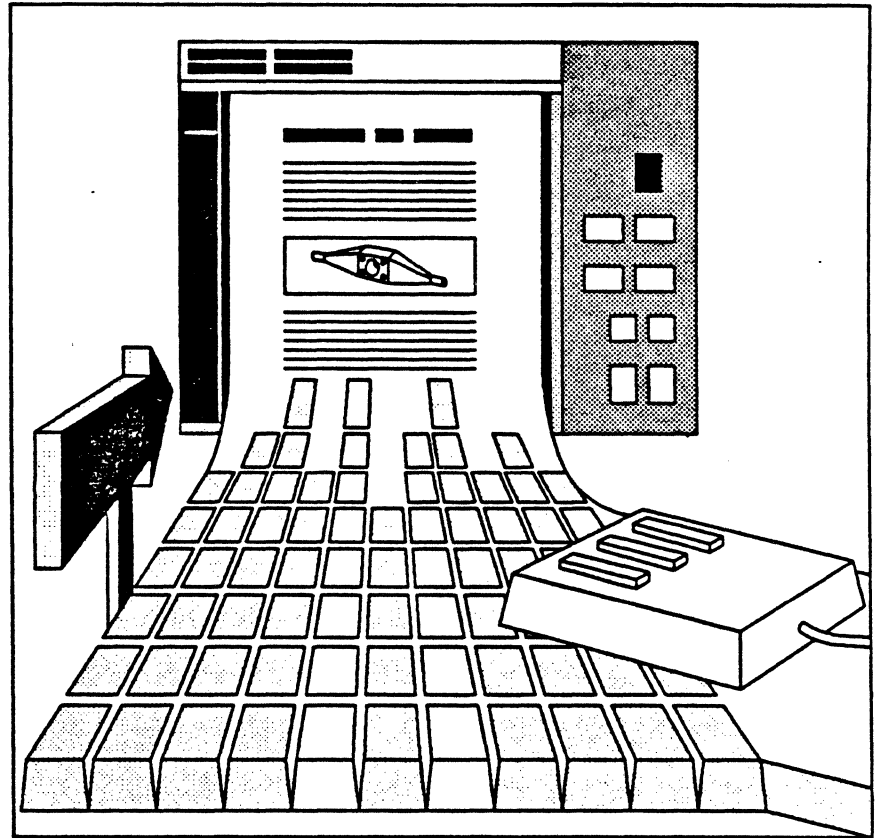


SignPosts



SignPosts is an overview of the user interface for the Interleaf publishing software.

If you like to explore a system by yourself, this section can act as a map to the Interleaf publishing software. It will get you started and help you keep your bearings as you experiment with the software.

If you prefer to read a manual before you try a new system, this section is essential for understanding the rest of the manual. It introduces concepts that are used over and over again in the software.

At the end of this section, there is an interpretation of the graphic symbols we use in the *Reference Manual*.

The Basic Features

The Interleaf publishing software is designed to be easy both for new users to learn and for experienced users to use. All of the other basic features are derived from this one.

- The *mouse* is used to select objects and to act upon them. When you move the mouse around on its pad, you move the mouse cursor around on the screen.
- Most of the time, you select the object you want to act upon, and then you choose the command you want to perform on it.
- The *desktop* is the Interleaf tool for managing your documents. It is the first thing you see when you begin to work in the publishing software.
- Most information is viewed through *windows*. You can resize windows to show more or less information and you can scroll them to see different information.
- Commands are usually presented on *popup menus*, which appear when you hold down the middle mouse button. In different parts of the system, you see different popup menus. Commands are also presented on *pulldown menus*, and a few are accessed using keyboard commands.
- The software presents its messages to you either through the *status line* at the top of a document window or through *stick-ups*, which require some response from you.
- Many objects have *property sheets* that show lists of attributes for the object. On a property sheet, you can change most of these attributes.
- Safety measures that allow you to recover from mistakes and accidents are built into many parts of the software. These safety measures allow you to experiment with new features without destroying important work you've done (although it is best to experiment in an unimportant document).
- All parts of the system are integrated. You can switch from text entry to diagramming to file management whenever you want to, and you never have to close down one part of the software before you start working in another.

The Mouse Model

The user interface to the Interleaf publishing software is based on the mouse. The mouse is used to cut and paste text, to create diagrams and business charts, and to manipulate documents on the desktop. The only activity for which you cannot use the mouse is actual text entry.

Many of the commands for manipulating text are duplicated on the keyboard, so that when you are typing in a lot of text, you need not switch between mouse and keyboard constantly. Nevertheless, the mouse is the primary interface.

Because the Interleaf mouse has three buttons, each of the buttons can have a strictly defined use that is the same in every part of the software. In software that uses a two- or one-button mouse, the buttons must be used differently in different parts of the software. In the Interleaf software, you do not have to remember

which button is used for what: each of the three buttons is always used in the same way.

The *left* mouse button is used to select an initial object. For example, you click the left mouse button to select a position in text, an object in diagramming, an icon on the desktop, or a choice on a stickup menu. It also deselects anything else that is already selected.

The *right* mouse button is used to extend your selection. When you have selected a position in text, you can use the right button to select a range of text. When you have selected an object in diagramming or an icon on the desktop, you can use the right button to select additional objects or icons. The right button is also used to modify your selection. For example, you can deselect an icon or diagramming object by clicking the right mouse button.

The *middle* mouse button is used to choose a command. When you hold down the middle button, you will see a popup menu showing you the commands that can be executed in the current part of the system. With the mouse button still held down, you move up or down the menu to the command you want to execute, and when the command is in reverse video, you release the button to execute the command.

Use the left button to select, the right button to extend or modify the selection, and the middle button to choose a command.

Mouse Cursor Shapes

As you work in the different parts of the software, you will notice that the mouse cursor changes its shape. Every time the cursor changes shape, it indicates that a different set of commands is available to you.

- ↑ On the desktop, in any open window except a document window, and on a stickup menu, the mouse cursor is an arrow.
- ▲ In the body of a document window, it is a chevron.
- ◆ In the component bar to the left of the document, it is a diamond.
- ▲ In the header and scroll bars of a window, it is a triangle. You will also see a triangle when you hold down the left mouse button on the desktop or in a diagram.
- On a popup or pulldown menu, it is a small square.
- ↖ In an open frame (in diagramming), it is a thin arrow.

In most of its forms, the mouse cursor blinks after it has been idle for 10 seconds. The blinking makes it easier for you to find the cursor when you want to use it.

The mouse cursor will not blink when you are using it on a pulldown, popup, or stickup menu because you are engaged in an operation, and it is waiting for you to decide what action to take.

The Command Model

In most computer programs, you decide first what action you want to perform (delete, open, or move, for example), and then you choose the object you want to act on. In the Interleaf publishing software, you choose the object you want to work on (a document, for example, or a character or a diagramming object) and then you decide what action you want to perform on it.

We think our approach is easier to learn and easier to use.

Suppose you want to delete a document. You need two pieces of information, the name of the document, which you probably know, and the name of the command that the particular program uses to delete something, which you may not know. It might be **Cut**, or **Delete**, or **Remove**, or some other word entirely.

In a conventional computer program, since you have to give the command first, you have to search through all the commands in the system until you find the one you think is appropriate. In the Interleaf publishing software, you select the document first. Then, the software gives you a list of commands that apply to documents, and you only have to look through this short list to find that we use **Cut** to delete documents.

The Desktop Model

The *desktop* in the Interleaf publishing software is the part of the software in which you manage your documents. On the desktop, you can create and cut documents, copy them, and organize them by project, due date, name, or some other criterion. Because you open documents through the desktop, it is also the entry to all other parts of the software.

There are four types of icons on the desktop: *graphic icons*, *documents*, *directories*, and the *clipboard* (Figure 1-1).

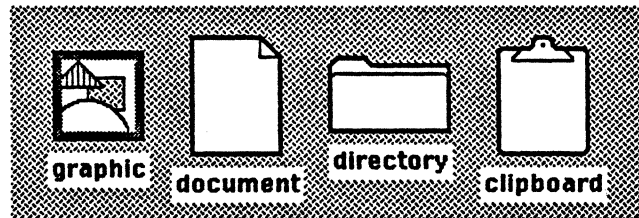


Figure 1-1. The four kinds of icons

Graphic icons are square, have a gray frame just inside a black border, and show a representation of the kind of graphics they contain. They cannot be opened: to see their contents you must paste them into a document.

Documents look like a piece of paper with one corner folded down. A document is the only kind of icon into which you can enter text. You can paste graphic icons and other documents into an open document.

There are four kinds of *directories*: the desktop itself, folders (☐), drawers (☐), and cabinets (☐). Directories can hold documents and other directories. Generally, cabinets are reserved for supplies. The *Graphics* and *Templates* cabinets are examples of this use of cabinets.

The *clipboard* is used to transfer objects between directories.

The clipboard is a special kind of directory. It is a holding place for objects that are being moved from one place to another. If, in *any* part of the system, you execute a **Cut** or **Copy** command, the object you cut or copy, whether it is a folder, a character, or a circle from a diagram, will be placed on the clipboard. And whenever you paste, the selected object on the clipboard will be pasted. (Of course, some objects cannot be pasted into others. For example, you cannot paste a folder into a diagram.)

Windows

In this publishing software, a *window* is an opening that lets you look at part of something—a page of your document, for example, or some of the icons in a folder. It is like a window in your house that lets you see part of the world outside.

Windows can be resized and moved. The contents of the window can be scrolled through the window. Windows can be stacked up on top of each other, and you can choose one to bring to the front or move to the back of the stack. Property sheets, open documents, and open directories are all shown in windows.

Windows are manipulated by their top, right, and bottom borders. If you point the cursor at one of these borders and hold down the middle mouse button, you will see a popup menu that lists most of the operations you can perform on a window. In addition, the dotted *scroll bars* along the right and bottom edges of a window are used to scroll the contents of the window behind it.

If you click the left mouse button while the mouse cursor is in the side scroll bar of the window, its contents are moved down, so you see whatever was above the original view. If you click the right button, the contents of the window are moved up, and you see what was below the original view. The left and right buttons have the same effect in the bottom scroll bar, except they move the contents of the window horizontally.

The window you are working in is displayed with the top border in white. All the other windows are shown with a black top border. As you move your mouse cursor from one window into another, you will notice the top borders changing to

show which is the active window. This, like the flashing of the mouse cursor, is a tool that helps you remember where you are working.

Figure 1-2 shows the scroll bars and top border of an active window.

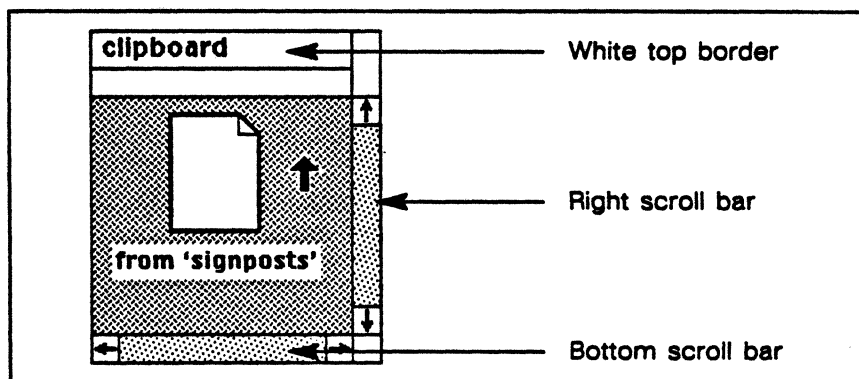


Figure 1-2. A window

Popup Menus

Most of the commands in the publishing software are found on *popup menus*. A popup menu is a list of commands that “pops up” when you hold down the middle mouse button. Figure 1-3 shows one popup menu.

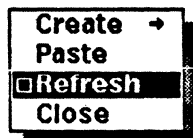


Figure 1-3. A popup menu

Popup menus are extremely efficient. You do not have to move your cursor to a special command region to execute a command. Whenever you hold down the middle mouse button, you see the commands you can use in that location. You do not have to memorize commands because you can always see what commands are available to you in any situation.

Two Sets of Popups

In most parts of the publishing software, there are two possible popup menus: one if you have something selected, the other if you have not. For example, if you are working in the text part of a document and the cursor is pointing at a position in text, when you hold down the middle mouse button you will see a popup showing commands like Paste. If you have a text region selected, the popup you see when you hold down the middle mouse button will show commands like Cut and Copy.

Popup Submenus

You will notice that many of the commands on a popup menu have an arrow after them. The arrow indicates that there is a *submenu* of options for that command. To see the submenu, slide the mouse cursor to the right, toward the arrow. *Figure 1-4* shows a submenu on one popup menu.

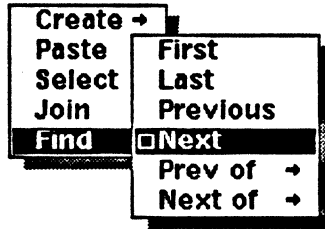


Figure 1-4. A submenu of a popup menu

You can see from this example that submenus may have further submenus.

In general, the most commonly used commands are on the main popup menu. Less frequently used commands are on submenus, as are the more complex commands. New users can concentrate first on the main popups, and, as they master the system, expand their knowledge by exploring the submenus.

System Defaults and Dynamic Defaults

You will notice that when you hold down the middle mouse button, one command on the popup is displayed in reverse video even before you move the mouse. That command is the *default*. If you release the middle mouse button without waiting for the popup to be displayed, the default command on the popup will be executed.

In many parts of the system, the default command changes in response to the work you do. For example, the initial (system) default on one of the diagramming popup menus is **Close**. If you choose the **Paste** command, though, the next time you see that menu, the default will have changed to **Paste** (*Figure 1-5*).

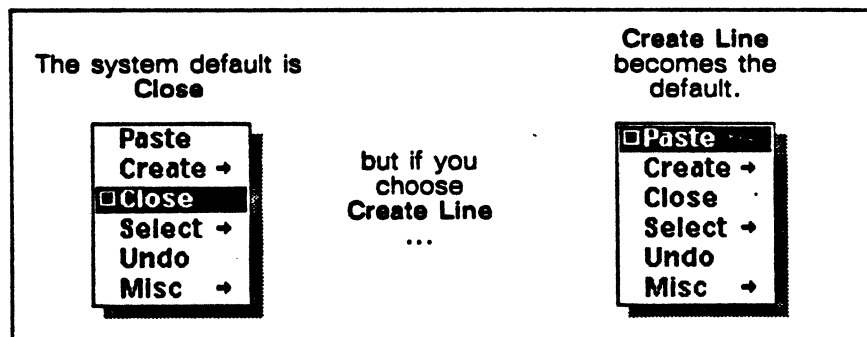


Figure 1-5. Dynamic defaults

We call this *dynamic defaulting*. The default you see when you first look at a menu is called the *system* default, and the command that becomes the default in response to your work is the *temporary* default.

Most commands can become the default, but in some cases, it is easier for the user if the command does not become the default after it has been used.

The default on a popup menu will often change back to the system default when you switch to a different part of the system. You can also reset the system default yourself. Just hold down the middle mouse button, slide the mouse completely off the menu, so that no command is displayed in reverse video, and release the button.

Pulldown Menus

In the top border of an open document, you will see four black boxes labeled with the name of the document, the current font, "Printer", and the page number. If you hold down the middle mouse button when you are pointing into one of these boxes, you will see a set of commands appropriate to the label in that box. The commands are listed on a *pulldown menu* (Figure 1-6).

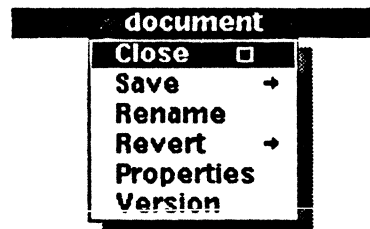


Figure 1-6. A pulldown menu

Pulldown menus are very much like popup menus: they have submenus and system defaults just like popup menus. The only difference is that you will always see the same pulldown menu in a particular location.

Messages

When the Interleaf publishing software needs to communicate with you, it will either display a message in the status line of an open document or it will display a stickup menu in the middle of the screen.

The Status Line

The *status line* is in the top border of the window, just below the boxes for the pulldown menus. It is used for error and status messages. For example, when the software has finished saving a document, it displays a message on the status line (Figure 1-7).

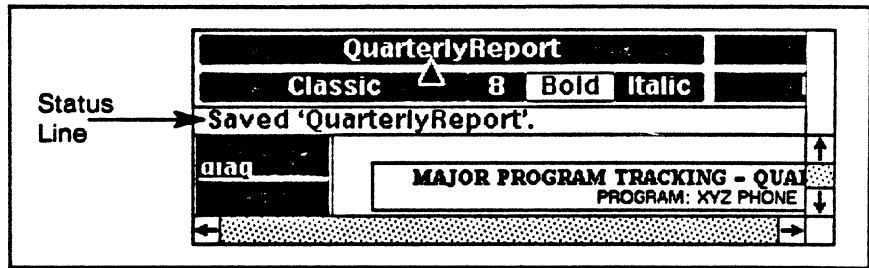


Figure 1-7. A sample message on the status line.

Stickup Menus

You will see a *stickup menu* when the system needs further information or confirmation of an action from you. For example, when you are moving to a specific page in your document, you type the page number in a stickup.

Figure 1-8 shows one stickup, with its parts labeled.

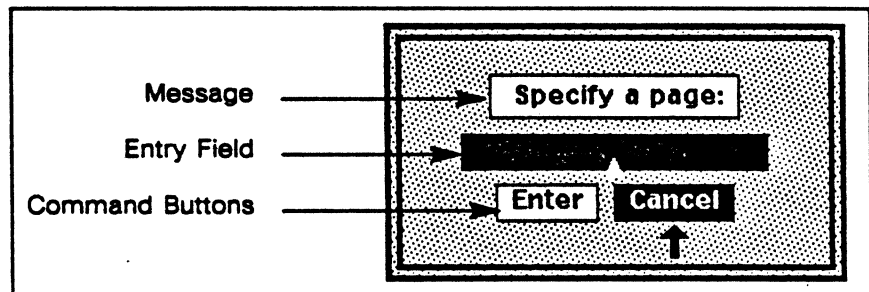


Figure 1-8. A stickup menu

There are three possible parts to a stickup. At the top of the stickup there will be a message that reports information or requests a specific action. Next there may be a black rectangular field in which you can type a response. This field does not appear on all stickups.

Finally, there is a set of command boxes. The mouse cursor will be pointing at one box, which will be shown in reverse video. To choose one of the other commands, slide the mouse left or right. You will notice that the mouse cannot go farther than the last box on either end of the row. When the command you want to execute is displayed in reverse video, select it by clicking the left button.

Property Sheets

Many objects in the publishing software have *property sheets* that show attributes of the object and allow you to change them. To look at the property sheet of an object, execute the **Props** or **Properties** command.

A property sheet appears in its own window, in the upper right corner of the screen. Figure 1-9 shows a component property sheet.

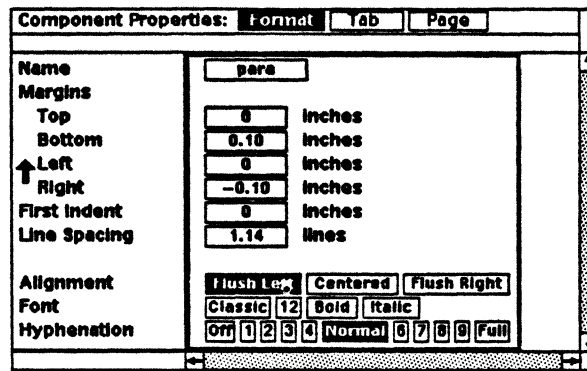


Figure 1-9. A property sheet

There are three different ways to change information on a property sheet.

- You can type new information in a *field*. You can identify a field because you will see a triangle shaped cursor in it when you point at it and click the left button.
- You can select a *toggle box*. You can identify a toggle box because the appearance of the box will be switched between reverse video and normal display when you point at it and click the left button.
- You can move forward or backward through a *list* of choices in a box by clicking the left or right mouse button. You can identify a list because you will see the next choice on the list when you point at it and click the left mouse button.

The changes you make in a property sheet must be *applied* with a popup menu command before you will see them take effect.

Safety Measures

Throughout the software you will find built-in safety nets that allow you to recover from mistakes and accidents. Here is a list of some of the safety measures—you will find others as you learn the system.

- Whenever you cut something, it is placed on the clipboard. It is *not* permanently discarded.
- When you edit a document, the original version is not modified until you decide to save your changes. At that point, the original becomes a *backup*, and a new original is created. The software also periodically saves your changes in a separate *checkpoint* document. At any time, you can revert to the original file, the backup, or the checkpoint file.
- There is a command in the diagramming part of the system that will undo the last changes you made to your diagram.

- Two commands on the property sheet popups allow you to undo all the changes you have made since you opened the sheet, or just the changes you have made since the last time you applied.

These measures and others are fully documented in later chapters of the *Reference Manual*.

Terms

There are a few words we use in the *Reference Manual* and in the messages that the software displays that you may not be familiar with. Here are their definitions.

