

USING VISIO 3.0



# visio®

**FOR BUSINESS  
GRAPHICS**



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# A new way to draw

You may not be an artist, but you probably communicate through drawings every day. Many people draw ideas, processes, and directions instead of writing them out—pictures are often faster to create and easier to understand than words for the same information.

The Visio™ drawing application enables you to communicate ideas quickly through the powerful medium of drawing. It is designed for business people, people in technical fields, and for everyone else who needs to create high-quality drawings quickly and easily. You don't have to be a graphic artist to use Visio—you just need to know what message you want to communicate and how to use Microsoft Windows.

## Visio basics

Before you start working in Visio, it's helpful to understand the basics of drawing in Visio and how Visio differs from other drawing programs you might have used. The big difference is this: you can create drawings without having to draw.

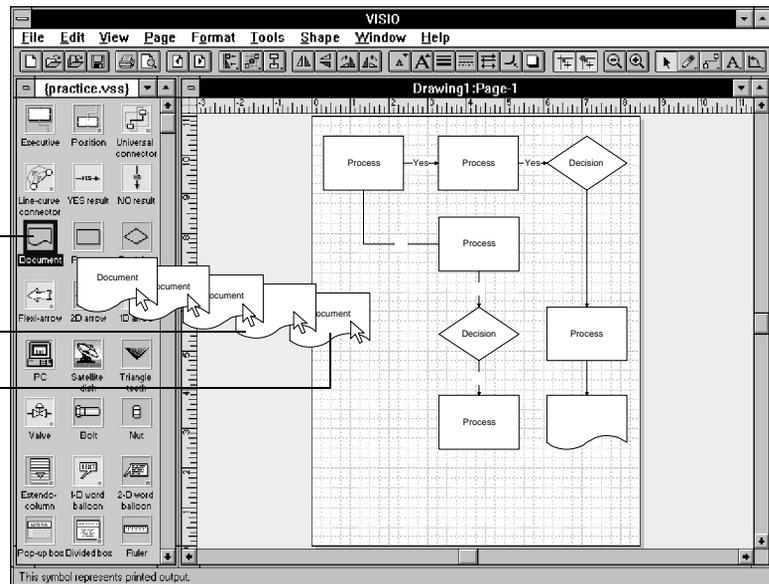
### Drag and drop drawing



Pointer tool

The easiest way to create a drawing in Visio is by dragging shapes from a *stencil* to a drawing page. This method is called drag and drop drawing.

1. Point to a shape on the stencil.
2. Drag the shape into the drawing window.
3. Drop an instance on the page.



Stencils are collections of *master shapes*. When you open a stencil, you see its *master shape icons* on a green background. When you open the drawing window, you see the drawing page—which looks like a piece of paper—on a blue background. You drag a master shape from the stencil to the drawing page and drop an *instance* of the master shape into your drawing.

For details about dragging and dropping master shapes, see Chapter 2, “Adding, arranging, and connecting shapes.”

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### *Stencils and templates*

You can open a stencil and drawing separately, but the easiest way to start a drawing is with a *template*. A template not only opens the correct stencil and a new drawing file for you, but also sets the drawing scale and copies styles into the new drawing file.

Visio comes with a variety of task-specific stencils, many of which can be opened by a corresponding template. All together, the stencils provided with Visio contain hundreds of master shapes. Use these master shapes as they are, modify them, or create your own master shapes.

For details about starting a drawing with a template, see Chapter 1, “Getting started with Visio.” For details about creating and modifying master shapes, see Chapter 6, “Creating masters, stencils, templates, and styles.”

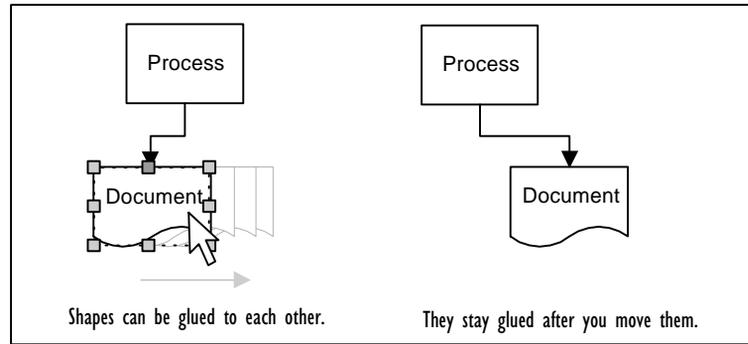
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### *SmartConnectors and glue*

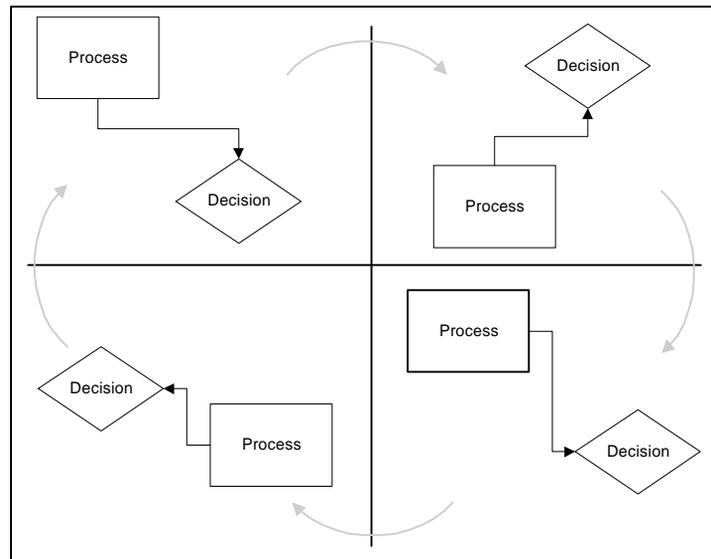


Connector tool

SmartConnectors are one-dimensional master shapes designed for connecting shapes in flowcharts, organization charts, and other drawings. There are several ways to add SmartConnectors to a drawing: You can drag and drop a SmartConnector master shape or add SmartConnectors automatically using the connector tool or the Connect Shapes command. When you move the shapes the SmartConnector is attached to, the shapes stay connected and Visio flips the connector line or redraws it to avoid crossing over the shapes.



You can also attach SmartConnectors to shapes using *dynamic* glue. If you move a shape attached to a connector with dynamic glue, the connector moves and reglues itself to the nearest connection point given the shape's new location.



With dynamic glue, connectors can move between connection points so connectors don't cross over shapes.

For details about connecting shapes, see Chapter 2, “Adding, arranging, and connecting shapes.”

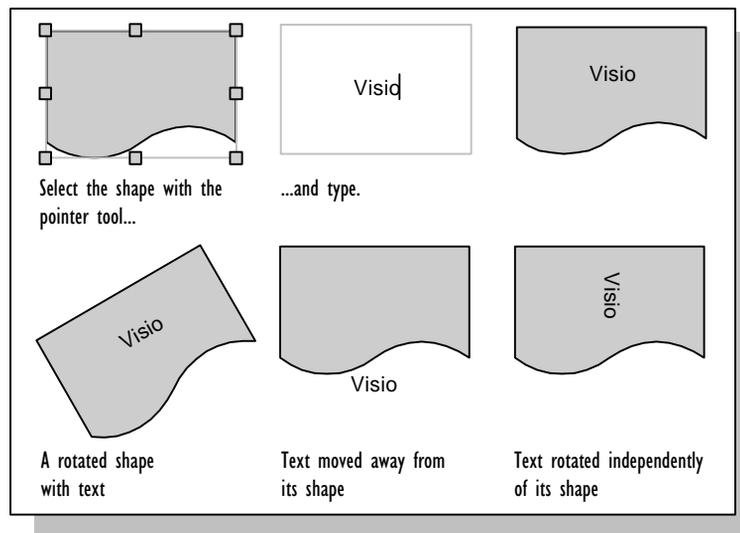
### Click and type text



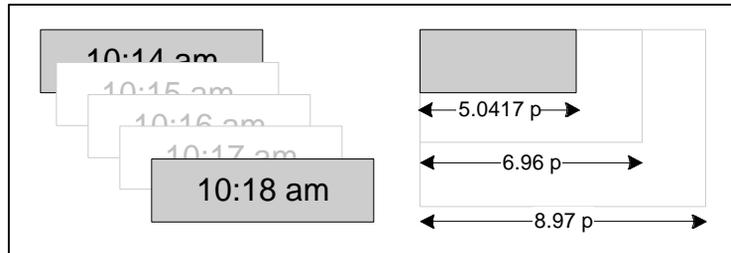
Text tool

Every shape, including lines and connectors, can have text. To add text to a shape, you click the shape and then type. That's all. To add a title or other text not associated with a shape, you click with the text tool where you want to start the text and then type.

When you rotate or move a shape, its text rotates and moves with it. But you can also rotate and move a shape's text independently of the shape.



Visio also has dynamic *fields* that update automatically. You can include fields in a drawing to hold information that's laborious to update by hand. For example, a field can contain the current date and time, or dimension information for a dimension line.



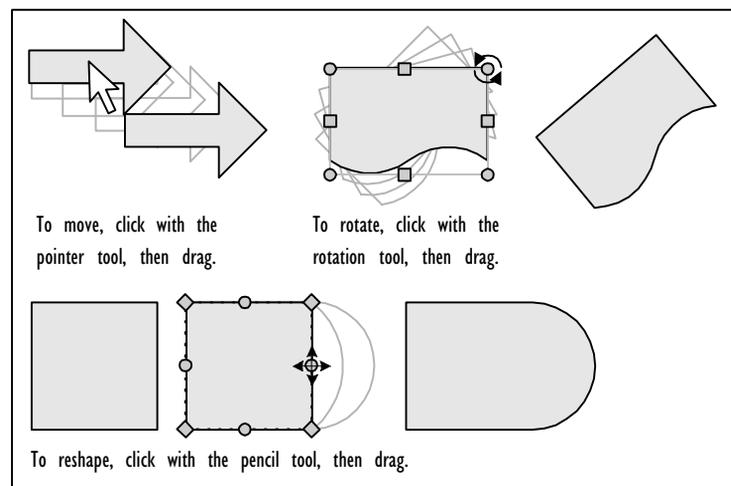
For details about working with text and fields, see Chapter 4, “Adding text to drawings.”

### Click and drag editing



Rotation tool

When you want to edit a shape, you just grab a part of the shape and move it to where you want it. For example, to rotate a shape, click the shape with the rotation tool, grab one of the rotation handles, and then drag until the shape is oriented on the page the way you want. To change the shape of a shape—even to change a line segment of a shape into an arc segment—grab the appropriate vertex or control point and drag it to where you want it.



For details about moving and editing shapes, see Chapter 2, “Adding, arranging, and connecting shapes,” and Chapter 3, “Creating shapes.”

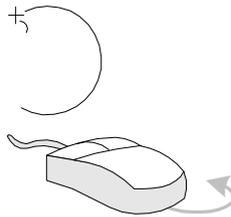
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### *Streamlined drawing tools*

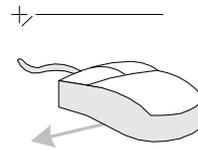


Pencil tool

You don't have to use the master shapes on stencils. You can draw your own shapes or use a combination of the master shapes and the shapes you draw. You can also save the shapes you draw as master shapes.



Curved movements create arcs.



Straight movements create lines.

In other drawing programs, you might have used tools similar to the Visio line, arc, rectangle, and ellipse drawing tools. Visio also includes an all-purpose drawing tool: the pencil tool.

The pencil tool is especially powerful because you can use it to draw both lines and arcs. As you begin to move the mouse, Visio quickly calculates the path the mouse pointer is traveling. If you move the mouse along a straight path, Visio draws a line; if you move the mouse along a curved path, Visio draws an arc.

For details about drawing your own shapes, see Chapter 3, “Creating shapes.”

### Extensive OLE 2.0 support

Visio supports Windows object linking and embedding (OLE), which lets you create an active link between applications. That means you can insert Visio drawings directly into reports, memos, and presentations without tedious conversions, and edit them in place. You can also insert objects from other Windows applications into Visio drawings and run the application from within Visio to edit the object. And you can control Visio through programs written in languages that support OLE Automation, such as Visual Basic. For details, see Chapter 7, “Using Visio with other applications” and Chapter 9, “Writing programs to control Visio.”

### SmartShapes

Every Visio shape is more than just a piece of clip art (although Visio comes with clip art as well). Each shape is backed by a ShapeSheet™ spreadsheet that contains information about the shape’s geometry and other properties. You can change information in a ShapeSheet to make a Visio shape smart—in other words, to create a Visio SmartShape™ shape.

| Drawing2:Page-1:Sheet.1 |             |              |            |
|-------------------------|-------------|--------------|------------|
| <b>Object Transform</b> |             |              |            |
| Width                   | 1.5000 in.  | PinX         | 4.2500 in. |
| Height                  | 1.5000 in.  | PinY         | 8.0000 in. |
| Angle                   | 0.0000 deg. | LocPinX      | 0.7500 in. |
| FlipX                   | FALSE       | LocPinY      | 0.7500 in. |
| FlipY                   | FALSE       | ResizeMode   | 0          |
| <b>Geometry 1</b>       |             |              |            |
|                         |             | X            | Y          |
| 1                       | Start       | 0.0000 in.   | 0.0000 in. |
| 2                       | LineTo      | 1.5000 in.   | 0.0000 in. |
| 3                       | LineTo      | 1.5000 in.   | 1.5000 in. |
| 4                       | LineTo      | 0.0000 in.   | 1.5000 in. |
| 5                       | LineTo      | 0.0000 in.   | 0.0000 in. |
| <b>Events</b>           |             |              |            |
| TheData                 | No Formula  | EventDbClick | No Formula |
| TheText                 | No Formula  | EventXFMd    | No Formula |

ShapeSheet

SmartShapes are shapes designed to act the way you need them to in a particular context. SmartShapes minimize your work. For example, Visio's SmartConnectors automatically flip themselves depending on which way you drag them, and many of the arrows can be stretched without distorting the arrowheads.

For details about the ShapeSheet, see Chapter 8, "Using ShapeSheets to create SmartShapes."

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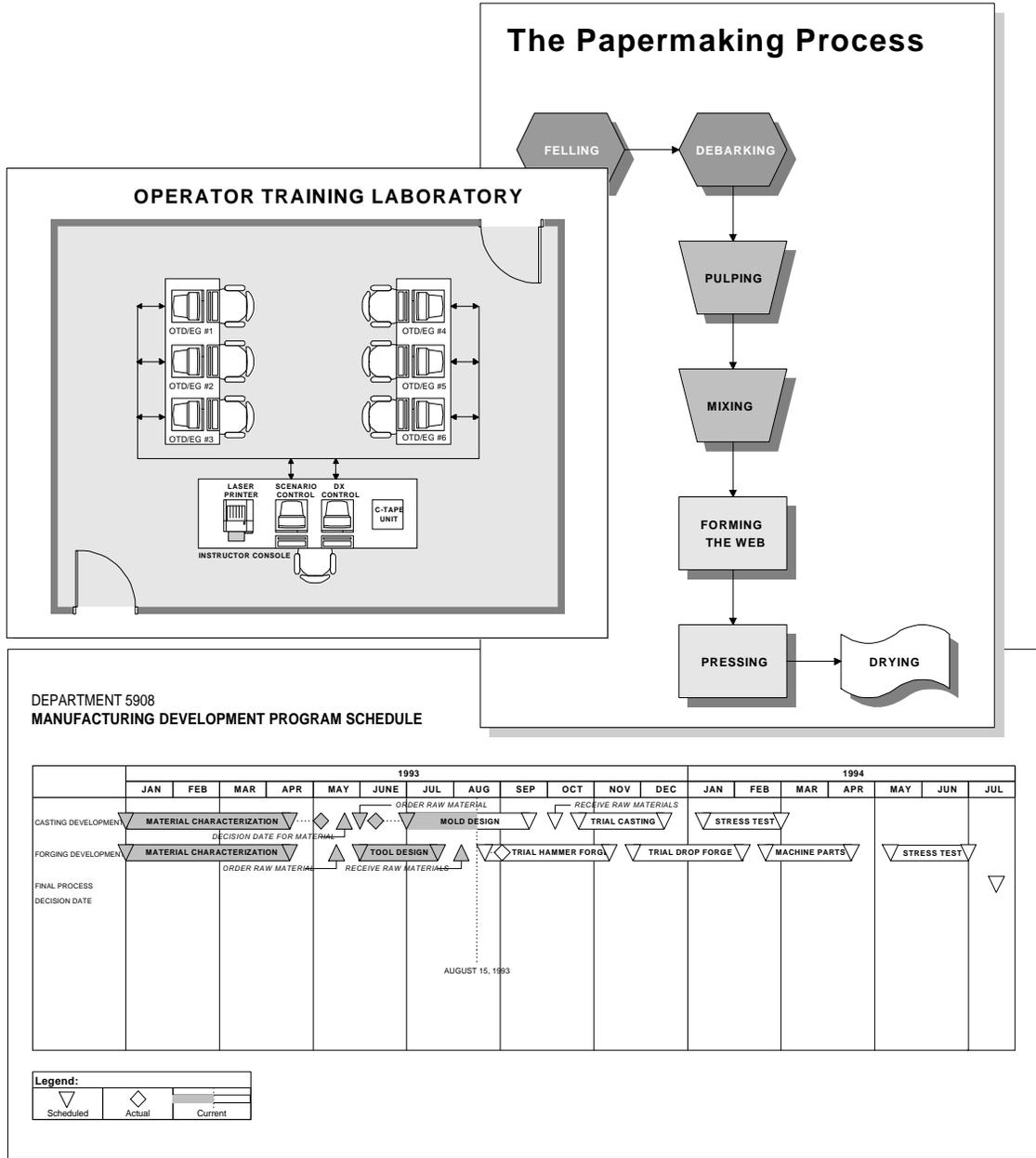
### *Familiar toolbars and menus*

For maximum productivity, Visio lets you choose the working environment that's most familiar to you. You can use Visio's standard menus and toolbars, or you can use menus and toolbars that resemble Microsoft Office or Lotus SmartSuite applications. You can easily switch from one toolbar and menu set to another by moving the pointer to the toolbar at the top of the Visio window, clicking the right mouse button, and then choosing the option you want.

For details about switching between Visio's toolbar and menu sets, see Chapter 1, "Getting started with Visio."

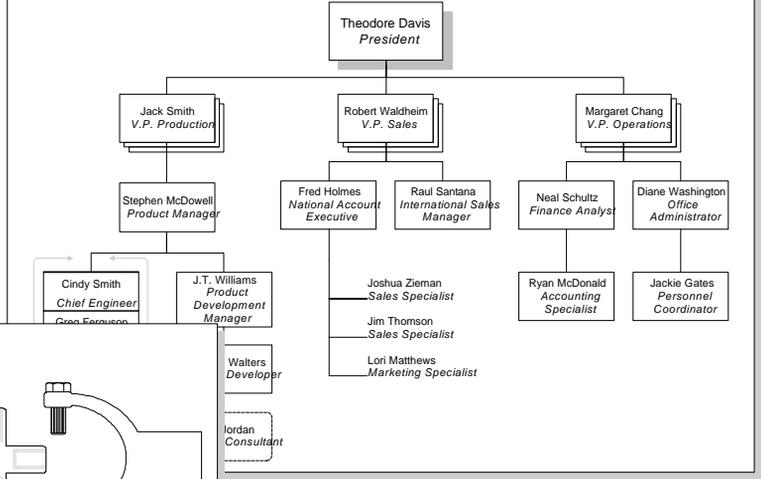
## Gallery of Visio drawings

Visio is designed to create a wide range of drawings, from organization charts to space plans and maps. The drawings in this section were created using Visio stencils and tools.

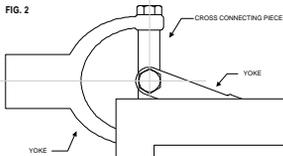
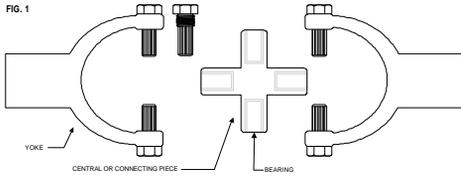




Organization Chart



UNIVERSAL JOINT



**Foods from Greece Promotion**

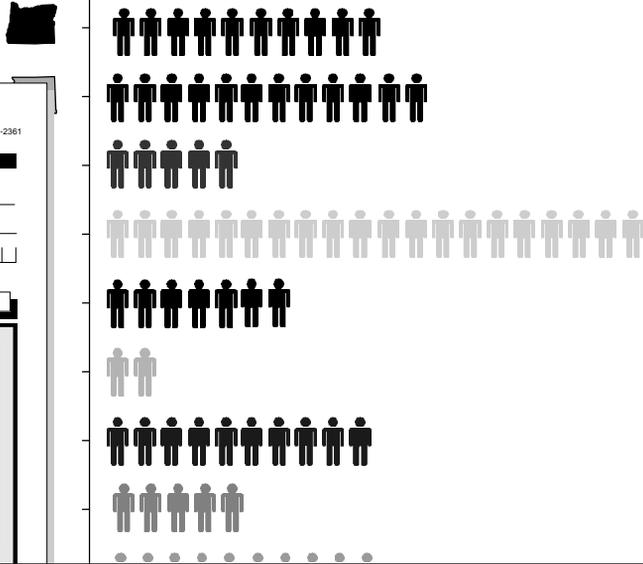
| Mia's Travel Itinerary | May 17 |   |   |   | May 24 |   |   |   | May 31 |   |   |   | June 7 |   |   |   | June 14 |   |   |   | June 21 |   |   |   | June 28 |   |   |   |   |   |   |   |   |   |   |  |
|------------------------|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---|---|---|---|---|---|---|--|
|                        | S      | M | T | W | T      | F | S | S | M      | T | W | T | F      | S | S | M | T       | W | T | F | S       | S | M | T | W       | T | F | S | S | M | T | W | T | F | S |  |
| New York to Chicago    |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| Detroit                |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| Denver                 |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| San Francisco          |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| Los Angeles            |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| Phoenix                |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| Dallas                 |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |
| New York               |        |   |   |   |        |   |   |   |        |   |   |   |        |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |   |   |   |   |   |   |   |  |

**Legend:**

|         |           |                |
|---------|-----------|----------------|
|         |           |                |
| AIRPORT | FOOD SHOW | PROMOTION ENDS |

|   | FRONTIER AIRLINES                       | FLIGHT # |
|---|---|----------|
| A | May 17: Depart 12:06 pm/Arrive 1:55 pm  | 1208     |
| B | May 24: Depart 8:30 am/Arrive 9:45 am   | 6902     |
| C | May 27: Depart 7:30 am/Arrive 1:20 pm   | 4520     |
| D | June 2: Depart 6:45 am/Arrive 10:01 am  | 699      |
| E | June 10: Depart 11:34 pm/Arrive 1:04 am | 5002     |
| F | June 21: Depart 9:09 am/Arrive 11:14 am | 3222     |
| G | June 28: Depart 2:23 pm/Arrive 10:52 pm | 9698     |

### Western State Populations



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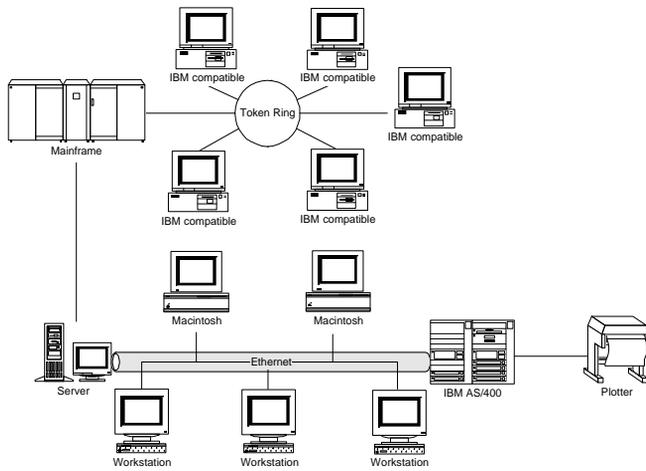
**client information**

name: \_\_\_\_\_  
address: \_\_\_\_\_  
phone: \_\_\_\_\_ credit card: | | | | | | | | | |

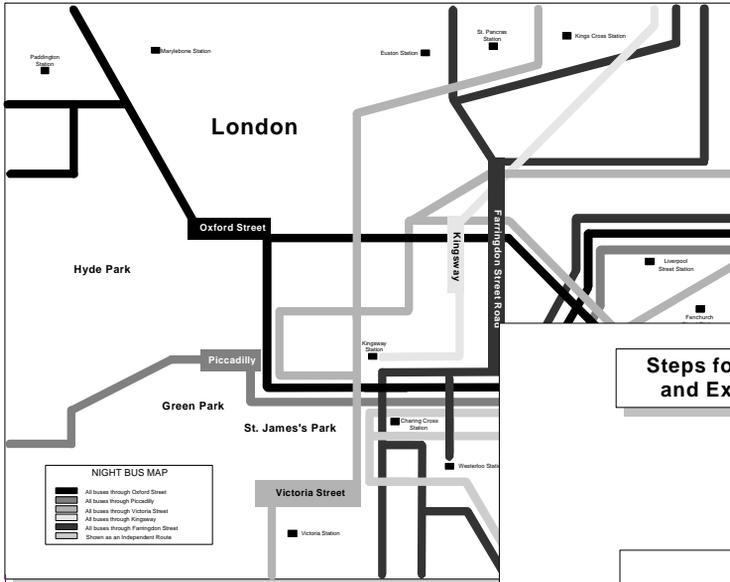
**destination and details**

|  |  |
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|  |  |
|  |  |
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|  |  |
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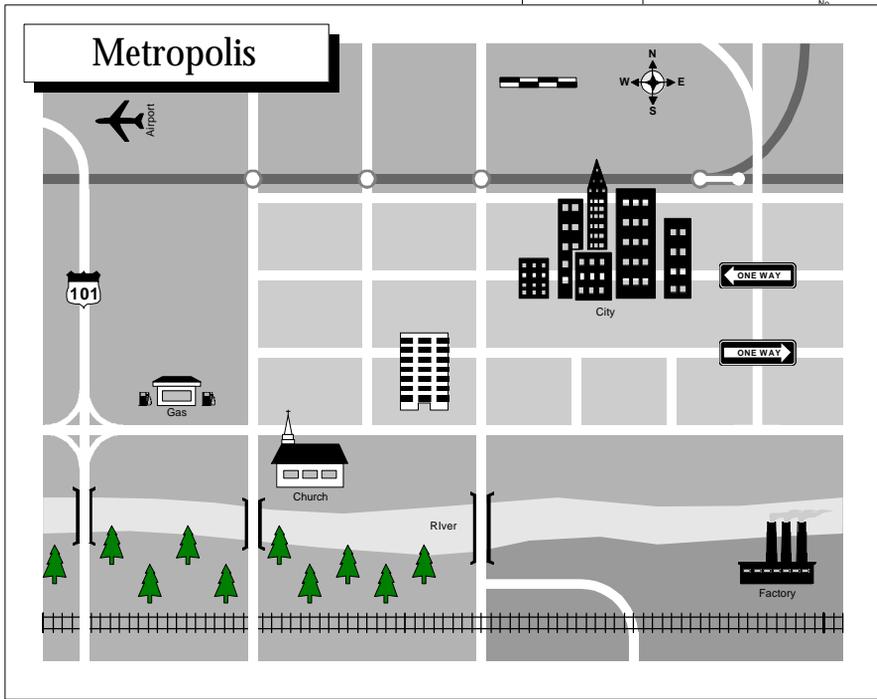
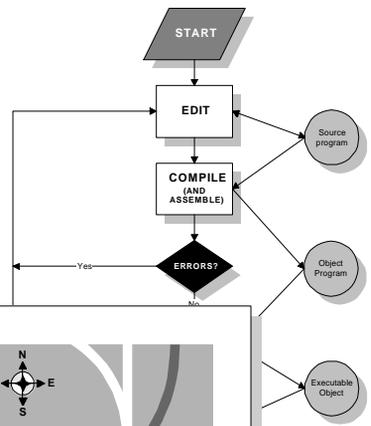
### Network Plan:



PROPULSION RESEARCH DEPARTMENT



**Steps for Entering, Compiling and Executing C Programs**



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## About this manual

The following sections cover several conventions and issues you should keep in mind when using this manual.

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### *Illustrations*

Some of the illustrations you see in this manual may vary from what you see on your screen. If so, don't worry. The Visio window content varies depending on whether:

- Your monitor is a VGA or a higher resolution display, and whether it is color or monochrome. The screen shots in this manual were produced using a Super VGA display with 800 x 600 pixel resolution. If you use another resolution, your screen will look different.
- Your Visio window is sized large or small.
- You are working with text or graphics.
- The drawing or stencil window, or the window for ShapeSheets, is active.
- Whether you're using Visio's standard, Microsoft Office, or Lotus SmartSuite menu and toolbar set.

Most shapes used in the illustrations come from the Practice stencil, which ships with all Visio products. However, you may occasionally see shapes you don't recognize. Those shapes may be from a stencil that's not included in the particular Visio product you're using, or they may be shapes drawn to illustrate a specific point.

Finally, some dialog boxes shown in this manual contain Browse and Network buttons, which are features of Windows for Workgroups. If you don't use Windows for Workgroups, these buttons will not appear in the dialog boxes you see.

---

## *Procedures*

Because the content of the Visio toolbar varies with the resolution of your monitor and the toolbar and menu set you're using, the procedures in this manual refer to menu commands (which are always available). Elements of Visio that provide shortcuts (such as buttons on the toolbar) are suggested as alternatives wherever applicable.

Procedure steps are based on the Visio standard toolbar and menu set. If a step in a procedure varies for the Lotus SmartSuite or Microsoft Office menu set, the alternate step follows the standard step and is preceded by a ❖. If a toolbar button looks different in the Visio standard, Microsoft Office, and Lotus SmartSuite toolbars, each button is illustrated and labeled in the margin.

---

## *Terminology*

It's helpful to understand how the terms shape and object are used in this book and in other Visio documentation.

A shape is a graphic element that you create in Visio, either by dragging and dropping a master shape onto a drawing page, drawing with the drawing tools, grouping other shapes, or converting an object from another application into a Visio shape.

The term shape is used throughout this manual unless reference is made to items from other applications. In that case, the term object is used. Object also has a special meaning in object linking and embedding (OLE) protocol. Object is used only when those topics are being discussed.

---

## Online help

The Visio online help displays helpful information on your computer screen when you press F1, choose a command from the Help menu, or click Help in a dialog box. The online help also contains information that does not appear in *Using Visio*, including a command and tool reference, a programming language reference, and a Shape-Sheet reference.

There are two Help windows. The main window displays a list of topics and command descriptions. The procedure window, which appears to the right of the main window, displays step-by-step instructions for completing tasks. The procedure window opens on top of the Visio window so you can easily follow the instructions on the screen while you work.

For details about Help, choose Using Help from the Help menu.

# 1

Getting started with Visio

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# Getting started with Visio

During a typical work session, you'll probably open at least one stencil and one drawing file. With both of these files open, you can drag master shapes from a stencil to a drawing.

Visio offers several ways to open the files you need. You can:

- Open individual drawing and stencil files.
- Open a template. Each template provided with Visio opens one or more stencils and a new drawing file and copies styles and other settings to the new drawing file.
- Open a file saved as a workspace. This opens all the files that were open when you last saved the workspace file.

This chapter explains how to install Visio, start a work session, open files, and end a work session. It also describes the parts of the Visio window and how to change the window display.

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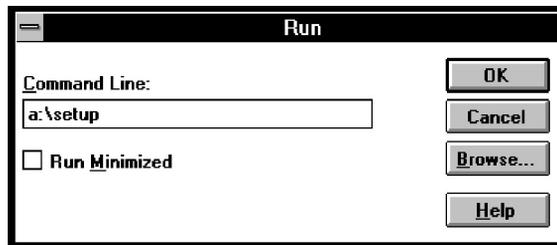
## Installing Visio

If you have not installed Visio, do so now.

### To install Visio:

1. Insert Disk 1-Setup into a disk drive.
2. In Windows Program Manager, choose Run from the File menu.
3. In the Command Line box, type *a:\setup*.

If Disk 1-Setup is in drive B, type *b:\setup*.



4. Choose OK.
5. Follow the instructions on the screen.

For details about installing Visio on a network and information about installation troubleshooting, see the installation card that comes with Visio. For a complete list of the files installed with Visio, see the README.TXT file installed in the Visio directory.

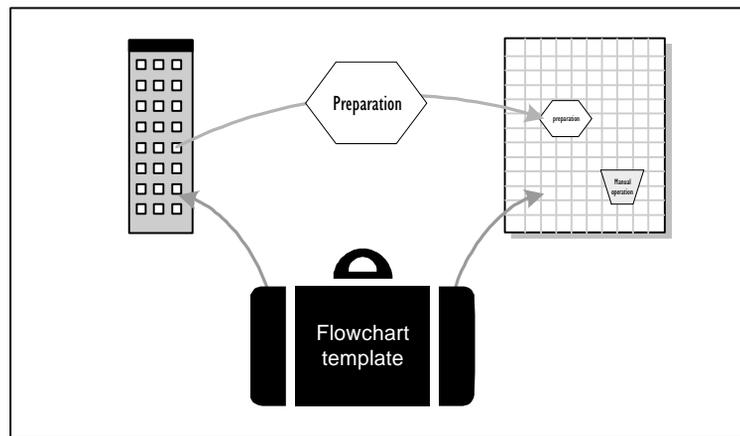
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## Understanding Visio files

Before you begin working in Visio, it's important to understand the basic relationships between the four types of Visio files: templates, stencils, drawings, and workspaces.

Templates provide the foundation for creating drawings quickly and easily. Think of a template as a kit for building a particular type of

drawing. For example, if you want to create a flowchart, you open a template for flowcharts. The template opens a blank drawing page, which is scaled appropriately for the drawing, and displays a grid to help guide you in creating the drawing. The template also makes a set of styles and settings available. Most important, the template opens a stencil—a file containing ready-made master shapes you can use to create a particular type of drawing. For example, if you open a flowchart template, Visio also opens a stencil that contains flowchart shapes you can drag and drop into drawings.



Templates provide the shapes, styles, and other settings you need for building a drawing.

If you want to use shapes from other stencils, you can open the stencils independently. You don't need to open a template to open a stencil.

When you've finished creating a drawing, you save the drawing file. Next time you open that drawing, the drawing page opens in the drawing window.

You can also save a file as a workspace. A workspace contains information about the size and position of windows open at the time you save the workspace. When you open a workspace, Visio re-creates the arrangement of windows for you.

## Starting Visio

You start Visio the same way as other Windows applications. You can start Visio, then open the files you need, or you can start Visio and open a new drawing file with a template in one step.

You can start Visio by double-clicking the Visio program icon. When the Visio main window and the New dialog box appear, open the files you need.

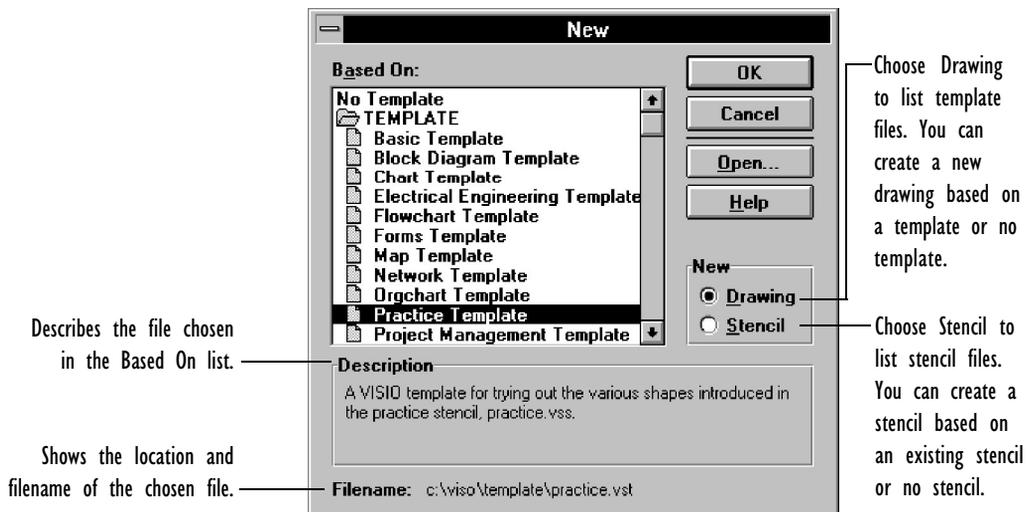
### To start Visio:

1. If Windows is not running, start it by typing *win* at the DOS prompt.
2. If the Visio program group is not already open, double-click the Visio program group icon in Program Manager.
3. In the Visio program group window, double-click the Visio icon.



The Visio main window and the New dialog box appear.

If you just installed Visio, a dialog box appears asking if you want the Quick Tour, an online introduction to Visio. To see the Quick Tour, choose Run Quick Tour Now, or choose Skip Tour And Continue to start working in Visio.



In the New dialog box, you can choose to create a new drawing or a new stencil. You can base the new file on an existing file or start your own from scratch.

4. Select the file you want to base the new file on, and then choose OK.

The new file opens in the Visio main window. For a description of the window, see “The Visio main window” later in this chapter.

You can also start Visio and open a new drawing file by opening a template.

### To start Visio and open a template:



#### Practice

1. In the Visio program group in Program Manager, double-click the icon for the template.

The template opens a stencil and a new drawing file, and copies styles and other settings to the new drawing file. For details about templates and drawing files, see “Starting a new drawing with or without a template” later in this chapter.

---

## Opening files

Visio uses four different file types: templates, stencils, drawing files, and workspaces. There are several ways to open each file type. The table below summarizes the simplest methods.

---

### The easiest way to

### Is to

Start a new drawing

Choose New from the File menu, and then choose the name of a Visio template from the Based On list.

Open an existing drawing

Choose Open from the File menu, and then choose the name of the drawing file. Drawing filenames have a .VSD extension.

*continued*

---

| <b>The easiest way to</b> | <b>Is to</b>   |
|---------------------------|--|
| Open a stencil            | Choose Open Stencil from the File menu, and then choose the name of the stencil file.                        |
| Open a workspace          | Choose Open from the File menu, and then choose a workspace file. Workspace filenames have a .VSW extension. |

---

Which type of file you open depends on what kind of work you want to do. Each file type, its use, and the various ways to open it are described in detail in the following sections.

---

### *Starting a new drawing with or without a template*

The best way to start a new drawing is to open a new drawing file with a template. The advantages of using a template are:

- It opens one or more stencils containing related shapes.
- It sets up the drawing page using a uniform grid and measurement system, saving you the time it takes to set up pages.
- It copies related styles to the drawing file, saving you the time it takes to define your own styles.

You can start Visio and open a new drawing file with a template provided with Visio in one step. For details about starting Visio by opening a template, see “Starting Visio” earlier in this chapter.

Once Visio is running, you can open new drawing files by using the New command on the File menu.

## To open a new drawing file based on a template:

1. From the File menu, choose New.



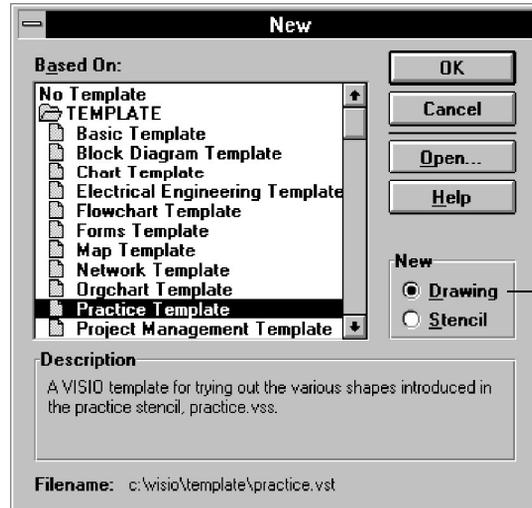
Standard and Microsoft Office toolbar



Lotus SmartSuite toolbar

Alternatively, click the New button on the toolbar. For details about the toolbar, see “The Visio main window” later in this chapter.

The New dialog box appears.



To start a new drawing, make sure the Drawing option is chosen, then choose a template from the list.

2. In the New section, make sure Drawing is chosen.
3. From the Based On list, choose a template.

Choose the template that is associated with the stencil you will use most in the drawing. Template filenames have a .VST extension.

If you need additional stencils, open the stencil files without their templates by using the Open Stencil command. For details, see “Opening a stencil file” later in this chapter.

4. Choose OK.

In the Visio main window, the stencil and a blank drawing page based on the template settings are displayed.

New drawing files usually have only one page, although templates can create drawing files that contain more than one page. For details about creating new pages and changing the drawing page size and scale, see Chapter 5, “Creating and printing drawing pages.”

To create a drawing from scratch—without a set of styles, shapes, and page settings—open the drawing without a template.

### To open a new drawing file without basing it on a template:

1. From the File menu, choose New.

Alternatively, click the New button on the toolbar.

2. In the New section, make sure Drawing is chosen.
3. From the Based On list, choose No Template.

Visio displays a blank drawing page in the Visio main window.



Standard and Microsoft Office toolbar



Lotus SmartSuite toolbar

---

### *Opening an existing file*

When you want to work on an existing drawing file, use the Open command. You also use the Open command to open a workspace and to open a template so you can edit it. For details about workspaces, see “Saving a workspace” later in this chapter. For details about editing templates, see Chapter 6, “Creating masters, stencils, templates, and styles.”

### To open an existing file:

1. From the File menu, choose Open.

Alternatively, click the Open button on the toolbar.

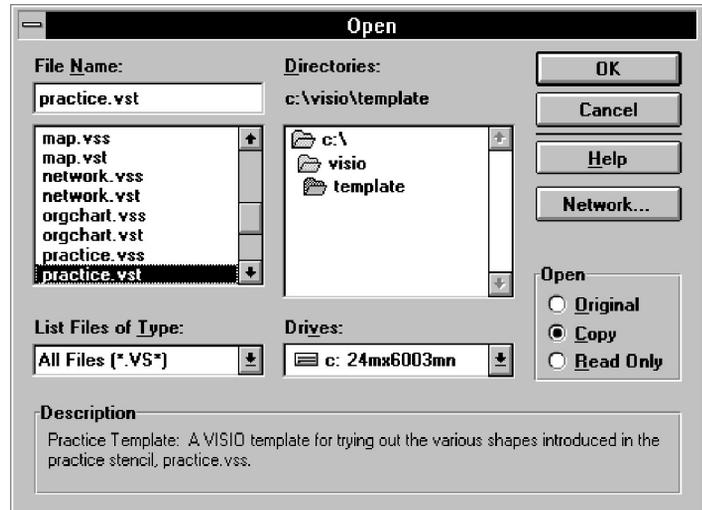


Standard and Microsoft Office toolbar



Lotus SmartSuite toolbar

The Open dialog box appears.



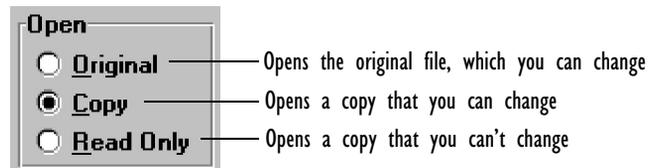
- From the File Name list, choose the name of the file you want.

Alternatively, type a path and filename in the text box.

Template filenames have a .VST extension, drawing files have a .VSD extension, stencil filenames have a .VSS extension, and workspace filenames have a .VSW extension.

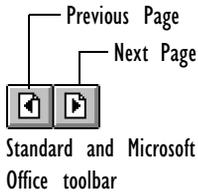
If the file you want is not listed, examine the List Files Of Type box and the current drive and directory. If you need a different file type, choose the type from the List Files Of Type list. If you need a file on a different drive or in a different directory, choose the drive or directory.

- In the Open section, choose to open the original, a copy, or a read-only version of the file.



- Choose OK.

The selected file opens in the Visio main window.



If you open a drawing file that contains several pages, you may need to go to a particular page. To display a page, choose Go To Page from the Page menu. In the dialog box, choose the page you want to display and then choose OK, or double-click the page you want to display. Alternatively, click the Previous Page and Next Page buttons on the toolbar.

You can save Visio files in formats that are compatible with earlier versions of Visio. For details about these files, see “Finishing up” later in this chapter.

---

### Opening a stencil file

In some cases, you may want to open a stencil without opening a template. For example, you may want to use shapes from several stencils in a drawing.

#### To open a stencil:

1. From the File menu, choose Open Stencil.

Alternatively, click the Open Stencil button on the toolbar.

The Open Stencil dialog box appears.

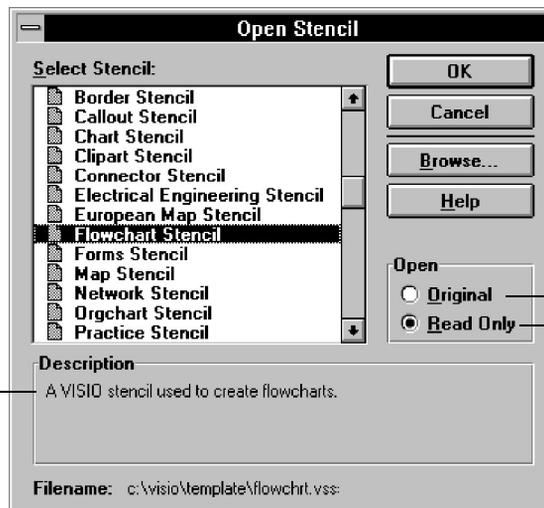


Standard and Microsoft Office toolbar



Lotus SmartSuite toolbar

Describes the shapes contained in the chosen stencil



Opens the original file, which you can change

Opens a copy you can't change

2. From the Select Stencil list, choose the name of the stencil you want to open.

If you don't see the stencil name, click the Browse button and locate the stencil file.

3. When you've located the file, choose OK.

The stencil opens in a separate stencil window.

---

### *Opening and saving files with different status options*

The ways you can work with an open file vary depending on whether you open a copy or the original, and whether the file was saved as read-only. By default, templates are saved as read-only and they open as copies so that you don't inadvertently alter the original files. Drawing and workspace files, however, open as originals because they're the files that contain your work. You can, however, change the status of any file by setting options in the Save As dialog box.

If you check Read Only in the Save As dialog box when you save a file, you cannot open the original file and save changes to it. You can only open a copy. When you open a file as read-only, its name appears in brackets in the window title bar.

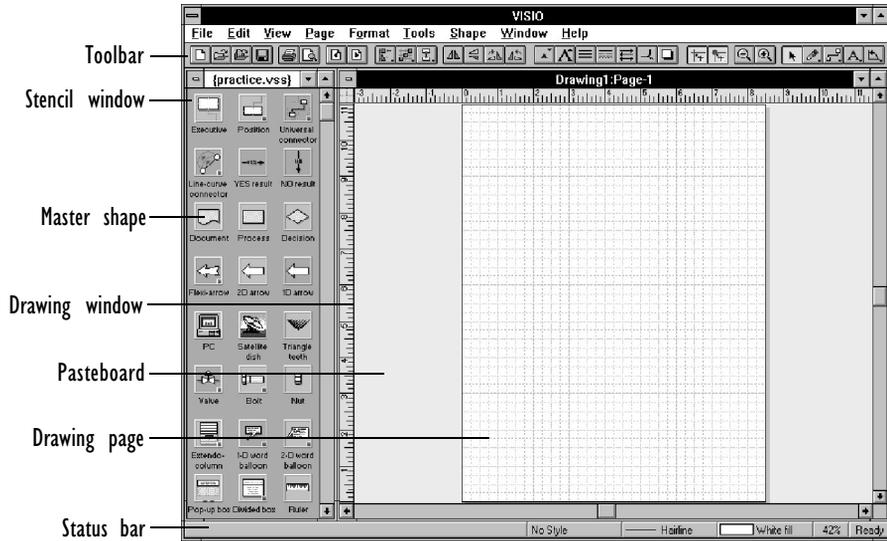
---

### *The Visio main window*

The main window usually contains a stencil window and a drawing window, although it can contain several of each. Only one window within the main window is active at a time.

The main window toolbar and menu bar vary depending on whether a drawing or stencil is active, the display resolution of your monitor, which tool you are using, and the size of the window. They also vary depending on whether you're using the standard Visio menu and toolbar set, or the toolbar and menu sets designed for people who

use Lotus SmartSuite and Microsoft Office applications. The following sections describe the content of the main window when the standard Visio toolbar and menu set is displayed. For details about Visio's Lotus SmartSuite and Microsoft Office menus and toolbars, see "Changing the toolbar and menu sets" later in this section, and Appendix A, "Toolbars."



The Visio main window usually contains a stencil window and a drawing window.

## Visio toolbars

The toolbar and the status bar in the Visio window provide buttons and lists you can use as shortcuts to choosing commands from menus. There are also several specialized toolbars you use in particular views or when working with text.

The illustrations in the following sections show the toolbars and status bar as they appear on a Super VGA display with 800 x 600 pixel resolution, with the main window maximized. The number and location of toolbar items vary depending on the display resolution of

the monitor and the size of your window. Therefore, you may see items in the illustrations that don't appear on your toolbars or you may see items on your toolbars that aren't listed here. For a complete list and descriptions of the toolbar contents at any resolution, see Appendix A, "Toolbars."

---

### Main toolbar and status bar

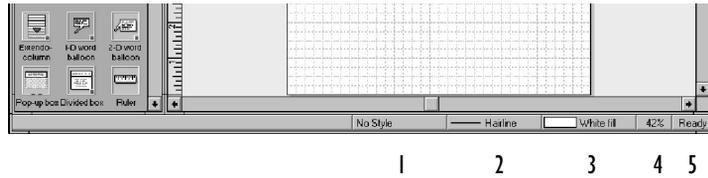
The main toolbar (the toolbar visible during most of your work in the drawing window) contains the following buttons and tools:



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

- |    |                           |    |                           |
|----|---------------------------|----|---------------------------|
| 1  | New button                | 17 | Increase Font Size button |
| 2  | Open button               | 18 | Line Weight button        |
| 3  | Open Stencil button       | 19 | Line Pattern button       |
| 4  | Save button               | 20 | Line Ends button          |
| 5  | Print button              | 21 | Corners button            |
| 6  | Print Preview button      | 22 | Shadow button             |
| 7  | Previous Page button      | 23 | Snap button               |
| 8  | Next Page button          | 24 | Glue button               |
| 9  | Align Shapes button       | 25 | Zoom Out button           |
| 10 | Distribute Shapes button  | 26 | Zoom In button            |
| 11 | Connect Shapes button     | 27 | Pointer tool              |
| 12 | Flip Horizontal button    | 28 | Drawing tool menu         |
| 13 | Flip Vertical button      | 29 | Connection tool menu      |
| 14 | Rotate Right button       | 30 | Text tool menu            |
| 15 | Rotate Left button        | 31 | Supplemental tool menu    |
| 16 | Decrease Font Size button |    |                           |

The content of the status bar changes depending on the location of the pointer. The following illustration shows how the status bar appears when the pointer is over the drawing window or the toolbar.



- 1 Text style list
- 2 Line style list
- 3 Fill style list
- 4 Zoom box
- 5 Status prompt

When the pointer is over the stencil window, the style lists are replaced by prompts that provide helpful information about the master shape under the pointer.

For details about buttons and lists that are not illustrated here but are visible on higher resolution monitors, see Appendix A, “Toolbars.”

## Text toolbar

When you are working with text, the toolbar and status bar display text formatting buttons and lists.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

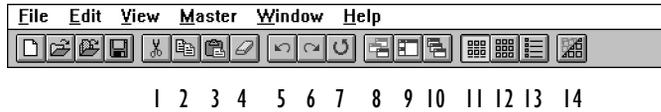
- |                             |                             |
|-----------------------------|-----------------------------|
| 1 Undo button               | 10 Subscript button         |
| 2 Redo button               | 11 Left Align Text button   |
| 3 Text Color button         | 12 Center Align Text button |
| 4 Decrease Font Size button | 13 Right Align Text button  |
| 5 Increase Font Size button | 14 Justify Text button      |
| 6 Bold button               | 15 Top Align Text button    |
| 7 Italic button             | 16 Middle Align Text button |
| 8 Underline button          | 17 Bottom Align Text button |
| 9 Superscript button        | 18 Zoom Text 100% button    |

For details about text toolbar buttons and lists (including items that are not illustrated here but are visible on higher resolution monitors), see Appendix A, “Toolbars.”

---

### The stencil toolbar and menus

When the stencil window is active, the toolbar and menu bar display buttons and menus for working in the stencil window. The menus display commands for creating and editing master shapes.



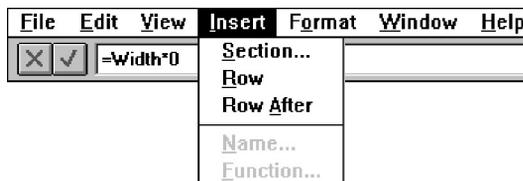
- |   |               |    |                        |
|---|---------------|----|------------------------|
| 1 | Cut button    | 8  | New Window button      |
| 2 | Copy button   | 9  | Tile button            |
| 3 | Paste button  | 10 | Cascade button         |
| 4 | Delete button | 11 | Icons And Names button |
| 5 | Undo button   | 12 | Icons Only button      |
| 6 | Redo button   | 13 | Names Only button      |
| 7 | Repeat button | 14 | Arrange Icons button   |

For details about stencil toolbar buttons, see Appendix A, “Toolbars.”

---

### The ShapeSheet menus

When the ShapeSheet window is active, the toolbar is not visible. The menus display commands for programming shape behavior and controlling the display of ShapeSheet information.



For details about using the ShapeSheet, see Chapter 8, “Using ShapeSheets to create SmartShapes.”

---

*The status bar, dynamic pointers, and other on-screen help*

Visio provides on-screen hints to help you determine what to do next and what you can do with a particular tool:

- In the status bar, Visio displays information about the command or tool that the pointer is on, or about the current task.
- If you pause with the pointer over a button or tool, Visio displays a ToolTip to identify the button or tool.
- In the drawing window, the pointer changes shape depending on which tool you are using and where the pointer is. For a complete list and description of pointers, see Appendix C, “The pointer library.”
- Handles and points on shapes vary in appearance depending on where they are on the shape and what you are doing with the shape.

---

## *Adjusting the view*

To make working in Visio easier, you can change toolbar and menu sets, magnify your drawing, arrange windows, and change other parts of the display.

---

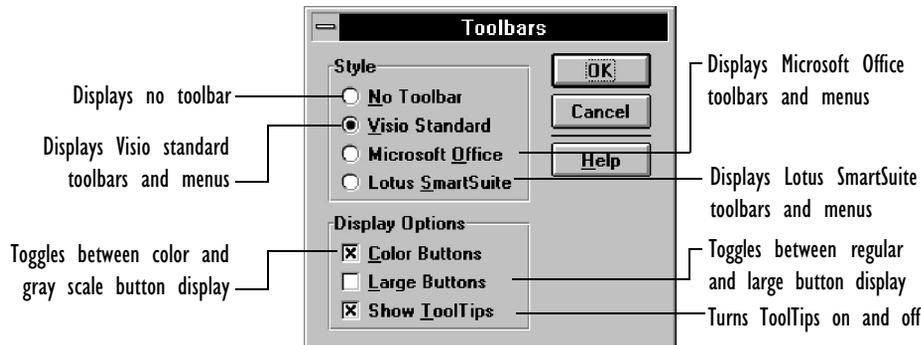
### *Changing the toolbar and menu sets*

For maximum productivity, Visio lets you choose the working environment that's most familiar to you. You can use Visio's standard menus and toolbars, or you can use menus and toolbars that resemble those in Microsoft Office or Lotus SmartSuite applications.

### To switch toolbar and menu sets:

- From the View menu, choose Toolbars.
  - ❖ In Visio's SmartSuite menu set, choose SmartIcons from the Tools menu.

Visio displays a dialog box containing several display options.



Alternatively, click between toolbar buttons with the right mouse button, and then choose the name of the menu and toolbar set you want from the shortcut menu.

- When you're finished, choose OK.

Visio displays the new toolbar and menu set.

---

### *Getting quick access to common commands*

You can quickly display a menu of common commands when you are working with a drawing page, a stencil, or a selected shape. For example, when a shape is selected, the menu displays commands for copying the shape, editing the shape's text, formatting the shape, and for adjusting your view of the drawing.

### To display the shortcut menu:

- Point to the item you are working with. If you are working with a shape, select the shape.

2. Click the right mouse button.
3. From the menu, choose the command you need.

---

**Tip:** This shortcut menu also provides easy access to the Actual Size and Whole Page view options.

---

### Zooming in or out

Depending on your task, you might need to see your entire drawing in the drawing window, or you might need to magnify a part of the drawing so you can work on details.

### To zoom into or out of your drawing:

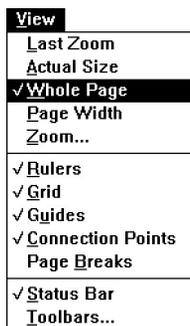
1. If you want to zoom into a particular area of your drawing, select a shape in the area you want to zoom.

If you are zooming out to a wider view, you can skip this step.

2. From the View menu, choose Actual Size, Whole Page, Page Width, or Zoom.

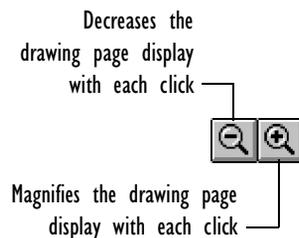
If you choose Zoom, the Zoom dialog box appears, which contains more zoom options than the View menu. Choose or type a magnification percentage. When you finish, choose OK.

You can also choose a magnification percentage in the Zoom box on the status bar.



The Whole Page command displays the entire drawing page within the drawing window. The Actual Size command displays a drawing at approximately its actual printed size. The size varies slightly depending on the display resolution of your monitor. The Page Width command displays the entire width of the drawing page. The Last Zoom command returns the view to the previous setting.

Alternatively, you can click the appropriate button to zoom in or out.



You can also use the following shortcuts to adjust the view.

| To                       | Do this  |
|--------------------------|--|
| Zoom in                  | Ctrl+Shift+left mouse click  |
| Zoom out                 | Ctrl+Shift+right mouse click   |
| Zoom in on selected area | Hold down Ctrl+Shift+left mouse button and drag a rectangle around the area you want to zoom in on |
| Automatically scroll     | Hold down Ctrl+Shift+right mouse button and drag the page  |

---

### *Arranging windows and changing window displays*

When you have several drawing and stencil windows open, you may need to arrange them so you can see them all.

#### **To tile windows so each window is visible:**

1. From the Window menu, choose Tile.

#### **To cascade windows so you can see the title bar of each:**

1. From the Window menu, choose Cascade.

#### **To size a window:**

1. Click the Minimize, Maximize, or Restore button in the upper-right corner of the window, or drag a window border.

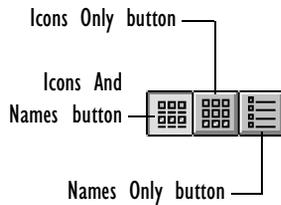
For details about opening multiple drawing windows, see Chapter 5, “Creating and printing drawing pages.” For details about arranging windows, see the Microsoft Windows documentation.

You can also change how the master shape icons appear in the stencil window.

### To change the stencil window display:

1. Click the title bar of the stencil window to make the window active.
2. From the View menu, choose the view you want.

To display both icons and names, choose Icons And Names. To display just icons, choose Icons Only. To display just the names, choose Names Only.



Alternatively, you can use the buttons on the stencil toolbar.

---

### *Setting display options*

When you start Visio the first time, the status bar, rulers, and grid lines appear in the window. If your drawing contains shapes with connection points, they appear as blue Xs. If your drawing contains guides, the guides are visible. You can turn these displays on and off.

### To turn the display of an item on or off:

1. From the View menu, choose the appropriate command—Rulers, Grid, Guides, Connection Points, or Status Bar.

If a command is checked, the item is displayed. If a command is unchecked, the item is not displayed.

---

**Tip:** You can also turn the toolbar display on and off. For details, see “Changing the toolbar and menu sets” earlier in this section.

---

These settings are saved by Visio, so they remain in effect until you set them again.

For details about using guides and connection points, see Chapter 2, “Adding, arranging, and connecting shapes.” For details about changing display options for a specific page, see Chapter 5, “Creating and printing drawing pages.”

## Finishing up

When you finish working, you need to save files you've changed, close files, and quit. You may want to save the arrangement of open files as a workspace, so you can open them all at once. It's also a good idea to create a summary for each file so you can easily identify files later. This section explains how to finish up a Visio work session.

### Saving files

When you have done substantial work on a drawing, you should save the drawing file. When you change a stencil or template, you should also save these files.

#### To save a new file:

1. From the File menu, choose Save or Save As.

Alternatively, click the Save button.

The Save As dialog box appears.



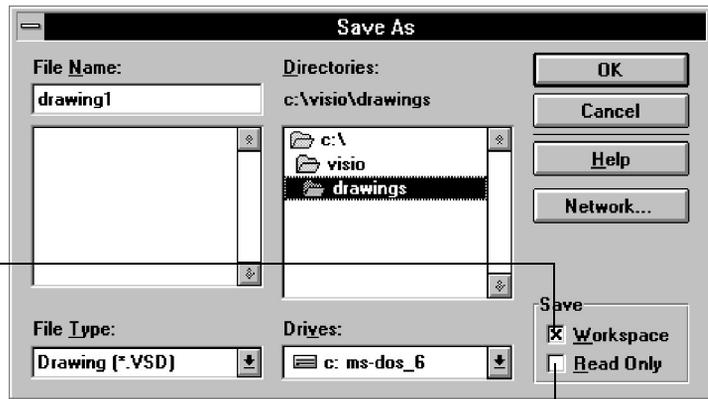
Standard and Microsoft Office toolbar



Lotus SmartSuite toolbar

Saves the drawing as a workspace

Locks the file so it can't be changed



2. In the File Name box, type a valid DOS filename for your drawing file.

If you don't type a filename extension, Visio uses the default extension for the file type.

