GlobalView

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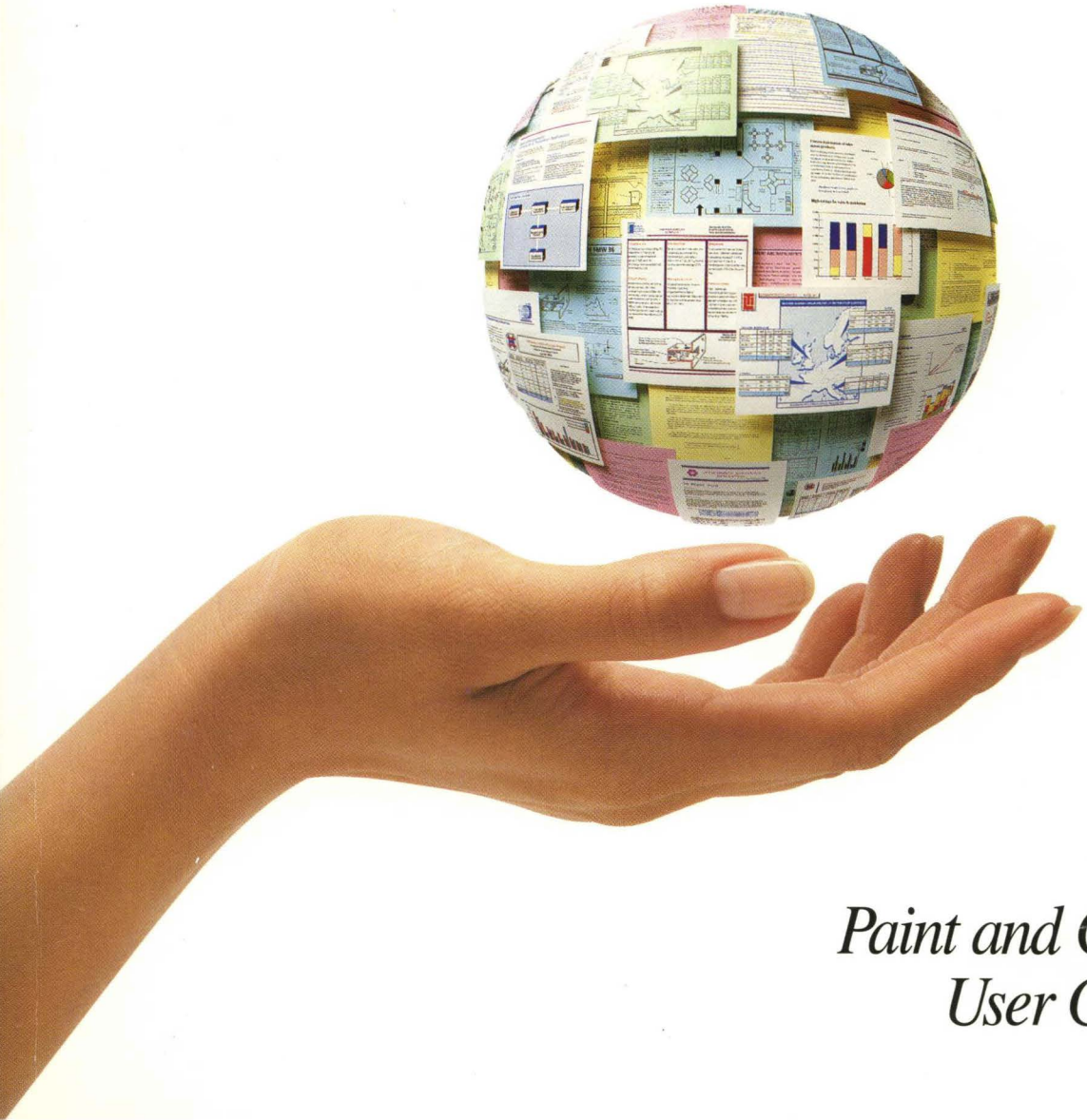

Paint and Chart User Guide

XEROX

GLOBALVIEW

Paint and Chart User Guide

Xerox GLOBALVIEW Applications
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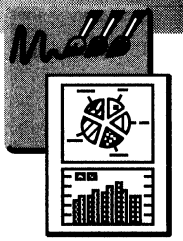

Contents

Before you begin

This user guide shows you how to create freehand drawings and bar charts, line charts, and pie charts.

Before you consult this user guide, you should complete the *GLOBALVIEW Quick Tour* and be familiar with the information in the *GLOBALVIEW Workspace User Guide*.

Xerox software is designed for multinational use, so your workstation's default settings might differ slightly from those shown in this publication. The software works the same way, however, despite such differences.

Software required—Run the GV Write software application to perform the tasks in this user guide. Additional required software applications are listed in the chapters that describe them.

All applications documented in this user guide might not be available on your workstation. Contact your local sales organization for more information.

Screen illustrations—Screens in this user guide show GLOBALVIEW running in the OPEN LOOK X Window manager. When you run GLOBALVIEW in another window manager, your screens will look slightly different from those shown in this user guide.

References to the keyboard—Key names that appear in this user guide are the names on the keyboard templates supplied with the software.

References to the mouse—GLOBALVIEW assigns different default values to mouse buttons depending on whether you have a two- or three-button mouse.

The following table shows GLOBALVIEW default mouse button settings for a two-button mouse.

Mouse button	GLOBALVIEW default
Left	Select
Right	Adjust
Chord (both buttons)	Menu

The following table shows GLOBALVIEW default mouse button settings for a three-button mouse.

Mouse button	GLOBALVIEW default
Left	Select
Middle	Adjust
Right	Menu

You can reprogram your mouse buttons. The chapter, "Customizing your workspace with the User Profile" in the *GLOBALVIEW Workspace User Guide* explains how to do so.

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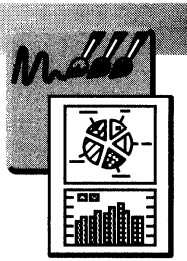


1. Creating freehand drawings

Use GV Paint to create drawings in a special window called a canvas. On the canvas you can create free-form lines and symmetrical shapes, and add special effects such as shadings and textures. You can save the canvas and print it or add it to a document.

GV Paint is a raster drawing package. The canvas is made up of rows of black, white, or colored dots called pixels. When you create or edit a drawing, you are choosing colors for those pixels. This differs from an object-oriented drawing package such as GV Draw, where you can create and overlay objects and later separate them.

With the Sun Raster converter, you can convert Sun Raster files to GV Paint canvases, and GV Paint canvases to Sun Raster files.

Software required—Run the following software applications to perform the tasks in this chapter. They are shown in the order you should run them.

- Raster Core
- GV Paint
- Sun Raster Converter

Creating a canvas

You create drawings in a black and white canvas or color canvas. You can create black and white drawings in either canvas, but you can add color to only a color canvas.

In most cases, if you are working in black and white, you can work in either a black and white canvas or a color canvas. Using a color canvas gives you the option to add color later on, but using a black and white canvas saves disk space.

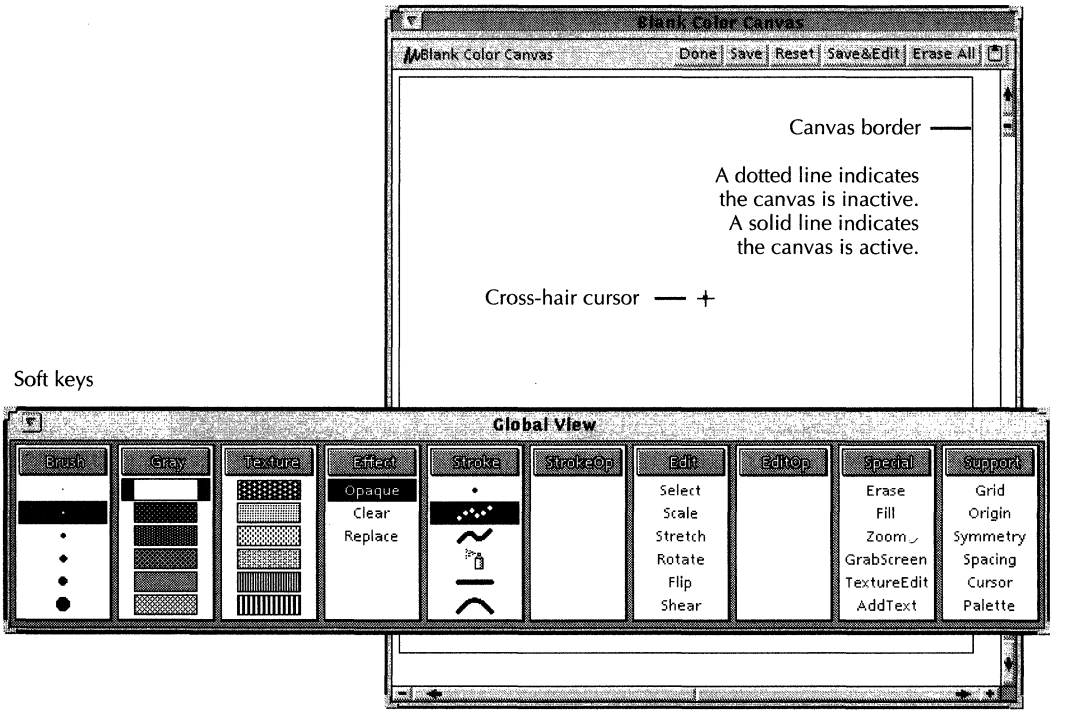
However, using a color canvas for a black and white drawing prevents you from using the Inverse commands, which are available only in a black and white canvas. See "Getting a reverse-out effect with a brush."

If you create a drawing in one canvas type and then decide to use the other canvas type, you can change the canvas to the other type using the procedure in the section "Converting canvases and Sun Raster images."

To create a black and white or color canvas:

1. Copy a Blank Canvas or Blank Color Canvas icon from the Basic Icons folder.
2. Open the icon and select Edit.

   The border of the canvas turns from dotted to solid, and a row of soft keys appears in a separate window. Inside the canvas, the pointer is a cross-hair cursor.
3. Select anywhere inside the canvas.

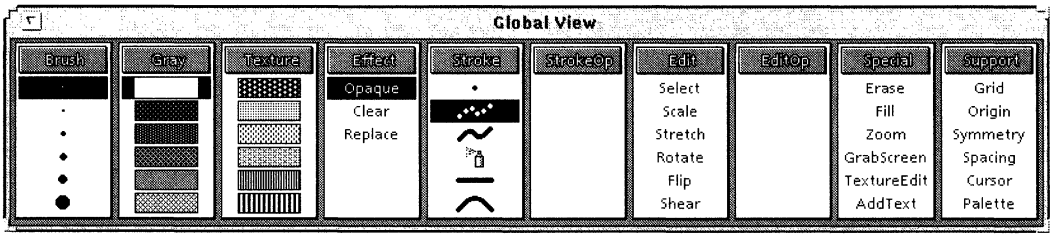


The canvas is now active, which means it is ready for editing. If you select outside the canvas, it becomes inactive. You can tell if the canvas is active by looking at the canvas border. A solid line indicates that the canvas is active. A dotted line indicates that the canvas is inactive.

Using the drawing tools

Drawing tools are available on the ten soft keys that appear in an open canvas and on the Special keyboard for Paint.

Using the soft keys

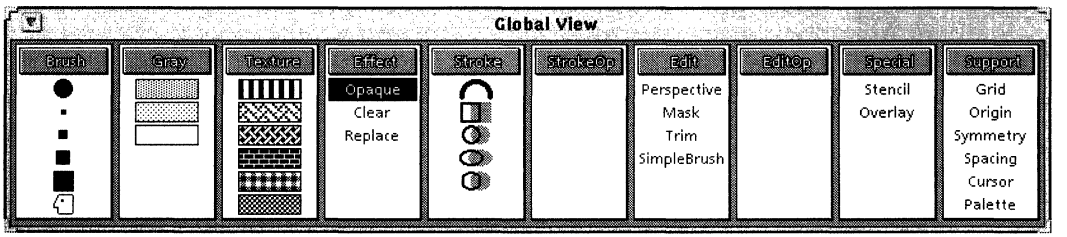


To select a command on a soft key:

- Click the Select mouse button on the command.

The first five soft keys (six, when the sixth soft key is displayed) are cycling soft keys, which means that you can cycle through them by repeatedly pressing the function key that corresponds to the soft key (function key 1 for the first soft key, and so on).

Some soft keys allow more choices than the six normally shown. The following illustration shows the additional choices available.



To display more command choices on a soft key:

- Click on the soft key title with the Select mouse button.

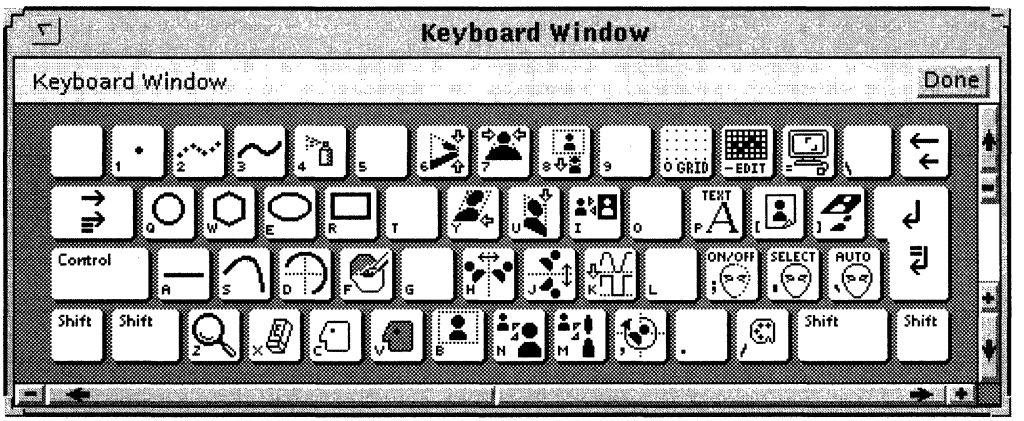
  The Texture soft key has three command displays. Select the soft key title twice more to display all of the choices.

To display the original command choices:

- Click on the soft key title with the Select mouse button again.

Using drawing tools on the Special keyboard for Paint

The Special keyboard for Paint is active whenever you select inside a canvas.



Each function on the soft keys is assigned to a key on the special keyboard. For example, pressing the X key selects Erase on the soft key.

To use drawing tools on the Special keyboard for Paint:

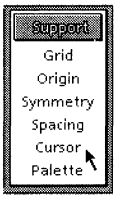
1. Select inside the canvas.
2. Press KEYBOARD+SPECIAL+SHOW.
3. Release the KEYBOARD key.

4. Select the command you want.

✦ **Note:** For shapes, pressing SHIFT, then pressing the key for the shape creates a filled shape.✦

The cross-hair cursor

The cross-hair cursor helps you locate your position in the canvas. For delicate work, the cross-hair might get in your way. You can remove it using the Cursor command.



To hide the cross-hair cursor:

- Select the Cursor command on the Support soft key.

To redisplay the cross-hair cursor:

- Select the Cursor command again on the Support soft key.

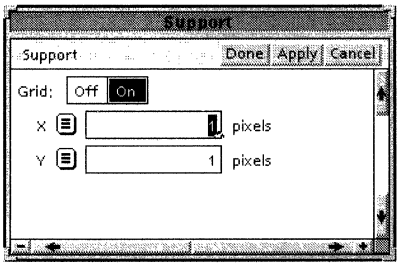
Using a grid in the canvas

A grid helps you align portions of your drawing by restricting where you can place a brush. When you turn on the grid and move a brush across the canvas, the brush jumps from point to point. You cannot see the grid in the canvas when you turn it on. You can see the grid in the Zoom window. For more information about the Zoom window, see "Zooming in on a section of canvas."

Use the grid to create flow diagrams, organization charts, and other drawings where alignment is important.

To turn on the grid and set the grid spacing:

1. Select Grid on the Support soft key.
2. Select On for the Grid option in the sheet that appears.



3. Select grid spacing values in the X and Y menus.

   The X property sets the horizontal spacing. The Y property sets the vertical spacing.

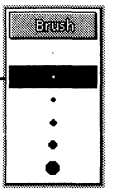
4. Select Done.

✦ **Note:** The upper left-hand corner of the canvas is by default the origin of the grid. To change the origin to another location (for example, the corner of an object already in the canvas), use the Origin command.✦

To change the origin of the grid:

1. Make sure the grid is off.
2. Select Origin on the Support soft key.
3. Select the location in the canvas for the new origin.
4. Turn the grid on to use the new origin.

Drawing on a canvas with a brush



You use a brush to draw on a canvas. GV Paint provides square and round brushes in various sizes. The size of the brush determines the thickness of the stroke: a large brush draws a thick line and a small brush draws a thin one.

Before you begin drawing, make sure the brush you want is selected.

You can also create your own brushes, which is described in the section "Creating your own brush."

To choose a brush:

1. The first six brush options are displayed on the Brush soft key. To display additional brush options, click the Select mouse button in the title bar of the Brush soft key.

   The last brush option is the user-defined brush. For details on the user-defined brush, see the section "Creating your own brush."

   To display the original set of brush options, select the title bar again.

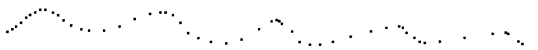
2. Select the brush you want.

The Stroke soft key determines what kind of mark the brush makes when you draw in the canvas.

The first command on the Stroke soft key places a single image of the brush when you click the Select mouse button. The second command draws repeated images of the brush when you hold down the Select mouse button and move the mouse. When you move the mouse quickly, the brush images are placed further apart.

Result of second Stroke command

Result of second Stroke command when quickly moving the mouse



Other options on the Stroke soft key, such as line, curve, and arc, are described in the "Drawing lines" and "Drawing shapes" sections later in this chapter.

To draw with the brush:

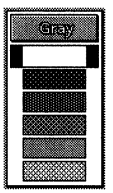
1. Select a brush on the Brush soft key.
2. Select a stroke on the Stroke soft key.
3. In the canvas, click the Select mouse button to place a black or color image of the brush, or the Adjust mouse button to place a white image of the brush.

Changing the color of a brush

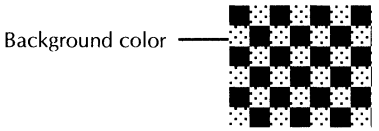
If you use a color canvas, use the color palette to change the color of the current brush. The color you choose remains in effect until you choose another color.

✦ **Note:** The procedures in this section apply to changing the color of the brushes on the Brush soft key supplied by the system. To change the color of a brush you create, see "Creating your own brush."✦

The software makes a distinction between the brush color and the background color. The brush color is the color drawn on the canvas when the first option on the Gray soft key is highlighted.



The background color is the color the system uses to create shading and texture patterns. The patterns are used for options on the Texture and Gray soft keys.

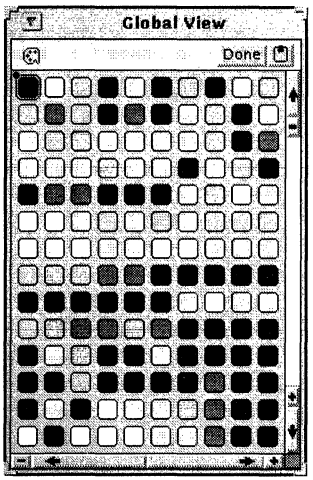


The palette shows the current brush color with a black outline and dot and the current background color with a white outline and dot.

To change the foreground and background colors of the brush:

1. Select the Palette command on the Support soft key.

   The Palette window appears.



2. Click the Select mouse button on the foreground color you want.
3. Click the Adjust mouse button on the background color you want.
4. Select Done to close the Palette window.

   You can leave the Palette window open during the editing session so it is immediately available.

You can change the brush or background to a particular color in the canvas with the SAME key. This lets you match a color without having to show the palette.

To change the color using the Same key:

1. Press SAME.
2. Do one of the following in the canvas:
   - To change the foreground brush color, click on the color you want with the Select mouse button.
   - To change the background color, click on the color you want with the Adjust mouse button.

Creating your own brush

You can select any portion of the canvas and create a brush from it. This lets you copy and rearrange elements in your drawing.

Define the brush by dragging a rectangle over the area you want to define, or by drawing a line around the area for the brush.

To create a brush from portions of the screen outside the canvas, see "Taking a snapshot of the screen" later in this chapter.

User-defined brush 

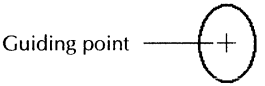
The brush you create is saved as the user-defined brush, and is available by selecting the user-defined brush option on the Brush soft key. You can save one brush at a time.

✦ **Note:** If the brush you create looks fuzzy or different from the area of the canvas you selected, make sure the option on the Gray soft key is set to black.✦

To create a brush from a rectangular area:

1. Select the Select command on the Edit soft key.
2. In the canvas, press and hold the Select mouse button at one corner of the area you want as a brush and drag the mouse diagonally to the opposite corner.