- pixel** A pixel is a single dot that can be either black or white. The display on your workstation screen is made from thousands of pixels.
- load** Loading means copying something from the hard disk where it is stored into the computer's memory. When you are opening a document, you will see messages in the status line that tell you what is currently being loaded.
- toggle** To toggle something is to switch from one of two states to the other. For example, a document is either selected or it isn't. If it is selected, toggling will deselect it.
- icon** An icon is a pictorial representation. The pictures that represent documents, folders, drawers, and cabinets on the desktop are icons, as are the pictures you use to change the appearance of a business chart.
- frame** A frame is a rectangular area in your document in which graphics can be created.

Graphic Symbols in Procedures

Throughout the *Reference Manual*, there are procedures that explain how to perform various operations in the most efficient way. Instead of numbering the steps in these procedures, we use a graphic symbol next to each step to indicate the kind of action we are asking you to perform.

Here is a list of the special symbols we use and what they mean.

- click the **left** mouse button.
- click the **middle** mouse button.
- click the **right** mouse button.
- hold down the **left** mouse button.
- hold down the **middle** mouse button.

- ☐ hold down the **right** mouse button.
- ☐ release whichever mouse button you are holding down
- ☐ represents the mouse.
 - ☐ indicates that you should move either the mouse (as in ☐) or the mouse cursor (as in ☐).
 - ☐ indicates that you need to use the keyboard, rather than the mouse, for this action.
 - ✓ means that you are being asked to do something you already know how to do.

In addition, you will notice that some sections—sometimes only a paragraph, sometimes a whole subject—will be marked with a special symbol.

- ☐ means that the information in the section is not necessary for new users and is of interest primarily to expert users.

Chapter 2

Document Management

In the Interleaf publishing software, there are two types of document management. One type affects documents when they are open on your desktop, and the other involves the unopened document icons.

This chapter is primarily concerned with the management of open documents. The Desktop Manager, which handles icons, is discussed *The Desktop Manager* in the second volume of *The Reference Manual*. When the two kinds of document management overlap, the overlapping areas are discussed in both chapters.

This chapter covers the following major topics:





- opening, closing, and saving documents
- resizing and moving document windows
- renaming open documents
- using the **Revert** command to open different versions of a document
- changing document properties
- printing documents

If you have not already done so, please read *SignPosts*, the first chapter of the *Reference Manual*. It is a short overview of the Interleaf publishing software that provides the essential concepts needed to use this manual effectively.

Opening a Document on Your Desktop

Opening a document on your desktop is very simple.

To open a document:

- ✓ If the icon for the document you want to open is not on your desktop, open the folder , drawer , or cabinet  it is in.
- ⇧ Position the mouse cursor in the document icon .
- ☛ Click the left mouse button to select the icon.

✓ Select **Open** on the Desktop Icon Selected popup menu.

The document you have selected opens in a window on your desktop. While the document is being opened, messages appear in the status line telling you how the open is progressing. *Figure 2-1* shows a document open in a window.

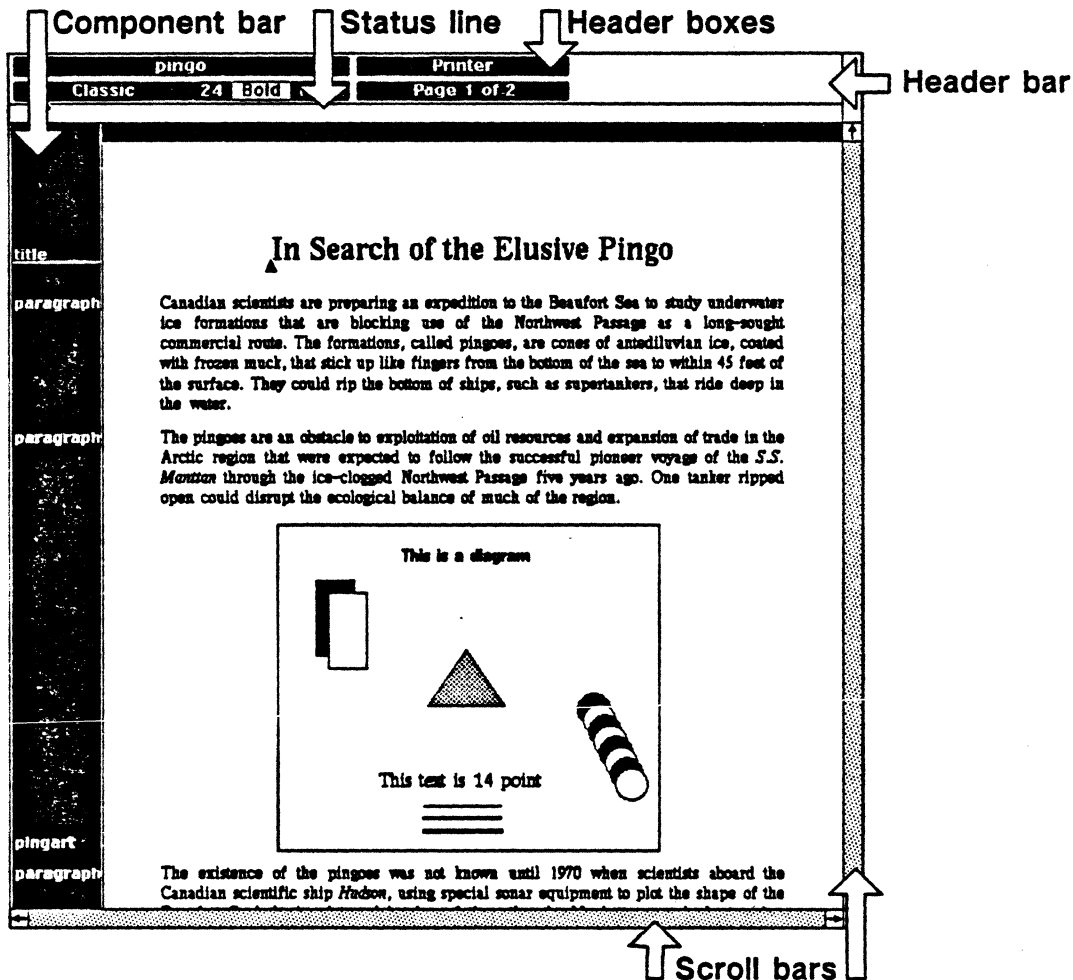


Figure 2-1. An open document in a document window

In this chapter, the uses of the *scroll bars*, the *header boxes*, the *header bar*, and the *status line* that pertain to document management are discussed. The *component bar* is discussed in the chapters on Page Makeup and Text Processing in this volume of *The Reference Manual*.

Opening Additional Documents

To open more than one document, repeat the Open command with each document icon you want to open. You can have a total of sixteen windows open at a

time on your desktop; this number includes open documents, folders, property sheets, etc.

Just as you can close a drawer in a real file cabinet once you have taken from it the files you want, you can open documents from drawers and folders on your desktop and then close the drawers and folders. With a real file cabinet, you would have to reopen the drawers and folders when you wanted to put away your documents. However, you can return documents to their Interleaf drawers without reopening the drawers. (See the section, *Closing a Document*.)

Canceling a Command

Sometimes you may start to open a document and realize that it is not the document you want to open at all. In this circumstance, you can cancel the Open command by holding down the CTRL key and typing g or by using the Interrupt stickup menu (*Figure 2-2*).

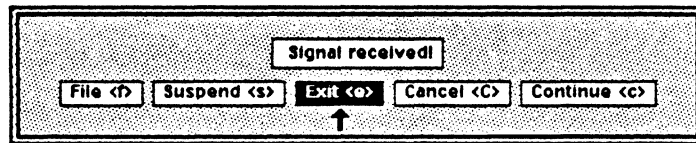


Figure 2-2. Interrupt stickup menu

You can also use the CTRL key sequence or the Interrupt stickup to cancel the following operations that are discussed in this chapter:

- printing
- an Ascii save
- the **Revert** command

To cancel a command using the Interrupt stickup menu:

- Hold down the CTRL key and type z.
- ✓ On the Interrupt stickup menu, move the mouse cursor to **Cancel** and click the left button.
- or Type C. (Be sure to type an uppercase C; a lowercase c denotes **Continue**, so the command will proceed.)

The Document Header Boxes

In the document window, there are four *header boxes*: the Document Name box, the Printer box, the Font box, and the Page box (*Figure 2-3*).



Figure 2-3. Document Header boxes

When you point the mouse cursor into each of the header boxes and hold down the middle mouse button, you gain access to the pulldown menu associated with that box. Except for the Printer box, the boxes themselves contain information about the document.

The Document Name box gives the name of the document and access to the Document Name pulldown menu (Figure 2-4) and its submenus.

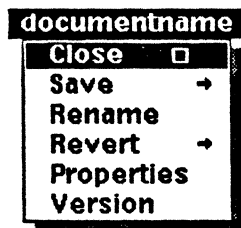


Figure 2-4. Document name pulldown menu

The Printer box gives you access to the Printer pulldown menu and its submenus (Figure 2-5).

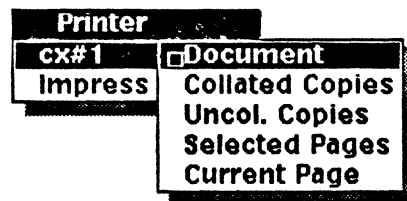


Figure 2-5. Printer pulldown menu

The Font box tells the font at the position of the text editing cursor and gives you access to the Font pulldown menu and its submenus (Figure 2-6).

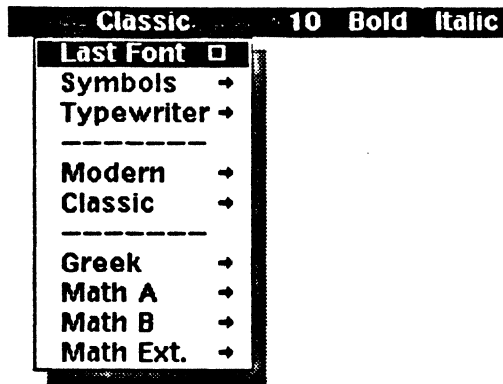


Figure 2-6. Font pull-down menu

The Page box gives the current page number and the number of pages in the document. If the page numbers for the document start with 1, the box registers *Page 21 of 25*. If the page numbers for the document do not start with 1 (if, for example, they start with 5), the Page box registers *Page 21 of 5 to 29*. The Page box also gives you access to the Page pull-down menu (Figure 2-7).

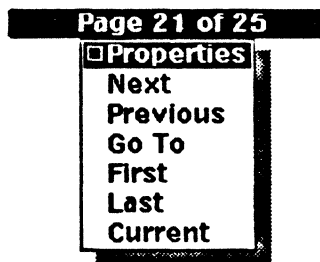


Figure 2-7. Page pull-down menu

Resizing and Moving Document Windows

There are many circumstances in which you may want to make the windows on your desktop larger or smaller or to move them around in relation to each other. For example, if you open more than one document, you may want to rearrange or resize the windows containing the documents so that you can see all, or at least some part, of each document. Sometimes you may want all of one document on top of other open windows.


Resizing and moving windows involve using the Window popup menu.


To use the Window popup menu:

- ☷▲ Move the mouse cursor into either of the scroll bars or into the document header outside of the header boxes and hold down the middle mouse button (Figure 2-8).



Figure 2-8. The Window popup menu


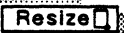


On this menu, the **Deselect** command becomes the default after either of the **Resize** commands. This means that you can just click the middle mouse button  after you have made the window the size you want it.

The **Deselect** command also becomes the default after the **Move** command, so that you can just click the middle mouse button  after you have moved the window where you want it.

Resizing a Document Window

A window can be resized either from the top left-hand corner or from the bottom right-hand corner.

To resize a window:

- ✓ Select either of the **Resize** commands on the Window popup menu.  resizes the window from the top left-hand corner.  resizes the window from the bottom right-hand corner.
-  Move the mouse, and you will see a shadow box of the window containing your document. This box is anchored in the corner of the window opposite the direction of resizing.
-  When the shadow box is the size you want the window to be, click the middle mouse button to **Deselect** the window.

The software saves the new size of the window, and the window will be this size when you reopen the document icon.



Changing the Position of a Window

There are three ways in which you can change the position of an open window: you can **Move** it around on your desktop, you can put it in **Front** of other open windows, or you can put it in **Back** of other open windows.


Using the Move Command

The **Move** command is useful in several different ways. Sometimes you want to move a window so that you can see the icons or open windows that are under it. Other times, you want to arrange windows that you often have open together in such a way that their contents are visible when all the windows are open.

To move a window around on your desktop:

- ✓ Select **Move** on the Window popup menu.
-  Move the mouse, and you will see a shadow box the size of the document window.
-  When the shadow box is where you want the window to be, click the middle mouse button to deselect the window.

The software saves the new location of the window, and the window will be in this location when you reopen the document icon.

You can use combinations of the **Resize** and **Move** commands by holding down the middle mouse button  between commands. For example, to use both **Resize** commands, use **Resize**, hold down the middle mouse button and move the mouse cursor to **Resize**. Click the middle button to deselect the window.

Using the Front and Back Commands

Your Interleaf desktop has a *surface* that is similar to the surface of a real desktop, but it also has *depth*, something that a real desktop does not have. When you open an icon on your desktop, the window in which its contents are displayed is on top of all the windows that you opened previously. This is true even when the windows appear to be side by side on the surface of the desktop. If you move one window so that it overlaps the other, you will see which window is on top.

With the **Front** and **Back** commands, you can change the depth of a window in relation to other open windows.

To move a window to the top of the open windows:

- ✓ Select **Front** on the Window popup menu.

To move a window to the bottom of the open windows:

- ✓ Select **Back** on the Window popup menu.

Closing a Document

When you have finished editing a document, it is as easy to close the document as it was to open it.

To close a document:

- ☰▲ Point the mouse cursor into the Document Name box in the header bar.
- ☐☐☐ Because **Close** is always the default on the Document Name pulldown menu, click the middle mouse button.

If you have not made any changes since the last time you saved the document, the document closes automatically and is returned to the cabinet/drawer/folder from which it came even if that directory is not currently open.

If you have made changes since the last time you saved the document, you will see a stickup menu asking you whether or not you want to save your changes before closing the document (*Figure 2-9*).

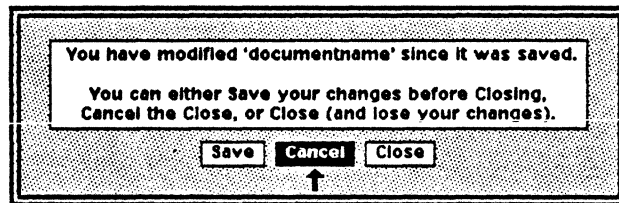


Figure 2-9. Close stickup menu

To save the document:

Move the mouse cursor into the Save box and click the left button.

As soon as the document has been saved, it will close automatically.

How Documents Are Saved

The Interleaf publishing software has four mechanisms for saving documents you are working on. *Document files* and *crash files* are created in response to actions by the user. *Backup files* and *checkpoint files* are automatically created by the software.

The document icon on the desktop represents all the current versions of a file.

You can find out which of these files exist for an open document by looking at the **Revert** submenu on the Document Name pulldown menu. The **Revert** sub-

menu is dynamic, which means that it grows and shrinks according to which versions of a document exist at any given moment. *Figure 2-10* shows the **Revert** submenu at its most complete. The use of the **Revert** submenu is discussed later in this chapter.

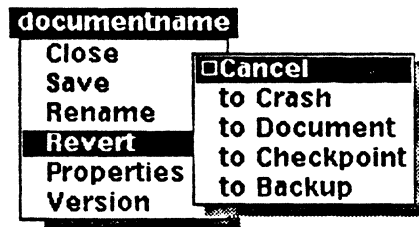


Figure 2-10. Revert submenu of the Name pulldown menu

The Document and Backup Files

When you create a new document on your desktop, the system creates the corresponding *document file*. Initially, this *document file* consists only of some structural information, such as the dimensions and margins of the page and the font of the default component.

When you save the document for the first time, this almost empty document becomes the *backup file*, and the document you have just saved becomes the *document file*.

As you work on the document and save it, this process continues. If the **Revert** submenu shows that *document* and *backup files* exist, you know that the *document file* is always the copy of the most recent save you have made, and the *backup file* is always the copy of the second most recent save you have made.

Normally, when you open a document, the *document file* opens automatically. The exceptions to this are discussed in the sections on the *crash file* and the **Revert** command.

The Checkpoint File

As you work in a document, a *checkpoint file* is created automatically by the system whenever you have made a certain number of keystrokes. For text entry the number of keystrokes is between 3000 for short documents and 7000 keystrokes for long documents. When you are working in diagramming, the mouse movements are also figured into this keystroke total.

The system recognizes a difference between straight text entry and editing, and it saves checkpoint versions of a document more often when you are editing than it does when you are entering blocks of text.

The *checkpoint file* represents a safeguard against loss of work if something like a power failure should occur while you are editing a document. However, the software does not make *checkpoint files* too frequently because this would interfere

with your editing. Therefore, you would do well to save your documents regularly particularly when you are doing something that would be difficult or time-consuming to reconstruct.

If there is a *checkpoint file*, it is a more recent version of your document than the *document* or *backup files*.

When you save a document in the normal way, the *checkpoint file* goes away because it is superseded by a more recent *document file*.

The *checkpoint file* does not go away when you create a *crash file*. There is always a slight chance that saving a document in a *crash file* will produce a version that is damaged. If this were to happen to one of your documents, the *checkpoint file* would be a useful starting place for rebuilding the document.

The Crash File

On the **Interrupt** stickup menu (see *Figure 2-2*), there is a **File** option that gives you a way of saving documents in extreme circumstances.

You should use this means of saving documents *only* on those rare occasions when your computer crashes while you are editing documents and you have no alternative way to save the work you have done.

In the case of a crash, the **Interrupt** stickup menu will appear automatically. If you want to save the changes in any documents you have open on your desktop, be sure to select **File** before **Exit**. **Exit** takes you back to the operating system immediately without an opportunity to save your documents.

If you have more than one document open when you select **File**, you will be asked if you want to save a *crash file* for each document you have changed.

If your computer runs out of memory, a stickup will give you the option of saving your documents in a *crash file*.

When you open a document that has a *crash file* associated with it, a stickup menu will give you a choice of which version of the document to open.

Figure 2-11 shows the most complete version of this stickup menu.

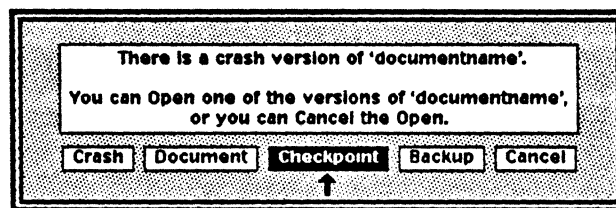


Figure 2-11. Crash version stickup menu

If there is a *crash file*, it is almost always * the most recent version of the document and the version you want to use.

When you save the document in the normal way, the version labeled *crash file* goes away. (It will, of course, become the *document file* if it is the version you save.)

The most important things to understand about the various versions of a document are:

If there is a *crash file*, it is almost invariably the most up-to-date version of the document.

If there is a *checkpoint file*, it is more up-to-date than the *document file*.

The *document file* is more up-to-date than the *backup file*.

The Save Submenu

On the Document Name pulldown menu, there is a Save submenu (*Figure 2-12*).

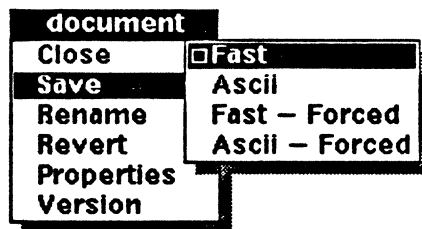


Figure 2-12. Save submenu

Fast is the default. This is the type of save you get when you release the middle mouse button on **Save →** without sliding off on the submenu and choosing another option. It is also the type you get when you save your document in response to all of the stickup menu queries.

There are four choices on the Save submenu, and they are paired.

When you use Fast or Fast — Forced, you get the same kind of file. Fast and Fast — Forced save a version of your document that is readable only within the Interleaf publishing software.

When you use Ascii or Ascii — Forced, you get another kind of file that you can read using either the Interleaf publishing software or some other editor. You

*The one, very unlikely exception: if you have a *crash file* of a document and you do enough editing so that a *checkpoint file* is created, and then you close without saving the document, the *checkpoint file* will be more recent than the *crash file*.

would most often use an Ascii save when you want to communicate your document to another computer for editing.

Some information will be lost when you save Ascii. For example, discretionary hyphens and the position of the cursors are lost in an Ascii save. If you do not want to use another editor with a document, you should always use one of the **Save →** **Fast** commands.

As the name implies a **Fast** save takes less time than an Ascii save. When a document has been saved **Fast**, it also opens more quickly than it does when it has been saved Ascii.

If you have a diagram open when you choose a **Fast** save, when you reopen the document the diagram will be open.

When you save Ascii, the system first saves a **Fast** version of the document in a temporary file. Then, it saves the temporary file as an Ascii document. The double save is one reason why saving Ascii is slower than saving **Fast**.