If you want to save the file to a directory or drive other than the current one, choose the directory or drive.

3. In the Save section, if you want to save a workspace with the file you are saving, make sure Workspace is checked. For details, see “Saving a workspace” later in this chapter. If you want to save a file so it opens as a read-only file, choose Read Only. Otherwise, leave both options unchecked.
4. If you like, choose a file format from the File Type list.

For example, if you want to be able to open a Visio 3.0 drawing file in Visio 2.0, choose Visio 2.0 Drawing (\*.VSD) from the File Type list. For details about choosing a file format see “About file formats” next in this chapter.

5. Choose OK.

By default, Visio prompts you for document summary information when you save a new file. To change the default setting, choose Options from the Tools menu, and then uncheck the Prompt For Document Information On Save option in the Options dialog box.

6. If necessary, enter summary information, and then choose OK to close the Summary Info dialog box. For details, see “Summarizing files” later in this chapter.
- ❖ If you’re using Visio’s SmartSuite toolbar and menu set, the name of the dialog box is Doc Info.

Saving existing files is fast, easy, and something you should do frequently while you work.

### **To save changes to an existing file:**

1. From the File menu, choose Save.

For details about saving stencils and templates, see Chapter 6, “Creating masters, stencils, templates, and styles.”

---

### *About file formats*

By default, new drawing, stencil, and template files are saved in Visio 3.0 format. Visio saves existing files in the same format in which they were created. You can change the format of a file by choosing a different format from the File Type list in the Save As dialog box.

You can also change the default file format if you want. To change the default file format, choose Options from the Tools menu. In the General section of the Options dialog box, check Save New Files In 2.0 Format.

Here are a few things to keep in mind about file formats:

- Files that you save in Visio 3.0 format are smaller. Saving these files takes a little longer, but the files require less storage space and open faster. The Visio 3.0 file format works well for stencils and other files that aren't changed or saved frequently but that you open often.
- Files saved in Visio 2.0 format require more storage space, but can be opened in Visio 2.0 or later versions.
- If a drawing file contains shapes that use Visio 3.0 features (such as connectors that use dynamic glue, wide dashed lines, or lines that have square end caps), those shapes may look or behave differently if the file is saved in Visio 2.0 format and opened in an earlier version of Visio.
- If a Visio 3.0 file contains text intended for use in Lotus Notes and you save the file in Visio 2.0 format, the Lotus Notes text is deleted.
- Visio 3.0 files are compound files, which means that summary information about the file (for example, the creator or description) can be read by other Windows applications.

---

### *Saving a workspace*

By saving a *workspace*, you save the arrangement of open files so you can open the files again in the same arrangement. You can save a workspace either within a drawing, stencil, or template file (usually within a drawing file), or as a workspace file, which has a .VSW filename extension.

#### **To save a workspace within a drawing file:**

1. From the File menu, choose Save As.
2. In the Save section, check Workspace.
3. Complete the dialog box as necessary, and then choose OK.

Saving a drawing file with the Workspace option checked gives two different results when you open it, depending on how you created the drawing file. If you:

- Based the drawing file on a template, Visio opens only the drawing file and the stencil associated with the drawing's template.
- Did not base the drawing file on a template, Visio opens all of the files that were open when you saved the file in the same arrangement as when the file was saved.

Another approach to saving a workspace is to use the Visio workspace file type. By saving a workspace with the Save Workspace command, you can later open your arrangement of files.

#### **To save a workspace file:**

1. Save the files you have edited.
2. From the File menu, choose Save Workspace.
3. In the dialog box, type a name for the file. Change the drive and directory if necessary.

Visio uses the .VSW filename extension unless you specify a different extension.

4. Choose OK.

---

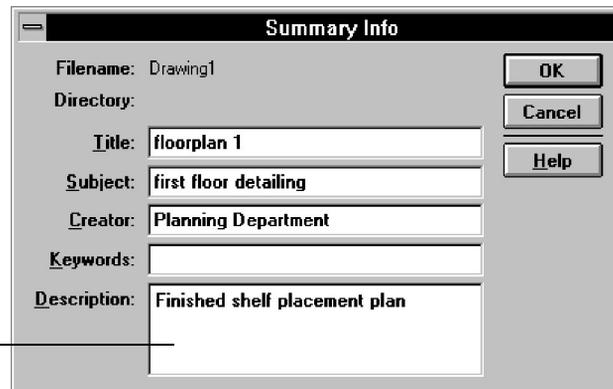
### Summarizing files

It's a good idea to create a summary for each file so you and others can easily identify the file later. When you choose a file's name in the New or Open dialog box, the description contained in the file's summary information appears in the Description section of the dialog box.

#### To create or edit file summary information:

1. While the file you want to summarize is open in the active window, choose Summary Info from the File menu.
- ❖ In Visio's SmartSuite menu set, choose Doc Info from the File menu.

The information you enter here is displayed in the Description section of the Open or New dialog box when you choose the filename.



The screenshot shows a dialog box titled "Summary Info". It has several input fields and buttons. The fields are: "Filename:" with the value "Drawing1"; "Directory:" (empty); "Title:" with the value "floorplan 1"; "Subject:" with the value "first floor detailing"; "Creator:" with the value "Planning Department"; "Keywords:" (empty); and "Description:" with the value "Finished shelf placement plan". On the right side, there are three buttons: "OK", "Cancel", and "Help".

2. In the dialog box, enter the file title, subject, creator, keywords, and a description.

The dialog box also displays the filename and the directory where the file is stored.

3. Choose OK.

You can include file summary information in the drawing by inserting Document Info fields. For details about text fields, see Chapter 4, “Adding text to drawings.”

For details about including summary information in a Lotus Notes database, see Chapter 7, “Using Visio with other applications.”

---

### *Closing files*

When you finish working with any file—a stencil, for example—close it so you have more room to work.

#### **To close files:**

1. From the File menu, choose Close.

Alternatively, double-click the window’s Control-menu box.

---

### *Quitting Visio*

When you finish a work session, quit Visio before you quit Windows.

#### **To quit Visio:**

1. From the File menu, choose Exit.

Alternatively, double-click the Visio window’s Control-menu box.

If an unsaved file is open when you choose the Exit command, Visio asks if you want to save the file before exiting. Choose Yes to save changes, No to close Visio without saving changes, or Cancel to cancel the Exit command and continue working in Visio.



# 2

Adding, arranging,  
and connecting shapes

---

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# Adding, arranging, and connecting shapes

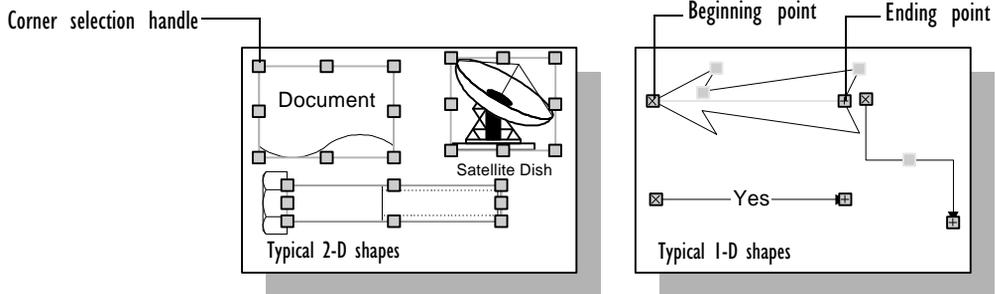
There are several ways to place shapes in a drawing. You can drag master shapes from stencils, draw your own shapes, or import or paste objects from other applications into Visio drawings. Once shapes are on the drawing page, you may need to position, size, and rotate them. You can also glue connector shapes between other shapes so the shapes stay connected even when you move them in relation to each other.

This chapter explains how to drag and drop master shapes into drawings. It also explains how to arrange and connect shapes.

For details about creating your own shapes, see Chapter 3, “Creating shapes.” For details about using objects from other applications, see Chapter 7, “Using Visio with other applications.” For details about adding text to shapes, see Chapter 4, “Adding text to drawings.”

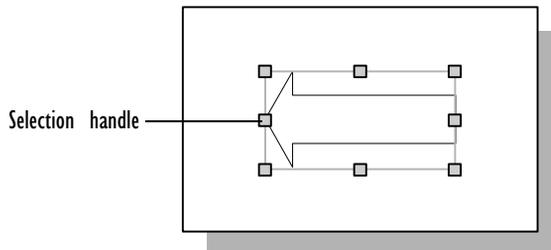
## Anatomy of a shape

Before you use master shapes, there are a few things you should know about shapes and master shapes.

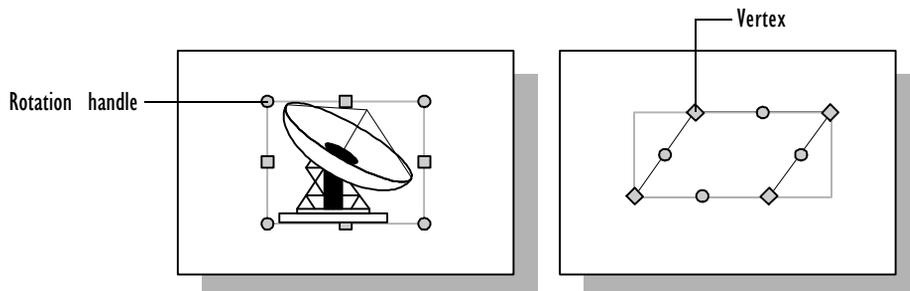


Most shapes are 2-D shapes, which means they have corner selection handles that you can use to size the shape proportionally.

Shapes such as SmartConnector master shapes and lines are 1-D shapes. 1-D shapes have a beginning and ending point so you can glue them between 2-D shapes.

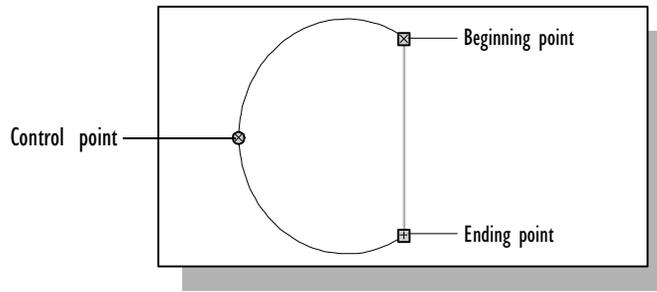


Selection handles appear when you select a shape with the pointer tool. You can drag a handle to size the shape.

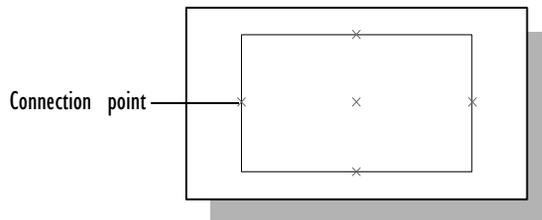


Rotation handles appear when you select a shape with the rotation tool. You can drag a handle to rotate the shape.

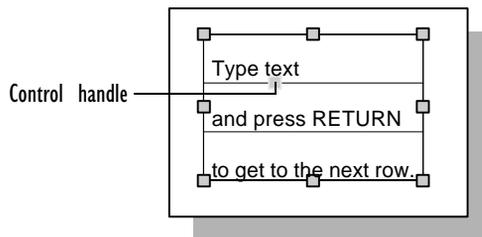
Vertices appear when you select a shape with the pencil, line, or arc tool. You can drag a vertex to reshape a shape.



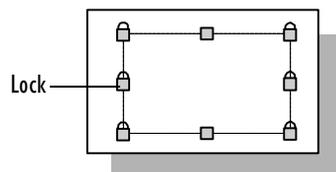
A control point appears on a line or an arc when the line or arc is selected with the pencil tool. You can drag a control point to change the curvature of a segment.



Connection points appear as blue Xs on some master shapes. You can glue either endpoint of a one-dimensional shape to a connection point or to other points on a shape.



A control handle lets you work with a shape in special ways, such as adjusting a rounded corner, reshaping an arrow, or dragging a connector directly out of a shape. For example, you can drag a control handle to change the height of a row.



A lock protects one or more characteristics of a shape.

For details about locking and unlocking shapes, see Chapter 3, “Creating shapes.” For details about connecting shapes, see “Connecting shapes by dragging and dropping” and “Special techniques for connecting shapes” later in this chapter.

You can convert a shape from two-dimensional to one-dimensional so you can use it as a connector, and you can convert a one-dimensional shape to a two-dimensional shape, which lets you size it proportionally by dragging its corner handles. For details about converting one-dimensional and two-dimensional shapes, see chapter 3, “Creating shapes.”

---

### *Dragging and dropping master shapes into drawings*

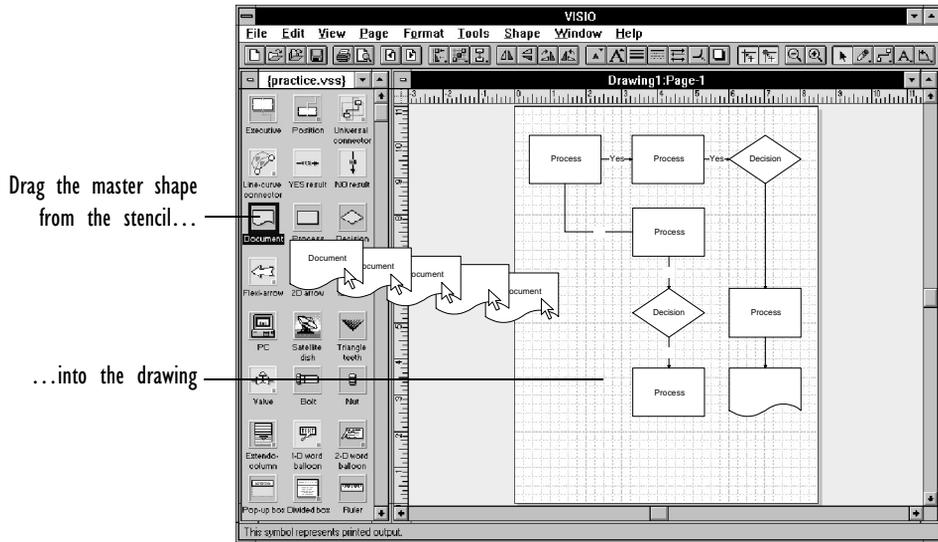
A master shape is a shape stored in a stencil. When both a stencil and a drawing page are open, you can drag master shapes from the stencil into the drawing.

Although you can drag and drop master shapes with most tools, it’s best to use the pointer tool so if you need to move shapes after you drag them, you can do so easily.

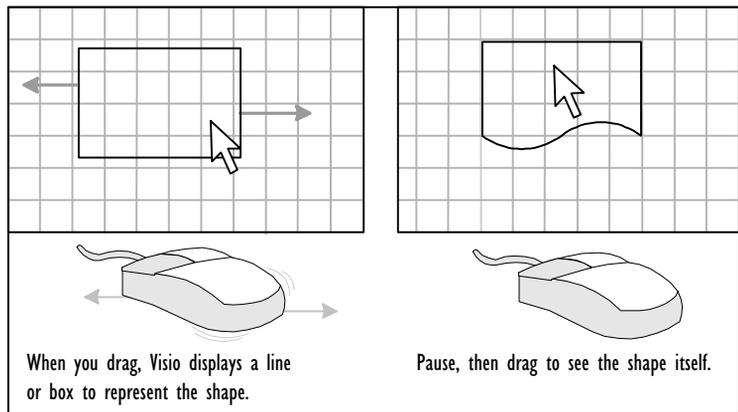
#### **To drag a master shape into a drawing:**



1. From the toolbar, choose the pointer tool.
2. In the stencil window, point to the icon for the master shape.
3. Hold down the left mouse button and drag the master from the stencil window into the drawing window.



As you drag, a box representing a two-dimensional shape or a line representing a one-dimensional shape shows the shape's location on the page. If you pause while dragging, you'll see the shape instead of a line or box representing the shape. This lets you position the shape more precisely.



4. Release the mouse button to drop an instance of the master shape on the drawing page.

All shapes, including lines and connectors, can have text. Some master shapes include text. To replace text, or to type text on a master that does not include text, select the shape and start typing. For details, see Chapter 4, “Adding text to drawings.”

You may need to rotate some shapes after you drag them into a drawing to orient them the way you want on the page. For details about rotating shapes, see “Flipping, reversing, and rotating shapes” later in this chapter.

---

### *Connecting shapes by dragging and dropping*

In charts and diagrams such as organization charts and flowcharts, it’s helpful to connect two shapes so when you rearrange the shapes in your drawing, the connector shape between them moves, rotates, or sizes appropriately. To connect shapes in your drawing, you can drag and drop connector master shapes.

You drag the connector shape toward the shape you want to glue it to. The connections are made at connection points, which appear as blue Xs on the screen. Connection points can be on a shape’s perimeter, inside the shape, or even outside the shape. You can glue the endpoint of a connector shape to points on two-dimensional shapes, groups, objects from other applications, or to an endpoint or connection point on another one-dimensional shape.

### **To use a connector master shape to connect two shapes:**

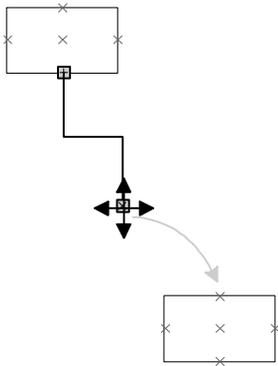
1. Drag the two-dimensional shapes you want to connect into position on the drawing page.
2. In the stencil, select a connector master shape.

Visio stencils contain a variety of connector shapes. Most are designed to connect specific points on two-dimensional shapes. The points they connect are indicated by the shape names (for example, Top to Top, Top to Side, Bottom to Top, and so on). Several other connectors are designed to connect shapes in a variety of ways. The most useful of these shapes is the Universal connector, which can bend to connect any two points on two shapes. For details about the Universal connector, see “About connectors and the Universal connector shape” later in this chapter.

3. As you drag the connector into the drawing window, position one end over a connection point on one of the two-dimensional shapes.
4. Release the mouse button.

If the endpoint is successfully glued to the connection point, the endpoint turns red.

If the connector shape does not glue to the connection point, make sure the appropriate glue settings are active. For details, see “Setting glue options” later in this chapter.



5. Point to the other endpoint on the connector.

When the mouse pointer is over an endpoint, it changes from an arrow to a four-headed arrow.

6. Drag the endpoint to a connection point on the other two-dimensional shape.
7. Release the mouse button.

For details about other methods of connecting shapes, see “Special techniques for connecting shapes” later in this chapter.

---

### Interpreting master shape icons

The stencil window contains icons that represent each master shape in the stencil. The icons provide clues about how to use the shape:

- A yellow background identifies a connector, a one-dimensional shape that is designed for connecting two-dimensional shapes.
- A green square in the lower-right corner indicates that the shape has one or more control handles.
- Two red bars on the bottom border of the icon indicate the shape has a special double-click behavior.
- A light gray illustration indicates how the shape can be transformed by dragging its handles.

---

### Viewing the drawing file stencil

The first time you drag a master shape into a drawing file, Visio places a copy of the master in the *drawing file stencil*. The drawing file stencil is a stencil stored within the drawing file that contains an inventory of all masters used in the file.

When you edit a master stored in the drawing file stencil, you update all instances of the master in that drawing file at the same time. An instance within the drawing file inherits characteristics from the master on the drawing file stencil unless you ungroup the instance or delete the master from the drawing file stencil.

#### **To view the drawing file stencil:**

1. From the Window menu, choose Show Master Shapes.

The drawing file stencil appears.

For details about editing the masters in a drawing file stencil, see Chapter 6, “Creating masters, stencils, templates, and styles.”

---

## Arranging shapes on the drawing page

Once shapes are in your drawing, you'll need to organize them on the drawing page. Visio provides the following tools and features to help you arrange shapes easily and precisely:

**Rotating and flipping** turn shapes so they are oriented on the drawing page the way you want.

**Snapping** pulls shapes to grid lines, ruler intervals, guides, and other items you specify so you can move shapes into place quickly.

**Distribution** places the selected shapes at regular intervals on the drawing page on the basis of the distribution parameters you specify. You can distribute shapes both horizontally and vertically.

**Aligning** places the selected shapes using the alignment parameters you specify. For example, you can align right or left edges, centers, and so on.

**Ruler intervals and grid lines** help you align shapes and space them evenly on the page.

**Guides**—non-printing lines that you drag out from rulers—also help you align shapes. You can glue shapes to a guide, then move the guide and the shapes with it.

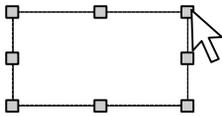
**Gluing** attaches shapes to each other while allowing you to move the shapes in relation to each other (with some restrictions). This way you can reposition connected shapes without having to redraw the connecting lines.

To use these features, you'll need to understand how to select shapes and how various points and handles on shapes work. For details about points on shapes and shape handles, see "Anatomy of a shape" earlier in this chapter. For details about selecting shapes, see the next section, "Selecting shapes." For details about copying and sizing shapes, see Chapter 3, "Creating shapes."

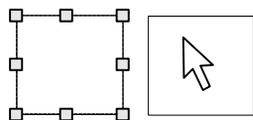
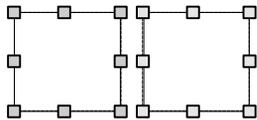
## Selecting shapes

You often need to select a shape before you can work with it. For example, to flip a shape, you first select it. To group several shapes together, you first select them. This section explains how to select shapes.

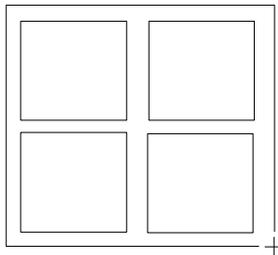
In most cases, you'll select shapes using the pointer tool. In some cases, you use other tools. For example, to rotate a shape, you select it with the rotation tool to display rotation handles on the shape.



Click to select one shape.



Hold Shift key and click to select several shapes.

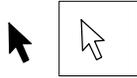


Drag to select several shapes.

| To   | Do this  |
|--|--|
| Select one shape   | Click the shape with the pointer tool.   |
| Select several shapes by clicking  | Select the first shape, hold down the Shift key, then click to select other shapes one at a time.        |
| Select several shapes by dragging  | With the pointer tool, drag a selection net around all the shapes you want to select.                    |
| Select all the shapes on the page  | Choose Select All from the Edit menu.  |
| Select all of a particular kind of item, such as shapes, groups, guides, and so on | Choose Select Special from the Edit menu. In the dialog box, choose the kind of item you want to select. |
| Cancel a selection   | Click away from selected shapes.   |
| Cancel the selection of one shape when several are selected                        | Hold down the Shift key and click the shape.   |

Here are some things to bear in mind when selecting shapes:

- When you select a shape, Visio displays a selection rectangle around the shape. Visio uses the rectangle's boundaries when you align and distribute shapes. For details about aligning and distributing shapes, see “Aligning shapes” and “Distributing shapes” later in this chapter.



- When the mouse pointer is over the shape, the pointer changes from a black arrow to a white arrow. When the arrow is white, you can click to select the shape.
- After you select a shape, green selection handles appear on it. When you hold down the Shift key and select multiple shapes, the first shape you select displays green selection handles and subsequent shapes display blue handles. When you select multiple shapes with a selection net, the topmost shape in the stacking order has green handles and the other shapes have blue handles. The handle color distinction is helpful when you want to align shapes or connect them using the Connect Shapes command. For details about the stacking order, see the next section, “Changing the stacking order of shapes.”

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### *Changing the stacking order of shapes*

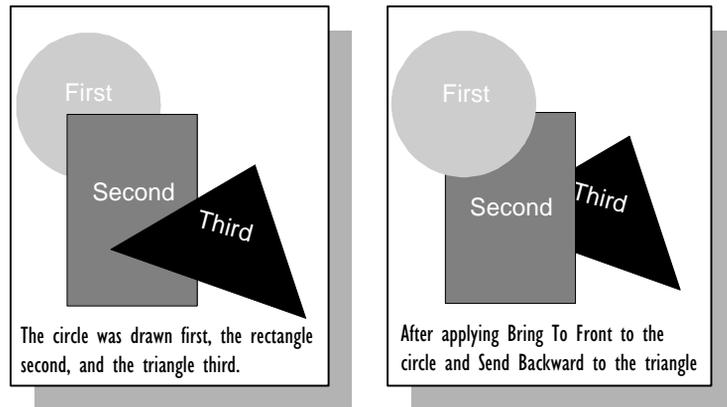
Shapes have a stacking order on the page. The first shape you draw or drop on the page is at the back of the stack, and the most recently created shape is at the front.

The stacking order affects the way shapes look on the page. It also affects the way shapes are selected and the way shapes are aligned when you use the Align Shapes command. For example, if you drag a selection net around several shapes, the top shape in the stacking order is the first shape selected (primary selection). The other shapes in the selection are aligned in relation to the location of the primary shape.

To move shapes in front of or behind other shapes, use the Bring To Front, Bring Forward, Send To Back, and Send Backward commands on the Shape menu.

**To change the stacking order of shapes:**

1. Select the shape whose position you want to change.
2. From the Shape menu, choose the appropriate command.



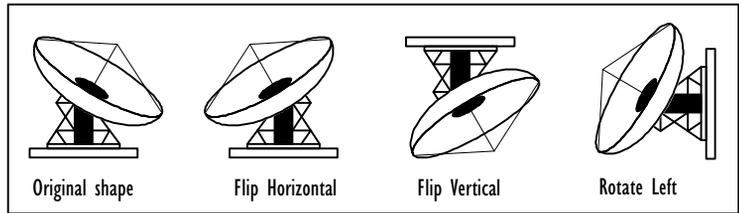
Bring Forward and Send Backward move the shape forward or backward one position in the stack. Bring To Front and Send To Back move the shape all the way to the front or back of the stack.

---

### *Flipping, reversing, and rotating shapes*

You'll often need to flip, reverse, or rotate shapes so they face the proper direction. You can flip a shape vertically or horizontally, or use the Reverse Ends command to flip a shape both vertically and horizontally. You can rotate shapes by 90 degree increments with the

Rotate Left or Rotate Right command. You can rotate a shape by any amount with the rotation tool. You can also rotate a one-dimensional shape around one of its endpoints.



Note that some shapes based on actual objects may be locked against being flipped, rotated, or reversed.

**To flip or reverse a shape:**

Flip Horizontal 

1. Select the shape.

Flip Vertical 

2. From the Shape menu, choose the appropriate command: Flip Vertical, Flip Horizontal, or Reverse Ends.

**To rotate a shape 90 degrees:**

Rotate Right 

1. Select the shape.

Rotate Left 

2. From the Shape menu, choose Rotate Left to rotate the shape 90 degrees counterclockwise, or Rotate Right to rotate the shape 90 degrees clockwise

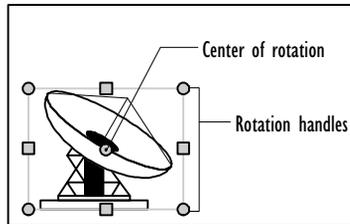
**To rotate a shape any amount:**



1. From the supplemental tool menu, choose the rotation tool.

2. Select the shape you want to rotate.

Round rotation handles appear on the shape's selection rectangle. On a two-dimensional shape, a plus sign in a circle appears at the center of rotation (usually at the center of the shape's selection rectangle).



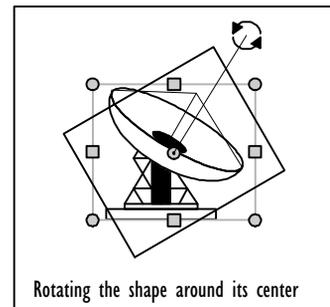
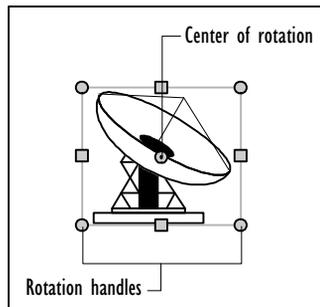
3. Drag a rotation handle.



When you point to a shape's rotation handle, the mouse pointer changes to two arrows forming a circle. When you press the left mouse button and move the mouse slightly, a line appears through the shape's center of rotation and the mouse pointer, showing the shape's angle of rotation. The shape's selection rectangle shows the shape's orientation on the page, and the status bar shows the angle of rotation in degrees.

For finer control, drag the rotation handle farther from the center of rotation.

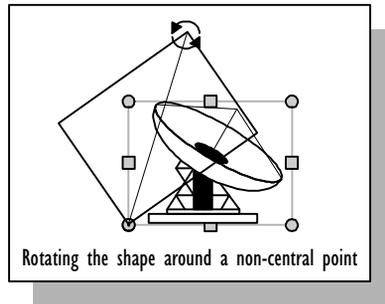
4. Release the mouse button.



You can rotate a two-dimensional shape around any point in the drawing window, not just around the shape's center, by moving the center of rotation.

**To move the center of rotation:**

1. With the rotation tool, drag the center of rotation.



You can also rotate a one-dimensional shape around one of its endpoints without using the rotation tool. Be careful not to size the shape as you rotate it.

**To rotate a one-dimensional shape around an endpoint:**

1. With the pointer tool, select the shape.
2. Drag one of the shape's endpoints to rotate the shape around its other endpoint.

When you point to a shape's beginning point or ending point, the mouse pointer changes from an arrow to a four-headed arrow, indicating that you can move the endpoint.

---

## Moving and snapping shapes

As you drag shapes—or afterward—you'll need to move the shapes into place on the page. You can align shapes with rulers and grid lines and with each other. You can also create guides and align shapes to the guides. When snapping is on, shapes can snap to the items that you align them with.

This section explains the basics of moving and snapping shapes.

---

### Moving shapes

To move a shape, just drag it to where you want it. Use the grid lines and rulers to help you place the shape.

#### **To move a shape:**

1. With the pointer tool, point to the shape.

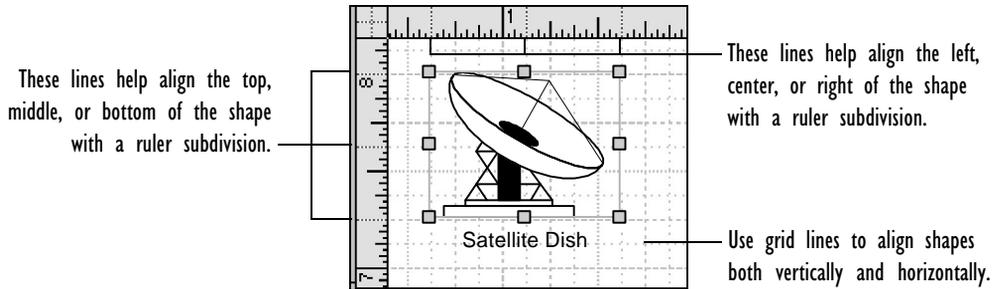
When the mouse pointer is over the shape but not over a handle, the pointer changes from a black arrow to a white arrow. Be careful not to point to a handle; dragging a handle will resize a shape.

2. Drag the shape to where you want it.

When you press the left mouse button, selection handles appear on the shape. As you drag, a box for a two-dimensional shape or a line for a one-dimensional shape shows the location of the shape on the page. Faint lines on each ruler also indicate the shape's location.

If you pause while moving the shape but continue to hold down the left mouse button, you will see the shape instead of the box or line that represents the shape. This allows you to move the shape more precisely.

If snapping is on, the shape may jump into place.



You can move a shape to a new location within the same window or into another open drawing window.

---

**Tip:** You can also move shapes or text from the page to the pasteboard (the area outside the drawing page boundary). Each page has its own pasteboard. Therefore, if you view a different page, you will no longer see the text or shape you placed on the pasteboard of the page you were working on. For details on viewing different pages, see Chapter 5, “Creating and printing drawing pages.”

---

### *Snapping shapes into place*

It’s easier to place shapes where you want them if snapping is on. Snapping pulls shapes toward the item you want to align them with. You determine when to snap, what to snap to, and the snap strength.

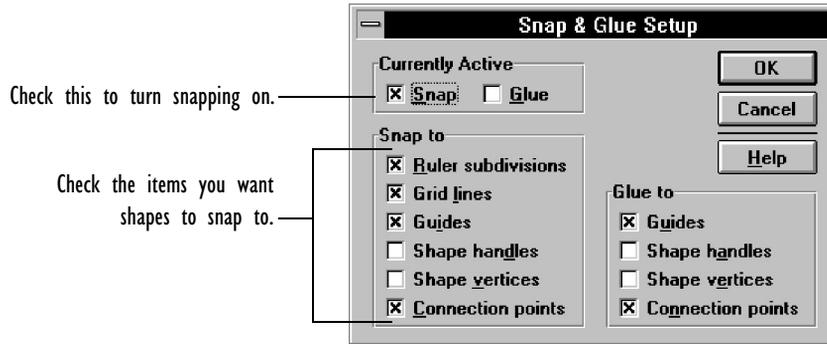
### **To turn snapping on or off:**

1. From the Tools menu, choose Snap & Glue Setup.

2. In the Currently Active section, check the Snap option, and then choose OK.



Alternatively, click the Snap button on the toolbar.



### To specify what to snap to:

1. From the Tools menu, choose Snap & Glue Setup.
2. In the dialog box, check the Snap To options you want.

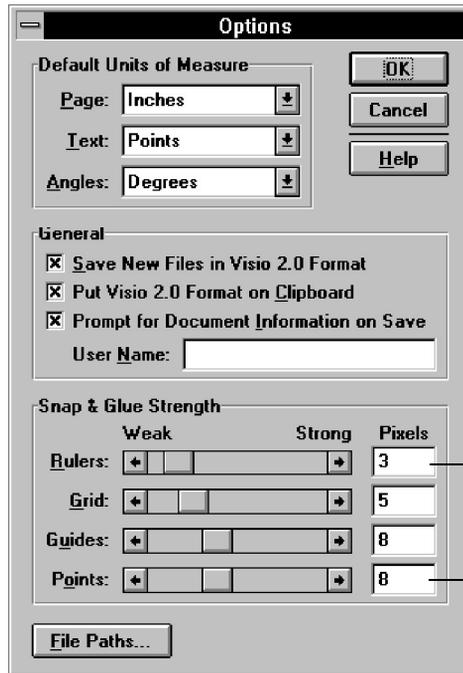
You can snap to as many items as you want. The Ruler Subdivisions, Grid Lines, and Guides options are useful for aligning shapes. The Shape Handles (selection handles), Shape Vertices, and Connection Points options are useful when connecting shapes together.

3. Make sure the Snap option in the Currently Active section is checked.
4. Choose OK.

You can change the snap strength. Increasing the snap strength means Visio will pull a shape toward the item from farther away.

**To change the snap strength:**

1. From the Tools menu, choose Options.



2. In the Snap & Glue Strength section, drag the box in the appropriate bar to increase or decrease the snap strength.

The Points bar controls the snap strength of selection handles, vertices, and connection points.

3. Choose OK.

Keep these things in mind when you set snap options:

- Turn off the snap options you don't need so they don't interfere with the options you want. For example, you might turn off the Grid Lines option if you are primarily interested in snapping to guides.
- To place shapes as precisely as possible, set a strong snap strength, zoom into your drawing, and then move the shapes into place.

---

## Aligning shapes

As you move shapes, you can visually align them with ruler intervals, grid lines, and guides. This section describes how to align shapes using the various methods.

---

### *Aligning shapes using the Align Shapes command*

With the Align Shapes command, you can align selected shapes with the primary selection. The primary selection is the shape with green handles—either the first shape you selected or the shape at the top-most layer of the stacking order. (For details, see “Selecting shapes” earlier in this chapter.) You can also align shapes with an automatically created guide. Use the methods described in this section for precise alignment.

#### **To align shapes with the primary selection:**

1. Select the shape that you want to align other shapes to.
2. Hold down the Shift key and select subsequent shapes.
3. From the Tools menu, choose Align Shapes.
4. In the dialog box, choose the alignment options you want.

Each alignment option is represented by an illustration. You can choose one Up/Down Alignment and one Left/Right Alignment option.

Up/Down Alignment options



Top Align



Horizontal Align



Bottom Align

Left/Right Alignment options



Left Align



Vertical Align



Right Align



To cancel the selection of the Up/Down Alignment or the Left/Right Alignment options, choose the red X in that section.

Alternatively, choose an alignment button from the toolbar.

5. If you want to create a guide and glue shapes to it so you can move the guide and the shapes with it, check Create Guide And Glue Shapes To It.

The guide location is determined by the shape you selected first and the alignment options you chose.

6. Choose OK.

Visio aligns the shapes. If you checked Create Guide And Glue Shapes To It, Visio creates the guide and glues the shapes to it. For more details, see “Aligning and gluing to guides and guide points” later in this chapter.

**To align the centers of shapes both horizontally and vertically:**

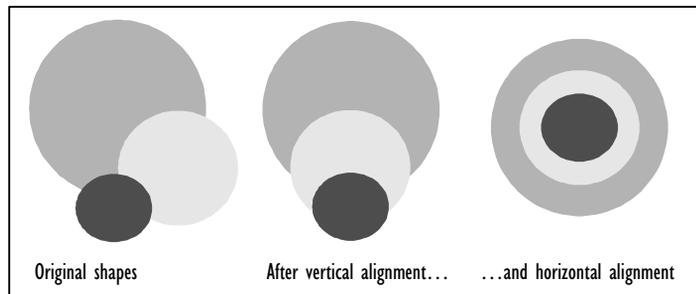
1. Select the shapes.
2. From the Tools menu, choose Align Shapes.
3. Choose the vertical center alignment option.

Visio aligns the shapes vertically at their centers.

4. Choose the horizontal center alignment option.

Visio aligns the shapes horizontally at their centers.

5. Choose OK.



---

### *Aligning and gluing to guides and guide points*

Guides are non-printing horizontal and vertical bars that help you align shapes. You drag guides from the drawing page rulers or create them automatically with the Align Shapes command.

Guides are helpful in some ways that rulers and grid lines are not. For example, you can move guides. This is particularly useful if shapes are glued to guides, because when you move the guides the shapes move too. Guides are also easier to see, and you can space them any way you want on the page.

#### **To create a guide:**

1. Make sure both Guides and Rulers are checked on the View menu.
2. Point to the ruler from which you want to drag a guide.

To create a horizontal guide, point to the ruler at the top of the drawing window. To create a vertical guide, point to the ruler at the left of the drawing window.

The mouse pointer changes to a two-headed arrow.

3. Drag to where you want the guide on the drawing.

The guide is visible as you drag.

4. Release the mouse button.

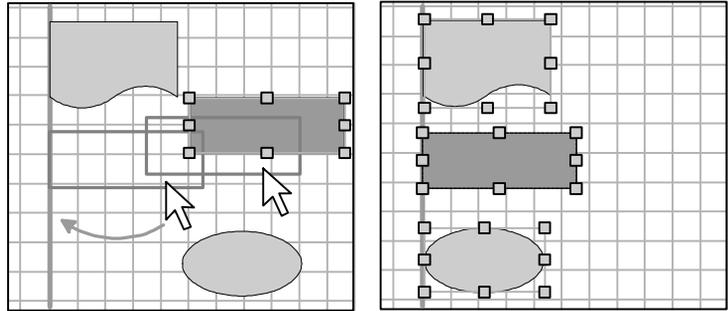
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**Tip:** You can't create diagonal guides. To align shapes diagonally, draw a diagonal line, align the shapes to the line, and delete the line when you're finished.

---

**To align shapes with a guide:**

1. Drag the shapes to the guide.



You delete guides the same way you delete shapes.

**To delete a guide:**

1. Select the guide.
2. From the Edit menu, choose Clear.

Alternatively, press the Delete key.

Guide points are crossbar-shaped guides that you drag from the intersection of the two rulers. You can align a shape's endpoint, center, or sides to a guide point.

**To create a guide point:**

1. In the upper-left corner of the drawing window, point to the crossbar at the intersection of the two rulers.

The mouse pointer changes to a four-headed arrow.

2. Drag to where you want the guide point.

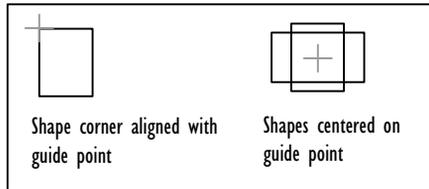
Two intersecting guides are visible as you drag.

3. When the guide point is positioned where you want it, release the mouse button.

The guide point looks like a crossbar.

### To align a point on a shape with a guide point:

1. Drag the shape and position the center or corner of a two-dimensional shape's selection rectangle or an endpoint of a one-dimensional shape on the guide point.



### To delete a guide point:

1. Click the guide point to select it.

You may need to zoom in to see it. Guide points on the primary selection turn green when selected; all others turn blue.

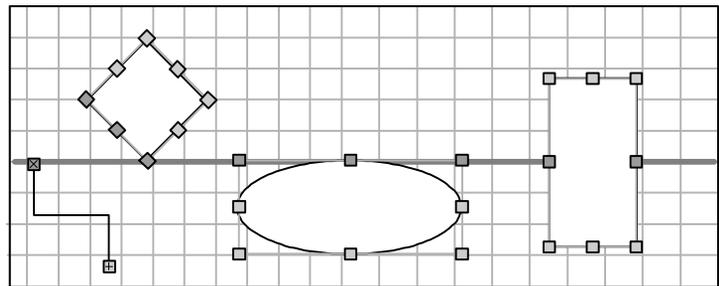
2. From the Edit menu, choose Clear.

Alternatively, press the Delete key.

Gluing a shape to a guide is similar to gluing a shape to another shape. You drag the shape that you want to glue toward the guide you want to glue it to. You can glue an endpoint of a one-dimensional shape to a guide or a guide point. You can also glue selection handles of a two-dimensional shape to a guide or guide point. For example, you can glue an entire side of a two-dimensional shape to a guide.

**To glue a shape to a guide:**

1. Make sure glue options are set appropriately.
2. Point to the shape that you want to glue to a guide.
3. Drag the shape to the place on the guide you want to glue it to:
  - If you’re gluing a one-dimensional shape, drag an endpoint to the guide. When the shape is successfully glued, the endpoint turns red.
  - If you’re gluing a two-dimensional shape, drag the shape toward the guide. When the shape is successfully glued, the selection handles on the part of the shape that is glued to the guide turn red.



You can glue a point, a side, or the middle of a two-dimensional shape to a guide.

You can automatically create a guide and glue shapes to it with the Align Shapes command. For details, see “Aligning shapes using the Align Shapes command” earlier in this chapter.

For details about gluing instances of master shapes as you drag and drop master shapes, see “Connecting shapes by dragging and dropping” earlier in this chapter.

---

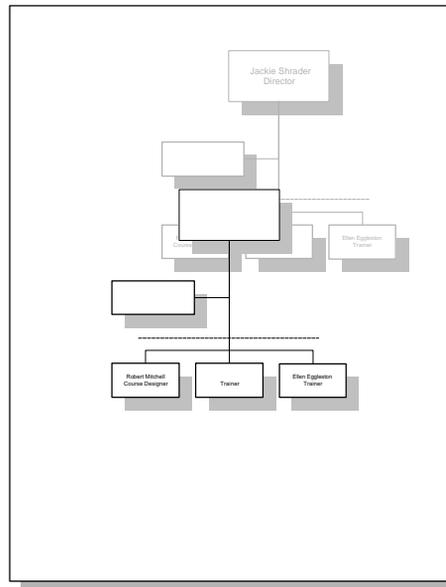
### *Centering the drawing on the page*

In some cases, you may find that your finished drawings are not centered on the page. For example, you might create an organization chart block by block and find that the finished chart extends off one side of the page and onto the pasteboard.

#### **To center the drawing on the page:**

1. From the Tools menu, choose Center Drawing.

Visio shifts the drawing to the center of the drawing page.



If you are using the grid to align shapes in your drawing, the shapes may no longer be aligned with the grid units after using this command.

---

### *Moving the zero point on rulers*

By default, rulers appear along the edges of the Visio drawing window. These rulers indicate the scale of the drawing and are helpful for aligning shapes on the page. If you don't see the rulers on the drawing window, make sure Rulers is checked in the View menu.

Sometimes it's useful to change the position of the zero point on the rulers. For example, you might want to measure the distances between shapes that aren't near the current zero point.

#### **To move the zero point on both rulers at once:**

1. Hold down Ctrl and drag from the intersection of the two rulers.

#### **To move the zero point on the ruler at the top of the window:**

1. Hold down Ctrl and drag from the ruler at the left of the drawing window.

#### **To move the zero point on the ruler at the left of the window:**

1. Hold down Ctrl and drag from the ruler at the top of the drawing window.

---

### *Distributing shapes*

Visio offers a quick method for creating equal distances between three or more selected shapes. You can distribute shapes both vertically and horizontally. For vertical distribution, the top and bottom shapes in the selection define the distribution boundaries. For horizontal distribution, the leftmost and rightmost shapes define the distribution boundaries.

### To distribute shapes:

1. Select three or more shapes.
2. From the Tools menu, choose Distribute Shapes.
3. Choose the appropriate option. Each distribution option is represented by an illustration.



Horizontal Ends  
Distribution



Left Distribution



Horizontal Center  
Distribution



Right Distribution



Vertical Ends  
Distribution



Top Distribution



Vertical Center  
Distribution



Bottom Distribution

Alternatively, choose a distribution button on the toolbar.

---

**Tip:** If the Create Guides And Glue Objects To Them option is checked in the Distribute Shapes dialog box, Visio creates multiple guides. Select and move the outermost guides to move the shapes without changing the distribution.

---

### *Special techniques for connecting shapes*

By dragging and dropping connector master shapes (described earlier in this chapter), you can connect shapes in any type of drawing. However, Visio provides several techniques for connecting shapes that make specific drawing tasks faster and easier. The following table summarizes these techniques and refers you to the section that describes the technique in detail.

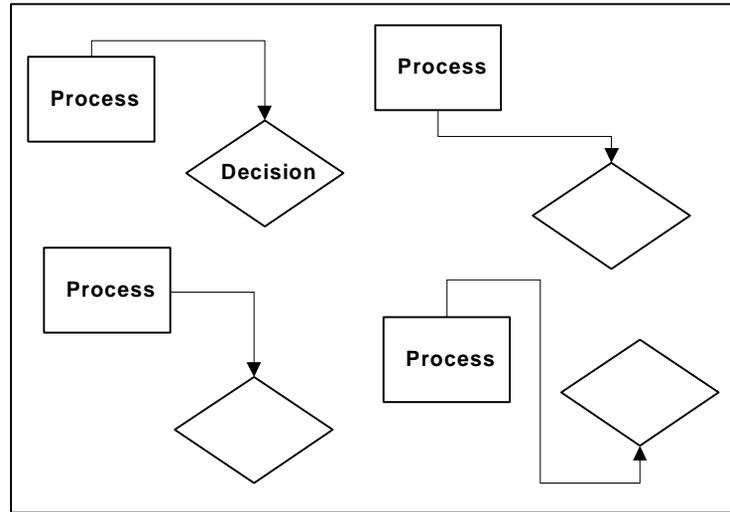
| <b>To</b>                               | <b>Do this</b>   |
|---|--|
| Connect shapes in a flowchart           | Drag and drop two-dimensional shapes using the connector tool. Connectors are glued automatically from one shape to another. For details, see “Quickly creating a flowchart.”  |
| Connect shapes in an organization chart | Drag control handles to create connectors, or use the connector tool to draw connectors between specific points on two-dimensional shapes. For details, see “Quickly creating an organization chart and similar drawings.” |
| Connect a series of shapes              | Choose Connect Shapes from the Tools menu. For details, see “Other ways to connect shapes.”  |
| Connect a callout line to a shape       | Drag and drop a callout master shape and glue it to a two-dimensional shape. For details, see “Connecting shapes by dragging and dropping” earlier in this chapter.  |

*About connectors and the Universal connector shape*

You can glue any one-dimensional shape—a line you draw or a one-dimensional master shape—between two-dimensional shapes as a connector. But in order to make it fast and easy to connect shapes and modify a drawing after shapes are connected, Visio provides special connector master shapes.

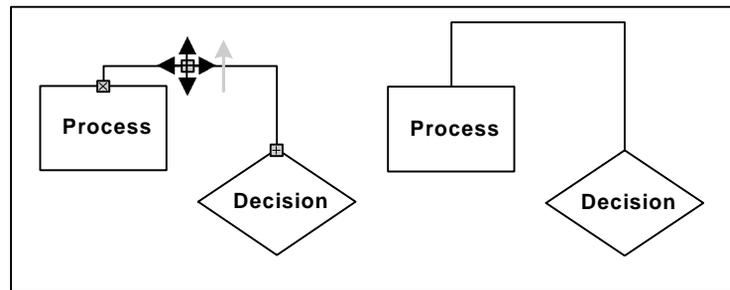
These connector shapes—called SmartConnectors—are one-dimensional master shapes that behave intelligently when you use them to connect other shapes. For example, if you connect two shapes with a connector and then move one of the shapes, the connector repositions itself automatically and, in some cases, changes its own shape to avoid crossing over the shapes it connects.

The smartest and most useful connector shape is the Universal connector, which bends to create any connection you need.



The Universal connector shape can connect any point on one shape to any point on another.

To adjust the way the connector bends, drag the control handles. The number of control handles varies depending on the number of bends in the shape.

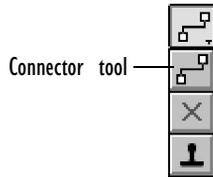


Move the control handles to adjust the location of the connector's segments.

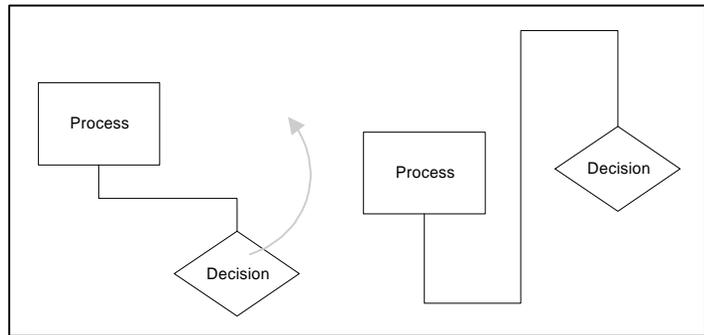
For more details about the Universal connector and other connector shapes, see “Which shapes can use dynamic glue?” later in this chapter.

About connections and glue

The bond Visio creates between a connection point on a shape and an endpoint of a connector varies depending on the technique you use to connect the shapes and which connector shape you use:

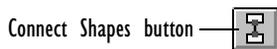


- When you drag the connector tool between connection points on two-dimensional shapes, Visio glues a connector solidly to the connection points. If you move the shapes the connector is glued to, the connector stays connected to those points. Visio creates the same kind of connection when you use the drag and drop technique to add connectors to your drawing.

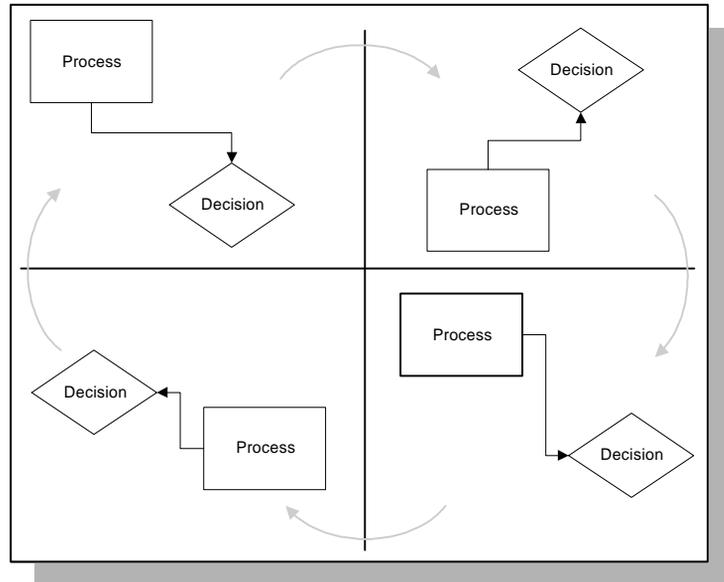


The connector stays glued to the same points when you move the 2-D shapes.

This kind of connection is useful in drawings where it's important to connect specific points on two-dimensional shapes. For example, to indicate levels of responsibility and relationships in an organization chart, connectors lead from certain points on some boxes to certain points on others. No matter where those boxes are in relation to each other, the lines should connect a specific point on one box to a specific point on the next.



- When you use the Connect Shapes command, or hold down the Ctrl key and drag the connector tool from one shape to another, Visio glues a connector to the shapes using dynamic glue. With dynamic glue, as you move one shape, the endpoint of the connector moves to the connection point closest to the other shape.



With dynamic glue, the connector moves to connect the two closest connection points.

Dynamic glue is best suited for drawings where it doesn't matter which specific points are connected on the shapes. In a flowchart, for example, connections between Process shapes indicate the path of a task or decision. Which points the connector is attached to is less important than having the correct shapes connected to each other.

You can tell whether a connection uses dynamic glue by selecting the connector and looking at its endpoints. In a standard connection, the connector's beginning point is marked by an X, and the ending point is marked by a plus sign. Both endpoints also have borders. In a connection that uses dynamic glue, the endpoints are not marked or surrounded by a border.

---

### *Which shapes can use dynamic glue?*

Visio stencils contain a variety of connector shapes. Most are designed to connect specific points on two-dimensional shapes. The points they connect are indicated by the shape names (for example, Top to Top, Top to Side, Bottom to Top, and so on). Because you use these connectors to connect specific points, these connectors are programmed to create solid (non-dynamic) connections.

Several other connectors are designed to connect shapes in a variety of ways. (The most useful of these shapes is the Universal connector, which can bend to connect any two points on two shapes.) You can use this kind of connector to create both solid and dynamically glued connections.

The following sections describe techniques for connecting shapes. No matter which technique you use, you can always switch between a solid connection and dynamic glue, as long as the connector is designed to work with dynamic glue.

---

**Tip:** By default, Visio creates an instance of the Universal connector shape when you use the Connect Shapes command and the connector tool. Although you can in some cases select another connector shape to use with the tool or command, it's often best to use the Universal connector because of its flexibility.

---

For details about switching between dynamic glue and a solid connection, see “Converting the glue” later in this chapter.

---

### *Quickly creating a flowchart*

The fastest and easiest way to create a flowchart is to drag and drop shapes with the connector tool. As each shape is dropped onto the drawing page, it is automatically connected to the previous shape.

**To connect a series of shapes as they're dropped onto the drawing page:**



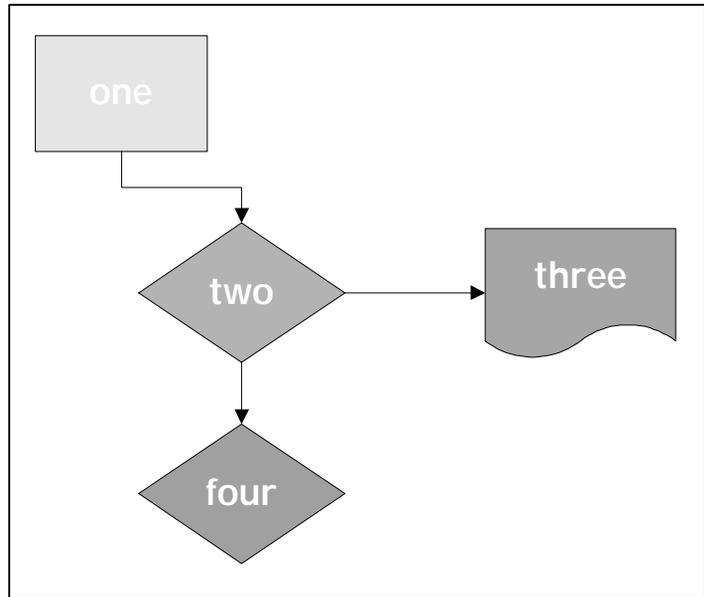
1. From the connection tool menu, choose the connector tool.
2. Drag and drop a two-dimensional shape from the stencil onto the drawing page.
3. With the first shape still selected, drag and drop another two-dimensional shape onto the drawing page.

Visio automatically connects the shapes with an instance of the Universal connector.

If you drag and drop a third two-dimensional shape, Visio adds a Universal connector between the second and third shapes.

As long as the connector tool is selected, Visio adds a connector between the last two shapes dropped onto the drawing page, creating a linear flow. To create new branches in the chart, click the drawing page to deselect the last shape you dropped, select the shape you want to branch from, and then drag a new shape onto the drawing page. Visio adds a connector between the selected shape and the new shape.

Connectors added with this technique are connected to the shapes using dynamic glue. For details about dynamic glue, see “About connections and glue” earlier in this chapter.



Visio adds connectors between shapes 1 and 2, then shapes 2 and 3. To begin branching from shape 2, deselect shape 3, and then select shape 2 before you drag and drop shape 4.

If the shapes are already in position on the drawing page, you can still use the connector tool to connect them with dynamic glue.

**To connect shapes that are already on the drawing page:**



1. From the connection tool menu, choose the connector tool.
2. If you'd like, choose a connector shape from the stencil.

This is an optional step. If you don't choose a connector, Visio uses the Universal connector by default. If you do choose a connector, be sure it's one that can work with dynamic glue. For details, see "Which shapes can use dynamic glue?" earlier in this chapter.

3. Hold down the Ctrl key and position the pointer over one of the shapes you want to connect.

Visio displays a box around the shape to indicate that you're creating a dynamic connection.

4. Drag the pointer and position it over the second shape.
5. Release the mouse button.

Visio creates an instance of the connector and connects it to the points using dynamic glue.

---

**Tip:** If you need to modify a drawing in which shapes are connected with a Universal connector, move the two-dimensional shapes first. Then, if necessary, use control handles on the Universal connector to adjust the connector's bends. For details, see "Adjusting the bends in a Universal connector" later in this chapter.

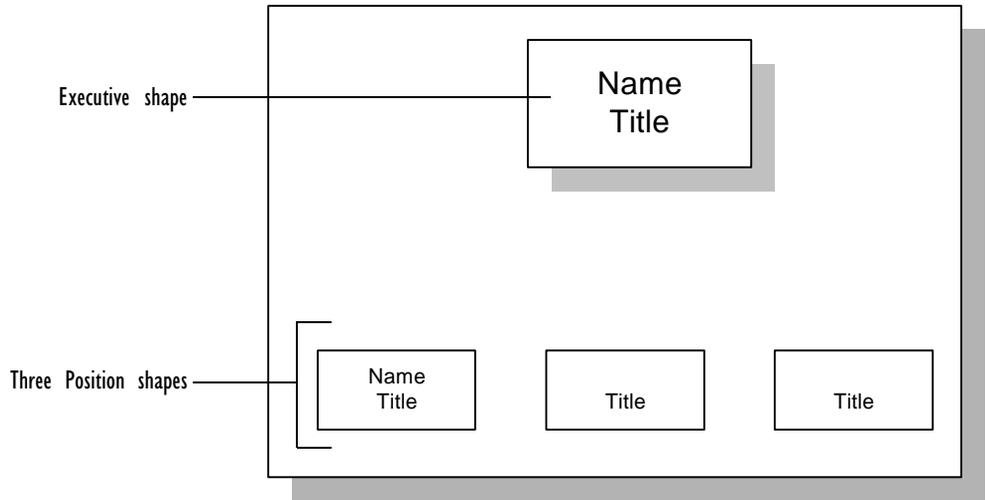
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### *Quickly creating an organization chart and similar drawings*

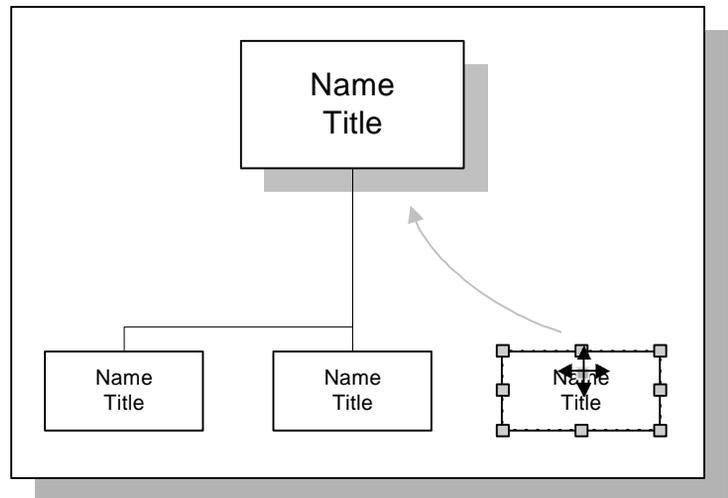
Many of the shapes designed to create an organization chart have control handles that you can drag to create connectors. You can tell which shapes produce connectors by looking at the master shape icon. Connectors appear as yellow lines extending from the main shape.

### **To create an organization chart by dragging connectors from a shape:**

1. Drag organization chart master shapes into position on the drawing page.



2. Drag the control handles on the shapes you want to connect and glue them to connection points on the shapes you want to glue them to.



Drag control handles on the Position shapes to create connectors that show the organizational reporting structure.

Visio glues the end of the connector to the connection point. If you move the shape the connector is glued to, the connector remains attached to that point.

For details about control handles, see Chapter 3, “Creating shapes.”

In some cases, you may want to create similar drawings using shapes that don’t have control handles. For example, you could create a family tree or a technical diagram using other master shapes or shapes you create. To connect specific points on these shapes, use the connector tool.

### To connect specific points on two-dimensional shapes:

1. Drag the two-dimensional shapes into position on the drawing page.
2. If you’d like, choose a connector shape from the stencil.

This is an optional step. If you don’t choose a connector, Visio uses the Universal connector by default.