3. Release the mouse button when you have outlined the area you want as a brush.
4. Click the Select mouse button to set the guiding point for the brush.

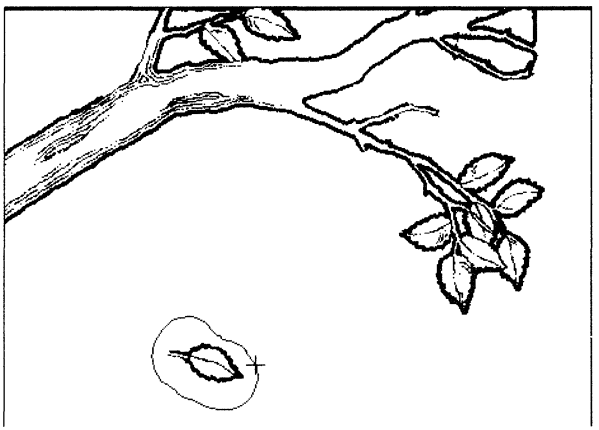


The guiding point of the brush is the location where the cross-hair cursor attaches to the brush. Whenever you move the cross-hair, the brush follows.

The cursor is now the brush. If you move the cursor in the canvas, you can see the new brush.

To create a brush by drawing a line around it:

1. Select the Select command on the Edit soft key.
2. Select the Lasso command on the Select soft key.
3. In the canvas, press and hold the Select mouse button to begin outlining the area you want as a brush.



4. Move the cursor along a path you want to select as the brush.
5. Release the mouse button when you have outlined the area.

If you have not completed the outline, the system completes it for you by drawing a straight line between the beginning and ending points.

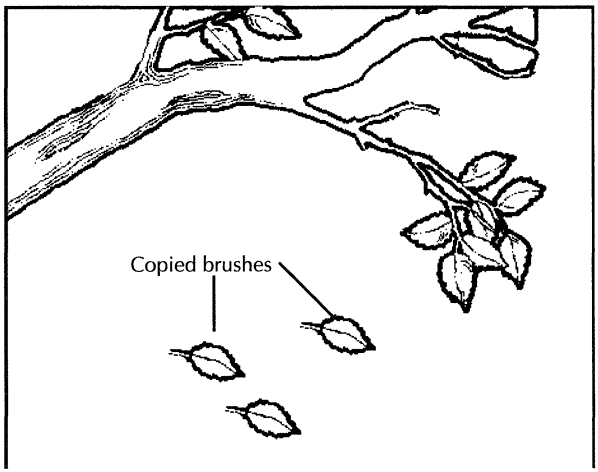
6. Click the Select mouse button to set the guiding point for the brush.

   The cursor is now the brush. If you move the cursor in the canvas, you can see the new brush.

To apply the brush you created:

- In the canvas, do one of the following:
  - To place the brush image, click the Select mouse button.
  - To erase part of the image in the canvas using the brush, click the Adjust mouse button.

  Click the Select mouse button for each instance of the brush you want to place. You can also press and hold the Select mouse button and move the mouse to repeat the brush image, if you select the second or third option on the Stroke key.

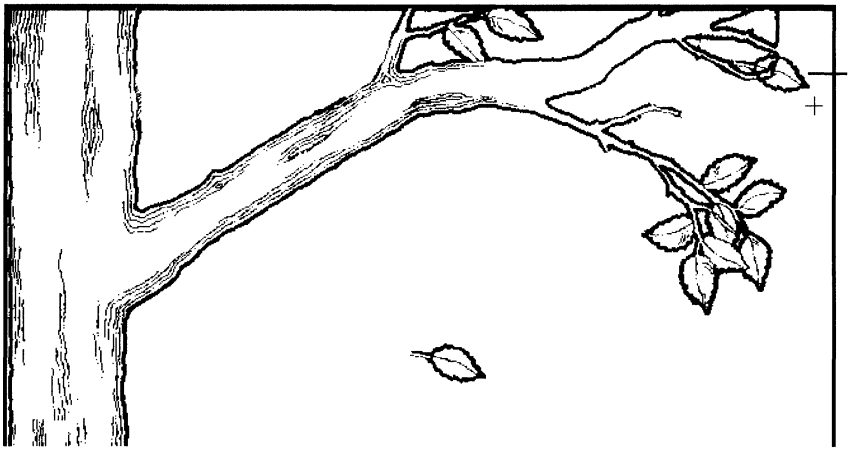


The brush you created remains active until you select another brush on the Brush soft key or create another brush. Keep this in mind when you begin drawing other images in the canvas, or when you want to edit pixels in a Zoom window. If you change to another system-defined brush, you can access the last brush you created by selecting the user-defined brush option on the Brush soft

key. Creating another brush cancels the last brush you created.

Clear and opaque parts of a brush

When you create a brush using the Normal method, the white parts of the brush are transparent and the colored parts are opaque. As you move the brush over the canvas, the transparent parts show the underlying image.

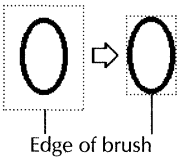


When you create a brush using the Lasso method, the white parts of the brush are opaque.

✦ **Note:** The Opaque and Clear options on the Effect soft key do not change the transparency of white pixels in a brush you create, whether or not you create the brush using the Normal or Lasso method. The white pixels are considered to be part of the brush. The Opaque and Clear options apply *only* to the texture or shading you add to a brush. See "Overlaying shades and textures" earlier in this chapter.

If the Replace effect is applied to a brush, the white pixels are opaque, whether or not the brush was created using the Normal or Lasso method. To apply the Replace effect, select Replace on the Effect soft key.✦

Trimming extra white space from a brush



You can remove extra white space from a brush using the Trim command on the Edit soft key. Using the Trim command creates the smallest rectangle possible for the brush without removing any black or colored pixels.

To trim extra white space from a brush:

1. Select the brush on the Brush soft key if it is not yet selected. You can select a system-supplied brush, or a brush you previously defined.

2. Select Trim on the Edit soft key. You might need to select in the title of the Edit soft key to see the command.

   The brush is automatically trimmed.

Changing a multi-colored brush to a single-color

If the brush you created is multi-colored, you can make it single-colored using the procedure below.

To change a multi-colored brush to a single color:

1. Display the palette if it is not yet displayed.
2. Click the Select button on the color you want.

   You can also change the background color using the Adjust button, if you want.

3. Select SimpleBrush on the Edit soft key. You might need to select in the title of the Edit soft key to see the command.

   All colored pixels in the brush change to the currently selected color on the palette. White pixels in the brush change to the background color.

Choosing a shade or texture

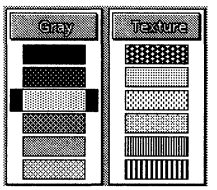
When you choose a shade or texture, the system changes some of the pixels in the brush to the background color. The pattern of pixels that change creates the shade or texture.

✦ **Note:** For a user-defined brush, the background color is always white.✦

You can choose a shade or a texture for a brush, but not both.

To choose a shade or texture for a brush:

1. Select any brush on the Brush soft key, or create your own brush.



2. Select an option on the Gray or Texture soft key. To see the complete set of options, you may active might need to select in the title bar of the soft key.

   The pattern is applied to the brush using the background color for a system-supplied brush, or white for a user-defined brush.

To remove a shade or texture:

- Select black, the first option on the Gray soft key.

Creating your own texture pattern

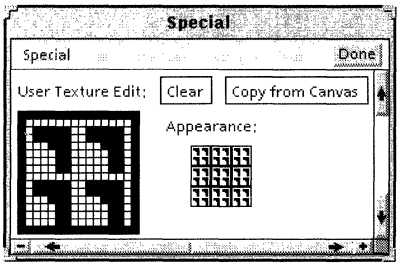
You can create your own texture pattern, or you can use an existing image in the canvas to create the texture. GV Paint stores the pattern for later use.

To create your own texture pattern:

1. Select the TextureEdit command on the Special soft key.

   A window appears.

2. Select Clear for the User Texture Edit option.
3. Draw the pattern in the grid box. Use the Select mouse button for black, and the Adjust mouse button for white.



4. Select Done.

To create a texture pattern from an image in the canvas:

1. Select the TextureEdit command on the Special soft key.

   A window appears.

2. Select Copy from Canvas for the User Texture Edit option.

   The cursor changes to a black box.

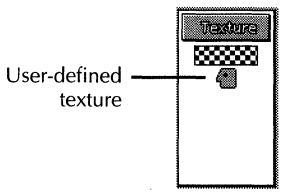
3. Click the black box on the pattern to copy.

   The pattern appears in the grid box and the Appearance box.

4. Edit the pattern if necessary. Use the Select mouse button for black, and the Adjust mouse button for white.

5. Select Done.

To use your new texture pattern:

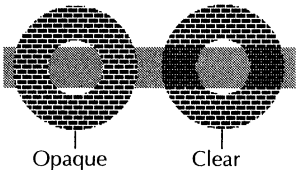


- Select the user-defined texture option, last on the Texture soft key. You might need to select the title bar of the soft key to display the option.

  The texture is applied to the brush.

Overlaying shades and textures

When you use a shaded or textured brush, you can make the texture pattern either opaque or clear.



Textured brush set to Opaque and Clear

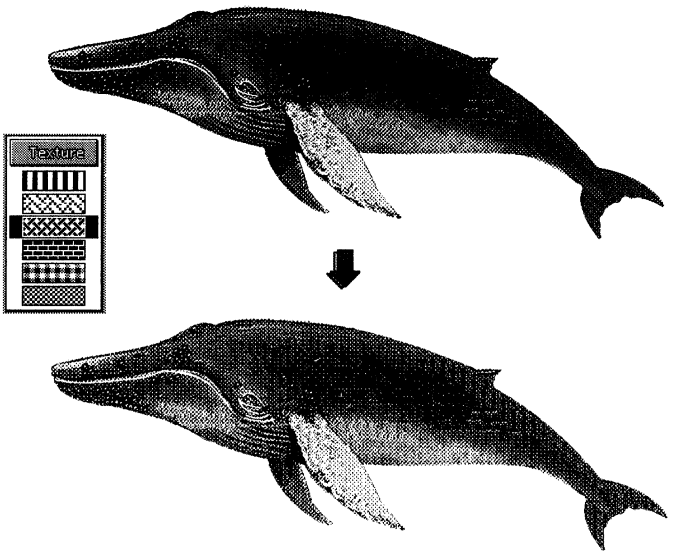
If you make the texture pattern opaque, existing images on the canvas are blocked out by the brush.

If you make the texture pattern clear, the images on the canvas show through the brush.

✦ **Note:** If a shade or texture uses a background color other than white, the pattern is always opaque.

White pixels that are part of the brush, not part of the shading pattern, are always clear. For example, if you create a brush that has a shading pattern, the shading pattern is considered part of the brush, not a texture. For this reason, white pixels in a user-defined brush are always clear. For more information about clear and opaque pixels in a user-defined brush, see "Clear and opaque parts of a brush" in the section, "Creating your own brush."

Applying a texture to a user-defined brush containing texture has unpredictable results. This is because the texture you're applying overlays itself on the existing texture, causing some pixels to be overwritten, and other pixels to remain. The following illustration shows the effect of applying a texture to a textured brush.✦



To make a brush pattern opaque:

1. Select the brush on the Brush soft key.
2. Select a pattern on the Gray or Texture soft key.
3. Select Opaque on the Effect soft key.

   If the brush is a system-supplied brush rather than a user-defined brush, make sure the background color is white. Otherwise, the shading or texture does not appear correctly.
4. Select in the canvas to place the brush.

To make a brush pattern transparent:

1. Select the brush on the Brush soft key.

   If the brush is a system-supplied brush rather than a user-defined brush, make sure the background color is white. Otherwise, the shading or texture does not appear transparent.
2. Select a pattern on the Gray or Texture soft key.
3. Select Clear on the Effect soft key.
4. Place the brush on the canvas using the Select mouse button.

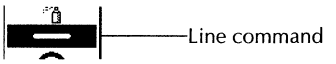
Drawing lines

You can use the soft keys to draw a straight line or to draw a freehand line that follows the path of your brush.

Drawing straight lines

To draw a straight line:

1. Select a line width on the Brush soft key.
2. Select the line command on the Stroke soft key.



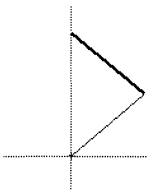
The Line soft key appears.

3. If you want to draw several lines that connect end to end, select the second option on the Line soft key. Otherwise, select the first option.

4. Move the cursor to the location where you want one end of the line and press and hold the Select mouse button.

   Guidelines show horizontal and vertical position.

5. Drag the mouse to the location for the other end of the line and release the mouse button.



6. If you are drawing lines end to end, continue by clicking the Select mouse button at the endpoint for the next line.
7. Do one of the following:
   - To stop drawing lines, select another option on the Stroke soft key.
   - To stop drawing end-to-end lines, select another option on the Stroke soft key, or press STOP.

Drawing freehand lines

You can draw a freehand line that follows the path of your brush.

As you move the mouse while pressing the Select mouse button, the system draws dots on the screen. When you release the mouse button, the system connects the dots to create a continuous line.

To draw a freehand line:

1. Select the line width on the Brush soft key.
2. Select the freehand line command on the Stroke soft key.

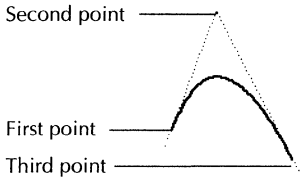
3. Press and hold the Select mouse button where you want to begin the line.
4. Trace the path of the line with the cursor.

   The system draws dots along the path.
5. Release the mouse button to end the line.

   The system connects the dots to draw a continuous line.

✦ **Note:** Always wait until the line is solid before you start working again. Otherwise, the software may skip an action you indicate with the mouse or keyboard.✦

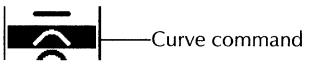
Drawing curves



When drawing a curve, you set the beginning point for the curve, select a second point that determines the curvature, then select a third point for the end of the curve. The second point sets the trajectory of the beginning and end of the line, as the illustration shows.

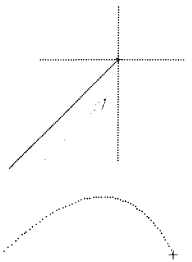
To draw a curve:

1. Select the line width on the Brush soft key.
2. Select the curve command on the Stroke soft key.



   The Curve soft key appears.

3. Do one of the following:
   - To draw a single curve, keep the option as is on the Curve soft key.
   - To draw more than one curve that connects end to end, select the second option on the Curve soft key.
4. In the canvas, press and hold the Select mouse button at the beginning of the curve.
5. Move the cursor to a second point to indicate the trajectory for the endpoints of the curve, then release the mouse button.



6. Press and hold the Select mouse button to determine the endpoint for the curve.

   The system shows the shape of the curve as you move the mouse.

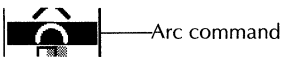
7. When you determine the curve's endpoint, release the mouse button.
8. If you are drawing more curves end to end, continue moving the cursor to determine the shape of the next curve and click the Select mouse button at the endpoint.
9. Do one of the following:
   - To stop drawing curves, select another option on the Stroke soft key.
   - To stop drawing end-to-end curves, select another option on the Stroke soft key, or press STOP.

Drawing arcs

An arc is a portion of a circle. When drawing an arc, you specify the radius of the circle and the starting and ending points of the arc.

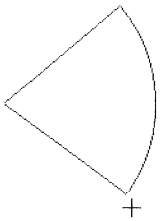
To draw an arc:

1. Select the line width on the Brush soft key.
2. Select the arc command on the Stroke soft key. You may need to click on the Stroke soft key header to see the command.



3. In the canvas, press and hold the Select mouse button at the center of the circle on which the arc will be drawn.

4. Move the cursor to set the diameter of the circle and the beginning point for the arc, then release the mouse button.



5. Move the cursor to determine the degree of the arc.

   The system draws a temporary circle as you move the cursor. Moving the cursor to the right of the beginning point starts the arc at zero degrees. Moving the cursor to the left of the beginning point starts the arc at 360 degrees.

6. When the arc is the size you want, click the Select mouse button to place the endpoint for the arc.

Drawing shapes

This section shows you how to draw rectangles, circles, ellipses, and polygons.

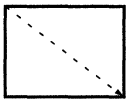
Drawing a rectangle

To draw a rectangle:

1. Select a line width on the Brush soft key.
2. Select the rectangle command on the Stroke soft key. You may need to select in the title of the Stroke soft key to see the command.

   The Rectangle soft key appears.

3. Select an open or solid rectangle on the Rectangle soft key.
4. In the canvas, press and hold the Select mouse button where you want one corner of the rectangle, and drag the mouse to the diagonally opposite corner.



Drag the mouse to the opposite corner

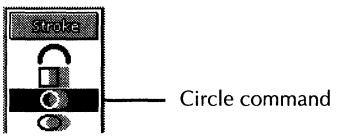
5. Release the mouse button when the rectangle is the size you want.
6. If you don't want to draw another rectangle, select another option on the Stroke soft key.

✦ **Tip:** To draw a square instead of a rectangle, turn on the grid. Then drag the mouse the same number of grid units in each direction and release the mouse button.✦

Drawing a circle and ellipse

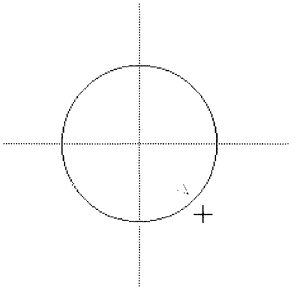
To draw a circle:

1. Select a line width on the Brush soft key.
2. Select the circle command on the Stroke soft key. You might need to select in the title bar of the Stroke soft key to see the command.

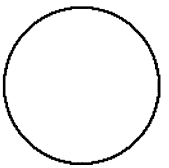


The Circle soft key appears.

3. Select an open or solid circle on the Circle soft key.
4. In the canvas, press and hold the Select mouse button where you want the center of the circle.
5. Move the cursor to specify the size of the circle.



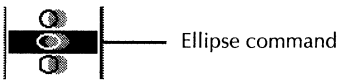
6. Release the mouse button when the circle is the size you want.



7. If you don't want to draw another circle, select another option on the Stroke soft key.

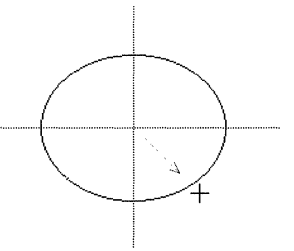
To draw an ellipse:

1. Select the line width on the Brush soft key.
2. Select the ellipse command on the Stroke soft key. You might need to select in the title of the Stroke soft key to see the command.

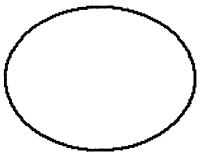


The Ellipse soft key appears.

3. Select an open or solid ellipse on the Ellipse soft key.
4. In the canvas, press and hold the Select mouse button where you want the center of the ellipse, and drag the mouse until the ellipse is the size and shape you want.



5. Release the mouse button.

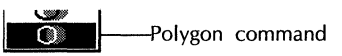


6. If you don't want to draw another ellipse, select another option on the Stroke soft key.

Drawing a polygon

To draw a polygon:

1. Select the line width on the Brush soft key.
2. Select the polygon command on the Stroke soft key. You might need to select in the title of the Stroke soft key to see the command.

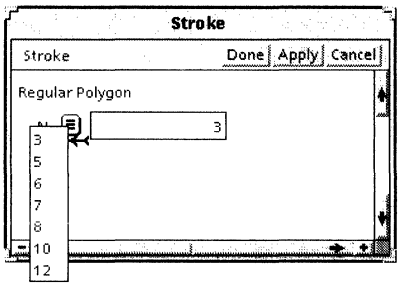


   The Polygon soft key appears.

3. Select an open or solid polygon on the Polygon soft key.
4. To change the number of sides for the polygon, select the Apex command on the Polygon soft key.

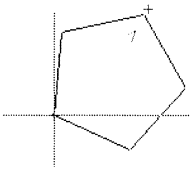
   The Polygon option sheet appears.

5. In the option sheet, select the number of sides for the polygon.

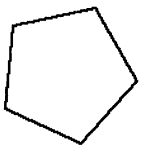


You can use the "N" menu or enter a value up to 50.

6. Select Done in the option sheet.



7. In the canvas, press and hold the Select mouse button at the center of the polygon and drag the mouse until the polygon is the size you want.



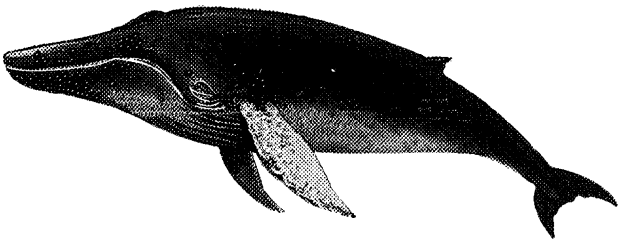
8. Release the mouse button when the polygon is the size and orientation you want.

   The number of sides you selected in the Polygon option sheet is maintained until you change the number, or close the canvas.