While a document is being saved, messages appear in the status line telling you what is currently being saved. If you are saving an Ascii version of the document, a message also tells you when the Ascii version is being saved.

Forced Saves

There are times when you may want to register a change in your document when you have not done any real editing. For example, you may want to move the editing cursor, so that the document will open at a particular place the next time you open it. A **Fast—Forced** save accomplishes this.

An **Ascii—Forced** save saves your document in Ascii format.

Canceling a Save

You cannot cancel a **Fast Save** once you have initiated it.

You can use **Cancel** on the **Interrupt** stickup menu (see *Figure 2-2*) to cancel an **Ascii Save**.

If you cancel the save while the temporary **Fast Save** is taking place, the **Fast Save** will be completed and then the **Ascii Save** will be canceled.

To cancel an Ascii Save:

- Hold down the **CTRL** key and type **z**.

- ✓ On the **Interrupt** stickup menu, move the mouse cursor to **Cancel** and click the left button.
- or Type **C**. (Be sure to type an uppercase **C**; a lowercase **c** denotes **Continue**, so the **Save** command will proceed.)

If you have canceled an **Ascii Save** and try to close your document without saving it, a stickup menu (*Figure 2-13*) will warn you of the consequences. If you want to be able to read your document again, or before you close it.

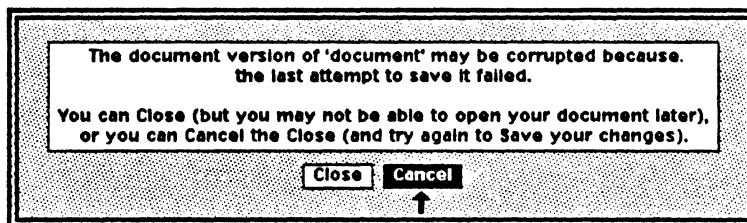


Figure 2-13. Warning stickup menu

Interleaf Files in the Operating System

When you look at the **Revert** submenu of the **Document Name** pulldown menu, you see a list of the versions of your document that currently exist. *Figure 2-14* shows the most complete example of this menu. You can also see a listing in the operating system of the versions of a document.

When you cut a document icon from your desktop or one of its directories, you cut *every* version of the document. If you want to accomplish the same result in the operating system, you must remove each one of these versions.

Details about the operating system are in the chapter *System Administration* in the second volume of *The Reference Manual*. In this section, we give only the most direct way to list the contents of a directory and to remove documents.

Listing the Files in an Operating System Directory

When you list the contents of an Interleaf directory in the operating system, the files that appear on the **Revert** submenu as *Document*, *Backup*, *Checkpoint*, and *Crash* have one name with different extensions. The extensions vary, depending on the version, but they all begin *.doc*. *Figure 2-14* shows the correspondence between desktop versions of an Interleaf document named *widgets* and the operating system versions.

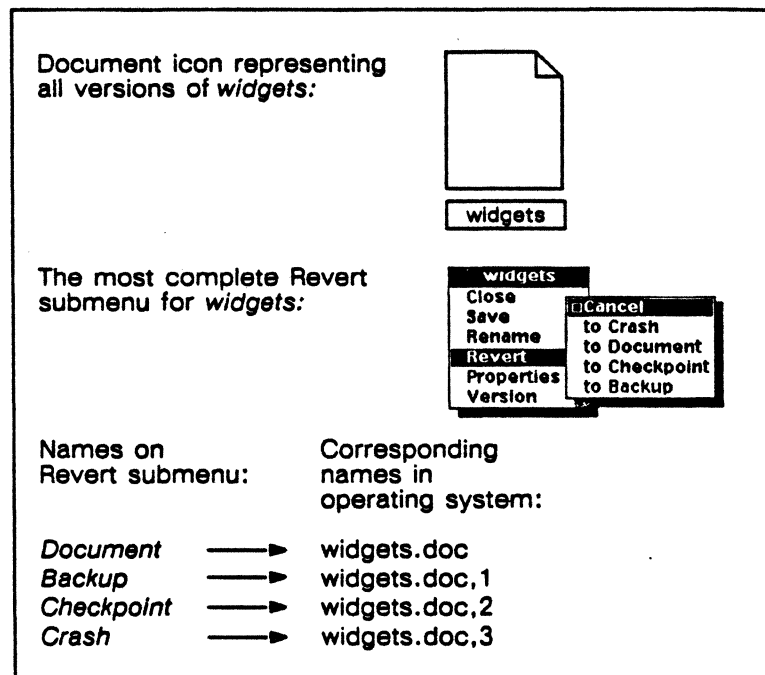


Figure 2-14. Names of Interleaf documents in the operating system

To list the contents of a directory in the operating system:

- ✓ Make sure you are in the directory that contains the document you want to list.
- ☐ At an operating system prompt, type
`ls <RETURN>`

A listing for all the files in the directory appears. For other operating system List commands, see System Administration.

Removing Documents through the Operating System

If you remove the *Document* version—the one with just *.doc* after its name—of a document through the operating system, you must also cut all the remaining versions or you will have an icon on your desktop that you cannot open or cut.

To remove a document in the operating system:

- ✓ Make sure you are in the directory that contains the document you want to remove.

- ☐ At an operating system prompt, type

`rm documentname <RETURN>`

For example, to cut widgets.doc,2, you would type

`rm widgets.doc,2 <RETURN>`

The Rename Command

Usually, when you want a copy of a document, you will use the Copy command on the Desktop popup menu. However, there are circumstances when you will need to make a copy of an open document. The following are two examples of such circumstances:

- You are working in a document for which you do not have write permission, and you want to save your work. In this case, if you try to save the document, you will see a Lack of Permission stickup menu (Figure 2-15).

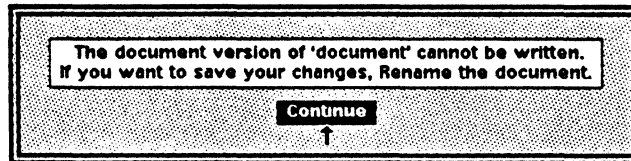


Figure 2-15. Lack of permission stickup menu

- You have done some work in a document, but you think you may not be using the best version of the document. You want to Revert to another version of the document, but you also want to be able to save the work you have done.

To rename a document:

- ✓ Select **Rename** on the Document Name pulldown menu.
- ☐ Type in the new name on the Rename stickup menu (Figure 2-16).

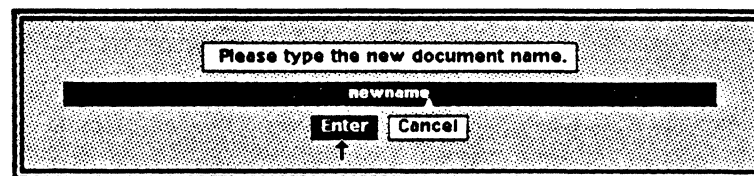


Figure 2-16. Rename stickup menu

☐☐ With the cursor point at the Enter box, click the left mouse button.

or ☐ Press the <RETURN> key.

When you rename a document, the original document is closed automatically and a new icon is created to represent the new document. However, in a sense, this new document does not yet exist on the system. You must save it in order to give the icon contents.

If you try to close a renamed document without saving it, you will see another stickup menu (*Figure 2-17*).

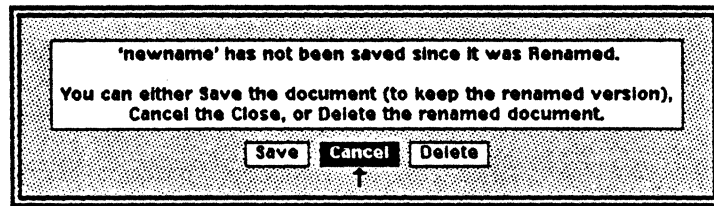


Figure 2-17. Renamed document closing stickup menu

You own the renamed document, and you are the only user who has write permission for the document. For a discussion of ownership and permissions, see *The Desktop Manager*.

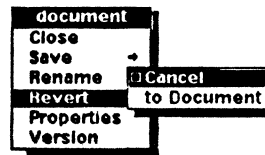
The Revert Command

On your desktop, you see an icon for only one of the versions of a document that exist. However, the other versions are accessible to you through the **Revert** command on the **Document Name** pulldown menu.

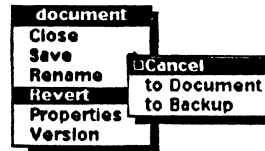
This **Revert** submenu grows or shrinks depending on which versions of a document exist at a particular moment.

There are several different sequences in which this submenu may change. *Figure 2-18* illustrates one sequence.

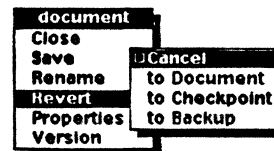
When you open a newly created document, the Revert submenu looks like this:



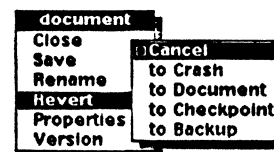
If you work for a while and then Save your document, the Revert submenu will look like this:



If you enter many characters and the system checkpoints the document, the Revert submenu will look like this:



If your computer crashes and you File your document, the Revert submenu will look like this:



When you Save your document the next time, the Revert submenu will look like this again because Crash and Checkpoint files are removed when you Save:

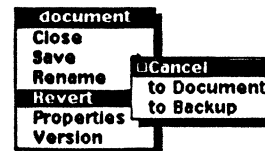


Figure 2-18. Revert submenu sequence

You can use the Revert command to browse through as many of the versions as you like, but it is important to remember that once you save your document, whichever version you save becomes the *document file*. The next time you look at the Revert submenu, you will see only *document* and *backup files* listed.

When to Use the Revert Command

When you open a document on your desktop, the *document file* is the version that, in most instances, opens automatically. There are two exceptions to this rule:

- if something is wrong with the *document file* and it cannot be opened;
- if there is a *crash file* of the document.

If a *document file* is damaged in some way, it cannot be opened. For example, if there is a power failure while the software is saving a document before closing it, the *document file* may be unreadable. If so, when you try to open it, a message will be displayed in the status line telling you what is wrong with the file. If there are any other versions of the document, you will also see a stickup menu (Figure 2-19) and can choose the appropriate action.

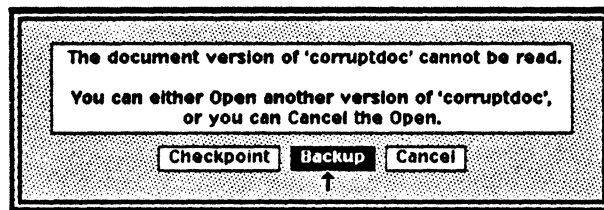


Figure 2-19. Damaged document stickup menu

The other case in which the *document file* does not open automatically occurs if there is a *crash file*. If there is a *crash file* when you open a document, you get a stickup menu asking which of the existing versions of the document you want to open (Figure 2-20).

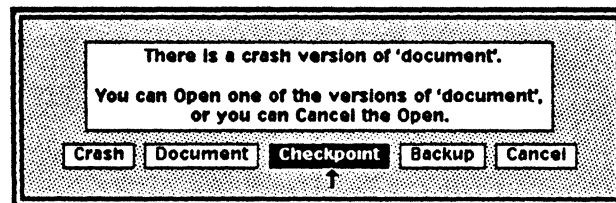


Figure 2-20. Crash version stickup menu

In most cases, if there is a *crash file*, this is the version you want to open since it is usually the most up-to-date version of your document. However, you can open any version of a document you choose and then use the **Revert** command if the version that opens is not the one you want or if you just want to look at other versions.

Canceling a Revert Command

You can use the **Interrupt** stickup menu to cancel a **Revert** command. When you cancel a **Revert** command, the document is automatically closed.

When you use the **Revert** command, the most important things to remember about the various versions of a document are:

If there is a *crash file*, it is almost invariably the most up-to-date version of the document.

If there is a *checkpoint file*, it is more up-to-date than the *document file*.

The *document file* is more up-to-date than the *backup file*.

Whichever version you save becomes the *document file*.

Changing Document Properties

If you choose **Properties** on the **Document Name** pulldown menu, you will see the **Document Property** sheet. *Figure 2-21* shows the sheet with the system defaults set.

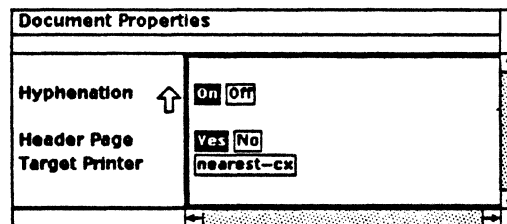


Figure 2-21. Document property sheet

Hyphenation

When you create a new document, hyphenation points are automatically inserted in words by the system. This does not mean that you *must* hyphenate your document. It does mean that, if you choose to hyphenate, you do not have to wait for while the software hyphenates the document.

Hyphenation is turned *on* as the default, so the system will hyphenate words at the ends of lines when this is appropriate. You can turn hyphenation *off* for components on their **Component Property** sheet, but it must be turned *on* on the

Document Property sheet if you want hyphenation to work anywhere in a document. How hyphenation works is discussed the chapter *Text Processing*.

To reverse the hyphenation setting for a document:

- ⇧ On the Document Property sheet, point the mouse cursor into the box opposite Hyphenation that is in normal video.
- ☐☐ Click the left button.
- ☐☐ Click the middle button to apply.

Header Page

When **Header Page** is turned *on*, a page giving details about the document you have printed is printed at the conclusion of each printing job (*Figure 2-22*). If you ever have trouble printing a document, Interleaf Customer Support will need the header page of the document in order to address the problem. Even if you do not care about the messages, the header page is useful as a way to separate jobs from one another at a busy printer.

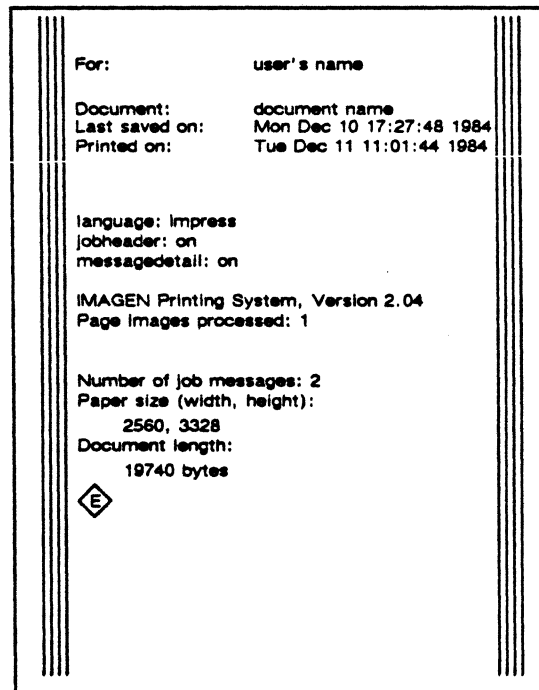


Figure 2-22. Printing header page

The default setting for Header Page is *on*.

To reverse the header page setting:

- ⇧ On the **Document Property** sheet, point the mouse cursor into the box opposite **Header Page** that is in normal video.
- ☐☐ Click the left button.
- ☐☐ Click the middle button to apply.

Target Printer

The default **Target Printer** setting is **nearest—cx**. The target printer information formats the document for this printer and saves the name of the target printer with the document so that it is the printer name to which the **Printer** pulldown menu defaults for the document.

If the target printer for a document is **nearest—cx** and you do not choose another printer's name on the **Printer** pulldown menu, the document will be sent to the **cx** printer that is physically closest to the workstation from which it is sent. If there is only one printer you can send documents to, both **nearest—cx** and the printer name that appears on the **Printer** pulldown menu refer to the same printer. The printer name is likely to be *cx#1*, though it could be a word like *backup* or *rover*.

Figure 2-23 shows the relationship between the **Target Printer** settings and the default on the **Printer** pulldown menu.

*To come

Figure 2-23. Target printer setting and Printer pulldown default

Using the Target Printer Setting

There are two situations in which you can use the **Target Printer** setting to your advantage.

Situation 1: Since the meaning of **nearest—cx** changes depending on which **cx** printer is closest to a particular workstation if your workstation is on a network, you can copy documents to other people's workstations, and the default on their **Printer** pulldown menu for these documents will automatically become their closest **cx**.

Situation 2: When you can print documents on more than one printer, there may also be times when you want to change the **Target Printer** for some of your documents. For example, if your nearest **cx** is **cx#1** and there is a document that you always prepare and print for a department that is closer to **cx#2**, it will save you or someone else time and steps if you change the **Target Printer** for this document from **nearest—cx** to **cx#2**.

If you want to print a document on a different printer only occasionally, you do not need to change the **Target Printer**. Instead, you can use the options on the **Printer** pulldown menu discussed in the next section.

To select a different Target Printer if you have more than one printer:

- ⇧ On the **Document Property** sheet, point the mouse cursor into the box with the name of the target printer in it.
- ☐☐☐ Click the left button to move forward through the printers (i.e., if you are attached to four printers and your target printer is **nearest—cx**, clicking the left button once will change your target printer to **cx#2**).
- or ☐☐☐ Click the right button to move backward through the printers (i.e., if you are attached to four printers and your target printer is **nearest—cx**, clicking the right button once will change your target printer to **cx#4**).
- ☐☐☐ Click the middle button to apply.

Printing

There are three ways to print a document using the Interleaf publishing software. The first, which directly prints a document that is open on your desktop, is usually preferable.

The second method involves making an *impress file* of an open document and, then, printing it from the operating system. This method is useful when you have a long document that you have trouble printing directly because you do not have enough space on your workstation.

The third method involves using either **Save → Ascii** or **Save → Ascii—Forced** and, then, printing the document from the operating system. When you save an Ascii file and print it from the operating system, the printed document will not look at all like an Interleaf document because it will not have multiple type fonts or graphics. The only reason to print the Ascii version of an Interleaf document is so that you can see the Ascii formatting instructions for an Interleaf document.

Direct Printing

When you print an open document directly, the software makes a copy of your document and sends it to the printer. You use the **Printer** pulldown menu to print directly. *Figure 2-24* shows the **Printer** pulldown menu with the direct printing submenu.

The default on the menu is direct printing of a single copy of your entire document.

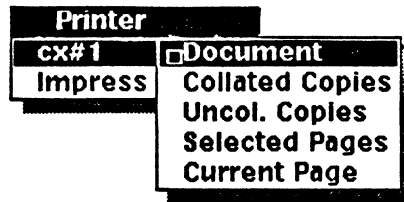


Figure 2-24. Printer pull-down menu

Printing Copies of a Document

You can also choose to print more than one copy of a document and have these copies collated or uncollated.

When you print **Collated Copies**, all the copies are made on your own workstation and then sent to the printer. Making multiple copies ties up your workstation for a long time, but it saves you time at the other end because you do not have to collate the printed copies.

Because the storage space on your workstation is likely to be inadequate to the task, printing collated copies may be impractical if your document is long or you want to make many copies.

When you print **Uncol. Copies**, only one copy of the document is sent from your workstation to the printer. Then, at the printer, multiple copies of each page are made.

Printing Selected Pages of a Document

When you choose to print **Selected Pages**, you will be asked to type in the range of pages you want to print. These pages must be consecutive. You may print more than one copy of the selected pages, and the copies will be collated. If you do not specify the number of copies you want printed, one copy will be printed.

Printing the Current Page of a Document

When you choose to print the **Current Page**, one copy of the page that is registered in the Page box in the document header will be printed.

How to Print an Open Document

To print an open document:

- Move the mouse cursor into the Printer box in the document header.
- ☐☐ If you want to print one copy of the whole document on your target printer, click the middle mouse button.

- or Hold down the middle mouse button to see the Printer pulldown submenu.
- Move the mouse cursor until the name of the printer you want is in reverse video.
- Move the mouse cursor onto the submenu.
- Release the mouse button when the option you want is in reverse video.

To cancel printing:

- Hold down the CTRL key, and type g.
- or Use the Cancel command on the Interrupt stickup menu (see *Figure 2-2*).

Impress Files

Another way to print a document uses an *Impress file*. You make an *Impress file* when you have a document open, but you must use the operating system to print the file. While direct printing creates a file that goes away as soon as the *print file* is sent to the printer, *Impress files* are like other Interleaf publishing software files and remain on your desktop until you cut their icons or remove them through the operating system. The icons for *Impress files* cannot be opened.

Impress files have their uses, but you should exercise caution with them. You should not keep *Impress files* around once you have used them because changes to the printer software could affect the way they print.

Also, in future releases, this format may change in ways that will make the *Impress files* you create today obsolete. Therefore, when you create an *Impress file*, you must be sure to keep the *document file* if you are going to need to use the document again.

The *Impress* choices are the same as the ones for direct printing except that you cannot make uncollated copies.

To make an Impress file:

- Move the mouse cursor into the Printer box in the document header boxes.
- Hold down the middle mouse button to see the Printer pulldown menu.
- Move the mouse cursor until *Impress* is in reverse video.

- ☐ Move the mouse cursor onto the **Impress** submenu (Figure 2-25).