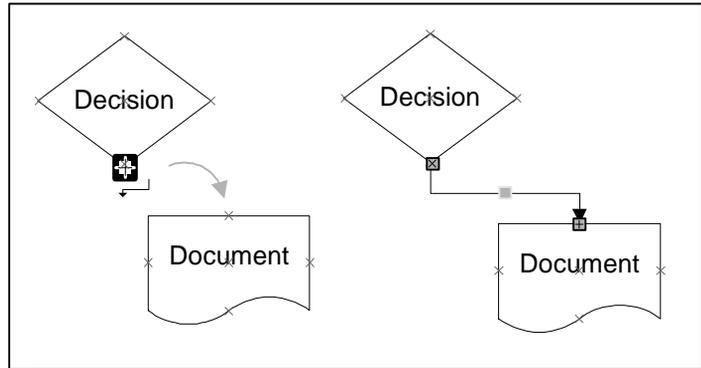
3. From the connection tool menu, choose the connector tool.
4. On the first shape, position the pointer over a connection point.

Visio displays a box around the connection point nearest the pointer.

Some master shapes have connection points at their centers that you can glue connectors to. However, if you position the connector tool over the middle of a shape that does not contain a center connection point, Visio displays a box around the entire shape to indicate that you’re using dynamic glue. For details, see “About connections and glue” earlier in this chapter.

5. Drag the pointer and position it over a connection point on the second shape.
6. Release the mouse button.

Visio creates an instance of the connector and glues it to the two points.



No matter where the shapes are in relation to each other, the endpoints of the connector remain glued to the same points. If you move the two-dimensional shapes, Visio redraws the connector so it flows as directly as possible between the connection points without crossing over the connected shapes.

---

**Tip:** If you need to modify a drawing in which shapes are connected with a Universal connector, move the two-dimensional shapes first. Then, if necessary, use control handles on the Universal connector to adjust the connector’s bends. For details, see “Adjusting the bends in a Universal connector” later in this chapter.

---

### *Other ways to connect shapes*

In addition to the techniques described in the previous sections, Visio provides several other tools for connecting shapes.

You can use the Connect Shapes command to connect shapes that are already on the drawing page.

### To connect a series of shapes using dynamic glue:

1. Hold down the Shift key and click each two-dimensional shape you want to connect in the order you want to connect them.

Green selection handles appear on the first shape you select. The other shapes have blue selection handles.

2. If you'd like, choose a connector shape from the stencil.

This is an optional step. If you don't choose a connector, Visio uses the Universal connector by default. If you do choose a connector, be sure it's one that can work with dynamic glue. For details, see "Which shapes can use dynamic glue?" earlier in this chapter.

3. From the Tools menu, choose Connect Shapes.



Alternatively, click the Connect Shapes button on the toolbar.

Visio creates an instance of the connector and uses dynamic glue to connect the shapes.

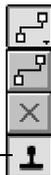
If you select shapes by holding down the Shift key and clicking each shape, Visio connects shapes in the order they were selected. For example, Visio connects the first and second shape, the second and third shape, the third and fourth shape, and so on. If you select shapes by dragging a selection net around the shapes or if you use the Select All command, Visio connects shapes in the stacking order of the shapes.

The rubberstamp tool, which is typically used for duplicating master shapes on a drawing page, is also handy for gluing connectors to specific points on two-dimensional shapes.

### To stamp a connector master shape between shapes:

1. Position the two-dimensional shapes on the drawing page.
2. From the connection tool menu, choose the rubberstamp tool.
3. In the stencil window, select a connector master shape.

Rubberstamp tool



4. In the drawing window, position the rubberstamp tool over a connection point on one of the two-dimensional shapes.
5. Hold down the left mouse button and drag to a connection point on the second shape.
6. Release the mouse button.

Visio adds an instance of the connector you selected between the points on the two-dimensional shapes.

---

**Tip:** The rubberstamp tool does not use dynamic glue, but you can change the connection's glue type. For details, see "Converting the glue" later in this chapter.

---

For details about using the rubberstamp tool to duplicate instances of a master shape, see Chapter 3, "Creating shapes."

---

### *Glue and connectors: The finer points*

This section describes some of the finer points of using connectors and glue, including some of the ways you can adjust connectors once they're in a drawing.

---

#### *Maintaining and breaking connections*

It's important to understand that you glue one shape to another. After shapes are glued, you can move the shape that has another shape glued to it without breaking the glue. For example, if you glue a connector to a box, you can move the box without breaking the glue. However, there are restrictions on how you can move the connector without breaking the glue.

The following actions do not break glued connections:

- Moving a shape or guide that has other shapes glued to it.
- Moving the free endpoint of a one-dimensional shape whose other endpoint is glued to a shape.
- Reversing a shape using Reverse Ends.

The following actions break glued connections:

- Moving the glued endpoint of a one-dimensional shape.
- Moving a shape glued to a guide away from the guide.
- Flipping or rotating a shape that is glued to another shape.

---

### *Converting the glue*

No matter which technique you use to add connectors to your drawing, you can switch between a solid connection and one that uses dynamic glue, providing the connector is designed to work with dynamic glue. For details, see “Which shapes can use dynamic glue?” earlier in this chapter.

### **To switch from a solid connection to dynamic glue:**

1. Choose the pointer tool and select the connector in the drawing.
2. Hold down the Ctrl key.
3. Drag each endpoint of the connector away from the connection point it is glued to.
4. Drag the endpoints back to the shape to glue the endpoints with dynamic glue.

Visio displays a box around the shape to indicate that you are creating a dynamic connection.

Once you get the shapes in their final positions, you may want to switch from dynamic glue to solid connections.

**To switch from dynamic glue to a solid connection:**

1. Drag the endpoints of the connector shape away from the connection points.
2. Drag the endpoints back to the connection points.

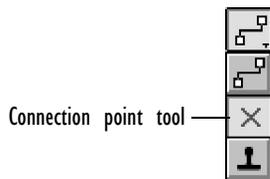
For details about identifying the glue type in a connection, see “About connections and glue” earlier in this chapter.

*Creating and deleting connection points*

Whenever you glue a shape to a vertex or selection handle on another shape, Visio creates a connection point. You can also create connection points at other locations on a shape or even outside a shape’s boundaries.

**To add a new connection point to a shape:**

1. Select the shape.
2. From the connection tool menu, choose the connection point tool.
3. Hold down the Ctrl key and click where you want to add the connection point. You can click on, inside, or outside the shape’s boundaries.



Visio adds an X to show the new connection point.

When multiple shapes are selected, the connection point is added only to the primary shape (the first shape you selected).

**To delete a connection point from a shape:**

1. From the connection tool menu, choose the connection point tool.
2. Click the connection point you want to delete.

When selected, the connection point turns magenta.

3. From the Edit menu, choose Clear.

Alternatively, press the Delete key.

Visio deletes the connection point.

You can also create connection points by using the ShapeSheet. For details about the ShapeSheet, see the Visio online help and Chapter 8, “Using ShapeSheets to create SmartShapes.”

---

### *Setting glue options*

Before you glue shapes, you may need to specify glue settings in the Snap & Glue Setup dialog box. Each template uses glue settings that are appropriate for the master shapes on the stencil associated with the template.

---

**Tip:** Glue options you set in the Snap and Glue Setup dialog box only apply when you use the drag and drop technique described earlier in this section and when you use the rubberstamp tool to connect shapes. You do not need to set glue options to use the Connect Shapes command and connector tool.

---

### **To turn glue on:**

1. From the Tools menu, choose Snap & Glue Setup.
2. Check the Glue option in the Currently Active section, and then choose OK.



Alternatively, click the Glue button on the toolbar.

### **To specify the points to glue to:**

1. From the Tools menu, choose Snap & Glue Setup.
2. In the dialog box, check the Glue To options you want.

You can check as many items as you want. If you want to glue the endpoints of one-dimensional shapes to the endpoints of other one-dimensional shapes, check either Shape Handles or Shape

Vertices. If you want to glue to selection handles on shapes, groups, and objects from other applications, choose Shape Handles.

3. Make sure the Glue option in the Currently Active section is checked.
4. Choose OK.

If you want to glue to guides, handles, or connection points, make sure these items are visible.

### **To display connection points or guides:**

1. From the View menu, choose Connection Points or Guides.

When the command is checked, the item is visible.

---

### *Adjusting the bends in a Universal connector*

The Universal connector uses the geometry of the shapes and the location of the connection points to calculate the most direct route between two shapes. When you move the shapes the connector is attached to, the connector adjusts itself to avoid crossing over the shapes it connects.

If you use a control handle to adjust the location of a connector segment, Visio will then maintain the segment's location in relation to the shapes. If you move the shapes the connector is glued to, the adjustment you made to the segment's location may cause the connector to cross over the connected shapes. You can easily reactivate the Universal connector's self-adjusting behavior by dragging an endpoint away from the shape and then reconnecting the endpoint to the shape.

---

**Tip:** To create a connection using dynamic glue, hold down the Ctrl key as you reconnect the endpoint to the shape.

---

---

### *Adding text to connectors*

Connectors are just like any other Visio master shape: Some connector master shapes have text and others don't. As with any other Visio shape, you can add text to connectors by selecting the shape and typing the text. You can also use the text tool to add or edit text.

#### **To add or edit text for a connector:**



1. From the text tool menu, choose the text tool.
2. Select the connector.

Visio opens the connector shape's text block.

3. To add text, simply type.

If the shape already has text, Visio replaces the text with the text you type. To edit existing text, select the text in the text block and then edit the text.

4. To close the text block, click the drawing page.

For details about working with text, see Chapter 4, "Adding text to drawings."

---

### *Adding, removing, and switching arrowheads*

Connector master shapes are formatted with a template-based style. Template styles are designed to match the requirements of the drawing type. For example, the connector shapes in flowchart-related stencils have arrowheads; the connector shapes in organization chart-related stencils do not.

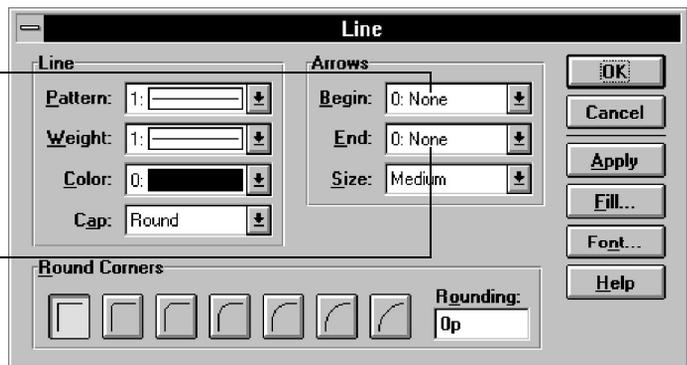
You can override the style settings for a connector and add, delete, or move the location of the arrowheads.

**To add or delete arrowheads for a connector shape:**

1. Select the connector.
2. From the Format menu, choose Line.
  - ❖ In Visio’s SmartSuite menu set, choose Line from the Style menu.
3. In the Arrows section, change the appropriate settings.

Determines whether an arrowhead appears on the connector’s beginning point (marked by an x).

Determines whether an arrowhead appears on the connector’s ending point (marked by a plus sign).



To add an arrowhead to the beginning point, ending point, or both, choose an arrowhead style from the Begin and End lists. To delete an arrowhead from the beginning or ending points, choose None from the Begin or End lists.



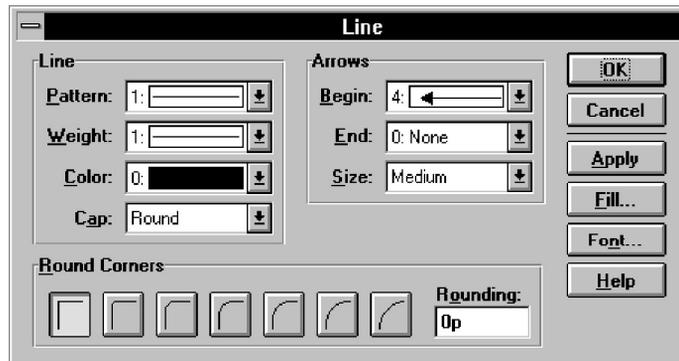
4. Choose OK.

Alternatively, select the connector shape and click the Line Ends button. The button adds and deletes arrowheads from each end of the connector shape with each consecutive click.

In some cases, you may need to adjust the direction of the connector shape. For example, you may draw a connector and find that the arrowhead is pointing at the wrong shape.

**To move the arrowhead from one end of the connector to the other:**

1. Select the connector.
2. From the Format menu, choose Line.
  - ❖ In Visio's SmartSuite menu set, choose Line from the Style menu.
3. In the Arrows section, change the appropriate settings.



To switch the arrowhead from the beginning point to the ending point, choose None in the Begin list and choose an arrowhead style from the End list.

Creating shapes

3

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# Creating shapes

Visio supplies all the shapes you need to create many types of drawings. But what if you need certain unique symbols, or you want to add creative touches to your drawings? You can create your own shapes by drawing them or by editing the shapes that come with Visio. And any shape you create can be saved as a master shape on a new or existing stencil, so you can reuse it at any time. For details about creating master shapes, see Chapter 6, “Creating masters, stencils, templates, and styles.”

The Visio drawing tools are straightforward, so it’s easy to draw your own shapes. In addition, Visio includes unique commands and tools that simplify the process of creating complex shapes. The Union and Combine commands create one shape from several other shapes, and the Fragment command breaks up shapes into smaller parts that you can rearrange, edit, or discard. Also, you can group shapes to create more complex shapes.

This chapter explains what shapes are (something you need to understand fully before you can successfully draw and edit shapes) and how to draw, edit, group, and format shapes. For details about adding text to shapes, see Chapter 4, “Adding text to drawings.”

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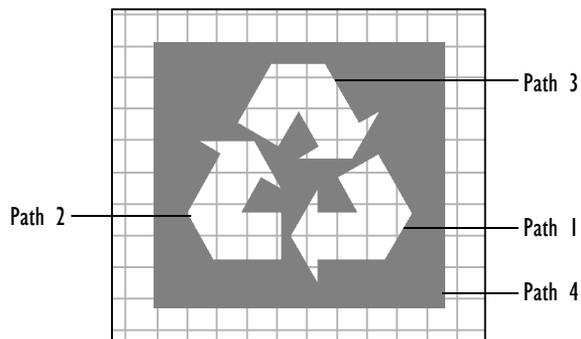
## Before you draw or edit shapes

Before you draw or edit shapes, it's helpful to understand the parts you draw to create a shape, what you can do with a shape, and how a shape behaves. This section explains these topics. In addition, it's important to understand the points on shapes—especially endpoints, vertices, and control points—that you use to reshape shapes. For an overview about the points on shapes, see “Anatomy of a shape” in Chapter 2, “Adding, arranging, and connecting shapes.”

A *shape* is one line or arc, a series of line and arc segments, or several shapes grouped together. A single line, for example, is a shape. So is a rectangle. So is a symbol composed of several simpler shapes grouped together.

A shape is either closed or open. You can fill closed shapes such as circles with colors and patterns. You can format the ends of open shapes such as lines, zigzag shapes, and half-circles. For example, any open shape can have an arrowhead at each end.

Most shapes have one *path*. A path is a continuous series of segments. Shapes can also have more than one path. For example, you might create a recycle symbol composed of several paths.



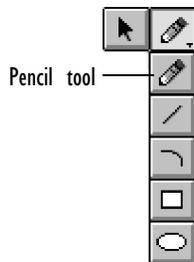
You can do these things with a shape:

- Size, move, and rotate it, and change its position in the stacking order.
- Add text to it.
- Format it.
- Copy, paste, duplicate, and delete it.
- Glue it to other shapes and guides.
- Specify whether the shape prints, how it appears on screen, how it sizes in a group, and what happens when you double-click it.
- Edit it with the pencil tool.
- Unless the shape is a group, you can also unite and combine it with other shapes, or fragment it into separate shapes.

You can also specify behavior for a shape through its ShapeSheet. For details, see Chapter 8, “Using ShapeSheets to create SmartShapes.”

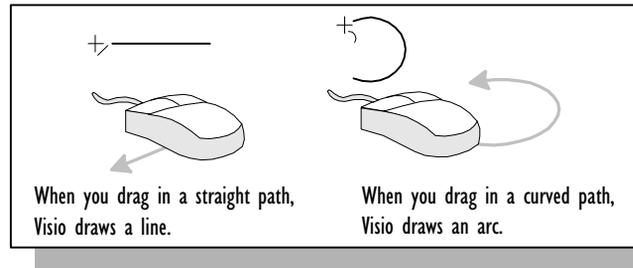
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## Drawing shapes



Drawing shapes is straightforward in Visio. Visio contains some standard drawing tools—plus some powerful additions. The pencil tool is especially powerful because you can draw both lines and arcs with it. As you begin to move the mouse, Visio quickly calculates the path along which the pointer appears to be traveling. If the path of the mouse is straight, the pencil tool draws a straight line segment. If the path curves, the pencil tool draws an arc.

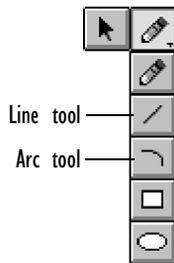
It's worth practicing with the pencil tool to get comfortable with it. Try drawing arcs and lines at different angles. Move the mouse as if you were drawing the same shapes with a pencil on paper. As you draw, you'll see how Visio interprets your gestures.



When you first draw a shape with any tool, don't be concerned if it doesn't look exactly right. You can modify the shape later. You can change arcs into lines and lines into arcs, and add and delete segments as necessary. For details, see "Editing shape segments" later in this chapter.

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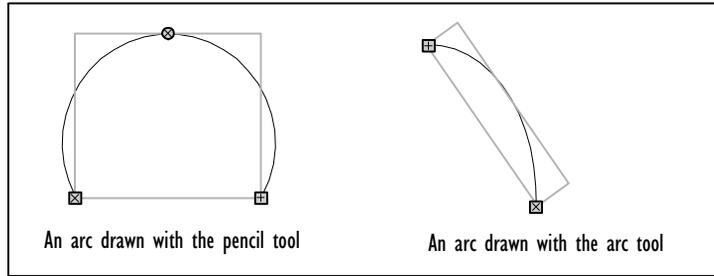
### Drawing a single line or arc



Use the pencil, line, or arc tool to draw a single line or arc shape. Lines are the same regardless of which tool you draw them with. Arcs differ depending on which tool you use to draw them. However, you can edit arcs considerably after you draw them so it doesn't matter whether you first use the pencil tool or the arc tool for drawing arcs.

Each arc you draw with the pencil tool is a portion of a circle. The portion and size of the circle vary depending on the way you move the mouse.

The arcs you draw with the arc tool are always a quarter of an ellipse. Like the pencil tool, the arc tool uses the path along which the pointer travels to determine which way the arc bows. Where you place the endpoint determines the arc's eccentricity (or how asymmetrical it is).

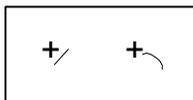
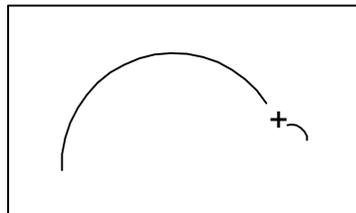


### To draw a line or an arc:

1. From the drawing tool menu, choose the pencil tool.

Alternatively, choose the line tool or the arc tool, whichever is appropriate.

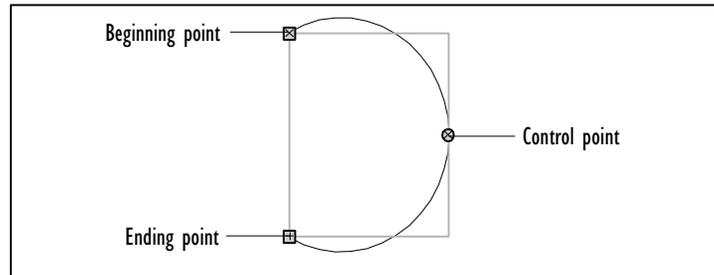
2. Point to where you want to start the line or arc.
3. Drag to draw the line or arc.



As you start drawing, the pointer changes to a crossbar, and then displays a line or an arc depending on what kind of segment you are drawing.

4. Release the mouse button.

The line or arc is initially a one-dimensional shape, so it has endpoints. When you select it with the pencil tool you'll also see a circle between its endpoints. That's the *control point* for changing lines to arcs and arcs to lines, and for changing the bow of an arc.



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### *Drawing shapes with several segments*

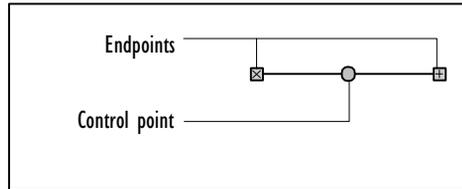
When you draw a shape with more than one segment, you start each subsequent segment at the endpoint or vertex of the previous segment. If you don't like a segment, you can delete it immediately by choosing Undo from the Edit menu. You can also adjust, add, and delete segments after you complete the shape.

#### **To draw a shape with several segments:**

1. From the drawing tool menu, choose the pencil tool.  
If you prefer, choose the line or arc tool.
2. Point to where you want to start the shape.
3. Drag to create the first segment.

4. Release the mouse button.

This single segment is a one-dimensional shape.

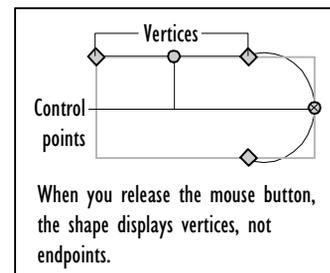
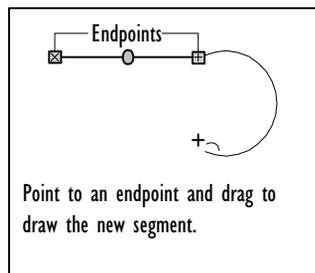


5. To draw the next segment, point to either endpoint of the first segment, and then drag. When you finish, release the mouse button.

Be careful not to select the endpoint of the first segment. If you select an endpoint, it turns magenta. If you drag a selected endpoint, Visio resizes the existing segment instead of starting a new one.

Note that the shape is now two-dimensional and it displays vertices at the ends of segments, not endpoints. When the shape is selected with the pencil tool, each segment also displays a control point.

6. To draw subsequent segments, point to a vertex, drag to draw the new segment, and then release the mouse button.



You close a shape in Visio just as you close a shape when you draw on paper: you drag the last vertex of the shape to the first vertex.

**To close a shape:**

1. When you draw the last segment of the shape, drag until the crossbar of the mouse pointer is over the vertex at the beginning of the first segment of the shape.
2. Release the mouse button.

The shape's fill color is white unless you have specified a different fill color or pattern for the shape.

Keep these things in mind when you are drawing shapes:

- You can switch between the pencil, arc, and line tools. Before you start a segment, choose the tool you want.
- To constrain lines to 45 degree intervals, hold down the Shift key as you draw the lines.
- To draw a complex shape, draw the shape's simple components first, and then use the Group, Union, Combine, or Fragment command to create the complex shape. For details, see "Grouping shapes" and "Joining and breaking up shapes" later in this chapter.
- To create shapes with multiple paths that don't touch each other, use the Combine command. For details, see "Joining and breaking up shapes" later in this chapter.

---

*Undoing segments*

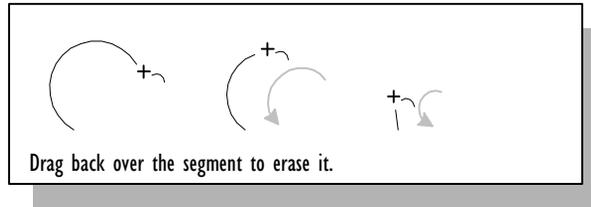
You can start a segment over before you finish drawing it, and undo segments one at a time.

**To start a segment over:**

1. Before you release the mouse button at the end of a segment, drag back to the vertex at the beginning of the segment.

Make sure you hit the vertex precisely or you might not completely delete the segment.

2. Redraw the segment.



Immediately after you draw segments, you can undo them in the reverse of the order in which you created them.

### To undo segments one at a time:

1. After you draw segments but before you perform other actions, choose Undo from the Edit menu.

Alternatively, press Ctrl+Z or Alt+Bksp.

Visio deletes the last segment you drew.

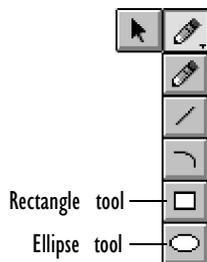
2. Repeat step 1 to delete other segments one at a time starting with the last segment you drew.

---

### Drawing ellipses and rectangles

An easy way to draw ellipses and rectangles is with the ellipse and rectangle tools. The ellipse tool also provides the best way to draw a circle, and with the rectangle tool you can easily draw a square.

### To draw an ellipse or a rectangle:



1. From the drawing tool menu, choose the ellipse or rectangle tool, whichever is appropriate.
2. Point to where you want to start the shape.

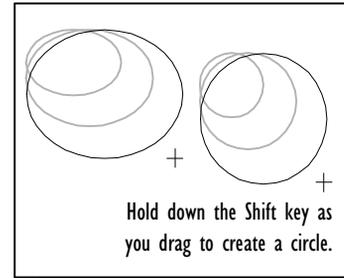
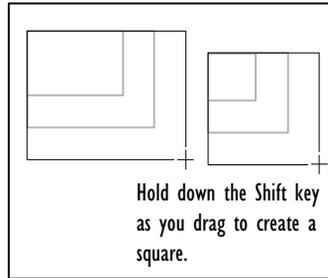
For ellipses, point to where you want a corner of the shape's selection rectangle.

For rectangles, point to where you want a corner.

3. Drag until the shape is the size you want.

For a circle or square, hold down the Shift key as you drag.

4. Release the mouse button.

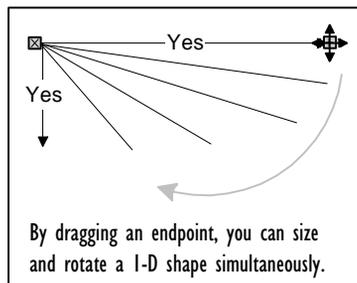


## Sizing shapes

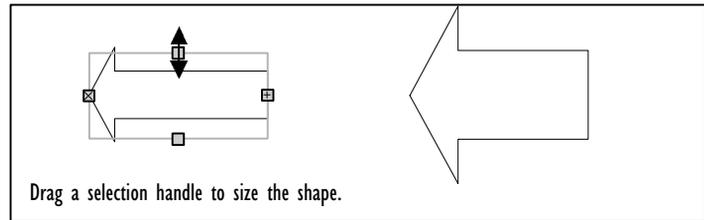
The method you use to size shapes depends on whether the shape is one-dimensional or two-dimensional.

### To size a one-dimensional shape:

1. With the pointer tool, select the shape.
2. Drag an endpoint until the shape is the size you want.



If the shape is not a straight line, you can also size it by dragging a selection handle.



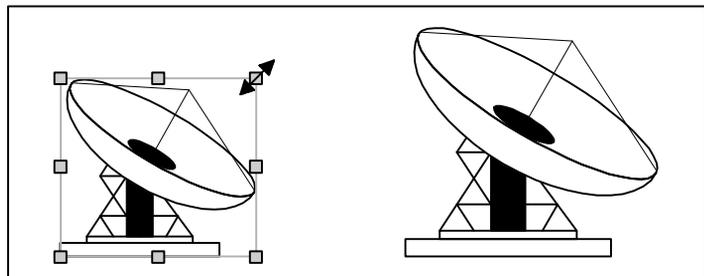
3. Release the mouse button.

You can size a two-dimensional shape one direction at a time or both directions at once, depending on which handle you drag.

#### To size a two-dimensional shape:

1. With the pointer tool, select the shape.
2. Drag a handle until the shape is the size you want.

To size the shape proportionally, drag a corner handle.



---

**Tip:** If you see fewer than eight handles on a two-dimensional shape, zoom in to see the rest of the handles and size the shape more accurately. For details about zooming, see Chapter 1, “Getting started with Visio.”

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## Editing shape segments

Visio shapes are flexible. You can change the angle at which two sides of the shape meet, add and delete arc and line segments, and change several aspects of arcs.

In most cases, you can make these changes by selecting the shape with the pencil tool and dragging a part of the shape until it looks the way you want it to.

This section explains how to move, add, and delete shape segments. For details about how to edit arcs, see “Reshaping arcs” later in this chapter.

Note that control handles may cause a shape to behave in ways that a standard one-dimensional or two-dimensional shape would not. For details, see “Working with control handles” later in this chapter.

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### *Changing shape angles by dragging a vertex*

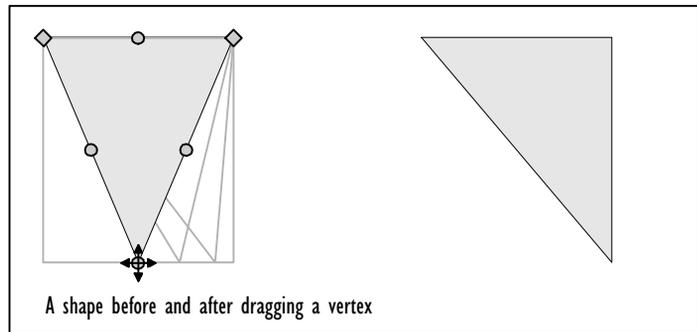
By dragging a vertex, you can change the angle where two segments meet. Dragging a vertex often makes the segments longer or shorter.

#### **To reshape angles by dragging a vertex:**

1. With the pencil tool, select the shape.
2. Click the vertex whose position you want to change.

The vertex turns magenta and the pointer tool changes to a four-headed arrow.

3. Drag the vertex to its new position.



You can select several vertices and drag them all at the same time. The selected vertices maintain their relationship to each other but move with respect to the rest of the shape. To select the vertices, select the first vertex, and then hold down the Shift key to select the others. To move the vertices, place the pointer over one of the selected vertices (the pointer changes to a four-headed arrow), and then drag.

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### *Adding and deleting segments*

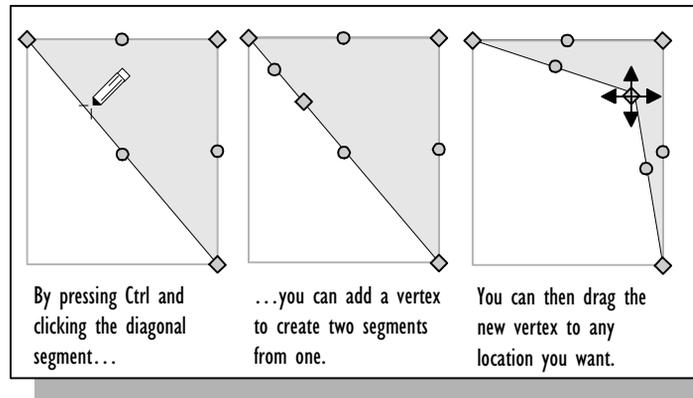
You add and delete segments to change the look of a shape. For example, you can add a segment to a triangle to make it a rectangle, or delete a segment from a rectangle to make it a triangle.

#### **To add a new segment:**

1. With the pencil tool, select the shape.
2. Point to where you want to create a new vertex.

It's helpful to zoom into your drawing so you can see clearly when the pencil is over a line or arc segment.

3. Hold down the Ctrl key and click.



Visio creates a vertex where you clicked. The vertex indicates where one end of the new segment meets the end of an existing segment. Each segment, including the new one, displays a control point at its center.

If you clicked a line segment, the new segment is a line. If you clicked an arc segment, the new segment is an arc.

---

**Tip:** Adding a segment is sometimes easier when snapping is turned off. For details about snapping, see Chapter 2, “Adding, arranging, and connecting shapes.”

---

If you want fewer segments in a shape, delete the segments you don’t want. You delete a segment by selecting a vertex associated with the segment, and then deleting it. After you delete segments, you may need to adjust the shape by dragging vertices and control points until the shape looks the way you want.

#### To delete a segment:

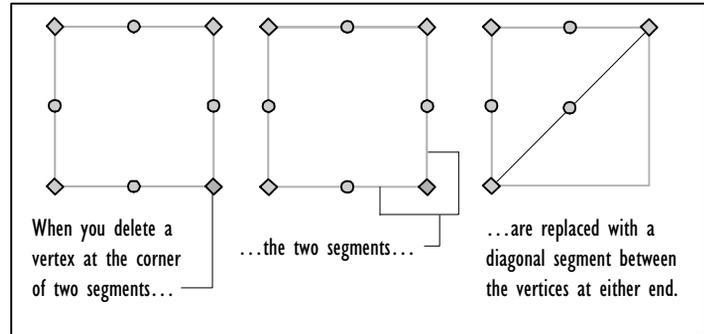
1. With the pencil tool, select the shape.
2. Point to a vertex associated with a segment you want to delete.

When the pointer is directly over a vertex, it changes from a pencil to a four-headed arrow.

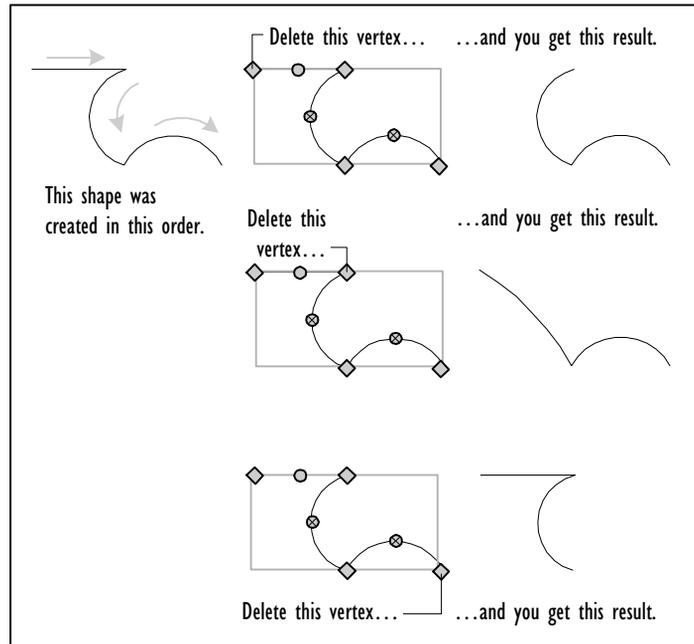
- Click the vertex to select it.

The vertex changes to magenta.

- Press the Delete key.



How Visio redraws the shape when you delete a vertex depends on whether the vertex is at the beginning or end of an open shape, the order in which the segments were created, and whether the segment that follows the vertex you delete is a line or an arc.



---

## Reshaping arcs

Whether you draw an arc with the pencil tool or the arc tool, you can edit an arc until it looks exactly as you want it to—even change it into a line. By dragging the arc’s control point or eccentricity handles, you can change its bow and its eccentricity.

---

### *Changing arcs to lines and lines to arcs*

You can flatten an arc until it becomes a line, or bow a line until it becomes an arc. An arc has an invisible snap point in the middle of an invisible line between its two endpoints. When you drag the control point to that snap point, the arc becomes a line.

#### **To change an arc to a line or a line to an arc:**

1. Select the arc or line with the pencil tool.

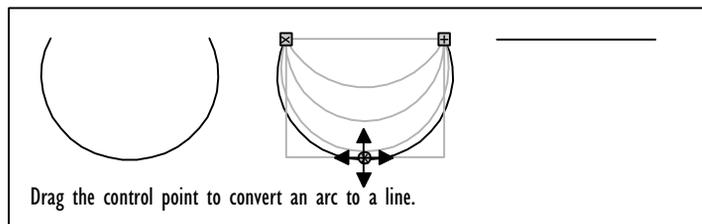
If the segment is in a multiple-segment shape, select the shape.

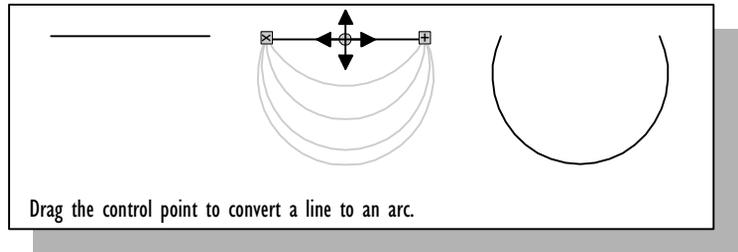
A control point appears on the arc or line.

2. Point to the control point.

The pointer changes to a four-headed arrow.

3. To change an arc to a line, drag the control point until it flattens to form a line. To change a line to an arc, drag the control point until it forms an arc.



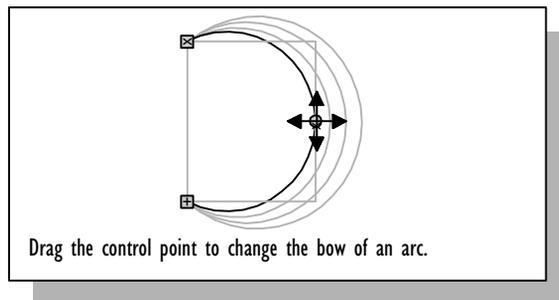


### *Changing the bow of an arc*

Every arc follows the perimeter of an invisible circle or an ellipse. You can change the bow of an arc so that it becomes a larger or smaller portion of the invisible ellipse. The bow is the curve in an arc. The greater an arc's bow, the greater the distance between the ends of the arc and the farthest point out on the arc.

#### **To change the bow of an arc:**

1. Select the arc or the shape that contains the arc with the pencil tool.
2. Point to the arc's control point.  
The pointer changes to a four-headed arrow.
3. Drag the control point up or down until the arc looks the way you want it to.



### Changing an arc's magnitude of eccentricity

Eccentricity is the measure of how elongated an ellipse is; it's the ratio between the ellipse's length and width. To change the eccentricity of an arc, you change the shape of the invisible ellipse that the arc is based on. An arc drawn with the pencil tool is based on an invisible circle and has an eccentricity of zero. The eccentricity of an arc you draw with the arc tool is determined by how you move the mouse as you draw.

By dragging one of the arc's eccentricity handles, you can reshape the invisible ellipse on which the arc is based, and make the arc more eccentric, or less.

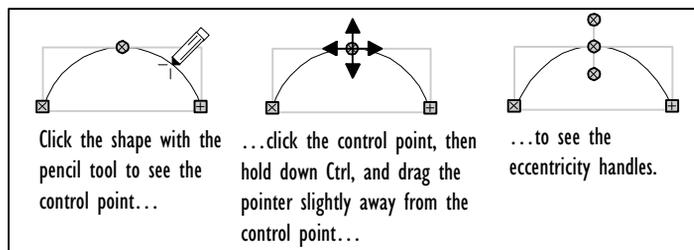
#### To change an arc's magnitude of eccentricity:

1. With the pencil tool, select the arc or the shape that contains the arc.
2. Point to the control point on the arc, and then click to select the control point.

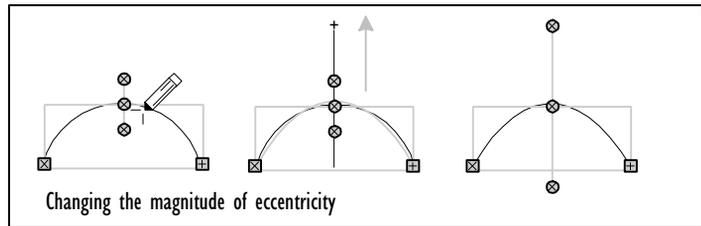
The control point turns magenta, and if the arc is not circular, you'll see the eccentricity handles. On circular arcs, the eccentricity handles are under the control point.

3. If you don't see the eccentricity handles, hold down Ctrl and drag the pointer slightly away from the control point.

Visio displays the eccentricity handles.



4. To change the magnitude of the arc's eccentricity, drag an eccentricity handle farther from or closer to the control point.



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### *Changing an arc's angle of eccentricity*

You can change how an arc leans by rotating its eccentricity handles to change its angle of eccentricity.

#### **To change an arc's angle of eccentricity:**

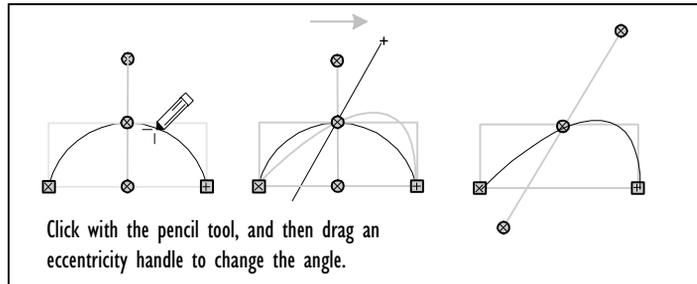
1. With the pencil tool, select the arc or the shape that contains the arc.
2. Point to the control point on the arc, and then click to select the control point.

The control point turns magenta, and if the arc is not circular, you'll see the eccentricity handles.

3. If you don't see the eccentricity handles, hold down Ctrl and drag the pointer slightly away from the control point.

Visio displays the eccentricity handles.

4. Drag an eccentricity handle to rotate it around the control point until the arc is aligned the way you want.



## Working with control handles

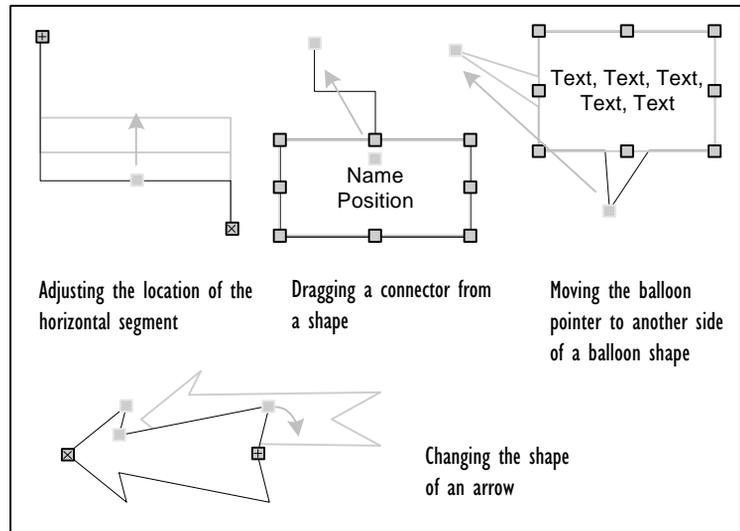
Some Visio shapes have special handles called control handles. A control handle lets you work with a shape in ways that are independent of standard one-dimensional and two-dimensional characteristics.



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You can tell which shapes have control handles by looking at the master shape icon in the stencil. These icons have a green square in the lower-right corner.

Control handles work differently depending on the shape's design and purpose. For example, you might drag a control handle on one shape to adjust a rounded corner; on another, to reshape an arrow; and on another, to pull a connector directly out of a shape. The illustration shows some examples of how control handles work.



When a control handle creates another shape such as a connector, the shapes may behave differently from how they would if you had created them independently of each other. For example:

- If you select a shape from which you've dragged a connector, the connector is also selected.
- To add text to a connector dragged from a shape, you must subselect the connector.

---

### *Duplicating, copying, and deleting shapes*

You can duplicate, copy, paste, cut, and clear shapes in Visio the same way you do in other Windows applications. You can also duplicate a shape at a specific location on the page or use the rubberstamp tool to create multiple instances of a master shape. For details about cutting, copying, and pasting between applications, see Chapter 7, "Using Visio with other applications." For shortcut keys related to these actions, see Appendix B, "Shortcuts."

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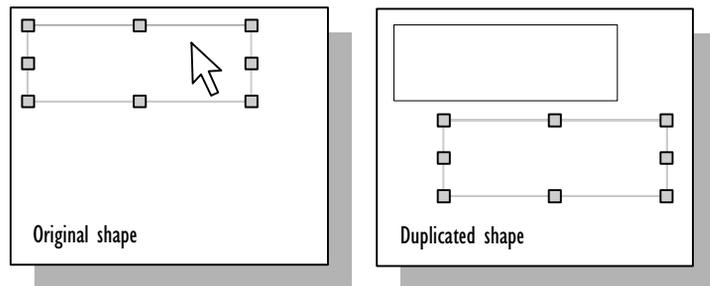
### Duplicating shapes in the current drawing

When you duplicate a shape, you can either create the copy at a standard distance from the original shape or specify exactly where you want the copy. If you create multiple copies, each copy is offset from the previous copy by the same amount the first copy is offset from the original.

#### To duplicate a shape:

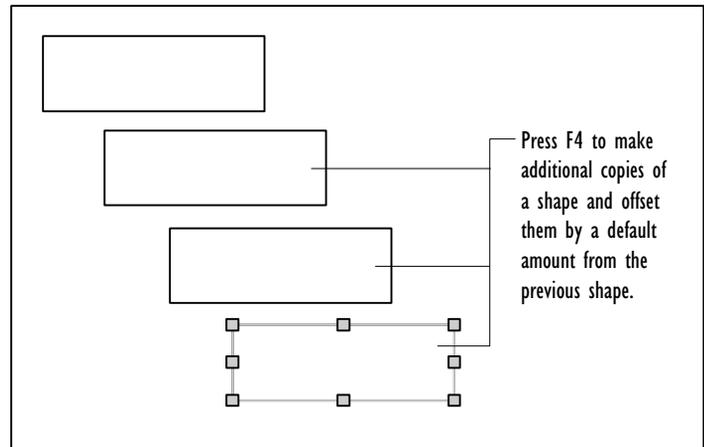
1. Select the shape.
2. From the Edit menu, choose Duplicate.

A copy of the shape appears slightly offset from the original.



#### To create more copies quickly:

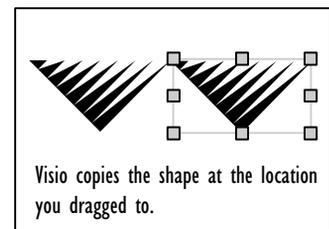
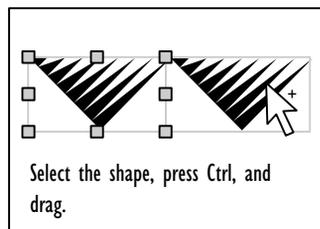
1. Immediately after you duplicate a shape, press F4 for each additional copy you want to create.



By specifying exactly where you want Visio to place a copy of the shape, you can quickly create borders, evenly spaced boxes in organization charts, and build other drawings that use several copies of the same shape. Consider using this technique instead of dragging and dropping the same master shape several times—it's often quicker.

### To duplicate a shape at a specific location:

1. With the pointer tool, select the shape.
2. Hold down Ctrl and drag the shape to where you want the copy.

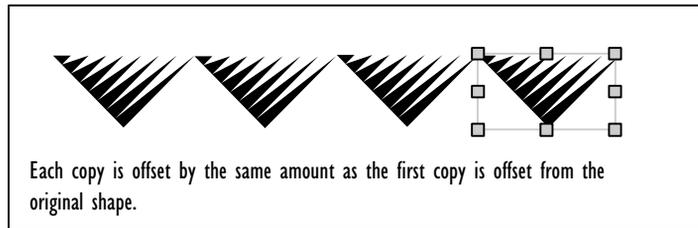


When you press Ctrl, the pointer changes to an arrow with a plus sign indicating that dragging will copy the shape. As you drag, you'll see an outline of the shape.

3. Release the mouse button.

The copy appears where you release the mouse button.

4. To create other copies, press F4 for each copy you want.



---

### *Using the rubberstamp tool to duplicate shapes*

Stamping is often the easiest way to create multiple instances of a master shape. You can use the rubberstamp tool with both one-dimensional and two-dimensional shapes.

#### **To stamp a master shape:**

1. From the connection tool menu, choose the rubberstamp tool.
2. In the stencil window, select a master shape.
3. In the drawing window, place the pointer where you want the center of the shape.
4. Click the left mouse button.

An instance of the master shape appears on the drawing page.

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**Tip:** You can also use the rubberstamp tool to quickly connect two-dimensional shapes. For details, see Chapter 2, “Adding, arranging, and connecting shapes.”

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### *Placing a copy of a shape into another drawing*

To place a copy of a shape into a different drawing, you can copy the shape to the Clipboard and then paste the shape from the Clipboard into the other drawing—or you can drag the shape there.

#### **To copy a shape and paste it into another drawing:**

1. Select the shape.
2. From the Edit menu, choose Copy.

A copy of the shape is placed on the Clipboard.

3. Display the drawing that you want to paste the shape into.

If the drawing is in the same drawing file, choose Go To Page from the Page menu, and then choose the page you want to display. If the drawing is in a different file, open the file, and then display the correct page.

4. From the Edit menu, choose Paste.

A copy of the shape appears in the center of the drawing.

If you want, you can use the Copy and Paste commands to create duplicates of shapes in your current drawing, but the Duplicate command is easier. Also, you can cut shapes with the Cut command, and then paste them.

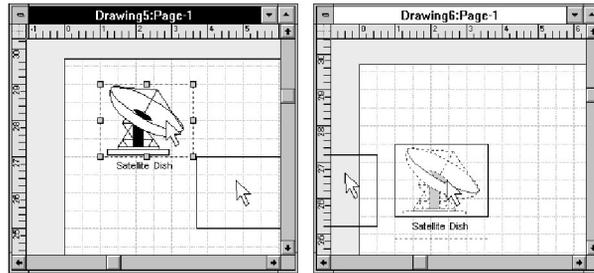
Visio has a shortcut for copying a shape and pasting it into another drawing.

#### **To place a copy by dragging:**

1. Display the drawing page that contains the shape you want to copy and the drawing page you want to copy the shape into.

For details about opening multiple drawing windows for the same file, see Chapter 5, “Creating and printing drawing pages.” For details about opening files, see Chapter 1, “Getting started with Visio.”

2. Point to the shape you want to copy.
3. Hold down Ctrl and drag the shape into the other drawing window.



A copy of the shape appears in the second drawing.

For information about dragging shapes from Visio into another application, see Chapter 7, “Using Visio with other applications.”

---

### *Cutting and clearing shapes*

If you no longer want a shape, you can cut or clear it to remove it from a drawing. When you cut a shape, Visio deletes the shape from your drawing but places a copy of it on the Clipboard so you can paste it if you want. When you clear a shape, Visio deletes it and does not copy it to the Clipboard. The way to restore the shape is by choosing Undo from the Edit menu (or press Ctrl + Z) before performing any other action.

#### **To cut or clear a shape:**

1. Select the shape.
2. From the Edit menu, choose Cut or Clear.

---

## Joining and breaking up shapes

When you want to draw a complex shape, first think about how you can break the shape into simpler shapes. You can often create a complex shape by drawing the simple parts that make up the shape, then putting them together. You can use the Union, Combine, and Fragment commands to easily create shapes that are often difficult to draw in other programs.

Each of these commands has a specific purpose:

- Union creates one shape from the perimeter of other shapes.
- Combine cuts holes in shapes.
- Fragment breaks one or more shapes into smaller shapes.

When you unite, combine, or fragment shapes, you are creating new shapes. The old shapes no longer exist, so their ShapeSheets—including their formulas—are discarded. Each new shape has its own ShapeSheet. For details about ShapeSheets, see Chapter 8, “Using ShapeSheets to create SmartShapes.”

If lines in a multiple segment shape are formatted with rounded corners, Visio discards this formatting when you unite, combine, or fragment shapes and replaces the round corners with arcs. For details about formatting, see “Formatting shapes” later in this chapter.

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### Uniting shapes

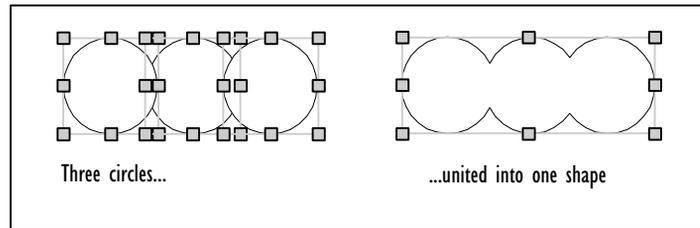
The Union command creates one shape from the perimeter of other shapes.

You can unite two or more overlapping closed shapes. If the shapes do not overlap, Union creates one shape out of them but the shapes might appear unchanged. If a shape is open, Visio discards the open shape when you choose Union.

The new shape inherits the formats and text of the first shape you select. The formats and text of other shapes are discarded.

**To unite shapes:**

1. Select the overlapping closed shapes that you want to unite.
2. From the Shape menu, choose Union.



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*Combining shapes*

The Combine command creates shapes with holes in them—such as picture frame shapes and doughnut shapes—and any other kinds of shapes with multiple paths.

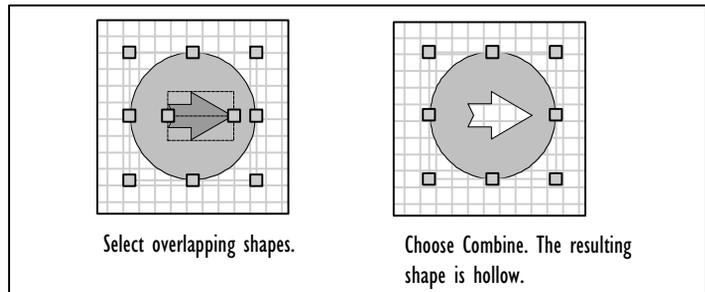
Usually, you combine a pair of two-dimensional shapes. When you combine two shapes, Visio discards the area where the two shapes overlap. For example, to create a doughnut shape, place a small circle in the middle of a large circle, then combine the shapes. Visio discards the area of the small circle to create the doughnut shape.

You can also combine one-dimensional shapes with each other and combine one- and two-dimensional shapes together. In these cases, Visio creates one shape from the selected shapes, but the new shape might not look different from the old ones. The difference is in the ShapeSheets. Each original shape has a ShapeSheet. Once the shapes are combined, the new shape only has one ShapeSheet.

As with Union, the new shape created with Combine inherits the formats and text of the first shape you select. The formats and text of other shapes are discarded.

**To combine shapes:**

1. Select the overlapping shapes that you want to combine.
2. From the Shape menu, choose Combine.



---

*Fragmenting shapes*

The Fragment command provides an ideal way to create Venn diagrams and marketing pyramids. With Fragment you can:

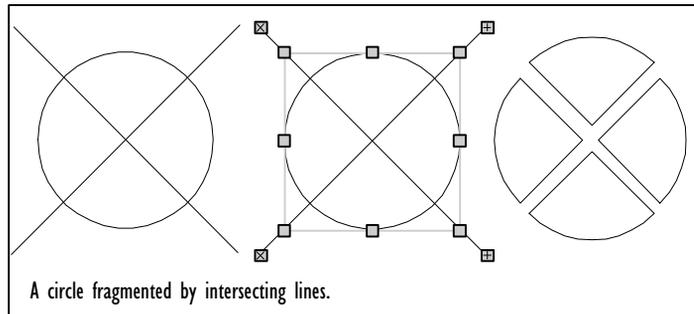
- Break a two-dimensional shape into smaller parts.
- Break a one-dimensional shape (except lines) into smaller parts.
- Create new shapes where two or more two-dimensional shapes overlap.
- Create a new shape from three or more intersecting lines.

After you fragment shapes, delete the pieces that you don't need.

**To break a two-dimensional shape into smaller parts:**

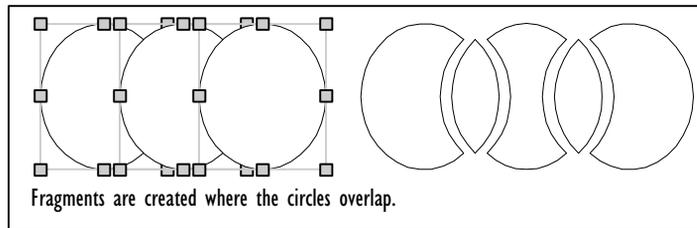
1. Draw lines through the shape where you want to break it.
2. Select the shape and the lines.

- From the Shape menu, choose Fragment.



### To create new shapes where two-dimensional shapes overlap:

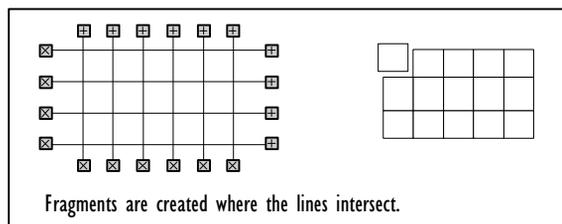
- Select the overlapping shapes.
- From the Shape menu, choose Fragment.



### To create a new shape from intersecting lines:

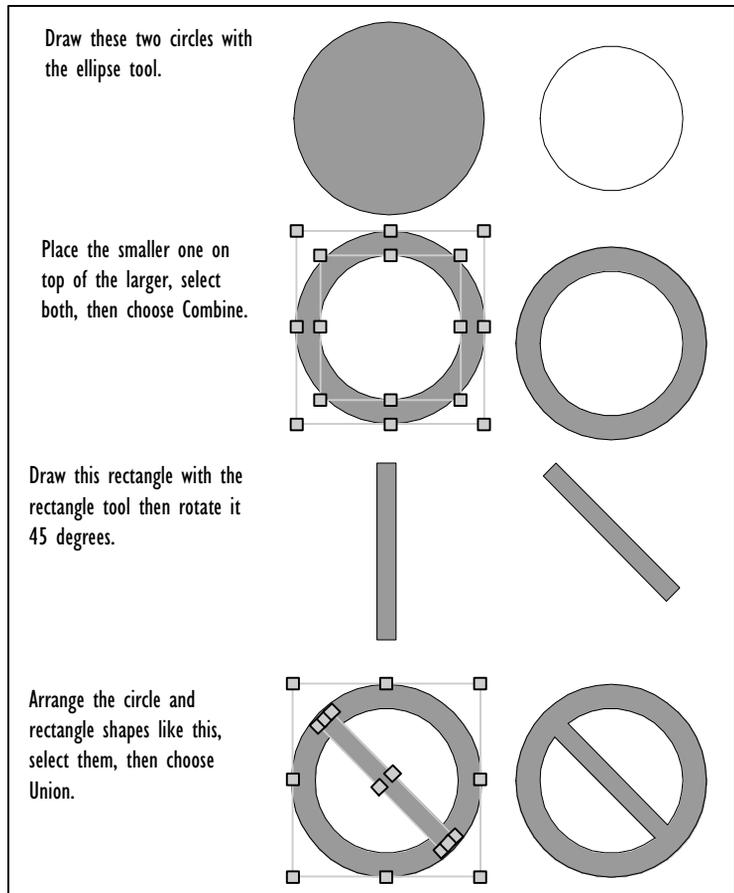
- Select the intersecting lines.
- From the Shape menu, choose Fragment.

The new shapes appear in the interior of the intersections.



### Example: Creating the No symbol

It could be difficult to draw the international No symbol in another program. In Visio it's easy: just create the simple shapes that make up the symbol, and then use the Combine command, the rotation tool, and the Union command to finish the shape.



---

## Grouping shapes

A *group* is a shape composed of other shapes. Several of the master shapes provided with Visio are groups of simple shapes that together make up a more complex shape. You can move and size a group as a single shape, but you can also edit the shapes in a group individually.

Although a group is considered a shape, technically it is different in some ways from other shapes. You cannot edit the group itself with the pencil tool, although you can edit the shapes in it. A group can include guides and objects from other applications as well as shapes. A group has a ShapeSheet, but so does each shape and each object in the group.

This section explains how to group and ungroup shapes, edit the entire group, and edit shapes in the group.

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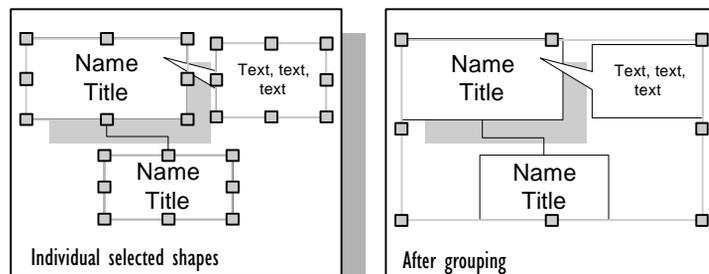
### Grouping and ungrouping shapes

You can group any shapes on the same drawing page, regardless of their proximity. Consider grouping shapes that you use together regularly, such as a table and chair.

#### To group shapes:

1. Select the shapes you want to include in the group.
2. From the Shape menu, choose Group.

A selection rectangle appears around the shapes in the group.



A group can be disassembled with the Ungroup command.

**To ungroup shapes:**

1. Select the group.
2. From the Shape menu, choose Ungroup.

When you ungroup shapes, Visio discards the group's ShapeSheet. If you ungroup an instance of a master shape, the shape no longer inherits characteristics from the master on the drawing file stencil.

---

*Editing a group*

You can size, move, rotate, and format all the shapes in a group in much the same way as you size, move, rotate, and format other shapes. You can also add or remove shapes from a group.

**To edit the entire group:**

1. Select the group.
2. Size, move, rotate, format, or add text to the group as you would for other shapes.

When you format the entire group, the formatting affects all the shapes in the group. When you add text to a group, the text appears on the frontmost shape in the group.

**To add or remove a shape from a group:**

1. Select the group.
2. From the Shape menu, choose Ungroup.
3. Hold down the Shift key and select the shapes you want to add to or remove from the group.
4. From the Shape menu, choose Group.

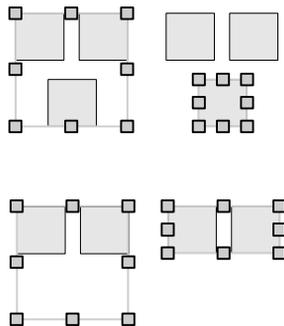
Alternatively, you can add and delete shapes without ungrouping the group. To add a shape to a group, choose Open Group from the Edit menu to open the group window, drag the shape you want to add into the group window, and then close the group window. To delete a shape from a group, open the group window, delete the shape you want to remove from the group, and then close the group window.

All shapes, groups, and objects from other applications are surrounded by a selection rectangle, which is displayed when the item is selected and can be used to align the items to the grid and with each other. If you add or remove a shape in a group and close the Group window, you may notice that the selection rectangle no longer fits the new group dimensions.