9. If you don't want to draw another polygon, select another option on the Stroke soft key.

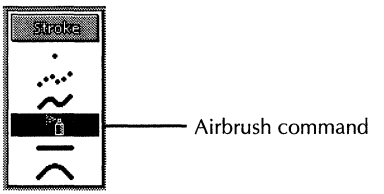
Using the airbrush

The airbrush command lets you paint a spray of dots. You can adjust the spray density to produce a dense or sparse scattering of dots. Airbrushing was used to create shading in the illustration below.



To use the airbrush:

1. For best effect, select one of the smaller brushes on the Brush soft key.
2. Select the airbrush command on the Stroke soft key.



The Airbrush soft key appears.

3. Choose the spray density on the Airbrush soft key.

Spacing = 0 Spacing = 16

A value of 4 is a very dense pattern. A value of 48 is a widely scattered pattern. Using the Other option, you can enter any number up to 500.

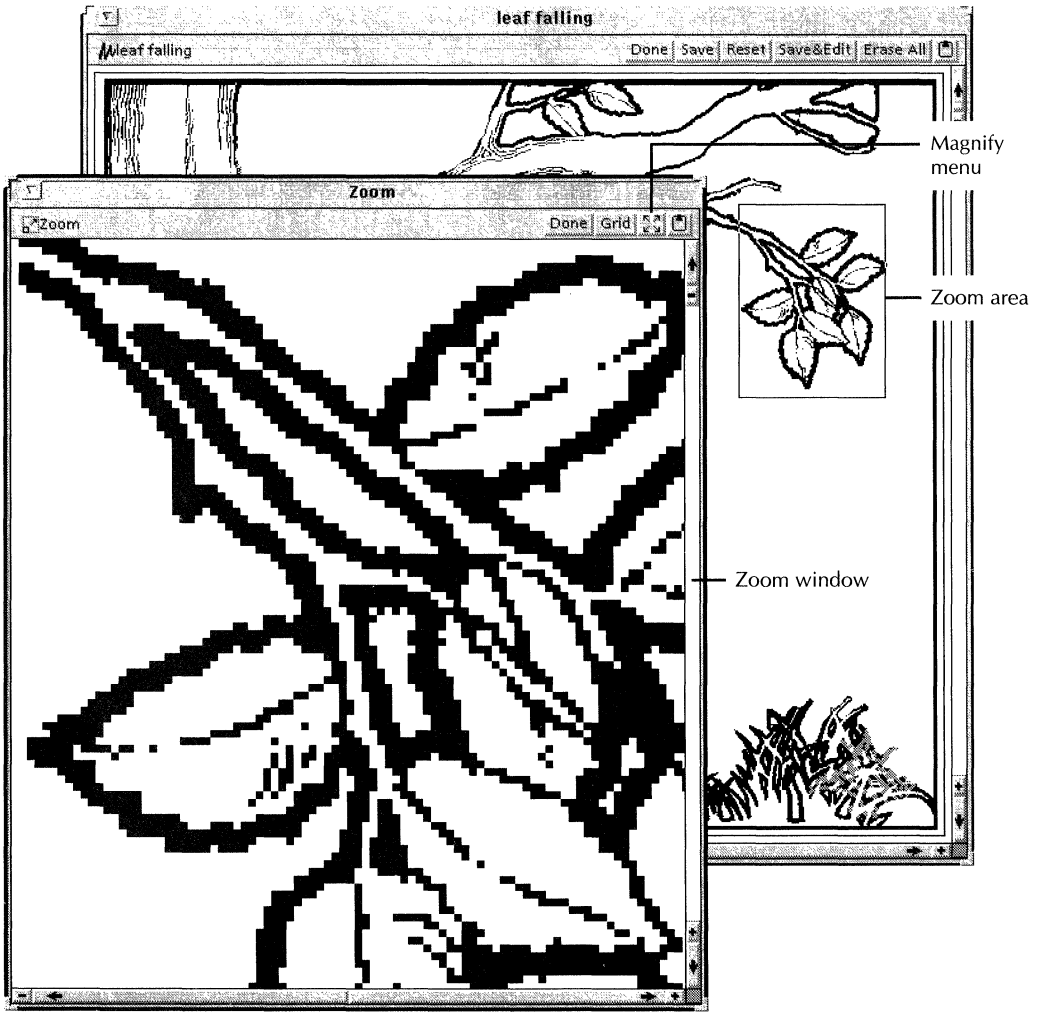
4. Press and hold the Select mouse button.
5. Move the mouse to spray the airbrush pattern.
6. Release the mouse to stop airbrushing.

✦ **Tip:** You can create a sparser pattern within a given density before you begin airbrushing using the Spacing command on the Support soft key. See "Spacing out a brush pattern" for more information.

You can airbrush over a stencil by creating a stencil using the Stencil command on the Special soft key. See the section "Creating a stencil on the canvas" for more information.✦

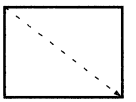
Zooming in on a section of canvas

Use the Zoom command on the Special soft key to magnify a section of canvas to edit individual pixels. The area you select for magnifying shows in a Zoom window, and is also outlined with a black border in the canvas.



To zoom a section of canvas:

1. Select Zoom on the Special soft key.
2. In the canvas, press and hold down the Select mouse button at one corner of the area you want to magnify.
3. Drag the mouse diagonally to the opposite corner and release the mouse button.



Drag the mouse to the opposite corner.

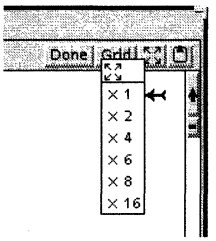
4. Edit the image in the window pixel-by-pixel. Do one of the following:
   - To add pixels, use the Select mouse button.
   - To erase pixels, use the Adjust mouse button or the Erase command on the Special soft key.
   - To copy pixels, create a brush from the pixels in the Zoom window and copy them.

   Changes in the Zoom window show immediately in the canvas. Changes in the canvas are reflected in the Zoom window.
5. Select Done when you finish editing in the Zoom window.

The scroll bars in the Zoom window let you scroll to different parts of the zoom area. This is especially useful if you have selected a larger area for zooming than can fit in the Zoom window. You can't, however, scroll to parts of the canvas outside the zoom area.

Changing the magnification of a Zoom window

You can change the magnification of the image in the Zoom window using the Magnify menu. The default magnification is six fold, and you can magnify up to 16 fold.



To change the magnification of the Zoom window:

1. Select the Magnify menu in the zoom window header.
2. Select the magnification factor you want.

Showing the pixel grid in the Zoom window

You can show a gridwork of lines marking each pixel in the magnified view in the Zoom window. The grid helps you see if pixels are horizontally or vertically aligned. This grid is different from the grid you set for the whole canvas, which allows you to restrict placement of a brush.

To show the pixel grid in the Zoom window:

- Select Grid in the Zoom window header.

Taking a snapshot of the screen

You can use the GrabScreen command to make a brush from a portion of the screen outside of the canvas.

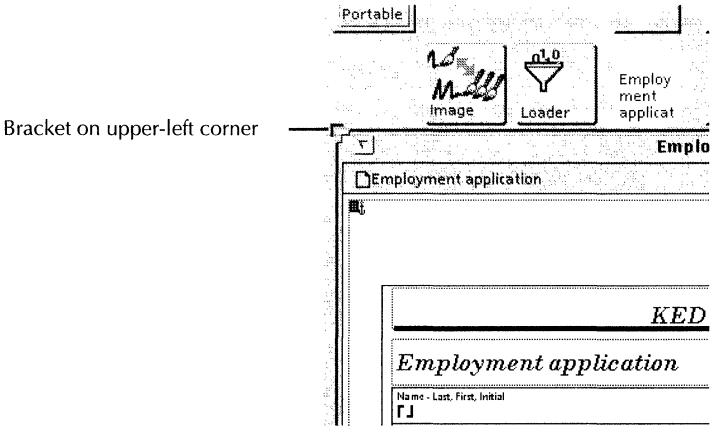
Do not use a black and white canvas to grab a screen image of a color drawing if the drawing has multiple colors: if you do, all of the colors are converted to black.

✦ **CAUTION:** To grab a color drawing on a personal computer, you need to use a 256-color display screen. You cannot grab color drawings on a 16-color display screen.✦

To grab a portion of the screen:

1. Select the GrabScreen command on the Special soft key.
2. Press and hold the Select mouse button at the corner of the area you want to grab.

   A small bracket appears.



3. Drag the mouse diagonally to the opposite corner.
4. Release the mouse button.
5. Move the pointer in the canvas and click the Select mouse button where you want to place the image.

   The image is your brush until you select or create another brush. Keep this in mind when you begin drawing other images in the canvas, or when you want to edit pixels in a Zoom window. If you change to another system-defined brush, you can access the last brush you created by selecting the user-defined brush option on the Brush soft key. Creating another brush cancels the last brush you created.

Filling areas with color and texture

You can fill enclosed areas on the canvas with a color or with any of the gray shades or texture patterns.

The area to be filled has to be completely enclosed by a solid line (in any color). If the line is broken with white pixels at any point, the fill leaks into the surrounding area.

✦ **Tip:** If you are not sure whether the area you want to fill is completely enclosed by a solid line, you can draw a rectangle

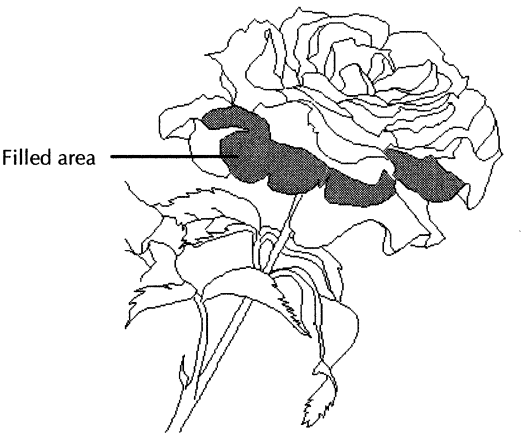
around the area. Then if the fill leaks from the area, it is contained by the rectangle.✦

To fill a closed shape:

1. If you want to choose a new fill color, select the Palette command on the Support soft key.
2. Do one of the following:
   - To fill the area with a solid color, select the first option on the Gray soft key, then select the color you want on the Palette.
   - To fill the area with a shade or texture, select a foreground color on the palette, then click the Adjust mouse button on a background color.

     Select a shade or texture pattern on the Gray or Texture soft keys.
3. Select the Fill command on the Special soft key.
4. In the canvas, select the area you want to fill.

   The system fills the area with the colors and pattern you selected.



You might need to stop a fill if it has leaked from a semi-enclosed area and threatens to engulf the entire canvas.

To stop a fill in progress:

- Press the STOP key.

Copying or moving part of the canvas

To copy or move part of the canvas, create a brush of the image, edit the image in the canvas, then place the brush in the canvas again.

To edit a brush, see the following procedures:

- Scaling and stretching a brush
- Rotating a brush
- Shearing a brush
- Creating a perspective with a brush
- Flipping a brush

To copy or move an existing image on the canvas:

1. Create a brush of the part of the image you want to copy or move.

   See the section, "Creating your own brush" for the procedure.

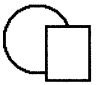
2. Do one of the following:

   - If you are copying the section of canvas, skip to step 3.
   - If you are moving the section of canvas, erase the original image. See the section, "Erasing part of the canvas" for the procedure.

     ✦ **Tip:** The fastest way to erase the old image is as follows: after selecting the brush and the guiding point, without moving the mouse, click the Adjust mouse button.✦

3. Click the Select mouse button where you want to move or copy the brush.

Separating images that overlap



Sometimes you need to separate two overlapping images on the canvas, such as the circle and square in the adjacent illustration.

To separate overlapping images:

1. Create a brush from one of the images.

   In this example, you could select the rectangle.

2. Erase the shape you have just used to create the brush.

   ✦ **Tip:** The easiest way to erase a shape you have made into a brush is to click with the Adjust mouse button, without moving the mouse, just after creating the brush.✦

3. Click the Select mouse button to place the image in the new location.

4. Reconstruct the missing portions of the underlying shape.

   In this example, you could reconstruct the circle by creating a brush from the left half of the circle, flipping the brush horizontally, and aligning that brush with the missing portions of the right side of the circle.

   See the following section, "Editing a brush" for the procedure to flip a brush.

Editing a brush

The procedures in this section show you how to edit the current brush. They have no effect on the canvas itself. To edit a portion of the canvas, select it as a brush, then modify the brush using the procedures in this section.

You can only edit a user-defined brush, not one of the system-supplied round or square brushes.

The procedures in this section show you how to:

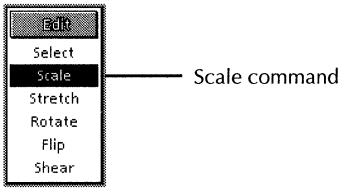
- Scale and stretch a brush
- Rotate a brush
- Flip a brush
- Shear a brush
- Create a perspective effect on a brush

Scaling and stretching a brush

Scaling a brush enlarges or reduces it proportionally. The size of the brush changes but not the shape. Stretching a brush lets you change both the size and shape of the brush. Stretching distorts a brush; scaling does not.

To scale a brush:

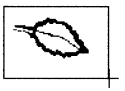
1. Create a brush for the image you want to scale, or select a brush you defined previously using the user-defined brush command on the Brush soft key.
2. Select the Scale command on the Edit soft key.



The Scale soft key appears.

3. Do one of the following:

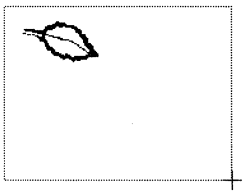
- To scale the brush interactively:



a. Keep Any selected on the Scale soft key and move the cursor to the canvas.

   A box outlining the image appears.

b. Press and hold the Select mouse button.



c. Move the cursor to resize the box, then release the mouse button.

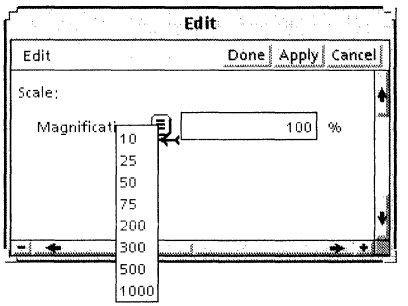
   The scaled image appears.

- To scale the brush an exact amount:

a. Select either Specify or a number on the Scale soft key.

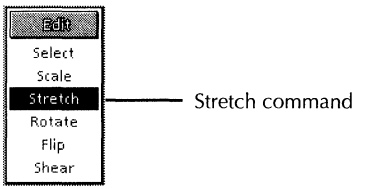
   Selecting Specify lets you choose an enlargement or reduction other than 2 or 3 fold.

b. If you chose the Specify option, select the scaling factor on the option sheet by entering a value in the box or using the Magnification menu, then select Done.



To stretch a brush:

1. Create a brush for the image you want to stretch, or select a brush you defined previously using the user-defined brush command on the Brush soft key.
2. Select the Stretch command on the Edit soft key.



The Stretch soft key appears.

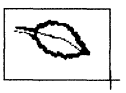
3. Do one of the following:
   - To stretch the brush interactively:
     a. Keep Any selected on the Stretch soft key and move the cursor to the canvas.

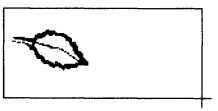
        A box outlining the image appears.

     b. Press and hold the Select mouse button.

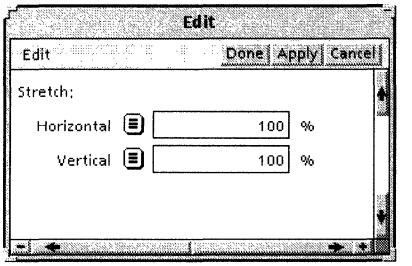
     c. Move the cursor to resize the box and then release the mouse button.

        The stretched image appears.





- To stretch the brush an exact amount:
  a. Select Specify on the Stretch soft key.



  b. Select horizontal and vertical scaling factors on the option sheet by entering values in the box provided or using the Horizontal and Vertical menus.
  c. Select Done in the window header of the option sheet.

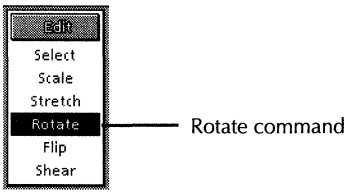
Rotating a brush

To rotate a brush:

1. Create a brush for the image you want to rotate, or select a brush you defined previously using the user-defined brush command on the Brush soft key.

   The Stretch soft key appears.

2. Select the Rotate command on the Edit soft key.



   The Rotate soft key appears.

3. Do one of the following:

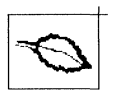
   - If you want to rotate the brush interactively:

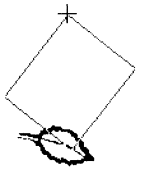
     a. Keep Any selected on the Rotate soft key and move the pointer to the canvas.

        A box outlining the image appears.

     b. Press and hold the Select mouse button.

     c. Drag the cursor to set the amount of rotation and release the mouse button.



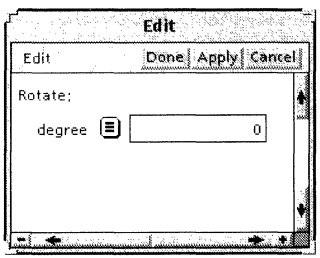


        The rotated image appears.

   - To rotate by a specified amount:

     a. Select one of the 90° rotations on the Rotate soft key or select Specify to choose another rotation.

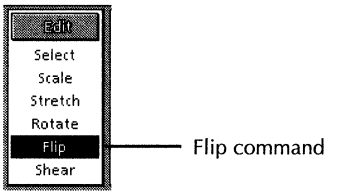
     b. If you select Specify, choose the degree of rotation on the option sheet by entering a value or by selecting from the Degree menu, then select Done.



Flipping a brush

To flip a brush:

1. Create a brush for the image you want to flip, or select a brush you defined previously using the user-defined brush command on the Brush soft key.
2. Select the Flip command on the Edit soft key.



The Flip soft key appears.

3. Do one of the following:
   - To flip the brush horizontally, select X on the Flip soft key.
   - To flip the brush vertically, select Y on the Flip soft key.

   The flipped brush appears in the canvas.

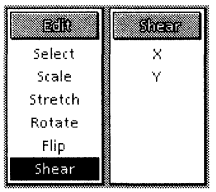
Shearing a brush

You can use the Shear command to shear a brush horizontally or vertically.

To shear a brush:

1. Create a brush for the image you want to shear, or select a brush you defined previously using the user-defined brush command on the Brush soft key.
2. Select the Shear command on the Edit soft key.

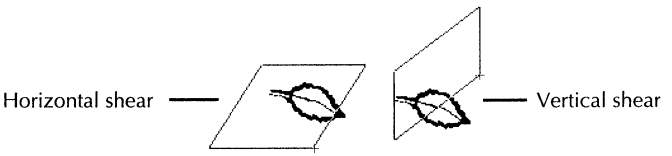
   The Shear soft key appears.



3. On the Shear soft key, select X for horizontal shear or Y for vertical shear.

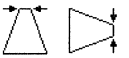
4. In the canvas, press and hold the Select mouse button.

   A box outlining the brush appears.
5. Drag the cursor to set the amount of shear, then release the mouse button.



6. The sheared brush appears in the canvas.

Creating a perspective effect

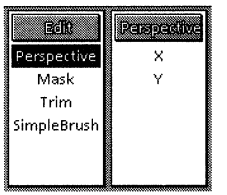


The Perspective command lets you squeeze and stretch opposite sides of a brush to create a horizontal or vertical vanishing point.

To create a perspective effect:

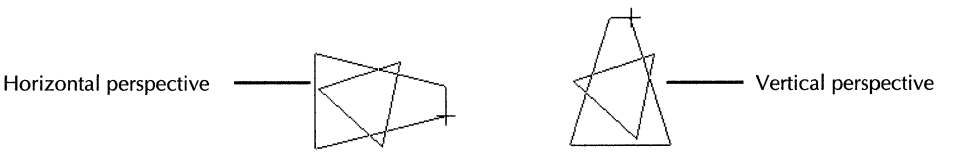
1. Create a brush for the image with which you want to create a perspective effect, or select a brush you defined previously using the user-defined brush command on the Brush soft key.
2. Select the Perspective command on the Edit soft key.

   You might need to click on the title of the soft key to see the command.



3. Select X or Y on the Perspective soft key.

   The X option creates a horizontal vanishing point. The Y option creates a vertical vanishing point.
4. In the canvas, press and hold the Select mouse button.



5. Drag the cursor to set the amount of distortion, then release the mouse button.

✦ **Tip:** If you select the brush with extra white space on one side, applying the Perspective command creates a vanishing point offset from horizontal or vertical.✦

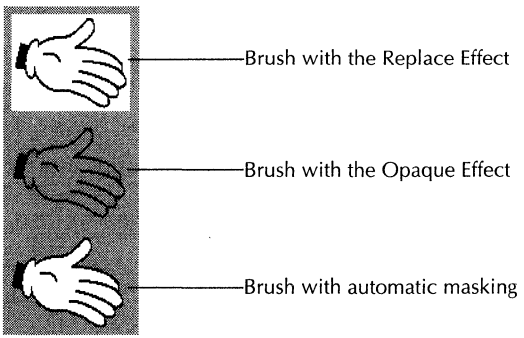
Creating a mask to make a shape opaque

Use masking to create an opaque image of a closed shape. When you use automatic masking, the system makes the white areas in the closed shape opaque and the white areas outside the shape clear.