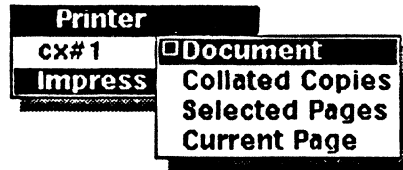


Figure 2-25. Impress submenu

- ☐ Release the middle button when the choice you want is in reverse video.

Once you have an *Impress file*, you must print it from outside of the Interleaf publishing software.

Printing an Impress File

Because of insufficient memory on your workstation, it is sometimes impossible to print directly all of a long document at one time. In these situations, it is usually possible to make an *Impress file*.

In the operating system, *Impress files* have an extension added to their names. For example, the *Impress file* for a document named *symbols* will be named *symbols.imp*.

You print an *Impress file* by invoking an operating system command called the *Line Printer Request (lpr)*.

To print an *Impress file* on the default printer:

- ☐ At an operating system prompt, type

`lpr documentname.imp <RETURN>`

For example, to print an Impress file named Schedule.imp, type
`lpr Schedule.imp <RETURN>`.

If you want to print an *Impress file* on a printer other than your default printer, you can do so by using the **-P** option. For example, if your default printer is **cx#1**, and you want to print on **cx#2**,

- ☐ At an operating system prompt, type

`lpr -Pcx#2 documentname.imp <RETURN>`

When you send a document to be printed, there is a period of time when two copies of the *Impress file* must exist on your workstation. Therefore, because of

storage difficulties on your workstation, it may be impossible to print an *Impress file* using the regular *lpr* command.

There is a printing option that you can use to your advantage in such a circumstance. The *-s* option creates a symbolic link that makes it unnecessary for the system to create a second *Impress* file on your workstation.

To print an *Impress* file most efficiently on the default printer:

- At an operating system prompt, type

```
lpr -s documentname.imp <RETURN>
```

You can combine the *-P* option and the *-s* option and print efficiently on a printer other than your default printer.

If you need to change which printer is your default printer, see your system administrator.

Ascii Files

You can print an Ascii file from inside the Interleaf publishing software or from outside the system. If save an Interleaf document in Ascii and print it from inside the Interleaf publishing software, the result will be an Interleaf document with multiple type fonts and graphics intact. If save an Interleaf document in Ascii and print it from the operating system, the printed document will not resemble an Interleaf document. It will be much longer than an Interleaf document and contain only text in typewriter font and extensive formatting instructions (graphics, for example, will be nothing but a large assemblage of numbers).

Printing Ascii Files from the Operating System

There is a printer command for printing Ascii files from the operating system, the *Ascii Line Printer Request (alpr)*. It has one limitation that neither direct printing nor printing *Impress files* has, and it can take several options.

The limitation is that you can print an Ascii file only on the printer that is closest to your workstation.

To print an Ascii file from the operating system:

- At an operating system prompt, type

```
alpr documentname.doc <RETURN>
```

The two options that are available when you print an Ascii file are *-l* (for *Landscape Orientation*) and *-L* (for *legal size*). If you want to print an Ascii

document on legal size paper, you must have a cassette for legal size paper or manually feed the paper into the printer.

The **Orientation** of pages is built into the format of a document as a result of the selection you make on the **Page Property** sheet, which is discussed in the next section.

Orientation and Size of Pages

The items on the **Page Property** sheet are primarily concerned with page makeup and are discussed in detail in *Page Makeup*. However, three settings on the sheet, **Orientation** and the **Height and Width** of pages, are directly involved with printing and are discussed in this section.

To open the **Page Property** sheet:

- ✓ Operadocument.
- ▲ Point the mouse cursor into the **Page** box in the header bar of the document.
- ☐☐☐ Hold down the middle mouse button to see the **Page** pulldown menu (*Figure 2-26*).

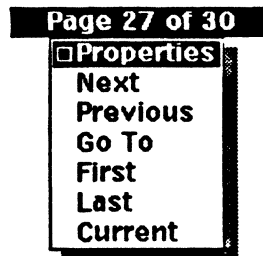


Figure 2-26. Page pulldown menu

- ☐☐☐ Release the button when **Properties** is in reverse video. (Initially, **Properties** is the default on this menu, but the default changes with some of the choices for make. If you choose **Next**, **Previous**, or **Go To**, that choice becomes the temporary default.)

Figure 2-27 shows the relevant part of the **Page Property** sheet with the defaults set.

Page Properties	
Orientation	Portrait Landscape
Height ↑	11 Inches
Width	8.50 Inches

Figure 2-27. Portrait Orientation and Height and Width on the Page Property sheet

When you change the Orientation to Landscape, the Height and Width of the page are automatically reversed (*Figure 2-28*).

Page Properties	
Orientation	Portrait Landscape
Height ↑	8.50 Inches
Width	11 Inches

Figure 2-28. Landscape Orientation and Height and Width on the Page Property sheet

Orientation refers to the direction in which the contents of a document are printed. In *Figure 2-29*, the page on the left is in **Portrait** mode, and the page on the right is in **Landscape** mode.

All the pages of a particular document must be of the same **Orientation**.

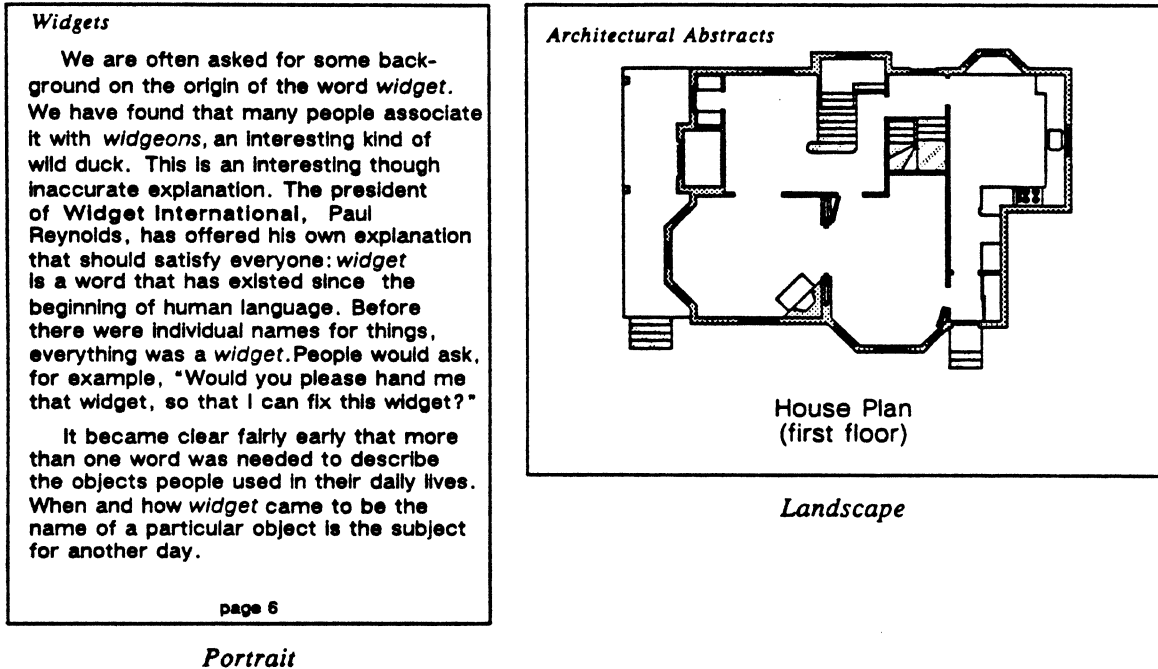


Figure 2-29. Orientation of pages

The paper cassette that comes with your cx printer holds paper that is 11 inches by 8.5 inches, and this is the default page size.

You can make the Height and Width of your pages smaller and either manually feed smaller paper into the printer or use the cassette for 11 by 8.5 inch paper and trim the pages later to the size you want them.

If you have a legal-size cassette, you can print pages up to 14 by 8.5 inches. If you do not have a legal-size cassette, you must manually feed legal-size paper into the printer.

Following a Document Through the Printing Process

No matter which of the three methods you use to print a document, the document you send goes to the workstation that functions as a server for the printer. This workstation keeps track of each document and makes sure that it is printed when it is its turn. You can find out whether the printer is operating and also where your document ranks in the print queue through another operating system command, the *Line Printer Queue* command.

To list the print queue for your default printer:

- ☐ At an operating system prompt, type

lpq <RETURN>

Figure 2-30 shows what a typical queue looks like.

cx1 is ready and printing				
Rank	Owner	Job	Files	Total Size
active	md	431	ascii.imp	57831 bytes
1st	kath	254	fonts.imp	594333 bytes
2nd	tim	132	desktop.imp	32465 bytes
3rd	sam	654	list.imp	452145 bytes
4th	jm	512	revision.imp	54095 bytes

Figure 2-30. Line Printer Queue listing

You can also see the queue listing for a printer other than your default printer by using the *-P* option.

Sometimes you will send something to print and realize that you do not want to print it at this moment. When that happens, you can remove it from the print queue. You can remove only the documents that you own.

To remove a document from the print queue of your default printer:

- ☐ At an operating system prompt, type

lprm job_number <RETURN>

For job number, see Figure 2-30.

You can also remove a document from the print queue of a printer other than your default by using the *-P* option.

To remove a document from the print queue of a printer other than your default printer:

- ☐ At an operating system prompt, type

lprm -Pprintername job_number <RETURN>

For example, if you were the owner of revision.imp and were printing it on a printer named backup that was not your default printer, you would remove it from the print queue by typing

lprm -Pbackup 512 <RETURN>

Chapter 3

Text Processing

The text processing features of the Interleaf publishing software are designed for convenience and flexibility.

The Interleaf software uses an editor that enables you to establish and change the format for a document easily. This editor encourages you to experiment with different formats for different parts of a document since you can as easily return to your original state if you do not like the results of your experimentation.

All Interleaf documents are made up of *components*, which are the building blocks which structure a document. The empty document you can create on your desktop has in it a single component, named *paragraph*. This component has a set of property sheets that tell everything about this component and its relationship to other components that are not yet defined.

From this one component, you can construct a varied format. For example, this *Reference Manual* started with that one *paragraph*. Now it consists of a number of different kinds of components that were given the properties appropriate to their functions in the manual.

On this page, there are components named *title2*, *para*, and *note*, among others. Any time we create a *note* component, we know that it will have a left margin of *1.5 inches* and be appropriate for a information that we want to stand out from the rest of the text on a page. If we decided that the information in a *note* was not so special after all, we could change the *note* into a *para* by using another feature of the editor.

A great many editing features are also available to you when you are editing the text of a component. For example, one of the properties of each component is its typeface, but, within the text of a component, you can change the typeface of any portion you like. On this page most of the text is in 12-point Classic roman, but there are regions of text in several components that is text in 12-point Classic *italic* type.

The details of how text editing features work and how to use them effectively are the subject of this chapter.

If you have not already done so, please read *SignPosts*, the first chapter of the *Reference Manual*. It is a short overview of the Interleaf publishing software that provides the essential concepts needed to use this manual effectively.

This chapter covers the following major topics:

- the component bar popup menus and the **Format** sheet of the **Component Property** sheets
- the text popup menus
- hyphenation
- the Page box and pulldown menu and scrolling
- tabs and the **Tabs** sheet of the **Component Property** sheets,
- search and replace operations
- the keyboard





Overview of Text Processing



Text processing has a number of aspects, some of which interact with one another. We have made the sections of this chapter as independent of each other as possible. However, when there are interdependent functions—as is the case of the **Cut**, **Copy**, and **Paste** commands—several commands on several different menus are discussed together.

The Cursors in a Document Window





When you are working in a document window, there are two cursors, the *mouse cursor* and the *editing cursor*, and both take various forms depending on circumstances.

The Mouse Cursor

On your desktop, you have already seen the mouse cursor as an arrow  and as a square  on a popup menu. You may also have seen it as an arrow  on a property sheet and as a triangle  in a directory header or scrollbar.

The two mouse cursor shapes that you will find only in document windows are the diamond  and the chevron .

The following is a list of the mouse cursor shapes in a document window:

-  is its shape in the component bar;
-  is its shape in text;
-  is its shape in the header bar and in the scroll bars;
-  is its shape on pulldown and popup menus.

In text, the editing cursor can also take different shapes depending on whether the font at the cursor position is roman, bold, or italic and on whether the editing cursor is by itself or has the mouse cursor merged into it.

As long as the mouse cursor is somewhere in the document window, you can edit text in a document. If the mouse cursor is in the component bar, the header, or a scrollbar when you begin editing text, it remains where it is until you move the mouse. However, if the mouse cursor is on the text page itself, it is merged into the editing cursor as soon as you use the keyboard. This has two major effects:

- the mouse cursor will not get in the way of your editing as it might if it were independent of the editing cursor;
- you know exactly where the mouse cursor is when you want to use it to do something, such as mark text or scroll your document.

The list below shows the shape of the editing cursor in text. On the left is the shape of the plain cursor, and on the right is shape of the cursor when the mouse cursor is merged into it. On the screen the differences are more obvious than they are here because the cursor is larger.

- ▲ ▲ are the shapes when the font is roman;
- ▲ ▲ are the shapes when the font is bold;
- ▲ ▲ are the shapes when the font is italic.

The Component and Text Popup Menus

Text processing uses paired popup menus in the same way that most of the rest of the Interleaf publishing software does. You see one menu when a location is selected in the component bar or in text and another when components or text are selected.

In the component bar, these two menus are the **Component Location Selected** and the **Component Selected** popup menus. In text, they are the **Text Location Selected** and the **Text Selected** popup menus (*Figure 3-1*).

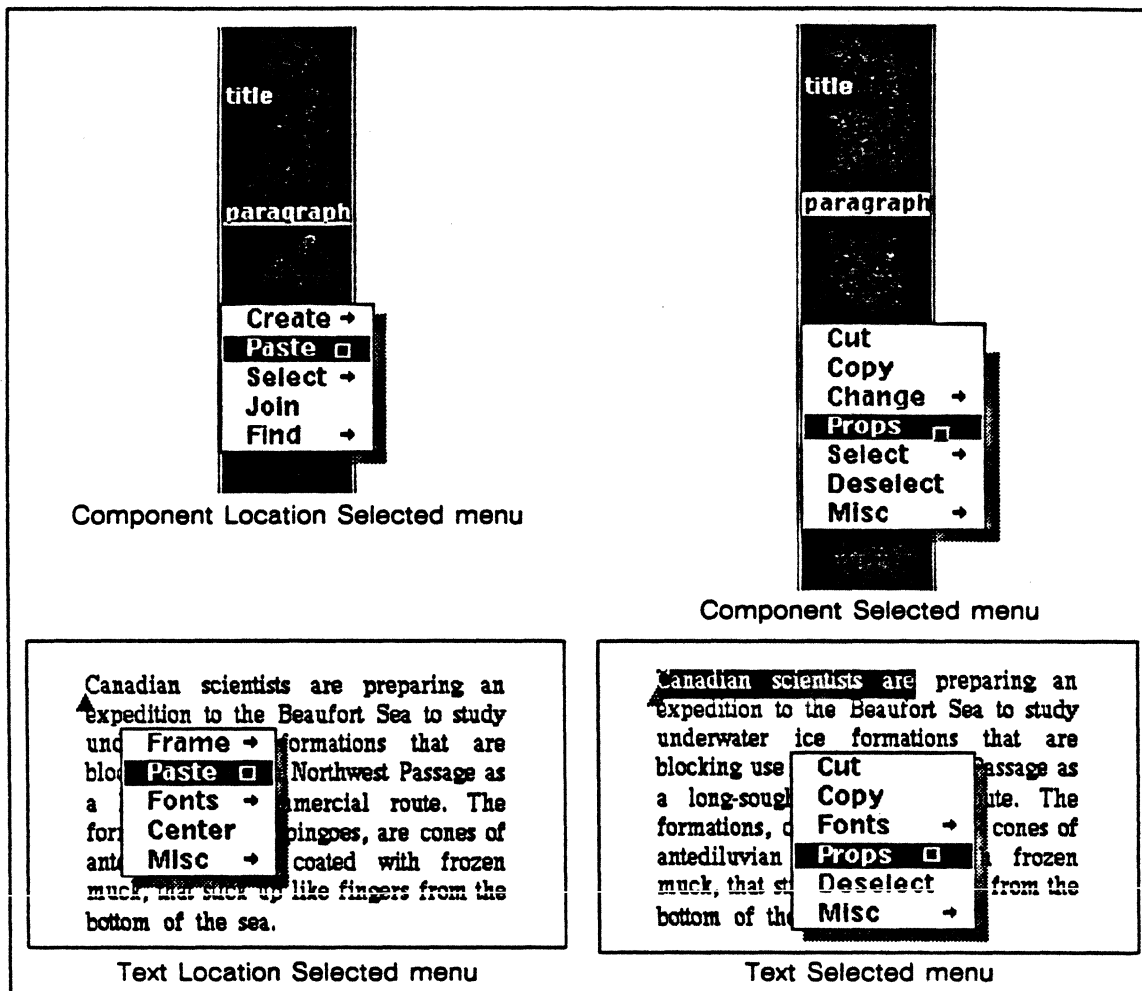


Figure 3-1. The Component and Text popup menus

When the mouse cursor is in the component bar and you hold down the middle mouse button, you see one of the Component menus.

- When there is a white line above or below a component name, you see the Location Selected popup menu. The white line is the *component caret*.
- When one or more of the component names is in black type in a white box, you see the Component Selected popup menu.

When the mouse cursor is in text and you hold down the middle mouse button, you see one of the Text menus.

- When nothing in text is selected, you see the Text Location Selected menu.

- When something in text is selected, you see the **Text Selected** menu. Selected text is displayed in reverse video.

The Component Location Selected Popup Menu

The **Component Location Selected** popup menu has five commands on it, three of which have submenus. In this section, we discuss:

- the *component caret*
- the **Create, Join, and Find** commands on the **Location Selected** popup menu.

The **Paste** command is discussed with **Cut** and **Copy** in the section, *Cut, Copy, and Paste*. The **Select** command is discussed in the section, *Selection*.

The Component Caret

The *component caret* always indicates the direction in which an action will occur when you choose a command on the **Component Location Selected** popup menu. *Figure 3-2* shows examples of how the placement of the *component caret* affects the direction of an action.

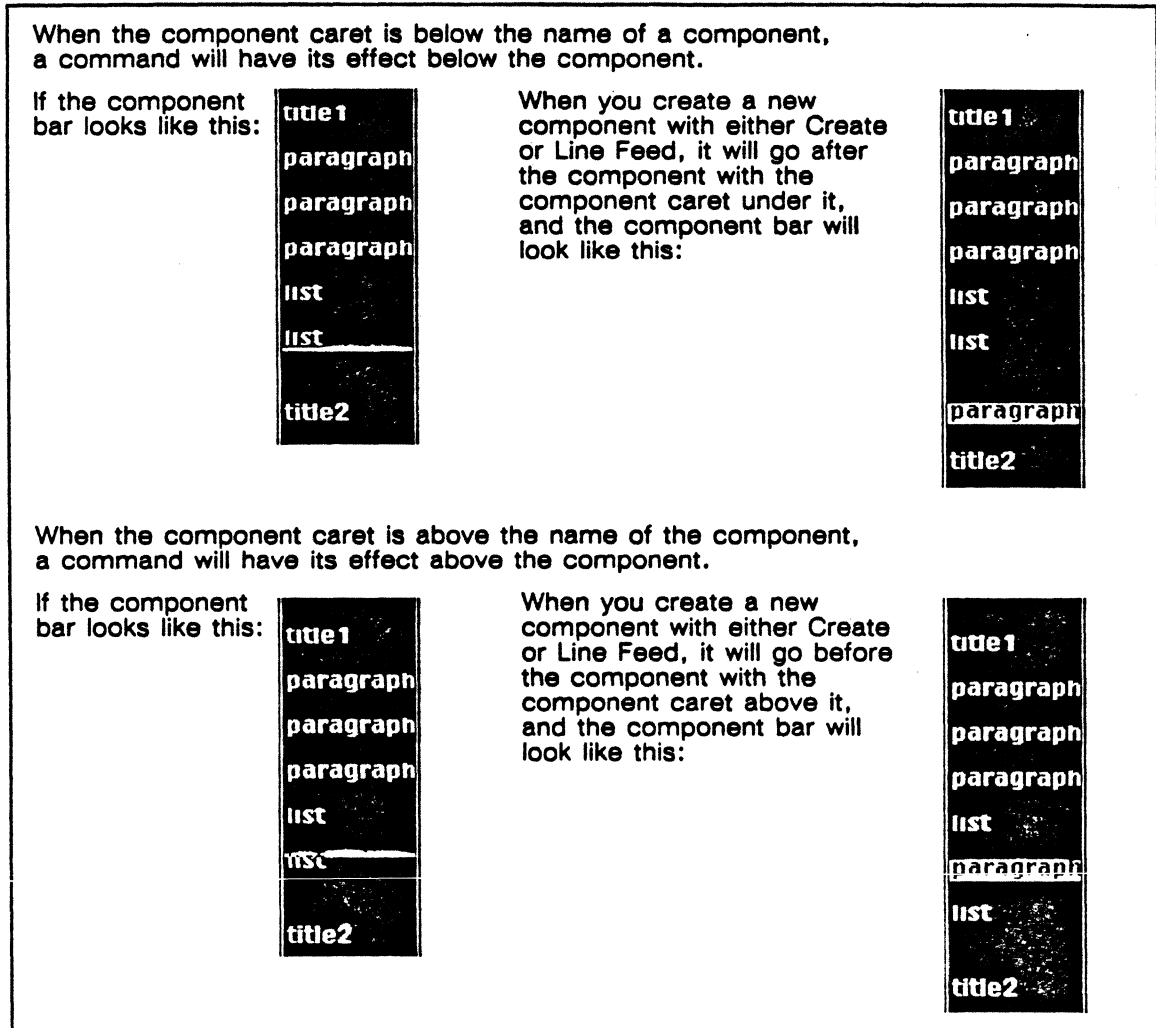


Figure 3-2. The meaning of the component caret

The *component caret* has an additional meaning when you use the LINE FEED key to create a new component. The new component will have the properties of the component with the *component caret*.