### To adjust the selection rectangle:

1. Select the group.
2. From the Tools menu, choose Update Alignment Box.

Note that some master shapes included with Visio have unusually large or small selection rectangles that are specifically designed to match the selection rectangles on related shapes. You should not adjust selection rectangles on instances of these shapes unless you don't plan to use the shape with another related shape.



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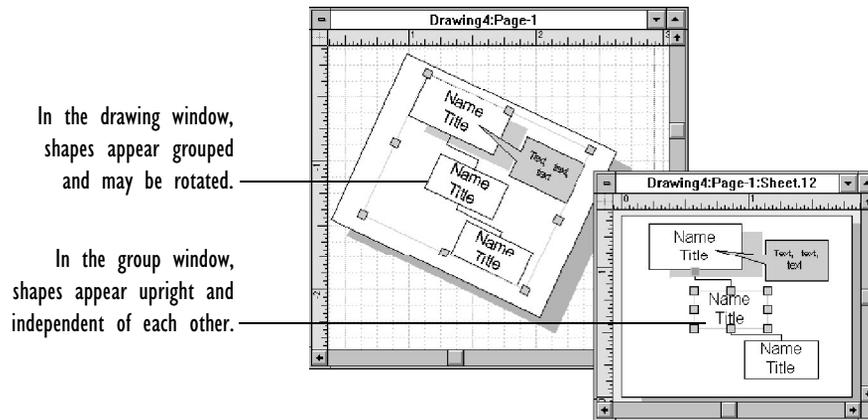
### *Editing the shapes in a group*

A group's members can be modified individually by opening the group in the group window. The window looks just like the normal drawing window, with the same menus and tools. However, the group appears unrotated in the group window even if it is rotated on the drawing page, so you can align shapes with grid lines and ruler intervals. Also, the shapes behave as if they are not grouped.

### To open the group window and edit a shape:

1. Select the group, then choose Open Group from the Edit menu.

The group window appears, and within the window, the shapes in the group behave as if they are not grouped.



Note that by default, when you double-click a group, the group window opens. However, double-clicking may cause different behavior. If you double-click a group for which a different double-click behavior has been specified, that action happens. For details, see “Specifying a shape’s double-click behavior” later in this chapter.

2. Edit the shapes in the group as you would edit ungrouped shapes on the drawing page.

As you make changes, you can see the changes in both the group window and the drawing window. You may need to reposition or tile the windows to see the changes in both windows.

3. To close the group window, double-click the Control-menu box in the upper-left corner of the window.

You can format and add text to a member of a group without opening the group window. Just subselect the shape you want to work with.

**To subselect a shape in a group:**

1. Select the group, then pause.

Green selection handles appear on the group.

2. Select the shape.

Gray selection handles appear on the shape.

3. Format or add text to the shape, just as you would to an ungrouped shape.

Keep these things in mind as you work with groups:

- You can add a guide and the shapes glued to it to a group. Be sure to select both the guide and shapes before you add them to the group; otherwise the glue breaks. You can add guides to rotated groups only when the group is displayed in the group window. For details about guides, see Chapter 2, “Adding, arranging, and connecting shapes.”
- If you want to rotate a group’s shapes independently of each other, do so in the group window.
- Bitmaps (imported objects) will not rotate even when you rotate the group they are included in.

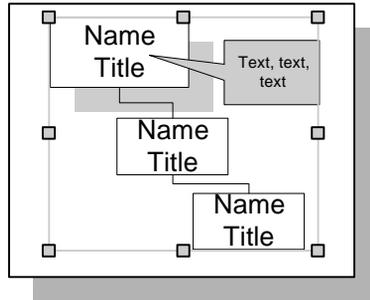
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*Controlling a shape’s behavior when you size a group*

When you resize a group in most applications, its members also resize. In Visio, you have a choice. When you resize a group, a shape in the group can either scale with the group or maintain its original size. Each shape in a group can be set to behave differently.

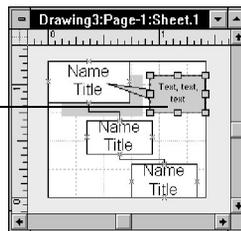
### To set the sizing behavior for a shape in a group:

1. Open the group window by first selecting the group, then choosing Open Group from the Edit menu.



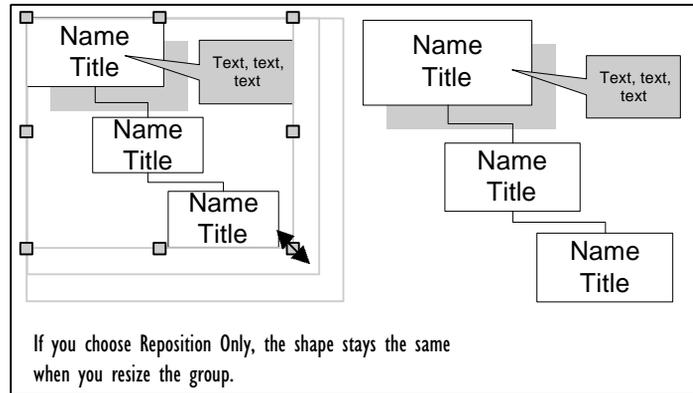
2. Select the shape.

In the group window, select the shape and apply the resize behavior.



3. From the Format menu, choose Behavior.
  - ❖ In Visio's SmartSuite menu set, choose Behavior from the Style menu.
4. In the Resize Behavior section of the dialog box, choose the resizing behavior for the shape.

Choose Scale With Group to resize the shape when the group is resized. Choose Reposition Only to keep the shape's original size when the group is resized. Choose Use Group's Setting if you want the shape to inherit sizing behavior set for the group.



5. Choose OK.
6. To close the group window, double-click the Control-menu box.

### To set the sizing behavior for a group:

1. Select the group.
2. From the Format menu, choose Behavior.
  - ❖ In Visio's SmartSuite menu set, choose Behavior from the Style menu.
3. In the Resize Behavior section of the dialog box, choose the option you want, and then choose OK.

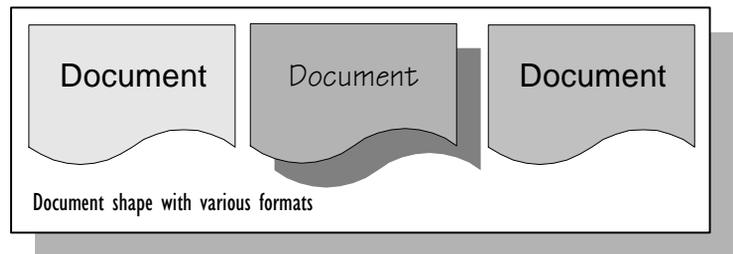
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## Formatting shapes

Formatting shapes can transform your drawing from a rough draft to a presentation-quality graphic. You can apply attributes individually—for example line weight, fill color, and font size—or use styles to apply more than one attribute at a time.

You can change the following attributes:

- Line pattern (solid, dashed), line weight, and line color.
- Line ends (arrowheads, dots, boxes) and line caps (round or square).
- Corners (to make them more or less rounded).
- Fill color and pattern.
- Shadow color, pattern, and location.
- Font, size and color, position, case, style (bold, italic), alignment within the text block, indentation, spacing, tabs, margins, and background color of the text block.



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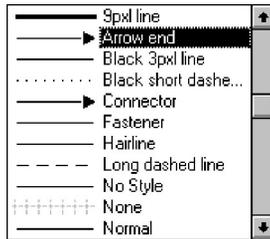
### *Quick ways to format shapes*

For most drawings, you'll want to take the simplest approach to formatting shapes: Either choose from a style list or use buttons on the toolbar. For a complete list of ways to format shapes, see "All the ways to format shapes" later in this chapter.

When you choose from a style list, you are applying a style, and when you use a button you are applying attributes as local formatting. There's a difference, which can be significant in some cases, but for many drawings, it won't matter which one you use. For details, see "Understanding local formatting and styles" later in this chapter.

### To apply a style from a style list:

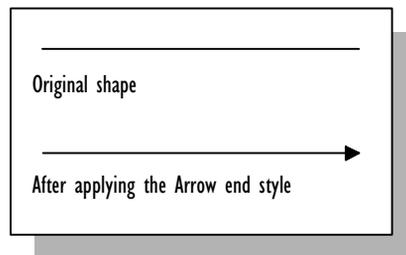
1. Select the shape you want to format.
2. From a style list on the status bar at the bottom of the Visio window, choose a style.



- ❖ In Visio's Microsoft Office toolbar, choose from a style list on the toolbar.

For example, if you want to apply the style to the shape's lines and arcs, choose the style from the Line style list.

Visio applies the style to the selected shape.



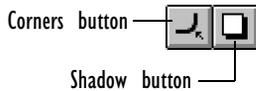
Some styles contain attributes for not just a line or fill or text, but for two or three of these items. If you choose such a style from the Line or Fill style list, a dialog box appears asking if you want to include other attributes of the style. Choose Yes if you want to apply all attributes in the style, and No if you want to apply only the attributes for the item indicated by the style list name (line, fill, or text).

You can use buttons on the toolbar to change some attributes. From the toolbar, you can change line ends (such as arrowheads), shadows, and corner rounding. From the text toolbar (which appears when a text block is open), you can apply bold, italic, underline, size, superscript, subscript, and color attributes to text.

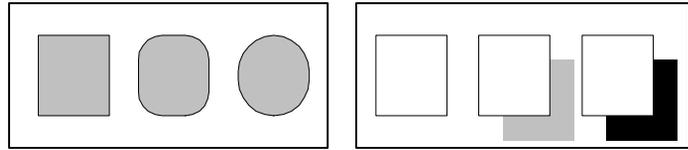
### To format a shape with a toolbar button:

1. Select the shape.

To format text, choose the text tool, and then click the shape to select it and open its text block.



- Click the appropriate button on the toolbar to apply a local format to the shape.



Visio cycles through various choices. For example, clicking the Shadow button cycles through shadows of various shades of gray.

You can format more than one shape at a time.

| To                            | Do this  |
|-------------------------------|--|
| Format all shapes in a group  | Select the group, and then the style or attribute.                             |
| Format several shapes at once | Select all the shapes, and then the style or attribute.                        |
| Quickly repeat formatting     | Format one shape, select other shapes, and then press F4 to format the others. |

If you can't see the effect of formatting, try these things:

- Click the Zoom In button for a closer look.
- If the shape is selected, click away from the shape to cancel the selection. That way, the selection handles won't block your view.
- Choose Behavior from the Format menu and turn off the display of handles that might block your view. (Don't forget to turn the display back on when you need to see the handles.)
- ❖ In Visio's SmartSuite menu set, choose Behavior from the Style menu.
- Print the page.

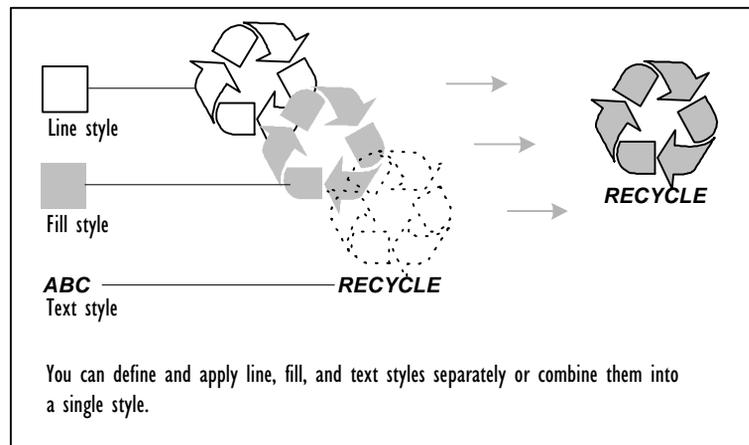
### Understanding local formatting and styles

There are two ways to change the look of a shape. One way is with local formatting, and the other is with styles. You can also use a combination of both.

**Local formatting.** You can apply a formatting attribute to any shape by selecting the shape and choosing either the appropriate option from a dialog box or the appropriate toolbar button. This kind of formatting is called local formatting. In general, use local formatting to give one or just a few shapes a unique look.

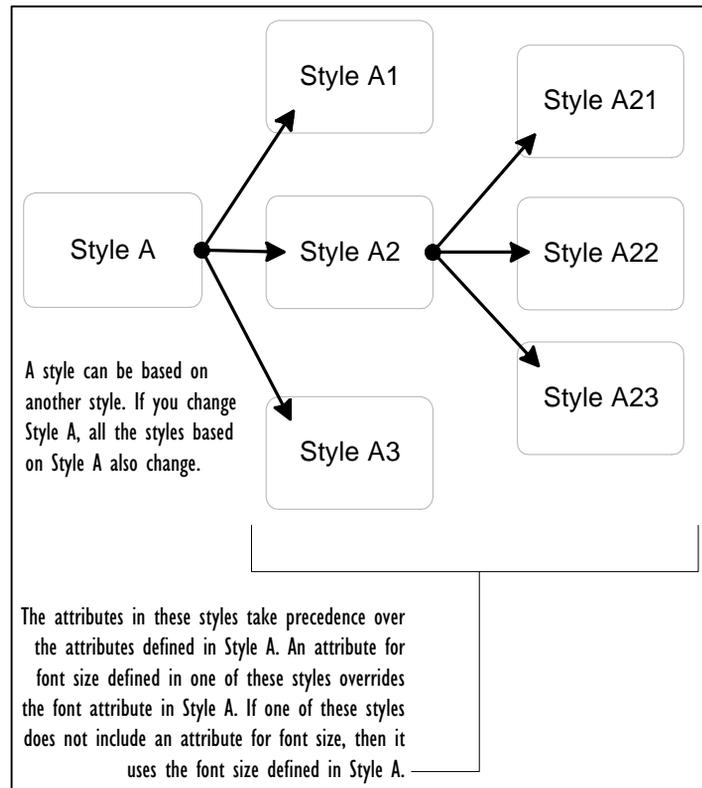
**Styles.** If there are several attributes you want to apply to multiple shapes in your drawing, you could apply each attribute separately to each shape. However, the simplest way to format several shapes using the same set of attributes is to use a formatting shortcut called a style.

A style is a named set of attributes that is saved with a template or a drawing. When you apply a style to a shape, you can apply several attributes at once. Styles make it easy to create a uniform look for any number of shapes. And if you want to change the look, all you need to do is edit the style. The new attribute will be applied globally to any shape that uses that style. In general, use styles to give many or all shapes in a drawing or group of drawings a consistent look.



Keeps these things in mind when you work with styles:

- One style can be based on another style. If you change a style, all styles based on that style also change.



- Many of the styles that come with Visio templates include attributes for only one item: either line, fill, or text. These styles are usually based on the Normal style.
- Typically, the styles that come in Visio templates include attributes for one item. A few include attributes for all three: lines, fills, and text. These styles are often based on one basic style for the template. For example, an organization chart stencil might have a basic style called Org Normal. The names of other styles that are based on Org Normal will also start with Org, such as Org Exec.

- Styles follow a “home team wins” rule. This rule determines what happens when a master shape and a drawing file each contain a style with the same name, but the styles are defined differently. When you drag the master shape into the drawing file, it will use the style as it is defined in the drawing file.
- When you edit a style, the effect it has depends on where you edit it. If you edit the style in a template file, from that point on all future drawing files based on that template will use the new style definition. If you edit the style in a drawing file, only that drawing file will use the new style definition.
- If you have applied line ends (such as arrowheads) to a shape and the style specifies no line ends, checking Preserve Local Formatting applies the style without removing the arrowheads from the lines.

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### *All the ways to format shapes*

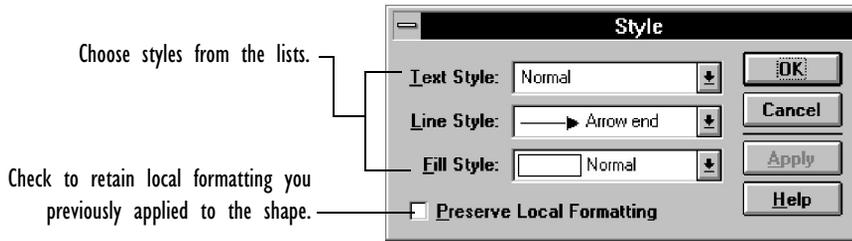
There are many ways to apply styles and attributes. This section lists all the methods.

#### **To apply all attributes (text, line, and fill) defined in a style:**

1. Choose the style from the Text, Line, or Fill style list. If a dialog box appears asking if you want to include other aspects of the style, choose Yes.

Alternatively, choose Style from the Format menu. In the dialog box, choose the same style name from each of the lists.

- ❖ In Visio’s SmartSuite menu set, choose Style from the Style menu.



### To apply only the text attributes of a style:

1. Select the shape with the text tool, and then choose the style from the Text style list. If a dialog box appears asking whether you want to include other aspects of the style, choose No.

Alternatively, choose Style from the Format menu, and then choose the style you want from the Text style list.

- ❖ In Visio's SmartSuite menu set, choose Style from the Style menu.

### To apply only the line attributes of a style:

1. Choose the style from the Line style list. If a dialog box appears asking whether you want to include other aspects of the style, choose No.

Alternatively, choose Style from the Format menu, and then choose the style you want from the Line style list.

- ❖ In Visio's SmartSuite menu set, choose Style from the Style menu.

**To apply only the fill attributes of a style, either:**

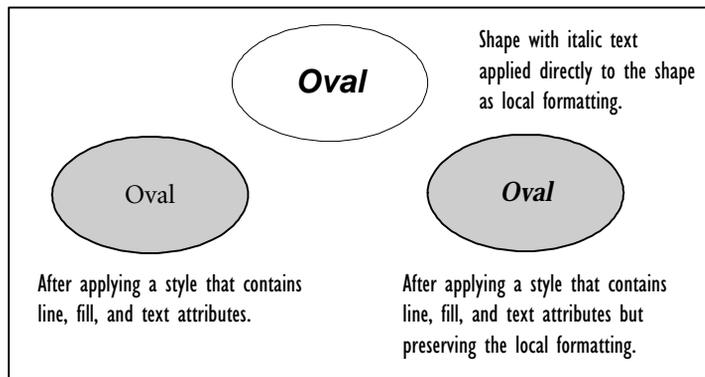
1. Choose the style from the Fill style list. If a dialog box appears asking whether you want to include other aspects of the style, choose No.

Alternatively, choose Style from the Format menu, and then choose the style you want from the Fill style list.

- ❖ In Visio's SmartSuite menu set, choose Style from the Style menu.

**To apply a style but protect the local formatting:**

1. From the Format menu, choose Style.
- ❖ In Visio's SmartSuite menu set, choose Style from the Style menu.
2. Choose the styles you want in the dialog box.
3. Check Preserve Local Formatting.

**To revert to a master shape's styles after applying local formats to an instance of a master shape:**

1. From the Format menu, choose Style.
- ❖ In Visio's SmartSuite menu set, choose Style from the Style menu.

2. In the dialog box, choose Use Master's Format from the appropriate lists.

The formatting reverts to the original formatting applied to the master shape. The Use Master's Format item appears at the top of each style list; you may need to scroll up to see it.

### To locally format lines, fills, or text:

1. Choose the appropriate command from the Format menu.

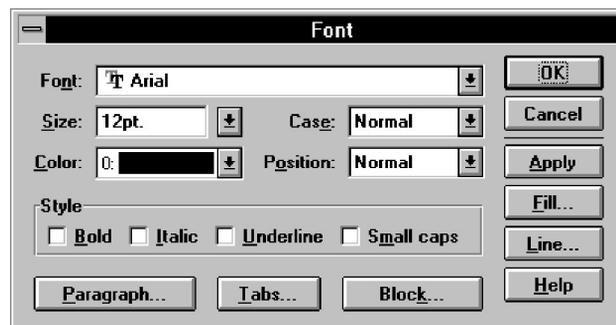
To format text, choose Font to change character fonts. Choose Paragraph or Tabs to change paragraph alignment. Choose Text Block to align the text within the text block or to choose a background color for text.

- ❖ In Visio's SmartSuite menu set, choose Font, Paragraph, Tabs or Text Block from the Style menu.
2. Choose the attributes you want in the dialog box.
  3. To view the effect of the local formatting before you close the dialog box, choose Apply.

If necessary, move the dialog box out of the way so you can see the shape.

4. Choose OK to close the dialog box.

Alternatively, choose Cancel to cancel the formatting.



For line ends such as arrowheads, corner rounding, shadow placement, and several text attributes, you can also use buttons on the toolbar. Click the buttons to see variations of the attribute.

### Creating specific visual effects

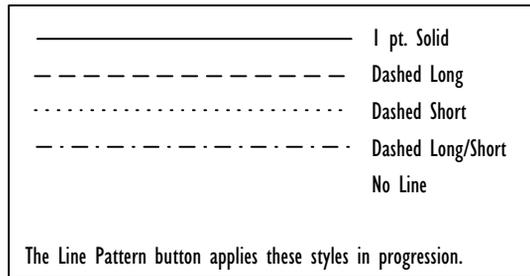
Keep these tips in mind for formatting lines and arcs:

- **Removing shape borders.** You can make the outline of a shape invisible by choosing None from the Line Pattern list in the Line dialog box. You can also use this option to hide open shapes. None is the first item in the Pattern list. You may need to scroll up to see it.
- **Creating dashed lines.** To create dashed lines, choose a dashed line pattern from the Line Pattern list in the Line dialog box.

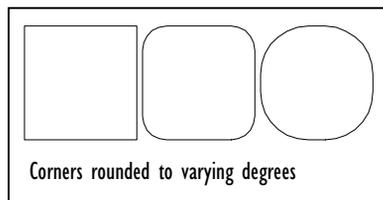


Line Pattern button

Alternatively, you can apply a dashed line or another pattern to the selected line by clicking the Line Pattern button in the toolbar. Consecutive clicks apply different patterns to the line.



- **Creating round corners.** To round the corners where two segments meet, choose an option from the Round Corners section in the Line dialog box or enter the number of screen units that you want to set the corner back from its original position. If you unite, combine, or fragment shapes, round corners are replaced by arcs.

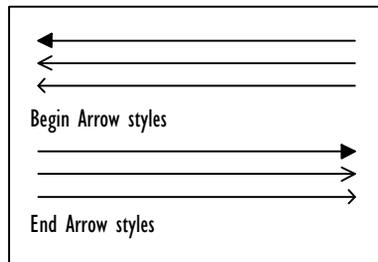




Corners button

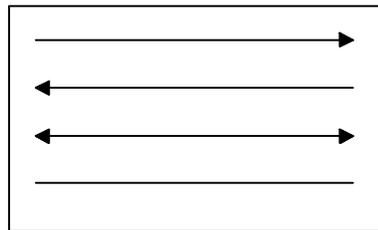
Alternatively, you can choose Corners from the Format menu and select the appropriate setting in the dialog box. You can also format the corners of the selected shape by consecutively clicking the Corners button in the toolbar.

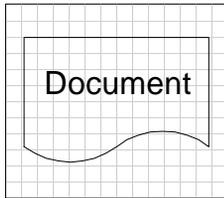
- ❖ In Visio's SmartSuite menu set, choose Corners from the Style menu.
- **Creating arrows.** You can turn any open shape into an arrow. In the Arrow section of the Line dialog box, choose a format from Begin to apply an arrowhead or other line end to the beginning of the shape, and choose a format from End to apply an arrowhead to the end of the shape.



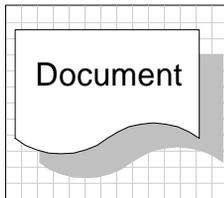
Line Ends button

Alternatively, you can apply arrowheads to one or both ends of an open shape by clicking the Line Ends button on the toolbar. Consecutive clicks add an arrowhead to the beginning point, the ending point, to both ends, and to neither end.





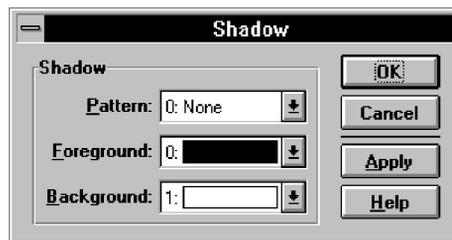
Shapes with a None fill are transparent.



Shape with shadow

Keep these tips in mind for formatting fills and shadows:

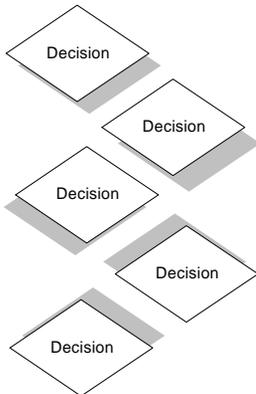
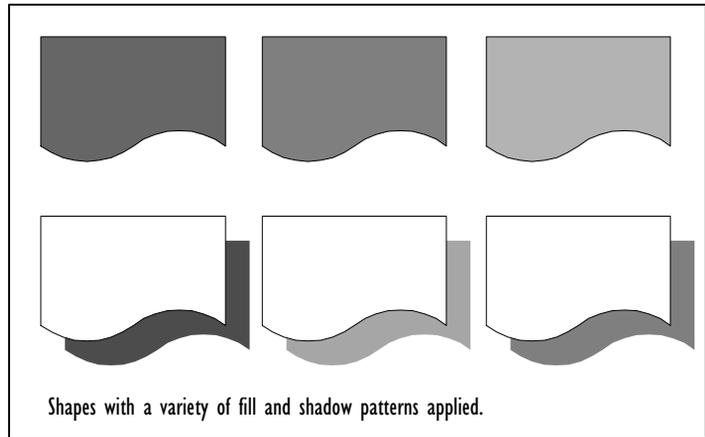
- **Creating a transparent shape.** From the Fill Pattern box in the Fill dialog box, choose None. To hide a shape completely, also choose None from the Line Pattern list in the Line dialog box. You can also create shapes with transparent holes in them by using the Combine command. For details, see “Joining and breaking up shapes” earlier in this chapter.
- **Adding and deleting shadows.** You can specify shadows using either the Fill or Shadow dialog box. To add a shadow, choose an item from the Shadow Pattern list. To change the shadow’s colors, choose from the Shadow Foreground and Shadow Background lists. To delete a shadow, choose None from the Shadow Pattern list.



Shadow button

Alternatively, you can apply a preset series of shadow depths to the selected shape by consecutively clicking the Shadow button on the toolbar.

- **Creating patterned fills and shadows.** To fill a shape or shadow with a pattern, choose an item other than 0 or 1 from the appropriate pattern list. Then from the Foreground and Background lists, choose the colors you want. The Foreground color changes the lines in the pattern. The Background color changes the background color in the pattern.



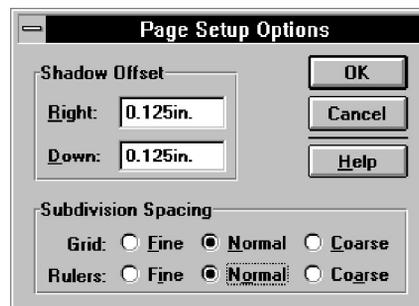
Shadow offset is specified through the Page Setup dialog box.

- **Changing the shadow offset.** Each shape's shadow can be a different color and pattern, but all shadows on the same page are offset from their shapes by the same distance.

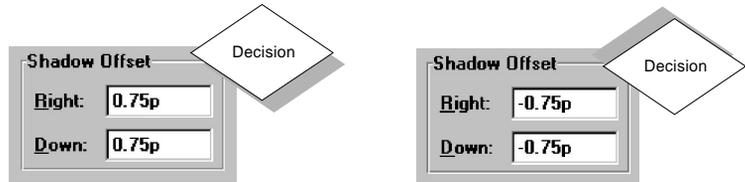
#### To change the shadow offset:

1. From the Page menu, choose Page Setup.
2. In the Page Setup dialog box, choose Options.

The Page Setup Options dialog box appears.



3. In the Shadow Offset section, type offset amounts in the Right and Down boxes.



Your choices affect both the size and angle of the shadow. To move the shadow from the right to the left of the shape, enter a negative number in the Right box. To move a shadow from the bottom to the top of a shape, enter a negative number in the Down box.

4. Choose OK.
5. In the Page Setup dialog box, choose OK.

---

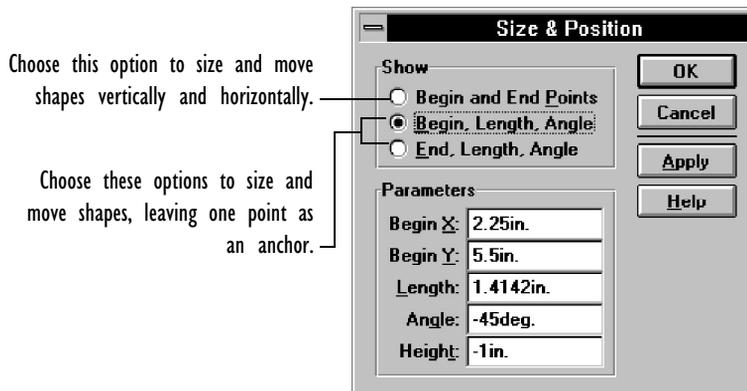
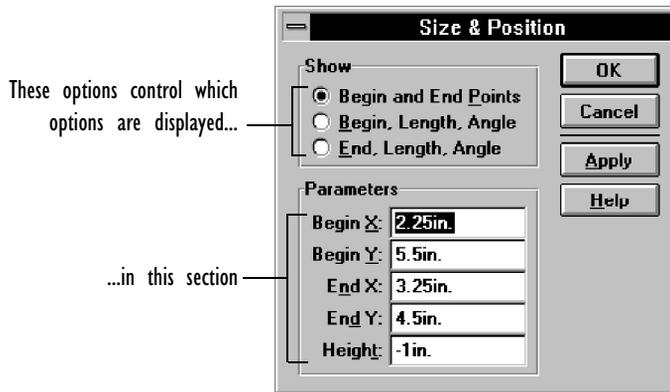
### *Using the Size & Position command for precision*

You can determine the exact size and location of a shape by choosing the Size & Position command. You can also use options in the Size & Position dialog box to move and size a shape. The options available vary depending on whether you're working with a one-dimensional or two-dimensional shape.

---

#### *Working with one-dimensional shapes*

The options in the Size & Position dialog box for a one-dimensional shape vary depending on which option you choose in the Show section.



**To resize a one-dimensional shape using the Size & Position command:**

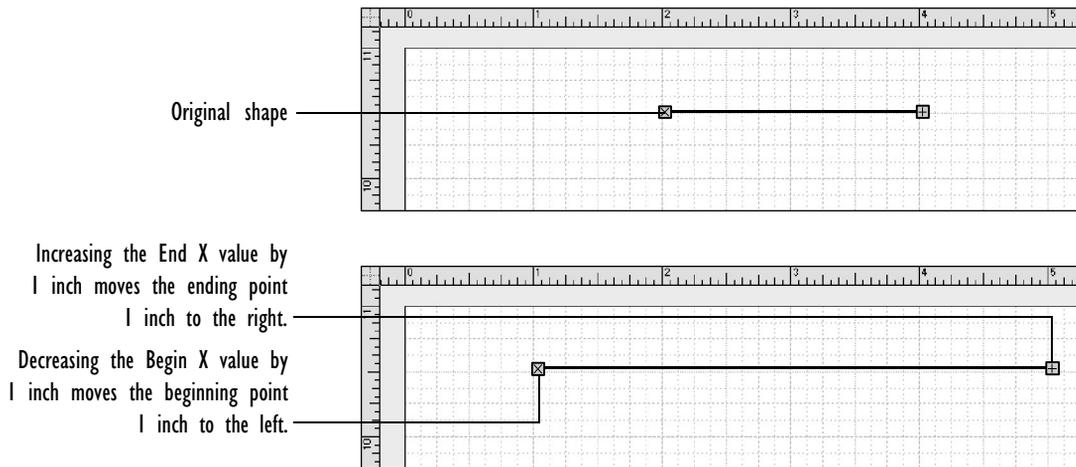
1. Select the shape.
2. From the Format menu, choose Size & Position.
  - ❖ In Visio's SmartSuite menu set, choose Size & Position from the Style menu.

The Size & Position dialog box appears.

By default, the Begin And End Points option is selected in the Show section and the Parameters section values show the current  $x$ - and  $y$ -coordinates of the shape's beginning and ending points.

3. Enter new values for any or all of the options.

To resize the shape vertically, enter values for either or both the Begin Y or End Y options. To resize the shape horizontally, enter values for either or both the Begin X and End X options.

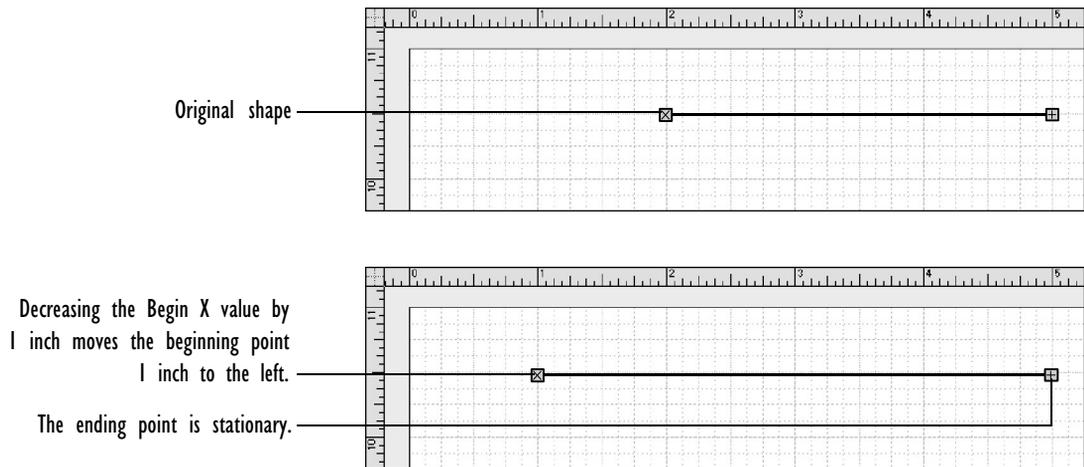


The line extends to match the new endpoint coordinates.

Alternatively, choose either the Begin, Length, Angle or the End, Length, Angle option in the Show section and enter new values for the options in the Parameters section:

- If you choose Begin, Length, Angle, specify a new value for Begin X to resize the shape horizontally or Begin Y to resize the shape vertically. The shape's ending point remains a stationary anchor point.

- If you choose End, Length, Angle, specify a new value for End X to resize the shape horizontally or End Y to resize the shape vertically. The shape's beginning point remains a stationary anchor point.



4. Choose Apply to see the results before you close the dialog box, or choose OK to apply the change and close the dialog box.

### To specify a new position for a one-dimensional shape:

1. Select the shape.
2. From the Format menu, choose Size & Position.
  - ❖ In Visio's SmartSuite menu set, choose Size & Position from the Style menu.

The Size & Position dialog box appears.

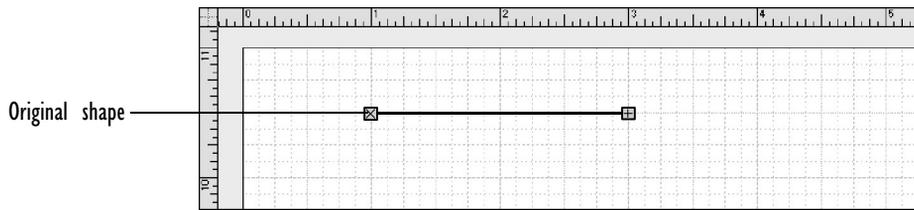
By default, the Begin And End Points option is selected in the Show section and the Parameters section values show the current *x*- and *y*-coordinates of the shape's beginning and ending points.

3. Enter new values for any or all of the options.

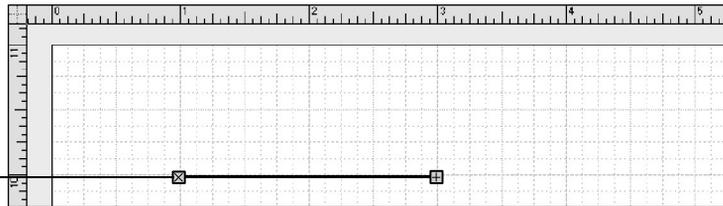
To move the shape to a new location without resizing or rotating it, increase or decrease the X and Y values by the same amount.

For example, to move the shape down the page by 1/2 inch decrease the values of Begin Y and End Y each by 1/2 inch.

4. Choose Apply to see the results before you close the dialog box, or choose OK to close the dialog box.



Decreasing the values of Begin Y and End Y by  $\frac{1}{2}$  inch moves the shape down.



If you enter new values for both the  $x$ - and  $y$ -coordinates, you can resize and rotate the shape too.

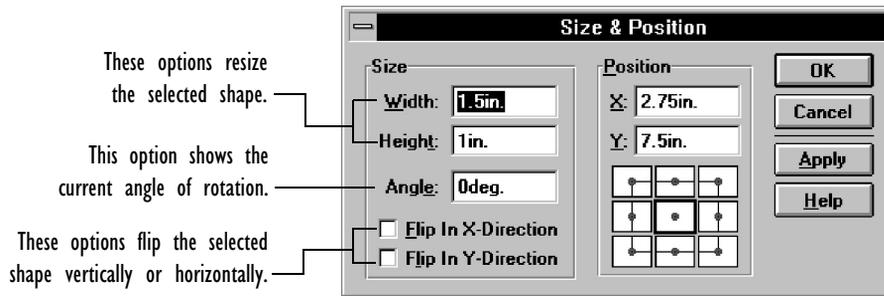
---

### *Working with two-dimensional shapes*

Using the Size & Position dialog box options, you can specify exact dimensions for a two-dimensional shape instead of dragging a handle to resize the shape.

### **To size a two-dimensional shape using the Size & Position command:**

1. Select the shape.
2. From the Format menu, choose Size & Position.
  - ❖ In Visio's SmartSuite menu set, choose Size & Position from the Style menu.



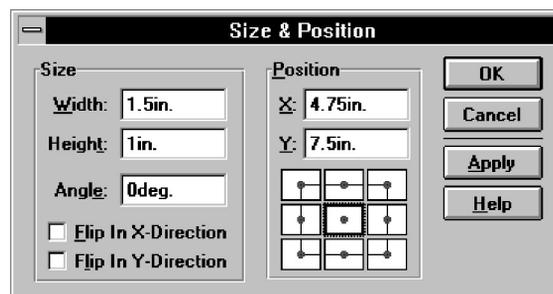
The Width and Height options display the current dimensions of the selected shape.

3. Enter new values for either or both the Width and Height options.
4. Choose Apply to see the results without closing the dialog box, or choose OK to close the dialog box.

### To specify a new location for a two-dimensional shape:

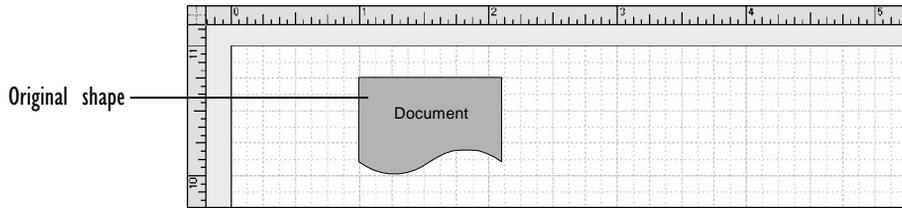
1. Select the shape.
2. From the Format menu, choose Size & Position.
- ❖ In Visio's SmartSuite menu set, choose Size & Position from the Style menu.

The Size & Position dialog box appears.

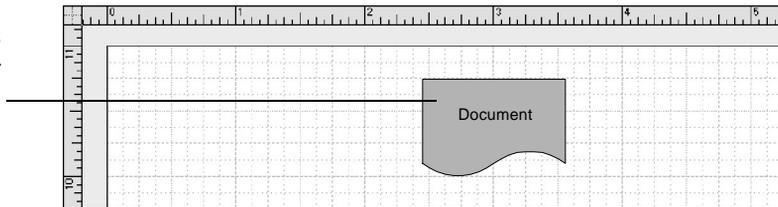


The shape diagram in the dialog box shows the current location (x-and y-coordinates) of the shape's center of rotation (by default, the center of a shape). The diagram section surrounding the center of rotation is highlighted by a dark line.

- To specify a new location for the shape, enter new values for either or both the X and Y options.



Entering 3 for the X value moves the shape horizontally so the center aligns with the 3 on the ruler.



- Choose Apply to see the results without closing the dialog box, or choose OK to close the dialog box.

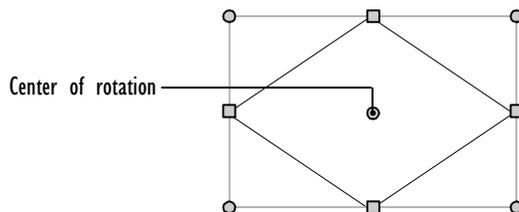
Visio moves the shape, placing the center of rotation at the location you specified.

You can also use the Size & Position dialog box to change the location of a two-dimensional shape's center of rotation (the point around which it rotates).

### To change the center of rotation:

- Choose the rotation tool and select the shape.

A plus sign surrounded by a circle indicates the shape's center of rotation.

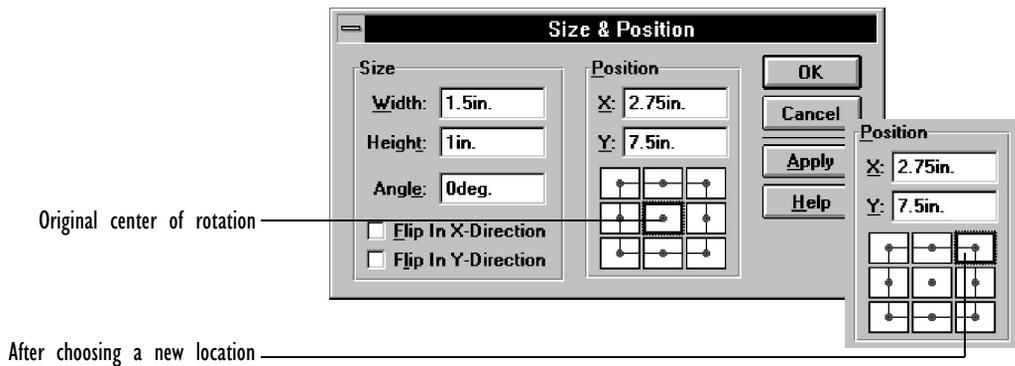


2. From the Format menu, choose Size & Position.

- ❖ In Visio's SmartSuite menu set, choose Size & Position from the Style menu.

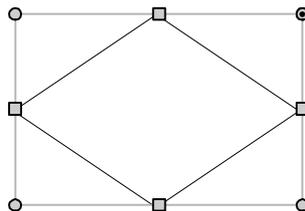
A section of the shape diagram at the bottom of the dialog box is highlighted to indicate the current location of the center of rotation.

3. Choose a different section in the diagram to move the shape's center of rotation to that area.



4. Choose OK to close the dialog box.

The shape's center of rotation moves to the area you specified in the dialog box and is positioned at the coordinates specified in the X and Y boxes.



To refine the location, use the rotation tool to drag the center of rotation to the location you want. For details about rotating shapes, see Chapter 2, "Adding, arranging, and connecting shapes."

## Switching shapes between one- and two-dimensional behavior

A Visio shape can be either one-dimensional or two-dimensional in its behavior. One-dimensional shapes are often used as connectors between two two-dimensional shapes.

You can convert a shape from two-dimensional to one-dimensional so you can use it as a connector, and you can convert a one-dimensional shape to a two-dimensional shape, which allows you to size it proportionally by dragging its corner handles.

### To set a shape's behavior as one-dimensional or two-dimensional:

1. Select the shape.
  2. From the Format menu, choose Behavior.
- ❖ In Visio's SmartSuite menu set, choose Behavior from the Style menu.

The Behavior dialog box appears.

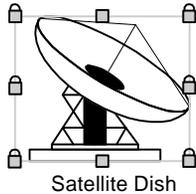


3. In the Interaction Style section, choose Line (1-Dimensional) or Box (2-Dimensional).
4. Choose OK.

Note that control handles may cause a shape to behave in ways that a standard one-dimensional or two-dimensional shape would not. For details, see “Working with control handles,” earlier in this chapter.

---

## Locking and unlocking shapes



You can protect various shape behaviors from changes by locking them with the Protection command. When a shape is locked, it displays padlocks. The protected behaviors cannot be changed unless you unlock the shape.

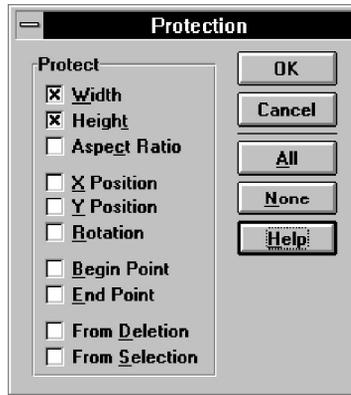
Several of the master shapes that come with Visio are locked to protect their angles and dimensions. It’s best to leave these shapes locked so they behave correctly, however you can unlock and edit them if you want.

Shapes can also exhibit lock-like behavior because of programming in their ShapeSheets. For details about ShapeSheets, see the Visio online help and Chapter 8, “Using ShapeSheets to create SmartShapes.”

### To lock or unlock shape behaviors:

1. Select the shape.
2. From the Format menu, choose Protection.
  - ❖ In Visio’s SmartSuite menu set, choose Protection from the Style menu.

The Protection dialog box appears.



3. Choose the shape behaviors that you want to lock or unlock.

When a behavior is checked, it is locked. To protect a shape from being selected, you must check the From Selection option in the Protection dialog box, and check Shapes in the Protect Document dialog box.

4. Choose OK.

For details about protecting files and about displaying and editing master shapes, see Chapter 6, “Creating masters, stencils, templates, and styles.”

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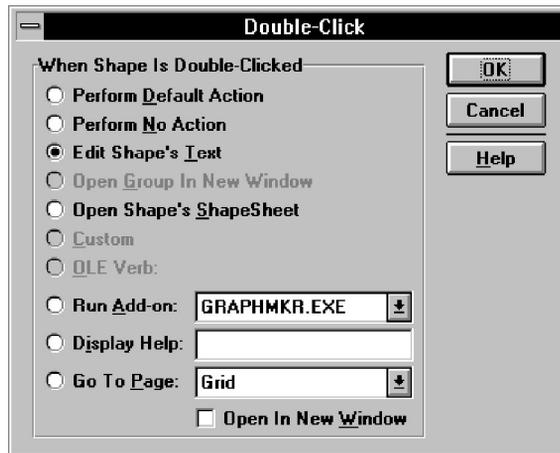
### *Specifying a shape's double-click behavior*

You can create shapes that behave in special ways when they are double-clicked. For example, if you want a multiple page drawing file to function as a presentation, you can create shapes that, when double-clicked, display the next or previous page in the presentation.

**To specify a shape's double-click behavior:**

1. Select the shape.
2. From the Format menu, choose Double-Click.
  - ❖ In Visio's SmartSuite menu set, choose Double-Click from the Style menu.

The Double-Click dialog box appears.



3. Choose a behavior for the shape from the dialog box, and then choose OK.



# Adding text to drawings

---

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# Adding text to drawings

Many drawings require labels, legends, and titles. All Visio shapes, including lines, can have text. When you size, rotate, or move a shape, its text block sizes, rotates, or moves too. You can also size, move, and rotate a text block separately from its shape.

This chapter explains how to create, edit, move, and format text, and how to insert fields into text.

---

## Typing text into shapes

To type text into a shape, just select the shape and start typing. If the shape is a group, the text appears on the frontmost shape in the group or on the shape that you subselect before you type. For details about editing in groups, see “Grouping shapes” in Chapter 3, “Creating shapes.”

### To type text into a shape:

1. Select the shape.

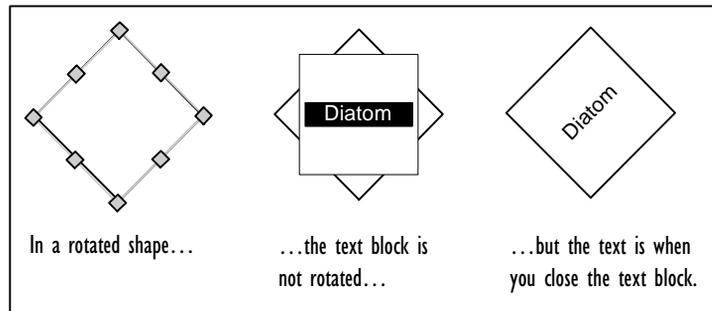
If necessary, choose the Actual Size command from the View menu so you can see what you are typing.

2. Type the text.

As soon as you start typing, Visio opens the shape’s text block.

If the shape already contains text, the existing text is replaced by the new text. For details about editing text, including how to add new text to existing text, see “Editing text” later in this chapter.

3. When you are finished typing, press Esc, or click outside the text block.



---

## Pasting text into shapes

You can paste text from another application by inserting it into a shape's text block or by replacing the entire text of a shape. To paste text from the Clipboard into the text block of a shape, select the shape with the text tool, and then choose Paste from the Edit menu. The text is inserted at the insertion point, or replaces selected text.

To paste the text in a freestanding text block, drag the text tool to create the text block, and then paste the text.

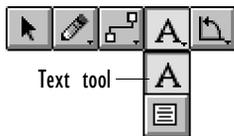
For details about copying and pasting information from another application into a Visio drawing, see Chapter 7, "Using Visio with other applications."

---

## Typing freestanding text

To type freestanding text such as a title, just click with the text tool where you want to start typing, and then type. Visio uses a default-size invisible shape to hold the text. If you want, you can specify a different size before you type the text.

### To type freestanding text:



1. From the text tool menu, choose the text tool.

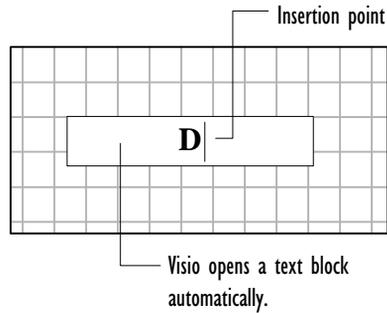
If necessary, choose the Actual Size command from the View menu so you can see what you are typing.

2. Click where you want to start typing.

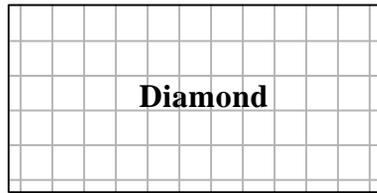
Visio places an insertion point where you clicked.

### 3. Type.

As soon as you start typing, Visio creates an invisible shape and opens its text block.



### 4. When you are finished typing, press Esc.



---

**Tip:** Although you can't type text in an object from another application, you can type text over the object by creating a freestanding text block.

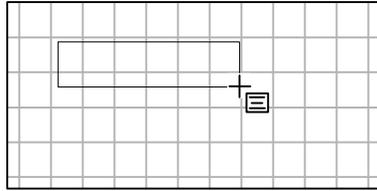
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You can specify the text block width before you type freestanding text.

#### To specify a freestanding text block width:

1. With the text tool, point to where you want to start the freestanding text block.
2. Drag left or right until the text block is the width you want.

3. Release the mouse button, and then type.



Drag the text tool to create the text block.

For details about sizing the text block after you type text, see “Selecting, sizing, moving, and rotating a text block” later in this chapter.

---

## Editing text

Editing text in Visio is similar to editing text in most word processing programs. To edit text, you must first open the shape’s text block.

### To open a shape’s text block:

1. Click the shape with the text tool.

Visio opens the text block and places the insertion point in the text block.

Alternatively, select the shape using any tool except the text tool and either choose Edit Text from the Edit menu or press F2 to open the text block. (If you select a shape with the text tool and then press F2, the text block is selected so you can resize or move it.)

---

**Tip:** Many of the master shapes that come with Visio provide an easy method for opening their text blocks: just double-click an instance of the master shape. You can set the double-click behavior for a shape using the Double-Click command. For details, see “Specifying a shape’s double-click behavior” in Chapter 3, “Creating shapes.”

---

To insert text into existing text or to select text, you first have to place the insertion point.

**To place the insertion point and add text to existing text:**

1. Open the text block.
2. Click where you want to place the insertion point.
3. Type the new text.

You can move the insertion point by clicking anywhere in the text block. You can also move the insertion point by using the keyboard, as shown in the following table.

| <b>To move the insertion point to the</b> | <b>Press</b>     |
|---|------------------|
| Beginning of text block                   | Ctrl+Home        |
| End of text block                         | Ctrl+End         |
| Beginning of paragraph                    | Ctrl+Up Arrow    |
| End of paragraph                          | Ctrl+Down Arrow  |
| Preceding line                            | Up Arrow         |
| Following line                            | Down Arrow       |
| Beginning of line                         | Home             |
| End of line                               | End              |
| Beginning of word                         | Ctrl+Left Arrow  |
| End of word                               | Ctrl+Right Arrow |
| Character to left                         | Left Arrow       |
| Character to right                        | Right Arrow      |

Before you copy, delete, paste, or format text, you must open the text block and select the text you want to work with. If no text is selected, the changes you make affect the entire text block. The following table shows some ways to select text in an open text block.

| <b>To</b>           | <b>Do this</b>                       |
|---------------------|--------------------------------------|
| Select all text     | Choose Select All from the Edit menu |
| Select character(s) | Click and drag                       |
| Select word         | Double-click                         |
| Select paragraph    | Triple-click                         |

You copy, cut, or paste text in Visio the same way as in most word processing programs. Remember that you can reverse text changes with the Undo command just as you reverse other actions in Visio. Also keep in mind that you can quickly repeat an action—for example, pasting text—by pressing the F4 key.

**To copy or cut selected text:**

1. With the text block open, select the text.
2. From the Edit menu, choose the appropriate command—Copy or Cut.

Visio copies or cuts the text and places the text on the Clipboard.

You can copy the entire contents of a text block without selecting anything. Just place the insertion point in the text block and then choose Copy.

**To paste text:**

1. With the text block open, place the insertion point where you want to paste the text.
2. From the Edit menu, choose Paste.

Visio pastes text from the Clipboard.

You can type special characters in Visio by pressing a combination of keys on the keyboard. You can also insert special ANSI characters into text. The ANSI character set consists of 256 characters established by the American National Standards Institute. The appearance of the character that is displayed when you type a special character or an ANSI character code depends on the font you are using.

### To type ANSI characters:

1. Hold down the Alt key. Using the keys on the numeric keypad, type *0*, and then the ANSI code for the character you want.

For example, to type an em dash (—), hold down the Alt key and type *0151*.

For information on the special character key-combinations and the character codes for special ANSI characters, see Appendix B, “Shortcuts.”

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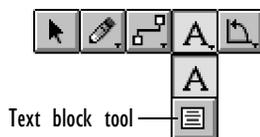
## Selecting, sizing, moving, and rotating a text block

When you size, move, or rotate a shape, its text block also sizes, moves, or rotates. However, you can also size, move, or rotate a text block independently of its shape, as explained in this section.

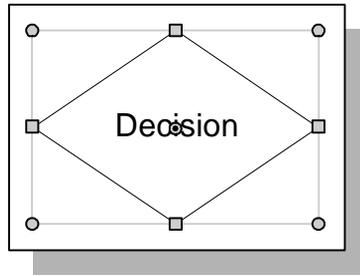
Before you can rotate, size, or move a text block, you must select it.

### To select a text block:

1. From the text tool menu, choose the text block tool.
2. Click the shape whose text block you want to select.



Alternatively, select the shape with the text tool, and then press F2 to select the text block.



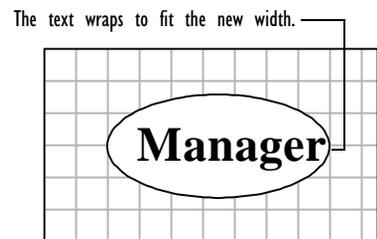
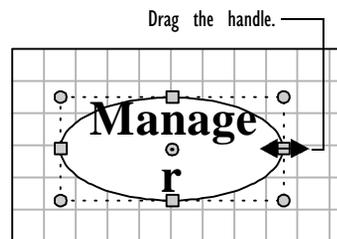
The text block displays selection handles; in addition, two-dimensional shapes display rotation handles at their corners. When you select the text block of a line, it appears that the line itself is selected, but it's really the text block that's selected.

When you type text into a shape, the text block width is determined by the shape width. When you type freestanding text, Visio uses a default text block width unless you specify a different width before you type. The text block height is determined by how much text you type and the text block width. You can change the text block width or height without changing the size of a shape.

**To change the text block width or height:**

1. Choose the text block tool, and then click the shape to select its text block.
2. Drag a selection handle until the text block is the width or height that you want.

The pointer changes to a double-headed arrow when it is over a selection handle.

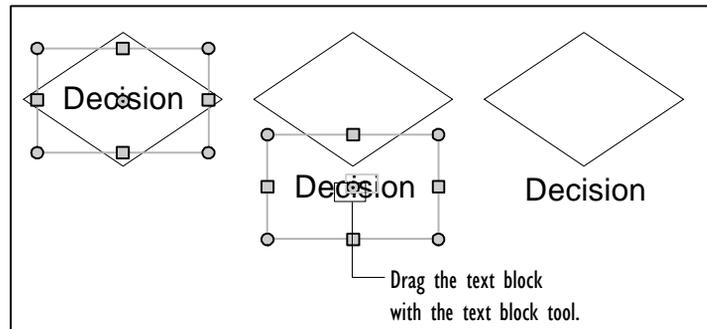


Moving a text block away from its shape is a good way to create a label that moves with the shape. You can move a shape's text block partially or completely outside the shape's borders. Even if the text block is not touching the shape, it moves, rotates, and sizes with the shape. It's often helpful to move a line's text away from the line to improve its legibility.

### To move text independently of its shape:

1. Choose the text block tool, and then click the shape to select its text block.
2. Point to the text block.

When the pointer is over the text block, it changes to two rectangles. Do not point to a selection handle or rotation handle unless you want to size or rotate the text block.



3. Drag the text block to where you want it and release the mouse button.

Text does not have to be oriented on the drawing page the same way as its shape. You can rotate text to any angle independently of its shape.

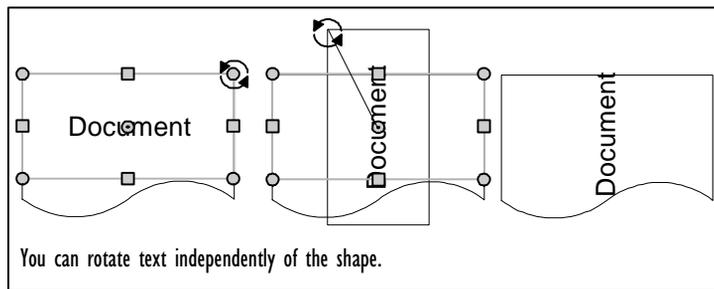
**To rotate text independently of its shape:**

1. Choose the text block tool, and then click the shape to select its text block.
2. If you don't see rotation handles on the text block, drag the middle selection handle out until you see the rotation handles.

When the pointer is over a rotation handle it changes to two arrows in a circle.

3. Drag a rotation handle.

For details about rotating shapes, see Chapter 2, “Adding, arranging, and connecting shapes.”




---

*Formatting text*

This section provides guidelines for formatting text, including how to format individual paragraphs, words, and characters. You format an entire text block the same way you format a shape's lines and fill. For details about applying attributes and styles to shapes, see “Formatting shapes” in Chapter 3, “Creating shapes.” For details about creating styles, see “Creating and editing styles” in Chapter 6, “Creating masters, stencils, templates, and styles.”

There are several ways to format text. Visio has four text formatting dialog boxes; each controls a visual attribute of text. You can also format text using the Style dialog box and the Text style list, the Font

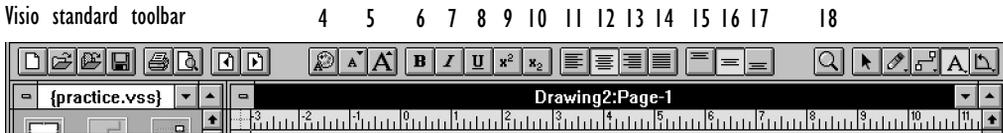
list, and formatting buttons (such as the Bold button) on the toolbar. You can format an entire text block, or you can format selected text, such as individual paragraphs and characters.

### To format an entire text block:

1. Select the shape.

When you want to format an entire text block, it's best to select the shape with the text tool so that the text toolbar and text formatting lists appear.

Visio standard toolbar



Visio standard status bar



- |                   |                      |
|-------------------|----------------------|
| 1 Text style list | 10 Subscript         |
| 2 Font list       | 11 Left Align Text   |
| 3 Font size list  | 12 Center Align Text |
| 4 Text Color      | 13 Right Align Text  |
| 5 Font size       | 14 Justify Text      |
| 6 Bold            | 15 Top Align Text    |
| 7 Italic          | 16 Center Align Text |
| 8 Underline       | 17 Bottom Align Text |
| 9 Superscript     | 18 Zoom Text 100%    |

❖ In Visio's Microsoft Office toolbar and menu set, the Text Style list, the Font list, and the Font size list appear on the text toolbar.

2. Choose the formats or styles you want.

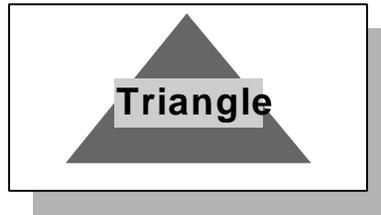
Visio applies the formatting to the text.

3. Press Esc.

You can color just the background of the text block without coloring the entire shape.

### To color the text block background:

1. Select the shape.
2. From the Format menu, choose Text Block.
- ❖ In Visio's SmartSuite menu set, choose Text Block from the Style menu.
3. Choose a color from the Text Background section of the dialog box, and then choose OK.



Visio applies color to the text block, which may be sized differently from the shape.

To format individual paragraphs, words, or characters, you must first select them. The options listed in the Paragraph and Tabs dialog boxes apply to entire paragraphs. So do the alignment options you specify in the Paragraph or Text Block dialog boxes or by clicking the appropriate alignment button on the toolbar. You can also apply attributes such as font styles to individual characters.