With automatic masking, you rely on the system to choose which pixels to make clear. You can choose which pixels to make clear using the Select option for masking.

Using automatic masking

The effect of automatic masking is to make the shape opaque while making the area of the brush around the shape transparent. Neither the Replace nor Opaque options on the Effect soft key produces the same effect, as shown in the following illustration.



A mask applies only to the current user-defined brush. If you select a new user-defined brush, the previous mask disappears with the brush.

You can temporarily turn off the mask for a brush using the On/Off option on the Mask soft key.

To use automatic masking for a brush:

1. Create a brush with the shape you want to use as a mask.

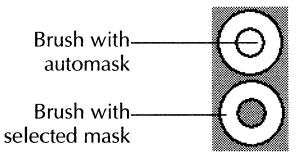
   Be sure the outline of the shape is complete; if the outline is broken with white areas, the system will not create a mask from the shape.

2. Select Mask on the Edit soft key. You might have to select in the Edit soft key title to display the Mask command.

3. Select Auto on the Mask soft key.

   The brush is now masked. You can turn off the mask by selecting On/Off on the Mask soft key.

Selecting your own masking pattern



Automatic masking does not always give the results you want, especially if you have a shape with interior areas that you want to be transparent in the mask. A donut is a good example: you may want the donut "hole" transparent and the donut opaque. For these kinds of shapes, you can select your own masking pattern.

To select your own masking pattern for a brush:

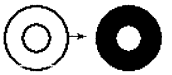
1. Create a brush that you want to mask and place it in a blank portion of the canvas.

   You modify this image to create the template for the mask.

2. In the brush you created, fill the areas with black that you want opaque in the final masked brush.

   Depending on the shape, you can use the Fill command on the Special soft key, or you might need to fill the areas by hand.

3. Reselect the original brush on the Brush soft key, if you de-selected it while filling it.
4. Select the Mask command on the Edit soft key.
5. Select the Select option on the Mask soft key.



6. Align the brush exactly over the filled-in template and press the Select mouse button.

   Black areas from the template are now opaque in the brush.

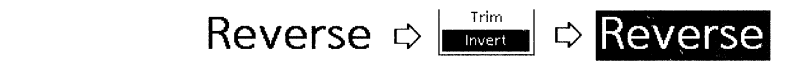
Getting a reverse-out effect with a brush

GV Paint offers two methods for creating an inverted image with a brush. One method changes the pixels in the brush; the other method does not change the pixels in the brush but does change their effect on the canvas.

✦ **Note:** These two effects are available only in a black and white canvas, not a color canvas.✦

Inverting black and white pixels in a brush

The Invert command on the Edit soft key changes pixels in the brush so that white becomes black and black becomes white, as shown in the following illustration.



To reverse black and white pixels in a brush:

1. Create the brush you want to invert.
2. Select Invert on the Edit soft key.

Reversing the effect of pixels on the canvas

The Invert command on the Effect soft key doesn't change the pixels in the brush. It does, however, change the effect of those pixels, depending on the background:

- On a black background, black pixels in the brush turn white and white pixels turn black.
- On a white background, white pixels in the brush stay white and black pixels stay black.

Inverting pixels on a black background but not a white one lets you easily create complex effects like the one shown in the following illustration.

To reverse the effect of pixels on the canvas:

1. Create the brush you want to reverse if you haven't already.
2. Select Invert on the Effect soft key.

Adding text to a drawing

Place text in your canvas with the Add Text command. You can add one line of text, the length of which is limited by the size of your canvas.

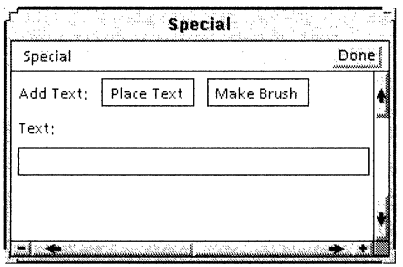
The text that you add is in the workstation's default font.

✦ **Tip:** If you want other typefaces or sizes for the text, or if you want to add a block of text, enter the text in a document, apply the character and paragraph properties you want, then use the GrabScreen command to create a brush.✦

To add text to a drawing:

1. Select Add Text on the Special soft key.

   A window for entering the text appears.



2. Select in the Text box and type to add to the canvas. Do not enter any carriage returns.

   GV Paint doesn't wrap the text when you place it in a canvas. Do not enter more text than will fit on one line in the canvas.

3. Do one of the following:

   - To place text on the canvas without losing your current brush, select Place Text.
   - To replace the current brush with the text, select Make Brush.

4. If the outline of the canvas is a dotted line, select anywhere in the canvas to reactivate the canvas.

5. Position the cursor or brush where you want the text, and click the Select mouse button to place the text on the canvas.

✦ **Note:** The system uses the screen font for adding text to the canvas. The resolution of the screen font is lower than the resolution of the printer font, so that characters in a canvas look more jagged than characters in a document.✦

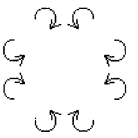
Creating symmetrical drawings

You can duplicate mouse movements to create a symmetrical drawing using the using the Symmetry command on the Support soft key.

You can specify cyclic or mirror symmetry. Cyclic symmetry arranges a specified number of symmetrical copies of your drawing in a circle. When you move the cross-hair cursor clockwise, the symmetrical copies also move clockwise.

Mirror symmetry arranges a specified number of symmetrical copies of your drawing as pairs of mirror images arranged evenly in a circle. When you move the cross-hair cursor clockwise, one member of each pair moves clockwise and its mirror image moves counter-clockwise.

Cyclic symmetry



Mirror symmetry

Setting the symmetry origin

The Origin command on the Support soft key sets the center of the circle for both cyclic and mirror symmetry. The default origin is the center of the canvas.

To set the symmetry origin:

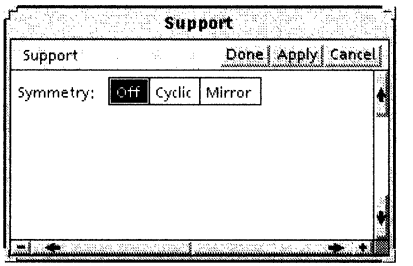
1. Select the Origin command on the Support soft key.
2. Click the Select mouse button in the canvas where you want the symmetrical drawing to be centered.

Choosing symmetry options

To turn on symmetry and choose options:

1. Select Symmetry on the Support soft key.

   An option sheet appears.



2. Select Cyclic or Mirror in the option sheet.
3. Select a number from the Value menu, or enter any number up to 50.

   The Value property determines how many symmetrical copies of your drawing the system creates.
4. Select Done in the window of the option sheet.
5. Draw in the canvas as you normally would. Remember where you placed the symmetry origin so the mirror or cyclic images appear where you want them.

Symmetry options remain in effect until you turn them off.

Turning off symmetry

To turn off symmetry:

1. If the Symmetry option sheet is not displayed, select Symmetry on the Support soft key.
2. Select Off on the Symmetry option sheet.
3. Select Apply or Done.

Spacing out a brush pattern

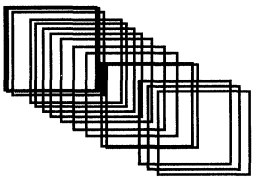
The Spacing command on the Support soft key lets you space out the image drawn with the brush by a specified number of pixels.

If you use the Spacing command with one of the system-supplied brushes and a stroke that draws a line or shape, you get a dotted line or shape.

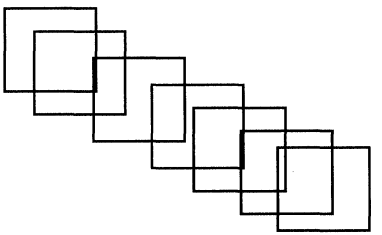
If you use the Spacing command with a brush created from an image in the canvas, the brush image is spaced apart by the amount you specify.

Applying spacing to a user-defined brush

Before:

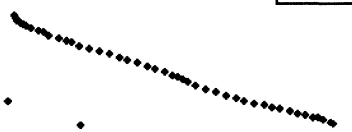


After:



Applying spacing to a system brush

Before:



After:

To space out a brush pattern:

1. Select a system-supplied brush or the user-defined brush on the Brush soft key.
2. Select Spacing on the Support soft key.

3. In the option sheet, select On.
4. Select a number in the Value menu, or enter a number from 0 to 50.
5. Select Done in the window header of the option sheet.
6. In the canvas, draw with your brush.

   The brush is spaced the number of pixels you select for Value.

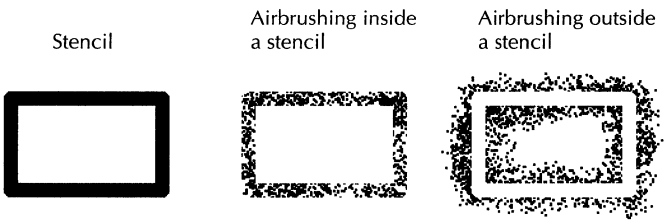
Spacing remains in effect until you turn it off.

Creating a stencil on the canvas

Use a stencil to specify an area on the canvas where you cannot paint. For example, use a stencil to airbrush a shape without going outside the boundary of the shape, or to draw around a shape.

You can also use the stencil to prevent painting over an intricate shape you have drawn on the canvas, while still allowing you to paint in all the white areas in and around the shape.

You can choose to draw on the stencil itself, or around the stencil. GV Paint considers only the black or colored pixels in the stencil as part of the stencil, or *inside* the stencil. It treats all white pixels in the stencil as *outside* the stencil. The illustration below shows the effects of airbrushing inside a stencil and outside a stencil.



You create the stencil using a brush or by selecting a portion of the canvas.

Only one stencil can be in effect at a time.

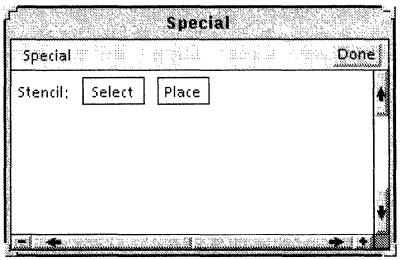
Using a brush for the stencil

When you use a brush for the stencil, you place the brush to determine the stencil's location, but the image of the brush does not appear on the canvas. The boundaries of the stencil are invisible, and only emerge as you draw.

To create a stencil from a brush:

1. Draw the shape that you want to use for the stencil.
2. Select the shape as a brush.
3. Select the Stencil command on the Special soft key. You might need to select in the title of the soft key to see the command.

   An option sheet appears.



4. In the option sheet, select Place.
5. In the canvas, select the location for the stencil.
6. Do one of the following:
   - To draw on the stencil (where the black or color pixels were in the brush), select Inside. You cannot draw anywhere on the canvas except on the stencil while the stencil is active.
   - To draw around the stencil (where the brush had white pixels, and anywhere outside the stencil), select Outside.

7. Select a brush to use for drawing inside or outside the stencil.
8. When you finish drawing, turn off or delete the stencil and select Done on the option sheet.

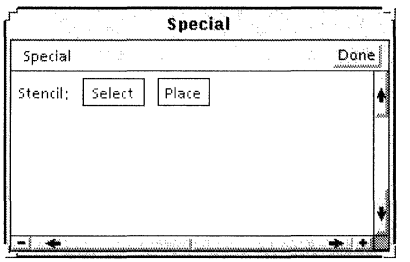
Using a portion of the canvas as the stencil

When you select a portion of the canvas to use as the stencil, the image you select remains on the canvas, along with the stencil. If you select Inside in the option sheet, you can draw over the image. If you select Outside, you can draw around the image, preserving it.

To use a portion of the canvas as the stencil:

1. Select the Stencil command on the Special soft key. You might need to select in the title bar of the soft key to see the command.

   An option sheet appears.



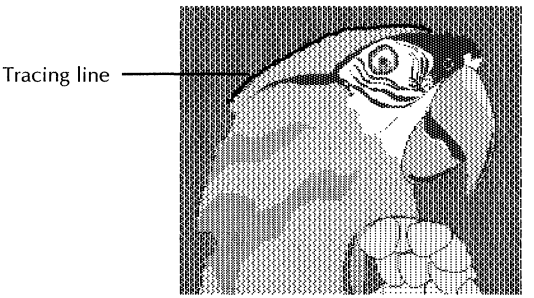
2. Select Select in the option sheet.
3. Press and hold down the mouse button at one corner of the area you want for the stencil.
4. Drag the mouse diagonally to the opposite corner and release the mouse button.
5. Do one of the following in the option sheet:
   - To draw on the stencil (where the black or color pixels were in the brush), select Inside. You cannot draw anywhere on the canvas except on the stencil while the stencil is active.

- To draw around the stencil (where the brush had white pixels, and anywhere outside the stencil), select Outside.

6. Select a brush to use for drawing inside or outside the stencil.
7. When you finish drawing, turn off or delete the stencil, and select Done in the option sheet.

Tracing an image using an overlay

Use the Overlay command to place an image on the canvas temporarily while you trace parts of the image. After tracing, you can remove the image without removing the tracing lines. While you trace, you can gray out the image to make it easier to distinguish between lines in the image and the lines you trace, as shown below.



To use an overlay for tracing an image:

1. Select the Overlay command on the Special soft key. You may need to select in the title bar of the soft key to see the command.

   An option sheet appears.

2. Do one of the following:

   - If you plan to use a brush for the image to be traced, select the brush and then select Place in the option sheet. Select in the canvas to place the overlay.

- If you plan to use a portion of the canvas for the image to be traced:
  a. Choose Select in the option sheet.
  b. Press and hold the Select mouse button at one corner of the area to be traced.
  c. Drag the mouse diagonally to the opposite corner and release the mouse button.
  d. Erase the image on the canvas.

     The temporary overlay image remains after you erase the actual image.

3. Select Shading in the option sheet if you want the image to be shaded while you trace it.
4. Trace the image.
5. When you finish tracing, select Delete Overlay in the option sheet.

Changing the size of the canvas

Use the Canvas Size property to make the canvas larger or smaller. The Gravity property lets you decide which sides of the canvas to add to or subtract from when changing the canvas size.

✦ **CAUTION:** If you reduce the size of a canvas in which you have drawn, you might cut off portions of the image. To be sure you do not lose portions of the image when reducing the canvas size, crop the canvas instead of changing the canvas size.✦

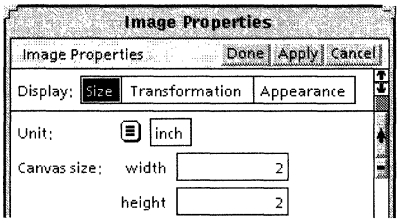
To change the canvas size:

1. If the canvas is inactive, select in the canvas to activate it.

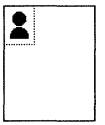
   You can tell the canvas is inactive if the canvas border is a dotted line.

2. Press PROPS.

   The Image property sheet appears.



3. Delete the values for Width and Height and enter new values.
4. Select one of nine locations in the Gravity box to determine which sides of the canvas are lengthened or shortened when you change the canvas size.



Canvas is added or removed on the right and bottom.

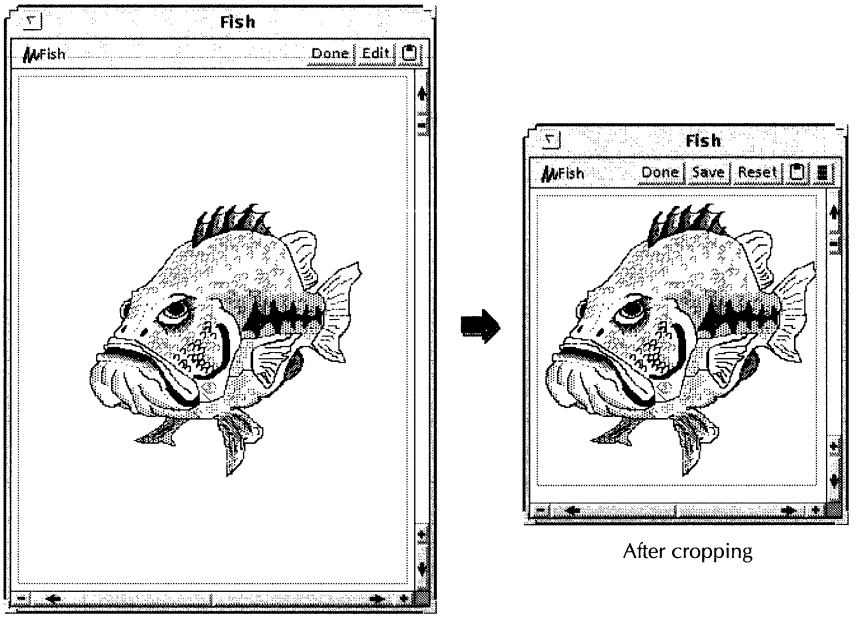
Canvas is added or removed on all four sides.

5. Select Done in the window header.

Cropping an image in the canvas

Use cropping to specify a portion of the canvas that you want to keep, and delete everything outside the area you specify. The size of the canvas changes according to the size of the image you keep. Crop an image when there is extra white space around it, or when you decide to keep only a portion of the image you have drawn.

✦ **Note:** White space in a canvas takes up storage space. To minimize the disk storage requirements of a canvas, crop the image closely after you have completed it.✦

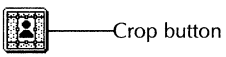


Before cropping

After cropping

To crop an image in the canvas:

1. If the canvas is inactive, select in the canvas to activate it.
2. Press PROPS.
3. Select the Crop button.



4. In the canvas, press and hold down the Select mouse button at one corner of the image to be cropped.
5. Drag the mouse diagonally to the opposite corner and release the mouse button.

   A box appears, outlining the area to be cropped. The midpoints and corners of the box are marked with control points (unless the box is too small to show them).

6. If necessary, do the following to adjust the location and size of the box:
   - To move the box, press and hold the Select mouse button on any control point and move the mouse.
   - To adjust the size of the box, press and hold the Adjust mouse button on a control point and move the mouse.
   - To cancel the crop, select Cancel in the Image property sheet, and repeat steps 2 through 5.
7. Select Done in the Image property sheet when you are ready to crop.

   The image outside the cropped area is deleted.

Changing the resolution of the canvas

The resolution of the canvas determines the size of the pixels when the canvas is printed or displayed in a document. Decreasing the resolution makes the image larger. Increasing the resolution makes the image smaller and less grainy.

To print or display an undistorted image, the resolution of the canvas should be evenly divisible into the resolution of the device used for displaying or printing the canvas.

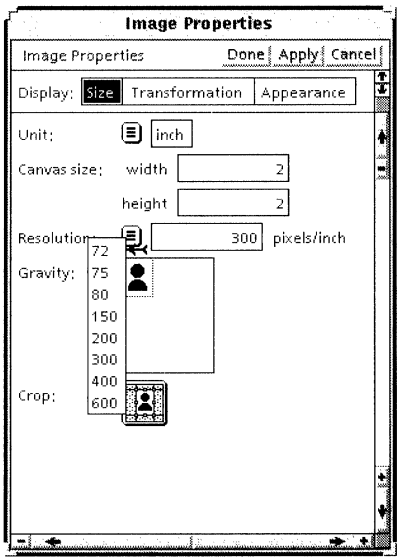
For example, if the computer screen has a resolution of 72 pixels per inch (ppi), the image is shown accurately if its resolution is also 72 ppi. If the printer has a resolution of 300 ppi, the image is printed accurately if its resolution is 75, 100, 150, or 300 ppi, because those numbers are evenly divided into 300.

If the resolution for a canvas is not evenly divisible into the resolution for the device, the image might look distorted and show patterns that distract the eye.

✦ **CAUTION:** Reducing the resolution can result in clipping parts of the image. To avoid this, either make the canvas larger or change the units to pixels before changing the resolution.✦

To change the resolution of a canvas:

1. If the canvas is inactive, select in the canvas to activate it.
2. Press PROPS.



3. Select a number in the Resolution menu, or delete the number in the box and type in a new number.
4. To keep the number of pixels in the canvas the same when you change the resolution, select Pixel in the Unit menu.
5. Select Done.

Flipping, stretching, rotating, and inverting a canvas

You can flip, stretch, rotate, and invert the entire canvas using the Image property sheet.

To apply these functions to just a portion of the canvas, see "Editing a brush" in this chapter.

To flip the canvas horizontally or vertically:

1. Select in the canvas and press PROPS.
2. In the Image property sheet, select Transformation for Display.
3. Select the Flip buttons to flip horizontally or vertically. You can flip the canvas in both directions at the same time.


