

GEM Draw Plus does not place extents around text after you enter it. To display the extents for a text element (and thereby make the element or elements current), click on the pointer icon in the toolkit and then select the text element or elements.

Editing Text Elements

You can add or delete characters anywhere in an existing text element. Just follow these steps:

1. Use the pointer to make the text element current.
2. Click on the TEXT icon in the toolkit.
3. Place the cross hair at the point in the text element where you want to make the change and click again. The text cursor appears at the location you select.
4. If necessary, use the left- and right-arrow keys to move the cursor back and forth to the exact location you want.
5. To insert characters, type them on the keyboard.
6. Use the Del or Backspace key to delete individual characters. Use Esc to delete parts of lines or whole lines.

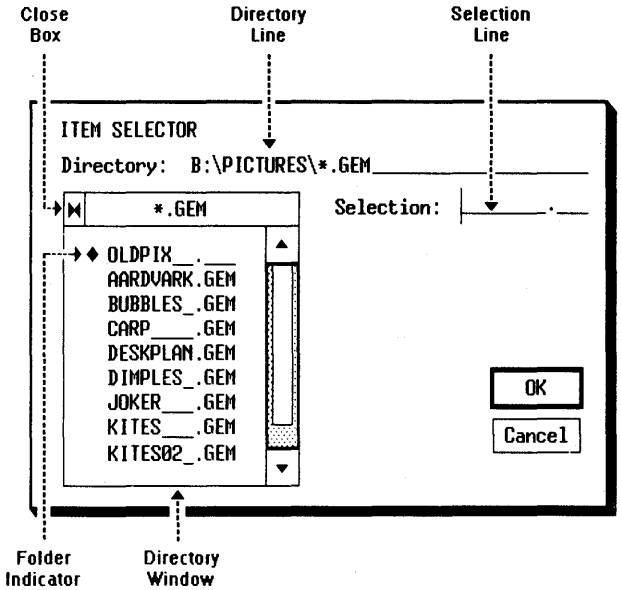
End of Section 5

Item Selector

The Item Selector (shown below with its major components labeled) appears when you want to do either of the following:

- save a picture on disk
- recall a picture previously stored on disk

You see the Item Selector when you choose the **Open** or **Save as** command from the File Menu and, under certain conditions, when you choose the **Close** command or click on the window's close box.



Item Selector

DIRECTORY LINE

The directory line shows the directory path for the folders and pictures listed in the directory window. You can change the information on this line to do the following:

- name a folder where you want to store a picture
- name a folder from which you want to recall a picture

To change the information on the directory line, place the pointer anywhere on the line and click. The text cursor appears after the last character on the line. Press the Backspace key to erase individual characters or press the Esc key to erase the entire line. Type the name of the folder you want to use.

Wildcard Character

You can enter asterisks (*) or question marks (?) in the directory line as a "wildcard" characters. For example, **B:\PICTURES*.GEM** means "all pictures of type GEM in a folder named PICTURES on disk drive B." The entry **A:\GEMAPPS*.T??** means "all items of a type whose extension begins with the letter T in a folder named GEMAPPS on drive A."

After you enter the information on the directory line, click inside the directory window or press Enter to update the window with a list of pictures in that folder.

Note: You can find more information about directory paths, folders, and wildcard characters in the GEM Desktop guide and in your operating system manuals.

SELECTION LINE

You can use the selection line to do the following:

- type the name of a picture you want to save on disk
- type the name of a picture you want to recall from disk

See Appendix B for information about picture names and types.

DIRECTORY WINDOW

The directory window lists the folders and pictures in the directory path specified on the directory line. The window can only show nine folder and picture names at a time. Use the scroll bar, arrows, and slider to move up and down in the directory if it contains more than nine items.

Note: Folder names (preceded by a diamond) always appear first in the directory window.

SELECTING PICTURES

You can use any of the following methods to select a picture from the directory window.

- Double-click on the picture's name in the directory window. This is the fastest method.
- Click on the picture's name in the directory window. GEM Draw Plus inserts the name in the Selection line. Click on the OK button or press Enter.
- Click on the Selection line. When the text cursor appears at the beginning of the line, type the picture's name and then click on the OK button or press Enter. (The picture's name does not have to be visible in the directory window to use this method.)

CLOSE BOX

The directory window has a close box in the upper left corner. Click on the close box to move back to the previous folder in the current directory path.

If you click on the close box when you are in the root (initial) directory of your disk, the directory window shows you the drive letters (A:, B:, C:, etc.) for the disk drives in your computer. You can change to another disk drive by clicking on its drive letter. You then see the contents of its root directory in the directory window.

End of Appendix A

Picture Names and Types

This appendix explains the rules and concepts concerning GEM Draw Plus picture names and types. It also explains how GEM Draw Plus protects your work by creating "backups" of your pictures.

PICTURE NAMES

Your GEM Draw Plus guide refers to pictures you create as "pictures." Your GEM Desktop guide refers to them as "items" or "documents." Your operating system manuals may refer to them as "files." These terms all mean the same thing.

You must name pictures you create with GEM Draw Plus when you want to store them on disk. Some rules apply for naming your pictures.

Picture names can contain from one to eight characters, and picture types up to three, for example "MONALISA.GEM." The characters can be any combination of numbers and letters, but most special characters (such as periods, question marks, brackets, etc.) and blank spaces are not acceptable. If you put spaces anywhere in a picture name, GEM Draw Plus automatically removes them.

PICTURE TYPE

GEM Draw Plus automatically appends a period (.) and the characters "GEM" to your picture name. These characters indicate the picture's "type." For example, if you name your picture POSTER, GEM Draw Plus saves the picture under the name POSTER.GEM.