A usage note: When no components are selected, the *component caret* is always either directly above or directly below the name of one component, but the caret does not represent a property of that component. Rather, it represents a location; and, except when the caret is before the first component or after the last, this location is always *between* two component names. To simplify some references, we often refer to “the component with the component caret” or “the component with the caret” to mean the component the caret is closest to.

The Create Command

The **Create** command has a submenu listing the names of the components in the document. With this command, you can create any kind of component at any location in your document. This command is used most often when you want to create a component that is different from the one with the editing cursor in it.

The **Create** submenu is dynamic, which means that it grows when you add component names and shrinks when you subtract them (*Figure 3-3*).

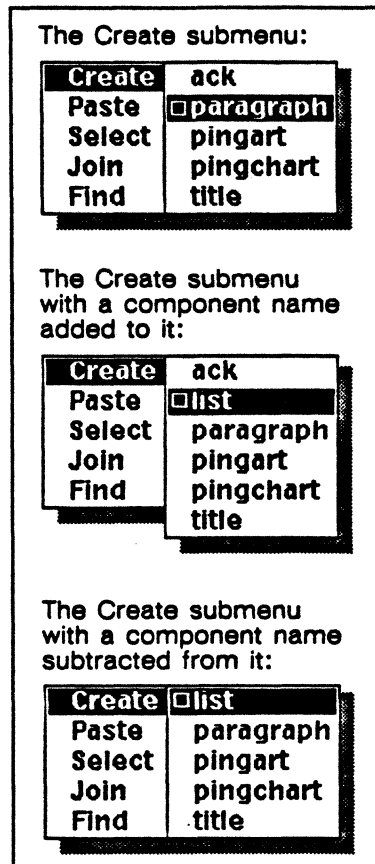


Figure 3-3. A dynamic menu

The **Create** command uses the first component of each name in a document as the standard for that component. When you invoke this command, the system creates a component like the first component of the name you choose at the location of the component caret.

The default on the **Create** submenu is the name of the component with the caret.

Using the Keyboard versus Using the Create Command

It is possible to use the keyboard as well as the **Create** command to create components. You can use either method at any time, but there are differences between them that you can use to your advantage in certain situations.

Using the Keyboard

When you use the keyboard to create a component, the new component is exactly like the component with the component caret. This is often what you want. For example, if you are typing a list of 20 items, you want one identical *list* component to follow another, and you can create them with the **LINE FEED** key without taking your hands off the keyboard.

When you use the keyboard to create a component and then want to make sure the component is like the standard component of its name, use the **Change** command on the **Component Selected** popup menu. See the section, *The Component Selected Popup Menu* for details of this command.

Using the Create Command

There is one time when it is more convenient to use the **Create** command than the **LINE FEED** key to create a component of the same name as the component with the component caret: If you have changed a property of the component with the component caret so that it is different from the standard component of its name, use the **Create** command if you want your new component to be standard.

The **Create** command uses the first component of each name in a document as the standard for that component.

The Join Command

The **Join** command unites one component with another. If the component caret is above the component name, **Join** unites this component with the one above it. If the component caret is below the component name, **Join** unites the component with the component below it.

There are two things to understand about this command: First, if the component with the caret is different from the component being joined to it, the combined component will have the name and properties of the component that was originally with the caret. Second, you will usually have to insert a space at the place where the two components are joined. The editing cursor will be at the point where the two components are joined, so inserting a space is very simple.

The Find Command

The **Find** command is used to reach a specific component quickly. When the command finds the specified component, it moves the component caret and the editing cursor to this component. If the component caret was above the component name when the **Find** command was initiated, it will be above the found component name. If it was below, it will be below. The editing cursor will be at the beginning of the component.

If the **Find** command reaches the end or the beginning of the document without finding the component you are looking for, you will see a stickup menu asking you if you want to continue the operation by wrapping to the beginning or the end of the document.

Find First and Find Last Component

Find First and **Find Last** give you quick ways to scroll to the beginning or the end of your document.

Find Previous Component

Find Previous finds the component immediately before the component with the caret. It is useful when the name of the previous component is not visible in the window.

Find Next Component

Find Next finds the component immediately after the component with the caret. It is useful when the name of the next component is not visible in the window.

Find Previous of and Find Next of

Find Prev of and **Find Next of** both have submenus of the list of component names for the document. With either of these commands, you can find a close-by example of a named component.

These commands can be useful in a number of situations. For example, you may not be sure whether you want to create a *list* or a *steps* component. If you execute **Find →** **Prev of →** **list** or **Find →** **Next of →** **list**, you will be able to see whether *list* or *steps* is the appropriate component for you to create.

You may also be wondering if you need to create a new component with somewhat different properties from either *list* or *steps*. With **Prev of** or **Next of**, you can find examples of each and look at their property sheets to see whether or not you need a new component.

The Text Location Selected Popup Menu

The **Text Location Selected** popup menu has five commands on it, three of which have submenus. In this section, we discuss:

- the *editing cursor*
- the relationship between the *editing cursor* and the *component caret*
- and the **Fonts**, **Center**, and **Misc** commands on the **Location Selected** popup menu

The **Paste** command is discussed with **Cut** and **Copy** in the section, *Cut, Copy, and Paste*, and the **Frames** command is discussed in the chapter *Page Makeup*.

The Editing Cursor

Like the component caret in the component bar, the *editing cursor* in text represents a location.

- When you start typing, the characters you type are inserted starting from the editing cursor. As you type, the cursor moves to the right across a line and then to the beginning of the next line when it reaches the right margin of the component.
- When you choose any of the commands on the **Text Location Selected** popup menu, the position of the editing cursor determines where the action occurs.
- When you are selecting text, the editing cursor represents the starting location for the selection. The selection can go forward or backward in text or in both directions, but the editing cursor stays where it starts.

You can move the editing cursor around in text in several ways:

- When you *hold down the left mouse button* and move the mouse, the editing cursor moves with the mouse cursor. This is the quickest way to move the editing cursor and an accurate way to position it when you get it where you want it. When you move the cursor this way, your document scrolls automatically when the mouse cursor reaches a window boundary.
- You *can move the mouse cursor* to the location where you want the editing cursor and *click the left button* to bring the editing cursor there. This is a slower and less accurate way to position the cursor, but some people prefer it.
- You can *use the arrow keys* on the keyboard. For details, see the section, *Keyboard*.

The Editing Cursor and the Component Caret

When the component caret is visible, the editing cursor is *always* in the text of the component with the caret. If you move the caret to another component, the editing cursor moves to the beginning of that component. If you move the editing cursor from the text of one component into the text of another component, the component caret moves, too. In this case, the caret will be above the component name if it was above the other component name and below if it was below.

The Fonts Command

The **Fonts** submenus make it possible for you to change fonts in text as you are typing.

Several of these commands are also available from the keyboard, so that you do not have to remove your hands from the keys in order to implement them. Where this is possible, the keyboard method is given in parentheses after the description of the mouse command in the following list.

Last Font

Last makes it possible for you to switch fonts and then switch back to the most recent font you used before the current one without going beyond the first submenu. Since there are commands that toggle between bold and roman and italic and roman on the same submenu, this command is most useful when you have used a font of a different family or size and now want to return to the font you were using. (On a Sun120 or a Sun50, press **P3**; on a Sun100, press **P1**).

Pickup Font

Pickup makes it possible for you to switch easily to any font that is in the text you can see in the document window.

To execute the pickup command:

- ✓ Position the *editing cursor* where you want the new font.
- ✓ Point the *mouse cursor* at a word in the font you want to use.
- ✓ Hold down the middle mouse button, and release it when **Pickup** is in reverse video.

Pickup is the default on this menu unless you have done something to change it temporarily.

Font Family

Family leads to a submenu with the listing of the available font families. These family names also have submenus of the sizes available in each family. You can, therefore, choose a family and a size in one action.

Font Size

Size is the option to choose if the font family at the cursor position is what you want, but the size is not. **Larger** is the default unless you have changed to another setting on the submenu (*Figure 3-4*).

(On a Sun120 or a Sun50, press **F8** key for a smaller size and **F9** for a larger size font.)

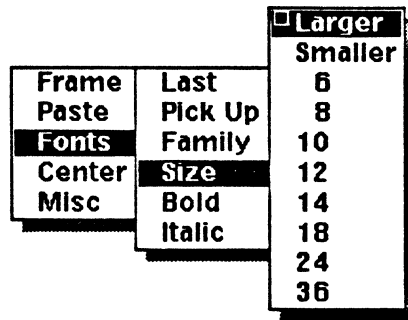


Figure 3-4. The Size submenu of the Fonts submenu

Bold and Italic

Bold and **Italic** are both commands that toggle the current font.

If the font designated in the Font box in the document header is roman, releasing the mouse button when **Bold** is in reverse video will change the font at the cursor position to bold (if bold is available in the family and size).

If the font designated in the Font box in the document header is bold, releasing the mouse button when **Bold** is in reverse video will change the font to roman.

Italic works the same way.

(On a Sun120 or a Sun50, press **P4** for **Bold** and **P5** for **Italic**; on a Sun100, press **PF2** for **Bold** and **PF3** for **Italic**.)

The Center Command

The **Center** command scrolls the document whatever amount is necessary to center the editing cursor in the document window.

This is a very useful command when you are editing towards the top or the bottom of the text in the window and would like to see the surrounding text while you edit.

There is another circumstance in which it is also very useful. Except for **Go To**, the commands on the **Page** pulldown menu do not change the position of the editing cursor. This is also true when you use the scroll bar for scrolling. These scrolling methods are particularly appropriate when you want to look through your document, but do not want to move the editing cursor from its location. When you have finished browsing, you can execute the **Center** command, and the page with the editing cursor on it will be immediately before you with the editing cursor centered in the window.

The Misc Command

The **Misc** command has a submenu with four commands on it, three of which have submenus of their own. *Figure 3-5* shows the **Misc** submenu. **Split** and the

Show submenu are discussed in this section. The Tabs submenu is discussed in the section, *Tabs*, and the Hyphen submenu is discussed in the section, *Hyphenation*.

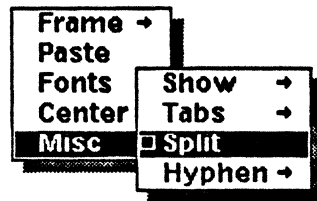


Figure 3-5. Misc submenu of the Location Selected popup menu

Split

Split is the default command on the Misc submenu unless you have changed defaults temporarily. It causes a component to break into two components of the same name at the editing cursor position.

The Show Submenu

All of the items on the Show submenu (Figure 3-6) are toggle settings.

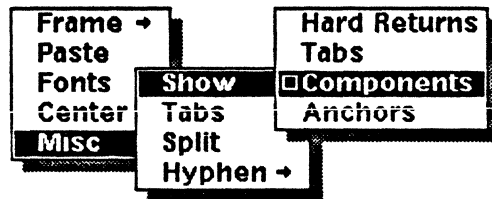


Figure 3-6. The Show submenu

Each of these items can be set so that you see a representation on the screen. None of these representations is printed. The defaults for all these settings is *on*.

- *Hard Returns* are represented by ¶.
- *Tabs* are represented by a dotted line. See the section, *Tabs*, for a discussion of Tabs.
- If *Components* is *on*, the component bar with the names of the components is visible.
- If *Anchors* is *on*, each frame anchor is represented by (see the chapter *Page Makeup* for more information about frames and their anchors).

Selection in the Component Bar

As elsewhere with this software, you can use the left and right mouse buttons to select components. There are also some selection and deselection commands on the **Component** popup menus.

Mouse button selection and popup selection of components are discussed together in this section because users combine them in various ways, and they are the bases for many other commands. The details of the **Component Selected** popup menu are discussed later in this chapter, but two commands on it, the **Select** and the **Deselect** commands, are discussed in this section because of their place in the selection process.

Using the Mouse Buttons to Select Components

You can use the mouse buttons to select components in several different ways. You will probably use most of these methods at one time or another and combine them in various ways.

The most efficient way to select one component is to hold down the left mouse button, move the mouse up or down in the component bar until the component you want to select is highlighted, and release the button. When you use this method, the document and the window scroll when the mouse cursor touches a window boundary.

You can also select a single component by positioning the mouse cursor over its name and clicking the left button.

Once you have selected one component with the left button, you can select a series of components by either holding down the right mouse button and sliding the mouse over the names of the components you want to select or by pointing the mouse cursor at each component and clicking the right mouse button.

The holding down method is more efficient if the components you want to select are in a series. The clicking method is more useful if the components are scattered throughout the document.

To add a series of components to your selection:

- ✓ Select the name of the first component in the series with the left mouse button, and slide the mouse cursor off this component name.

Sliding off is necessary, so that you do not deselect this component when you follow the next instruction.

☐☐ Holding down the right button, move the mouse cursor down or up the component bar to select the other components.

☐☐ Release the button.

After you release the button, you can move the mouse cursor in the component bar and add components to the ones you have already selected by repeating this process.

To add components that are scattered:

- ✓ Select the name of the first component with the left mouse button.
- ✓ Point at the names of each of the other components you want to select, and click the right mouse button.

Using the Select Commands on the Component Location Selected Popup Menu

There are Select commands on both the Component popup menus (*Figure 3-7*).

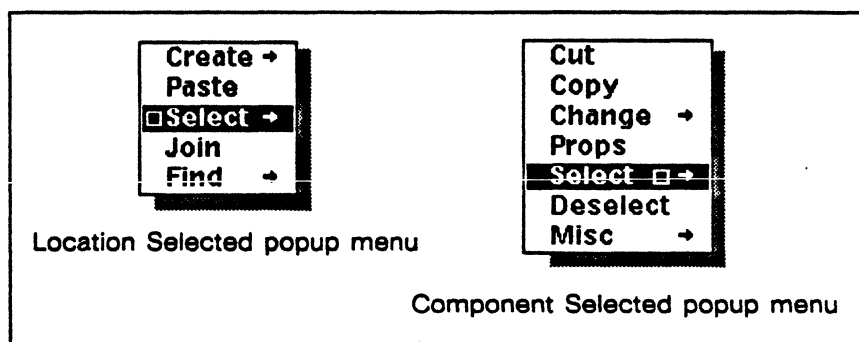


Figure 3-7. The Component popup menus

The Select command on the Location Selected popup menu has a submenu that gives you six options (*Figure 3-8a*), one of which has its own submenu (*Figure 3-8b*).

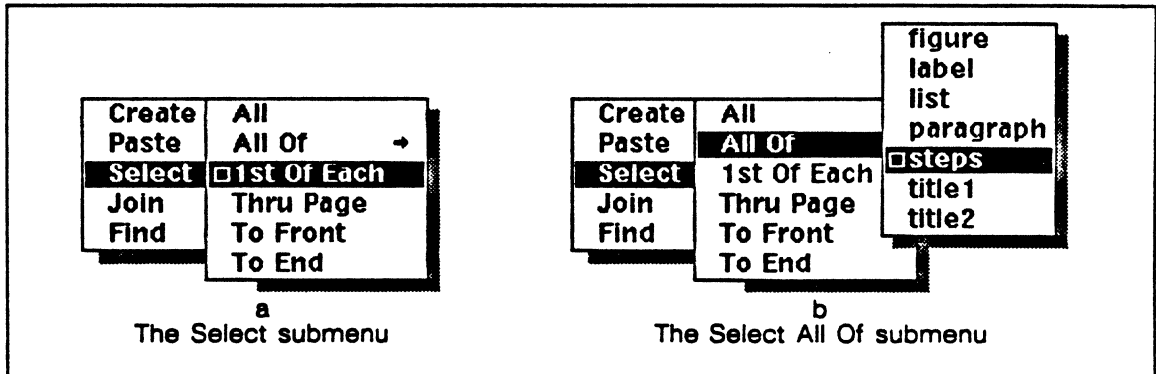


Figure 3-8, The Select submenus of the Location Selected menu

The Select All Command

Select All selects every component in the document.

The Select All Of Command

Select All Of has a submenu listing the names of the components in the document. With Select All Of, you can select all the components with a particular name. The default is the name of the component with the caret.

This command is useful when you want to do something like change all the *title3* components in your document to *title2*'s. You can Select All Of the *title3*'s, and then use the Change command on the Component Selected popup menu to change them to *title2*'s. (Note that *title3* will no longer appear on the Create/Change, etc. submenus. If you think you might want to use *title3* again later, be sure to keep one *title3* component around as a template.)

This Select All Of command may be combined with the Select All Of command on the Component Selected popup menu to construct tables of contents.

The Select 1st of Each Command

Select 1st of Each selects the first component with each name in a document. It is used to make templates for sets of documents you want to structure the same way.

The Thru Page Command

Thru Page selects all the components from the location of the component caret to the end of the page you designate on a stickup menu.

There are three things to remember about **Thru Page**:

- the command works in either direction—from the component caret position on *page 23* through the last component on *page 25* or from the component caret position of *page 25* through the first component on *page 23*;
- whether the component caret is above or below the component name determines whether it is included in the selection;
- if you are on *page 25* and execute a **Thru Page** command for *page 25*, the components on the below the component caret are the ones that will be selected.

The To Front and To End Commands

To Front selects all the components between the component caret and the beginning of the document. If the component caret is below the component name, the component will be included in the selection, while, if it is above the component name, the component will not be included.

To End selects all the components between the component caret and the end of the document. The position of the component caret has the same meaning for the **To End** command as for the **Thru Page** command: if it is above the component name, the component will be included in the selection, while, if it is below the component name, the component will not be included.

Selecting Additional Components

Once you have used the mouse buttons or the commands on the **Location Selected** popup menu to select components, when you hold down the middle mouse button you see the **Component Selected** popup menu, which gives you the commands that you can execute (for example, **Cut** or **Copy**). One of these commands is another **Select** command. The **Select** command on this popup is used to alter your initial selection. **All Of** on the **Select** submenu has a submenu of its own (*Figure 3-9*).

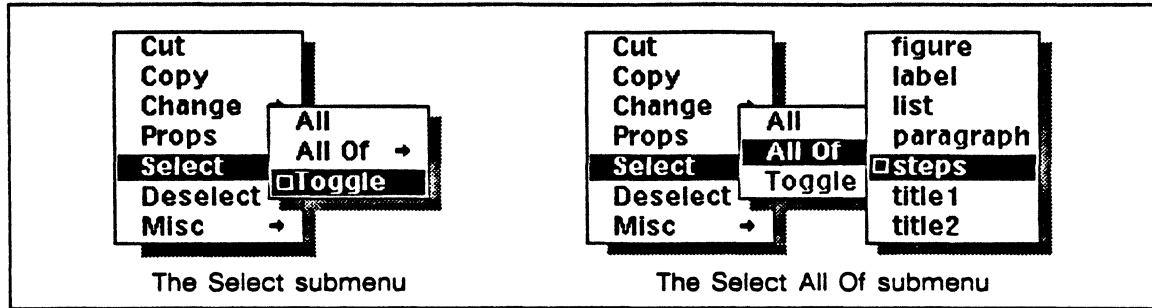


Figure 3-9. The Select submenus of the Component Selected menu

The Select All Command

Select All selects the rest of the components in the document.

The Select All Of Command

Select All Of lets you select all the components of a particular name. This command is useful when you want to create a table of contents. If the different kinds of components you want to appear in the table of contents have names like *title1*, *title2*, and *title3*, you can use the Select All Of command on the Location Selected popup menu to select the *title1*'s and then use the Select All Of command on the Component Selected popup menu twice to add the components named *title2* and *title3* to the selection.

The Toggle Command

Toggle deselects the selected components and selects the others. This command is useful when you want to do something like copy 50 components out of a total of 55 components. You can select the 5 you do *not* want to copy, and, then, use Toggle to reverse the selection.

Deselecting Components

There are several ways to deselect components. Which one you use depends on circumstances.

The following actions in text deselect the selected components and place the component caret below the name of the component the editing cursor is in:

- typing characters from the keyboard
- using the Frame, Paste, or Split command on the Text Location menu
- using the Cut command on the Text Selected menu

You can deselect individual components:

- by positioning the mouse cursor over their names and clicking the right mouse button,
- by holding down the right mouse button and moving the mouse cursor over the names of selected components.