Flip horizontally


Flip vertically

4. Select Done.

To scale or stretch the canvas:

1. Select in the canvas and press PROPS.
2. In the Image property sheet, select Transformation for Display.
3. Select the Scale or Stretch button.


Scale or stretch

4. Select the Scale or Stretch box.

   Scale magnifies or reduces the canvas without changing its shape. Stretch lets you change the size and shape of the canvas.

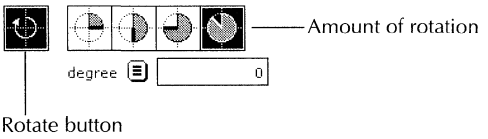
5. Choose the amount of scaling by selecting numbers in the percentage menu or by typing an amount in the box. If

you are stretching the canvas, set the scaling independently for the horizontal and vertical axes.

6. Select Done.

To rotate the canvas:

1. Select in the canvas and press PROPS.
2. Select Orientation for Display.
3. Select the Rotate button.



4. Select the amount of rotation.

   If you select the last button, a Degree box lets you specify a rotation other than 90-degree intervals. You can enter any value from 360 to -360, or select a value in the Degree menu.

   ✦ **Note:** If you select a rotation other than a 90-degree interval, the rotated image may be distorted.✦

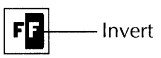
5. Select Done.

   The system expands the size of the canvas to accommodate the rotated image.

To invert the pixels in the canvas:

✦ **Note:** This operation is only available for black and white canvases.✦

1. Select in the canvas and press PROPS.
2. Select Orientation for Display.
3. Select the Invert button to invert the canvas.



4. Select Done.

Changing the color values of a canvas

Color values are available only for color canvases, not black and white canvases. The color values you can change are hue, saturation, brightness, and contrast.

Hue is the dominant color of a pixel. Hues can be arranged in a color wheel instead of a rainbow, so that the location of a hue on the color wheel can be represented as a number between 0 and 360. You can think of changing the hue for a canvas as shifting each of the hues in the canvas around on the color wheel by the same amount. You select the amount of shift when you select a value on the slider bar for the Hue property.

Saturation is the intensity or vividness of a color. A vivid red has a higher saturation than a muddy or dull red.

Brightness is the amount of black or gray mixed with the color. It is the lightness or darkness of a color, usually measured as a percentage with white being 0% at the top of the value scale, and black, 100% at the bottom end of the scale.

Contrast is created when colors differ from each other in hue, saturation, and value (or any combination of them). The stronger the contrast, the greater the visibility. For example, the strongest contrast is black type on white paper, since both colors are at opposite ends of the value scale.

To change the color values of a canvas:

1. Select in the canvas and press PROPS.
2. Select Appearance for Display.
3. Select the button for changing color values.


——Change color value

4. Select in the slider bars for Hue, Saturation, Brightness, and Contrast to adjust these color values.

   ✦ **Note:** These operations are not reversible. Increasing brightness by two units on the slider bar and then

reducing brightness by the same amount does not restore the original color values to the canvas.✦

5. Turn on error diffusion if you want it.

   See the discussion on error diffusion in the section "Converting canvases and Sun Raster images" later in this chapter.

6. Select Done.

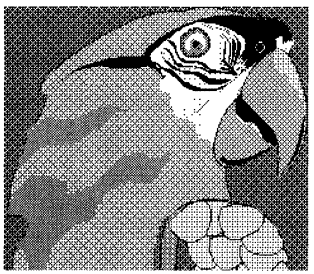
Blurring, sharpening, or outlining an image

You can use the filtering effect to blur, sharpen, or outline the image in the canvas.

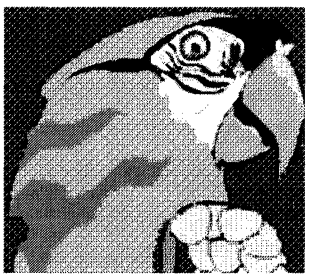
Blur makes the transition between areas of different color more gradual.

Sharpen makes the transition between areas of different color less gradual by substituting more contrasting pixels. Sharpen has no effect on black and white images.

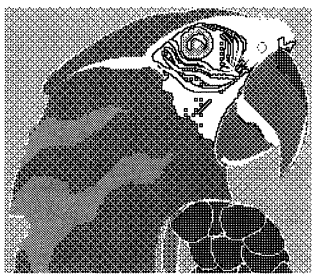
Outline makes a 1-pixel border around any continuous patch of black, gray, or color pixels.



Original image



Blurred image

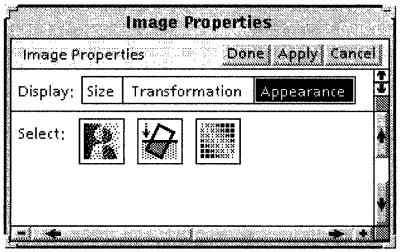


Outlined image

Not shown: sharpened image

To blur, sharpen, or outline an image:

1. Select in the canvas and press PROPS.
2. Select Appearance for Display.



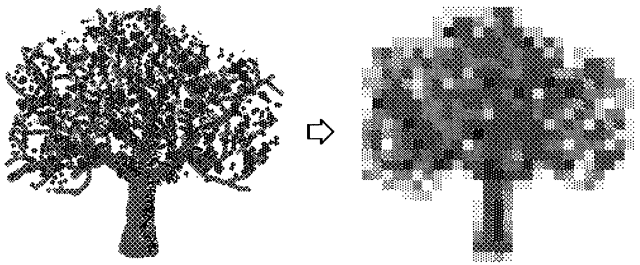
3. Select the button for filter effect.

4. Select blur, sharpen, or outline for Filter Type.
5. Turn on error diffusion if you want it.

   See the discussion on error diffusion in the section "Converting canvases and Sun Raster images" later in this chapter.
6. Select Done.

Creating a mosaic effect

The mosaic button on the Image property sheet averages clusters of pixels in the canvas to create a blocked or mosaic effect.



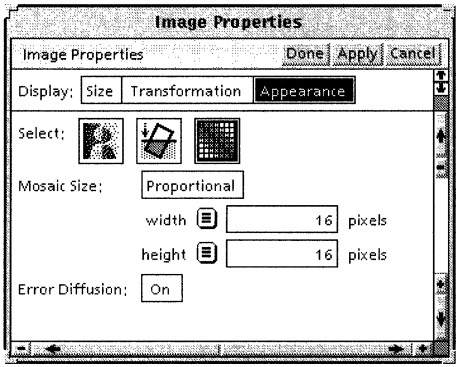
The mosaic effect applied to an image.

To create a mosaic effect:

1. Select in the canvas and press PROPS.
2. Select Appearance for Display.
3. Select the button for mosaic effect.

4. Select or deselect the Proportional property.

   If you select the Proportional property, the mosaic "tiles" are square. If deselected, the mosaic tiles can be square or rectangular.



5. Choose a number for the size of the mosaic tiles, either from the width and height menus or by entering a value from 1 to 500 in the box.

   If the Proportional property is deselected, you can enter values separately for the width and height of the mosaic tiles.

6. Turn on error diffusion if you want it.

   See the discussion on error diffusion in the section "Converting canvases and Sun Raster images" later in this chapter.

7. Select Done.

Erasing images in a canvas

Use one of the following methods to erase images in the canvas.

Erasing the entire canvas

To erase the entire canvas:

1. Select Erase All in the window header of the canvas.
2. Confirm that you want to erase the canvas.

To restore an erased canvas:

1. Select Reset.
2. Confirm that you want to reset the canvas.

✦ **CAUTION:** Reset restores an erased canvas only if you have not saved the canvas after erasing it. Reset also causes you to lose any drawing you have done since the last save.✦

Erasing part of the canvas

To erase a rectangular area of the canvas:

1. Select the Erase command on the Special soft key.
2. Press and hold the Select mouse button at one corner of the area you want to erase.
3. Drag the mouse to the opposite corner and release the mouse button.

To erase an irregular area of the canvas:

1. Select a brush size that corresponds to the detail of the area you want to erase.

   For individual pixels, use the smallest brush and use a Zoom window.

2. Move the mouse to the area you want to erase and press the Adjust mouse button.

   ✦ **Note:** By changing the stroke on the Stroke soft key, you can erase using a straight or curved line or any of the other brush strokes. The default stroke lets you erase continuously as long as you continue to hold down the mouse button.✦

Converting canvases and Sun Raster images

Use the Image Converter icon to convert GV Paint canvases and Sun Raster files to other formats. You can convert color canvases to black and white canvases, and vice-versa, and you can convert color or black and white canvases to Sun Raster files, and vice-versa. The following table shows the conversions available for Sun Raster files and GV Paint canvases.

	B/W canvas	Color canvas	Sun Raster B/W	Sun Raster (palette) color	Sun Raster grayscale
Black and white canvas		X	X	X	X
Color canvas	X		X	X	X
Sun Raster black and white	X	X		X	X
Sun Raster full color	X	X	X		X
Sun Raster palette color	X	X	X		X
Sun Raster grayscale	X	X	X	X	

When you convert a color canvas or Sun Raster image to black and white, you lose color settings. However, the image converter offers several options for simulating the brightness and contrast of the colors.

To convert a GLOBALVIEW black and white canvas to a GLOBALVIEW color canvas, you can grab a screen image of the black and white canvas and place it in the color canvas instead of using the image converter. See "Taking a snapshot of the screen" for the procedure to grab a screen image.

The difference between full color and palette color is that palette color consists of the image data and a color map. The color map usually consists of 256 colors, in which case, each pixel value uses 8 bits.

A full color image only has image data. The image data usually consists of red, green, and blue values. Each color value uses 8 bits, so the image data requires 24 bits. The larger image values mean that a full color image is larger than a palette image, and that there are virtually unlimited colors

allowed, in comparison to the 256 colors available in palette color.

Retrieving the image converter icon

To retrieve the image converter icon:

1. Open the Office Accessories folder in the Workstation divider.
2. Copy the Image Converter icon to your workspace.

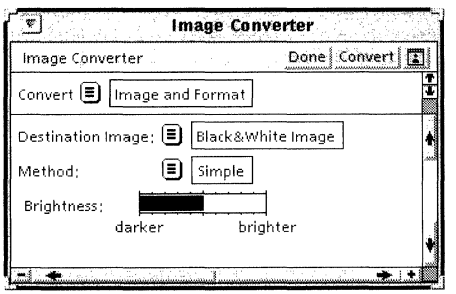
Converting the image

If you need to convert a Sun Raster file to a GV Paint canvas, you first have to copy the Sun Raster file to your workspace using the Window to Unix File System. See the "Filing" chapter in the *GLOBALVIEW Workspace User Guide* for information about the Window to Unix File System application.

To convert a canvas or Sun Raster image:

1. Select the canvas or Sun Raster image in your workspace and press COPY.
2. Select the Image Converter icon.

   The Image Converter option sheet appears, as well as a window containing the source image.



There are a number of conversion options available to you depending on the type of file you're converting, and the type of file you're converting to. The option sheet may

look different than the one shown above. The options are explained following the procedure.

✦ **Note:** When you convert a color or grayscale Sun Raster image, the image does not appear correctly in the Source Image window unless you move the cursor inside the window. However, moving the cursor in the Source Image window inverts the rest of the screen. Moving the cursor outside the Source Image window returns the screen to normal.✦

3. Select Image and Format or Format Only for the Convert property.

   Selecting Format Only turns off the Destination Image and Method choices and automatically determines the destination format. For example, if you're converting a color canvas and select Format Only for the Convert option, the file is automatically converted to a color Sun Raster file.

   Selecting Image and Format allows you to select the Destination Image type, and the conversion method.

4. If Destination Image is displayed, select the type of image you want to convert to. The options are different depending on the type of file you're converting. The options are described following the procedure.

5. Select an option for Method. The options vary depending on the type of file you're converting. They are described following the procedure.

6. If the option sheet has a Brightness bar, slide it in the direction you want by selecting the bar, pressing and holding the Select mouse button, and moving the mouse. The Brightness options are described following the procedure.

7. If the option sheet has Foreground Color and Background Color options, select the colors you want from the menus.

   These options appear when you are converting a black and white canvas or file to color. All black pixels in the source file become the foreground color in the destination file, and all white pixels become the background color.

8. Select Convert in the option sheet window header.

   The Destination Window appears, and the Image Converter property sheet displays additional options.

   ✦ **Note:** If you convert the image to grayscale, the image does not appear correctly in the Destination Image window unless you move the cursor inside the window. However, moving the cursor in the Destination Image window inverts the rest of the screen. Moving the cursor outside the Source Image window returns the screen to normal.✦

9. Do one of the following:

   - If the conversion is satisfactory and you don't want to change the format, enter the name for the converted canvas in the Name box and select Save in the window header.

     The converted image is copied to your workspace.

   - If you want to save the image in another format, select another option in the Format menu, then select Save in the window header.

     For example, you can convert a black and white canvas to a GV Color Canvas, then save the converted image as a color Sun Raster. The converted image is a palette color Sun Raster.

     Depending on the type of conversion, other options may not be available in the Format menu.

   - If the conversion is not satisfactory, choose another conversion method and select Convert in the window header.

     You can continue experimenting with conversions until you find the best one, then select Save in the window header.

10. Select Done in the window header of the option sheet.

    The Source Image and Destination Image windows also close.

Options for converting a canvas

There are a number of conversion options available to you depending on the type of file you're converting, and the type of file you're converting to. The options are described below.

Convert

Image and Format—Converts the image and the format of the image. For example, if you want to convert the image and format of a black and white Sun Raster file, you can convert it to:

- A grayscale image and save it as a Sun Raster file
- A GV Color image and save it as a Sun Raster file
- A GV Color image and save it as a canvas

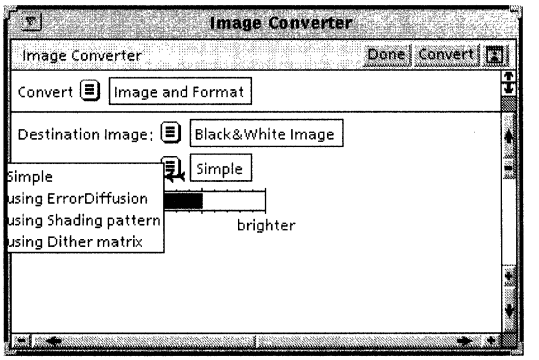
Format Only—Using the above example, selecting Format Only when converting a black and white Sun Raster file converts the file to a black and white canvas.

Destination Image

The options available are Black&White Image, GV Color Image and Grayscale Image. The table at the beginning of this section shows the conversions available for the different source files. You can convert a GV Color image to a Sun Raster palette color image by selecting Format Only in the Convert menu.

Method

If you choose Black&White Image for the Destination Image option, four choices are available for the Method option. If you're converting to a grayscale image or GV Color image, only the Simple option appears. The options are described below.



The images shown below each option description are converted from a color canvas with shades of brown, rust, and gold (the original colors in the Mona Lisa). Use the illustrations as a guideline. The best way to choose a conversion method is to experiment with the different options before saving the converted file.

Simple—The Simple method uses a single threshold value throughout the canvas to determine whether colored pixels should be black or white. You choose the threshold value by adjusting the brightness slider bar.

This conversion method typically creates large areas of solid black and white, and loses much of the detail in the areas of the original image that were colored or gray.

If the canvas has just one color plus white, this technique gives the best results.

Using Error Diffusion—The error diffusion method examines each pixel in turn and decides whether it should be black or white. The difference in brightness between the original and replacement pixel—the error—is then used to adjust the brightness of surrounding pixels.

This technique preserves fine detail in the canvas, but typically creates a snake-skin pattern. In a canvas with wide areas of uniform grey or color the pattern can be distracting, but in a canvas with fine detail, the pattern is not as noticeable.

Using Shading Pattern—The Shading pattern method uses the nine gray shades on the Gray soft key (including black and white) to simulate colors in the canvas.

If your canvas has only a few colors, this method is a good compromise between the Dither matrix method and the Simple threshold method.

Using Dither matrix—The Dither matrix method uses a matrix of dots, called halftone dots, to simulate the gray value of colors. Each halftone dot varies in size with the brightness of the original color at that location.

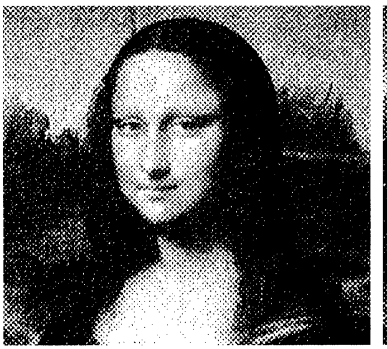
The four options for halftone dots let you make a tradeoff between using a fine dot pattern to preserve detail and a coarse dot pattern to simulate a large number of colors.

Halftone 1 is the standard pattern, with an intermediate dot spacing.

Halftone 2 is the high-contrast pattern, with a coarse dot pattern that can simulate a large number of colors.

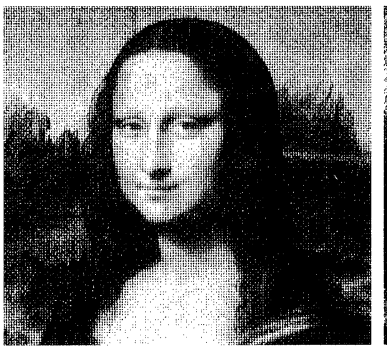
Halftone 3 is the high-resolution pattern, with a fine dot pattern that preserves detail but cannot simulate many colors.

Halftone 4 determines the dot pattern based on the resolution of your display.



Halftone 1

Halftone 2

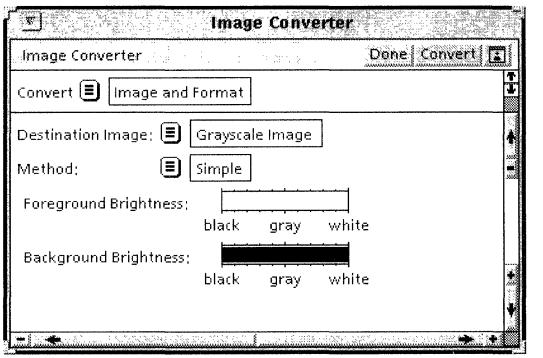


Halftone 3

Halftone 4

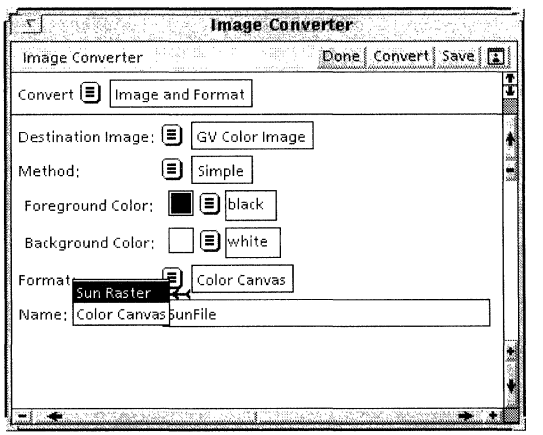
Error Diffusion See the description of the "Using Error Diffusion" option under "Method."

Brightness When you convert to a black and white image, the Brightness option is available. When you convert to a color or grayscale image, the Foreground Brightness and Background Brightness options are available.



Brightness is the amount of black or gray mixed with the color. It is the lightness or darkness of a color, usually measured as a percentage with white being 0% at the top end of the value scale, and black, 100%, at the bottom end of the scale.

Format This option appears after you select Convert in the window header.



The Format option allows you to save an image in another format after you convert it. For example, if you want to convert a black and white canvas to a color Sun Raster image, you can convert the canvas to a GV color canvas, select Sun Raster in the Format menu, then select Save. The image is converted to a palette color Sun Raster.

Placing a canvas in your document

To incorporate a GV Paint canvas into a GLOBALVIEW document, you create a space for the canvas using a bitmap frame inside a GV Draw frame.

✦ **Note:** In GV Draw, you can use the same bitmap frame for either a color canvas or black and white canvas.✦

Sizing the canvas for printing

The resolution of the canvas is one factor in determining how large the printed image is in the document. The other factor is the Scaling property of the bitmap frame, which interacts with the canvas resolution in the following way:

- If you choose Automatic, the image expands to fill the frame, regardless of the resolution of the canvas.
- If you choose Fixed, the size of the image is determined by the canvas resolution, multiplied by the scaling factor set for the bitmap frame.
- If you choose Print Resolution, the size of the image is determined by the canvas resolution only if the Print Resolution property is set to Print Source. If it is set to any of the print resolution values, the resolution of the canvas is ignored and the selected value is used instead.

In addition, the bitmap frame and the GV Draw frame must be large enough to fit the image in the canvas, or some of the image is cut off.