### To format individual paragraphs, words, or characters:

1. Open the text block using the text tool.
2. Select the text you want to format.

If you want to format a paragraph, select all or part of the paragraph.

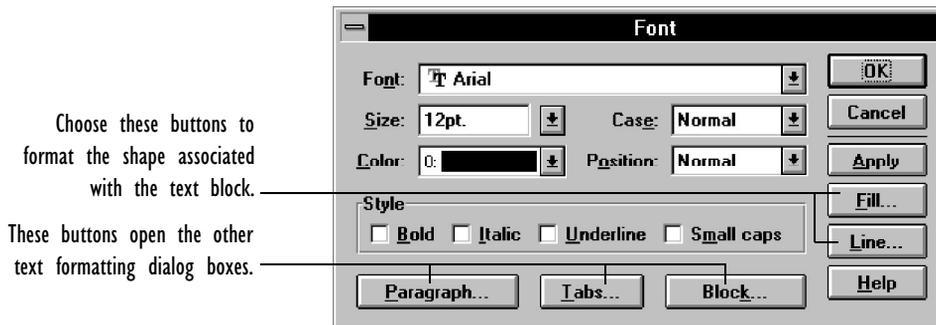
3. Choose the attributes you want.

Visio has four text formatting dialog boxes. Each controls a set of text attributes.

### To specify font attributes and character position:

1. Select the characters or text block you want to format.
2. From the Format menu, choose Font.
  - ❖ In Visio's SmartSuite menu set, choose Font from the Style menu.

Visio displays the Font dialog box, which contains options for specifying the font, font color, font size, style, case, and the character position relative to the text line.



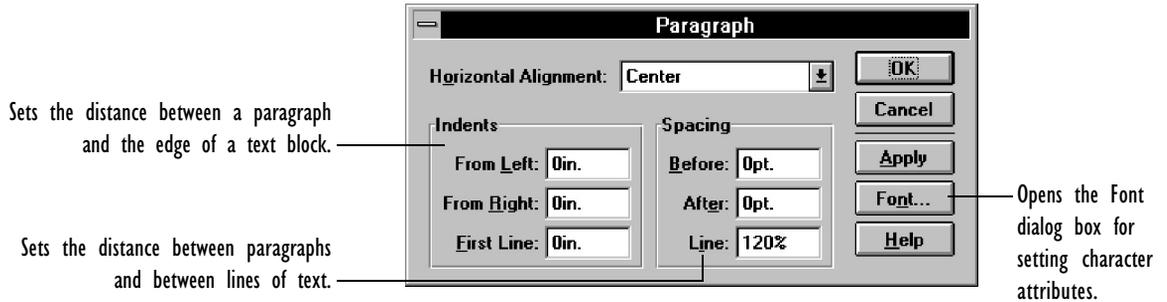
3. Choose the attributes you want, and then choose OK to format the text and close the dialog box.

Alternatively, choose Apply to format the text without closing the dialog box so you can see the change.

### To specify horizontal alignment and vertical line spacing:

1. Select the paragraph or text block you want to format.
2. From the Format menu, choose Paragraph.
  - ❖ In Visio's SmartSuite menu set, choose Paragraph from the Style menu.

Visio displays the Paragraph dialog box, which controls how paragraphs align with the left and right text block margins and how paragraphs and lines are spaced vertically within the text block.



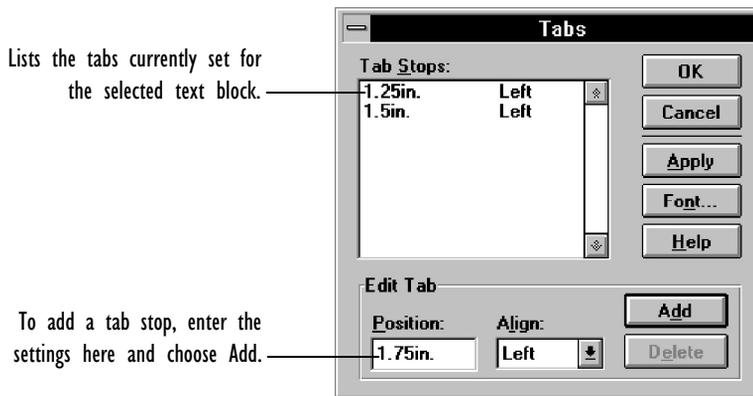
3. Choose the attributes you want, and then choose OK to format the text and close the dialog box.

Alternatively, choose Apply to format the text without closing the dialog box so you can see the change.

**To specify the tab indentations for selected paragraphs:**

1. Select the paragraph you want to format.
2. From the Format menu, choose Tabs.
  - ❖ In Visio’s SmartSuite menu set, choose Tabs from the Style menu.

Visio displays the Tabs dialog box, which contains options for setting tab stops in the selected paragraph.



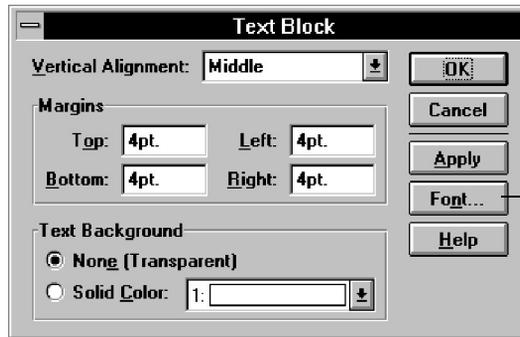
3. Choose the attributes you want, and then choose OK to format the text and close the dialog box.

Alternatively, choose Apply to format the text without closing the dialog box so you can see the change.

### To specify the margins and vertical alignment:

1. Select the text block you want to format.
  2. From the Format menu, choose Text Block.
- ❖ In Visio's SmartSuite menu set, choose Text Block from the Style menu.

Visio displays the Text Block dialog box, which contains options for setting the margins between text and the edges of the text block, the vertical alignment of text in relation to the text block, and the text block background. These formats apply to the entire text block.



Opens the Font dialog box for setting character attributes.

3. Choose the attributes you want, and then choose OK to format the text and close the dialog box.

Alternatively, choose Apply to format the text without closing the dialog box so you can see the change.

For more details about the text formatting dialog boxes, see their entries in the Visio online help.

---

## Using fields

A *field* is a placeholder in a text block that displays information—for example, a date, time, or measurement—that changes automatically as you update a drawing. You can use fields in drawings to add dimension lines, callouts, and legends that reflect the drawing’s current state.

Some field categories, such as Geometry and Date/Time, are useful for providing up-to-the-minute information in final drawings. Other field categories, such as Document Info, Object Info, and Page Info, help you keep track of information as you work on a drawing. For example, one of the Object Info fields displays a shape’s ID number and another displays its name. You might want to use this information to ensure that a technical drawing includes its required elements. However, you might delete these fields before you print the final drawing.

You can use predefined fields or create your own formulas for fields. You can also specify a format for each field. A text block can contain as many fields as you want. You can format or delete fields in the same way as you format or delete other text.

You can choose fields from the following field categories:

- **Custom Formula.** Displays the result of a calculation you define by entering a formula. Formulas use ShapeSheet functions. For details, see Chapter 8, “Using ShapeSheets to create SmartShapes.”
- **Date/Time.** Displays file creation, revision, printing date and time information, and the current date and time. These fields are based on the system date and time.
- **Document Info.** Displays the information entered in the Summary Info dialog box for a drawing file, such as the file’s name, creator, and description. For details about the Summary Info command, see its entry in the Visio online help.
  - ❖ In Visio’s SmartSuite menu set, the name of the command and the dialog box is Doc Info.
- **Geometry.** Displays width, height, and angle information. Use the Width field for dimension lines. Use the Angle field to show how far a shape is rotated from its original position. Use any of these fields to automatically update technical specifications in a drawing.
- **Object Info.** Displays the information entered in the Special dialog box, such as the shape’s master shape name and ID number. The Data fields can contain any information you choose. For details about the Special command, see its entry in the Visio online help.
- **Page Info.** Displays information about the foreground page of a drawing based on information in the Page Setup dialog box. Even if these fields are on a background page, they display information about the foreground of the drawing. Use the Number field to include a page number. For details about the Page Setup command, see its entry in the Visio online help.

- **Lotus Notes Field.** Lotus Notes can read file summary information from a Visio drawing. Likewise, Visio can read text from Lotus Notes. For details about this field category, see Chapter 7, “Using Visio with other applications.”

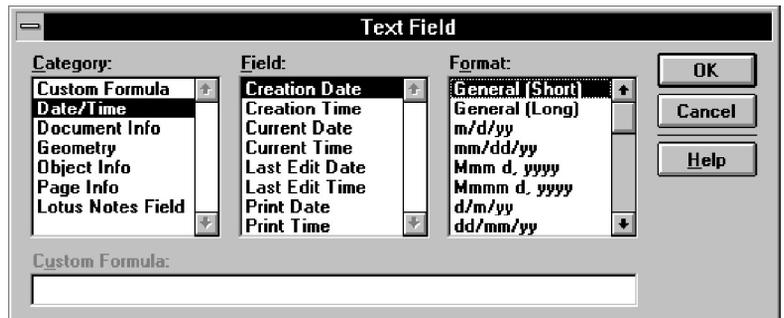
**To insert a field into text:**

1. With the text block open, click with the text tool where you want to insert the field.

If you want the field to replace all the existing text in the shape, just select the shape. You don’t have to open the text block and place an insertion point.

2. From the Edit menu, choose Text Field.

The Text Field dialog box appears.



The Field and Format lists vary depending on the category you choose.

3. Choose a field category.

Unless you choose Custom Formula, Visio displays the fields for the category.

4. Choose a field.

If you chose Custom Formula as the category, enter the formula in the Custom Formula box.

5. Choose a format for the field information.

6. Choose OK.

Visio inserts the field at the insertion point. The field displays its current information. For example, the Current Date field displays the current system date in the format you chose.

---

**Tip:** Consider adding phrases before or after fields. For example, before the Current Date field you might type the phrase “Today’s date is” followed by a space.

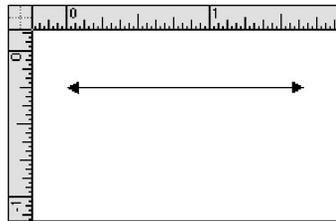
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To create custom formulas, you use the same functions and syntax used to create ShapeSheet formulas. For details about the ShapeSheet, see Chapter 8, “Using ShapeSheets to create SmartShapes,” and the Visio online help.

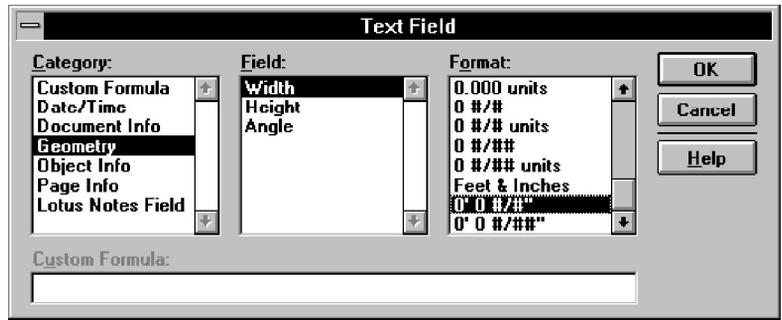
Dynamic dimension lines are a valuable addition to many types of drawings. This procedure explains how to create a dimension line using a field.

**To create a dimension line:**

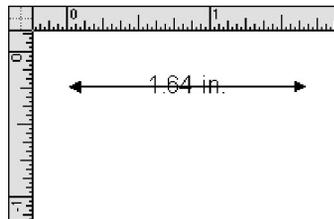
1. Draw a line. Add arrowheads to it if you want.



2. To create the text for the dimension line, select the line, and then choose Text Field from the Edit menu. In the dialog box, choose Geometry as the category and Width as the field. Choose a format if you want, and then choose OK.



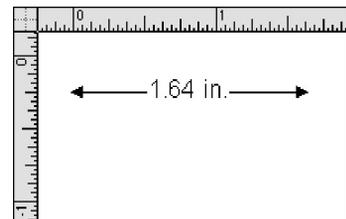
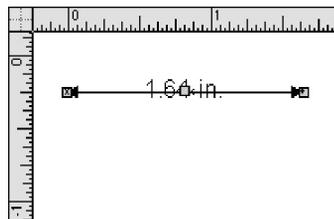
The field appears on the line.



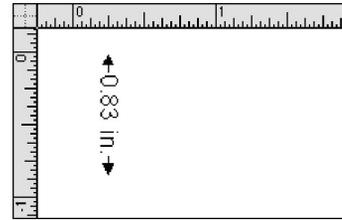
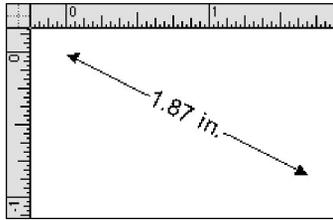
You can make the line look better by adding a background to the field text.

3. To add the background, select the line, and then choose Text Block from the Format menu.
- ❖ In Visio's SmartSuite menu set, choose Text Block from the Style menu.

In the dialog box, choose white as the solid color in the Text Background section, and then choose OK.



4. To test the field, resize the line by dragging one of its endpoints. The field text changes as the line length changes.



# 5

Creating and printing drawing pages

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# Creating and printing drawing pages

The drawings you create may often be parts of larger projects that include several related drawings or other documents. In many cases, you may need to maintain visual standards, use special symbols, or adhere to certain industry specifications such as page sizes and scales. And in the end, you'll probably need to print your drawings for other people to see.

This chapter explains how to:

- Create and store several pages in a drawing file, so you can easily access and modify them as a set.
- Give a set of drawings a similar look by using backgrounds.
- Set page size and scale to meet industry or corporate requirements.
- Print drawings, including printing at certain sizes and page orientations.

To help maintain a consistent look in your drawings you can also create your own master shapes, templates, and stencils. For details, see Chapter 6, “Creating masters, stencils, templates, and styles.” If you want to use a Visio drawing in a word processing document such as a report, or use another file in Visio, see Chapter 7, “Using Visio with other applications.”

---

## Working with drawing pages

This section describes foreground and background pages, how to create new drawing pages, and how to work with the pages in a drawing file.

The New Page and Page Setup commands display similar dialog boxes. To create and set options for a new page, use New Page. To change the displayed page, use Page Setup.

---

### *About foreground and background pages*

A drawing can be composed of layers of information. Each drawing you create has a layer called a foreground page. Each foreground page can be assigned a layer called a background page, which is useful for adding shapes that appear on every page in the drawing file (for example a corporate logo or the outer walls in a home design).

A foreground page can be assigned only one background page. However, a background page can be assigned to more than one foreground page. In addition, each background page can be assigned its own background page, allowing you to create multiple levels in your drawing.

The following sections describe how to create and display pages and how to arrange foreground pages in a drawing file. For details about assigning background pages, see “Working with backgrounds” later in this chapter.

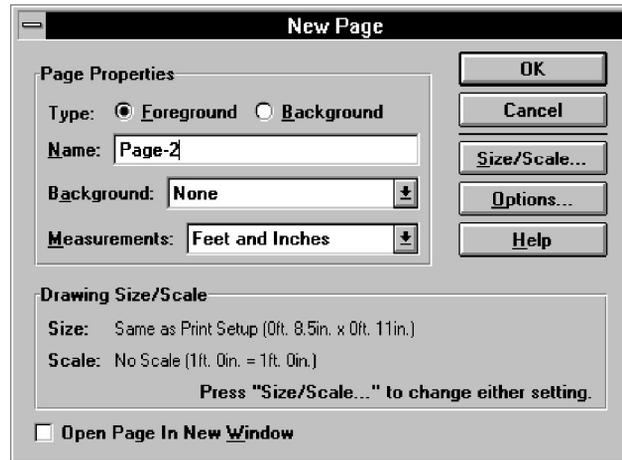
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### *Creating a new page*

Unless you specify otherwise in the New Page dialog box, a new page you create uses the same Page Setup settings as the page displayed in the drawing window. If you want to change page size and scale, see “Changing the drawing size and scale” later in this chapter.

### To create a new page based on the displayed page:

1. From the Page menu, choose New Page.



2. In the dialog box, name the page if you want, or use the default name provided by Visio.

Using the default name can be advantageous when reordering pages. For details, see “Rearranging foreground pages” later in this chapter.

3. Choose OK.

Visio displays the new page in the current window or in a new window if you check Open Page In New Window in the New Page dialog box.

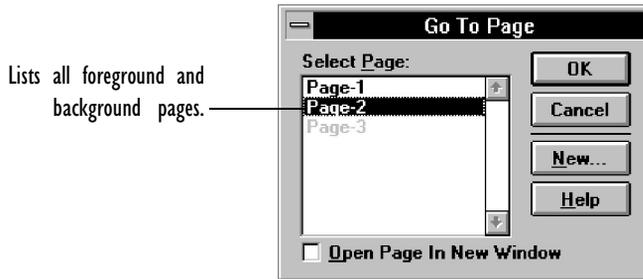
---

### *Displaying pages*

Visio displays one page in a drawing window at a time. You can display a different page in the window, or you can open other drawing windows so you can see more than one page at a time or see more than one view of the same page.

### To display a different page in a drawing window:

1. From the Page menu, choose Go To Page.



2. In the dialog box, choose the page that you want to display in the current window.
3. Choose OK.

Alternatively, if you are working on a foreground page, you can click the Next Page or Previous Page button on the toolbar to turn a single page at a time.



Visio standard and  
Microsoft Office toolbar



Lotus SmartSuite toolbar

---

**Tip:** In Windows applications, you can hold down the Alt key and type the underlined letters in the menu and command names to open dialog boxes automatically. For example, to display the Go To Page dialog box, press Alt+P+G.

---

### To open a new drawing window and display a page in it:

1. From the Window menu, choose New Window.

If you choose New Window when a drawing window is open, the new window displays a duplicate of the contents of the open window. If no drawing window is open, New Window opens a copy of the active stencil window.

2. To see the open windows, choose Tile from the Window menu.

Alternatively, you can display a page in a new window by checking Open Page In New Window in either the New Page or Go To Page dialog box.

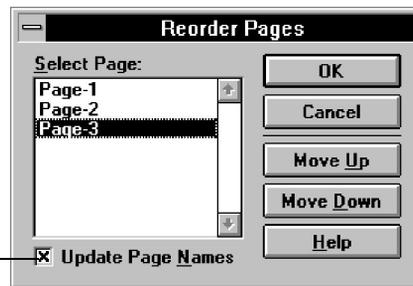
### Rearranging foreground pages

Drawings print in the order in which their foreground pages are stored. You can view and change the order of foreground pages by using the Reorder Pages command. When you create a new foreground page, Visio stores it last in the order of all the foreground pages in the file.

#### To change the order of foreground pages:

1. From the Page menu, choose Reorder Pages.

This option updates only the default names, not custom names.



2. In the dialog box, choose the page you want to move.

The list displays the page names in the order that the pages are stored in the file.

3. Choose Move Up or Move Down to move the page to a new position.

The list order changes.

4. If you want the default page names to reflect the new page order, check Update Page Names.

If a page has a name other than its default name, checking this option has no effect.

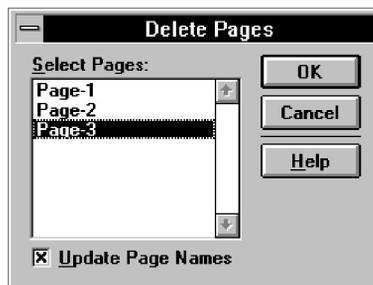
5. Choose OK.

### Deleting pages

If you no longer need a page, delete it. However, you cannot delete a background page that is assigned to another page. For details about canceling a page's background assignment, see "Working with backgrounds" later in this chapter.

#### To delete a page:

1. From the Page menu, choose Delete Pages.



2. In the dialog box, choose the page or pages you want to delete.

To delete a range of pages, choose a page, and then hold down the Shift key and choose another page. Those pages and any pages between them are selected. To delete non-consecutive pages, choose a page, and then hold down the Ctrl key and choose another page.

3. If you want the default page names to reflect the new page order, check Update Page Names.

If a page has a name other than its default name, checking this option has no effect.

4. Choose OK.

If you try to delete the last remaining page in a file, Visio replaces that page with a blank page.

### Setting page display options

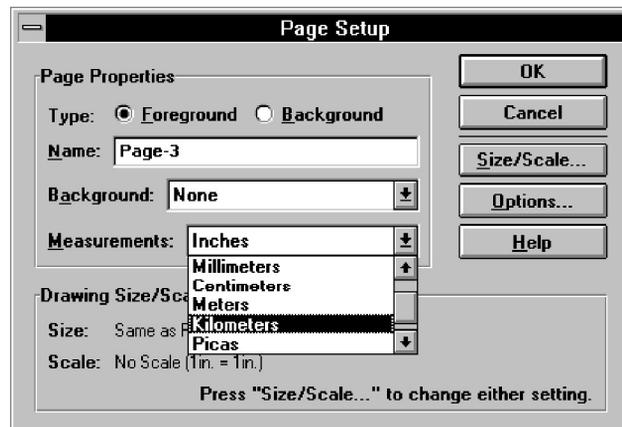
For each page, you can specify units of measure for rulers as well as spacing for ruler subdivisions and grid lines.

#### To change the ruler units of measure:

1. From the Page menu, choose Page Setup.

The Page Setup dialog box appears.

2. From the Measurements list, choose a unit of measure.



3. Choose OK.

Setting a drawing scale often changes the units of measure on the rulers. For details, see “Changing the drawing size and scale” later in this chapter.

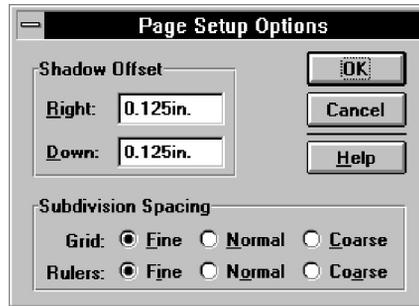
#### To set grid line and ruler subdivisions:

1. From the Page menu, choose Page Setup.

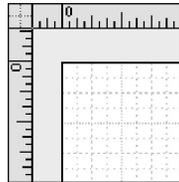
The Page Setup dialog box appears.

2. Choose Options.

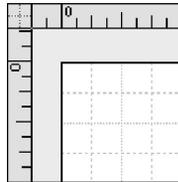
The Page Setup Options dialog box appears.



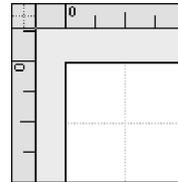
3. In the Subdivision Spacing section, choose Fine, Normal, or Coarse for grid line and ruler subdivisions.



Fine grid



Normal grid



Coarse grid

4. Choose OK.
5. In the Page Setup dialog box, choose OK.

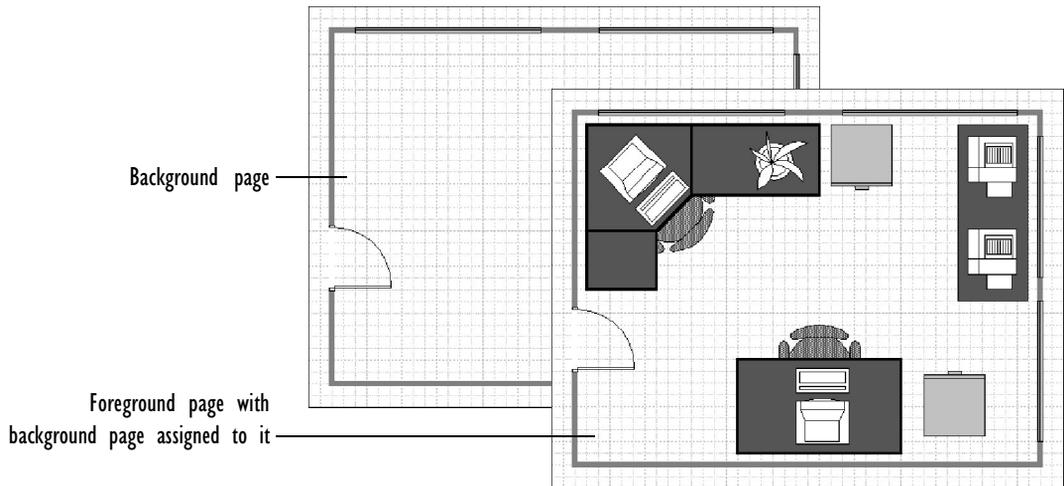
You can also adjust the page magnification and other aspects of the screen display. For details, see Chapter 1, “Getting started with Visio.” For details about changing the page orientation, see “Changing the drawing page, printed drawing, and paper size together” later in this chapter.

---

## Working with backgrounds

You can assign one background page to each foreground page. And each background page can have a background, so you can effectively create drawings that are several layers deep. A foreground, its background, and other backgrounds progressively assigned to a drawing

work like transparent sheets. From the foreground, you can see through to the shapes on the backgrounds.



Every drawing must have a foreground page. Foreground pages cannot be assigned to other pages; the foreground is always the topmost layer of a drawing. A drawing, however, does not have to have a background page.

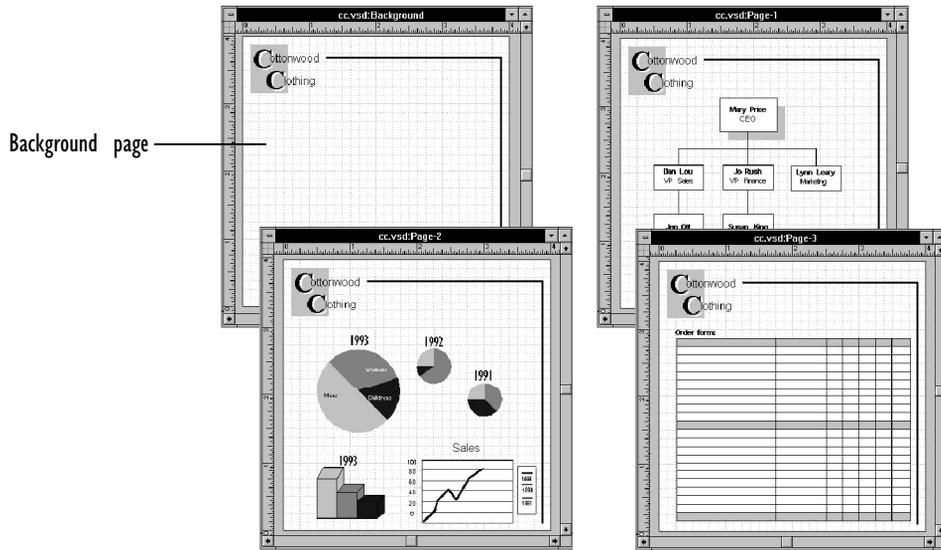
This section describes some typical uses of backgrounds and then explains how to create, assign, and edit background pages.

---

### *Working in layers*

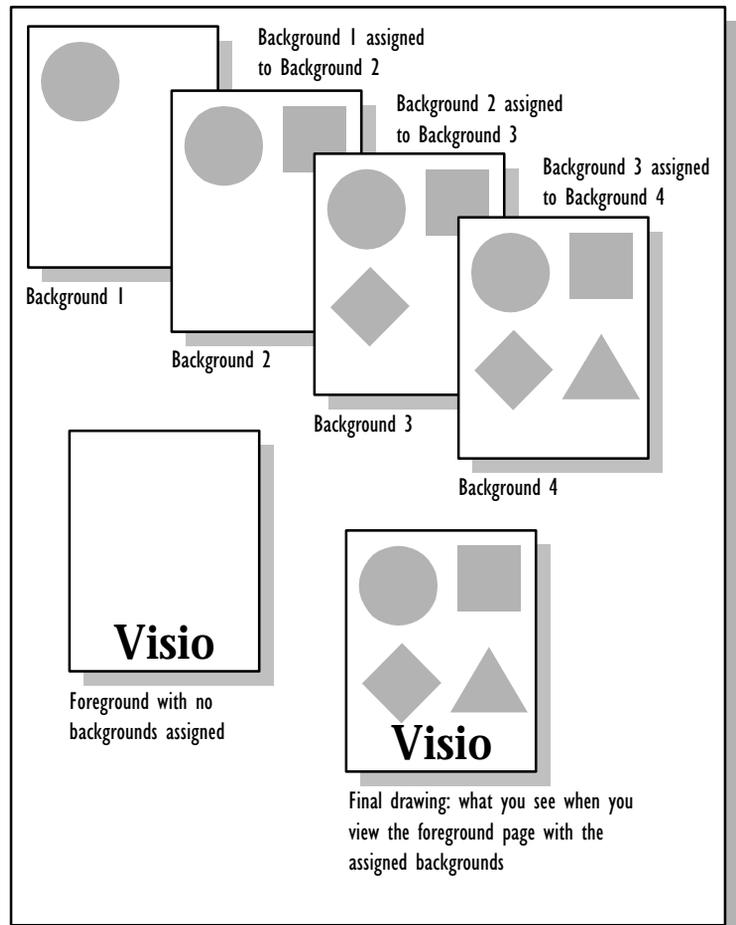
Use layered drawings to:

- **Show the same shapes in the same place in several drawings.** If you want a logo, border, title, or other shapes to appear in several drawings, place the shapes on a background page and assign that background to as many pages as you want. When you edit the background page, you'll see the changes in all of the drawings that use that background.

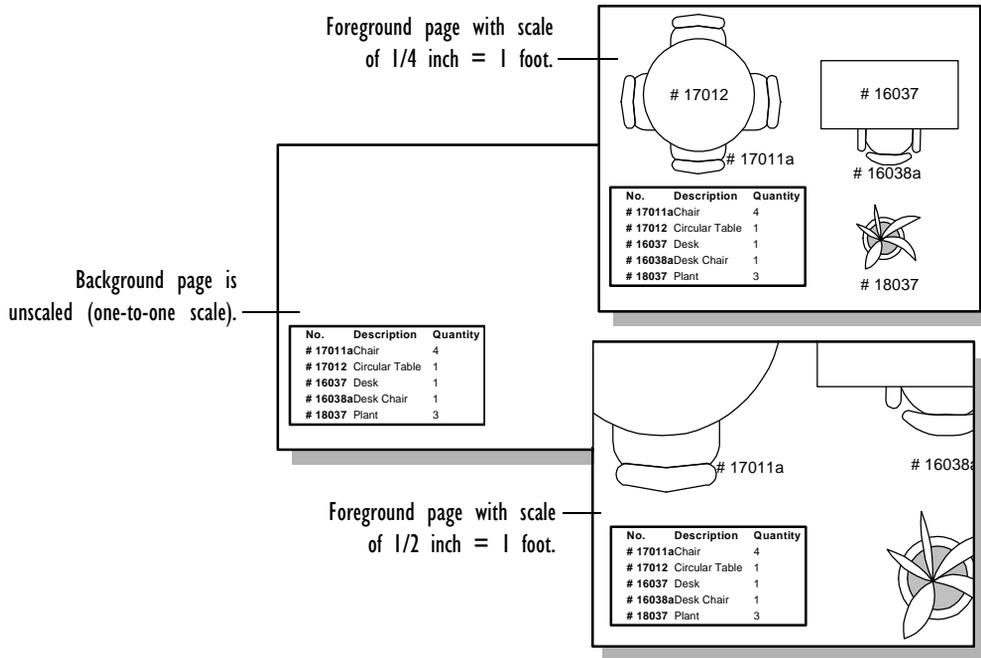


The same background assigned to several foregrounds

- View, edit, and print part of a drawing without affecting other parts.** By placing some information on the foreground and other information on one or more backgrounds, you can build a drawing progressively and, if necessary, view, edit, or print parts of the drawing separately. For example, you might use a foreground and several backgrounds to show how a river changes course over time, or to show the skeletal, muscular, and circulatory systems of an animal.



- Use different scales for parts of a drawing.** You might need to scale a map without scaling its legend. Or you might need to reduce an organization chart for an annual report without changing the registration marks used for printing the report. If a drawing requires shapes created at different scales, use a foreground page and one or more background pages to separate the shapes by scale. You can also use layered pages to include shapes with different shadow offsets in the same drawing.



### Creating a background page

You can create a new page as a background, or convert a foreground page to a background.

#### To create a background page:

1. From the Page menu, choose Page Setup or New Page.  
The Page Setup or New Page dialog box appears.
2. In the Type section, choose Background.
3. Choose OK.

Visio adds the background name to the Background list in the New Page and Page Setup dialog boxes.

---

### *Assigning a background page*

You can assign only one background page to each existing or new page. However, you can assign the same background page to as many pages as you want. If you decide you no longer want a background page assigned to a particular page, you can cancel the assignment.

#### **To assign a background to a page:**

1. Display the page to which you want to assign the background.
2. From the Page menu, choose Page Setup. The Page Setup dialog box appears.
3. From the Background list, choose the name of the background that you want to assign to the page.
4. Choose OK.

---

**Tip:** You can assign a background to a new page by choosing a background from the Background list in the New Page dialog box.

---

#### **To cancel a page's background assignment:**

1. Display the page to which the background is assigned.
2. From the Page menu, choose Page Setup.
3. From the Background list, choose None.
4. Choose OK.

---

### *Guidelines for editing a background*

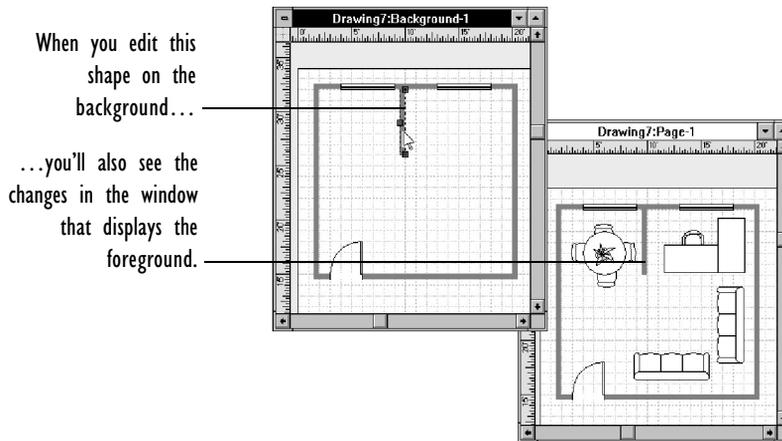
You edit a background the same way you edit a foreground, but you may want to do something extra. It's helpful to display the background in one window and the page it's assigned to in another window, so you can see how your changes affect both.

**To display a page and its background in separate windows:**

1. Display the page to which the background is assigned.
2. From the Page menu, choose Go To Page.
3. Choose the background name and check the Open Page In New Window option.
4. Choose OK.

Another drawing window opens, displaying the background.

5. From the Window menu, choose Tile.



When the pointer is over a background shape in the window that displays the foreground, the pointer remains black. This means you cannot edit the background shape from the foreground view.

---

**Tip:** To move between the foreground and the background pages in a drawing, use the Edit Foreground and Edit Background commands on the Tools menu. While the foreground is displayed, choose Edit Background to display its background. Choose Edit Background again to cycle through all the background pages for the drawing. To return to the foreground, choose Edit Foreground.

---

---

## Changing the drawing size and scale

Some drawings such as floor plans are drawn on a scale of feet to inches. Other drawings are very large or very small and require a drawing page other than the standard letter-size page. This section explains the relationship between the drawing page, the printed drawing, and the paper size. The section also shows you how to change the drawing size and scale.

---

### *About the drawing page, printed drawing, and paper size*

If you open a new file without a template (or if the template with which you open a file does not change the drawing page size or scale), the *drawing page*, *printed drawing*, and *paper size* are the dimensions you specified in the default paper size settings in Windows, and the drawing scale is one to one. These settings are displayed in the Print Setup dialog box.

Understanding the differences between the drawing page, printed drawing, and paper size is important if you want to adjust the drawing size or scale or the print settings. Here are the differences:

- **The drawing page** is the page you see in the drawing window. The rulers indicate its size, although it might look larger or smaller than its actual size depending on the magnification of the page display.
- **The printed drawing** is the drawing page when it is printed. The drawing page and the printed drawing are the same size unless you specify a drawing scale other than one to one or you reduce or enlarge the drawing when you print it.
- **The paper size** is the size of the paper on which you print drawings. Most laser printers accept only standard paper sizes, such as 8.5-by-11-inch paper. The drawing page and printed page are the same size as the paper unless you specify a drawing page size that is different from the paper size.

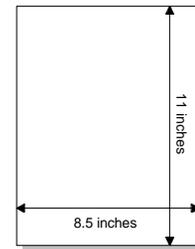
By default, the drawing page in the drawing window, the printed drawing, and the paper on which the drawing is printed are the same size.



Drawing page



Unscaled printed drawing



Paper size

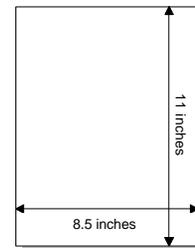
However, the drawing page, the printed drawing, and the paper size can be different from each other.



Drawing page



Unscaled printed drawing



Paper size

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### *Changing the drawing page, printed drawing, and paper size together*

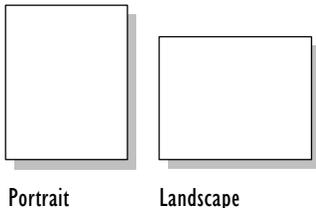
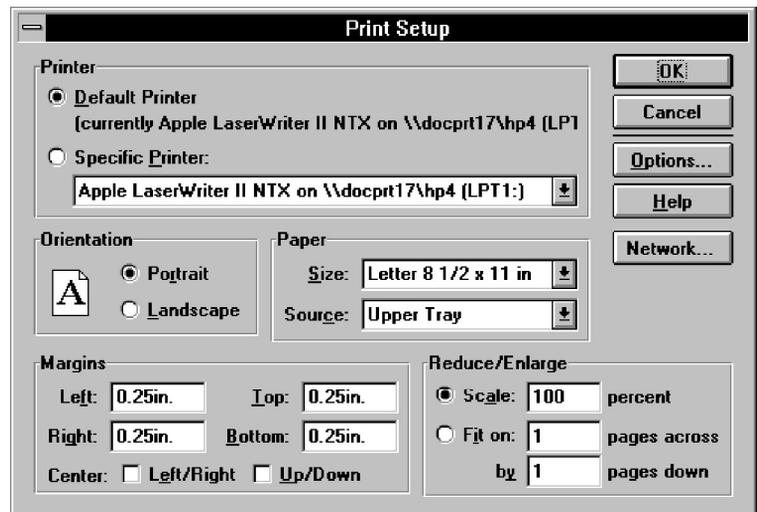
You can change the drawing page, printed drawing, and paper to a new size by setting options in the Print Setup dialog box. To ensure that the drawing page is the same size as the paper size specified in the Print Setup dialog box, you must verify a setting in the Page Setup Size/Scale dialog box.

Visio saves the Print Setup dialog box settings with each drawing file. A drawing page inherits the Print Setup settings unless you specify a different size for the drawing page. A new drawing file uses the default Print Setup settings or the Print Setup and Page Setup settings saved in the template with which you opened the new file.

### To change the drawing page, printed page, and paper size:

1. From the File menu, choose Print Setup.

The Print Setup dialog box appears.



2. In the Orientation section, choose Portrait or Landscape.

For tall pages, choose Portrait. For wide pages, choose Landscape.

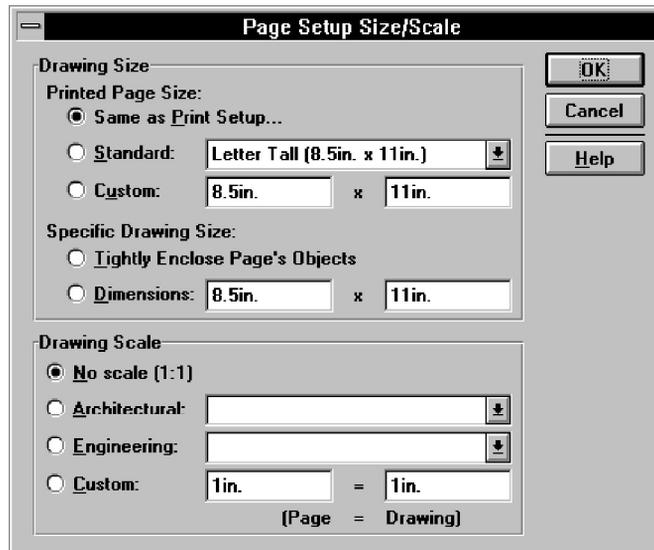
3. In the Paper section, choose a size from the Size list.
4. Choose OK.

Changing the Print Setup settings affects a drawing page only if Same As Print Setup is checked in the Page Setup Size/Scale dialog box. The printed drawing is the same size as the drawing page and paper if the drawing scale is one to one and if you do not reduce or enlarge the page during printing.

**To ensure that a drawing page and printed drawing inherit the Print Setup settings:**

1. Display the drawing page.
2. From the Page menu, choose Page Setup.
3. In the dialog box, choose Size/Scale.

The Page Setup Size/Scale dialog box appears.

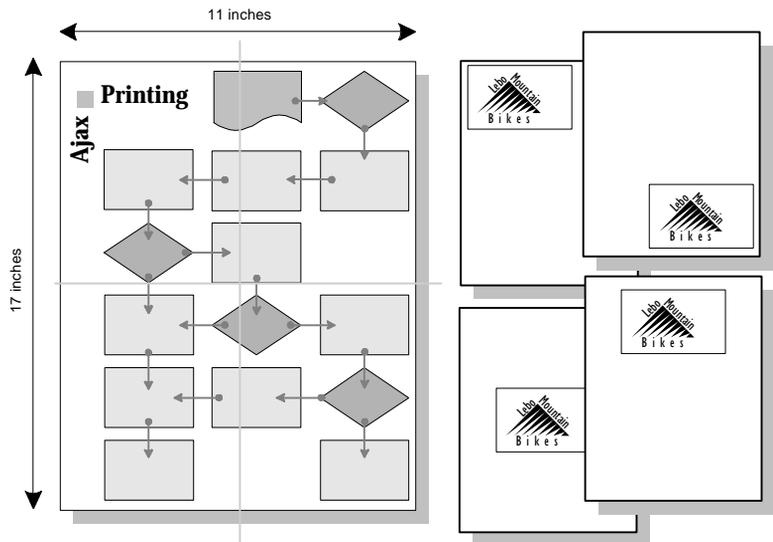


4. In the Drawing Size section, make sure Same As Print Setup is chosen.
5. In the Drawing Scale section, make sure No Scale (1:1) is chosen.
6. Choose OK.
7. In the Page Setup dialog box, choose OK.

### Setting the drawing page size independently of the paper size

To make a complex drawing (for example, a flowchart for a large project) easy to read, you might need to create it on a drawing page larger than the paper in your printer. You may also want to create a small drawing that you will print at various locations on a sheet of paper.

You can create drawing pages that are a different size from the paper specified in the Print Setup dialog box. A large drawing page is automatically *tiled* (printed over several sheets of paper). A small drawing page easily prints at various locations on a sheet of paper. For details about printing large and small drawings, see “Printing” later in this chapter.



Large drawing tiled to fit 8.5-by-11-inch paper

Small drawing printed at various locations on 8.5-by-11-inch paper

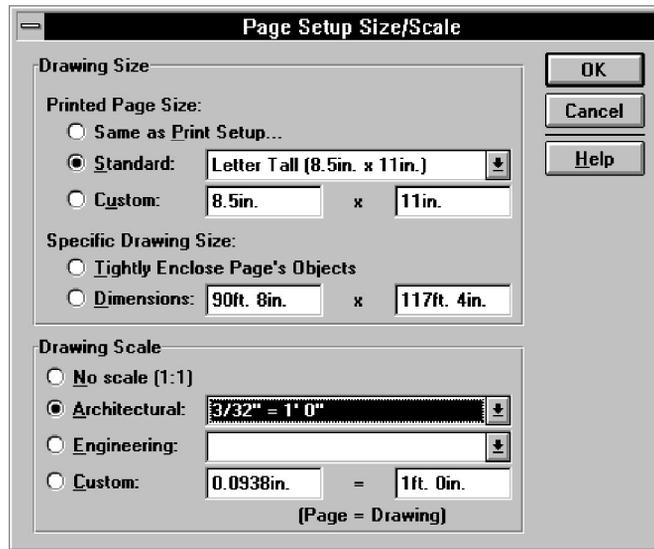
### To size a drawing page independently of the paper size:

1. Display the drawing page.
2. From the Page menu, choose Page Setup.

- In the Page Setup dialog box, choose Size/Scale.

The Page Setup Size/Scale dialog box appears.

- In the Drawing Size section, choose an option other than Same As Print Setup.
- Choose OK.
- In the Page Setup dialog box, choose OK.



If you change the drawing page size in relation to the paper size, keep in mind that:

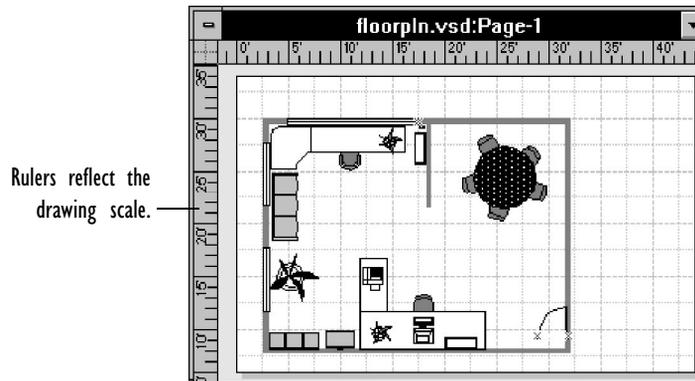
- The Standard list reflects page orientation as well as size. The first measurement is the width and the second is the height. So, to change a letter-size drawing page from tall to wide, choose Letter Wide (11 in. x 8.5 in.).
- Changing the drawing page orientation by changing its size does not change the paper orientation. Mismatched orientations could result in your drawing not printing correctly. To change the orientation, use the Print Setup dialog box.
- Changing the size of a drawing page does not change the size of a background page assigned to it. You must change the size of a background separately.

- The printed drawing is the same size as the drawing page unless you set a drawing scale other than one to one or reduce or enlarge the drawing for printing.
- If you choose Tightly Enclose Page's Objects in the Page Setup/Size Scale dialog box and then edit your drawing, the page may no longer tightly enclose the shapes. To reapply the Tightly Enclose Page's Objects option, choose Page Setup from the Page menu, and then choose OK.

---

### *Setting a drawing scale*

To create accurate architectural, engineering, and scientific drawings, you need to draw them to scale. The scale determines the relationship of the drawing page to the printed drawing (unless you also reduce or enlarge the printed drawing in the Print Setup dialog box).



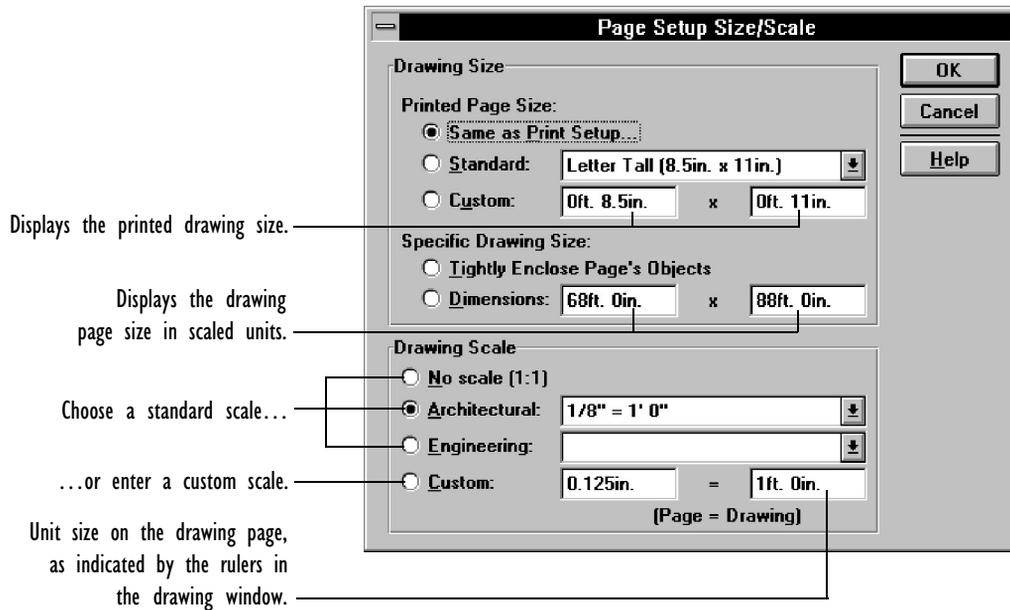
To create drawings that represent very small or very large areas, set a drawing scale.

### **To set a drawing scale:**

1. Display the drawing page.
2. From the Page menu, choose Page Setup.
3. In the Page Setup dialog box, choose Size/Scale.

The Page Setup Size/Scale dialog box appears.

4. In the Drawing Scale section, choose a standard architectural or engineering scale or enter a custom scale.
5. Choose OK.
6. In the Page Setup dialog box, choose OK.



If you change the drawing scale, keep in mind that:

- The ruler units are the same as those specified in the drawing scale unless you specify different units in the Measurements list in the Page Setup dialog box.
- Changing the scale of a drawing page does not change the scale of a background page assigned to it.
- Most master shapes are designed for drawings with a scale of one to one. A few, such as the space planning master shapes, are designed for drawings with a specific scale. Visio compensates for an instance whose scale differs greatly from the drawing's scale. In some cases, however, if you drag a master into a drawing that has an inappropriate scale, its instance (or part of its instance) might be too large or too small.

To change the drawing size for printing, use the Print Setup dialog box. For details, see “Reducing and enlarging drawings for printing” later in this chapter.

---

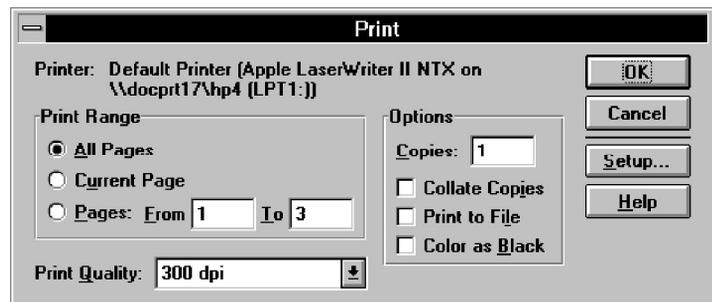
## Printing

To print most drawings you simply choose Print from the File menu, and then choose OK in the Print dialog box. However, for some drawings you may need to adjust margins, set how color prints on monochrome printers, or determine whether the drawing page should print full-size or reduced. This section covers how to print and how to adjust print settings.

### To print a drawing:

1. From the File menu, choose Print.

The Print dialog box appears.



2. In the Print Range section, choose All Pages, Current Page, or enter a range of pages in the Pages From and To boxes.

Visio prints drawings in the order in which their foreground pages are stored in the drawing file.

If a foreground is displayed, Current Page prints the entire drawing, including the foreground page and all the background pages for the drawing. If a background is displayed, Current Page prints that background page and all the other background pages for the drawing.

3. In the Print Quality box, choose the quality setting you want.  
The quality settings vary by printer. For details, see the documentation for your printer.
4. To print multiple copies, in the Options section, specify the number of copies you want. To collate the copies, check Collate Copies.
5. To print to a file, in the Options section check Print To File.  
For details, see “Printing to a file” later in this chapter.
6. To print colors as black, in the Options section check Color As Black.  
For details, see “Printing colored drawings on monochrome printers” later in this chapter.
7. Choose OK.

#### **To print the current page:**

1. Click the Print button on the toolbar.  
Visio prints the page currently displayed.



Visio standard and  
Microsoft Office toolbar



Lotus SmartSuite toolbar

#### **To print a page without its background:**

1. Display the page you want to print.
2. From the Page menu, choose Page Setup.
3. Cancel the background assignment by choosing None from the Background list.

Alternatively, you can select each shape on the background, choose Behavior from the Format menu, and check Non-Printing Shape.

- ❖ In Visio’s SmartSuite menu set, choose Behavior from the Style menu.

### To print a background page and its backgrounds:

1. Display the background in an open window.
2. From the File menu, choose Print.
3. Check the Current Page option, and then choose OK.

Alternatively, click the Print button on the toolbar.

Note that this procedure prints the background page plus any background pages assigned to it. For details about canceling a background assignment, see “Assigning a background page” earlier in this chapter.



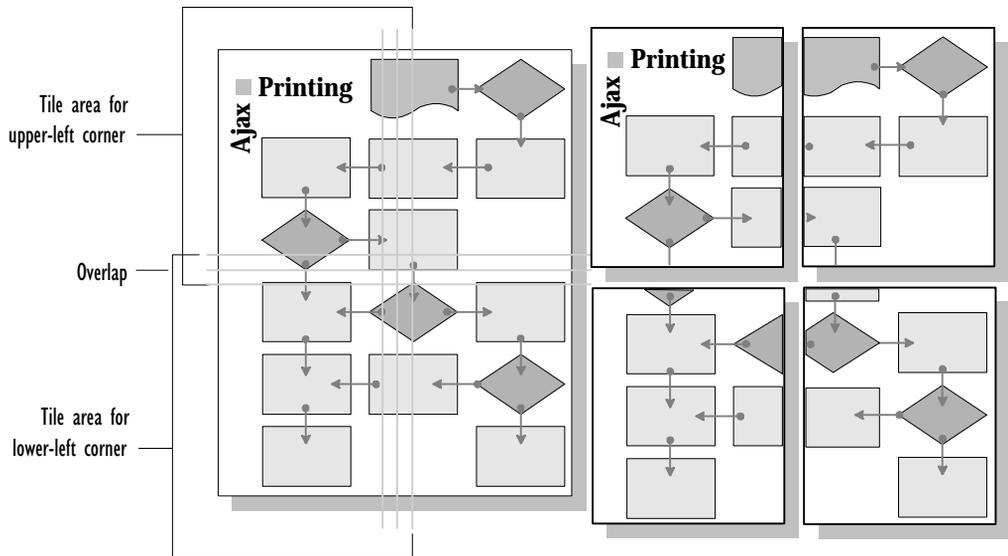
Visio standard and  
Microsoft Office toolbar

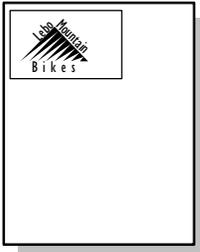


Lotus SmartSuite toolbar

### Printing large and small drawings

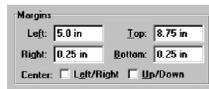
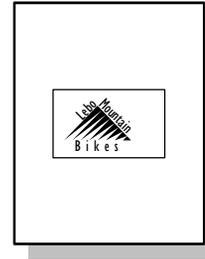
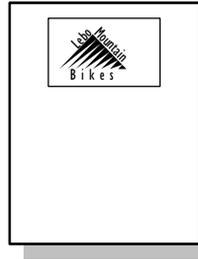
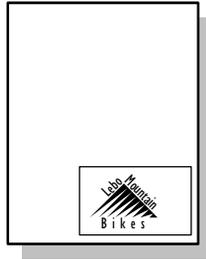
Visio tiles drawings that are larger than the paper size.





By default, a small drawing prints in the upper-left corner within the margins. The default margins are 0.25 inches wide.

By changing margin settings, you can print a small drawing at various locations on a sheet of paper.



You can move a drawing by setting margins and options for centering the drawing in the Print Setup dialog box. The illustration at the left uses no centering option. In the middle illustration, the image is centered horizontally (Left/Right). In the illustration at the right, the image is centered both horizontally and vertically.

---

### Previewing a printed drawing

Before you print a drawing, you can preview it to see how it will appear when it is printed. Previewing a drawing is especially helpful if you need to know if a drawing fits within the margins of a page or if you want to see how a large drawing tiles.

#### To preview the printed version of the current drawing:

1. From the File menu, choose Print Preview.

Alternatively, click the Print Preview button on the toolbar.

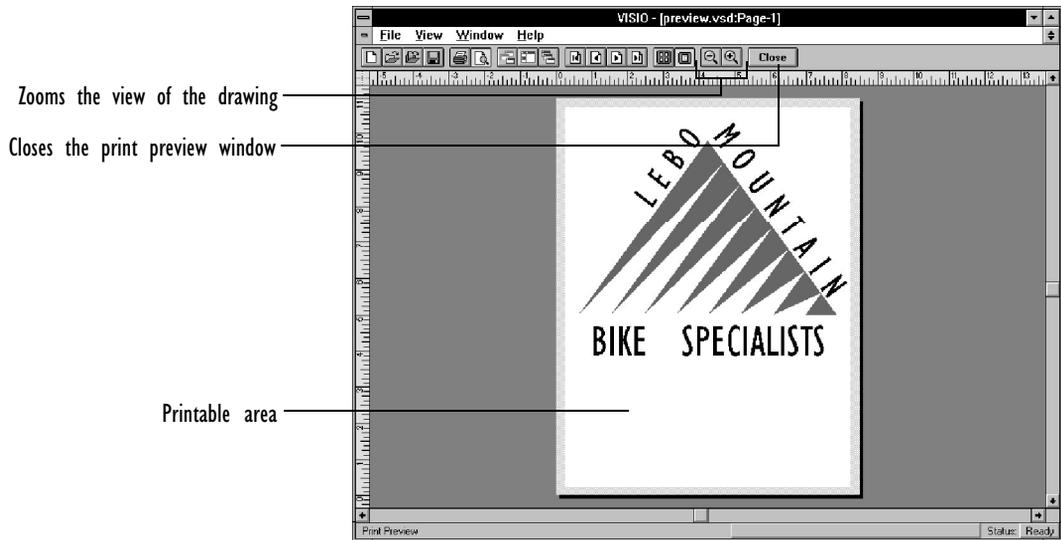


Visio standard and  
Microsoft Office toolbar



Lotus SmartSuite toolbar

Visio displays the current drawing in the print preview window. The preview image reflects the current settings in the Print Options dialog box. If the drawing page is larger than the paper specified in the Print Setup dialog box, Visio displays the entire drawing and shows where the drawing will be tiled when printed.



By previewing a drawing, you can see how the drawing fits within the margins of a page.

In the print preview window, you can preview any drawing in the file. You can also look at a close-up view of any tile in a tiled drawing and zoom in on a tile to view it at its actual size.

### To view other drawings in the same drawing file:

1. From the View menu, choose the appropriate command: Previous Tile, Next Tile, or Go To Page.

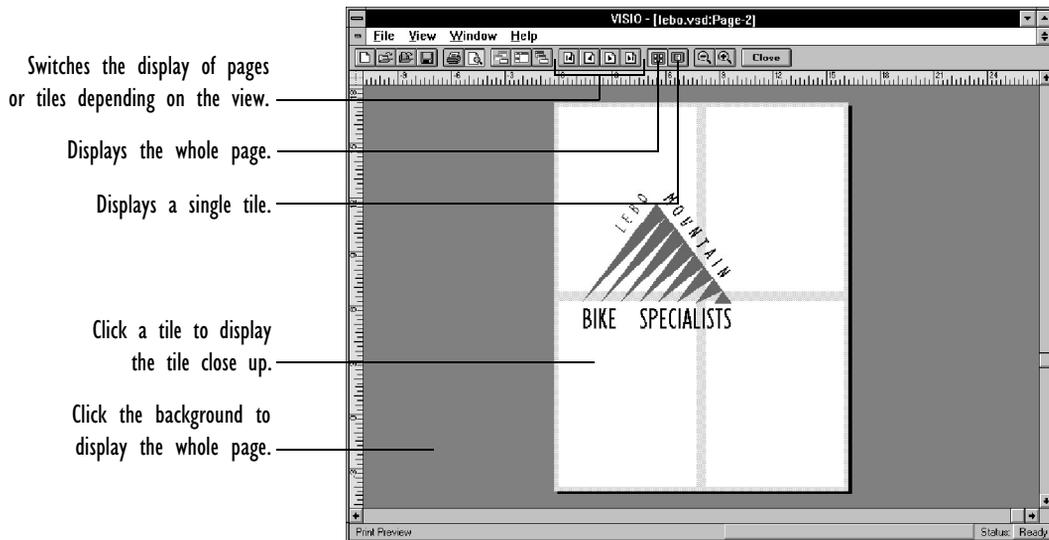
Alternatively, use the First Tile, Previous Tile, Next Tile, and Last Tile buttons on the toolbar.

### To switch between the whole page view and single tile view of a tiled drawing:

1. From the View menu, choose the appropriate command: Single Tile or Whole Page.

Alternatively, you can click a tile area to view it close up, or click the background of the print preview window to return to Whole Page view.

You can also use the Zoom In and Zoom Out buttons to change the view in the print preview window.



Visio previews a large drawing as it will be tiled when printed. The gray lines outline the edges of each tile.

### To close the print preview window:

1. Choose the Close button on the toolbar.

---

### Viewing how a drawing fits on the page

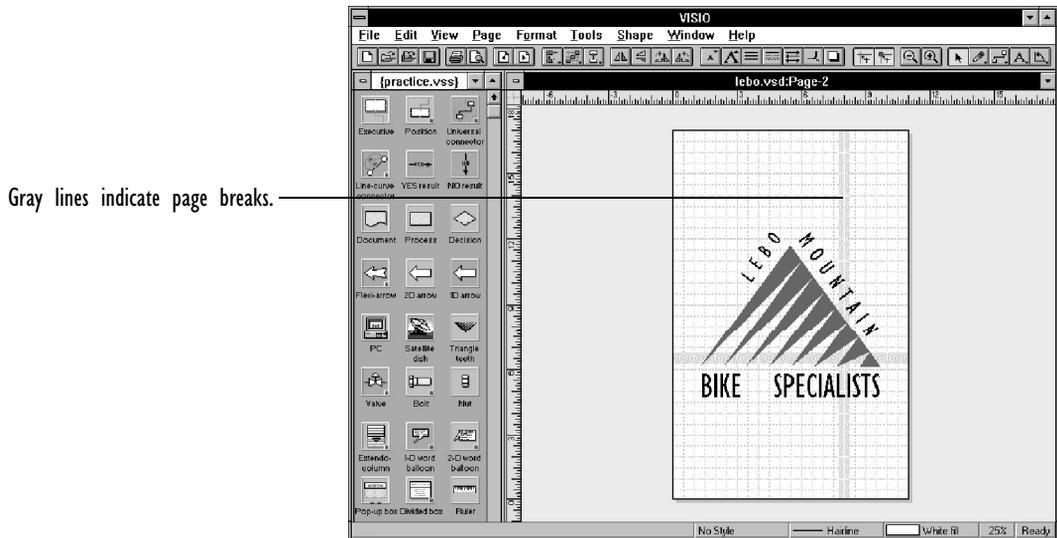
When working in the drawing window, you can quickly check how a drawing fits within the printable area of the paper specified in the Print Setup dialog box. You can check to make sure that a drawing

will fit on one page or see where a large drawing will tile. If the drawing will not fit on one page, or if a tile does not show the shapes you want, you can adjust your drawing to make it fit.