The picture type helps you and GEM Draw Plus distinguish pictures from

other items on your disks. For example, when you choose the **Open** command, GEM Draw Plus lists all pictures with a GEM type in the directory window of the Item Selector. You can select the picture you want to open from this list.

Note: GEM Draw Plus only works with GEM type pictures.

GEM TYPE DOCUMENTS AND OTHER GEM APPLICATIONS

Many GEM applications create a GEM type document when you save an item on disk. (They're primarily for use with GEM OUTPUT.) In some cases (though not all), you can use these GEM type documents with GEM Draw Plus. See the guide for your particular GEM application to find out if this is possible.

BACKUP PICTURE PROTECTION

Every time you save a picture that has been saved before on disk, GEM Draw Plus retains the original version as a backup. The backup version has the same picture name, but GEM Draw Plus changes its type from GEM to BAK.

For example, assume you created a picture and named it STILLIFE (which GEM Draw Plus stored under the name STILLIFE.GEM). You subsequently decide to make changes to the picture and, after making your changes, use the **Save** command to update the disk. GEM Draw Plus does the following:

- It stores the revised version of your picture under the name STILLIFE.GEM.
- It retains your original picture on disk under the name STILLIFE.BAK.

GEM Draw Plus can only access pictures having the GEM type. If you

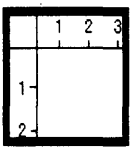
want to use the BAK version of a picture with GEM Draw Plus, you must first change its type to GEM. You can do this from the GEM Desktop using the **Info/Rename** command on the File Menu. However, you must also change its picture name since two pictures of the same name cannot reside in the same folder.

End of Appendix B

Shortcuts

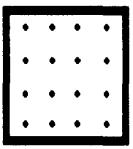
Frequently-used GEM Draw Plus commands have shortcut methods, which you can read about in this appendix. While using GEM Draw Plus, choose the **Shortcuts** command from the Page Menu to see an on-screen summary of the shortcuts.

PAGE SIZE COMMAND



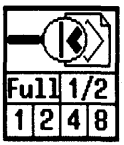
Double-click on the ruler icon to invoke the **Page size** command (see page 4-15).

RULER SPACING COMMAND



Double-click on the grid icon to invoke the **Ruler spacing** command (see page 4-15).

ZOOMER/PANNER



Double-click on a magnification state in the zoomer to automatically invoke the panner. This helps you quickly locate the area of your picture where you want to work. See pages 2-16 and 2-17 for descriptions of the zoomer and panner.

KEYBOARD SHORTCUTS

Many of the menu commands have a keyboard shortcut, that is, a way of entering that command by pressing a combination of keys instead of clicking in the menu. These key combinations usually involve holding down the Alt key or Ctrl key (shown on screen as the diamond and caret symbols) while pressing another.

For instance, Alt-D means hold down the Alt key and press the D key. That has the same effect as clicking on **Delete** in the Modify Menu. Holding Ctrl and pressing O is the same as clicking on the **Open** command to open a new picture. The exceptions are the Function Keys (F1, F2, F4, and F6). These keys are pressed by themselves. For instance, pressing Function key 6 (F6) displays the **End Styles** dialog in the Line Menu.

Table C-1. File Menu

Command	Shortcut	Meaning
New	Ctrl-W	Create new picture
Open	Ctrl-O	Open existing picture
Close	Ctrl-C	Close active window
Save	Ctrl-V	Save picture edits
Save as	Ctrl-M	Save and name picture
Abandon	Ctrl-A	Abandon changes made
To Output	Ctrl-U	Send to printer, etc.
Quit	Ctrl-Q	Leave GEM Draw Plus

Table C-2. Page Menu

Command	Shortcut	Meaning
Auto grid Off/On	Alt-G	Control Auto Grid
Page size	Function Key 2	Set page orientation
Ruler spacing	Function Key 4	Set ruler increments
Shortcuts	Function Key 1	Display viewing aids
Save preferences	Alt-V	Save GEM Draw Plus settings

Table C-3. Modify Menu

Command	Shortcut	Meaning
Delete	Alt-D	Erase selected element(s)
Undelete	Alt-U	Restore erased element(s)
Make Copy	Alt-C	Reproduce element(s)
Select all	Alt-S	Make all elements current
Rotate	Alt-R	Turn element 90 degrees
Flip horizontal	Alt-Z	Flip element left/right
Flips vertical	Alt-T	Flip element top/bottom

Table C-4. Alignment Menu

Command	Shortcut	Meaning
Put in front	Alt-F	Element in foreground
Put in back	Alt-K	Element in background
Make group	Alt-M	Group elements
Break group	Alt-B	Separate elements
Align left	Alt-H	Left column alignment
Align center	Alt-I	Center column alignment
Align right	Alt-J	Right column alignment
Align top	Alt-Y	Top row alignment
Align middle	Alt-L	Center row alignment
Align bottom	Alt-N	Bottom row alignment
Page center	Alt-P	Center on page
Even spacing	Alt-E	Even vertical spacing

Table C-5. Line Menu

Command	Shortcut	Meaning
End styles	Function Key 6	Set line end style

Note: Keyboard shortcuts are not available when a GEM Desktop Accessory (for example, the Calculator) is on the screen.

End of Appendix C

Using a Graphic Tablet with GEM Draw Plus

To use a graphics tablet with GEM Desktop and GEM Draw Plus, you need the device drivers on your GEM Desktop disks. If your software is not set up to use a graphics tablet, run GEM Setup.

Most graphics tablets operate on the principle of absolute coordinates. Therefore, unlike the mouse, when you lift the stylus and move it to a different location on the tablet, the screen pointer also moves to that location.

See your graphics tablet manual for instructions on attaching it to your computer and learning its general operating principles.

End of Appendix D

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