✦ **Note:** It is best not to scale an image with a resolution of more than 150 ppi, or an image that is more complex than line art. If your image has these characteristics, reference it

from your workspace. See "Referencing a canvas stored on the workspace" in this section.✦

Copying the canvas in and out of a bitmap frame

The following procedure assumes that you have already added a bitmap frame to the GV Draw frame in your document. For instructions on adding a bitmap frame to a GV Draw frame, see the *GLOBALVIEW Write and Draw User Guide.*

To add a canvas to a bitmap frame:

1. Make sure the bitmap frame can accommodate the size of the image. Make the bitmap frame size exactly match the image size if one or more of the following conditions apply:

   - Your screen resolution is different from your image resolution
   - The image's resolution is high (150 ppi or greater)
   - The image is more complex than line art

   Making the bitmap frame size exactly match the image size reduces the possibility of moire effects or other display problems.

2. Select the canvas you want placed in the document.
3. Press COPY.
4. Select inside the bitmap frame in the document.
5. If the bitmap already contains a bitmap, you see a message asking if you want to delete the existing bitmap. Select Yes to substitute the new canvas.

When the canvas is in the bitmap frame, you cannot edit it. To edit a canvas in a bitmap frame, either reference the canvas (described in the next section) or copy the canvas to the workspace, edit it there, and then replace it in the bitmap frame.

To copy a canvas from a bitmap frame to the workspace:

1. Select the bitmap frame.
2. Press COPY.
3. Select a location for the canvas on the workspace.

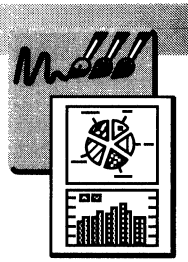
   The canvas is copied to the workspace and given the name "Anonymous."

Referencing a canvas stored in the workspace

Instead of copying a canvas to a bitmap frame in a GV Draw frame or Pro Illustrator frame, you can set up the bitmap frame to reference the canvas on the workspace. Then, when you edit the canvas, it changes automatically in the document.

Referencing a canvas also reduces the size of the document, since the canvas is not stored in the document.

See the *GLOBALVIEW Write and Draw User Guide* for details on referencing a canvas in a draw frame.



2. Using GV Chart

Using GV Chart, you can transform numerical data from tables into bar charts, pie charts, and line charts.

Software required—Run the following software applications to perform the tasks in this chapter:

- GV Draw
- GV Chart

To use GV Chart effectively, you should be familiar with GV Draw. GV Chart has features similar to those of GV Draw. For example:

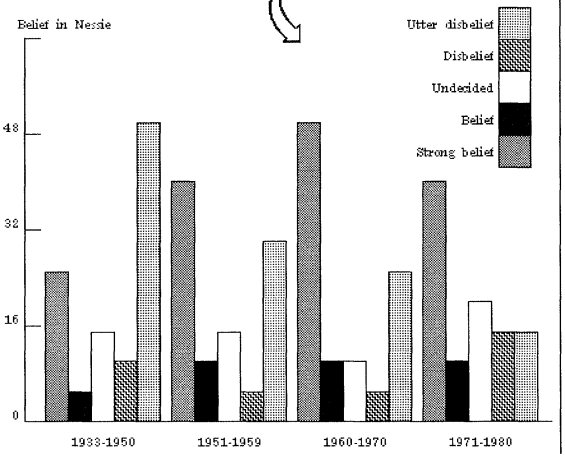
- Each chart is a graphics object on which you perform standard graphics operations.
- You insert a chart inside a Draw frame.
- Each chart has associated property sheets. Many of the properties are identical to the properties of GV Draw objects.
- You can combine charts with other illustrations.
- The function keys that stretch, magnify, display a grid, draw lines and curves, join objects, and place objects above or below each other are the same as those for GV Draw.

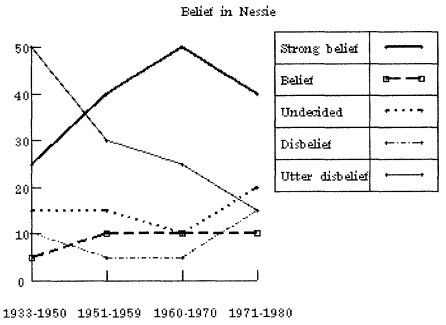
For more information, see chapter 14, "Using GV Draw," in the *GLOBALVIEW Write and Draw User Guide*.

The following illustration shows the different types of charts you can create with GV Chart.

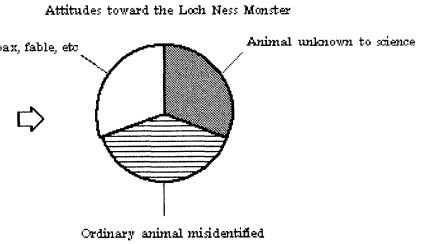
The bar chart and the line chart are generated by the top table; the pie chart is generated from the bottom left table.

Years	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1933-1950	25	5	15	10	50
1951-1959	40	10	15	5	30
1960-1970	50	10	10	5	25
1971-1980	40	10	20	15	15





Labels	Animal unknown to science	Ordinary animal misidentified	Imagination, hoax, fable, etc.
	38,7	48,4	38,7



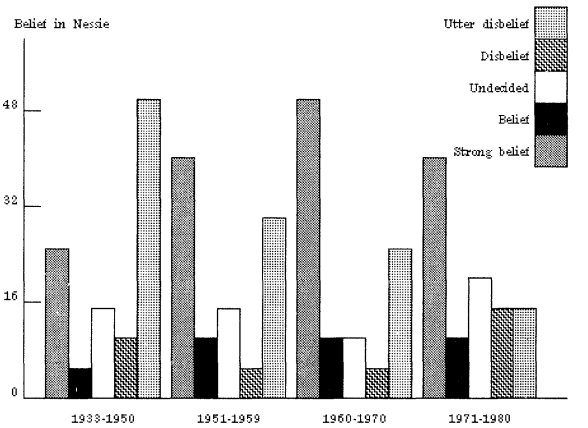
Selecting the best chart for the job

Before you select the type of chart to use, think about the information you want to convey. Your choice should reflect whether you want to:

- Show trends
- Make comparisons
- Show relationships between variables
- Show percentages

If the information you want to convey contains very specific values, use a table. Your chart does not replace a table; it conveys trends, overviews, and general behavior.

Use a bar chart to compare a set of elements or a single element over definite time intervals, such as weeks, months, or years. Each group of bars is called a bar set.

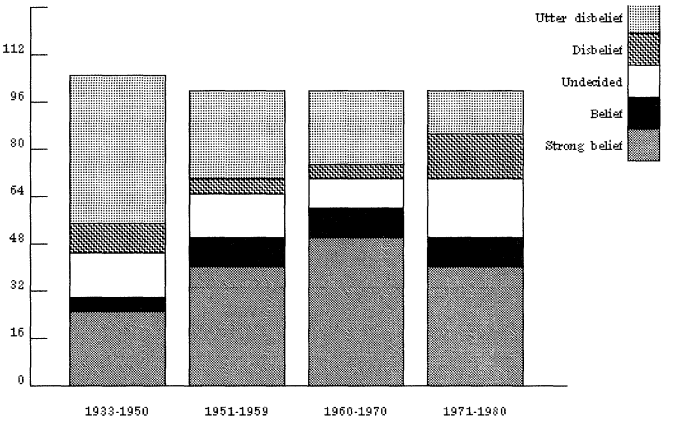


The chart in the preceding illustration is an example of a grouped bar chart. It compares an independent series of elements over a period of time. Use a stacked bar chart to show multiple measurements stacked into a single bar set.

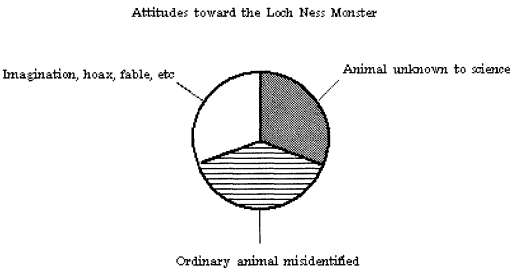
Use a stacked bar chart when:

- The bar sets have labels and you do not use a key; the side-by-side layout is more likely to cause the labels to overlap.
- The values are all positive or all negative.

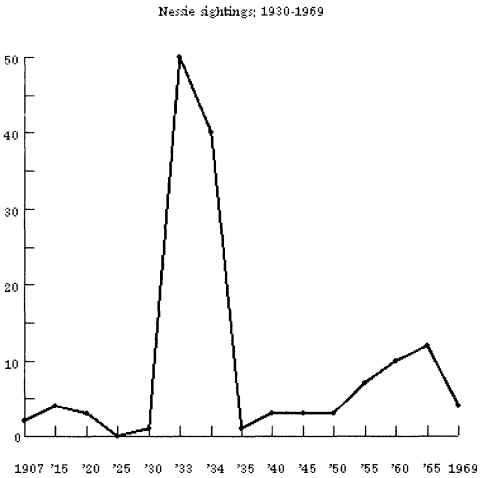
The following illustration uses the same data from the grouped bar chart to generate a stacked bar chart.



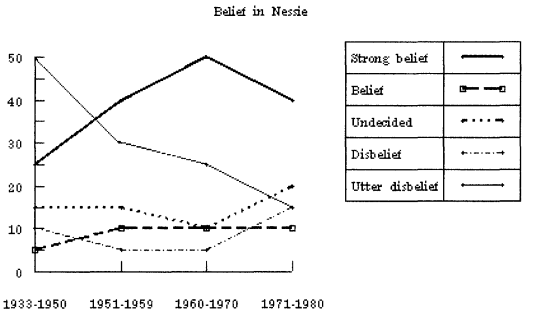
Use a pie chart to represent data as percentages of a whole. Each slice of a pie shows a percentage of the total.



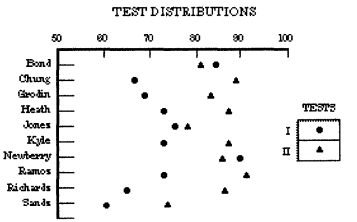
Use a line chart to show trends or a progression of one or more variables over a period of time. The line in the following illustration is built from a series of data points for one variable.



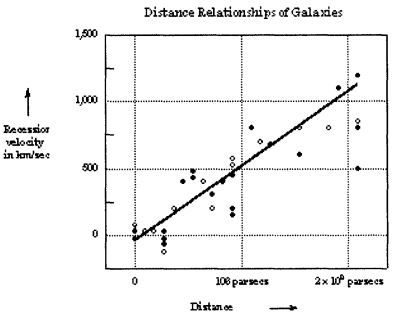
Line charts are useful for contrasting related variables. The following illustration shows contrasting variables over a specified period of time.



You can show just the data points by modifying the line chart. Use a data point chart to represent data without trend information and to show data points in relation to each other. As shown in the following figure, each test score corresponds to one data point.



Add a single straight line to a data point chart to indicate where most of the data points converge. This is called a data point best fit chart, shown in the following illustration.



Inserting a chart in a document

Insert charts into documents using either the Special keyboard for graphics or the Draw Transfer Document. Procedures for inserting charts with both tools are in the following sections.

The information in a chart is generated from data in a table. The table can be in the property sheet associated with the chart or in the same document containing the chart. Refer to the section, "Adding table data to a chart" for more information.

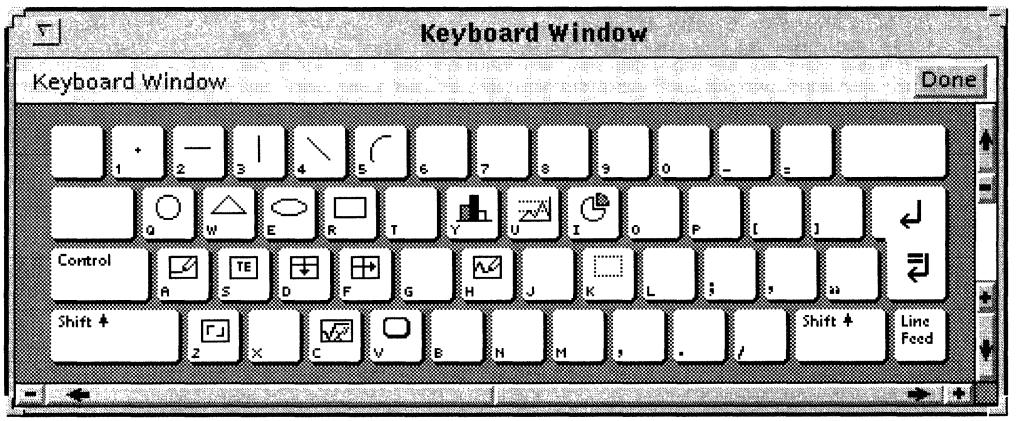
When you insert a chart into a document, the text in the chart is 12-point Modern. To change text on each type of chart, refer to the sections, "Formatting bar chart labels," "Formatting pie chart labels,"and "Formatting line chart labels."

Inserting a chart using the Special keyboard for graphics

To insert a chart using the Special keyboard for graphics:

1. Insert a draw frame into the document (KEYBOARD+SPECIAL+A) and enlarge the frame to the size you want.
2. Position the pointer inside the draw frame, and click the Select mouse button.

   The top left corner of the chart is positioned where you place the pointer.
3. Press and continue to hold KEYBOARD, and press SPECIAL.
4. Press SHOW to see the Special keyboard for graphics.



Special keyboard for graphics

5. Do one of the following:
   - If you want a bar chart, press Y.
   - If you want a line chart, press U.
   - If you want a pie chart, press I.
6. To enlarge the chart, select the chart and press STRETCH or MAGNIFY. If you hold down the Select mouse button during the stretch or magnify operation, you see a "ghost" image of the chart as it enlarges.

   For more information about stretching or magnifying a chart, see the section, "Modifying the size or position of a chart."

Inserting a chart using the Draw Transfer Document

The Draw Transfer Document is found in the Basic Icons folder.

To insert a chart using the Draw Transfer Document:

1. Insert a draw frame into the document (KEYBOARD+SPECIAL+A) and enlarge the frame to the size you want.
2. Select one of the chart types displayed in the Draw Transfer Document, and press COPY.

3. Position the pointer inside the draw frame, and click the Select mouse button to insert the chart.
4. To enlarge the chart, select the chart and press STRETCH or MAGNIFY. If you hold down the Select mouse button during the stretch or magnify operation, you see a "ghost" image of the chart as it enlarges.

   For more information about stretching or magnifying a chart, refer to the section, "Modifying the size or position of a chart."

Adding table data to a chart

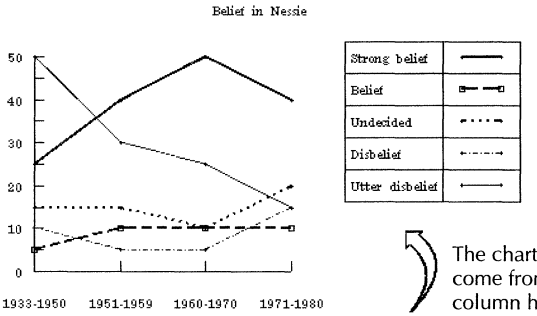
This section contains procedures for adding data to a table that is used to generate a chart. You can add chart data to one of the following tables:

- A table in the chart property sheet
- A table in the same document containing the chart

To edit a chart, you edit the table containing the chart data. If you edit the graphics elements of a chart directly, the edits are lost the next time you generate the chart.

Changing the table data also changes the chart appearance. The size and position of the bars, lines, or pie slices are directly affected by the information in the corresponding table. For general information about tables, see chapter 10, "Adding tables to documents," in the *GLOBALVIEW Write and Draw User Guide*.

Chart labels and chart keys are derived from the column headers and the first column of a table. You can use numbers or text for chart labels or keys.



The chart key labels come from the column headers.

The chart labels come from the first column.

Year	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1933-1950	25	5	15	10	50
1951-1959	40	10	15	5	30
1960-1970	50	10	10	5	25
1971-1980	40	10	20	15	15

All other information in a table must be numeric. The numbers can be positive, negative (except in pie charts), decimal, or in scientific notation. If you enter a number exceeding fourteen digits, the number is automatically converted to scientific notation.

If you leave a table cell blank in a table that generates a bar chart, a bar does not appear on the chart for that entry. If you leave a table cell blank in a table that generates a line chart, a point does not appear on the chart for that entry.

The properties you specify for the chart data are the same for all three chart types. The only difference between them is how the information in the rows and columns of a table is used to create the axes and keys of a chart. See the section, "How the Data Set Is property affects charts" for more information.

After you build a chart, you need to edit it.

- To stretch or magnify the chart, see the section, "Modifying the size or position of a chart."
- To edit individual chart elements, such as changing text frames or moving the chart, see the section, "Changing individual chart elements."

- To edit the layout or appearance of the chart and chart labels, see the sections, "Editing a bar chart," "Editing a pie chart," or "Editing a line chart."
- To add a caption to your chart, see chapter 13, "Using frames in documents" in the *GLOBALVIEW Write and Draw User Guide.*
- To change other properties of the draw frame such as borders and margins, see chapter 13, "Using frames in documents" in the *GLOBALVIEW Write and Draw User Guide.*

Adding chart data from a table inside a document

Follow the procedure in this section to generate a chart from a table in a document. If the table doesn't already exist, create it and name it. The table you use to create a chart cannot contain subdivided columns and rows.

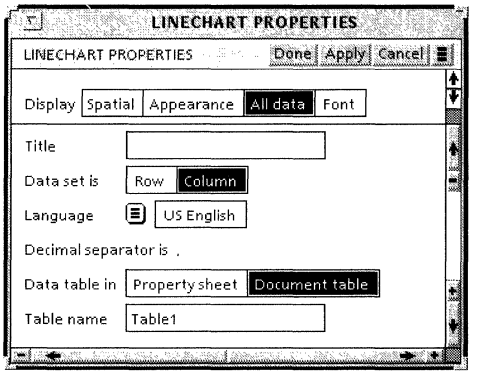
For information about creating tables in documents, see chapter 11, "Adding tables to documents," in the *GLOBALVIEW Write and Draw User Guide.*

Only the table column headers and the first column can contain text. All other columns must contain numbers or be blank.

✦ **Note:** Although the text in a chart comes from the text in a table, the chart text can be formatted separately. The Font property sheet for each chart lets you format chart text. See the sections, "Formatting bar chart labels," "Formatting pie chart labels," and "Formatting line chart labels," for more information.✦

To add chart data from a table inside a document:

1. Insert a chart using the procedure described in the section, "Inserting a chart in a document."
2. Select the chart, and press PROPS.
3. Select All Data for the Display setting.



4. Enter a name in the Title box if you want the chart to have a title. The title is not transferred from the table.
5. Select Column or Row for the Data Set Is property.

   Refer to the section, "How the Data Set Is property affects charts" for information about how this property affects bar charts, pie charts, and line charts.
6. To change the decimal separator, change the default language by selecting a different language in the menu.
7. Select Document Table for the Data Table In property.

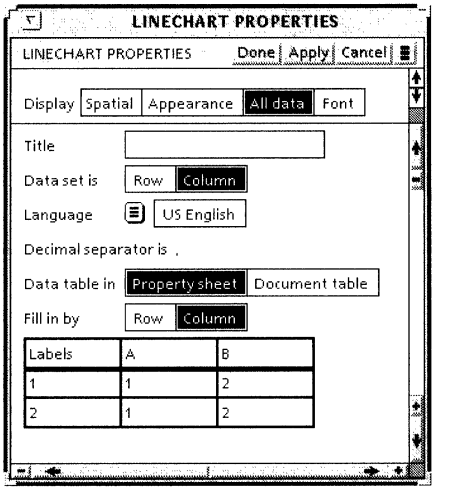
   The Table Name property appears.
8. Type the name of the table as it appears in the Name property in the Table property sheet. The table must be in the same document as the chart.
9. Select Done.

   If the data does not fit in the chart, stretch or magnify the chart, then generate it again. See the procedure in the section "Modifying the size or position of a chart" for more information.

Adding data to the Chart property sheet table

Follow this procedure to build a table for your chart inside the Chart property sheet shown in the following illustration.

Property sheet table



To build a chart using the Chart property sheet table:

1. Insert a chart using the procedure described in the section, "Inserting a chart in a document."
2. Select the chart, and press PROPS.
3. Select All Data for the Display setting.
4. Enter a name in the Title box if you want your chart to have a title.
5. Select Column or Row for the Data Set Is property.

   See "How the Data Set Is property affects charts" for more information.
6. If you want to change the decimal separator, change the default language by selecting a different language in the menu.
7. Select Property Sheet for the Data Table In property.

   A small table appears in the property sheet.

8. Select Row or Column for the Fill In By property.

   Using the Fill In By property, you can specify the effect of pressing SKIP/NEXT when entering data in the table. If you select Row, pressing SKIP/NEXT moves the caret to the next cell in the row. If you select Column, pressing the SKIP/NEXT key moves the caret to the next cell in the column.

9. Enter data in the property sheet table.

   To enter data for a pie chart, you must fill the first row (the row following the column header) or second column of the table, depending on how you set the Data Set Is property. You must enter positive numbers in the table. The values do not have to add up to 100.