### To view how a drawing fits on the page:

1. From the View menu in the drawing window, choose Page Breaks.

If the drawing will be tiled, Visio outlines the edges of the tiles. If the drawing fits on the currently chosen paper size, Visio outlines the border of the page.



Page breaks show how an 11 x 17 inch drawing page is tiled to fit on 8½ x 11 inch paper.

If a drawing does not fit within the printable area of a piece of paper, you can adjust the drawing in the following ways to make it fit:

- In the drawing window, move shapes away from the edges of the drawing page. Alternatively, choose Center Drawing from the Tools menu to center the drawing on the page. For details, see Chapter 2, “Adding, arranging, and connecting shapes.”

- Before you print, reduce the drawing by a small amount. For details, see “Reducing and enlarging drawings for printing” next in this chapter.
- Set margins, and then specify that you want to fit the printed drawing on one page. For details, see “Setting margins” later in this chapter.

---

### *Reducing and enlarging drawings for printing*

You can reduce or enlarge a drawing for printing. This is helpful if you need to print the same drawing at various sizes or if you need to fit a drawing within the printable area of the paper. You can also specify the number of sheets of paper across and down on which to print a drawing. When you specify the number of sheets, Visio reduces or enlarges the drawing to fit that number.

#### **To reduce or enlarge a drawing:**

1. From the File menu or the Print dialog box, choose Print Setup.  
The Print Setup dialog box appears.
2. In the Reduce/Enlarge section, type a percent in the Scale percent box.  
To reduce a drawing, type a number less than 100. To enlarge a drawing, type a number greater than 100.
3. Choose OK.

#### **To specify the number of sheets for a tiled drawing:**

1. From the File menu or the Print dialog box, choose Print Setup.  
The Print Setup dialog box appears.
2. In the Reduce/Enlarge section, choose Fit On, and then type the number of sheets across and the number of sheets down in the Fit On boxes.
3. Choose OK.

The number of sheets down and across must represent an area with proportions similar to those of the drawing page. If the drawing is square, for example, and you specify two sheets down and four sheets across, Visio will reduce or enlarge the drawing to fit within a square area that is no more than two sheets either way. Visio will not print on the nonessential sheets.

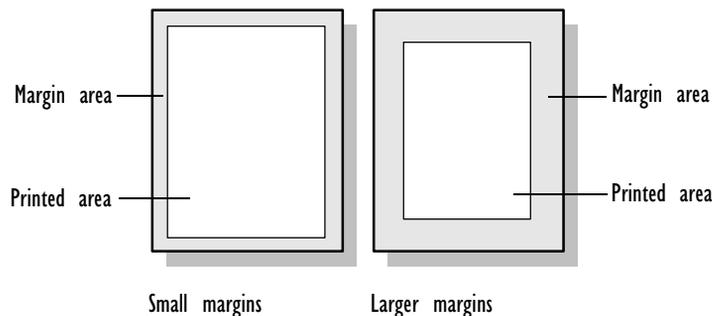
---

### Setting margins

By setting margins you can:

- Create a non-printable area of any width around a drawing that prints on one sheet of paper.
- Create a non-printable area around a tiled drawing and increase the area where the tiles of the drawing overlap.
- Move a small drawing to various locations on the page.

Visio never clips a drawing at the margins. Therefore, when you print on a sheet of paper that is the same size as the drawing page, the margins have no effect unless you also use the Fit On option in the Print Setup dialog box to specify that you want to print the drawing on one sheet down by one sheet across. When you specify to print on a single sheet, Visio reduces the drawing (if necessary) to fit within the margins.



**To set margins:**

1. From the File menu or the Print dialog box, choose Print Setup.  
The Print Setup dialog box appears.
2. In the Margins section, type a number in the Left, Right, Top, and Bottom boxes to specify the size of each margin.
3. If you are printing a drawing page that is the same size as the paper, in the Reduce/Enlarge section, type *1* in each of the Fit On boxes.
4. Choose OK.

---

*Printing colored drawings on monochrome printers*

When you print on a monochrome printer, Visio translates the colors on your screen into gray tones on the printed page. White prints as no color and black prints as black. Other colors print as grays.

For the best gray tones in a printed drawing, use the grays in the Visio default color palette. If you use patterned fills, try using a solid color for the fill background and a shade of gray for the foreground. These patterns print better than some other patterns.

If a shape does not appear in the printed drawing, and you did not check Non-Printing Shape for the shape in the Behavior dialog box, it probably means that Visio translated the color of the shape's line and fill as white. To correct this problem:

- Change the color of the shape's line or fill to a darker color. Visio interprets the color as a darker gray, so the shape prints.
- In the Print dialog box, choose Color As Black. Visio prints the lines and fills of all shapes as black, so all the shapes are visible in the printed drawing. This is helpful if you can't determine which shapes are missing from the printed drawing.

Some printer drivers provide gray-scale print options in the Options dialog box that you can open from the Print Setup dialog box. Experiment with the gray-scale options to find the one that works best.

**To specify a gray-scale option:**

1. From the Print Setup dialog box, choose Options.

The Options dialog box appears.

2. Change settings that affect the gray scale.
3. When you are finished with the dialog box, choose OK.
4. In the Print Setup dialog box, choose OK.

---

*Choosing a printer*

If you have difficulty printing, choose Print Setup from the File menu and make sure a printer is available and selected. For details about printers and printing in Windows, see your Microsoft Windows documentation.

**To choose a printer:**

1. From the File menu or the Print dialog box, choose Print Setup.

The Print Setup dialog box appears.

2. In the Printer section, choose the default printer, or choose a printer from the Specific Printer list.
3. Choose OK.

### Printing to a file

There may be times when you need to print to a file. For example, you can print a drawing file to another file, and then print that file on a computer that has a setting you want to use for printing.

#### To print to a file:

1. From the File menu, choose Print.

The Print dialog box appears.

2. In the Options section, choose Print To File.
3. Choose OK.

The Print To File dialog box appears.

4. Type the name of the file that you want to print the drawing file to.
5. Choose OK.

#### To send a file to the printer:

1. In Windows Program Manager, double-click the MS-DOS icon in the Main group.
2. At the DOS prompt, type a command to send the file to the printer, such as:

```
copy /b c:\project\pfile lpt1:
```

where */b* copies the entire file, *c:\project* is the path where the file is stored, *pfile* is the file to which you printed your Visio file, and *lpt1:* is the port to which your printer is connected.

---

**Tip:** If you have problems printing, see Appendix D, “Troubleshooting,” for some helpful information.

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# 6

Creating masters, stencils,  
templates, and styles

---

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# Creating masters, stencils, templates, and styles

Visio comes with master shapes, stencils, templates, and styles designed to help you create drawings quickly, but you can also develop your own to make your work faster and easier or to set up drawing standards for your department or company. You can:

- Draw your own master shapes, or modify the master shapes that come with Visio.
- Create your own stencils so they include the master shapes you use most frequently.
- Design your own templates to create drawings with the shapes, size, scale, and styles you use most.
- Modify existing styles or create your own styles.

This chapter explains how to create and edit master shapes, master shape icons, stencils, templates, and styles. It also explains how to protect files from unauthorized or accidental changes.

---

## Creating master shapes

Creating custom master shapes is a powerful way to increase your efficiency with Visio. This section explains how to make new master shapes and how to specify master shape characteristics.

There are two ways to create master shapes:

- Add a shape from a drawing to a stencil, and then specify its master shape characteristics (name, master shape prompt, and so forth).
- Add a blank master shape icon to a stencil and specify the master shape characteristics, and then draw the associated master shape in the master shape drawing window.

The following sections describe both techniques.

To create and edit master shapes and their icons, you use the commands on the Master menu. The Master menu commands are available only when the stencil window is active and when the stencil is opened as a copy or an original file (not as read-only). To activate the stencil window, click the title bar on the stencil window.

Note that you can also use objects from other applications as masters by using the same techniques described in this section. However, you may not be able to edit an object from another application in all the ways you edit a shape. For details about objects from other applications, see Chapter 7, “Using Visio with other applications.”

---

### *Creating a master shape from an existing shape*

It’s easy to use a master shape in a drawing: you just drag the shape from the stencil into the drawing. It’s just as easy to turn any shape in a drawing into a master shape stored in a stencil.

### To create a master shape from a shape in a drawing:

1. In the drawing window, display the page that contains the shape you want to use as a master shape.

Alternatively, display a drawing page and draw the shape you want to use as a master shape.

2. Open the stencil in which you want to store the new master shape.

By default, stencil files open as read-only. Make sure the Original option is checked in the Open Stencil dialog box when you open the stencil or you won't be able to add a new master shape.

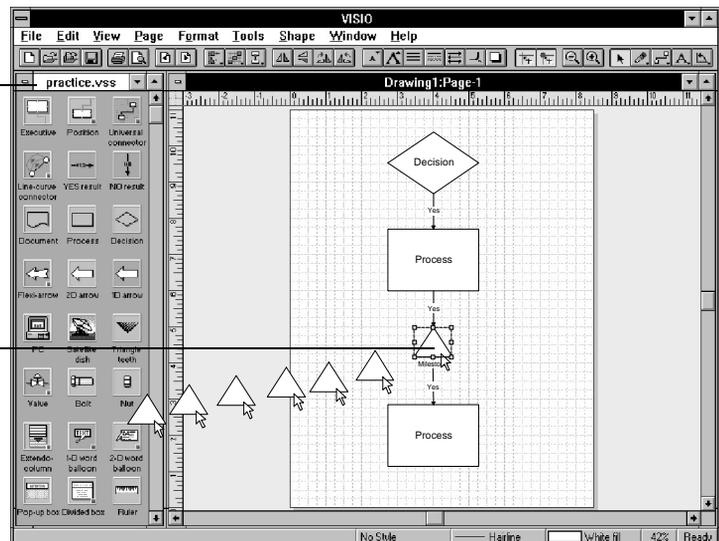
3. Make sure the drawing window is active.
4. With the pointer tool, point to the shape that you want to use as a master.
5. Drag the shape from the drawing into the stencil window.

Alternatively, you can move a copy of the shape to the stencil window by holding down the Ctrl key while you drag the shape.

An icon based on the shape and a default name for the new master shape appear in the stencil window.

No brackets indicates you can add a master shape to this stencil.

Drag the shape from the drawing window to the stencil window.



6. To realign icons after adding a master shape, choose Arrange Icons from the Window menu.

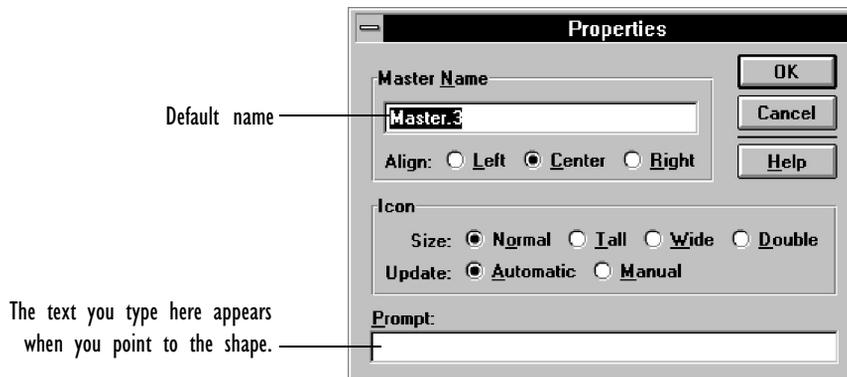
For details, see “Arranging icons” later in this chapter.

To finish creating the master shape, you need to specify its master shape characteristics. You name the master shape, position its name and adjust its icon, and write a prompt that appears when you point to the master shape’s icon.

### To specify master shape characteristics:

1. Make sure the stencil window is active.
2. Click the new master shape icon to select it.
3. From the Master menu, choose Properties.

The Properties dialog box appears and displays a default name for the master shape.



4. In the Master Name section, type a name for the master.
5. Choose an alignment option to align the name to the left, right, or center of the icon.

6. In the Icon Size section, leave the icon at its default size (Normal) or, if you want a larger icon, choose Tall, Wide, or Double.
7. In the Icon Update section, choose Automatic if you want the icon to automatically reflect changes you make to the master shape it represents. Choose Manual if you want to update the icon manually by choosing the Update Icon command from the Master menu.

If you plan to create a custom icon for the master shape, choose Manual. That way you won't accidentally replace the custom icon when you edit the master shape. For details about creating custom icons, see "Arranging, updating, and creating master shape icons" later in this chapter.

8. In the Prompt section, type information that will appear when you point to the master shape icon. The prompt should provide helpful information (such as suggesting uses for the shape, providing dimensions, and so on).
9. Choose OK.

When you're finished, you have a fully defined master shape, ready to be dragged and dropped onto a drawing page.

---

#### *Another method: Creating master shapes from scratch*

You can also create master shapes from scratch using the New Master command on the Master menu.

You create and edit master shapes using the same tools and commands that you use to create and edit shapes in a drawing. However, you work on master shapes in the master shape drawing window, not the main drawing window. The master shape drawing window looks like the main drawing window, except that:

- The window background is green.
- The drawing page is usually only slightly larger than the shape.

### To create a master shape from scratch:

1. Click the stencil window title bar to make the stencil window active.
2. From the Master menu, choose New Master.

The New Master dialog box appears.

3. Complete the dialog box the same way you complete the Properties dialog box, and then choose OK. For details about the Properties dialog box, see “Creating a master shape from an existing shape” earlier in this chapter.

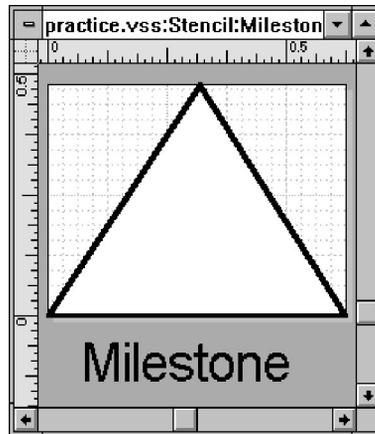


A blank master shape icon appears in the stencil window.

4. To create the master shape itself, double-click the master shape icon to open the master shape drawing window.

Alternatively, choose Edit Master from the Master menu.

5. Draw the master shape.



6. Close the master shape drawing window.



Visio displays an icon based on the shape you drew.

Now you can drag the shape from the stencil into a drawing.

---

## Arranging, updating, and creating master shape icons

The first things you see when you open a stencil are the master shape icons. Icon design can convey important information about a shape's behavior or use. Visio provides a variety of options for both customizing the look of master shape icons and arranging them in a stencil.

You can let Visio arrange icons or you can arrange them yourself. Similarly, you can have Visio update an icon automatically when you edit a master shape, or you can choose when to update the icon. You can also create a custom icon that looks different from the master shape it represents.

This section explains how to work with master shape icons. To work with master shape icons, the original or a copy of the stencil must be opened and the stencil window must be active. (Click the title bar to activate the stencil window.)

---

### Arranging icons

You might want to change the order of icons in a stencil so that the icons you use most are most accessible. Also, you might want to straighten out icon rows after you add, delete, or reorder icons.

To automatically arrange the icons each time you modify the stencil window contents, choose Auto Arrange on the View menu. Otherwise, choose Arrange Icons from the Window menu to realign the icons after each change.

#### **To change the order of icons in the stencil window:**

1. Drag each icon to approximately where you want it.

When Auto Arrange is checked, the other icons move to accommodate it. If Auto Arrange is not checked, choose Arrange Icons from the Window menu.

For details about setting other aspects of the stencil window display, see Chapter 1, "Getting started with Visio."

---

### *Updating an icon to reflect changes in the master shape*

When you create or update a master shape, you can create your own master shape icon or you can let Visio create an icon based on the master shape. The latter option usually produces the best results with simple master shapes. Whenever you edit the master shape, you can have Visio update the icon to reflect changes.

One way to ensure the icon is updated when you update the master is to set the update option in the Properties dialog box.

---

**Tip:** You can also specify whether the icon will be updated when you create a new master by checking the update option in the New Master dialog box.

---

### **To automatically update an icon to reflect master shape changes:**

1. Select the icon you want to update.
2. From the Master menu, choose Properties.  
The Properties dialog box appears.
3. In the Icon Update section, choose Automatic.
4. Choose OK.

Even if you leave the setting on Manual, you can also choose to update an icon at specific times.

### **To update a master shape icon at a specific time:**

1. Select the icon you want to update.
2. From the Master menu, choose Update Icon.

Visio updates the icon with a miniature version of the master shape.

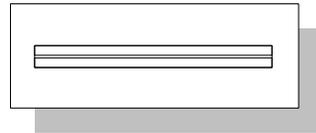
---

### Creating a custom icon

A master shape's icon should reflect the master shape's purpose. For example, you might use a color to represent the purpose (as some Visio master shape icons use a yellow background to represent connectors). You could also use a completely different image for the icon. Sometimes an icon that looks different from its master can best represent the master.



Window



Window master shape icon

Window master shape

You create a custom icon in the edit icon window. Before you create the icon, make sure you choose the following options in the Properties or New Master dialog box:

- The icon size you want, because the size you choose determines the area for creating the icon in the edit icon window.
- Manual as the icon update option, so you don't accidentally replace the custom icon when you edit the master shape.

As you edit an icon, Visio updates the icon in the stencil window so you can see how it looks. You cannot cancel changes to the icon after you close the edit icon window, so before you close the window, make sure the icon looks the way you want. However, as long as the edit icon window is open, you can use the Undo command to undo changes to the icon.

#### **To work in the edit icon window:**

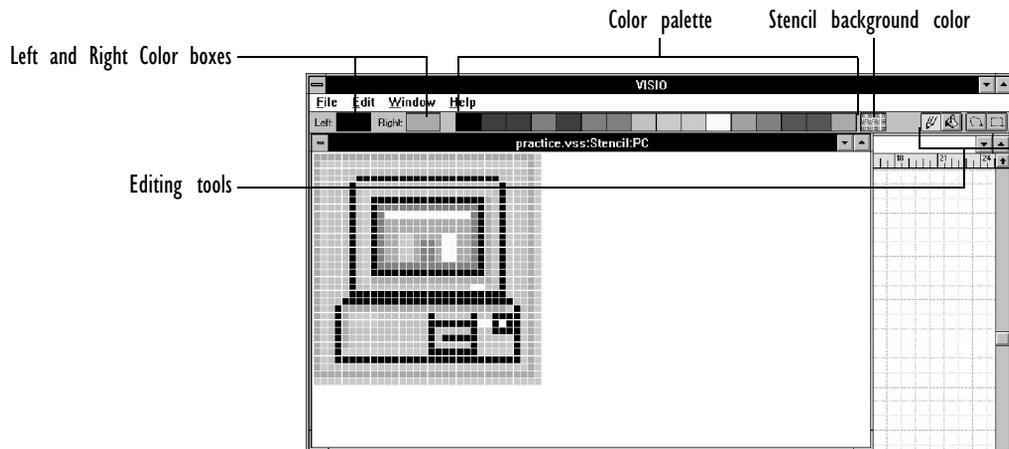
1. Make sure the stencil window is active.
2. Select the master shape icon that you want to edit.

3. From the Master menu, choose Edit Icon.

The edit icon window appears. If an icon exists for the master, the icon appears in the window. Also, the icon editing tools appear on the toolbar.

4. If necessary, move the edit icon window so that you can see changes to the icon in the stencil as you edit the icon.
5. Edit the icon or create a new icon.
6. When you are finished, close the edit icon window.

Visio updates the icon.



To create or edit an icon, you change the colors of the individual blocks of display information (known as *pixels*) that make up the icon. When you use the icon pencil tool or the paint bucket tool to change colors, you can “load” the left mouse button with one color and the right mouse button with another color, and then use the same mouse button to apply the color. For example, you can load the left mouse button with blue and the right mouse button with red. When you click a pixel with the left mouse button, the pixel turns blue; when you click a pixel with the right mouse button, it turns red.

Icon pencil tool



### To change the color of one pixel at a time:

1. Choose the icon pencil tool.
2. Point to a color in the color palette.

Left:  Right: 

3. Click the color with the left or right mouse button.

The color appears in the Left or Right Color box on the toolbar.

If you want to create icons that appear to have holes cut in them, use the stencil background color.

4. Point to the pixel you want to change.
5. Click the pixel with the mouse button that is assigned the color you want.

### To change an area of color:

Paint bucket tool

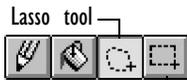


1. Choose the paint bucket tool.
2. Click a color, then, pressing the same mouse button, click a pixel within the area you want to change.

Visio colors the pixel you clicked and all pixels of the same color within the area.

You can select part of an icon, then delete or move it.

### To delete part of an icon:



Selection net tool

1. With the lasso tool or selection net tool, select the area you want to delete.
2. From the Edit menu, choose Cut.

The deleted area is replaced with the stencil background color.

### To move part of an icon:

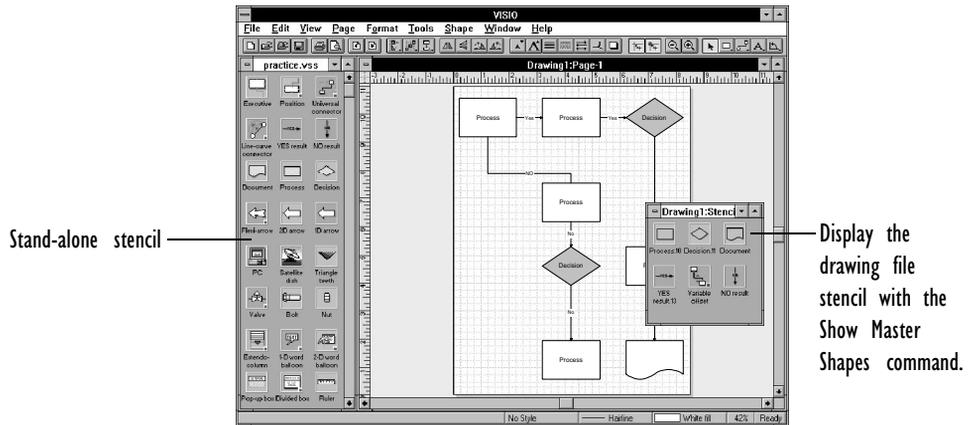
1. With the lasso tool or selection net tool, select the area you want to move.
2. Drag the selection to where you want it.

You can also copy and paste selected parts of an icon. For details about working in the edit icon window, see the the Visio online help.

## Revising stencils

There are two types of stencils:

- A **stand-alone stencil** is a stencil file with the extension .VSS, which can be opened separately or with associated templates.
- A **drawing file stencil** is a stencil stored within a drawing file. It contains copies of all the master shapes used in the drawing file.



Changing a master shape in a stand-alone stencil does not affect instances of that shape in a drawing; changing a master shape in a drawing file stencil does.

For example, if you create a new drawing based on the Practice template, the stand-alone stencil that the template opens is PRACTICE.VSS. If you use the Arrow, Process, and Decision master shapes in your drawing, the drawing file stencil stored with your drawing contains those shapes.

The effect of revising a stand-alone stencil is different from that of revising a drawing file stencil. The type of stencil you choose to revise depends on how far-reaching you want the changes to be:

- When you add or edit master shapes in a stand-alone stencil file, you change a stencil that may be associated with one or more templates. The new or revised master shapes become available in any new drawing you create that is based on that stencil or template file. Existing instances of the master shapes in a drawing are not affected.
- When you add or edit master shapes in a drawing file stencil, the changes affect only that drawing file. The new or revised master shapes are available only in that drawing. However, these master shapes are linked to their instances in your drawing. When you modify the master shapes in a drawing file stencil, the changes are reflected in each instance of the shape contained in the drawing.

The following sections describe how to edit master shapes in each kind of stencil file. For details on adding new master shapes, see “Creating master shapes” earlier in this chapter.

---

#### *Editing master shapes in a stand-alone stencil file*

By default, stand-alone stencils open as read-only to prevent changes. To add, delete, or modify master shapes in a stand-alone stencil, you need to open the original files or copies of those files. To determine whether a stencil that’s already open can be modified, look at the stencil name in the title bar. If the name appears between brackets, the stencil was opened as read-only. If there are no brackets, you can modify the stencil.

### To revise a stand-alone stencil:

1. From the File menu, choose Open Stencil.

Alternatively, click the Open Stencil button on the toolbar.

The Open Stencil dialog box appears.

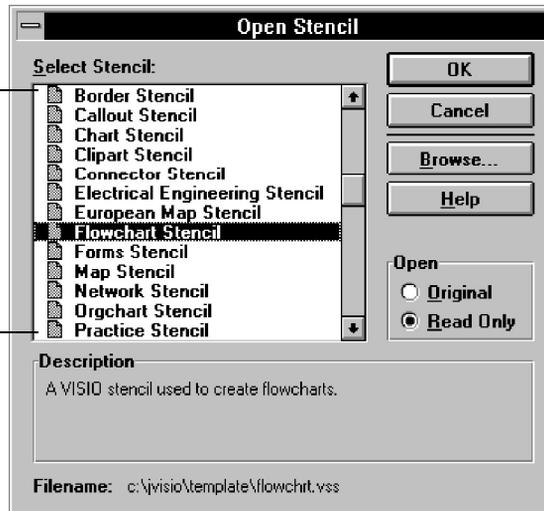


Standard and Microsoft Office toolbar



Lotus SmartSuite toolbar

Visio lists the names of the stencils found in each directory listed in the VISIO.INI setting for "Template Path"



2. Choose the name of the stencil containing the shape you want to edit.
3. In the Open section, choose Original to open the original version of the stencil file.

Visio opens the stencil in the stencil window.

4. In the stencil window, double-click the icon for the master shape you want to edit.

If nothing happens when you double-click the icon, make sure the stencil window is active by clicking the stencil window title bar.

5. In the master shape drawing window, edit the master shape.
6. To close the master shape drawing window, double-click the Control-menu box.

Visio asks if you want to update the master. Choose Yes to make the changes, or No to ignore them. If you choose Yes, the master shape is revised and your changes will appear in the next instance you create. Existing instances are not changed.

---

### *Editing master shapes in a drawing file stencil*

The quickest way to update every instance of a master shape in a drawing file is to edit the master shape stored in the drawing file stencil. When you edit the master shape, you change every instance of the shape in that drawing file. You do not, however, change the master shape in any stand-alone stencil you may have used to create the drawing.

#### **To revise a drawing file stencil:**

1. Make sure the drawing window is active by clicking the title bar.
2. To display the drawing file stencil, choose Show Master Shapes from the Window menu.
3. In the drawing file stencil, double-click the icon for the master shape you want to edit.
4. In the master shape drawing window, edit the master shape.
5. To close the master shape drawing window, double-click the Control-menu box.

Visio asks if you want to update the master and all its instances. Choose Yes to make the changes, or No to ignore them.

---

### *Deleting a master shape from a stencil*

When you no longer need a master shape, you can delete it. Deleting a master from a drawing file stencil breaks the link between the master and any instances in the drawing.

**To delete a master shape:**

1. Make sure the stencil window is active.
2. Select the master shape icon.
3. From the Edit menu, choose Clear.

Alternatively, choose Cut, or press the Delete key.

When you try to delete a master shape from a drawing file stencil, Visio warns you that deleting the master shape severs the connection between the master and its instances. Choose OK to delete the master or Cancel to cancel deletion.

4. If Auto Arrange is not checked in the View menu, choose Arrange Icons from the Window menu to realign the icons.

---

*What if you can't edit or delete a master shape?*

If you double-click a master shape in a stand-alone stencil to open the master shape drawing window (or if you try to delete a master shape) and nothing happens, it probably means that:

- The stencil window is not active. Click the title bar to activate the window.
- You opened a read-only copy of the stencil (which is the default). You can tell the file is read-only because its name in the title bar is in brackets. You must open the original stencil or a copy of it to change the master shapes.
- The document's master shapes are protected. You can tell when a master shape is protected because instances of the master shape display locks when they are selected. To turn off the protection, choose Protect Document from the Tools menu and uncheck the Master Shapes option. For details about protecting and unprotecting shapes, see "Locking and unlocking shapes" in Chapter 3, "Creating shapes."

---

## Creating stencils and templates

You aren't limited to the stencils and templates provided with Visio. You can create your own. You might want to create new stencils either to mix and match master shapes from several stencils and store them in one place, or to store a new set of masters for a particular type of drawing unique to your business. You create a new stencil by opening and saving a new stencil file or by saving a drawing file stencil as a stand-alone stencil file.

If you frequently use the same stencil, styles, and page settings in your drawings, create a new template with these settings. The easiest way to create a template is to save a drawing file that contains the settings you want as a template.

---

**Tip:** The master shapes in stencils you create will seem better related to each other if you standardize the master shape names, prompts, styles, grid size, scale, icons, and file summary information.

---

Once you create files, you can protect them by using the Protect Document command, or by saving them as read-only.

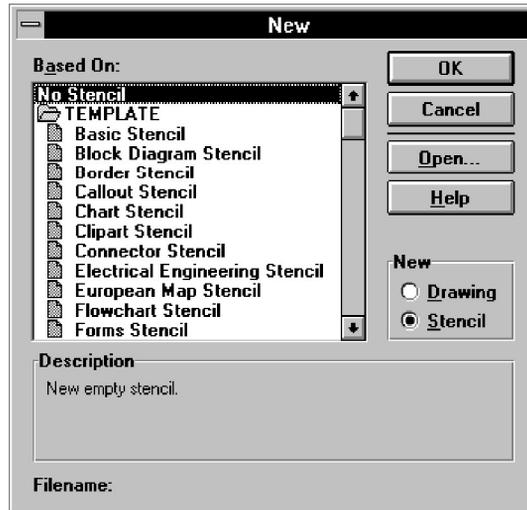
---

### Creating a new stencil file

You can base a new stencil file on an existing stencil file. When you do so, the new stencil file contains a copy of all the master shapes in the original stencil file. You can also create a new, blank stencil and then add master shapes to it.

**To create a new stencil:**

1. From the File menu, choose New.
2. In the New section, choose Stencil.



3. From the Based On list, choose No Stencil to create a blank stencil, or choose the stencil on which you want to base the new stencil.
4. Choose OK.

Visio opens the new stencil.

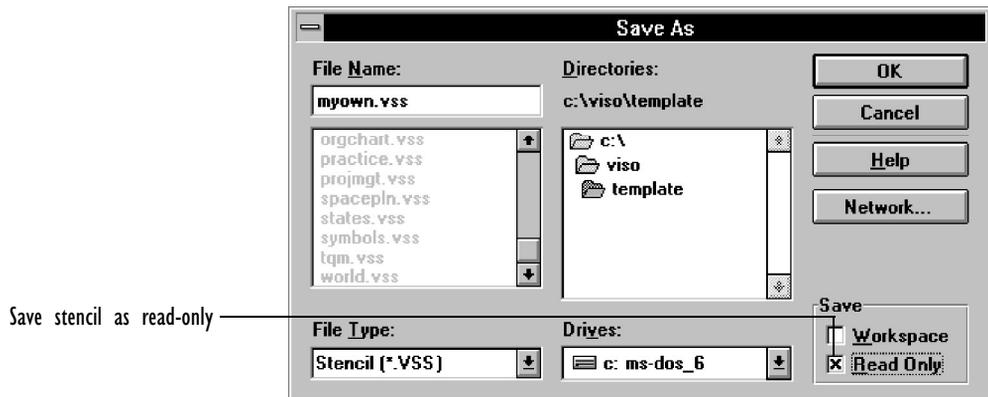
As soon as you create a new stencil, save it.

**To save a stencil file:**

1. Make sure the stencil window is active.

2. From the File menu, choose Save As.

The Save As dialog box appears.



3. In the File Type section, make sure Stencil (\*.VSS) is chosen.

If you share stencils with someone who uses an earlier version of Visio, save the stencil in Visio 2.0 format. For details about Visio file formats, see Chapter 1, “Getting started with Visio.”

4. In the File Name box, type a name for the stencil file.
5. If you want to protect the stencil from accidental changes, check Read Only in the Save section.

When you save a file as read-only, it opens as a read-only file unless you check Original or Copy when you open the file. For details about protecting files, see “Protecting stencils, templates, and drawing files” later in this chapter.

6. To save the file to a different drive or directory, choose the drive or directory.
7. Choose OK.

---

### *Saving a drawing file stencil as a stand-alone stencil*

If a drawing file stencil contains a set of master shapes that you frequently use, save a copy of the drawing file as a stencil file. The drawing file stencil becomes a new stand-alone stencil file.



Standard and Microsoft  
Office toolbar



Lotus SmartSuite toolbar

### To create a stand-alone stencil file from a drawing file stencil:

1. From the File menu, choose Open.

Alternatively, click the Open button.

The Open dialog box appears.

2. From the File Name list, choose the drawing file.
3. In the Open section, choose Copy, and then choose OK.

Visio opens a copy of the file.

4. From the Window menu, choose Show Master Shapes.

Visio displays the drawing file stencil.

5. Make the drawing window active, and then choose Delete Pages from the Page menu.

6. In the Delete Pages dialog box, click a page, hold down the Shift key and choose all other pages, and then choose OK.

Visio deletes all the drawings from the copy of the drawing file, so that the file contains only its drawing file stencil.

7. From the File menu, choose Save As.
8. From the File Type list, choose Stencil (\*.vss).
9. Name the stencil file, and then choose OK.

For details about saving stencil files, see “Creating a new stencil file” earlier in this chapter.

---

### *Moving master shapes between stencils*

You can drag a master shape from one stencil to another, the same way you drag a master into a drawing. For convenience, you might want a master shape to appear on more than one stencil. If you hold down the Ctrl key and drag, the master appears in both stencils.

---

### *Creating templates*

Creating a template is a convenient way to open a stencil and store styles, a color palette, and page settings so you can use them any time.

Templates can include:

- **Links to one or more stencils**, which are not actually stored in the template, but are opened when you open a new drawing file with the template.
- **One or more drawing pages**, including background pages. Each page can contain a drawing and use a unique size and scale. For details about creating pages, see Chapter 5, “Creating and printing drawing pages.”
- **Print settings** from the Print Setup dialog box. For details, see Chapter 5, “Creating and printing drawing pages.”
- **Styles** for lines, text, and fills. For details about creating styles, see “Creating and editing styles” later in this chapter.
- **Snap and glue settings** from the Snap & Glue Setup dialog box. For details, see Chapter 2, “Adding, arranging, and connecting shapes.”
- **A color palette**. For details, see “Choosing a color palette” later in this chapter.
- **Window size and position**. For details about arranging windows, see Chapter 1, “Getting started with Visio,” or see your Microsoft Windows documentation.

You create a template by saving a drawing file that contains the settings you want for the template or by saving a new drawing file as a template.

**To create a template from a drawing file:**

1. Open the drawing file.
2. If you want the template to open one or more stencils, open the stencil files.
3. Arrange the stencil and drawing windows as you want them to appear when you open a new drawing file with the template.
4. If the drawing window is not active, click its title bar.
5. From the File menu, choose Save As.

The Save As dialog box appears.

6. In the Save section, make sure Workspace is checked.
7. From the File Type list, choose Template (\*.VST).
8. In the File Name box, enter a name for the template.

Because you chose Template in the File Type list, Visio supplies the .VST filename extension.

9. Choose OK.

When you create templates, keep these things in mind:

- Make sure the shapes you develop work well with the drawing scale and grid you're using in your template. Master shapes can behave in unexpected ways if the master shape and drawing page scales differ greatly. For example, the shape may appear tiny or huge, and scaled shapes containing fixed measurements can come apart when you use them in unscaled drawings. The scale of a drawing page is set by the template. The scale of a master shape is set by the scale at which the master shape is drawn. To avoid unexpected behavior, the master shapes and drawing pages should either use the same scale or one scale should be no more than eight times greater than the other.
- If you don't want to include drawings in the template, open a copy of the drawing file. Delete the drawings and the master shapes on the drawing file stencil. Save the copy of the drawing file as the template.

- You can create a template from a new drawing file. Just open the new file, set the options and open the stencils you want, and then save the new drawing file as a template.
- To edit a template, choose Open from the File menu, then either open the original template file and edit it, or if you want to prevent modification of the original, open a copy of the template and edit it.

---

### *Protecting stencils, templates, and drawing files*

Once master shapes, stencils, templates, and drawing files look the way you want them to, you might want to protect them from accidental or unauthorized changes.

---

#### *Protecting a file*

You can prevent changes to the styles, backgrounds, shapes (including objects from other applications), and master shapes in a file.

#### **To protect a file:**

1. From the Tools menu, choose Protect Document.
2. In the Protect Document dialog box, type a password.

You can protect a document without a password, but if you use one, remember it or write it down. After you close the dialog box, the password is not visible.

3. Choose the items that you want to protect.

Options include styles, backgrounds, shapes (Visio shapes and objects from other applications), and master shapes.

4. Choose OK.

When you no longer need to protect a file, you can remove the protection.

**To remove protection:**

1. From the Tools menu, choose Unprotect Document.
2. Type the password if you used one.
3. Choose OK.

---

*Saving a file as read-only*

If you want to prevent changes to a file, it's helpful to save the file as read-only. That way, the original file cannot be accidentally edited. However, you can open and edit a copy of the file. For details about saving files, see Chapter 1, "Getting started with Visio."

**To save a file as read-only:**

1. From the File menu, choose Save As.  
The Save As dialog box appears.
2. In the Save section, choose Read Only.
3. Complete the rest of the dialog box.
4. Choose OK.

---

*Creating and editing styles*

If there are several attributes you want to apply to multiple shapes in your drawing, you could apply each attribute separately to each shape. However, the simplest way to format several shapes using the same set of attributes is to use a formatting shortcut called a *style*.

A style is a named set of attributes that is saved with a template or a drawing. When you apply a style to a shape, you apply several attributes at once. Styles make it easy to create a uniform look for any number of shapes. And if you want to change that look, all you need to do is edit the style. The new attribute will be applied to all the shapes that use that style.

You can create new styles and save them in templates and drawing files. You can also edit existing styles. A style's name appears in the Line, Fill, or Text style list and in the Style dialog box.

For details about styles and how to apply them, see “Formatting shapes” in Chapter 3, “Creating shapes.”

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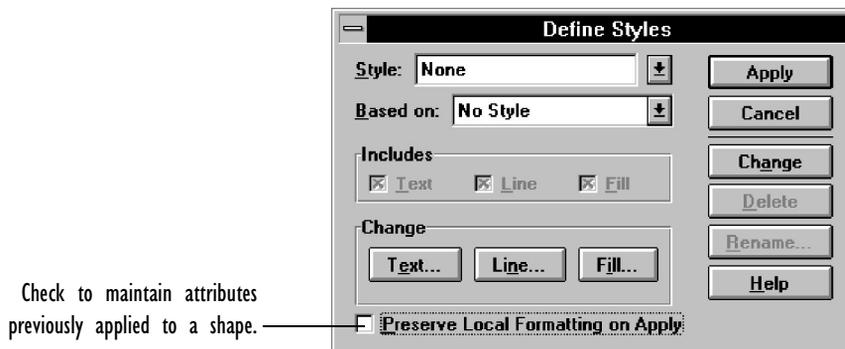
### *Creating a new style*

You create new styles by using the Define Styles dialog box. You can create a new style from scratch or base a new style on an existing one.

#### **To create a style:**

1. Make sure the drawing window is active.
  2. From the Format menu, choose Define Styles.
- ❖ In Visio's SmartSuite menu set, choose Define Styles from the Style menu.

The Define Styles dialog box appears.



3. In the Style box, type a name for the new style.

Note that if you use the same style names in both the drawing file and the stencils associated with a template, you must make sure that the styles' definitions are the same. If you don't, shapes may behave in unexpected ways when dragged from a stencil to a drawing. For details, see Chapter 3, "Creating shapes."

4. From the Based On list, do one of the following:
  - If you're creating a style based on another style, choose the style name from the list.
  - If you're creating a style from scratch, choose No Style from the list.
5. If you want the style to include text, line, or fill attributes and to be displayed in the associated style list, check the appropriate item in the Includes section. To exclude the attributes, make sure the item is not checked.

If you are creating a style based on another style, the new style inherits the base style's attributes (instead of default attributes) and the new style name appears on the related style list.

If you are creating a style from scratch and you check the Text, Line, or Fill item in the Includes section, the new style automatically uses default attributes for text, line, and fills. In addition, the new style name appears on the related style list by default.

6. To specify or change text, line, and fill attributes for the new style, choose the appropriate button in the Change section, complete the dialog box, and then choose OK.

When you open each dialog box, the attributes of the style on which the new style is based appear. Make the changes necessary to define the new style. After you close the dialog box, a green line appears under the corresponding button in the Change section to indicate you made changes.

For details about the formatting dialog boxes, see Chapter 3, “Creating shapes,” and the Line, Fill, Font, Paragraph, Tabs, and Text Block entries in the Visio online help.

7. If a shape was selected when you chose Define Styles, and you want the local formatting for a shape to remain intact when you use the Apply button, check the Preserve Local Formatting On Apply option.

For example, if you check this option, text which you have formatted as bold without using a style will remain bold even when you apply a style that specifies normal text.

Keep in mind that if you checked the Text, Line, or Fill item in the Includes section of the Define Styles dialog box, the style has attributes associated with that item even if you don't make changes to them. If you don't check Preserve Local Formatting On Apply, the default attributes will replace local formatting.

8. When the style contains the attributes you want, choose OK.

If any shapes are selected, choose Apply to apply the style and close the dialog box.

You can also choose Add or Change to save the new style and leave the Define Styles dialog box open for further work.

---

### *Editing, deleting, and renaming styles*

Editing styles is a quick way to change the look of multiple shapes in a drawing. When you edit a style, the change is reflected in each shape which uses that style in the drawing.

**To edit a style:**

1. From the Format menu, choose Define Styles.
  - ❖ In Visio's SmartSuite menu set, choose Define Styles from the Style menu.
2. From the Style list in the Define Styles dialog box, choose the name of the style you want to edit.
3. Edit the style.
4. Choose Change.
5. Choose OK.

The changes you make are reflected in any shape with that style applied to it.

**To delete a style:**

1. From the Style list in the Define Styles dialog box, choose the name of the style you want to delete.
2. Choose Delete.
3. Choose OK.

All shapes that use the deleted style are changed to the style in the Based On box.

**To rename a style:**

1. From the Style list in the Define Styles dialog box, choose the name of the style you want to rename.
2. Choose Rename.

The Rename dialog box appears.

3. Type a new name for the style.

4. Choose OK.
5. In the Define Styles dialog box, choose OK.

The new name appears in the style list.

---

### *Choosing a color palette*

The templates provided with Visio use the default color palette. You can specify a different color palette for a template or a drawing file by choosing one of the color palettes provided with Visio, or by copying a color palette from an existing file into your file.

#### **To choose a color palette:**

1. From the Tools menu, choose Color Palette.

The Color Palette dialog box appears.

2. In the Copy Colors From list, either choose a color palette or filename from the list.

Choosing a filename from the list copies the color palette. Only the names of open files appear in the list.

3. Choose OK.

For details about the color dialog boxes, including the options for creating your own colors, see the Color Palette entry in the Visio online help.



# 7

Using Visio with other applications

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# Using Visio with other applications

Visio is probably only one of many tools you use in your work. You may want to combine Visio shapes and drawings with reports, charts and graphs, spreadsheets, and other kinds of information. This chapter explains how to integrate Visio drawings with documents created in other applications, and how to import and export information in other file formats.

---

## About linking, embedding, importing, and exporting

Linking, embedding, importing, and exporting—as well as copying and pasting—are methods of integrating a Visio shape or drawing with another document. You can use these features to put a shape or drawing created in Visio into another application, or bring objects from another application into a Visio drawing. Visio offers a wide choice of methods for accomplishing these tasks:

- You can *copy* or *paste* information to or from another application by copying the information to the Clipboard and then pasting it from the Clipboard into another application.
- If the other application supports *object linking and embedding* (OLE), you can link or embed information for easy updating and editing. For example, if you're working in Microsoft Word, you can run Visio and *embed* a flowchart in a Word document. You can then edit the flowchart from within Word.

If you want to use a Visio drawing in several different documents, you can *link* the drawing. The drawing is updated in each document whenever you edit the drawing. For example, if you use an organization chart in multiple documents and then change the chart, the changes will be reflected in each document the chart is linked to.

- If the application you want to exchange information with doesn't support copying and pasting or embedding and linking, you can also *export* and *import* files and convert objects in Visio to another file format.

The following table summarizes the different methods for integrating a Visio shape or drawing with another document. Which method you use depends on the capabilities of the other application and how you want to use the material at its destination.

| <b>To</b>  | <b>Do this</b>                                   | <b>Limitations</b>   |
|--|--|--|
| Transfer text or graphic information to or from an application that supports the Windows Clipboard                               | Copy and paste                                   | You might not be able to update the pasted information.                                |
| Update multiple instances of an object automatically   | Link information                                 | You need to update a link if a file is renamed, moved, or copied to another directory. |
| Link to an external file so you can use it with other applications or drawings   | Link information                                 | Both applications must support OLE.  |
| Create an object that you want in only one document  | Embed information                                | The document is larger because it contains a copy of the embedded information.         |
| Paste an object without maintaining an external file on disk   | Embed information                                | Both applications must support OLE.  |
| Quickly move, copy, or paste an object from one application to another to embed or link the object                               | Drag and drop the object                         | Both applications must support OLE 2 and the drag and drop method.                     |
| Create an OLE object in an application you start within Visio or create a Visio shape or drawing from within another application | Create an object from within another application | Both applications must support OLE.  |
| Send a file to another computer  | Mail a file                                      | Requires MAPI and CMC mail systems like Microsoft Mail.                                |
| Bring a file in another format into a Visio drawing  | Import a file                                    | You must have the appropriate import filters installed.                                |
| Convert a Visio drawing into another file format   | Export a file                                    | You must have the appropriate export filters installed.                                |

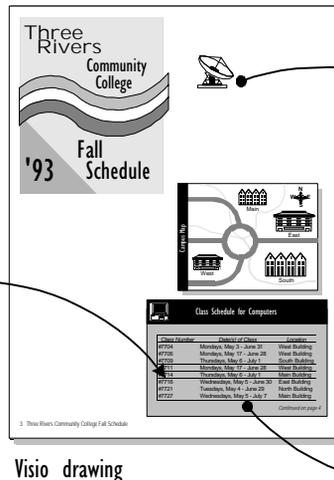
## Linking versus embedding

OLE is a powerful method for sharing information between Visio and other Windows applications. Both linking and embedding create an active link between the application that creates the OLE object and the OLE container, the application into which you paste it. When you embed or link objects, your document contains or refers to data created in different applications, and you can edit the data from within your document. For example, you can create an organization chart in Visio. By linking or embedding the organization chart into another application, you can update it from within the application. Visio supports OLE 2, which lets you edit an object in place and drag and drop objects from one application to another. For details, see “Editing an embedded Visio object in place” and “Dragging and dropping a Visio object into other applications” later in this chapter.

When you link an OLE object, you link only a reference to the data, not the data itself. When you embed an object, you embed a copy of the data in the container application. For example, if you link the organization chart to another application, the data remains in the Visio file; if you embed the organization chart, a copy of the data is stored in the container’s file. Because linking and embedding differ in where the actual data of the object is stored, whether you choose to link or embed an object depends on how you intend to work with it.

Microsoft Excel chart embedded in Visio so it can be easily updated within Visio

| Class Number | Details of Class         | Location      |
|--------------|--------------------------|---------------|
| 07704        | Monday, May 9 - June 31  | West Building |
| 07705        | Monday, May 17 - June 28 | East Building |
| 07706        | Monday, May 24 - June 1  | West Building |
| 07707        | Monday, May 31 - June 11 | West Building |
| 07708        | Monday, May 17 - June 28 | West Building |
| 07709        | Monday, May 24 - June 1  | West Building |
| 07710        | Monday, May 31 - June 11 | West Building |
| 07711        | Monday, May 9 - June 28  | East Building |
| 07712        | Monday, May 16 - June 28 | West Building |
| 07713        | Monday, May 23 - June 7  | West Building |



Visio drawing

Visio shape embedded in Microsoft Publisher

Visio drawing linked to Publisher so it can be easily updated from within Publisher



Final layout in Microsoft Publisher

---

*When to link information*

Linked information can be updated every time you open the document that contains the reference to the source data (the link), so any changes made to the original file appear automatically in documents that are linked to it. If you need to use the same information in more than one document and it's important that the most current version be used, link the information rather than embed it.

Links take a little more care to maintain than embedded information, because the original file must be available so Visio can update the linked information. If the original file is renamed or moved to a different directory, the link to the document may need to be updated. This also means that if you copy the Visio document to another system, you must also copy the original file, and the link may have to be updated the first time the document is opened on that system. For details, see “Managing links between Visio drawings and other documents” later in this chapter.

---

*When to embed information*

Documents that contain embedded information can be easier to work with because there are no links to maintain and the document does not need access to other files. Therefore you can copy the document to another system without having to copy additional files. Because the information is not linked, changes to the original file are not reflected in the document. Embedding information makes the document larger because the document contains a copy of the information itself rather than a link to another file. In addition, you can edit embedded objects without leaving the container application. For details, see “Editing an embedded Visio object in place” later in this chapter.

---

### *What Visio needs to link or embed information*

Visio can link or embed information from any Windows OLE-object application. Information from Visio can be linked to or embedded in any Windows application that supports OLE as a container. An OLE container is an application that can link or embed objects from other applications. For details about a particular application's capabilities for object linking and embedding, see its documentation.

---

**Tip:** If you want to take advantage of OLE, make sure your system has enough RAM for both the OLE-object application and the container application to run simultaneously.

---

### *Linking or embedding Visio drawings into other applications*

The drawings you create in Visio may be only part of the message you're trying to communicate. You may want to create diagrams and flowcharts to illustrate a technical report, or simply to include a floor plan in a memo. You can embed or link selected shapes, a drawing, or an entire file. Then, from within the other application, you can double-click the Visio object to edit it. You can also create Visio shapes or drawings from within other applications (most often by using the application's Insert Object command.) For related information, see "Creating a new shape or drawing in Visio from within another application" later in this chapter. For details, see the documentation for that application.

---

### *Embedding Visio shapes in another document*

You can embed shapes from a Visio drawing in another document by copying the shapes to the Clipboard and then pasting them into the container application. You can also embed Visio shapes by dragging and dropping them into another OLE 2 container application. For details, see "Dragging and dropping a Visio object into another application" later in this chapter.

**To embed selected shapes in another document:**

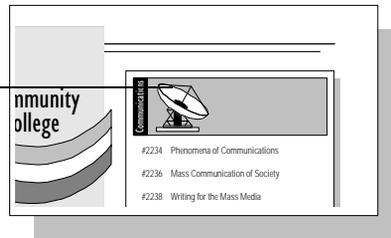
1. In your drawing, select the shapes that you want to embed in the other document.
2. From the Edit menu, choose Copy.

Even if you are finished using Visio, don't close it. To embed shapes, the other application needs certain information which is obtained more quickly if Visio is still running.

3. In the other application, display the document in which you want to embed the shapes.
4. Choose the command used by that application to embed objects in its documents.

This command is usually Paste on the Edit menu, but may be Paste Special, Paste Object, or a command unique to the application. For details, see the OLE documentation for that application.

A Visio shape embedded in another application



---

**Embedding or linking a drawing**

If you want to use an entire Visio drawing in another document, you can embed the drawing in much the same way as you embed selected shapes, or you can link the Visio file that contains the drawing to the document. When you embed or link an entire drawing, the whole drawing page is not displayed. Instead, you see an area just large enough to hold all the shapes on the page. If you want to view more of the drawing, you can define a larger area to embed or link.

**To embed or link a drawing in another document:**

1. Make sure nothing in the drawing is selected.

If any shapes are selected, Visio will embed or link only those shapes instead of the whole drawing.

2. If you want to create a link to the drawing rather than just embed a copy of it, save the drawing file.

Because a link consists of a reference to the original file, you must save the file before you can link to it.

3. From the Edit menu, choose Copy Drawing.

Copy Drawing selects all the shapes on the foreground page and the shapes on any background page.

Even if you are finished using Visio, don't close it. To embed or link the drawing, the other application needs certain information which is more quickly obtained if Visio is still running.

4. Display the document in which you want to embed or link the Visio drawing.

5. Choose the command used by that application to embed or link objects.

For embedding, this command is usually Paste on the Edit menu. For linking, this command may be Paste Special, Paste Link, or another command unique to the application. For details, see the OLE and Clipboard documentation for the application.

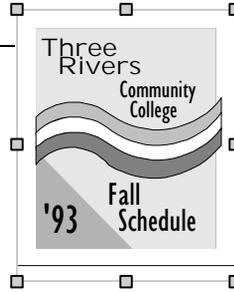
To include a border around the drawing, you can increase the area Visio copies by creating a rectangle that encloses the area you want.

**To embed or link a larger area of the drawing:**

1. In Visio, draw a rectangle that encloses the area you want to embed or link.
2. Make the rectangle transparent by applying the fill style None to the rectangle, or move it behind the shapes by choosing Send To Back from the Shape menu.

3. If you don't want the drawing to have a border, make the border transparent by applying the line style None to the rectangle.
4. Follow the steps in the preceding procedure to copy the drawing and embed or link it into the other document.

The rectangle defines an area that extends past the shapes in the drawing's foreground.



For details about formatting shapes, see “Formatting shapes” in Chapter 3, “Creating shapes.”

You can also extend the area around embedded Visio shapes or drawings by choosing Page Setup from the Page menu and then choosing Size/Scale. In the Page Setup Size/Scale dialog box, type the width and height of the drawing in the Dimensions boxes. If you are editing an object in place, you can enlarge the drawing area by dragging a handle on the border.

---

**Tip:** You can link only one object at a time. To link multiple objects at one time, group the objects, and then link the group.

---

#### *Editing an embedded Visio object in place*

You can edit an embedded Visio object without leaving the OLE 2 container application. A special set of Visio menus and toolbars temporarily replaces the existing menus and controls of the active window while you are editing the Visio object.

**To edit an embedded Visio object in place:**

1. In the container application, double-click the embedded object.  
A special set of Visio menus and controls appears.
2. Edit the object.
3. Click anywhere outside the drawing to exit in-place editing.

You cannot edit an object embedded in Visio in place.

---

*Creating a new shape or drawing in Visio from within another application*

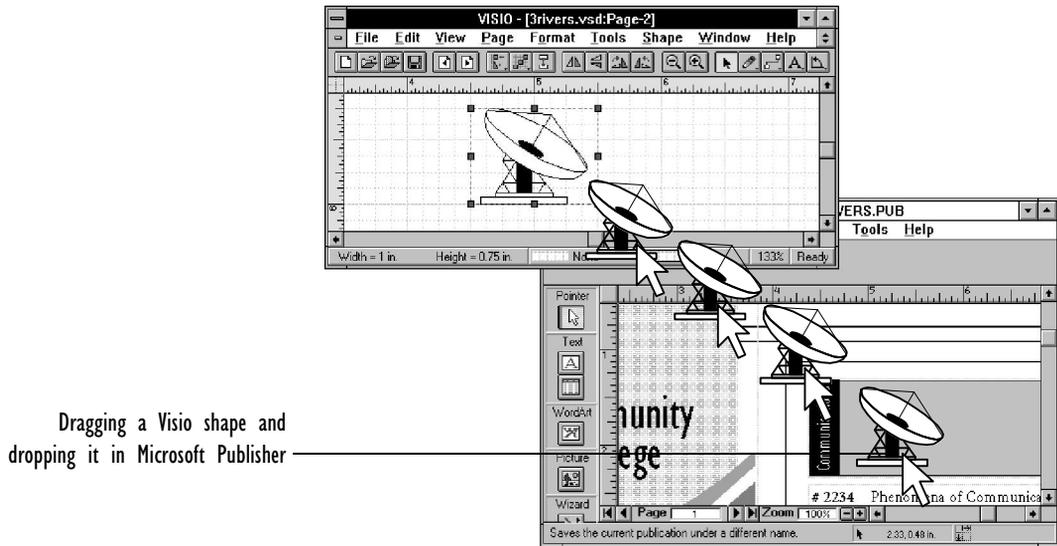
If an application supports OLE, you can create shapes or drawings in Visio from within the other application by using the Insert Object (or equivalent) command. For example, if you are working in Microsoft Word, you can open Visio and create a shape without leaving your Word document. New Visio shapes or drawings you create from within other applications are either linked or embedded. For related information, see “Creating an object in another application from within Visio” later in this chapter. For details, see the documentation for that application.

---

*Dragging and dropping a Visio object into other applications*

As an alternative to cutting—or copying—and pasting, you can drag and drop an object from one application to another. You can use this method only if both the OLE object and container applications support OLE 2. By dragging and dropping an object, you do not use the Clipboard; therefore no information on the Clipboard is affected.

When you drag and drop an object from one application to another it will be embedded, linked, or pasted into the container application depending on what keys you hold down as you move the object and what formats the application supports.



Dragging a Visio shape and dropping it in Microsoft Publisher

### To move an object from Visio to another application:

1. Hold down the Shift key as you drag an object from Visio to the container application.

The object will be embedded in the container application and deleted from Visio. If you do not want to delete the object, choose Undo from the Visio Edit menu after moving the object.

### To copy an object from Visio to another application:

1. Hold down the Ctrl key as you drag an object from Visio to the container application.

The object will be embedded in the container application but not deleted from Visio.

### To link an object from Visio to another application:

1. Select the object. While still pressing the mouse key, hold down the Ctrl and Shift keys and drag an object from Visio to the container application.

You cannot move an object from a read-only Visio file, or move a master shape from a stencil to another application. However, you can copy a master shape from a stencil to another application.

If you are moving, copying, or linking an object, the mouse pointer changes to indicate the action. The mouse pointer will also change to indicate if the application does not support drag and drop embedding or linking.

| Mouse pointer   | Action                         |
|---|--------------------------------|
|  | Move                           |
|  | Copy                           |
|  | Link                           |
|  | Unable to link or embed object |

### Linking or embedding objects into a Visio drawing

Just as you use Visio drawings to enhance the message in another document, you may want to enhance your Visio drawings with information you create in other applications. You can embed or link information into a Visio drawing from any Windows application that supports OLE.



Sound application icon

Most linked or embedded objects in Visio look exactly as they do in the original application. However, what you see in Visio is a representation provided by the OLE-object application. Some OLE-object

applications can't provide a realistic representation of their objects, so they provide a representation such as an icon. For example, a sound application would probably provide an icon to represent its object.

An OLE object's representation is usually a Windows Metafile, which means you can convert most linked or embedded objects to Visio shapes. Doing so breaks the link, but you can then work with the component shapes like any others. For details about converting objects to Visio shapes, see "Converting objects to Visio shapes" later in this chapter.

---

### *Embedding an object into a Visio drawing*

If an application supports OLE, Visio can embed an object so you can modify it in its original application. The embedded object doesn't retain an association with its original file, so changes to the original don't affect the embedded object in your drawing.

### **To embed an object from another application into a Visio drawing:**

1. Display the document that contains the information you want in its application window.
2. In the document, select the information you want to embed in your Visio drawing.
3. Choose the command used by that application to place information on the Clipboard.

This will usually be the Copy command on the Edit menu.

4. Display the drawing in which you want to embed the object in the Visio window.

5. From the Edit menu, choose Paste.

Visio pastes the information from the Clipboard into the drawing as an object. The object is placed in the center of the view. You can select and move the object just like a Visio shape.

---

### *Linking an object's file to a drawing*

If you need to use the same OLE object in more than one drawing or application, and it's important that the most current version be used, you can link your drawing to the original file that contains the object. A linked OLE object can be updated automatically every time you open the drawing, or only when you explicitly request it. Any time a link is updated, changes made to the object in its original file appear in the document that the file is linked to. You link a drawing to the file that contains an object by pasting and linking it.

### **To link a file to a drawing:**

1. Save the original file.

Because a link consists of a reference to the original file, you must save the file before you can link to it.

2. In the original file, select the information you want in your Visio drawing.
3. Choose the command used by the OLE-object application to place information on the Clipboard.

This will usually be the Copy command from the Edit menu.

4. Display the Visio drawing you want to link the file to.
5. From the Edit menu in Visio, choose Paste Special.
6. In the Paste Special dialog box, check Paste Link.

Visio pastes the information from the Clipboard into the drawing as an object; the drawing contains a link to the object's original file.

Paste Link will not be available if you cut the object (instead of copying it), or if the application does not support linking.