When you use the **Deselect** command on the **Component Selected** popup menu:

- every selected component is deselected;
- the component caret is *below* the name of the component it was with when you started the selection (notice that the editing cursor has stayed in this component no matter how many components you have selected).

The second result makes **Deselect** particularly useful if you have been scrolling through the document selecting components and, then, decide you do not want to do what you thought you did. If you use the **Deselect** command and the component with the editing cursor in it is off the screen, move the mouse cursor into text, and execute the **Center** command on the **Text Location Selected** popup menu. The line where the editing cursor is located will be centered in the document window.

The Component Selected Popup Menu

With one or more components selected, when you hold down the middle mouse button, you see the **Component Selected** popup menu (*Figure 3-10*).

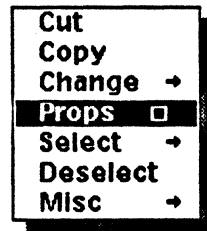


Figure 3-10. The Component Selected popup menu

Except for **Props**, you can use the commands on this menu on any number of components. You can see the property sheet for only one component at a time, and a message in the status line informs you of this if you choose **Props** when more than one component is selected.

Change, **Props**, and the **Misc** submenu are discussed in this section. **Cut** and **Copy** are discussed in the section, *Cut, Copy, and Paste*. **Select** and **Deselect** are discussed in the section, *Selection in the Component Bar*.



The Change Command

The **Change** command makes it possible for you to alter the properties—including the name—of components in certain ways without opening component property sheets. When you use the **Change** command, the selected components are changed to be like the component you choose on the **Change** submenu.

The **Change** command, like the **Create** command on the **Location Selected** menu, uses the first component of each name in a document as the standard for that component. When you invoke the **Change** command, the software makes the properties of the selected components like the properties of the first component of the name you choose.

The command is useful when you want to change a component completely; for example, change a *list* component to a *paragraph* component.

It is also useful when you want to be sure a component is exactly like the first component by the same name in the document.

A third use occurs when you paste components from other documents. If the *paragraph* components you paste are in 10-point Modern roman and the *paragraph* components in the document you are pasting them into are in 12-point Classic roman, you can change the font (and other properties, too, of course) of the pasted *paragraphs* by selecting all of them and using  .

This sequence assumes that you have not pasted a 10-point Modern *paragraph* component before the first 12-point Classic *paragraph* component and, thereby, changed how the standard *paragraph* component is defined for the document.

When you want the pasted *paragraph* components to come before the first *paragraph* in the original document, first, **Paste** them below it (the components will remain selected), use the **Change** command (the components will still be selected), **Cut** them, and **Paste** them above the first *paragraph* component.

Props

The **Props** command opens the three **Component Property** sheets—the **Format** sheet, the **Tab** sheet, and the **Page** sheet. *Figure 3-11* shows the **Format** sheet for the *paragraph* component in the default document. The **Tab** sheet is discussed later in this chapter in the section, *Tabs*. The **Page** sheet is discussed in the chapter on **Page Makeup**.

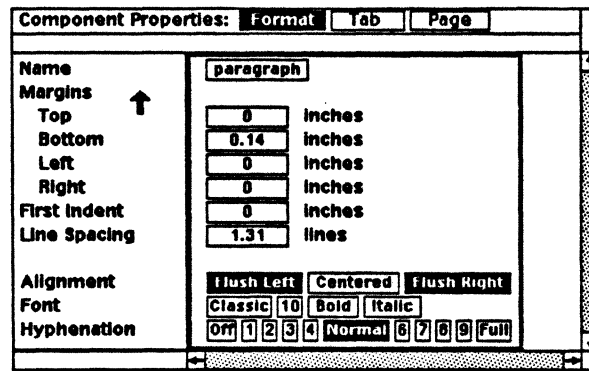


Figure 3-11. The Format sheet of the Component Property sheet

The Format Sheet of the Component Property Sheet

As on most other property sheets, there are three ways to make changes to the Format sheet:

- by typing something (the contents of the Name field is an example of this kind of information),
- by pointing into a box and clicking the left mouse button to turn a property *on* or *off* (Alignment is an example),
- by point the mouse cursor into a box and clicking the left or the right mouse button to circle through the available choices (the Font Family and Size boxes are the only two examples on this sheet).

The Component Property Sheet Popup Menus

When you make changes to properties on the Component Property sheets, you can apply them to a single component or to all the components with the same name. When you apply changes globally, you are asked to confirm. Figure 3-12 shows the Apply popup menu with the Global Apply submenu.



Figure 3-12. The Apply popup menu with Global Apply submenu

Cancel on the main Apply popup menu cancels any changes you have made since the last time you applied or globally applied changes. Cancel on the Global Apply submenu cancels only the Global Apply command; it has the same effect as moving the mouse cursor off the menu and releasing the middle button has. If you want to cancel the change(s) completely, use Cancel on the main Apply popup menu.

When you have applied changes and then hold down the middle mouse button, you see the Close popup menu. *Figure 3-13* shows the Close menu with the Unify submenu.



Figure 3-13. The Close popup menu with Unify submenu

Reset on the Close menu resets all the changes you have made on any of the three **Component Property** sheets to what they were when you opened the sheets. When you use **Reset**, a message appears in the status line *Please apply to reset the component*. If you have globally applied any changes, you must use **Global Apply** in order to reset all the components.

Unify is a more powerful command than **Global Apply** and also requires confirmation. **Unify** makes *almost all* the properties of all the components with the same name identical to the properties of the component whose property sheets are open. The only properties that not affected by **Unify** are **Begin New Page**, **Allow Page Break Within**, and **Allow Page Break After** on the **Component Page Property** sheet.

The Name Field

In the **Name** field, you can type in the name of a new component. A component name can be up to 9 characters in length and be comprised of any combination of letters and numbers.

The list of component names is used by the **Create**, **Select**, and **Find** commands on the **Component Location Selected** popup menu and the **Change** and **Select** commands on the **Component Selected** popup menu. They appear on the list in a sorted order; i.e., if all the names contained nothing but alphabetic characters, the list would be alphabetical.

When you use numbers in component names, you should remember that the system collates the names in the list character by character with digits coming before alphabetic characters. This means that *title13* will be above *title3* in the list of component names and *10para* will be above *1para*. If you have a long list of component names, you may want to make their order easier to use by naming *title3 title03* and naming *1para 01para*. *Figure 3-14* shows three component lists. *Figure 3-14c* is probably the easiest one to use.

Create	□10list	Create	□01list	Create	□figure
Paste	1list	Paste	01steps	Paste	list01
Select	1steps	Select	02list	Select	list02
Join	20steps	Join	10list	Join	list10
Find	2list	Find	20steps	Find	paragraph
	figure		figure		steps01
	paragraph		paragraph		steps20
	title		title		title
	title1		title01		title01
	title13		title02		title02
	title2		title03		title03
	title3		title13		title13

(a)

(b)

(c)

Figure 3-14. Collated component lists

Margins

On the **Page Property** sheet, you establish the margins for the entire document. On the **Format** sheet of the **Component Property** sheets, you establish the margins for individual components and for all the components with a particular name. The margin settings are mostly self-explanatory, but you should keep in mind a couple of points:

- The left component margin is the distance from the left page margin to the beginning of the component, and the right component margin is the distance from the right page margin to the end of the component. When they are set to 0, the margins of the component are the same as the margins of the page. In this *Reference Manual*, for example, most of the components have a left margin of 0, but the component you are reading has a left margin of 1.5 inches.
- The values for the top and bottom margins of components are added together. For this reason, your documents will have a more even vertical alignment if you make the top margin of each component 0 and use the bottom margin to change vertical spacing.

First Indent

Many times, you will want the first line of a certain kind of component indented. With typewriters and word processors, you set a tab for the indentation and then have to hit the tab key at the beginning of each paragraph. **First Indent** makes it possible for you to set an indentation and then let the system keep track of it.

A setting of .25 inches gives a very pleasing indentation for paragraphs, but you can set the indentation of the first line to any width that will leave at least one word on the first line.

You can also set a negative indentation when you want the first line to be to the left of the other lines in a component (this is often called a *hanging indent*). For a hanging indent, make the **left margin** a positive number (for example, *.25 inches*) and the **first indent** the same number but negative (for example, *-.25 inches*).

Line Spacing

Line Spacing determines the distance between the lines of type in a component. It is determined proportionally so that a setting of *1.31 lines* (the default) will be adjusted for different sizes of type.

Alignment

The **Alignment** settings allow you to change the horizontal alignment of components. There are four possibilities:

- *flush left*, which lines up the component on its left margin and leaves a ragged right margin (the components in this document have flush left alignment);
- *flush left* and *flush right*, which justifies the text between the left and the right margins;
- *centered*, which centers the component between the left and right margins (when you center a component, the *first indent* must be *0*, or the first line will not be correctly centered.
- *flush right*, which lines up the component on its right margin and leaves a ragged left margin.

Font

You can change the font family by pointing the mouse cursor into the first box and clicking either the left or the right button. The left button circles through the choices as they appear from top to bottom on the various **Fonts Family** sub-menus, and the right button circles through the choices as they appear from bottom to top.

You can change the size of the font you choose by pointing the mouse cursor into the second box and clicking either the left or the right button. The left button circles through the choices until it gets to the largest font available in the font; then it starts over with the smallest available font. The right mouse button circles in the opposite direction to the smallest font available; then it starts over with the largest.

Hyphenation

If **Hyphenation** is turned on for a document, changing the setting on the **Format** sheet will change the way hyphenation works in a particular component. See the section, *Hyphenation*, for details.

Selection in Text

To select text, you use both the left and the right mouse buttons. The left button positions the editing cursor, which acts as an anchor for the selection. The right button does the selecting and the deselecting.

Text can be selected forward and backward from the editing cursor and in both direction. It can also be selected across component boundaries. But all the text that is selected at one time must be connected.

Just as there are several ways to select components, there are several ways to select text, and they can be combined. The first, which involves holding down the left and right mouse buttons, is the more efficient, but some people prefer the pointing and clicking method, and some people use a combination.

To select text:

- ✓ Hold down the left mouse button, and position the editing cursor where you want to begin your text selection. Release the button.
- ✓ Hold down the right mouse button, move it in any direction until the text you want to select is in reverse video, and release the button.

If you select more text than you intend you can deselect some before you release the right button merely by moving the mouse until the text you want to deselect is no longer highlighted.

- ✓ If you want to add to the selection *in either direction*, move the mouse cursor beyond one end of the text that is in reverse video.
- ✓ Hold down the right button again, and move the mouse until the additional text is in reverse video.

Using pointing and clicking to select text:

- ✓ Point the mouse cursor where you want to begin the selection of text and click the left mouse button to position the editing cursor there.
- ✓ Move the mouse cursor to the other end of the text block you want to select, and click the right mouse button.

The selected text is in reverse video.

Deselecting Text

You can deselect text in a number of ways. The following methods deselect *all* the selected text.

- click the left mouse button
- use the keyboard
- move the editing cursor
- execute the **Deselect** command on the **Text Selected** popup menu
- execute either the **Clear** or the **Set** command on the **Hyphenation** submenu of the **Text Selected** popup menu

It is also possible to deselect just a portion of the selected text. There are two methods for doing this. We describe both methods as though you could select text only one direction at a time, but the procedures for deselecting text that is on both sides of the editing cursor is essentially the same and is explained at the end of this section.

To deselect a portion of text by holding down the right mouse button:

Place the mouse cursor at the end of the select block of text that is opposite the editing cursor.

Hold down the right mouse button and move the mouse cursor to the character that marks the end of the text you want to remain selected.

As you move the mouse cursor over the text, the selected text will be deselected.

Release the button.

To deselect a portion of text by clicking the right mouse button:

Place the mouse cursor next to the character that marks the end of the text you want to remain selected.

Click the right mouse button.

The text between the editing cursor and the mouse cursor remains selected, and the rest of the text is deselected.

If you have selected text on both sides of the editing cursor and you want to deselect some text from both ends of the selected text, repeat either of these methods on either side of the editing cursor.

The Text Selected Popup Menu

Once you have selected text, the Text Selected popup menu shows you what you can do with it (Figure 3-15).

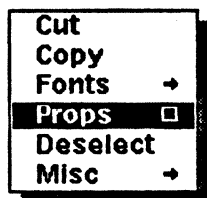


Figure 3-15. Text Selected popup menu

In this section, we cover **Fonts**, **Props**, two commands on the **Misc** submenu, **Remove Returns** and **Put in Returns**. **Cut** and **Copy** are discussed in the section, *Cut, Copy, and Paste*. **Deselect** is discussed in the previous section, *Selection in Text*.

Fonts

The **Fonts** submenus give you access to the full-range of font choices. The menus are identical to the ones you see when you choose the **Fonts** command on the **Text Location Selected** popup menu (see Figure 3-4).

When you have text selected and you use the **Fonts** submenus, the selected text is changed to the font you select (Figure 3-16).

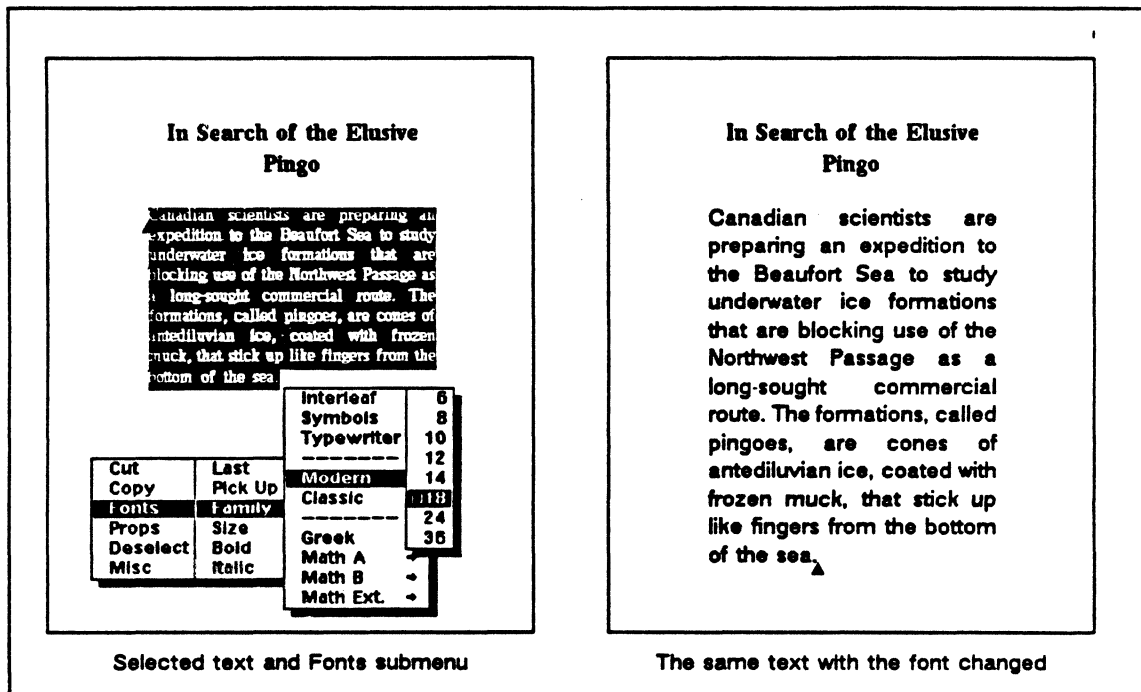


Figure 3-16. Changing the font of selected text

Props

The Props command is used primarily to gain access to the Frames property sheet, which is discussed in the chapter *Page Makeup*. When you choose Props when you have other text selected, you get a message in the status line telling you something about the selected text (for example, *This is a text string is one message*).

If you want to see the Frames property sheet, and, instead, there is a message in the status line, you have selected text as well as the frame. You can most easily correct this by pointing at the frame itself and clicking the left mouse button. If you want to select the frame by selecting its anchor, you must be very careful not to include any characters or spaces in your selection.

Since there are several different kinds of spaces available to you (one soft and four hard spaces), the Props command is also useful if you want to know what kind of space is between two words. If you select the space and execute the Props command, the message in the status line will tell you precisely which kind of space it is. See the section, *Spaces*, in the *Keyboard* section of this chapter for a description of the different kinds of spaces.

Put in Returns and Remove Returns on the Misc Popup Menu

The Misc popup menu has three commands on it. **Put in Returns** and **Remove Returns** are covered in this section. The **Hyphenation** submenu is discussed in the section, *Hyphenation*.

When external documents are opened on your desktop, they often have RETURNS at the ends of lines. Sometimes you want these to remain and sometimes you do not. When you do not want the returns, select the text and execute the **Remove Returns** command.

With the **Put in Returns** command you can put in returns. However, you should be aware that the returns you put in will correspond to the Interleaf software line breaks, not the line breaks that were in the external document . *Figure 3-17a* shows a paragraph from an external document. *Figure 3-17b* shows it after the returns have been removed, and *Figure 3-17c* shows it with returns put in again.

We at Widget International are often asked for some background on the origin of the word widget. Everyone here knows what we mean when we say widget, but anyone who has looked the word up in a dictionary knows that it doesn't appear in any of the standard dictionaries. Even in *The Oxford English Dictionary*, the most complete dictionary of them all, there is no entry between widgeon and widow.

(a)

We at Widget International are often asked for some background on the origin of the word *widget*. Everyone here knows what we mean when we say *widget*, but anyone who has looked the word up in a dictionary knows that it doesn't appear in any of the standard dictionaries. Even in *The Oxford English Dictionary*, the most complete dictionary of them all, there is no entry between *widgeon* and *widow*.

(b)

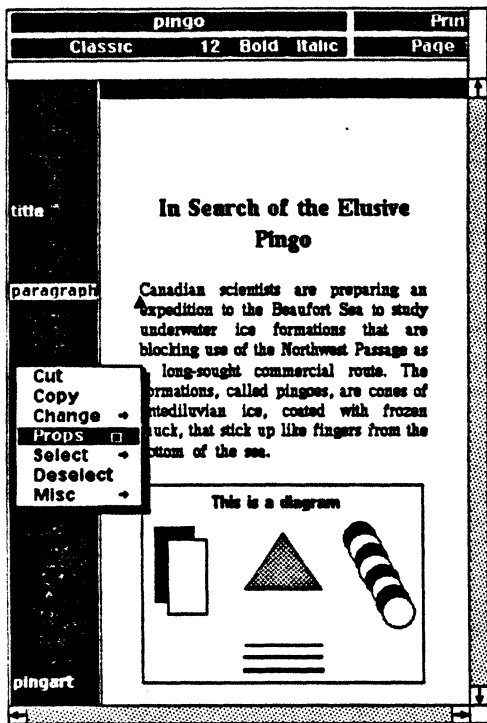
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(c)

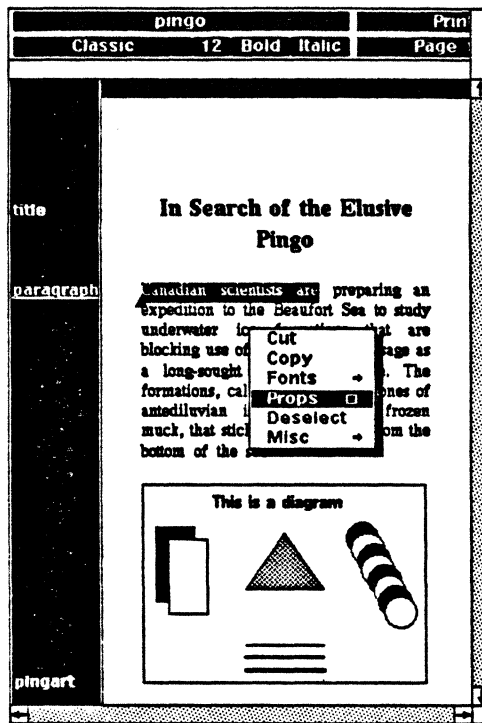
Figure 3-17. Text with and without returns

Cut, Copy, and Paste in Documents

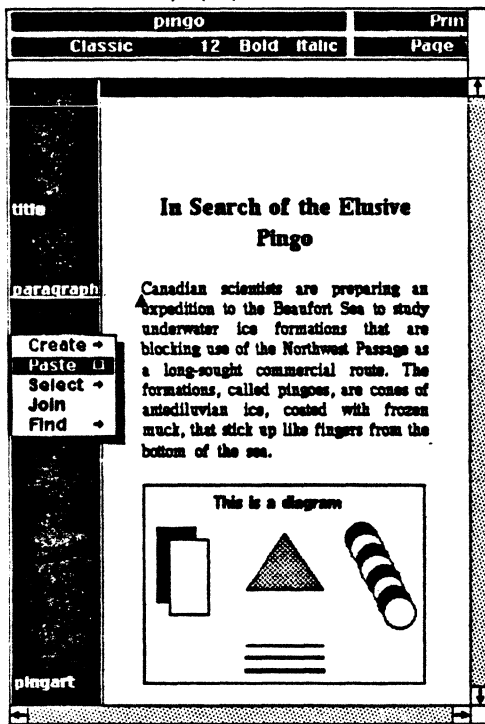
There are **Cut** and **Copy** commands on both the **Component Selected** and the **Text Selected** menus, and **Paste** commands on both the **Component Location Selected** and **Text Location Selected** menus (*Figure 3-18*).