10. Add rows or columns to the table by doing one of the following:

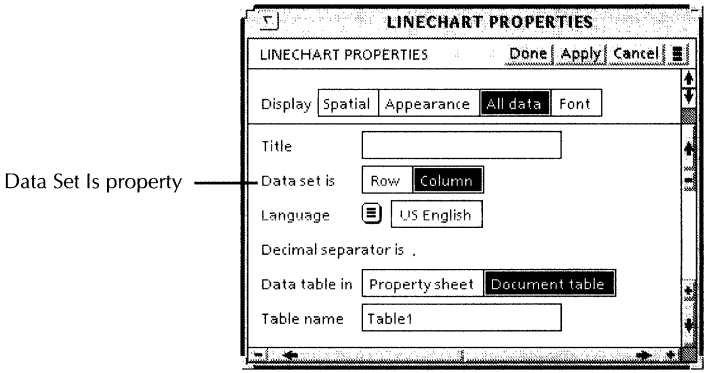
    - Select a cell in the row or column, extend the selection to another cell in a row or column, and press COPY. You can copy the row or column between rows and columns, or after the last row or column.
    - Press SKIP/NEXT to automatically create a new row or column when the cursor is in the bottom right cell of the table. The choice you selected in step 8 for the Fill In By property determines whether a row or column is added.

11. Select Done.

    If the data does not fit in the chart, stretch or magnify the chart. Refer to the procedure in the section, "Modifying the size or position of a chart" for more information.

How the Data Set Is property affects charts

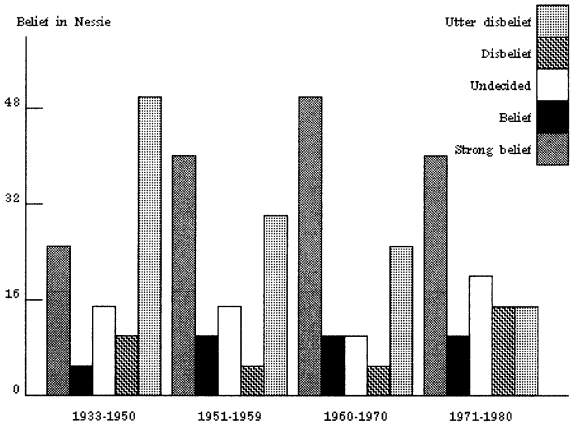
The Data Set Is property specifies how information in the rows and columns of a table is used to create the axes and keys of a chart. As shown in the following illustration, you have two options, row or column.



The following sections describe how the Data Set Is property affects each type of chart.

Bar charts

When you select Column for the Data Set Is property, GV Chart does the following:

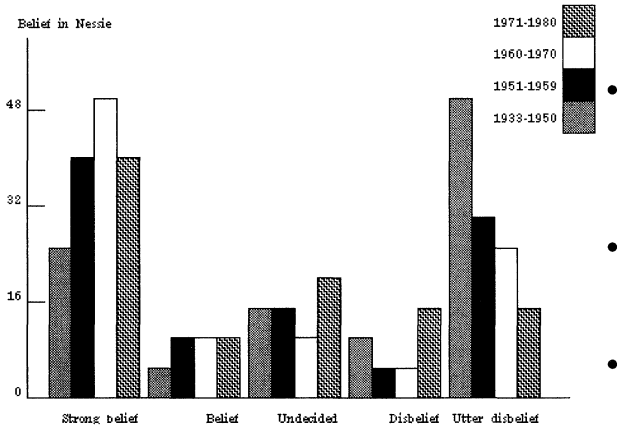


- Creates the names for each bar and the key from the column headers
- Builds each bar from the table rows
- Generates the x-axis labels from the entries in the first column of the table

Years	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1933-1950	25	5	15	10	50
1951-1959	40	10	15	5	30
1960-1970	50	10	10	5	25
1971-1980	40	10	20	15	15

The numbers on the y-axis are generated automatically according to the range of numbers in your table. You can modify the numbers in the Spatial property sheet.

When you select Row for the bar chart Data Set Is property, GV Chart does the following:



- Creates the names for each bar and the key from the entries in the first column
- Builds each bar from the table columns
- Generates the x-axis labels from the entries in the column headers

Year	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1933-1950	25	5	15	10	50
1951-1959	40	10	15	5	30
1960-1970	50	10	10	5	25
1971-1980	40	10	20	15	15

The numbers on the y-axis are generated and averaged automatically according to the range of numbers in your table. You can modify the numbers in the Spatial property sheet.

Pie charts

When you select Column for the Data Set Is property, GV Chart:

- Generates the pie chart labels from the column headers
- Builds the pie slices from the values in the first row following the column headers

When you select Row for the Data Set Is property, GV Chart:

- Generates the pie chart labels from the first column
- Builds the pie slices from the values in the second column

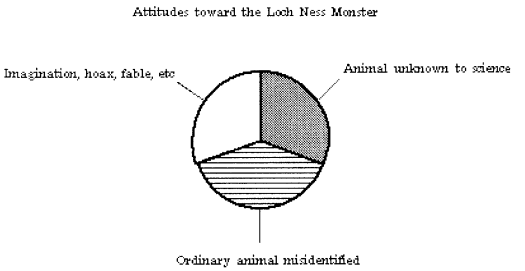
✦ **CAUTION:** Pie charts do not display correctly if the data is placed incorrectly in relation to the property selected for the Data Set Is property.

If you select Column for the Data Set Is property, make sure that the labels are in the column headers and the data is in the first row. If you select Row, make sure the labels are in the first column and the data is in the second column.✦

✦ **Note:** You must use positive numbers in the table. The numbers do not have to add up to 100.✦

The following illustration shows the resulting pie chart if you enter the data from the tables shown.

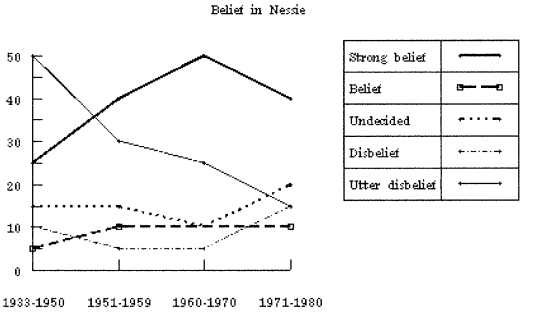
Labels	Animal unknown to science	Ordinary animal misidentified	Imagination, hoax, fable, etc.
	38.7	48.4	38.7



Labels	
Animal unknown to science	38.7
Ordinary animal misidentified	48.4
Imagination, hoax, fable, etc.	38.7

Line charts

When you select Column for the Data Set Is property, GV Chart does the following:

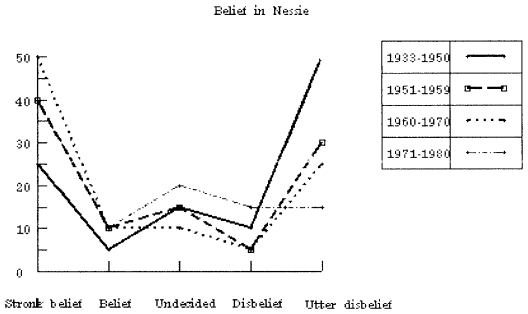


- Creates the names for each line and the key from the column headers
- Builds each line from the table columns
- Generates the x-axis labels from the entries in the first column of the table

Years	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1933-1950	25	5	15	10	50
1951-1959	40	10	15	5	30
1960-1970	50	10	10	5	25
1971-1980	40	10	20	15	15

GV Chart generates the numbers on the y-axis automatically according to the range of numbers in your table. You can modify the numbers on the y-axis in the Spatial property sheet.

When you select Row for the Data Set Is property, GV Chart:



- Creates the names for each line and the key from the entries in the first column
- Builds each line from the data in the table rows
- Generates the x-axis labels from the entries in the column headers

Years	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1933-1950	25	5	15	10	50
1951-1959	40	10	15	5	30
1960-1970	50	10	10	5	25
1971-1980	40	10	20	15	15

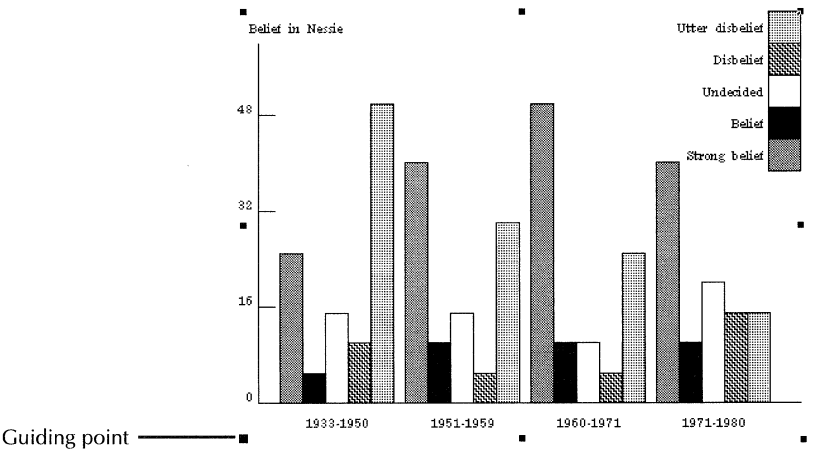
Again, the numbers on the y-axis are generated and averaged automatically according to the range of numbers in your table. You can modify the numbers in the Spatial property sheet.

Modifying the size or position of a chart

After you build a chart, you might want to modify its size or position inside the frame.

You modify a chart in the frame using control points. Each chart has eight control points you can use to stretch, magnify, copy, or move the chart. The control points become visible when you select the chart. One of the control points is the guiding point, which is located nearest to the place where you select the chart.

The guiding point is the focus point for the modification. It appears larger than the other control points, as shown in the following illustration.



For more information about control points and guiding points, see the "Using GV Draw," chapter in the *GLOBALVIEW Write and Draw User Guide*.

To modify the size or position of a chart:

1. Select a line or other chart element to select the chart.

   Selecting white space around the chart does not select the chart.

   The Draw soft keys appear.

2. Press STRETCH or MAGNIFY, or press MOVE or COPY.
3. Move the pointer according to the modification you want to make, and click or release the mouse button.

Editing a bar chart

Edit a bar chart to change layout properties such as the orientation of the bar sets, the scale, and the spacing between bar sets.

You can also edit the appearance of individual bar chart elements such as shading, texture, and the text of the chart labels.

Changing the layout of a bar chart

You can change the following properties of a bar chart using the Spatial property sheet for bar charts:

- Tick marks
- Vertical axis
- Orientation
- Bar layout
- Key

To change the layout of a bar chart:

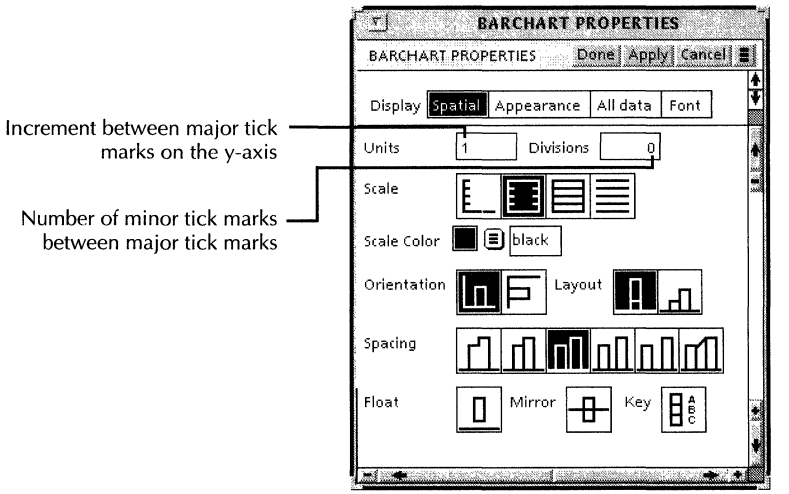
1. Select the bar chart, and press PROPS.
2. Select Spatial for the Display setting.

   The Spatial property sheet for bar charts appears.

3. To change the increment between major tick marks on the y-axis, delete the number in the Units box, and enter a different number. For example, if you enter 5, each successive major tick mark represents a change of five units (5, 10, 15, and so on).

   When you first build a chart, the units on the y-axis are generated automatically according to the range of numbers in your table.

   ✦ **Note:** If you specify an increment so small that it places too many numbers along the y-axis, GV Chart automatically chooses a larger increment.✦



4. To specify the number of minor tick marks between major tick marks on the y-axis, delete the number in the Divisions box, and enter a different number. Divisions are the spaces between major tick marks and minor tick marks.

   To display no minor tick marks, enter 0 or 1.

5. Select a Scale property to change the style of the y-axis.
6. Select a Scale Color property to change the color of the x- and y-axes.
7. Select an Orientation property to change the bars to horizontal or vertical orientation.

8. Select a Layout property to determine whether the bars are stacked on top of each other or placed side by side.

   The Layout property appears in the property sheet when the chart contains more than one bar set.

9. Select a Spacing property to change the spacing between the bars.

   The first Spacing property is not available in this release. The other five choices specify increasing amounts of space between the bar sets. As the amount of space increases, the bars become narrower. The last Spacing choice spaces the bars apart and uses lines, or ramps, to connect bars in the bar set.

10. Select the Key property if you want a key showing the labels and shading of each bar set. The key appears in the upper right corner of the chart.

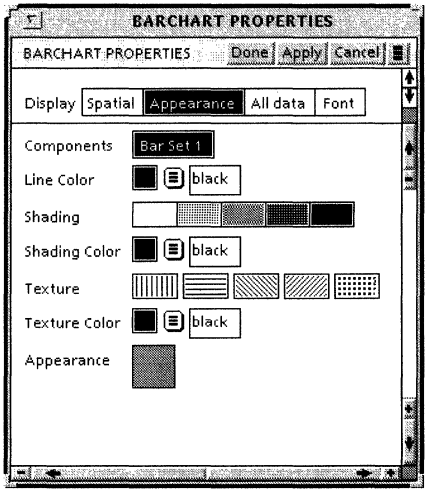
11. Select Done.

Changing the shading and texture of bar chart elements

To change the shading and texture of bar chart elements:

1. Select the bar chart, and press PROPS.
2. Select Appearance for the Display setting.

   The Appearance property sheet for bar charts appears.



3. Select the bar set you want to change for the Components property.

   If the bar sets do not have labels, the system supplies the names (Bar Set 1, Bar Set 2, and so on).

4. Select a Line Color property to apply to the bar set outlines.

5. Select a Shading property.

6. Select a Shading Color.

   You can select a different color than black or white when you select the last Shading option (black).

7. Select a Texture property.

   Look at the Appearance box to see what the shading and texture combination looks like. Modify the shading and/or texture if needed.

8. Select a Texture Color.

   You can select a different color than black or white when you select the last Shading option (black).

9. Repeat steps 3-8 for each bar set you want to change.

10. Select Done.

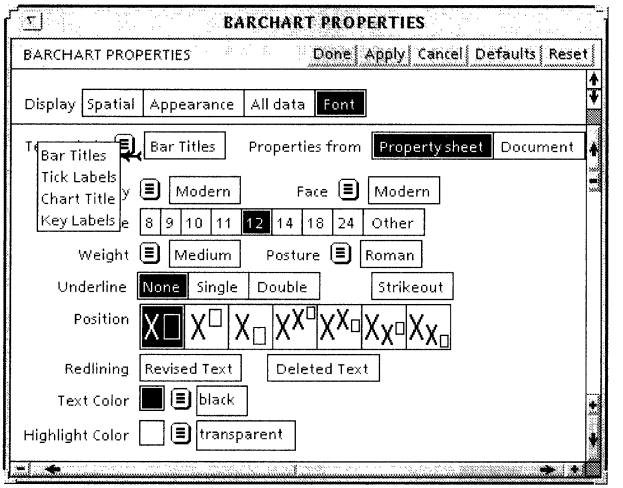
Formatting bar chart labels

The labels of a bar chart come from the table that generates the chart. Whether the table is in the document or in the property sheet, the bar chart labels can be formatted independently of the table.

To format bar chart labels:

1. Select the bar chart, and press PROPS.
2. Select Font for the Display setting.

   The Font property sheet for bar charts appears.



3. Select the Text Label to format from the Text Labels menu.

   For bar charts, you can format the following Text Labels:

   - Bar titles
   - Tick labels
   - Chart title
   - Key labels

   If the Properties From property does not appear, the Text Label you selected can only be formatted by the property sheet, not from the document table.

4. Do one of the following:
   - If you want the label to appear as it does in the document table, select Document for the Properties From property.
   - If you want to format the label using this property sheet, select Property Sheet for the Properties From property.
5. Select font properties to format the chart text.
6. Select Done.

Editing a pie chart

You can edit the layout properties of a pie chart, such as the line width and whether the pie chart slices are adjoining or separated.

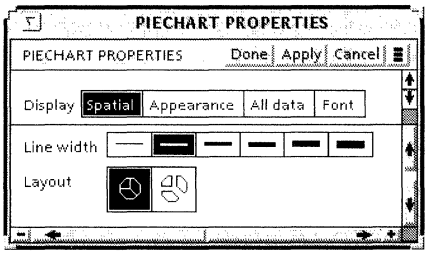
You can also edit the shading and texture of individual pie chart elements and the text of the chart labels.

Changing the layout of a pie chart

To change the layout of a pie chart:

1. Select the pie chart, and press PROPS.
2. Select Spatial for the Display setting.

   The Spatial property sheet for pie charts appears.



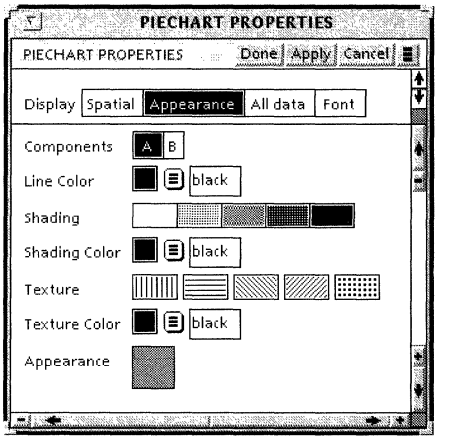
3. Select a Line Width property to change the line width.
4. Select adjoining or separated pie slices for the Layout property.
5. Select Done.

Changing the shading or texture of pie slices

To change the appearance of pie chart elements:

1. Select the pie chart, and press PROPS.
2. Select Appearance for the Display setting.

   The Appearance property sheet for pie charts appears.



3. Select the pie slice you want to change for the Components property. If the pie slices do not have labels, the system supplies the names (A, B, C, and so on).
4. Select a Shading property.
5. Select a Texture property.

   Look at the Appearance box to see what the shading and texture combination looks like. Modify the shading and texture if needed.
6. Repeat steps 3-5 for each pie slice you want to change.
7. Select Done.

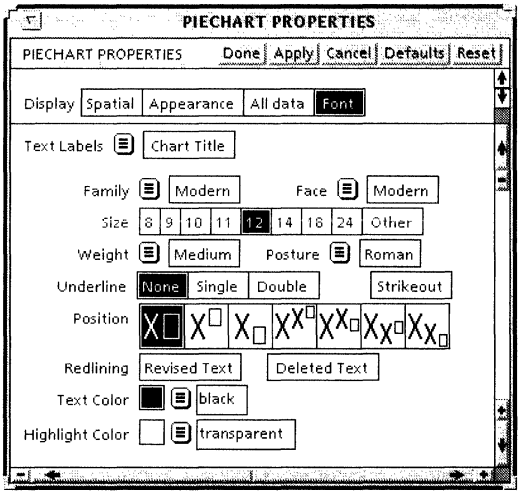
Formatting pie chart labels

The labels of a pie chart come from the table that generates the chart. Whether the table is in the document or in the property sheet, the pie chart labels can be formatted independently of the table.

To format pie chart labels:

1. Select the pie chart, and press PROPS.
2. Select Font for the Display setting.

   The Font property sheet for pie charts appears.



3. Select the Text Label that you want to format.

   For pie charts, you can format the following Text Labels:

   - Chart title
   - Slice labels

4. Select Chart Title.
5. Select font properties to format the Chart Title, then select Apply.
6. Select Slice Labels and do one of the following:

   - If you want the slice labels to appear as they do in the document table, select Document for the Properties From property.
   - If you want to format the slice labels using this property sheet, select Property Sheet for the Properties From property.

7. Select font properties to format the slice labels, then select Done.

Editing a line chart

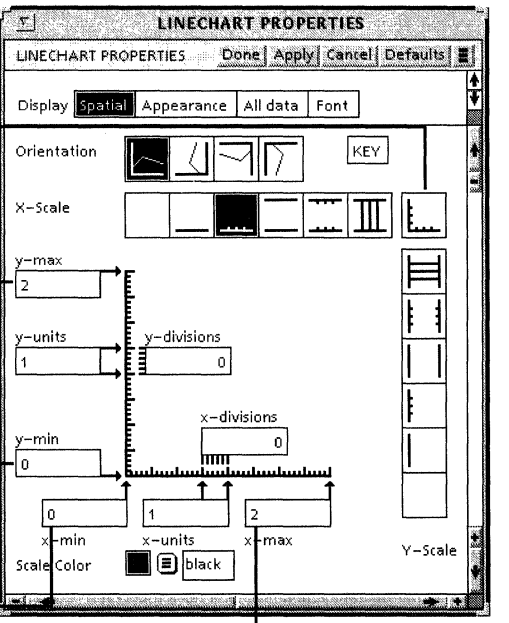
You can edit the following layout properties of a line chart:

- The style of the chart axes
- The chart orientation
- The style of each line or set of points
- Whether the chart includes an explanatory key

You can also edit the appearance of individual line chart elements, such as data points and connecting lines, and font properties of the chart labels.