---

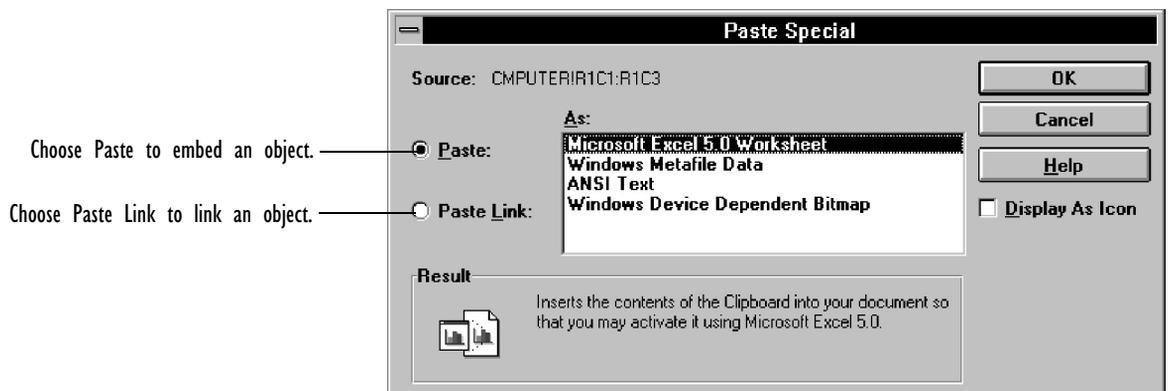
### *Pasting information in a particular format*

Most applications place information on the Clipboard in more than one format to make the information usable by more applications. When you paste information from the Clipboard into an application, it uses only one of the available formats by default. However, you may want to use a different format. For example, you may want to paste something as a bitmap or a Windows Metafile, rather than embed it in your drawing. You can paste information from the Clipboard in a particular format by using the Paste Special command instead of Paste.

### **To paste information from the Clipboard in a particular format:**

1. Copy the information you want to the Clipboard.
2. Display the Visio drawing into which you want to paste the information.
3. From the Edit menu, choose Paste Special.

The Paste Special dialog box appears.



4. In the dialog box, choose Paste, and then choose the format you want from the list.
5. Choose OK.

---

### *Creating an object in another application from within Visio*

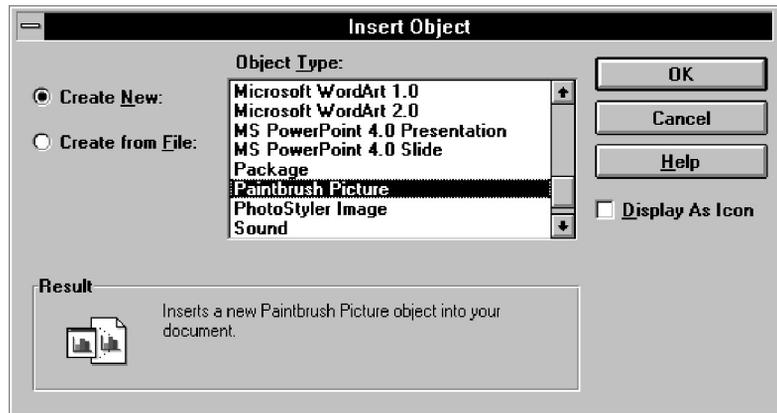
Because Visio supports OLE, you can create objects in other applications from within a Visio drawing. (However, you cannot edit an object embedded in Visio in place.) For example, if you are working in Visio, you can open Microsoft Excel and create a spreadsheet without leaving Visio. You can run another application from within Visio and either create a new object or open an existing file. New objects you create from within Visio are always embedded. Objects from existing files are either linked or embedded.

Depending on the OLE-object application, objects or files that are linked or embedded through the Insert Object command may appear as icons. You can specify that a file appear as an icon by choosing Display As Icon in the Insert Object dialog box.

### **To create a new object in another application:**

1. From the Page menu, choose Insert Object.

The Insert Object dialog box appears.



2. Choose Create New.
3. From the Object Type list, choose the type of object you want to create, and then choose OK.

Visio runs the application for creating that object.

4. Create the object you want.
5. From the File menu in the application, choose Exit.

### **To create an object from a file:**

1. From the Page menu, choose Insert Object.

The Insert Object dialog box appears.

2. Choose Create From File.
3. Choose Link if you want to link the file to the Visio drawing.
4. Type a path and filename in the text box. Alternatively, click Browse and choose the name of the file you want.
5. Choose OK.

---

### *Editing an embedded or linked object*

You can modify an embedded or linked object in its original application from within your Visio drawing. When you modify an embedded file, you are modifying a copy of the original file. When you modify a linked file, you are changing the original file. The OLE-object application provides a command on the Visio Edit menu especially for editing its objects.

Most applications provide a command that displays a submenu of actions you can perform on an OLE object. Usually the command on the submenu for editing an OLE object is Edit. Whatever the command is, the submenu usually appears below the Links command on the Edit menu in Visio. For details about the <OLE object> Edit command, see the Visio online help.

### To edit an embedded or linked object:

1. Select the object you want to edit.
2. From the Edit menu in Visio, choose the command to edit the object.

This command will usually be Edit on the <OLE object> submenu.

As a shortcut, you can select and edit the object by double-clicking the object in your drawing.

Windows runs the OLE-object application and displays the object in the application window. If the object is linked, the application opens the original file that contains the object.

| Edit                 |            |
|----------------------|------------|
| Undo Paste Special   | Ctrl+Z     |
| Repeat Paste Special | F4         |
| Cut                  | Ctrl+X     |
| Copy                 | Ctrl+C     |
| Paste                | Ctrl+V     |
| Paste Special...     |            |
| Clear                | Delete     |
| Duplicate            | Ctrl+D     |
| Select All           | Ctrl+A     |
| Select Special...    |            |
| Edit Text            | F2         |
| Text Field...        |            |
| Links...             |            |
| Worksheet Object     | Edit       |
|                      | Open       |
|                      | Convert... |

**Note:** If you have embedded a Visio 3.0 object and then try to open it in Visio 2.0, you can see the object but you won't be able to edit it.

## Managing links between Visio drawings and other documents

Linked OLE objects can be extremely useful in a drawing because you can update the drawing with the most current version of the object from its original file and edit the object in its original application. And unlike an embedded object, a link consists of a reference to the file that contains the object rather than all the data associated with the object itself, so the drawing file is smaller than it would be with embedded objects.

However, because links refer to other files, they can take a little more work to maintain. A link's file reference consists of a drive letter and the full directory path to the file on disk. If a file is renamed, deleted, or moved to another drive or directory, Visio won't be able to find the file to update the linked object and you'll have to change the link to refer to the file in its new location, or cancel the link if the file no longer exists. This can also occur when you give a drawing and its linked files to another person. Unless the files are copied to the same—or relative—drive and directory path as on your system, Visio may not be able to update the linked objects in the drawing.

---

**Tip:** OLE 2 supports relative linking so you can move the linked files to corresponding drives. For example, if the original linked files were in c:\projects\homeplan.vsd and c:\budget.xls you can move them to a:\projects\homeplan.vsd and a:\budget.xls.

---

### *Opening a drawing that contains linked objects*

When you open a drawing that contains a linked object, Visio may display a message asking you whether to update links in the document. This message appears when the drawing contains a link and the OLE-object application for that linked object is unavailable.

If the OLE-object application is not available—for example, if you open a drawing on a system that doesn't have that application installed—Visio displays a message to that effect. The visible representation of the object in the drawing is not affected, but you cannot edit the object.

---

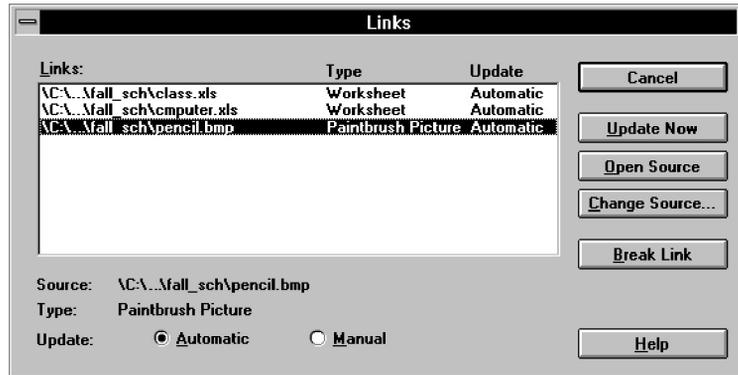
### *Viewing and updating links*

You can view all of the links for a drawing and set a link to be manually or automatically updated. If Visio cannot find the file to update a link, you can change the file reference to the correct file.

### To view the links between a drawing and other files:

1. From the Edit menu, choose Links.

The Links dialog box appears.



### To change a link:

1. In the Links dialog box, choose the link you want to change.
2. If you want Visio to update the link automatically, choose Automatic. If you want to update the link by using the Links command, choose Manual.
3. If you want to change the link, choose Change Source and select a new file reference in the Change Source dialog box.
4. When you finish viewing and changing links, choose OK in the Change Source dialog box, and then choose Close in the Links dialog box.

You can change a link's file reference to any other file of the same format as the original file. For example, you can change the link for a .BMP file to a different .BMP file to display its image in a drawing, or change the link to an Excel spreadsheet to display the same range of cells from a completely different spreadsheet file.

You can update manual or automatic links at any time by using the Links command.

**To update a link manually:**

1. From the Edit menu, choose Links.
2. Choose the link you want to update.
3. Choose Update Now.

---

*Breaking links*

You may want to break the link between an object in a drawing and another file. Perhaps you want to give the drawing to someone without having to provide the linked files with it, or the information in the linked file has stabilized and you don't need to update the object in the drawing any more. You can break a link between an object and a file by canceling the link.

**To break a link between a drawing and another file:**

1. From the Edit menu, choose Links.
2. In the Links dialog box, choose the link you want to break.
3. Choose Break Link.

Visio converts the object to a Windows Metafile in the drawing and discards the reference to its original file.

You can also break a link between an object and its original file by converting the object to a Visio group. For details, see “Converting objects to Visio shapes” later in this chapter.

---

*Exchanging information with Lotus Notes*

Visio supports a two-way exchange of information between Visio and Lotus Notes. With Lotus Notes/FX, you can use fields in drawings to manage information such as shape details, shape measurements, and date of creation. For example, you can create a

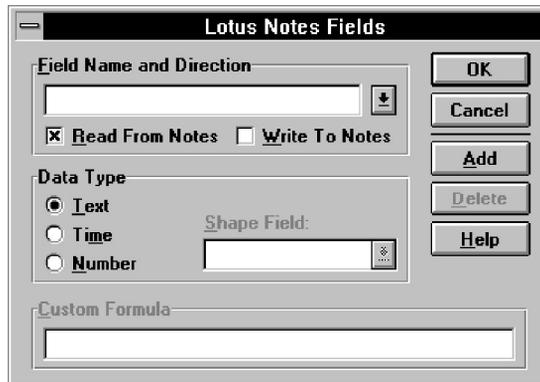
date field in Lotus Notes that automatically updates a Visio timeline. Or, you can enter information into the Summary Info dialog box for a drawing file and read it in Lotus Notes.

- ❖ In Visio's SmartSuite menu set, the name of the dialog box is Doc Info.

For more information about fields, see “Using fields” in Chapter 4, “Adding text to drawings,” or see your Lotus Notes documentation.

### To create a field for exchanging information with Lotus Notes:

1. From the File menu, choose Lotus Notes Fields.



2. In the Field Name And Direction box, type a name for the field.
3. To read information from Lotus Notes, check Read From Notes. To write information to Lotus Notes, check Write To Notes.
4. Choose the type of data you want to exchange: Text, Time, or Number.
5. To create a new field that exchanges information between Visio and Lotus Notes, choose Add.

To update information in an existing field, choose Change.

## Importing and exporting

If the application you want to exchange information with doesn't support copying and pasting or embedding and linking, Visio also supports importing and exporting.

Importing brings a file in another format into a Visio drawing. Visio creates a placeholder in your drawing to hold the imported information. The way Visio imports a file depends on what kind of file it is:

- If the file is in Windows bitmap (.BMP), device-independent bitmap (.DIB), or metafile (.WMF) format, Visio pastes the contents of the file into the drawing.
- Otherwise, Visio uses an *import filter* to convert the contents of the file from its original format into a metafile.

Exporting a Visio drawing converts it into another file format so that another application can use it. To export a drawing to any format except a Windows Metafile, Visio must have an *export filter* to convert the drawing to the desired format.

**Tip:** If you want the entire contents of a file in your drawing, importing can be faster than copying the contents of the file and pasting it from the Clipboard.

An import filter converts a file into a format that Visio can use. This is an Aldus FreeHand drawing imported into Visio.

| Class Number | Days/Time of Class       | Location      |
|--------------|--------------------------|---------------|
| CS101        | Monday, May 12 - June 18 | East Building |
| CS102        | Monday, May 12 - June 18 | East Building |
| CS103        | Monday, May 12 - June 18 | East Building |
| CS104        | Monday, May 12 - June 18 | East Building |
| CS105        | Monday, May 12 - June 18 | East Building |
| CS106        | Monday, May 12 - June 18 | East Building |
| CS107        | Monday, May 12 - June 18 | East Building |
| CS108        | Monday, May 12 - June 18 | East Building |
| CS109        | Monday, May 12 - June 18 | East Building |
| CS110        | Monday, May 12 - June 18 | East Building |
| CS111        | Monday, May 12 - June 18 | East Building |
| CS112        | Monday, May 12 - June 18 | East Building |
| CS113        | Monday, May 12 - June 18 | East Building |
| CS114        | Monday, May 12 - June 18 | East Building |
| CS115        | Monday, May 12 - June 18 | East Building |
| CS116        | Monday, May 12 - June 18 | East Building |
| CS117        | Monday, May 12 - June 18 | East Building |
| CS118        | Monday, May 12 - June 18 | East Building |
| CS119        | Monday, May 12 - June 18 | East Building |
| CS120        | Monday, May 12 - June 18 | East Building |
| CS121        | Monday, May 12 - June 18 | East Building |
| CS122        | Monday, May 12 - June 18 | East Building |

An export filter converts a Visio drawing into a format that another application can use.

---

### Importing files in other formats into Visio drawings

You can import an entire file into a Visio drawing. Visio can import files in any of these formats:

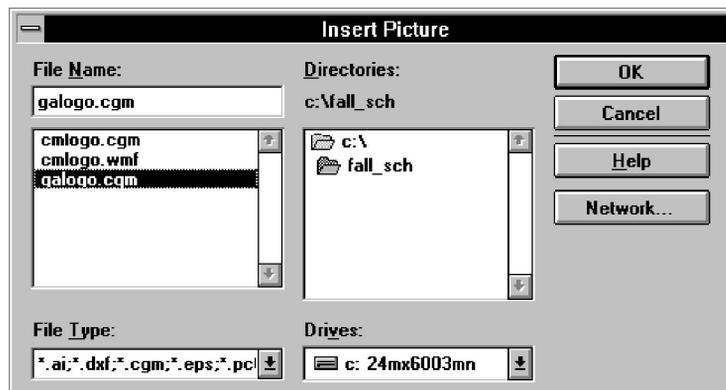
- Adobe Illustrator (.AI)
- AutoCAD Drawing Interchange Format (.DXF)
- Computer Graphics Metafile (.CGM)
- Encapsulated PostScript File (.EPS)
- Macintosh PICT Format (.PCT)
- Tag Image File Format (.TIF)
- Windows bitmap (.BMP or .DIB)
- Windows Metafile (.WMF)
- ZSoft PC Paintbrush Bitmap (.PCX)

When you import a file, its contents appear in the center of the view. You can select and move the object just like any other Visio shape.

#### To import a file into a Visio drawing:

1. From the Page menu, choose Insert Picture.

The Insert Picture dialog box appears. The import filters installed with Visio determine the types of files you can import.



2. In the File Type list, choose the format you want.

Visio lists the files in that format. If the file you want is not in the list, change to the drive and directory that contains the file.

3. From the File Name list, choose the file you want.
4. Choose OK.

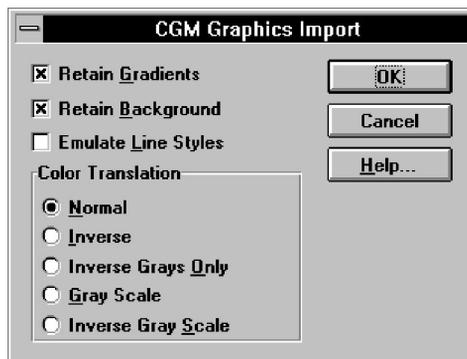
Depending on the type of file you are importing, Visio may ask you to choose options that affect the file's appearance. For details, see "Specifying graphic import options" next in this chapter.

When you finish choosing import options, Visio imports the file into the drawing.

---

### *Specifying graphic import options*

For files imported with an import filter, you can control aspects of the way an imported file is displayed in the drawing. When you import such a file, Visio displays the Graphics Import dialog box.



The following table summarizes graphic import options.

| <b>Option</b>       | <b>Description</b>   |
|---------------------|--|
| Retain Gradients    | Retains gradient fills.  |
| Retain Background   | Retains the background specified in the original application by creating a rectangle of that color.  |
| Emulate Line Styles | Draws thick or patterned lines as polygons to more closely represent the way they appear in the image, rather than using the line style and width capabilities of the display or printer driver. |
| Normal              | Uses colors exactly as specified in the image file.  |
| Inverse             | Inverts all colors. For example, black becomes white and white becomes black, to create the effect of a photographic negative.   |
| Inverse Grays Only  | Inverts only black, white, and grays; all other colors retain their original color. This is useful for accentuating shading or patterns.   |
| Gray Scale          | Converts all colors to shades of gray.   |
| Inverse Gray Scale  | Converts all colors to shades of gray and then inverts them to create the effect of a black-and-white photographic negative.   |

---

### *Exporting a Visio drawing into another file format*

You can export a Visio drawing into any of these file formats:

- Adobe Illustrator (.AI)
- AutoCAD Drawing Interchange Format (.DXF)
- Computer Graphics Metafile (.CGM)
- Encapsulated PostScript File (.EPS)
- Macintosh PICT Format (.PCT)
- Tag Image File Format (.TIF)
- Windows bitmap (.BMP or .DIB)
- Windows Metafile (.WMF)
- ZSoft PC Paintbrush Bitmap (.PCX)

You can export any selected shape or shapes from a Visio drawing into another document. If no shapes are selected, Visio exports a rectangular area just large enough to hold all the shapes on the current page, but you can define a larger area to export. For details, see “Embedding or linking a drawing” earlier in this chapter.

#### **To export shapes or a drawing to another file format:**

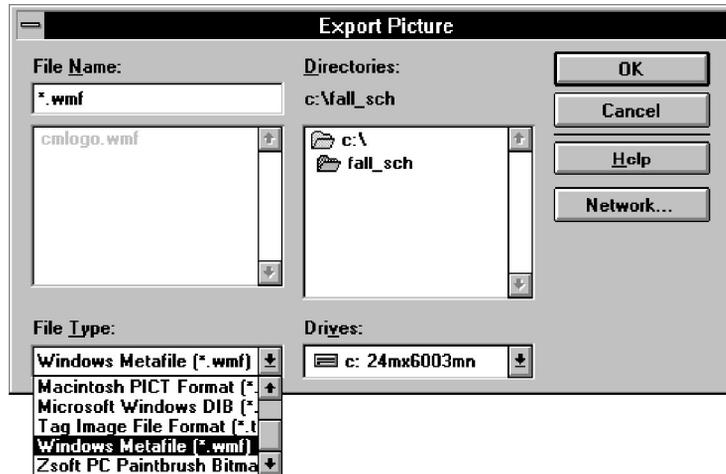
1. Select the shapes you want to export.

If no shapes are selected, Visio exports a rectangular area large enough to hold all the shapes on the current page.

2. From the Page menu, choose Export Picture.

The Export Picture dialog box appears.

3. In the File Type list, choose the format you want.



4. In the File Name box, type a filename for the exported file.
5. Choose OK.

Visio exports the drawing to the file in the format you chose. You can use the file in any application that can read files in that format.

You can use Visio to convert a file from one format to another by importing the file into Visio and then exporting it to the format you want. For details about importing files, see “Importing files in other formats into Visio drawings” earlier in this chapter.

---

### *Modifying an object from another application in a Visio drawing*

Although you can't do everything to an object from another application that you can to a Visio shape, you can do quite a few things to make the object look the way you want. You can:

- Size the object.
- Crop or expand the object's borders without altering its appearance.

- Reposition the object within its borders.
- Apply styles or formats for the object's line and fill.
- Edit a linked or embedded object using the application in which the object was created.
- Convert most objects to another file format.
- Convert most objects to Visio shapes.

---

### *Scaling, cropping, and panning an object from another application*

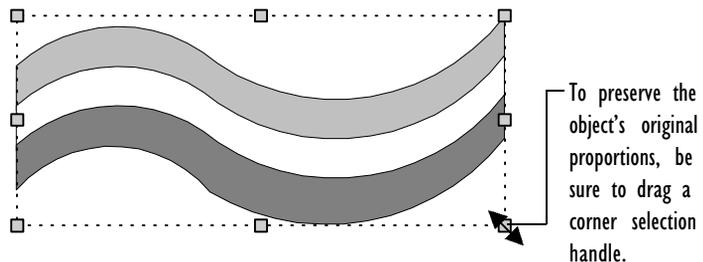
After you paste an OLE object into a Visio drawing, you'll probably want to adjust its appearance. You may want to make the object larger or smaller, or you may want to see only part of it. When you paste an object into a Visio drawing, the object initially is the same size as in its original application. To adjust the object, you can:

- *Size* the object to change its dimensions.
- *Crop* the object to shrink or expand its borders without sizing it.
- *Pan* the object to move it within its borders.

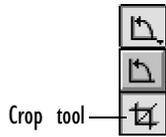
#### **To size an object from another application:**

1. With the pointer tool, select the object.
2. Drag a selection handle until the object is the size you want.

Drag a corner handle to size the object proportionally. Drag a side handle to stretch or shrink the object vertically or horizontally.

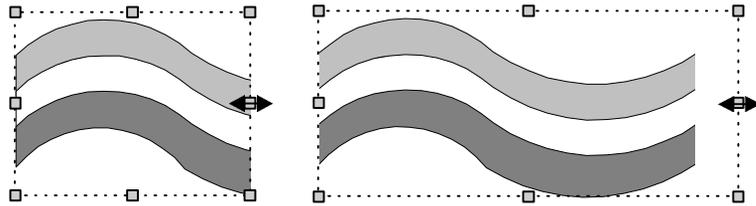


### To crop an object from another application:



1. From the supplemental tool menu, choose the crop tool.
2. Select the object.
3. Drag a selection handle until the object's borders are the size you want.

Visio retains the entire object so you can crop it differently if you want.



Drag a selection handle with the crop tool to shrink an object's borders without shrinking or stretching the object.

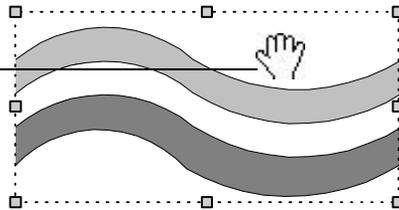
You can expand an object's borders to create empty space around the object.

Although you don't see the cropped parts of an object, they're still present in your drawing and can occupy valuable memory when you print. For more efficient printing, try to paste objects at the size you want, rather than cropping large areas of the object.

### To pan an object from another application:

1. From the toolbar, choose the crop tool.
2. Point inside the object and press the left mouse button.

You can point inside the borders of an object with the crop tool to reposition the object within its borders.



3. Drag until the object is positioned the way you want inside its borders.

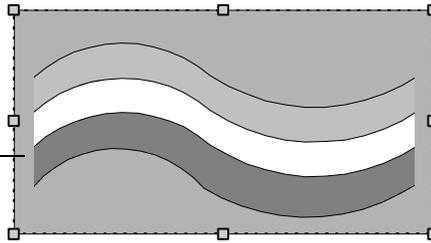
---

### Formatting an object from another application

You can format an object from another application in the following ways:

- You can apply a line style or format to change the appearance of the object's border. For example, you might choose a distinctive outline for embedded or linked objects to indicate that they can be edited from within a drawing.
- You can apply a fill style or format to change the fill color and pattern of the object. In order to see the fill color and pattern of an object, there must be some empty space around the object within its border.

When you apply a fill color and pattern to an object, the color and pattern appear in the space between the object and its borders.



For details about formatting shapes, see “Formatting shapes” in Chapter 3, “Creating shapes.”

---

### Converting objects to other formats

You can convert some embedded objects to other file formats if the application of the embedded object supports the other file format. You can also specify that an object appears as an icon by selecting Display As Icon.

As with an object's representation, the OLE-object application provides a command on the Visio Edit menu especially for converting its objects. Most of the time this command is Convert. Some applications use a different command, or may display a submenu of actions you can perform on that object. Whatever the command is, it usually appears below the Links command on the Visio Edit menu.

**To convert an embedded object to another format:**

1. Selected the embedded object you want to convert.
2. From the Edit menu, choose the command to convert the object.

This command will usually be Convert on the <OLE object> submenu.

---

*Converting objects to Visio shapes*

You can convert a pasted or imported Windows Metafile into a Visio group or shape. If a linked or embedded object is represented by a metafile, you can also convert the object to a Visio group or shape, although doing so breaks the object's link to its original file and its ability to be edited in its original application. You can convert a metafile to a Visio group or shape in two ways:

- To preserve the relationship of the shapes to each other, use the Convert To Group command from the Shape menu to change the metafile into a Visio group.
- To separate the metafile into individual shapes, use the Ungroup command. You don't need to convert the metafile to a group first before ungrouping it.

A metafile may contain a bitmap as a component, or a metafile may consist solely of a bitmap. Bitmaps cannot be converted to Visio shapes. However, a metafile that consists of a single bitmap usually stores the bitmap in segments. When you convert such a metafile to Visio shapes, each segment of the metafile becomes an individual bitmap object, and you will probably want to convert the metafile to a group to keep the bitmaps together.

To modify shapes within a group, use the Open Group command on the Edit menu or double-click the group. For details about editing groups, see "Grouping shapes" in Chapter 3, "Creating shapes."

A metafile stores graphic information in a more compact form than Visio does, so converting a metafile to Visio shapes increases the size of the drawing file. Keep this in mind when considering whether to convert a metafile to Visio shapes. If you don't need to work with the shapes individually, you may want to leave the metafile unconverted.

---

### *Sending a Visio drawing through electronic mail*

You can quickly send a Visio drawing through electronic mail that supports Messaging Application Program Interface (MAPI) or the Common Messaging Call (CMC) protocol.

#### **To send a drawing file by mail:**

1. While the drawing file is open, from the File menu, choose Send.

If your mail application was not previously running, it starts and asks for your password. After you type your password, a mail message containing the Visio icon and the filename appears.

2. Address, type a message, and send the mail message as you would any other message.

#### **To view a Visio file sent by mail:**

1. Open the mail message, then double-click the Visio icon.



# Using ShapeSheets to create SmartShapes

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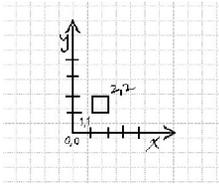
# Using ShapeSheets to create SmartShapes

You've probably noticed that some of the master shapes in the Visio stencils behave differently from the shapes you draw. The behavior of these master shapes is determined by the formulas in the cells of their ShapeSheets. These formulas make the shapes smart.

This chapter gives you an overview of the Visio ShapeSheet and the mechanics of making shapes smart. The book *Developing Visio Shapes* (published by Shapeware) is a detailed guide to creating SmartShapes. For details about the ShapeSheet sections, commands, and formulas, see the Visio online help.

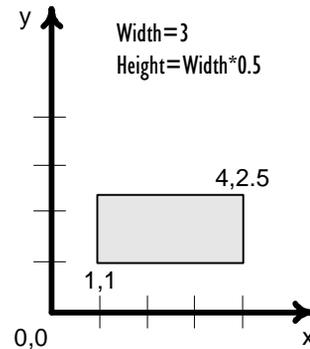
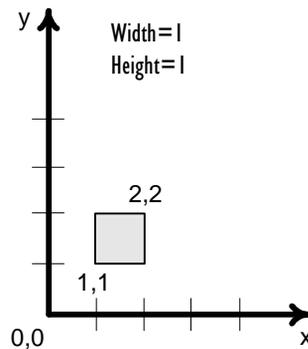
## How shapes become smart

Most drawing programs are based on two-dimensional geometry. When you draw an object, the program records the object as a collection of horizontal and vertical locations. These locations (called *vertices* in Visio) are measured from a point of origin on the page and are connected with line segments, just as if you were drawing the object on a piece of graph paper.



Like any drawing program, Visio records each shape vertex as a set of  $x,y$  coordinates. When you move the shape or change its size, Visio records the changes to the shape's vertices and redraws the shape at its new position or size.

The difference between Visio and other drawing programs is that you can enter formulas in the shape's ShapeSheet to control the location of a vertex. Instead of simply recording a new position when a shape is moved or sized, you can calculate a vertex in relation to other vertices or other shapes, or constrain it to a fixed position on the page.



When you create a formula for a shape, Visio recalculates the shape's vertices on the basis of your formula.

Formulas control not only the locations of a shape's vertices; they can control the position, format, and even the content of a shape's text, or they can change a shape's color or pattern. The ability to program

shapes with formulas opens a wealth of possibilities for making shapes behave in sophisticated ways—in other words, for making shapes smart.

---

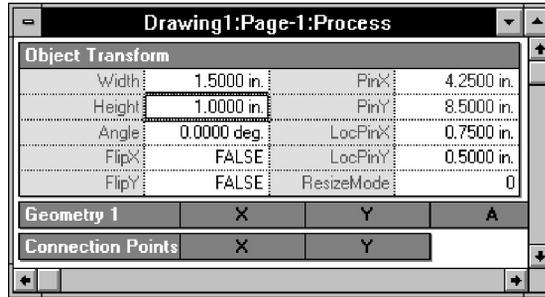
### *The role of ShapeSheets*

Every shape, group, and object from another application has a ShapeSheet. All masters have ShapeSheets. In groups, both the group and each shape or object in the group has its own ShapeSheet. Each guide and guide point also has a ShapeSheet.

Visio uses a ShapeSheet to store information about a shape or other object, such as its dimensions, its angle and center of rotation (its *pin*), and the formatting attributes that determine the shape's appearance. The ShapeSheet also contains information such as the *x*- and *y*-coordinates of each vertex relative to the shape's origin. Visio automatically maintains ShapeSheets and creates new ones as you make changes in your drawing.

Each ShapeSheet is divided into sections that control an aspect of a shape's behavior or appearance, such as its geometry or its formatting. Each section consists of cells that contain formulas. These can be the default formulas created by Visio or formulas you create. A formula might be simple and always evaluate to the same value, or the formula might be built from functions, operators, and other elements that evaluate to different values depending on the circumstances. You change a shape's behavior by editing formulas in cells. Editing formulas provides a way to change a shape with greater precision than is possible in the drawing window. By entering and editing formulas in the ShapeSheet, you can turn ordinary shapes into SmartShapes.

While a shape is selected, you can display its ShapeSheet. You can display a ShapeSheet for more than one shape at a time to compare values or to copy and paste formulas between the ShapeSheets.



The Height formula in the Object Transform section causes Visio to calculate the shape's height as one-half its width.

### Displaying the ShapeSheet

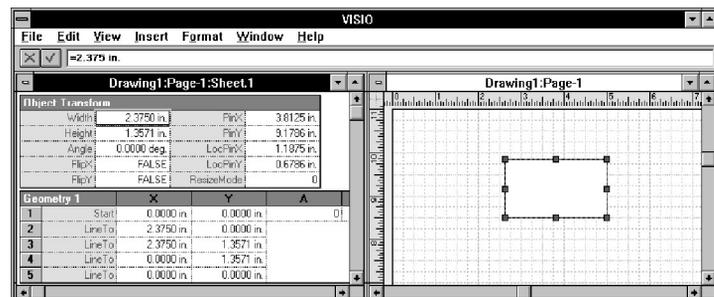
ShapeSheets are displayed in the ShapeSheet window within the Visio main window.

### To display a shape's ShapeSheet:

1. Select the shape.

To select a shape within a group, open the group window and select the shape. To select a master, open the stencil as an original or copy, click the title bar of the stencil window, double-click the master to open the master shape drawing window, and then select the shape.

2. From the Window menu, choose Show ShapeSheet.



The ShapeSheet window

3. If you want, choose Tile from the Window menu to see both the drawing page and the ShapeSheet window.

This allows you to see how changes you make in a shape's ShapeSheet affect that shape.

---

**Tip:** Press Ctrl and choose Tile from the Window menu to tile all open windows horizontally.

---

When the ShapeSheet window is active, the menu bar changes to display menus and commands you use to work in the ShapeSheet. When a ShapeSheet cell is selected, a *formula bar* appears, which you use to enter and edit ShapeSheet formulas.

#### **To close a ShapeSheet window:**

1. From the Control menu, choose Close.

Alternatively, double-click the ShapeSheet window's Control-menu box.

---

#### *Anatomy of a ShapeSheet*

The sections that appear in a ShapeSheet depend on the shape itself and the sections you choose to display. By default, each ShapeSheet has at least one section. For example, shapes and other objects always have at least an Object Transform section; guides and guide points always have a Guide Info section. Visio automatically adds other sections required for the shape or object as it's drawn.

| Object Transform |             |            |            |
|------------------|-------------|------------|------------|
| Width            | 2.0000 in.  | PinX       | 5.7475 in. |
| Height           | 0.5000 in.  | PinY       | 6.7500 in. |
| Angle            | 0.0000 deg. | LocPinX    | 1.0000 in. |
| FlipX            | FALSE       | LocPinY    | 0.2500 in. |
| FlipY            | FALSE       | ResizeMode | 0          |

| Geometry 1 |        | X          | Y          | A |
|------------|--------|------------|------------|---|
| 1          | Start  | 0.0000 in. | 0.0000 in. |   |
| 2          | LineTo | 2.0000 in. | 0.0000 in. |   |
| 3          | LineTo | 2.0000 in. | 0.5000 in. |   |
| 4          | LineTo | 0.0000 in. | 0.5000 in. |   |
| 5          | LineTo | 0.0000 in. | 0.0000 in. |   |

| Connection Points | X | Y |
|-------------------|---|---|
|                   |   |   |

| Protection |
|------------|
|            |

Parts of a ShapeSheet

A ShapeSheet may not have every possible section—for example, a two-dimensional shape doesn't have a 1-D Endpoints section, and only an object from another application has an Image Info section. Guides and guide points have ShapeSheets that contain a Guide Info section and can have only a few additional sections, for example Protection and Scratch. Knowing what information is contained in a shape's ShapeSheet gives you an idea of how you can control the shape with formulas.

Not all ShapeSheet sections refer to a shape's position or size. For example, a cell in the Protection section contains either zero or a non-zero value, depending on whether the aspect of the shape represented by that cell is unlocked or locked. A cell in the Line Format section might contain a number that corresponds to a particular line pattern. Another might contain a measurement indicating the line weight.

A ShapeSheet can contain the following sections:

- **Object Transform**—General positioning information about a shape, such as its width, height, angle and center of rotation (pin), whether the shape has been flipped, and how the shape should behave when resized within a group.

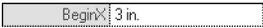
- **Geometry**—The coordinates of the vertices for the lines and arcs that make up the shape. If the shape has multiple paths, the ShapeSheet contains a Geometry section for each.
- **Protection**—The lock settings set with the Protection command, plus a few additional locks that can be set only in the ShapeSheet.
- **Line Format**—The line formatting attributes for the shape, including pattern, weight, and color, the type of line cap, whether the line has an arrowhead at the beginning or end, the arrowhead's size, and the radius of the rounding circle applied to the line.
- **Fill Format**—The fill formatting attributes for the shape and the shape's drop shadow, including pattern, foreground color, and background color.
- **Character Format**—The formatting attributes for the shape's text, including font, color, text style, case, position in relation to the baseline, and point size.
- **Paragraph Format**—The paragraph formatting attributes for the shape's text, including indents, line spacing, and horizontal alignment of paragraphs.
- **Text Block Format**—The alignment and margins of text in the shape's text block.
- **Text Fields**—Custom formulas inserted in the shape's text using the Insert Field command.
- **Text Transform**—Positioning information about the shape's text block, including its width, height, and angle and center of rotation (pin).
- **Scratch**—Work area for entering and testing formulas that other cells refer to.
- **Connection Points**—The coordinates of each connection point defined for the shape.
- **Glue Info**—Information for a connector shape.

- **1-D Endpoints**—The coordinates of the beginning point and ending point of a one dimensional shape.
- **Alignment**—The alignment of a shape relative to the guide to which the shape is glued.
- **Guide Info**—The coordinates of a guide or guide point.
- **Image Info**—The width and height of an object from another application and the distance the object's image is offset within its borders.
- **Controls**—The coordinates of each control handle defined for the shape and how they should behave.
- **Events**—Behavior when the shape is double-clicked or another event such as moving or rotating a shape occurs.
- **Miscellaneous**—Miscellaneous object properties including selection highlighting and visibility.

---

## Working with formulas

If you've used a spreadsheet, you've probably created formulas that calculate new values based on the values in other cells. You've probably used functions such as SUM to add a range of values or SQRT to obtain the square root of a number, and used constants and operators to get the results you want. Visio formulas are similar to typical spreadsheet formulas in many ways:



BeginX: 3 in.



Width: SQRT(2)

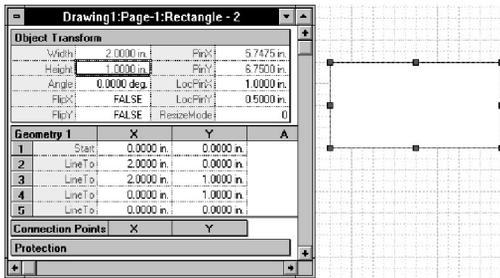
- Like most spreadsheet programs, Visio regards anything in a cell as a formula, even if it's a numeric value or simple cell reference. Every formula begins with an equal sign (=) when it is entered in the formula bar.
- Visio supports standard mathematical and comparison operators as well as a full set of mathematical, trigonometric, statistical, and date and time functions (plus several functions that are unique).

PinX: (BeginX+EndX)/2

- Formulas can contain references to other cells in the ShapeSheet and to cells in other ShapeSheets.

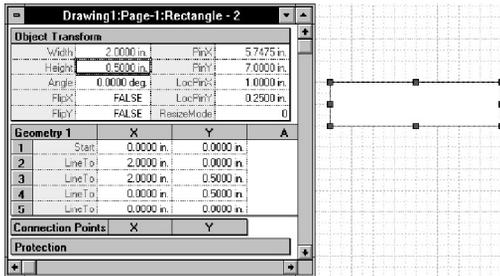
The similarities essentially stop there, however. Here are some of the ways in which ShapeSheets differ from typical spreadsheets:

**Default formulas.** When you create a shape, Visio automatically creates default formulas. To see what the default formulas are, draw a simple shape (such as a rectangle, ellipse, or line) and take a look at its ShapeSheet.



This ShapeSheet contains the default formulas for the rectangle on the right.

**Automatic updates.** Visio automatically updates certain cells whenever you change the shape in a drawing. This means that under some circumstances your formulas can be replaced with formulas from Visio. For example, if you drag a corner handle to resize the shape, Visio resets formulas in the PinX, PinY, Width, and Height cells.



Visio automatically updates the ShapeSheet contents to reflect the shape's new size.

If necessary, you can protect formulas against changes by using the GUARD function. For details about the GUARD function, see the Visio online help.

**Coordinate systems.** Visio uses coordinate systems to refer to positions of vertices in relation to the origin of a shape and to the origin of the group or page that contains the shape. Most formulas for controlling the position and size of a shape are expressed as coordinates.

**Units of measure.** Because many drawings represent physical objects, Visio accepts units of measure in the English and metric systems, and you can specify angles in radians or degrees, or minutes and seconds of arc. You can also use standard typographical measurements such as picas, points, ciceros, and didots. As in spreadsheet formulas, it's important to use the right numbers in a calculation. For example, you shouldn't add angles to lengths.

---

### *The smart arrow: An example*

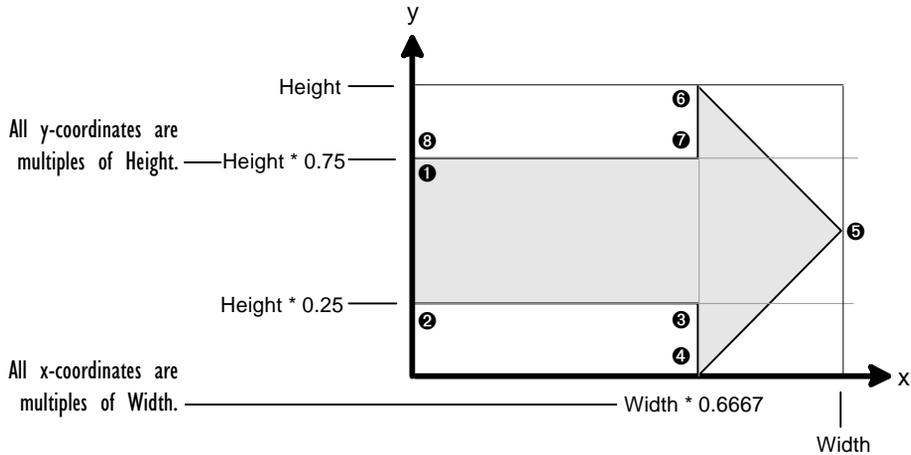
The quickest way to see how formulas can make a shape smart is by looking at an example. Changing a simple arrow shape into a full-powered smart arrow demonstrates how to add intelligence to a shape.

---

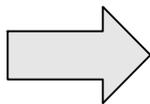
#### *An unschooled arrow*

When you draw a closed arrow with the line tool, Visio creates default formulas in its ShapeSheet. These default formulas cause the arrow shape to scale proportionally when you size it horizontally or vertically.

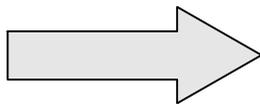
The following illustration shows the formulas Visio creates for the arrow's vertices. Each vertex is calculated as a fraction of width and height, and its formulas are placed in the Geometry section of the ShapeSheet.



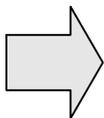
An unschooled arrow and the default formulas for its vertices



Unschooled arrow



Resized width



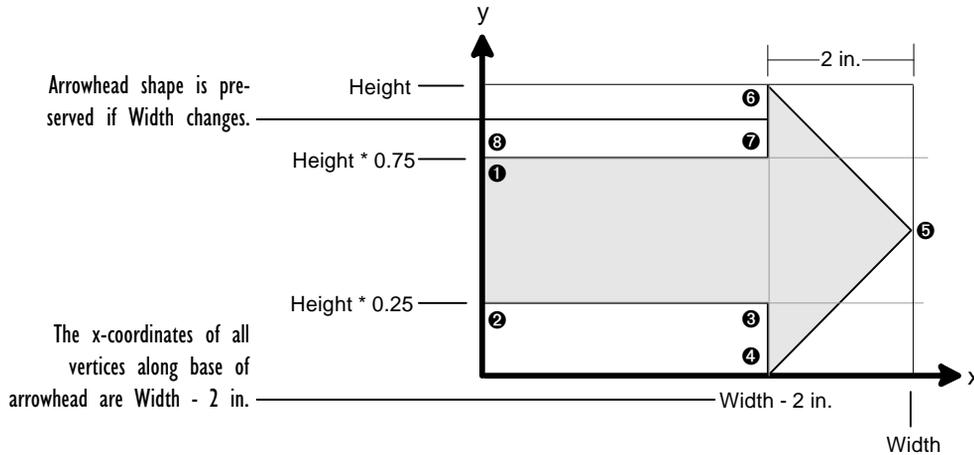
Resized height

| Segment type | X                | Y               |
|--------------|------------------|-----------------|
| ❶ Start      | = Width * 0      | = Height * 0.75 |
| ❷ LineTo     | = Width * 0      | = Height * 0.25 |
| ❸ LineTo     | = Width * 0.6667 | = Height * 0.25 |
| ❹ LineTo     | = Width * 0.6667 | = Height * 0    |
| ❺ LineTo     | = Width * 1      | = Height * 0.5  |
| ❻ LineTo     | = Width * 0.6667 | = Height * 1    |
| ❼ LineTo     | = Width * 0.6667 | = Height * 0.75 |
| ❽ LineTo     | = Geometry1.X1   | = Geometry1.Y1  |

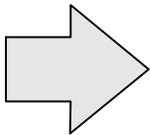
This arrow looks fine until you resize it in one direction; then, because it scales proportionally, the shape of the arrowhead becomes distorted.

### Making the arrow slightly smarter

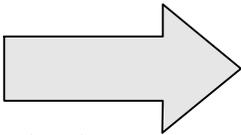
By adjusting formulas in the ShapeSheet, you can make the arrow smart enough to keep its arrowhead at a fixed size, even if the arrow itself is stretched horizontally.



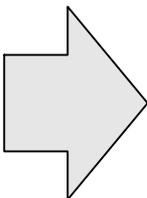
The slightly smarter arrow's formulas keep its arrowhead from stretching horizontally.



Slightly smarter arrow



Resized width



Resized height

| Segment type | X               | Y               |
|--------------|-----------------|-----------------|
| ① Start      | = Width * 0     | = Height * 0.75 |
| ② LineTo     | = Width * 0     | = Height * 0.25 |
| ③ LineTo     | = Width - 2 in. | = Height * 0.25 |
| ④ LineTo     | = Geometry1.X3  | = Height * 0    |
| ⑤ LineTo     | = Width * 1     | = Height * 0.5  |
| ⑥ LineTo     | = Geometry1.X3  | = Height * 1    |
| ⑦ LineTo     | = Geometry1.X3  | = Height * 0.75 |
| ⑧ LineTo     | = Geometry1.X1  | = Geometry1.Y1  |

This can be done by changing the values of the  $x$ -coordinates of points along the base of the arrowhead (vertices 3, 4, 6, and 7) to a fixed distance, such as 2 inches, measured from the right end of the arrow. The formula looks like this:

$$= \text{Width} - 2 \text{ in.}$$

This formula is entered in cell X3 of the Geometry1 section, which determines the  $x$ -coordinate of vertex 3. Rather than repeat this formula in the cells that control the  $x$ -coordinates of the other base vertices, it's more efficient to enter a formula that refers to the value of cell X3. This also allows more flexibility for adjusting the arrow's behavior later, because you can change the formula in one cell instead of several.

Now the arrow can be stretched to any width and its arrowhead always remains the same length: 2 inches measured from the right end of the arrow.

That takes care of when the arrow becomes wider. However, the arrowhead still distorts when the height of the arrow changes.

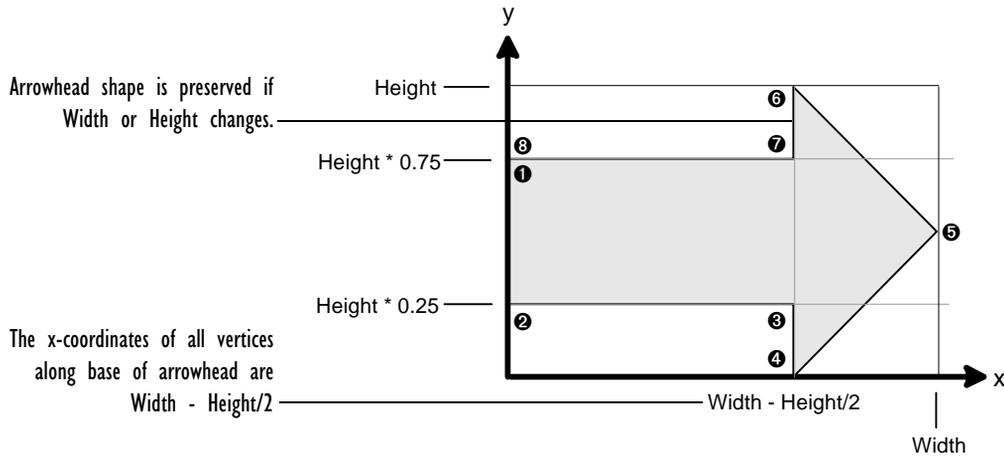
---

#### *Making the arrow even smarter*

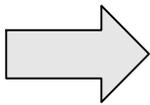
To prevent the arrowhead from distorting when the height of the arrow changes, replace the formula in cell X3 with a slightly different formula—one that calculates the location of the arrowhead's base as a fraction of its height:

$$= \text{Width} - \text{Height}/2$$

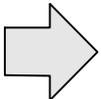
This formula gives the arrowhead a constant 90-degree tip. Because the  $x$ -coordinates of the other vertices along the base already refer to this cell, no other formulas need to be changed.



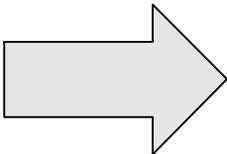
The smarter arrow's formulas keep its arrowhead from stretching horizontally or vertically.



Smarter arrow



Resized width



Resized height

| Segment type | X                  | Y               |
|--------------|--------------------|-----------------|
| ① Start      | = Width * 0        | = Height * 0.75 |
| ② LineTo     | = Width * 0        | = Height * 0.25 |
| ③ LineTo     | = Width - Height/2 | = Height * 0.25 |
| ④ LineTo     | = Geometry1.X3     | = Height * 0    |
| ⑤ LineTo     | = Width * 1        | = Height * 0.5  |
| ⑥ LineTo     | = Geometry1.X3     | = Height * 1    |
| ⑦ LineTo     | = Geometry1.X3     | = Height * 0.75 |
| ⑧ LineTo     | = Geometry1.X1     | = Geometry1.Y1  |

---

### *A sophisticated arrow*

You can create a sophisticated arrow that can easily be customized for different situations by adding a Scratch section to the ShapeSheet. You enter values in the Scratch section and refer to them in cells in the Geometry section. The cells affect how close the arrow's ends come to the selection rectangle, and the relative shapes of the arrow shaft and the arrowhead. In addition, the arrow is designed so that its base won't appear behind its beginning—in other words, the arrow can't be turned inside out by shrinking its width too much. This is accomplished by defining the formula for locating the base of the arrowhead on the arrow shaft as follows:

$$= \text{Width} - \text{MIN}(\text{Geometry1.X1} + \text{Height} * \text{Scratch.B1}, \text{Width}/2)$$

This formula ensures that the arrowhead base never moves past the middle of the arrow.

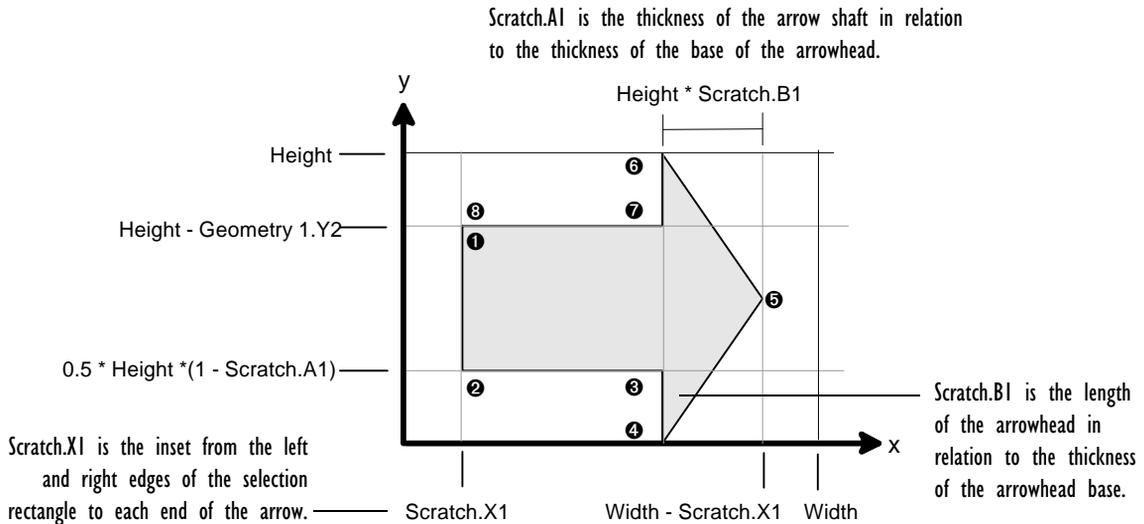
These Scratch cells affect the arrow's behavior in the following ways:

**Scratch.X1.** A value that the ends of the arrow are offset from the arrow's selection rectangle. This is useful for block diagrams in which you want to preserve a uniform distance between the boxes and arrows.

**Scratch.A1.** A value between 0 and 1 that represents the arrow shaft's thickness relative to the thickness of the arrowhead's base (the value in the Height cell). The higher the value of Scratch.A1, the thicker the shaft becomes in relation to the arrowhead's base. For example, if the value of this cell is 0.5, the shaft of the arrow is one half the thickness of the base of the arrowhead.

**Scratch.B1.** A value greater than 0 (and generally no more than 2) that represents the length of the arrowhead relative to the thickness of the arrowhead's base. The higher the value, the sharper the arrowhead's point becomes.

| Segment type | X  | Y   |
|--------------|--|---|
| ① Start      | = Scratch.X1   | = Height - Geometry1.Y2                           |
| ② LineTo     | = Geometry1.X1   | = $0.5 * \text{Height} * (1 - \text{Scratch.A1})$ |
| ③ LineTo     | = $\text{Width} - \text{MIN}(\text{Geometry1.X1} + \text{Height} * \text{Scratch.B1}, \text{Width}/2)$ | = Geometry1.Y2                                    |
| ④ LineTo     | = Geometry1.X3   | = Height * 0                                      |
| ⑤ LineTo     | = Width - Geometry1.X1   | = Height * 0.5                                    |
| ⑥ LineTo     | = Geometry1.X3   | = Height * 1                                      |
| ⑦ LineTo     | = Geometry1.X3   | = Geometry1.Y1                                    |
| ⑧ LineTo     | = Geometry1.X1   | = Geometry1.Y1                                    |



A sophisticated arrow can be customized by adding values to its Scratch cells.

**Tip:** You can add even more flexibility and control to the arrow by adding control handles to it. For an example, see the Flexi-Arrow shape on the Practice stencil.

---

## Working within the ShapeSheet

This section discusses techniques you can use to work efficiently in the ShapeSheet. It describes how to move around the ShapeSheet, change the display, and modify the structure of the ShapeSheet.

---

**Tip:** If you don't see ShapeSheet commands on the Edit, View, or Insert menu, make sure the ShapeSheet window is active.

---

### Moving around the ShapeSheet

To move from cell to cell in the ShapeSheet, use the arrow and Tab keys. You can also just click a cell to activate it, or scroll the ShapeSheet without changing the active cell.

---

| To                              | Do this                               |
|---------------------------------|---------------------------------------|
| Activate a cell                 | Click the cell with the mouse pointer |
| Select a numbered row of cells  | Click the row number                  |
| Move left one cell              | Press the Left Arrow key or Shift+Tab |
| Move right one cell             | Press the Right Arrow key or Tab      |
| Move up one cell                | Press the Up Arrow key                |
| Move down one cell              | Press the Down Arrow key              |
| Move to the last cell in a row  | Press End                             |
| Move to the first cell in a row | Press Home                            |
| Scroll down one screen          | Press the Page Down key               |
| Scroll up one screen            | Press the Page Up key                 |

*continued*

| <b>To</b>                                     | <b>Do this</b>       |
|---|----------------------|
| Scroll right one screen                       | Press Ctrl+Page Down |
| Scroll left one screen                        | Press Ctrl+Page Up   |
| Scroll to the ShapeSheet's lower-right corner | Press Ctrl+End       |
| Scroll to the upper-left corner               | Press Ctrl+Home      |

---

### *Displaying values or formulas in cells*

Sometimes it's helpful to display formulas in the cells of a ShapeSheet to see how the formulas relate to each other. You can display formulas or values in cells. A *value* is the result you get when Visio calculates a cell's formula.

#### **To display formulas in cells:**

1. From the View menu, choose Formulas.

Visio displays formulas in cells, widening the cells if necessary. Some long formulas, however, may be truncated.

#### **To display values in cells:**

1. From the View menu, choose Values.

Visio displays values in cells, shrinking the cells to their default size.

---

### *Showing, hiding, adding, and deleting sections*

You can change the display of sections to best suit your task. You can collapse and expand sections, hide and show them, add new ones, and delete those you don't need.

If you hide the cells in a section but leave the section heading visible, you can expand the section to see its cells again.

**To collapse or expand a section:**

1. Point to the section title.

If the mouse pointer changes to a minus sign, you can collapse the section.

If the mouse pointer changes to a plus sign, you can expand the section.

2. Click the section title.

Visio changes the display to either hide or show the section's cells.

To completely hide sections you don't need or to show sections you do need, use the Sections command on the View menu.

**To show or hide sections:**

1. From the View menu, choose Sections.

The Sections dialog box appears.

2. Check the sections you want to show, or uncheck the sections you want to hide.

If a section is dimmed in the dialog box, it is not available for the selected shape. For example, Image Info is available only for objects from other applications.

3. Choose OK.

Visio adjusts the display of the ShapeSheet to either hide or show the selected sections.

By adding new sections to the ShapeSheet, you can add new characteristics to the shape. For example, you can add a Connection Points section so you can specify the coordinates of the shape's connection points. When you no longer need a section, you can delete it.

**To add a section:**

1. From the Insert menu, choose Section.

The Insert Section dialog box appears.

2. Choose the sections you want to add.

If a section is dimmed in the dialog box, it is already included in the ShapeSheet or is not available for the selected shape or object.

3. Choose OK.

Visio adds the section to the ShapeSheet.

If you use the Section command to add a section to the ShapeSheet, but you don't see the new section in the ShapeSheet window, use the Sections command to make sure the section is set to display.

You can delete sections from a ShapeSheet by using the Delete Section command. You must first select a cell in the section before you can delete it.

**To delete a section:**

1. Select a cell in the section you want to delete.
2. From the Edit menu, choose Delete Section.

Visio deletes the section from the ShapeSheet.

There are certain sections that cannot be deleted. For example, you cannot delete an Object Transform section because it specifies a shape's position. If you cannot delete a section, Delete Section is dimmed on the menu.

---

*Adding and removing rows*

You can add rows to ShapeSheet sections to hold additional formulas. You might insert a row in the Geometry section to add a new segment to the shape, add a row to the Connection Points section to

define a new connection point, or insert a row in the Scratch section to make more room for storing parameters used in the formulas of several cells. Similarly, you can remove rows you no longer need.

**To add a new row before an existing row:**

1. Select a cell in the row in the position where you want to add the new row.
2. From the Insert menu, choose Row.

Visio inserts the new row above the row you selected.

**To add a new row after an existing row:**

1. Select a cell in the row that's one row above the position where you want the new row.
2. From the Insert menu, choose Row After.

Visio inserts the new row below the row you selected.

**To delete a row:**

1. Select a cell in the row you want to delete.
2. From the Edit menu, choose Delete Row.

Visio removes the selected row and moves any following rows up by one row in the section.

---

## *Entering and editing formulas in a ShapeSheet*

By editing a cell's formula, you change how the value of the cell is calculated and, therefore, change a particular behavior of the shape.

A formula always starts with an equal sign. You don't have to type the equal sign; Visio inserts it. What follows may be as simple as a single-digit number. For example  $= 6$  is a valid formula that always

evaluates to the number 6. On the other hand, what follows the equal sign can be considerably more sophisticated. For example, you can create a formula that changes a shape's default proportional scaling so that when a shape is scaled, specific vertices remain offset a fixed amount from the left of the shape.

The formula in a cell can be the Visio default formula, one that you enter in the cell, or one that is inherited from a master shape.

A formula can contain these elements:

| <b>Element</b>            | <b>Description</b>  |
|---------------------------|---|
| Numbers                   | Used in formulas to specify a wide range of values, for example, measurements, angles, styles, and colors. A number can include a plus or a minus sign and can be entered in exponential notation (for example, 1.2E-6) or as a fraction (for example, 5 9/16). |
| Units of measure          | Used after a number to specify the unit of measure that the number represents. If you don't specify a unit of measure, Visio uses default units of measure in cells that require a unit of measure.   |
| Cell references           | Used in formulas to calculate the value of one cell based on the value of another cell.   |
| Functions                 | The mathematical, trigonometric, logical, date and time, statistical, and miscellaneous functions in Visio that are used for a variety of purposes in formulas.   |
| Operators and parentheses | Used to create mathematical expressions in formulas.  |
| Special terms             | Used to refer to page properties and text in formulas.  |

## Typing formulas

You can type formulas in the formula bar, much as you do in a spreadsheet program.

### To type a new formula for a cell:

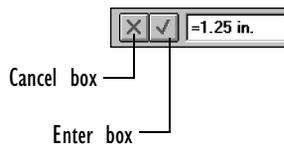
1. In the ShapeSheet, click the cell to select it.

The cell's formula appears in the formula bar.

2. Type the formula.

The formula you type replaces the cell's previous formula.

If you type a number but don't supply units of measure, Visio uses the units from the cell's previous value (if there was one). Otherwise, Visio uses the default units of measure for the cell.



3. To accept the formula, click the Enter box in the formula bar or press Enter.

To cancel your changes, click the Cancel box in the formula bar or press Esc.

If the number or formula contains an error, Visio displays a message and highlights the error in the formula bar. Correct the error, and then click the Enter box or press Enter to accept the correction.

If you don't want to replace an entire formula, you can select and edit the part you want to change.

### To edit a selected part of a formula:

1. In the ShapeSheet, select the cell you want.
2. In the formula bar, edit the formula using the following techniques.

| <b>To</b>                         | <b>Do this</b>   |
|-----------------------------------|--|
| Place the insertion point         | Click where you want the insertion point to appear     |
| Move the insertion point          | Press the Left or Right Arrow key                      |
| Delete the character to the left  | Press Backspace  |
| Delete the character to the right | Press Delete   |
| Select text                       | Drag the mouse over the text                           |
| Extend the selection to the left  | Press Shift+Left Arrow                                 |
| Extend the selection to the right | Press Shift+Right Arrow                                |
| Select a word                     | Press Ctrl+Shift+Right Arrow or double-click the word  |
| Select to the end                 | Press Shift+End  |
| Select to the beginning           | Press Shift+Home                                       |
| Replace selected text             | Type the new text                                      |
| Delete selected text              | Press Delete or choose Cut or Clear from the Edit menu |

---

### *Building a formula by pasting*

You can build formulas by typing, but Visio also has commands for pasting cell names and functions into a formula.