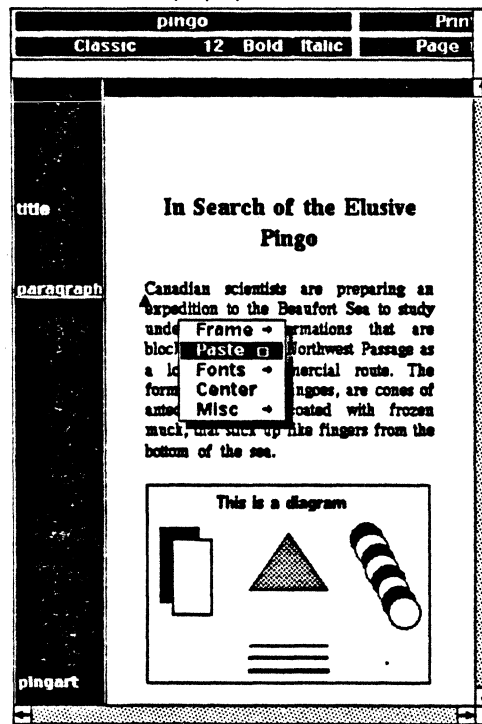
Component Selected popup menu



Text Selected popup menu



Component Location Selected popup menu



Text Location Selected popup menu

Figure 3-18. Component bar and text popup menus

There is interaction among these commands—for example, you can cut components and paste them as text or copy text and paste it as a component; so we discuss them together.

There is also interaction on the clipboard because anything besides diagramming objects that you cut or copy from an open document becomes the contents of a document icon on the clipboard named *from 'documentname'*.

While there are circumstances in which you can have more than one icon named *from 'documentname'* on the clipboard, there is usually only one, and its contents are overwritten whenever you cut or copy components or text from an open document. This means that, if you cut *one word* of text, you may be overwriting the *20 components* you previously copied. On those rare occasions when there is more than one *from 'documentname'* icon on the clipboard, *all* are vulnerable to overwriting.

For a discussion of the clipboard, please see the chapter, *Desktop Manager*.

The discussion of **Cut**, **Copy**, and **Paste** proceeds as follows:

- First, we discuss cutting and copying components and text;
- then, pasting components as components and text as text;
- finally, we discuss pasting components as text and text as components.

The Cut and Copy Commands

When you *cut* components or text, what you have cut is removed from where it was and becomes the contents of a document represented on the clipboard by an icon named *from 'documentname'*.

When you *copy* components or text, a copy of the components or text is put into a document represented on the clipboard by an icon named *from 'documentname'*. The document from which the material was copied is unchanged.

What is on the clipboard in the *from 'documentname'* icon is identical regardless of whether it is the result of a **Cut** or a **Copy**, but your intention towards what you have cut or copied will be different.

Users *cut* something for one of two reasons: because they want to delete it entirely or because they want to move it from one location to another.

Users *copy* something because they want to leave the document in one place as it is, but they want to put a copy of some portion of a document somewhere else.

Your intention dictates what you do once you have cut or copied something.

- If you have cut something in order to be rid of it, you do not have to think anymore about it. Eventually, you can purge it from the clipboard.

- If you have cut something in order to move it, you have to do one of two things to protect the icon it is in from being overwritten: either immediately move to the location where you want to paste the text and paste it or paste the icon on your desktop or in an open directory window until you are ready to use it.
- With a copy, you will also want either to paste it in a document, on your desktop, or in an open directory window. This is usually less crucial with a copy than a cut because the original still exists. However, it is a good idea to think of the things you cut or copy to the clipboard as identical to one another, so that you dispose of them appropriately and do not lose something important.

If you paste an icon on your desktop and intend to leave it there for very long, you will probably want to rename it because *from* 'documentname' is not usually descriptive of the contents of an icon. Also, if you put it back on the clipboard as a *from* 'documentname' icon, it will be vulnerable to overwriting.

You can select and, then, you can cut or copy any number of components. These can be scattered throughout a document or be together in a series.

You can cut or copy only one uninterrupted block of text at a time, but the block can be as long as you like.

Copy As the Default Command

The software takes advantage of the capacity to change defaults temporarily to set up combined **Copy** and **Paste** operations. When you copy components, **Copy** becomes the default on the **Component Selected** popup menu. Similarly, when you copy text, **Copy** becomes the default on the **Text Selected** popup menu.

When you **Cut** and **Paste** components as components or text as text, what you have pasted is still selected and the command on the **Component Selected** popup menu or the **Text Selected** popup menu is **Props**. If you then choose the **Copy** command, **Copy** becomes the temporary default.

This interaction between **Copy** and **Paste** is useful when you have something you want in a number of places. You can copy it and paste it as many times in a row as necessary.

Figure 3-19 shows the combinations that occur with **Cut** and **Copy** on the **Component Selected** popup menu and the **Text Selected** popup menu.

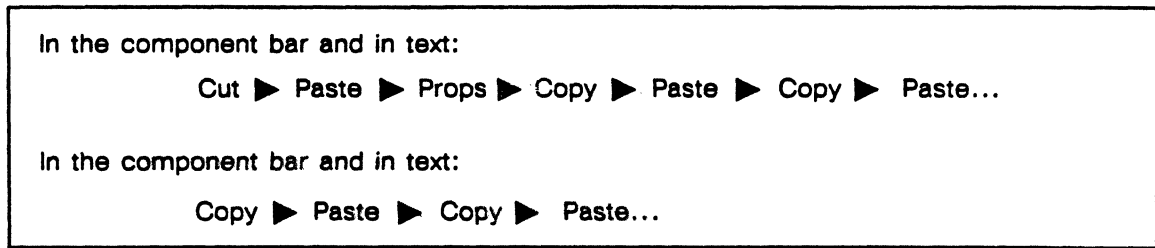


Figure 3-19. How Cut and Copy work with Paste

Cut As the Default

Usually, when you want to cut a group of components, the easiest thing to do is select them all and execute a **Cut** command. However, you may sometimes want to cut components one or two at a time, so that you can look them over before you cut them. The stickiness of the **Cut** command makes a series of cuts easy to accomplish: you have to choose **Cut** only once. Then you can select the component(s) you want to cut and click the middle mouse button.

Cut remains the default on the **Component Selected** popup menu until you either choose another command on one of the component bar popup menus or slide off the menu to reset the default to **Props**.

The **Cut** command on the **Text Selected** popup menu acts in exactly the same way. The stickiness of the **Cut** command is even more useful in text than in the component bar because you cannot select multiple text blocks at once as you can select multiple components.

The Paste Commands

There are four ways to use the **Paste** commands on the **Component** and **Text Location Selected** popup menus. You can paste:

- components as components,
- components as text,
- text as text,
- or text as components.

Pasting Components as Components

Pasting components as components is the way you insert an entire document into another document. It is also, of course, the way you do such things as move one or more components from one place to another in the same document or from one document to another.

When you paste components as components, they are inserted at the component caret position in the order in which they originally occurred.

The document in which the **Paste** command is issued is the document whose page properties, such as page margin and header style, prevail. When you are going to combine two documents, be sure that you paste into the document that has the properties you want.

Pasting Components as Text

You will not often want to paste components as text because the pasted components become plain text and lose their identity as components; that is, if you paste 20 components of different names into the text of a *paragraph* component, the 20 components are melded together and take on the characteristics of the *paragraph* component.

Because of the potential loss of component information, you are asked to confirm on a stickup that you really want to execute the **Paste** command if what you are pasting has more than one component in it (*Figure 3-20*).

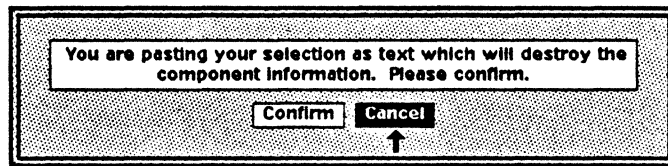


Figure 3-20. Stickup to confirm the pasting of components as text

Pasting Text as Text

You can paste text as text within a single document, or you can cut or copy text in one document and paste it in another. In either case, you simply position the editing cursor where you want to paste the text and execute the command.

If what you are pasting consists of text from more than one component you will get a stickup to confirm the execution of the **Paste** command (see *Figure 3-20*). For example, if you have selected and copied the last sentence in a *paragraph* component and the first sentence in the *list* component following it and are now pasting the selection in text, the system warns you that you will be losing component information if you proceed.

Pasting Text as Components

When you paste text in the component bar, the new component retains its component information. For example, if you have copied four words from a *para-*

graph component and you execute a **Paste** command in the component bar, a *paragraph* component with the four words in it will be inserted.

If you have copied four words from a *paragraph* component along with another four from the *list* component that follows it and you execute a **Paste** command in the component bar, a *paragraph* component with the four words in it and a *list* component with four words in it will be inserted, so all the component information will be preserved.

Hyphenation

In this section, when we refer to hyphens, we mean the character inserted *by the software* at the end of a line, not the hyphen character that the user can type from the keyboard.

The purpose of hyphenation is to make the lines of text as uniform and aesthetically pleasing as possible.

When a component has alignment that is **Flush Left** and **Flush Right**, both margins of the component are *justified*; i.e., every line of the component is the same length and stretches from the left-hand margin to the right-hand margin. If words in a justified component cannot be hyphenated, the spaces between words often have to be stretched out to unattractive lengths so that the lines of text will extend from the left margin to the right margin.

When a component has an alignment of **Flush Left** or **Flush Right**, one of the margins of the component is *ragged*. When words in a ragged component cannot be hyphenated, the lengths of lines can vary widely, particularly in narrow columns or when long words occur towards the end of lines.

When a component has an alignment of **Centered**, both margins of the component are ragged. It is rare to use hyphenation in a centered component; however, hyphenation for centered components is handled the same way that it is for the other components with ragged margins.

In this section, we discuss the following topics:

- how the software sets hyphenation points;
- how the user can see where there are hyphenation points, can set hyphenation points, and can remove hyphenation points;
- how the software hyphenates.

How the System Sets Hyphenation Points

The hyphenation system used by the Interleaf publishing software is based on an algorithm of Donald E. Knuth.* This algorithm is based on rules, rather than on a dictionary. These rules are conservative so that the system will almost never hyphenate incorrectly although it may not hyphenate as frequently as you would like. However, you can use a command on the **Text Location Selected** popup menu to set your own hyphenation points in places that the rules dictate skipping.

When you create a new document, the software inserts *hyphenation points*. It also inserts *hyphenation points* in documents created before this release and in non-Interleaf documents that are copied to your desktop. This does not mean that you must hyphenate documents. It does mean that the software is ready to hyphenate instantly if you decide you want hyphenation.

Hyphenation points are not hyphens; they merely tell the software where it is permissible to hyphenate words if two conditions are met. The first condition: **Hyphenation** must be turned *On* for the whole document on the **Document** property sheet (Figure 3-21). The default setting is *On*.

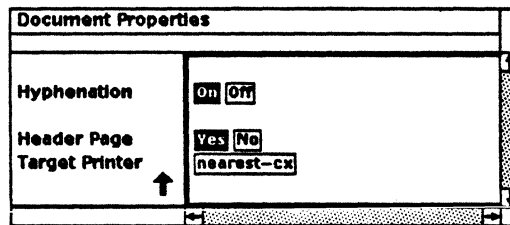


Figure 3-21. Document property sheet with hyphenation setting for the entire document

The second condition: the **Hyphenation** setting on the property sheet for the particular component must be something other than *Off*. Figure 3-22 shows a **Component** property sheet with the default setting of *Normal*.

* *T_EX and Metafont: New Directions in Typesetting*, Digital Press, American Mathematical Society, 1979, pp. 180-186.

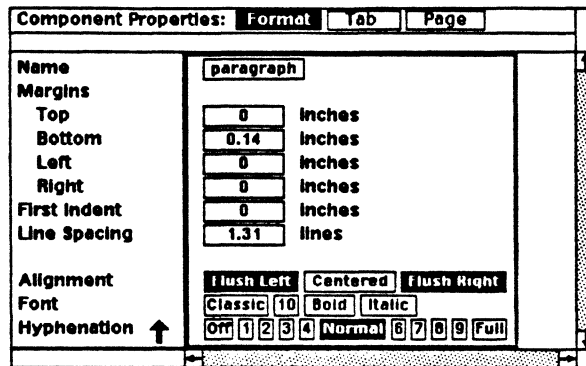


Figure 3-22. Component property sheet with hyphenation settings

The Hyphenation Commands on the Text Popups

The software sets hyphenation points according to its rules, but the user can both remove these hyphenation points and set other ones if that is desirable.

There are hyphenation commands on both the **Text Location Selected** popup menu (Figure 3-23a) and the **Text Selected** popup menu (Figure 3-23b). These make it possible for the user to manipulate hyphenation in text in several ways. **Set** and **Clear** appear as commands on both menus, but they have different meanings on the two popups.

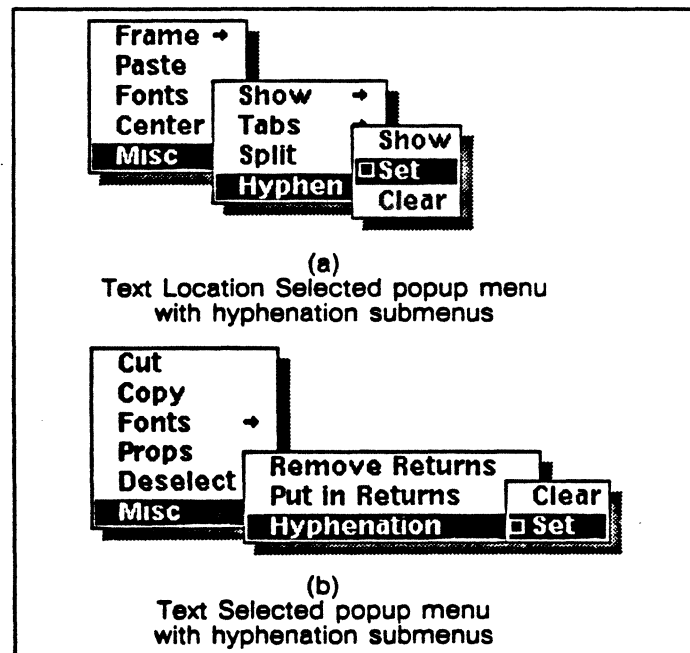


Figure 3-23. Hyphenation submenus on the text popup menus


The Hyphenation Commands on the Location Selected Menu

There are three commands on the **Text Location Selected** popup menu.

The **Set** command is the default and makes it possible for you to put a hyphenation point at a place in a word where the system does not hyphenate. There are several guidelines for putting in hyphenation points:

- you cannot set a hyphenation point after the first letter in a word;
- there must be at least two letters after a hyphenation point in a word;
- you cannot set a hyphenation point in a word that is fewer than five characters long;
- you cannot set a hyphenation point before an *en dash*—which is the same as the *minus sign* (-), a *hyphen character* (-), or an *apostrophe* (').
- there is an implied hyphenation point after an *en dash*—which is the same as the *minus sign* (-), a *hyphen character* (-), and after an *apostrophe* (') except at the beginning or the end of a word;
- if you want to set hyphenation points for a word in a way that is different from the way the algorithm would hyphenate it, you must change the hyphenation points for each instance of the word;
- if you edit a word containing a user-set hyphenation point, the hyphenation point will be cleared (see the section *Maintaining User-Set Hyphenation Points*);
- if you cut or copy a word containing a user-set hyphenation point, the point will be preserved when you paste the word as long as the word is not changed (see the section *Maintaining User-Set Hyphenation Points*).

To set a hyphenation point:

- ✓ Position the editing cursor where you want the hyphenation point.
- ✓ On the **Text Location Selected** popup menu, execute .

If there is already a hyphenation point at this location, a message in the status line informs you that there has been no change. It also shows you all the hyphenation points in the word.

The **Clear** command on this menu works in the same way as the **Set** command. With it you can remove both system-generated and user-set hyphenation points one at a time.

To clear a hyphenation point:

- ✓ Position the editing cursor where the hyphenation point is you want to remove.
- ✓ On the **Text Location Selected** popup menu, execute **Misc → Hyphen → Clear**.

If there is no hyphenation point at this location, a message in the status line informs you that there has been no change. It also shows you all the hyphenation points in the word.

There is one situation in which these instructions for clearing a hyphenation point must be modified: if there is a hyphen at the end of a line, you cannot position the editing cursor after it on the same line. To clear the hyphenation point, which in this case removes a hyphen, position the editing cursor at the *beginning of the next line* before executing **Misc → Hyphen → Clear**..

With the **Show** command, you can find out where there are hyphenation points in a particular word.

To see the hyphenation points in a word:

- ✓ Position the editing cursor anywhere in the word.
- ✓ On the **Text Location Selected** popup menu, execute **Misc → Hyphen → Show**.

The word appears in the status line. If hyphenation points have been set in it, either by the software or the user, these are marked.

Preserving User-Set Hyphenation Points

Discretionary hyphens will be removed from a word if the word is edited. For example, the word *selected* is not hyphenated by the software, but you may want to set a hyphenation between *se* and *lected*. If you delete the *ed* from the end of the word, the hyphenation point will be removed.

In this case, you purposely edited the word, but there are instances in which you can preserve hyphenation points by avoiding unintentional editing. For example, if you want to insert *the* before *selected*, make sure there is a space between the editing cursor and *selected* before you type *the*.

A similar strategy applies when you have cut or copied a word with a discretionary hyphenation point in it and are pasting it somewhere. If you make sure there is a space of either side of the editing cursor when you execute the **Paste** com-

mand the hyphenation point will be preserved. Otherwise, the hyphenation points in the word will be reset according to the algorithm.

The Hyphenation Commands on the Text Selected Menu

There are two hyphenation commands on the **Hyphenation** submenu of the **Text Selected** popup menu.

When you execute a **Clear** command on selected text, the system removes both the system-generated and the user-set hyphenation points from the selected text. This command is useful when you want hyphenation in a document and in a component, but you do not like the way part of the component looks when it is hyphenated.

When you execute a **Set** command on selected text, the system puts back *only* the system-generated hyphenation points. You would need to use this command only if you had used one of the **Clear** commands and wanted to reset the system's hyphenation points.

How Hyphenation Works

Hyphenation works in slightly different ways in ragged and in justified text. However, you can switch from ragged to justified or justified to ragged text, and the software will make the necessary adjustments for you.

In this section, we explain how hyphenation for both ragged and justified text is determined. At the end of the section, we give the numbers involved in the **Hyphenation** settings on the **Format** sheet of the **Component** property sheet.

The default setting on the property sheet, *Normal*, is designed to give a reasonable hyphenation frequency in both ragged and justified components.

As the settings move towards *off*, the frequency of hyphenation in the component decreases until none occurs when *off* is the setting.

In the other direction, as the settings move towards *full*, the frequency of hyphenation in the component increases.

Hyphenation in Ragged Text

In this section, we use the hyphenation of flush left/ragged right text as the example, but hyphenation in ragged left and centered text behaves in the same way.

When ragged text is being hyphenated, the hyphenation setting is the guideline for how much hyphenation can take place. The setting establishes a zone at the end of each line of text. Once a space band occurs within this zone, the line will look all right without hyphenation. If no space band occurs before the maximum width of the component is reached, hyphenation comes into play.

The wider the hyphenation zone, the less hyphenation will occur.

If the component is three inches wide or wider, the hyphenation setting represents a percentage of the component width. For example, if the component is *6 inches* wide and the setting is *Normal*, the hyphenation zone is 8% of *6 inches* or *.48 inches*. If the setting is *2*, the hyphenation zone is 20% of *6 inches* or *1.2 inches*.

If the component is narrower than *3 inches*, the hyphenation zone is a percentage of *3 inches*. For example, if the component is *3 inches* wide, a setting of *Normal* gives a hyphenation zone of *.24 inches*. If the component is *2 inches* wide, a setting of *Normal* also gives a hyphenation zone of *.24 inches*.

Hyphenation in Justified Text

The method for hyphenating justified text is different from the method for hyphenating ragged text. When text is justified, the space bands often have to be made bigger in order to stretch the line out from the left to the right margin. If the method for determining hyphenation were the same for justified as for ragged text—using a fixed hyphenation zone to determine when to hyphenate, a line with only one or two space bands would have very wide and very ugly space bands (narrow justified columns in newspapers often have this problem).

Instead of using this approach to hyphenating justified text, the Interleaf publishing software uses the concept of “glue stretch”. The same settings that determine the width of the hyphenation zone for ragged text determine the amount that each space band on a line can be stretched beyond its normal width before the system looks for a word to hyphenate.

For example, when the setting is *Normal*, every space band on a line can be up to *1.5 times* its normal width before the system looks for a word to hyphenate. When the setting is *off*, there will be no hyphenation in the component and the space bands on each line will be stretched as far as is necessary to justify the text. At the other end of the spectrum, when the setting is *Full*, the space bands are not supposed to stretch beyond their normal width.