Changing the layout of a line chart

You can change layout properties of a line chart using the Spatial setting of the Line Chart property sheet.



This box shows the combination of X-Scale and Y-Scale properties. Select Apply to see the changes on the chart.

The y-max value you enter must be equal to or greater than the largest value in the table.

The y-min value you enter must be equal to or less than the smallest value in the table.

If your x-axis labels contain text instead of numbers, entries for the x-min, x-units, and x-max properties have no effect.

The x-min value you enter must be equal to or less than the smallest value in the table.

The x-max value you enter must be equal to or greater than the largest value in the table.

To change the layout of a line chart:

1. Select the line chart, and press PROPS.
2. Select Spatial for the Display setting.
3. Select an Orientation property.

   This orientation displays every part of the chart except the key.
4. Select the Key property to display a key that shows the labels and appearance of the line sets or point sets.

   ✦ **Note:** If the key appears, but does not contain labels, it is because the table does not contain labels. You need to enter text in the table column headers or first column, depending on what you select for the Data Set Is property.✦
5. Select an X-Scale and a Y-Scale property to specify the style of the x- and y-axes.
6. Change the x-max and y-max values to change the maximum values on the x- and y-axes.

   You can choose to round up the values that appear in the x-max and y-max boxes so the scales have even increments.
7. Change the x-min and y-min values to change the minimum values on the x- and y- axes.

   You can choose to round down the values that appear in the x-min and y-min boxes, or even set them to zero, so the scales have even increments.
8. Change the x-units and y-units values to change the increment between major tick marks on the x- and y-axes. For example, if your y-scale values range from zero to 50 units, and you want a tick mark every 10 units, enter 10 for the y-units value.

   Changing the units also changes the axis labels.

   ✦ **Note:** If you specify an increment so small that it places too many tick marks along the axis, GV Chart chooses a larger increment.✦
9. Change the x-divisions and y-divisions values if you want to change the number of divisions between major tick

marks on the x- and y-axes. Minor tick marks identify the divisions.

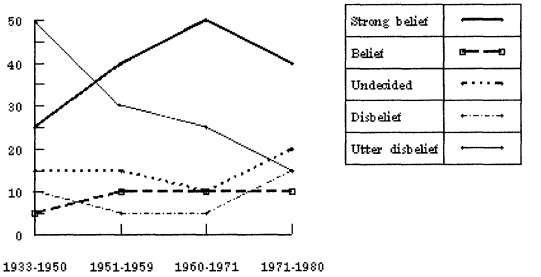
To display no tick marks, enter 0 or 1.

10. Change the Scale Color property, if you want.
11. Select Done.

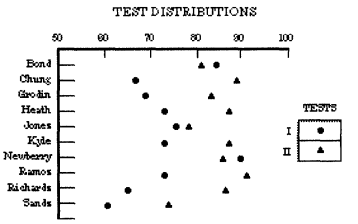
Changing the appearance of line and data point chart elements

There are two kinds of line charts: regular line charts and data point charts. This section contains one procedure for changing both line chart and data point chart elements, and a procedure for changing a line chart to a data point chart.

Line chart showing lines connecting data points



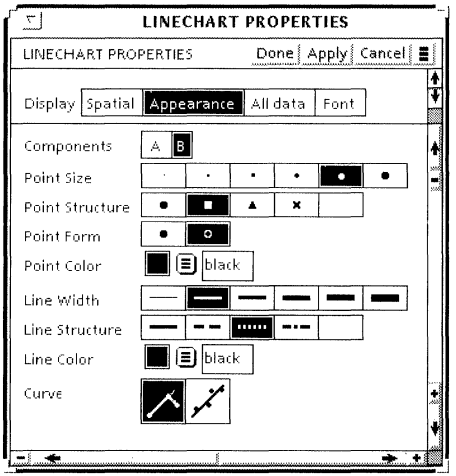
Data point chart without lines connecting data points



To change the appearance of line chart elements:

1. Select the chart, and press PROPS.
2. Select Appearance for the Display setting.

   The Appearance property sheet for line charts appears.



3. Select the line set you want to change for the Components property. If the line sets do not have labels, the system supplies the names (A, B, C, and so on).
4. Select a point size for the Point Size property.
5. Select a point shape for the Point Structure property.

   If you do not want points to appear with the lines in the chart, select the blank property.

   ✦ **Note:** You cannot select the blank property for both Point Structure and Line Structure properties.✦
6. Select a hollow or solid point for the Point Form property.
7. Select a line width for the Line Width property.
8. Select a solid, dotted, or dashed line for the Line Structure property.

   If you select the blank property, GV Chart builds a data point chart. You cannot select the blank property for both Point Structure and Line Structure properties.
9. Do one of the following:

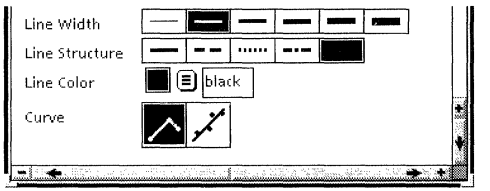
   - If you want the line to join each of the points, select the first value for the Curve property.

- If you want to indicate the best fit of a straight line through the points, select the second value for the Curve property.

10. Select Done.

To change a line chart to a data point chart:

1. Select the chart, and press PROPS.
2. Select Appearance for the Display setting.
3. Select a point size for the Point Size property.
4. Select a point shape for the Point Structure property.
5. Select a hollow or solid point for the Point Form property.
6. Select blank for the Line Structure property.



7. If you want to indicate the best fit of a straight line through the points, select the second value for the Curve property.
8. Select Done.

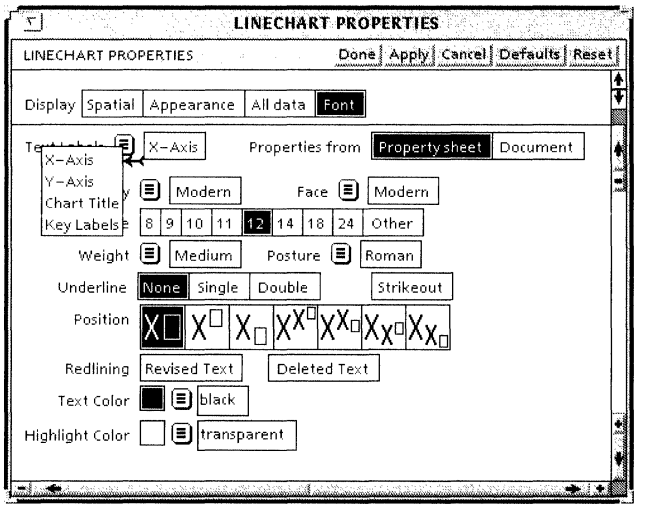
Formatting line and data point chart labels

The labels of a line and data point chart come from the table that generates the chart. Whether the table is in the document or in the property sheet, the line chart labels can be formatted independently of the table.

To format line and data point chart labels:

1. Select the line chart, and press PROPS.
2. Select Font for the Display setting.

   The Font property sheet for line charts appears.



3. Select the Text Label that you want to format.

   For line charts, you can format the following Text Labels:

   - X-axis
   - Y-axis
   - Chart title
   - Key labels

   If the Properties From property does not appear, the Text Label you selected can only be formatted by the property sheet, not from the document table.

4. Do one of the following:

   - If you want the label to appear as it does in the document table, select Document for the Properties From property.
   - If you want to format the label using this property sheet, select Property Sheet for the Properties From property, and format the text.

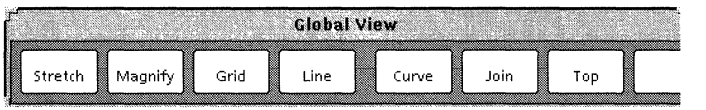
5. Select Done.

Changing individual chart elements

A chart is a special type of graphics cluster or collection of joined objects. Each chart element—bar set, pie slice, point set, line set, or label—is an object that can be changed as other GV Draw objects can be changed.

When you create a chart, GV Chart automatically positions and shades each element.

You can split a chart into its component parts using the JOIN soft key in the Draw soft keys.



Draw soft keys

When you use JOIN to split a chart, each chart element becomes a distinct object. You can select and modify the appearance of each object using its associated property sheet. See the "Using GV Draw" chapter in the *GLOBALVIEW Write and Draw User Guide* for information about the property sheets associated with shapes, points, and lines.

Following are some modifications you can make by splitting the chart elements.

- Change the properties of bar sets, pie slices, point sets, line sets, or labels.
- Move the explanatory key within the chart.
- Move the labels.
- Adjust the spacing between bars on a bar chart.
- Delete bars, pie slices, or lines.
- Enlarge a text frame for a chart label so all the text is visible.

When you finish modifying the individual elements, you can join them into a chart again by pressing JOIN.

✦ **Note:** Changing individual chart elements does not affect table data. These changes are temporary and are removed the

next time you generate the chart. To make permanent changes to a chart, you must modify the table data.✦

To change individual chart elements:

1. Select the chart, and press JOIN.

   The control points disappear, and the following message appears: "This chart has been split."

2. Select a chart element you want to modify. Press PROPS, MOVE, COPY, DELETE, or one of the function keys, depending upon how you want to modify it.

3. Repeat step 2 until you have modified all the elements you want.

4. When you finish modifying the chart, rejoin it by selecting a single chart element and pressing JOIN.

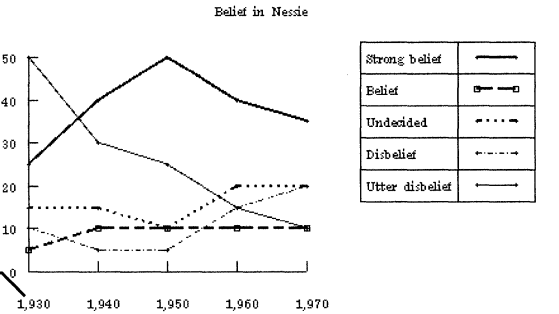
   The control points reappear and the following message appears: "This chart has been joined."

   ✦ **Note:** If you select more than one element and press JOIN, you create a graphics cluster of those elements rather than rejoining the entire chart. If this occurs, select the graphics cluster and press JOIN again. Then select one chart element and press JOIN.✦

5. Select Done.

Changing numeric labels in line charts to regular text

In line charts, you may need to change numeric labels so they are treated as text instead of as numbers. For example, if the x-axis of a line chart is derived from dates (1980, 1990, and so on), GV Chart automatically generates those dates as numbers, which causes the dates to appear with commas separating the first and second digits.



Dates appear with commas separating the first and second digits

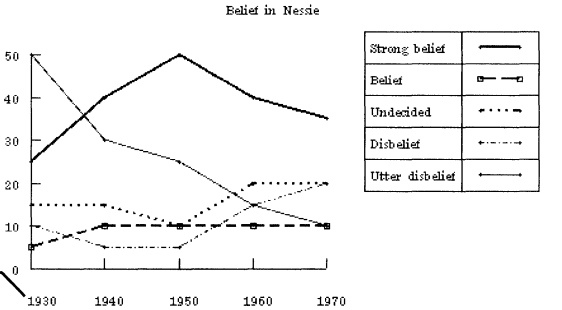
You can avoid this by inserting a space character before the numbers inside the table generating the chart. You only have to enter the space character in the first cell. This changes the label type from numeric to text and stops the software from automatically generating the numeric labels.

To change numeric labels to regular text:

- Do one of the following:
  - If your chart is generated by a table in a document, add a non-breaking space character to the first cell in the table by pressing KEYBOARD+SPECIAL+W. Update the chart following the instructions in the next section.
  - If your chart is generated by a table in a chart property sheet, add a thin space character to the first cell in the table by pressing KEYBOARD+OFFICE+O.

Non-breaking space or thin space inserted in first entry of first label

	Strong belief	Belief	Undecided	Disbelief	Utter disbelief
1930	25	5	15	10	50
1940	40	10	15	5	30
1950	50	10	10	5	25
1960	40	10	20	15	15
1970	35	10	20	20	10



Dates appear correctly, without commas separating the numbers

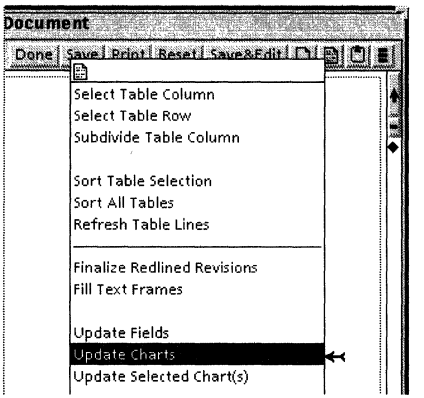
Updating charts

The way you update a chart depends on whether the table driving the chart is in the Chart property sheet or in a separate table inside your document.

If the chart is generated by a property sheet table, the chart updates automatically whenever you edit the table in the property sheet. When you close the property sheet, the chart updates to reflect the new data in the table.

If the chart is generated by a table in the same document, and you change the data in the table, you must manually update the chart using the Update Charts or Update Selected Chart(s) command in the Content menu. The Update Charts command updates all of the charts in your document. If a single table drives more than one chart, selecting Update Charts updates all of the charts related to that table.

If you want to update one or a few charts without updating all the charts in your document, use the Update Selected Chart(s) command.



To update all the charts in your document:

1. Edit the table(s) if you haven't already done so.
2. Select Update Charts in the Content menu.

To update one or a few charts in a document:

1. Edit the table(s) driving the chart(s) if you haven't already done so.
2. Select the chart or charts you want to update.

   To update more than one chart, select the first chart, then click the Adjust mouse button on the other charts.
3. Select Update Selected Chart(s) in the Content menu.

   The charts are updated automatically.

Changing the defaults for charts

Change defaults for pie charts and bar charts by editing entries in the Chart PieSlice Defaults section and the Documents section of your User Profile. To add or change entries in your User Profile, refer to the "User Profile options for documents" chapter in the *GLOBALVIEW Write and Draw User Guide*.

In the following list of User Profile entries, each entry is followed by a colon, one space, and the preset default. Options for the default value appear on the next line preceded by two dashes. Explanations follow options that might not be self-explanatory.

To change the preset default, replace it with one of the other options shown for the entry.

Changing pie chart defaults

Changing the following entries in the Chart PieSlice Defaults section of the User Profile changes the options displayed in the Pie Chart property sheet.

[Chart PieSlice Defaults]

Border Width: Width2
--Width2|Width1|Width3|Width4|Width5

> Use this entry to set the Line Width of your pie slice borders. You can choose Width1, Width2, Width3, Width4, Width5, or Width6.

The following shading and texture choices can be used together to create a different appearance for a pie slice that you select. To apply the choices, you must first log off, then log back on. Then, select the pie chart, and select Appearance for the Display setting. Select the pie slice to which you want to apply the default properties, and select Defaults in the property sheet window header.

Shading: White
--White|25% Gray|50% Gray|75% Gray|Black

Vertical Texture: False
--False|True

Horizontal Texture: False
--False|True

UpperLeft-LowerRight Texture: False
--False|True

LowerLeft-UpperRight Texture: False
--False|True

Dotted Texture: False
--False|True

Changing bar chart defaults

Change the following entry in the [Documents] section of the User Profile to control how the y-axis expands when the tallest bar reaches the top of the y scale.

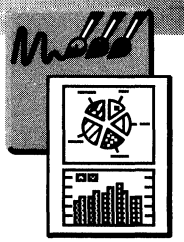
Expand Bar Chart If Highest Bar: Is Within Half Unit Of Top Of Scale

--Is Within Half Unit Of Top Of Scale|Exceeds Top Of Scale|Meets Or Exceeds Top Of Scale

Is Within Half Unit Of Top Of Scale—Expands the y-axis of the bar chart if the highest bar extends past half of the highest unit. For example, if the highest unit is 100, and the highest bar reaches to 96, y-axis expands.

Exceeds Top Of Scale—Expands the y-axis only when the highest bar exceeds the top of the y scale. For example, if the highest y-axis unit is 100, and the highest bar is 101, the y-axis expands. If the highest bar is 100, the y-axis doesn't expand.

Meets Or Exceeds Top Of Scale—Expands the y-axis when the highest bar meets or exceeds the top of the y scale. In this case, a setting of 100 for the highest bar causes the scale to expand when the highest y-axis unit is 100.



A. Glossary

automatic masking Automatic masking makes a shape opaque while making all of the areas of the brush around the shape transparent according to system-defined variables. You can select your own masking pattern using the Select option for masking.

bar set A group of bars in a bar chart.

best fit chart A data point chart that has a single straight line showing where most of the data points converge.

bitmap An image composed of dots or pixels. Each dot is assigned one of two values: black or white.

bitmap frame Allows you to place raster and bitmap graphics created using GV Paint into GLOBALVIEW documents.

brightness The amount of black or gray mixed with a color. It is the lightness or darkness of a color, usually measured as a percentage with white being 0% at the top of the value scale, and black, 100% at the bottom end of the scale.

brush In a GV Paint canvas, a tool for creating, copying, and erasing parts of an image. Brushes can be created or selected from any source in the workspace. GV Paint also supplies a set of brushes.

color palette In a color GV Paint canvas, changes the color of the current brush.

contrast Created when colors differ from each other in hue, saturation, and value (or any combination of them). The stronger the contrast, the greater the visibility. For example, the strongest contrast is black type on white paper, since both colors are at opposite ends of the value scale.

cross-hair cursor Appears when you select inside a GV Paint canvas. Helps you locate your position in the canvas.

cyclic symmetry In a GV Paint canvas, arranges a specified number of symmetrical copies of your drawing in a circle. When you move the mouse clockwise, the symmetrical copies also move clockwise.

data point chart Shows just the data points used to generate a chart. Represents data without trend information and shows data points in relation to each other.

data set In GV Chart, the data set you choose specifies how information in the table generating the chart is used to create the axes and keys of a chart. The data set can be the rows or the columns of the table. For example, when you select columns for the data set in a bar chart, the x axis labels are generated from the entries in the first column of the table, and the bars are built from the table rows.

dither matrix When converting a color canvas to a black and white canvas, the system uses a matrix of dots, called halftone dots, to simulate the gray value of colors.

draw In a GV Paint canvas, draws a freehand line that follows the path of your brush.

error diffusion When converting a color canvas to a black and white canvas, error diffusion examines each pixel in turn and decides whether it should be black or white.

filtering In a GV Paint canvas, used to blur, sharpen, or outline an image in a canvas.

grouped bar chart A bar chart that is arranged linearly, comparing independent series of elements over a period of time.

halftone Used in the dither matrix method of converting color canvases to black and white canvases, halftones are a matrix of dots that simulate the gray value of colors. Each halftone dot varies in size with the brightness of the original color at that location.

hue In a color GV Paint canvas, hue is the dominant color of a pixel. Hues can be arranged in a color wheel instead of a rainbow, so that the location of a hue on the color wheel can be represented as a number between 0 and 360. Changing the hue for a canvas shifts each of the hues in the canvas around on the color wheel by the same amount.

masking Makes the white areas of a closed shape opaque and the white areas outside a shape clear. See *Automatic masking.*

mirror symmetry In a GV Paint canvas, arranges a specified number of symmetrical copies of your drawing as pairs of mirror images arranged evenly in a circle. When you move the mouse clockwise, one member of each pair moves clockwise and its mirror image moves counter-clockwise.

overlay In a GV Paint canvas, an overlay is a temporary image you can trace. After tracing, you can remove the image without removing the tracing lines.

paint In a GV Paint canvas, draws repeated images of the brush when you hold down the Select mouse button and move the mouse.

pixel In an illustration, the smallest controllable element that can be displayed by a device. Short for picture element.

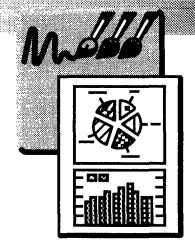
raster format Represents objects as an arrangement of bits, or pixels.

resolution The fineness of detail that can be produced in an image. Determines the size of the pixels when the canvas is printed or displayed in a document. Decreasing the resolution makes the image larger. Increasing the resolution makes the image smaller and less grainy.

saturation The intensity or vividness of a color. For example, a vivid red has a higher saturation than a muddy or dull red.

Special keyboard for Paint Appears when you select in a GV Paint canvas and press KEYBOARD+SPECIAL+SHOW. Contains keys for drawing and editing images in a GV Paint canvas. Each key on the special keyboard is assigned to a soft key in the canvas.

stacked bar chart A bar chart that shows multiple measurements stacked into a single bar set, as opposed to showing the measurements linearly. See *grouped bar chart.*



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