#### **To paste a cell name into a formula:**

1. In the formula bar, place the insertion point where you want to paste the name.

Until you place the insertion point, the Name command is unavailable.

2. From the Insert menu, choose Name.

The Insert Name dialog box appears.

3. Choose the name you want from the list.
4. When the formula is finished, click the Enter box in the formula bar to accept the formula. Click the Cancel box to cancel your changes.

Alternatively, you can paste the name of a cell into a formula by placing the insertion point in the formula bar, then clicking the cell you want. Visio inserts the name of the cell at the insertion point.

### **To paste a function into a formula:**

1. In the formula bar, place the insertion point where you want to paste the function.

Until you place the insertion point, the Function command is unavailable.

2. From the Insert menu, choose Function.

The Insert Function dialog box appears.

3. Choose the function you want from the list.
4. If you want Visio to include the syntax for the function's arguments, check Insert Arguments.
5. Choose OK.
6. Supply the arguments for the function by typing them, by clicking cells in the ShapeSheet, or by using the Name command.
7. When the formula is finished, click the Enter box in the formula bar to accept the formula. Click the Cancel box to cancel your changes.

---

### *Copying and pasting formulas between cells*

Often the formula you want is similar to a formula in another cell, either in the same ShapeSheet or another ShapeSheet. Rather than retype the formula, you can save time by copying and pasting it into a cell, and then editing the formula as needed.

**To copy and paste a formula:**

1. Select the cell that contains the formula you want to copy.
2. In the formula bar, select the formula.
3. From the Edit menu, choose Copy.

Visio copies the formula to the Clipboard.

4. Cancel the activation of the source cell by clicking the Cancel box or pressing Esc.

If you don't cancel the source cell, the cell reference of the next cell you click will be added to the source cell's formula.

5. Select the cell where you want to paste the formula.
6. In the formula bar, select the formula.
7. From the Edit menu, choose Paste.

Visio pastes the formula into the formula bar.

8. Click the Enter box or press Enter to accept the formula.

To discard the formula, click the Cancel box or press Esc.

---

*Working with local and inherited formulas*

Each cell in a ShapeSheet can be defined with a local formula, or it can inherit its formula from the shape's master or style. Visio uses color in the ShapeSheet to indicate whether a cell's formula is local: local formulas are blue and inherited formulas are black.

In general, you should use inherited formulas. You should be aware that some Visio commands cause cells to gain or lose local formulas and that there are different ways to protect a cell's formula.

Visio uses inherited formulas whenever possible. This means that an instance uses the formulas in its master rather than making local copies of them. Using inherited formulas requires less memory and results in uniform behavior. If you add local overrides—for example, if you format an instance of a master shape—you are adding local formulas to the shape. After you add a local override, changing the master no longer changes the local value for the overridden cell—the value comes from the local formula instead.

To delete a local formula and use an inherited one, enter an “empty” formula in the cell.

**To enter an “empty” formula:**

1. Select the cell.
2. In the formula bar, delete the formula’s text.
3. Press Enter.

Try this with a newly created Scratch cell after inserting a local formula. It reverts to No Formula, because there’s no formula to inherit from the master. If No Formula is displayed in a cell other than a Scratch cell, you’ve probably made a mistake—choose Undo from the Edit menu to restore the previous formula.

An easy way to delete all local formulas in a format section (line, fill, text, character, or paragraph) is to apply an appropriate style to the shape. Applying a style deletes all local formulas in the related cells unless the Preserve Local Formatting option is checked in the Styles dialog box when the style is applied.



# 9

Writing programs to control Visio

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# Writing programs to control Visio

In earlier chapters you learned how to control Visio by using Visio menus and commands. This chapter introduces you to controlling Visio by writing programs.

This chapter provides only an overview of what you must know to write programs that control Visio. The book *Programming Visio* (published by Shapeware) is a detailed guide to creating these programs. For a list of terms you can use in writing programs for Visio, see the Visio online help.

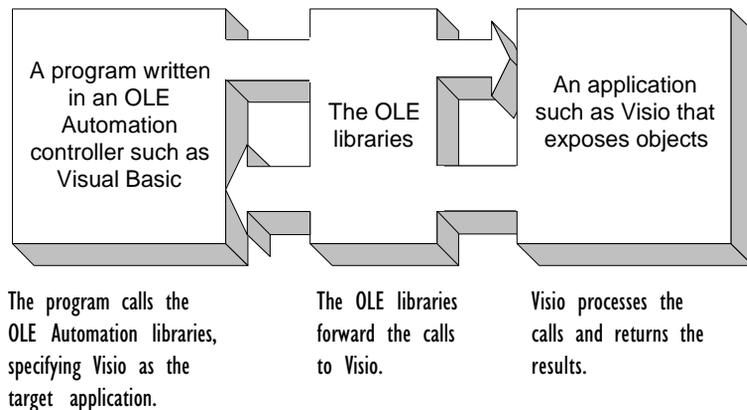
To understand this chapter, you should be familiar with basic programming terms and concepts.

---

## How programs work

You can write programs that are external and independent of Visio to create and control shapes in Visio. To write these programs, you use an OLE Automation controller such as Visual Basic 3.0 (or another programming language that supports OLE Automation).

The OLE Automation controller interacts with applications through the OLE 2.0 libraries. These libraries are installed on your system when you install either Visual Basic or Visio. The following illustration shows how a Visual Basic program and Visio interact through OLE Automation.



The program you write can control the drawing and diagramming capabilities of Visio. For example, it can automate simple repetitive tasks like:

- Printing all the master shapes on a particular stencil.
- Creating a floating list to turn pages.
- Generating an organization chart from a list of names and positions.

Programs can also incorporate Visio into a larger custom solution.

For more information about OLE Automation, see the *Object Linking and Embedding Programmer's Reference*, published by Microsoft Press.

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## Writing programs

Visio provides objects, methods, and properties so that programs can communicate with it:

- *Objects* represent the documents, drawing pages, styles, and shapes you work with in Visio.
- *Methods* are actions associated with objects. For example, in a program you can employ a method that opens documents. This method is equivalent to opening a document using the Open command on the File menu in Visio.
- *Properties* are attributes that affect the appearance or behavior of objects. For example, a document or page object has a Name property, which represents the name of the object.

For information about the objects, methods, and properties provided by Visio, see the Visio online help.

Writing a program to control Visio is similar to creating any computer program.

### **To write a program to control Visio:**

1. Describe what you want to do in statements called pseudo code. For an example, see “A sample program” later in this chapter.  
  
Alternatively, illustrate the process by drawing a flowchart using Visio.
2. Use Visual Basic 3.0 (or another programming tool that supports OLE Automation) to write code representing what you want to do.
3. Compile the code into an executable program.
4. If you plan to run the program as an add-on in Visio, save the compiled program in the Visio Add-ons directory.

Alternatively, save the executable file in the appropriate location for your program application.

---

## Running programs

There are several ways to run programs.

You can run a program from a program icon, just as you run other Windows programs. First create a program, and then create an icon and add it to the Visio program group (or the group of your choice).

### **To run a program from a Windows icon:**

1. Open the Windows program group containing the icon.
2. Double-click the icon representing the program.

From within Visio, you can run an add-on from the File or Tools menu. (If the drawing window is active, you run the add-on from the Tools menu; otherwise, you run it from the File menu.)

### **To run a program from Visio's File or Tools menu:**

1. From the menu, choose Run Add-On.
2. In the Run Add-On dialog box, choose the name of the add-on you want to run, and then choose OK.

You can automate the process of running a program by associating it with a particular shape in a drawing.

### **To associate a program with a shape and run the program:**

1. Select the shape.
2. From the Format menu, choose Double-Click.
  - ❖ In Visio's SmartSuite menu set, choose Double-Click from the Style menu.
3. In the Double-Click dialog box, choose the Run Add-On option.
4. From the list of add-on programs, choose the one you want to run.

5. Choose OK.
6. Double-click the shape to run the program.

---

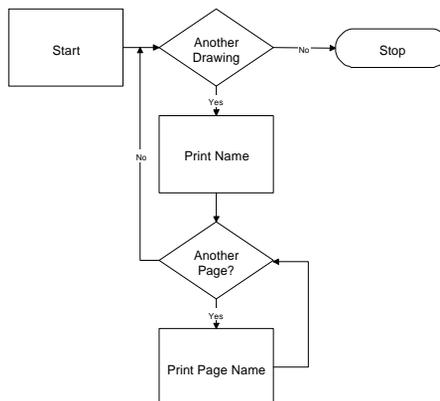
### *A sample program*

This section illustrates a program that examines the open drawings in Visio and then prints the name of each drawing, followed by the names of the pages in the drawing.

In pseudo code, the program does the following:

1. Finds a drawing that is open in Visio.
2. Prints the name of the drawing.
3. Prints the name of each page in the drawing.
4. Repeat steps 1 through 3 until there are no more open drawings.

In a flowchart, these steps look like:



The following table shows the Visual Basic program that implements this pseudo code.

| <b>This Visual Basic code</b>                 | <b>Does this</b>       |
|---|------------------------|
| Sub ShowNames ()                              |                        |
| Dim iDoc As Integer, iPag As Integer          | Variable declarations  |
| Dim appVisio As Object                        |                        |
| Dim pagObj As Object, docObj As Object        |                        |
| Dim docsObj As Object                         |                        |
| Set appVisio = GetObject("visio.application") |                        |
| Set docsObj = appVisio.Documents              | Gets all open drawings |
| For iDoc = 1 To docsObj.Count                 |                        |
| Set docObj = docsObj(iDoc)                    | Gets one drawing       |
| Printer.Print docObj.Name                     | Prints its name        |
| For iPag = 1 To docObj.Pages.Count            |                        |
| Set pagObj = docObj.Pages(iPag)               | Gets a page            |
| Printer.Print Tab(5); pagObj.Name             | Prints its name        |
| Next iPag                                     |                        |
| Next iDoc                                     |                        |
| Printer.EndDoc                                |                        |
| End Sub                                       |                        |

The following table illustrates the sample output.

| <b>Sample output</b>    | <b>Description</b>             |
|-------------------------|--------------------------------|
| c:\drawings\pages.vsd   | The name of the first drawing  |
| Background-1            | The name of page 1             |
| Background-2            | The name of page 2             |
| c:\drawings\recycle.vsd | The name of the second drawing |
| Page-1                  | The name of page 1             |
| Page-2                  | The name of page 2             |
| Page-3                  | The name of page 3             |



A

Appendixes, Glossary, and Index

# Toolbars

The toolbars and menus available in Visio vary depending on several factors, including whether a drawing or stencil window is active, the resolution of your display, and which tools you are using. This appendix illustrates the Visio standard toolbars and menus as they appear on a Super VGA monitor with 800 x 600 pixel resolution with the screen maximized.

The tables that follow each toolbar illustration describe every item available on the toolbar at the highest resolution displays. These tables also show buttons as they appear on Visio's Lotus SmartSuite and Microsoft Office toolbar options.

Finally, if a button has been identified earlier in the appendix, it isn't identified again in the illustrations of the toolbars.



| Visio standard and Microsoft Office   | Description  | Lotus SmartSuite  |
|---|--|---|
|    | <b>Right Align button.</b> Aligns the right edges of the selected shapes with the right edge of the first shape selected.  |    |
|    | <b>Top Align button.</b> Aligns the tops of selected shapes with the top of the first shape selected.  |    |
|    | <b>Horizontal Align button.</b> Aligns the centers of the selected shapes horizontally with the center of the first shape selected.  |    |
|    | <b>Bottom Align button.</b> Aligns the bottom edges of the selected shapes with the bottom edge of the first shape selected.   |    |
|    | <b>Horizontal Ends Distribution button.</b> Distributes three or more selected shapes horizontally so that there are uniform gaps between the shapes. The leftmost and rightmost shapes do not move. |    |
|   | <b>Horizontal Center Distribution button.</b> Distributes three or more selected shapes horizontally so that their centers are uniformly spaced. The leftmost and rightmost shapes do not move.      |   |
|  | <b>Vertical Ends Distribution button.</b> Distributes three or more selected shapes vertically so that there are uniform vertical gaps between the shapes. The top and bottom shapes do not move.    |  |
|  | <b>Vertical Center Distribution button.</b> Distributes three or more selected shapes vertically so that their centers are uniformly spaced. The top and bottom shapes do not move.                  |  |

| Visio standard and Microsoft Office   | Description   | Lotus SmartSuite  |
|---|---|---|
|    | <b>Connect Shapes button.</b> Glues a one-dimensional shape between the closest connection points on selected two-dimensional shapes. |    |
|    | <b>Flip Horizontal button.</b> Reverses the left and right sides of the selected shape.   |    |
|    | <b>Flip Vertical button.</b> Reverses the top and bottom of the selected shape.   |    |
|    | <b>Rotate Right button.</b> Rotates the selected shape 90 degrees clockwise.  |    |
|    | <b>Rotate Left button.</b> Rotates the selected shape 90 degrees counterclockwise.  |    |
|    | <b>Decrease Font Size button.</b> Reduces the font size of the selected text.   |    |
|    | <b>Increase Font Size button.</b> Enlarges the font size of the selected text.  |    |
|   | <b>Line Weight button.</b> Applies a series of line weights to the selected shape.  |   |
|  | <b>Line Pattern button.</b> Applies a series of patterns to the selected shape.   |  |
|  | <b>Line Ends button.</b> Adds arrowheads to one or both ends of the selected shape.   |  |
|  | <b>Corners button.</b> Applies a series of rounded corner styles to the selected shape.   |  |
|  | <b>Shadow button.</b> Applies a series of shadows to the selected shape.  |  |
|  | <b>Snap button.</b> Turns the snapping feature on and off.  |  |

| Visio standard and Microsoft Office   | Description   | Lotus SmartSuite  |
|---|---|---|
|    | <b>Glue button.</b> Turns the glue feature on and off.  |    |
|    | <b>Zoom Out button.</b> Decreases the page magnification, centering the selected shape in the new view. |    |
|    | <b>Zoom In button.</b> Magnifies the page view, centering the selected shape in the new view.           |    |
|    | <b>Pointer tool.</b> A general tool for dragging masters and selecting, moving, and resizing shapes.    |    |
|    | <b>Pencil tool.</b> Draws line and arc segments.  |    |
|    | <b>Line tool.</b> Draws straight line shapes.   |    |
|    | <b>Arc tool.</b> Draws elliptical arc shapes.   |    |
|    | <b>Rectangle tool.</b> Draws rectangular or square shapes.  |    |
|    | <b>Ellipse tool.</b> Draws elliptical or circular shapes.   |    |
|   | <b>Connector tool.</b> Draws a connector between shapes.  |   |
|  | <b>Connection point tool.</b> Adds a connection point to the selected shape.                            |  |
|  | <b>Rubberstamp tool.</b> Stamps instances of the selected master shape into a drawing.                  |  |
|  | <b>Text tool.</b> A specialized tool for working with text and displaying the text toolbar.             |  |
|  | <b>Text block tool.</b> Selects the text block for moving and rotating independently of the shape.      |  |
|  | <b>Rotation tool.</b> Rotates the selected shape by any amount.   |  |
|  | <b>Crop tool.</b> Sizes the border or frame that surrounds an imported, linked, or embedded object.     |  |



Text toolbar

The following table describes the buttons available only on the text toolbar.

| Visio standard and Microsoft Office   | Description   | Lotus SmartSuite  |
|---|---|---|
|    | <b>Undo button.</b> Reverses the last action.   |    |
|    | <b>Redo button.</b> Reverses the last undo command.   |    |
|    | <b>Text Color button.</b> Applies a series of colors to the selected text.                                |    |
|    | <b>Bold button.</b> Adds or removes bold face from the selected text.                                     |    |
|    | <b>Italic button.</b> Adds or removes italics from the selected text.                                     |    |
|    | <b>Underline button.</b> Adds or removes an underline from the selected text.                             |    |
|   | <b>Superscript button.</b> Elevates the selected text into superscript position.                          |   |
|  | <b>Subscript button.</b> Drops the selected text into subscript position.                                 |  |
|  | <b>Left Align Text button.</b> Aligns the text to the left edge of the selected text block.               |  |
|  | <b>Center Align Text button.</b> Centers the text horizontally within the selected text block.            |  |
|  | <b>Right Align Text button.</b> Aligns the text to the right edge of the selected text block.             |  |
|  | <b>Justify Text button.</b> Evenly distributes the text within the boundaries of the selected text block. |  |

| Visio standard and Microsoft Office   | Description  | Lotus SmartSuite  |
|---|--|---|
|  | <b>Top Align Text button.</b> Aligns the selected text to the top of the text block.         |  |
|  | <b>Middle Align Text button.</b> Centers the selected text vertically within the text block. |  |
|  | <b>Bottom Align Text button.</b> Aligns the selected text to the bottom of the text block.   |  |
|  | <b>Zoom Text 100% button.</b> Magnifies the view of the selected text to 100%.               |  |



Stencil toolbar

The following table describes the buttons available only on the stencil toolbar.

| Visio standard and Microsoft Office   | Description   | Lotus SmartSuite  |
|---|---|---|
|  | <b>Cut button.</b> Removes the selected shape or text and places it on the Clipboard. |  |
|  | <b>Copy button.</b> Places a copy of the selected shape or text on the Clipboard.     |  |
|  | <b>Paste button.</b> Pastes the contents of the Clipboard into the current drawing.   |  |
|  | <b>Delete button.</b> Deletes the selected shape or text.                             |  |

| Visio standard and Microsoft Office   | Description  | Lotus SmartSuite  |
|---|--|---|
|  | <b>Repeat button.</b> Repeats the last action.   |  |
|  | <b>New Window button.</b> Opens a new window that contains a copy of the current window's contents.          |  |
|  | <b>Tile button.</b> Places the open windows side by side across the screen.                                  |  |
|  | <b>Cascade button.</b> Positions the open windows on top of each other so that their title bars are visible. |  |
|  | <b>Icons And Names button.</b> Displays the master shape icons and names in the stencil window.              |  |
|  | <b>Icons Only button.</b> Displays only the master shape icons in the stencil window.                        |  |
|  | <b>Names Only button.</b> Displays only the names of master shapes in the stencil window.                    |  |
|  | <b>Arrange Icons button.</b> Arranges the icons in the stencil window.                                       |  |



Edit icon toolbar

The following table describes the buttons available only on the edit icon toolbar.

| Visio standard and Microsoft Office   | Description   | Lotus SmartSuite  |
|---|---|---|
|  | <b>Icon pencil tool.</b> Applies the selected color to single pixels as you click or drag the tool.                           |  |
|  | <b>Paint bucket tool.</b> Applies the selected color to all adjacent, like-colored pixels when you click the tool in an area. |  |
|  | <b>Lasso tool.</b> Selects a non-rectangular area.  |  |
|  | <b>Selection net tool.</b> Selects a rectangular area.  |  |



Print preview toolbar

The following table describes the buttons available only on the print preview toolbar.

| Visio standard and Microsoft Office   | Description  | Lotus SmartSuite  |
|---|--|---|
|  | <b>First Tile button.</b> Displays the first page or tile in the print preview window.       |  |
|  | <b>Previous Tile button.</b> Displays the previous page or tile in the print preview window. |  |
|  | <b>Next Tile button.</b> Displays the next page or tile in the print preview window.         |  |
|  | <b>Last Tile button.</b> Displays the last page or tile in the print preview window.         |  |
|  | <b>Whole Page button.</b> Displays the entire drawing page in the print preview window.      |  |
|  | <b>Single Tile button.</b> Displays a single tile in the print preview window.               |  |

# Shortcuts

This appendix lists keyboard shortcuts that you can use to work more efficiently in Visio. Keyboard shortcuts for some commands are also listed on Visio's menus and are the same regardless of which menu set you're using (Visio standard, Microsoft Office, or Lotus SmartSuite).

Also included in this appendix are methods for typing special characters, either by using Visio's shortcuts or by accessing the ANSI character set.

Some keyboard shortcuts use the F11 or F12 keys. If your keyboard has only 10 function keys, use Alt+F1 for F11 and Alt+F2 for F12.

---

## Keystroke shortcuts

| <b>To choose this tool</b> | <b>Press</b> |
|----------------------------|--------------|
| Arc                        | Ctrl+4       |
| Connection point           | Ctrl+8       |
| Connector                  | Ctrl+7       |
| Ellipse                    | Ctrl+6       |
| Line                       | Ctrl+3       |
| Pencil                     | Ctrl+2       |
| Pointer                    | Ctrl+1       |
| Rectangle                  | Ctrl+5       |
| Rotation                   | Ctrl+0       |
| Text                       | Ctrl+9       |

| <b>To insert a field in text</b> | <b>Press</b> |
|----------------------------------|--------------|
| Height field                     | Ctrl+Shift+H |
| Rotation angle field             | Ctrl+Shift+A |
| Width field                      | Ctrl+Shift+W |

| <b>To choose this command</b> | <b>Press</b> |
|-------------------------------|--------------|
| Actual Size                   | Ctrl+I       |
| Bring To Front                | Ctrl+F       |
| Clear                         | Delete       |
| Copy                          | Ctrl+C       |
| Cut                           | Ctrl+X       |
| Duplicate                     | Ctrl+D       |

*continued*

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| <b>To choose this command</b> | <b>Press</b>   |
|-------------------------------|----------------|
| Flip Horizontal               | Ctrl+H         |
| Flip Vertical                 | Ctrl+J         |
| Group                         | Ctrl+G         |
| New                           | Ctrl+N         |
| Open                          | Ctrl+O         |
| Paste                         | Ctrl+V         |
| Print                         | Ctrl+P         |
| Redo                          | Ctrl+Backspace |
| Rotate Left                   | Ctrl+L         |
| Rotate Right                  | Ctrl+R         |
| Save                          | Ctrl+S         |
| Select All                    | Ctrl+A         |
| Send To Back                  | Ctrl+B         |
| Undo                          | Ctrl+Z         |
| Ungroup                       | Ctrl+U         |
| Whole Page                    | Ctrl+W         |

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| <b>To format text in a text block</b> | <b>Press</b> |
|---------------------------------------|--------------|
| Bold                                  | Ctrl+Shift+B |
| Italic                                | Ctrl+Shift+I |
| Small caps                            | Ctrl+Shift+Y |
| Subscript                             | Ctrl+Shift+X |
| Superscript                           | Ctrl+Shift+Z |
| Underline                             | Ctrl+Shift+U |

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## View shortcuts

| To change the view     | Press  |
|------------------------|--|
| Actual size            | Ctrl+I   |
| Drag drawing           | Ctrl+Shift+press the right mouse button and drag                               |
| Whole page             | Ctrl+W   |
| Zoom in                | Ctrl+Shift+click the left mouse button   |
| Zoom into defined area | Ctrl+Shift+left mouse button and drag rectangle to designate area to zoom into |
| Zoom out               | Ctrl+Shift+click the right mouse button  |

---

## Function key shortcuts

You can use function keys to perform many tasks more quickly in Visio.

| Function Keys | To                                  | Press    |
|---------------|-------------------------------------|----------|
| <b>F1</b>     | Display online help                 | F1       |
| <b>F2</b>     | Open or select a shape's text block | F2       |
| <b>F3</b>     | Fill command                        | F3       |
|               | Line command                        | Shift+F3 |
| <b>F4</b>     | Repeat command                      | F4       |
|               | Exit command                        | Alt+F4   |

*continued*

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| <b>Function Keys</b> | <b>To</b>                 | <b>Press</b>   |
|----------------------|---------------------------|----------------|
| <b>F5</b>            | Go To Page command        | F5             |
|                      | Page Setup command        | Shift+F5       |
| <b>F6</b>            | Zoom command              | F6             |
| <b>F7</b>            | New Window command        | F7             |
|                      | Tile command              | Shift+F7       |
|                      | Cascade command           | Alt+F7         |
| <b>F8</b>            | Align Shapes command      | F8             |
| <b>F9</b>            | Glue                      | F9             |
|                      | Snap                      | Shift+F9       |
|                      | Text Field command        | Ctrl+F9        |
|                      | Snap & Glue Setup command | Alt+F9         |
| <b>F10</b>           | Activate menu bar         | F10            |
| <b>F11</b>           | Font command              | F11            |
|                      | Paragraph command         | Shift+F11      |
|                      | Tabs command              | Ctrl+F11       |
|                      | Text Block command        | Alt+F11        |
| <b>F12</b>           | Save As command           | F12            |
|                      | Save command              | Shift+F12      |
|                      | Open command              | Ctrl+F12       |
|                      | Print command             | Ctrl+Shift+F12 |
|                      | Save Workspace command    | Alt+F12        |

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## Typing special characters

Use these key combinations to type commonly used special characters in text.

| To type                  | Press             |
|--------------------------|-------------------|
| ‘ beginning single quote | Ctrl+[            |
| ’ ending single quote    | Ctrl+]            |
| “ beginning double quote | Ctrl+Shift+[      |
| ” ending double quote    | Ctrl+Shift+]      |
| • bullet                 | Ctrl+Shift+8      |
| – en dash                | Ctrl+=            |
| — em dash                | Ctrl+Shift+=      |
| - discretionary hyphen   | Ctrl+hyphen       |
| - nonbreaking hyphen     | Ctrl+Shift+hyphen |
| / nonbreaking slash      | Ctrl+Shift+/<br>/ |
| \ nonbreaking backslash  | Ctrl+Shift+\<br>\ |
| § section marker         | Ctrl+Shift+6      |
| ¶ paragraph marker       | Ctrl+Shift+7      |
| © copyright symbol       | Ctrl+Shift+C      |
| ® registered trademark   | Ctrl+Shift+R      |

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## ANSI extended characters

You can type characters from the ANSI extended character set by using the numeric keypad on your keyboard.

### To type a character from the ANSI character set:

1. Press the Alt key.
2. On the numeric keypad, type *0* (zero).
3. Type the three-digit code for the character you want.

The following table lists codes for extended characters from the ANSI character set.

| Character | ANSI code | Character | ANSI code | Character | ANSI code |
|-----------|-----------|-----------|-----------|-----------|-----------|
| ,         | 130       | ”         | 148       | ¡         | 166       |
| <i>f</i>  | 131       | •         | 149       | §         | 167       |
| »         | 132       | —         | 150       | ¨         | 168       |
| ...       | 133       | —         | 151       | ©         | 169       |
| †         | 134       | ~         | 152       | ª         | 170       |
| ‡         | 135       | ™         | 153       | «         | 171       |
| ^         | 136       | š         | 154       | ¬         | 172       |
| %o        | 137       | ›         | 155       | -         | 173       |
| Š         | 138       | œ         | 156       | ®         | 174       |
| ‹         | 139       | •         | 157       | -         | 175       |
| CE        | 140       | ž         | 158       | °         | 176       |
| •         | 141       | Ÿ         | 159       | ±         | 177       |
| Ž         | 142       |           | 160       | ²         | 178       |
| •         | 143       | ı         | 161       | ³         | 179       |
| •         | 144       | ç         | 162       | ´         | 180       |
| ‘         | 145       | £         | 163       | µ         | 181       |
| ’         | 146       | ¤         | 164       | ¶         | 182       |
| “         | 147       | ¥         | 165       | ·         | 183       |

*continued*

| Character | ANSI code | Character | ANSI code | Character | ANSI code |
|-----------|-----------|-----------|-----------|-----------|-----------|
| ,         | 184       | Ñ         | 209       | é         | 233       |
| ı         | 185       | Ò         | 210       | ê         | 234       |
| ◦         | 186       | Ó         | 211       | ë         | 235       |
| »         | 187       | Ô         | 212       | ì         | 236       |
| ¼         | 188       | Õ         | 213       | í         | 237       |
| ½         | 189       | Ö         | 214       | î         | 238       |
| ¾         | 190       | ×         | 215       | ï         | 239       |
| ˙         | 191       | Ø         | 216       | ð         | 240       |
| À         | 192       | Û         | 217       | ñ         | 241       |
| Á         | 193       | Ü         | 218       | ò         | 242       |
| Â         | 194       | Û         | 219       | ó         | 243       |
| Ã         | 195       | Ü         | 220       | ô         | 244       |
| Ä         | 196       | Ý         | 221       | õ         | 245       |
| Å         | 197       | Þ         | 222       | ö         | 246       |
| Æ         | 198       | ß         | 223       | ÷         | 247       |
| Ç         | 199       | à         | 224       | ø         | 248       |
| È         | 200       | á         | 225       | ù         | 249       |
| É         | 201       | â         | 226       | ú         | 250       |
| Ê         | 202       | ã         | 227       | û         | 251       |
| Ë         | 203       | ä         | 228       | ü         | 252       |
| Ì         | 204       | å         | 229       | ý         | 253       |
| Í         | 205       | æ         | 230       | þ         | 254       |
| Î         | 206       | ç         | 231       | ÿ         | 255       |
| Ï         | 207       | è         | 232       |           |           |
| Ð         | 208       |           |           |           |           |

# The pointer library

In Visio, the pointer changes to reflect the action you can perform with the current tool, in the current window, or at the current pointer location. The table in this appendix illustrates each pointer and describes the cases in which you see that pointer.

## Drawing and stencil window pointers

| With a  | You can                             | To see this pointer  |
|---|-------------------------------------|--|
|    | Move a shape                        | Point to shape with pointer tool                                 |
|    | Duplicate a shape                   | Press Ctrl, then point to a shape with the pointer tool          |
|    | Drag an endpoint or a control point | Select shape, then point to an endpoint                          |
|    | Size a shape                        | Point to handle of shape selected with pointer tool              |
|    | Draw line or arc                    | Point to drawing window with pencil tool                         |
|    | Draw line                           | Point to drawing window with line tool                           |
|    | Draw arc                            | Point to drawing window with arc tool                            |
|  | Draw ellipse                        | Point to drawing window with ellipse tool                        |
|  | Draw rectangle                      | Point to drawing window with rectangle tool                      |
|  | Connect shapes                      | Point to a shape with the connector tool                         |
|  | Create an instance of a master      | Select master, point to drawing window with the rubberstamp tool |
|  | Rotate a shape                      | Point to drawing window with rotation tool                       |

*continued*

| With a  | You can  | To see this pointer                                |
|---|--|--|
|    | Rotate a shape or text block                             | Point to rotation handle with rotation tool        |
|    | Move a center of rotation                                | Point to center of rotation with rotation tool     |
|    | Crop a shape   | Point to drawing window with crop tool             |
|    | Move an object from another application within its frame | Point to object with crop tool                     |
|    | Add a connection point to a shape                        | Point to drawing window with connection point tool |
|    | Add text to a drawing                                    | Point to drawing window with text tool             |
|    | Place insertion point in text                            | Point to open text block                           |
|   | Insert text in text block                                | Click in an open text block with text tool         |
|  | Move a text block  | Select text block with text block tool             |
|  | Zoom into or out of drawing window                       | Press Ctrl+Shift                                   |
|  | Cannot drop a master                                     | Drag master to inappropriate location              |

---

## ShapeSheet pointers

| With a  | You can            | To see this pointer                     |
|---|--------------------|---|
|  | Select a row       | Point to left column of the ShapeSheet  |
|  | Select a cell      | Point to ShapeSheet cell                |
|  | Expand a section   | Point to heading of a collapsed section |
|  | Collapse a section | Point to heading of an expanded section |

---

## Edit icon window pointers

| With a  | You can                 | To see this pointer   |
|---|-------------------------|---|
|    | Edit individual pixels  | Point to edit icon window with the icon pencil tool               |
|  | Change color of an area | Point to edit icon window with paint bucket tool                  |
|  | Select pixels           | Point to edit icon window with either lasso or selection net tool |

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# Troubleshooting

Support technicians diagnose problems by asking questions related to specific problem types (for example, installation, printing, display errors, and so on). This appendix lists questions you may be asked if you call for technical support. Each section of the appendix is devoted to a specific problem area.

The purpose of this appendix is to help you make the most of your time and effort. In some cases, answering the questions may lead you to a solution on your own. If not, by answering these questions you'll gather critical information that will help a support technician provide you with faster, more efficient service.

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**Important:** Some of the procedures in this appendix involve modifying files that affect the way Windows and your operating system function. If you are not sure about any of the instructions, do not attempt to complete the procedure on your own. This is especially important if you're using a shared version of Visio or Windows over a network. Contact your network administrator or information system manager for help.

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If you follow the steps outlined in this appendix and still need technical support, it's always best to be at the computer on which the problem occurred. In addition, please have the following information on hand:

- Your product serial number, which is located on the registration card.
- A complete description of what you were doing when the problem occurred and, if applicable, the wording of the error message you received.
- A description of what you've done to diagnose the problem and the results of your research.

The more information you can provide up front, the faster you'll be up and running.

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### *Getting more information from Shapeware*

This appendix covers only general diagnostic procedures. Some problems are more specialized, and others may result from the introduction of new operating systems, hardware, or applications.

To provide you with up-to-the-minute information, Shapeware has a Fax Information System. To receive information by fax, call (206) 521-4550 and follow the recorded instructions. For an index of available documents, request document #1000.

The Shapeware technical support team is also ready to assist you. For details about technical support services, see the Visio online help.

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## Installation problems

For information related to installing Visio, see the Visio installation card. For late-breaking information, see the README.TXT file. For information about installing Visio 3.0 on a network, see the NETWORK.TXT file. Both files are located on Visio Disk 1-Setup.

If you have questions during installation, choose the Help button in the setup dialog box.

To receive late-breaking installation details by fax, call the Fax Information System and request document #4000.

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## Printing problems

To print drawings, Visio relies on printer drivers installed in Windows. Printing errors in Visio can often be related to printer driver problems or to a faulty connection between your printer and computer. For example, you may not be using the most current driver for your printer.

The following sections describe common printing problems and some of the ways to solve them.

---

*If only part of a drawing prints*

### **Are the missing or incomplete shapes outside the drawing page?**

If shapes in your drawing are positioned outside the edges of the drawing page (the white area in the Visio drawing window), they may not print. You can preview a printed drawing to check the position of the shapes. For details about previewing a drawing before you print, see Chapter 5, "Creating and printing drawing pages."

### Is your print file exceeding the memory of your printer?

When the complexity of the print file exceeds the available memory of the printer, pages may not print completely or you may see memory-related error messages on the display panel of your printer. (According to printer manufacturers, a typical page of text and graphics printed at 300 dpi resolution may require as much as 1MB of printer memory.) To test whether low memory is a problem, choose a lower print quality setting in the Print dialog box, and then print the drawing again. You can also try printing the drawing on a printer that has more memory. If no other printer is available, try streamlining the drawing. For details, see “Optimizing performance” later in this appendix.

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**Tip:** The display panels on some printers—for example, Hewlett-Packard LaserJet 4 printers—provide clues to memory problems by displaying messages related to printer memory or “print overruns.”

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For current information about memory and other specific printers, call the Fax Information System described earlier in this appendix, and see the README.TXT file installed with Visio.

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*If the drawing doesn't print at all*

### How many stencils and drawing files do you have open?

If you have more than one stencil or drawing file open, try closing some files to provide more memory for printing.

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**Tip:** To see a list of open Visio files, open the Window menu. Open files are listed at the bottom of the menu.

---

### **Can you print other Visio drawings on the same printer?**

If some drawings print successfully but others do not, try to determine what the drawings that don't print have in common. (Do they contain a common shape or imported object? Do they contain substantially more shapes than the drawings that print? Do they contain any bitmap graphics?) If there is a common element, remove that element temporarily and try printing again. If the drawing still doesn't print, try the techniques suggested in the section "Optimizing performance" later in this appendix.

### **Can you print successfully to the same printer from another Windows application?**

Try printing a file from another Windows application using the same printer driver and print settings. (It's best to use a test file that includes graphic elements.) If you can print from another application, continue researching the questions below. If you can't print from another application, there may be several causes:

- The printer driver may not be installed properly. Try removing the printer driver and then reinstalling it. For details, see your Windows documentation.
- The information Windows has about your printer setup may be inaccurate. To update the information, open the Windows Main program group, double-click the Control Panel icon, and then double-click the Printers icon. In the Printers dialog box, select the printer again, and then choose Setup. Choose OK in the Setup dialog box, and then choose Close in the Printers dialog box to update the information in Windows.
- System resources required by Windows may be low. To check system resources, open Windows Program Manager and choose About Program Manager from the Help menu. The dialog box shows a percentage of available system resources. If the percentage is below 30 percent, close some Windows applications before you print or restart Windows. Be sure to close any applications that Windows starts automatically before you print.

### **Are you connected directly to the printer, or do you share a printer through a switchbox, print-sharing device, or network?**

If possible, connect your computer directly to the printer to rule out any communication-related problems. Also, make certain that cables between your computer and printer are firmly connected.

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*The drawing prints incorrectly*

### **Are you using the current version of the printer driver?**

Microsoft and printer vendors frequently update Windows printer drivers. To determine the version of most printer drivers, open the Control Panel window and then double-click the Printers icon. Select the printer from the Installed Printers list, choose the Setup button, and then choose the About button in the next dialog box that appears. For information about the current release of your printer driver, contact your printer manufacturer or Microsoft.

If lines and fills in your printed drawing are missing or print incorrectly, there may be a problem with the way Windows and your display driver are interacting.

When you print, Visio communicates with the printer using the Windows Graphics Device Interface (GDI). GDI supplies a common language for Windows applications and converts that language to printer language such as PCL or PostScript. Sometimes GDI cannot translate graphic information into an equivalent function in the printer language. When this occurs, GDI uses the display driver to produce a bitmap version of the graphic and sends that version to the printer. If the display driver can't provide adequate information, you will see problems in your printed output.

For details about display-related printing problems, see the following section, "Display problems."

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## Display problems

Display problems show up in a variety of ways. For example, you may see an error message when you scroll in a window, size or drag a shape, or change views. You may also notice that colors are displayed incorrectly, or that lines and fills are not visible at some views.

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**Tip:** Error messages regarding display drivers often contain filenames ending with the extension `.DRV`.

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Visio relies on display drivers installed in Windows to display drawings on the screen. As a result, display errors in Visio can often be attributed to incompatibilities with particular display drivers. For example, you may not be using the correct settings or the most up-to-date driver.

If you suspect you might be having display problems, it's important to first determine which display mode you're using.

### To check your current display mode:



1. In the Windows Main program group, double-click the Windows Setup icon.
2. In the Windows Setup dialog box, check the Display line for a description of the mode you're using.

A typical description contains a reference to both resolution and the number of colors supported under the mode of the driver. For example, the description might read 800 x 600-256 colors.

3. If the display mode is something other than VGA or Super VGA and you know that your display card can emulate a VGA card, consider installing the standard VGA driver files from your Windows disks to test whether display problems are related to the mode you're using.

For details about specifying a different display driver and changing display settings, refer to your Windows or display card documentation.

If you can't reproduce the print or display problem using the VGA driver (a basic Windows driver file), there may be a problem with the display driver you're using. It is possible that there are incompatibilities with some display modes but not others. To test this, try using drivers for other supported display modes. For example, you may solve the problem by using the 16-color display mode instead of the 256-color mode. For information about the most current release of your display driver, contact the display card manufacturer.

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## Optimizing performance

There are many factors that can affect the performance of a software application. Large file sizes and faulty system configuration are the most common factors. The following sections describe several ways you can optimize performance in Visio.

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### *Check your system first*

If Visio's performance is less than optimal, the first thing to check is your system. At a minimum, Visio requires a 386-based computer with 4MB of RAM running at 25 Mhz, and a VGA graphics card and monitor. Like other applications, Visio performs better on a system with a faster processor (for example, a 486-based computer running at 66 Mhz), additional memory, and a faster graphics card.

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**Tip:** Although a math coprocessor is not required to run Visio, it can improve performance.

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### *Streamline your drawings*

If your system meets the minimal requirements outlined in the previous section, try using the following techniques to reduce file size and increase on-screen performance:

- **Save files in Visio 3.0 format.** Visio 3.0 creates smaller files than earlier versions of Visio. Smaller files require less time to open and less disk space. For details about saving files in the Visio 3.0 format, see Chapter 1, “Getting started with Visio.”
- **Use master shapes instead of custom shapes.** Drawings that use master shapes require less disk space than custom shapes. If you find you use custom shapes frequently (whether you draw them or copy them from another application), save those shapes as master shapes on a stencil instead of creating and duplicating custom shapes within a drawing. For details about creating master shapes, see Chapter 6, “Creating masters, stencils, templates, and styles.”
- **Avoid creating groups within groups.** Creating groups within groups can quickly increase file size and the time it takes to draw the shapes on the screen. If you create small groups in the process of creating a complex shape, it’s best to ungroup the small groups before you group all the shapes into a large group.
- **Convert complex shapes to Windows metafiles.** If you plan to change only the size or position of a complex shape (and not edit its color, text, lines, and so on), consider converting the shape to a Windows metafile to speed up the time it takes to redraw the image on the screen and to reduce the file size. To do so, select the shape, choose Copy from the Edit menu, and then choose Paste Special from the Edit menu. In the Paste Special dialog box, choose Windows Metafile from the As list, and then choose OK
- **Use styles instead of local formatting.** When you use styles, Visio stores only a reference to the style. When you use local formatting, Visio stores information about the individual attributes of each shape. For details about styles and local formatting, see Chapter 3, “Creating shapes.”

- **Delete styles and master shapes you don't use.** The less the file contains, the smaller the file. For details about deleting these items, see Chapter 6, “Creating masters, stencils, templates, and styles.”
- **Add only the connection points you need.** Fewer connection points means fewer lines in the ShapeSheet, which means a smaller file size. For details about adding connection points, see Chapter 2, “Adding, arranging, and connecting shapes.”
- **Close extra stencils before you save a drawing.** For details about saving drawing and workspace files, see Chapter 1, “Getting started with Visio.”

For a comprehensive list of optimizing techniques, call the Fax Information System. For details, see “Getting more information from Shapeware” earlier in this appendix.

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### *OLE-related errors*

Object linking and embedding (OLE) is a feature of the Windows operating system that is used by many applications to facilitate data exchange. Windows keeps track of the OLE capabilities of each of your OLE applications in the REG.DAT file. Applications must register information in the Windows REG.DAT file in order to perform OLE-related tasks such as linking and embedding. If an application is not properly registered when you attempt to use it, Windows displays an error message. For example, when you double-click a Visio object embedded in another application when Visio is not properly registered, Windows may display a message saying that it cannot find the source application or that OLE is not registered properly.

Some registration errors occur when Visio is improperly registered in the REG.DAT file. You can register Visio manually using the following procedure.

**To manually register Visio:**

1. In Windows Program Manager, choose Run from the File menu.
2. In the Run dialog box, type the Visio path and command line followed by /r. For example:

```
c:\visio\visio.exe /r
```

Visio starts and is registered in the REG.DAT file.

For details about copying and pasting information between Visio and other applications and about using OLE, see Chapter 7, “Using Visio with other applications.” For additional information about OLE, see the README.TXT file installed with Visio.

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## *Exchanging data between applications*

In general, the easiest and best way to exchange data between applications is to use OLE, which is often as simple as choosing Copy in one application, switching to the other application, and then choosing Paste. There may be times, however, when you need to use import or export filters that come with Visio to exchange data between applications. For example, you may need to import a piece of clip art into your drawing. The following section contains guidelines for making importing and exporting successful.

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### *Importing and exporting tips*

Like most other applications, Visio uses filters when you import or export data. Filters translate files from one format to another. Precise translation from one graphic language to another is not always possible. Lines, fills, text, and colors often look different or may not appear at all in some file formats. Fonts may not be translated and sizes may be altered in translation. Precision in translation depends mainly on three factors: the quality of the translation made by the export filter, the format used for the exported data (some are better than others), and the quality of the import filter’s interpretation.

Visio is a vector-based application, which means importing and exporting files that are written in vector-based formats usually produces better, more flexible results. If you plan to use Visio shapes or files in another application, check to see which formats the other application reads. In general, Windows Metafile (.WMF) is the best format to use when exchanging data between Visio and other Windows applications.

---

### *General Protection Faults and related error messages*

A General Protection Fault is a Windows 3.1 error that occurs when two applications try to use the same bit of memory to look up or store information. (Later versions of Windows may display errors with different wording, but the cause is the same.)

#### **When you get a General Protection Fault or related error while using Visio:**

1. Write down what you were doing when the error occurred.
2. Write down the full error message, including the module name and address.
3. Exit Windows and restart your computer.
4. Restart Windows.
5. Press Ctrl+Esc to display the Windows Task List and close any applications that are loaded automatically when you start Windows (except Windows Program Manager).
6. Open Visio and try to reproduce the General Protection Fault by re-creating the situation that caused the error.

If you cannot reproduce the error, the General Protection Fault may have resulted from low system resources, which are replenished when you restart your computer.

If you can reproduce the error, the information you gather by following this procedure may help the support technician isolate the problem more quickly.

For additional suggestions, see your Windows documentation.

---

### *Adjusting settings in the VISIO.INI file*

The VISIO.INI file contains several settings that you can adjust to accommodate your own work style. To adjust the settings, you need to edit the VISIO.INI file.

#### **To edit the VISIO.INI file:**

1. Close Visio.
2. In the Windows Main program group, double-click the File Manager icon.
3. In the Visio directory, locate the VISIO.INI file.
4. Double-click the filename to open the VISIO.INI file in Notepad.
5. Locate the setting you want to edit.
6. Change the setting.
7. Save the changes to the VISIO.INI file and close Notepad.
8. Start Visio.



The new settings take effect immediately.

---

### *Making items more visible on screen*

If you are using Visio with a gray-scale monitor or have difficulty seeing some items on your color screen, you may want to adjust some of the settings in the [color] section of the VISIO.INI file.

The table below shows the default values for each setting. The values that follow the setting's name represent red, green, and blue, respectively. For example, with the ColorStencilBackground setting, the default value for red is 128; for green, 255; and for blue, 128. The values 0 0 0 represent black and 255 255 255 represent white.

| <b>To modify</b>      | <b>Change this setting</b>         |
|-----------------------|------------------------------------|
| Stencil window color  | ColorStencilBackground=128 255 128 |
| Major grid line color | ColorGridMajor=80 80 80            |
| Minor grid line color | ColorGridMinor=192 192 192         |

---

### *Adjusting the size of the stencil window*

In some cases, the Visio stencil window may be too small to display all of the master shape icons completely. To adjust the width of the window, modify the value of the following setting in the [application] section of the VISIO.INI file:

TileStencilWindowWidth=172

The value 172 represents the width (in screen pixels) of the stencil window, including the scroll bar, when tiled. To increase the width of the window, increase the value of the setting.

---

### *Adjusting the size of the Visio window for in-place editing*

To change the default size of the Visio window that appears when you edit in place, adjust these settings in the [application] section of the VISIO.INI file:

InPlaceWidth=5.5in

InPlaceHeight=3.0 in

---

### *Changing the way you edit embedded Visio objects*

To switch between in-place editing and working in the full Visio window when creating an embedded Visio object, change the value of the following setting in the [application] section of the VISIO.INI file:

EditInPlaceOnInsertObject=1

There are two possible values:

- 1** The default. Enter this value to create an embedded Visio object in place (if the container application supports in-place editing).
- 0** Enter this value to open a full Visio window when creating an embedded Visio object.

---

### *Adjusting the number of undo actions*

The setting that controls the number of consecutive actions you can reverse using the Undo command is:

MaxUndo=10

This setting is in the [document] section of the VISIO.INI file. Ten is the default value. A higher value may require more memory, but will let you undo more actions. A lower value requires less memory.

# Glossary

**Alignment box.** The rectangle that appears around shapes and objects from other applications as you move them. This rectangle is used for aligning and distributing shapes and objects from other applications. *See also* selection rectangle.

**Attribute.** An individual formatting element—such as line color, fill color, and line weight—that you can apply to shapes. A style can have several attributes. *See also* format, style.

**Background.** A page that can be assigned to another page to create multiple layers in a drawing. You can see shapes on a background when the page it is assigned to is displayed, but you can't select or change any of the background's shapes without displaying the background page. You can assign the same background to more than one page. A background can also have a background. *See also* foreground.

**Bitmap.** An image stored as a pattern of dots. A scanned photograph or graphic you create in a paint program is usually stored as a bitmap.

**Center of rotation.** The point around which a shape or text block moves when you rotate the shape. When you select a shape with the rotation tool, its center of rotation is marked by a circle with a plus sign inside it. Initially, the center of rotation is in the center of the shape. You can move the center of rotation by dragging it with the rotation tool.

**Clipboard.** A temporary storage location in Windows that is used to transfer data between documents and applications. You can use the Clipboard to copy text and shapes between drawings in Visio or between Visio and other Windows applications.

**Connection point.** A point on a shape where a connector can be glued to the shape. Any vertex and most handles can be connection points. You can also create connection points inside, outside, or on the boundary of a shape by using the connection point tool. Gluing a connector to a shape automatically defines a connection point in the shape's ShapeSheet. You can also define connection points directly in the ShapeSheet. Once defined, each of a shape's connection points is marked with a blue X when Connection Points is checked on the View menu.

**Connector.** Any one-dimensional shape that can be glued between two shapes in a drawing to connect the shapes. Some master shapes are connectors. You can also use lines and other shapes you draw as connectors. *See also* SmartConnector, Universal connector.

**Control handle.** A handle that makes shapes behave in special ways. For example, you might use a control handle to adjust the roundness of a shape's corners, to reshape an arrow, or to drag a connector shape directly out of another shape. How a control handle changes a shape is programmed in the Controls section of its ShapeSheet.

**Control point.** The circle that appears on a line or an arc (or a line or an arc segment) when the line or arc is selected with the pencil tool. You can drag a control point to change the curvature of an arc or ellipse.

**Coordinates.** A pair of numbers that specifies the distance of a point from the origin of a shape, a group, or the page. The *x*-coordinate specifies the horizontal distance and the *y*-coordinate specifies the vertical distance. *See also* origin.

**Crop.** To reduce or expand an object from another application used in a Visio drawing without changing the size of the image within its borders. Cropping an object can give the visual effect of clipping parts of the object, except Visio doesn't discard any part of the object. You crop an object by selecting it with the crop tool and dragging one of its handles.

**Drag and drop drawing.** To create an instance of a master shape in a drawing by dragging the master shape from a stencil into the drawing. To drag a master shape, point to it with the mouse, hold down the left mouse button, and then move the mouse until the shape is where you want it in the drawing. To drop the shape, release the mouse button.

**Drawing.** All the shapes on a foreground page and any backgrounds associated with the foreground page.

**Drawing file.** A Visio file that contains one or more drawings. You can create a new drawing file by using the New command from the File menu. A drawing file can be based on a template. Every drawing file also has its own stencil, which contains an inventory of all the master shapes used in all of the drawings in the file. *See also* template.

**Drawing file stencil.** A stencil stored in a drawing file, which contains an inventory of the master shapes used in the drawings in the file. Master shapes on the drawing file stencil are linked to their instances in the drawings. To display the drawing file stencil for the current drawing file, choose Show Master Shapes from the Window menu. *See also* stand-alone stencil, stencil.

**Dynamic glue.** A type of glue that allows the endpoint of a connector shape to move from one connection point to another as the connected shapes are moved. (When dynamic glue is not used, the endpoints of the connector are attached to specific connection points. When the connected shapes are moved, the connector changes shape to avoid crossing over the shapes.)

**Eccentricity handle.** The circle that appears at each end of a dotted line when a control point of an elliptical arc is selected with the pencil tool. You can drag eccentricity handles to change the angle and magnitude of an arc's eccentricity.

**Endpoint.** One of the square handles that appear at the beginning or end of a selected line, arc, or other one-dimensional shape. The endpoint at the beginning of the shape (beginning point) is marked by an X. The endpoint at the end of the shape (ending point) is marked by a plus sign (+). *See also* vertex.

**Field.** A placeholder in a text block that displays dynamic information such as a dimension, date, or time. A field might display the date and time a drawing is printed, a shape's angle of rotation, or the result of a formula you define.

**Fill.** The color and pattern inside a closed shape. Visio's default fill is solid white.

**Foreground.** A page on the topmost layer of a drawing. Shapes on the foreground are not visible when a background is displayed. *See also* background.

**Format.** To affect the visual appearance of a shape—for example the thickness and color of its lines, the color and pattern inside the shape, and its font—either by using a style or by applying individual attributes. *See also* attribute, style.

**Glue.** A property of shapes that causes them to stay connected, even when a shape that was glued to is moved. *See also* dynamic glue.

**Grid lines.** The faint vertical and horizontal lines that appear in the drawing window when the grid is turned on. You can use grid lines to help position shapes precisely.

**Group.** A shape that is composed of other shapes. A group can also include other groups and objects from other applications. A group can be moved and sized as a single shape, but its members retain their original appearance and properties. A group's members can be modified individually by selecting the group and choosing Open Group from the Edit menu to display the group in a drawing window.

**Guide.** A reference line that is dragged into the drawing window to help position shapes precisely. A horizontal guide is dragged from the top ruler, a vertical guide from the left ruler, and a guide point from the upper-left corner of the drawing window where the rulers meet.

**Handle.** A control that appears on a selected shape. You can use a handle to alter a shape. Handles differ depending on the type of shape and the tool you use to select it. For example, when you select a shape with the pointer tool, it displays selection handles you can drag to change the shape's size and proportions. When you select a shape with the rotation tool, it displays rotation handles you can drag to rotate the shape. *See also* control handle, eccentricity handle, rotation handle, selection handle.

**Instance.** A “copy” of a master shape you create by dragging the master shape from a stencil into a drawing. An instance is more than just a copy: when the first instance of a particular master shape is created in a drawing file, Visio adds a copy of the master shape to the drawing file stencil. Instances of the master shape are linked to the master shape in the drawing file stencil. If you change the master in the drawing file stencil, all of its instances inherit those changes.

**Link.** To establish a dynamic connection between an object in a Visio drawing and another application's file by using the object linking and embedding (OLE) protocol. When the original file changes, the most current version of the object appears in the drawing. Link also refers to the connection between a master shape in a drawing file stencil and instances of it in a drawing. Changes made to the master in the drawing file stencil are inherited by its instances.

**Master shape.** A shape in a stencil. You drag and drop a master shape from a stencil into a drawing to create an instance of the master shape. Many of the master shapes in the stencils provided with Visio are SmartShapes—shapes with programming that controls how the shape behaves when it is moved or sized.

**Object.** A Visio shape or material created in another application and imported, embedded, or linked in a Visio drawing.

**Object linking and embedding (OLE).** A Windows protocol that makes it possible to embed an object created in one Windows application into a document created in a different Windows application, or to link an object to a file that contains the original object.

**One-dimensional shape.** A shape that can be sized or rotated by its endpoints and that does not have corner selection handles. A single line or arc is one-dimensional when you first draw it. Connectors on stencils are also one-dimensional. You can define any shape as one-dimensional. A one-dimensional shape has a beginning point and an ending point and can be glued between other shapes to connect them.

**Origin.** The lower-left corner of the selection rectangle of a shape, a group, or the drawing page. The  $x$ - and  $y$ -coordinates of the origin are always 0,0. Dimensions of a shape such as its width, height, and center of rotation are measured from its origin. The location of a shape in relation to its parent (a group or the page) is measured from the parent's origin. *See also* coordinates.

**Page.** The area in the drawing window that contains a drawing. A page can be either a foreground or a background. The size of a page usually corresponds to a standard paper size. A page also has a scale. A drawing file can contain more than one page.

**Pan.** To shift text or graphic information from another application within its borders in a Visio drawing.

**Paste.** To insert information from the Windows Clipboard into a Visio drawing or another Windows document.

**Pasteboard.** The area that surrounds a page in the drawing window. You can store shapes on the pasteboard. Each page has its own pasteboard.

**Path.** A series of contiguous line or arc segments in a shape. A shape can have more than one path. For example, a shape with an interior hole has two paths: one that describes its outside perimeter and another that describes the perimeter of its interior hole. *See also* segment.

**Pixel.** An individual block of display information. The term pixel is derived from the phrase “picture element.”

**Rotation handle.** One of the round handles that appear at a corner of a shape's selection rectangle when you select the shape with the rotation tool.

**Scale.** A measure of the relationship between actual distances and those distances as they are represented in a Visio drawing. For example, a floor plan might have a scale of one foot of actual distance to one inch in the drawing.

**Segment.** A line or arc that is part of a more complex shape. *See also* path.

**Selection.** Shapes in a drawing or text in a text block that are the target of your next action. Selected shapes display handles. Selected text is highlighted.

**Selection handle.** One of the square handles that appear on a shape selected with the pointer tool. Selection handles indicate that you can size or move the shape. *See also* handle.

**Selection net.** A means of selecting shapes by dragging the pointer tool over a rectangular area.

**Selection rectangle.** The dotted line that surrounds selected shapes or objects from other applications. *See also* alignment box.

**Shape.** A line, arc, ellipse, or rectangle; a closed or open series of line and arc segments; or a group. You create a shape by dragging a master shape from a stencil into a drawing, by using Visio's drawing tools, by copying shapes, by grouping shapes, or by converting an object from another application. *See also* group.

**ShapeSheet.** The spreadsheet that contains information about a shape, such as its dimensions, its angle and center of rotation, and the styles that determine the shape's appearance. ShapeSheets can contain formulas that define how the shape behaves when it is moved or sized.

**Size.** To change the dimensions of a shape by dragging one of its handles after it has been selected with the pointer tool.

**SmartShape.** A shape that is programmed to behave correctly when you move or size it, usually by means of formulas in the shape's ShapeSheet. *See also* SmartConnector.

**SmartConnector.** A connector shape in a Visio stencil. SmartConnectors are programmed to behave intelligently when the shapes they connect are moved. *See also* connector, Universal connector.

**Snap.** The ability of guides, grid lines, and other elements in Visio to pull shapes toward them when the shapes are moved and sized.

**Stacking order.** The front to back relationship of shapes on a drawing page. The first shape added to the page is behind all shapes added to the page after it. You can change the stacking order of shapes by using the Bring Forward, Send Backward, Bring To Front, and Send To Back commands on the Shape menu.

**Stamp.** To create an instance of a master shape with the rubberstamp tool. To stamp a master shape, select the master shape in the stencil, choose the rubberstamp tool, and click where you want the instance to appear. To glue a connector with the rubberstamp tool, select the connector in the stencil, and then drag between connection points on the shapes you want to connect.

**Stand-alone stencil.** A Visio file with a .VSS filename extension that contains master shapes and is usually referred to simply as a stencil. Unlike a drawing file stencil, a stand-alone stencil's master shapes are not linked to instances of masters in a drawing. *See also* stencil, drawing file stencil.

**Status bar.** The area at the bottom of the Visio window that displays helpful prompts, information about the location, size, and angle of the selected shape, the magnification of the view, and Visio's current status. When the Visio standard or Lotus SmartSuite toolbar and menu set is displayed, the status bar also contains style lists. When Visio's Microsoft Office toolbar and menu set is displayed, style lists appear in the toolbar. *See also* toolbar.

**Stencil.** A collection of master shapes you can drag and drop into a drawing. Stencils are stored in stencil files, which are opened automatically when you create a new drawing based on the stencil's associated template. You can also open a stencil file independently of a template. Each drawing file also has its own stencil (known as a drawing file stencil), which contains an inventory of the master shapes used in the drawings in that drawing file. *See also* drawing file stencil, stand-alone stencil, template.

**Style.** A collection of attributes that has a name and is saved with a template or drawing file. You can use a style to apply a predefined set of attributes to a shape with a single action. Many of Visio's templates contain styles. *See also* attribute.

**Subdivision.** The division between grid lines and between ruler intervals. This option is set using the Page Setup Options dialog box. The choices are Fine, Normal, and Coarse.

**Template.** A Visio file that contains styles and settings for a particular kind of drawing (for example, the appropriate scale and grid) and that can open one or more stencils. You can create a new drawing with a template's styles and settings by opening the template. *See also* stencil.

**Text block.** The text area associated with a shape that appears when you click the shape with the text tool or the text block tool, or when you select the shape and start typing. You can size a text block and move a text block in relation to its shape.

**Tile.** A command on the Window menu that arranges open windows side by side in the Visio main window. Also, a printing technique whereby oversized drawing pages are printed on multiple sheets of paper. Each individual page is a tile.

**Toolbar.** The row of boxes, buttons, and tools that appears below the menu bar in the Visio window. In the toolbar, you turn options such as snap and glue on and off and choose tools to create and modify shapes. The Visio main window, the stencil window, and the ShapeSheet window all have specialized toolbars.

**Two-dimensional shape.** A shape that has corner selection handles which you can use to size the shape proportionately. You can define any shape as two-dimensional. Most rectangles, ellipses, and free-form shapes are defined as two-dimensional. *See also* one-dimensional shape.

**Units of measure.** The type of measurement system used in a drawing. You specify the units of measure (inches, feet, miles, points, meters, and so on) in the Page Setup or New Page dialog box.

**Universal connector.** A master shape that is programmed to connect any two points without crossing over the shapes it connects. By default, an instance of the Universal connector is created when you use the connector tool and the Connect Shapes command. *See also* connector, SmartConnector.

**Vertex.** One of the diamond-shaped handles that appear between two segments or at the end of a segment when you select a multiple-segment shape with the pencil tool. You can reshape a shape by dragging its vertices. *See also* endpoint.

**Workspace.** A Visio file that contains information about the size and position of drawing and stencil windows at the time you save the workspace. When you open a workspace, Visio re-creates the arrangement of stencil and drawing windows for you. You can store a workspace within a drawing file or save a workspace as a workspace (.VSW) file.

**Zoom.** To increase or decrease the display size of a drawing in the drawing window. A display size of 100% displays the drawing in the same size it will be when it is printed, unless you reduce or enlarge the printed output in the Print Setup dialog box.

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