Since it is not always possible to find a legal hyphenation point where it is needed, space bands in justified components are sometimes stretched more than their settings suggest.

The Algorithms That Determine the Frequency of Hyphenation

The following information is for users who want to know more precisely what values the **Hyphenation** settings on the **Component Property** sheet represent.

For components with ragged margins, the settings correspond to a percentage of the column width if the component is three inches wide or wider. If the component is narrower than *3 inches*, the hyphenation zone is a percentage of *3 inches*. *Figure 3-24* shows how these settings work.

Ragged Text	
Setting	Percentage
Off	—
1	40.0%
2	20.0%
3	13.3%
4	10.0%
Normal	8.0%
6	6.7%
7	5.7%
8	5.0%
9	4.4%
Full	0.0%

Figure 3-24. Translating hyphenation settings to percentages of column width

For justified components, the settings correspond to the amount the space bands can be stretched before the system attempts to hyphenate. For example, if the setting is *Normal*, each space band on a line can be increased by one-half the normal width. Figure 3-25 shows how these settings work.

Justified Text	
Setting	Maximum stretch
Off	—
1	4
2	3
3	2
4	1.75
Normal	1.50
6	1.38
7	1.28
8	1.18
9	1.09
Full	1.00

Figure 3-25. Translating hyphenation settings for justified components into the amount each space band on a line will stretch

The Page Box and the Page Pulldown Menu

The **Page** box in the document header gives you page information about your document, and the **Page** pulldown menu gives you access to several page-related commands.

From looking at the **Page** box, you can learn the current page number, how many pages there are in the document, and what the first page number is.

The current page number that is registered in the box is the number of the page that fills more than half of the document window. When the division is about 50/50, it will be impossible for you to judge this with your eyes.

Figure 3-26a shows the way the box looks when the page numbers start with 1, and Figure 3-26b shows the way the box looks when the page numbers begin with another number.



Figure 3-26. Page box with different starting page numbers

Page numbers are one of the properties entered on the **Page Property** sheet. You gain access to this sheet by executing the **Properties** command on the **Page** pulldown menu (Figure 3-27). This property sheet is discussed in the chapter *Page Makeup*.

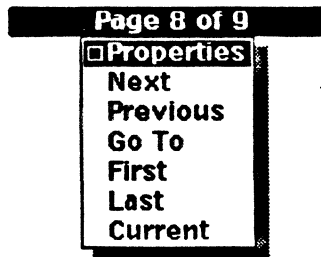


Figure 3-27. Page pulldown menu

Properties is the default on the menu, but **Next**, **Previous**, and **Go To** become temporary defaults when they are executed. When you use **First**, **Last**, or **Current**, **Properties** remains the default since **First**, **Last**, and **Current** are absolute, rather than relative, destinations.

The commands on the menu other than **Properties** represent ways to move through a document in a very measured and orderly way. They always take you to the top of the specified page.

When you execute the **Go To** command, the editing cursor moves to the beginning of the first component of the page you specify. In the case of the other commands, the editing cursor remains where it is when you execute the command.

Next Page

The **Next** command scrolls the document to the next page as defined by the page number registered in the **Page** box. When you are on the last page of a document, you get a message in the status line *This is the last page*. The editing cursor does not move.

Previous Page

The **Previous** command scrolls the document to the previous page as defined by the current page number that is registered in the **Page** box. When you are on the first page of a document, you get a message in the status line *This is the first page*. The editing cursor does not move.

Go To Page

The **Go To** command produces a stickup menu on which you type in the number of the page you want to move to. The editing cursor moves to the beginning of the first component on that page.

First Page

The **First** command scrolls the document to the first page of the document. When you are on the first page of a document, you get a message in the status line *This is the first page*. The editing cursor does not move.

Last Page

The **Last** command scrolls the document to the last page of the document. When you are on the last page of a document, you get a message in the status line *This is the last page*. The editing cursor does not move.

Current Page

The **Current** command scrolls the document, so that the current page as defined by the page number registered in the **Page** box begins at the top of the document window. The editing cursor does not move.

Setting Tabs

There are four kinds of tab settings in Interleaf documents:

- left
- center
- right
- decimal

You can insert tabs in any component that is either **left aligned** or both **left and right aligned**. Because tabs are set with reference to the left margin of a component not with reference to the left margin of the page, they have meaning only in components that have a left alignment.

Even though you cannot insert tabs in the text of a **centered** or **right aligned** component, **centered** and **right aligned** components can have *tabs settings*. The tab settings on the **Tab** sheet of the **Component Property** sheets can, therefore, be maintained if you change the alignment of a component.

When you are setting tabs, consider the left margin of the component to be at tab position *0 inches*. *Figure 3-28* shows where text appears when **left**, **center**, **right**, and **decimal** tabs are set at *2 inches* (that is, 2 inches from the left margin of the component). The arrowhead shows where the tab is set in each instance.

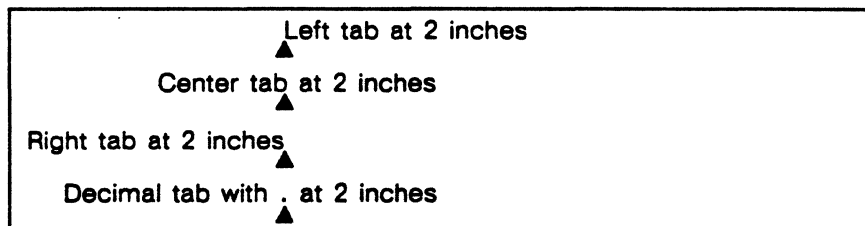


Figure 3-28. Comparison of tab settings

In *Figure 3-28* the 2-inch tab is set in the same place no matter whether the tab is **left**, **center**, **right**, or **decimal**. The difference comes in the placement of the text in relation to the tab setting.

- When you use a **left** tab setting, the text grows to the right of the tab setting.
- When you use a **center** tab setting, the text is centered around the tab setting (in *Figure 3-28*, the *C* of *Center* and the *s* of *inches* are equidistant from the tab setting).
- When you use a **right** tab setting, the text grows to the left of the tab setting.

- When you use a decimal tab setting, the text grows to the left until a decimal point is encountered. From the decimal point on, the text grows to the right, so that the decimal points in a column line up properly. In other words, a decimal tab behaves like a right tab up to the decimal point and like a left tab from the decimal point on. If no decimal occurs in the text, a decimal tab behaves like a right tab. If the first character typed at the tabstop is a decimal, a decimal tab behaves like a left tab.

The Tab Sheet of the Component Property Sheet

Tabs for each component can be set on the Tab sheet, which is one of the **Component Property** sheets. *Figure 3-29a* shows the Tab sheet with its default settings. As with any other properties you set on a **Component Property** sheet, the tabs for all the components with a particular name can be set individually or globally.

You can enter tab settings in any order (*Figure 3-29b*), and the system will reorder them properly after you apply them (*Figure 3-29c*).

It is not necessary to turn on **Remove** for *all* the extra tabs, only those that are within the range of the tabs you do want. For example, in *Figure 3-29b*, new tabs are set at 0, 2, 4, and 5.5 inches, so only the tabs for settings between 0 and 5.5 inches have to be removed.

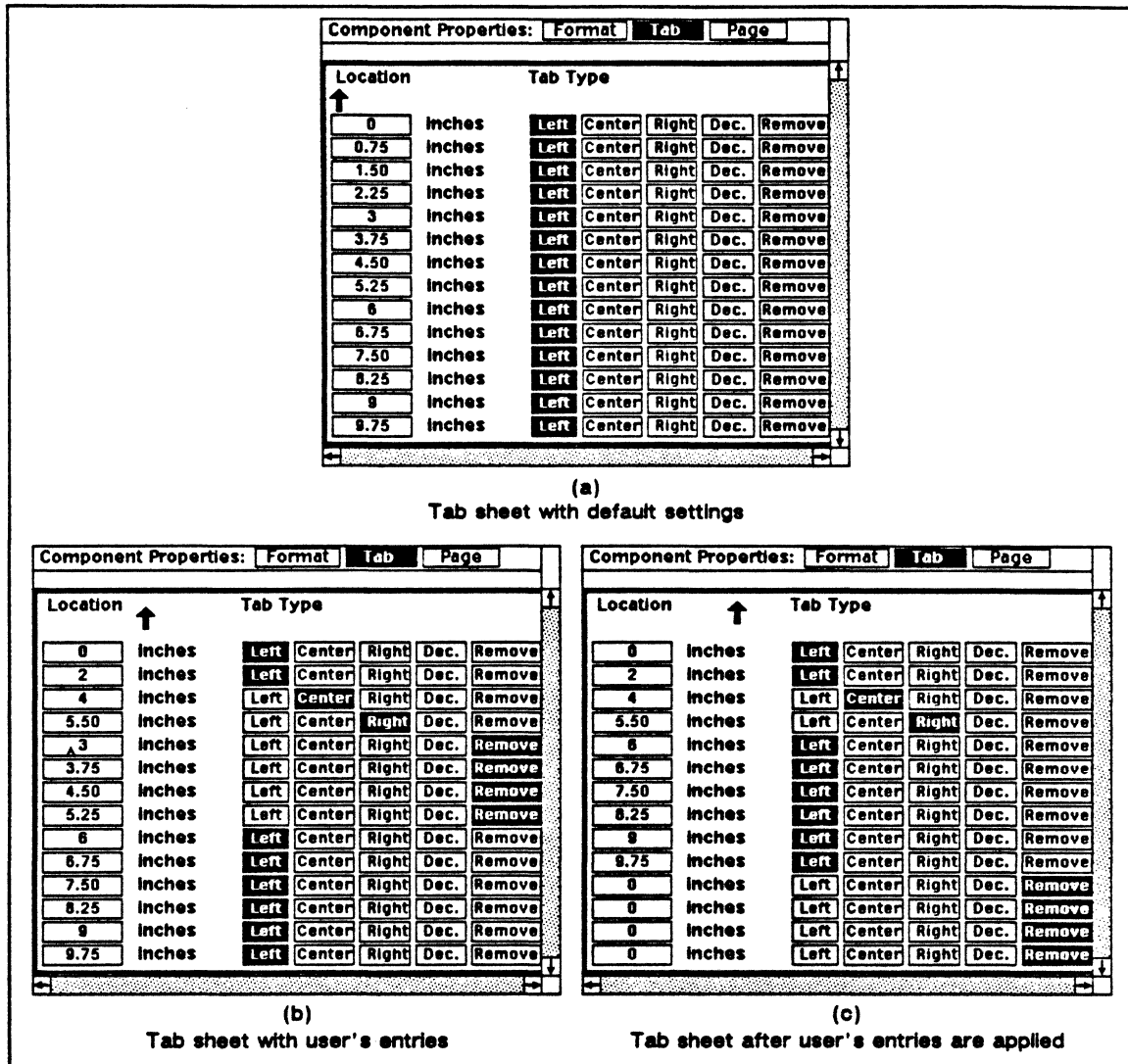


Figure 3-29. Tab sheet of the Component Property sheet

As you will see in several of the examples in this chapter, it is possible (and often very useful) to have negative as well as positive tab settings. In these circumstances, it is necessary to include a tab setting at 0 inches, which is at the left margin of the component.

Search and Replace Operations

With the **search operation** you can look for a string of characters in text (for example, *elephant* or *American businesses*).

You can start a search from anywhere in a document. You can search forward or backward, and you can switch the direction of the search whenever you like and as often as you like.

After you have located the search string, the **replace operation** makes it possible for you to replace the search string with another string of characters (for example, to replace *elephant* with *zebra* or *American businesses* with *United States corporations*). You can replace the search string one instance at a time or globally.

Both **Search and Replace operations** are accomplished through the keyboard.

Search and Replace operations work only in plain text, not in Frames.

Search Strings

When you initiate a search operation, the software asks you what you want to search for, that is, the *search string*.

A search string is a group of characters, including spaces, tabs, and hard returns. A good search string is one that is inclusive enough to find what you are looking for and exclusive enough to ignore a search string that is embedded in other strings; for example, find *is*, but not *this* and *history*.

You can search for almost anything you can type on your keyboard. For example, you can search for minus signs (-) or you can search for hyphens (-). You search for hyphens the same way you insert them in text: by pressing the ESC key and then typing a minus sign. (See the section on the keyboard in this chapter for other sequences that use the ESC key.)

With the Interleaf publishing software, a search string can be approximately 50 characters long, but users seldom even approach this limit.

If you keep several considerations in mind, you will be able to use the search operation efficiently.

- If, in response to the question on the stickup, you type a search string with only lowercase letters in it, the search routine will find any example of the string. Thus, you can type *elephant* if you want to find *elephant*, *Elephant*, and *ELEPHANT*.

- The search operation is sensitive to uppercase letters. If you type *Elephant*, it will find only *Elephant* and *ELEPHANT*. If you type *ELEPHANT* (or *ELephant* or *elepHaNt* or any other version of the word that has at least two uppercase letters in it), the operation will find only *ELEPHANT*.
- When your search string includes characters produced by ESC and another key, the escape sequence is usually represented on the Search stickup menu as \uparrow *character* or as an *<abbreviation>*. For example, a hyphen appears as \uparrow -, and a hard space appears as *<hsp>*.
- Because the RETURN key can be used to confirm a search string, there is a special technique for searching for Hard Returns. To search for a Hard Return, press the following sequence of keys: BACKSPACE, ESC, RETURN. On the Search stickup menu, the Hard Return appears as *<ret>*.
- When you want to search for a word like *is* but not for all the words that have *is* in them, such as *this* and *history*, type a space before *is*. (Do not type a space after the word or you will miss any instances of the word followed by a punctuation mark.)

Forward and Backward Searches

There are several ways both to start a forward or a reverse search and to confirm that the search string you have typed is the correct one. We go through one method for the forward search and one for the backward search and then tell you the alternatives. We think the method we give in detail is usually best because it does not require you to move your hands very far from their normal position on the keyboard. The only differences between the forward search and the reverse search are the keys used.

The Forward Search

A forward search begins at the position of the editing cursor and moves towards the end of the document.

To begin a forward search:

- Hold down the CTRL key, and type *s*. *Figure 3-30* shows the Forward Search stickup menu.

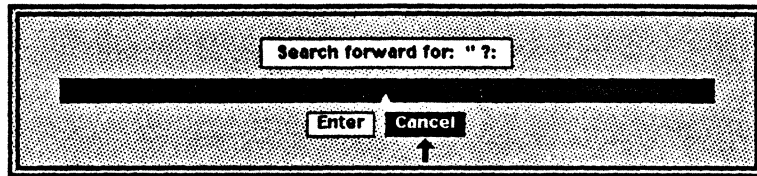


Figure 3-30. Forward search stickup menu

- Type in the search string.
- Confirm the entry by holding down the CTRL key and typing *s*.

The first instance of the search string after the editing cursor is highlighted.

To continue a forward search:

- Hold down the CTRL key and type *s*.

When a forward search reaches the end of the document, a stickup menu (Figure 3-31) gives you the opportunity to cancel the search or to continue the search from the beginning of the document.

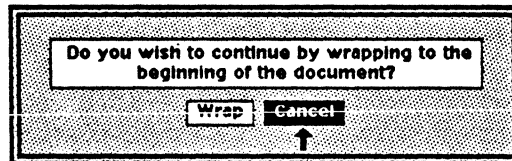


Figure 3-31. Search wrap stickup menu

To continue the search from the beginning of the document:

- Hold down the CTRL key and type *s*.

The following are alternative forward search techniques:

- You can also begin a search, confirm a search string, and continue a search to the end of the document by pressing the R3 key (not available on the Sun100).
- You can confirm a search string by either pressing the RETURN key or by moving the mouse cursor on the Search stickup menu to Enter, and clicking the left mouse button.
- You can confirm that you want to continue the search from the beginning of the document either by pressing the RETURN key or by moving the mouse cursor on the Wrap stickup menu to Wrap and clicking the left mouse button.

The Backward Search

The process you use to search backward in a document is identical to the process you use to search forward. The only difference is some of the keys you use.

To begin a backward search:

- Hold down the CTRL key, and type *r*.
- On the stickup menu, type in the search string.
- Confirm the entry by again holding down the CTRL key and typing *r*.

The first instance of the search string that occurs before the editing cursor is highlighted.

To continue a backward search:

- Hold down the CTRL key and type *r*.

When a backward search reaches the beginning of the document, a stickup menu gives you the opportunity to cancel the search or to continue the search from the end of the document.

To continue the search from the end of the document:

- Hold down the CTRL key and type *r*.

The following are alternative reverse search techniques:

- You can also begin a reverse search, confirm a search string, and continue a reverse search to the beginning of the document by, first, pressing the BACKSPACE key and typing R3 key (not available on the Sun100).
- You can confirm the search string for a reverse search by either pressing the RETURN key or by moving the mouse cursor on the Backward Search stickup menu to Enter and clicking the left mouse button.
- You can confirm that you want to continue the search from the end of the document either by pressing the RETURN key or by moving the mouse cursor on the Wrap stickup menu to Wrap and clicking the left mouse button.

Switching Directions

Forward and backward searches are interchangeable. You can switch from one to the other anytime you choose.

To switch from a forward to a backward search:

- Hold down the CTRL key and type *r*.

To switch from a backward to a forward search:

- Hold down the CTRL key and type *s*.

Stopping a Search in Progress

Occasionally, almost everyone mistypes a search string and realizes the mistake while hitting the RETURN key. If the software is looking for *Figure 58* when it should be looking for *Figure 1-58*, the search will fail; but, in a long document with many occurrences of the word *figure*, the process will take awhile. In this circumstance, most users want to cancel the search and start over.

The search operation compares the search string with the words in the document character by character: therefore, if the search string is a string the search operation is unlikely to find *any* match for, the search will fail more quickly than you can cancel it. For example, if the software were searching for *ffigure* instead of *figure*, it would take it no time at all to compare and eliminate the words in a very long document.

There are two methods of canceling a search in progress. They achieve the same result, but the first is faster.

To cancel a search in progress:

- Hold down the CTRL key and type *g*.

You can also cancel a search in progress by using the Cancel option on the Interrupt stickup menu.

To gain access to the Interrupt stickup menu and cancel a search:

- ✓ Hold down the CTRL key and type *z*.
- ✓ Select **Cancel** or type *C* (you must type a capital *C* because lowercase *c* represents **Continue**).

Interrupting or Terminating a Search

There are several ways to interrupt or terminate a search, and which one you choose depends on circumstances.

- If you have searched for a string and intend to replace it with something else in a number of places, you should move from the search routine to the replace routine. The next section, *Replacing Text*, deals with the replace routine.
- If you have searched for a string in order to replace it with something else, you can delete the old string, which is highlighted, and type in the new string. This is a reasonable thing to do if there is only one instance of the string you want to change.
- If you have searched for a string in order to find a particular place in text, you can terminate the search by starting to type, by moving the editing cursor, or by holding down the CTRL key and typing *g*. The last of these three is useful when you want to begin a search for a different search string immediately.

When you start a new search, the previous search string will be the default string. You can continue searching for this string by holding down the CTRL key and typing *s* (for a forward search) or *r* (for a backward search). Or you can search for something new by typing in a new search string and then confirming.

Replacing Text

You can use the search operation without replacing the search string, but you must use the search operation in order to use the replace operation.

You can replace a text string one instance at a time, which gives you the freedom to skip instances; or you can replace a text string globally. Because a global replace can be difficult to undo, we recommend that you save your document before you replace text globally and that you define the replacement string very narrowly. For example, if you want to replace *is* with *are* globally, be sure to put a space before *is* so that you do not end up with *thare* and *haretory* in place of *this* and *history*.

Replacement Text

When you type in the replacement string you should remember two of the same considerations that were mentioned regarding search strings:

- When your replacement string includes characters produced by ESC and another key, the escape sequence is usually represented on the **Replace** stickup menu as \uparrow *character* or as an *<abbreviation>*. For example, a hyphen appears as \uparrow -, and a hard space appears as *<hsp>*.
- Because the RETURN key can be used to confirm a replacement string, there is a special technique for with Hard Returns. To replace with a Hard Return, press the following sequence of keys: BACKSPACE, ESC, RETURN. On the **Replace** stickup menu, the Hard Return appears as *<ret>*.

Replacing the Replacement String with a Null String

When you initiate the first replace operation in a document, the default replacement string is nothing, that is a *null string*. What you type in as the replacement string becomes the default replacement string for the document until you either type in something else or close the document.

Sometimes you may want the replacement string to be a *null string*. For example, if you were changing a list of words from British spelling to American spelling, you could search for the *u* in words like *favour* and *behaviour* and delete it. To make the replacement string a *null string*, press the following sequence of keys: BACKSPACE, ESC, DEL. On the **Replace** stickup menu, the *null string* appears as *<nil>*.

If you use this method to delete an entire word, you should delete the word and a space in order not to end up with two spaces between the remaining words.

Replacing Extra Spaces

If you are accustomed to typing two spaces after marks of punctuation like periods and semi-colons, the double-spaces will not give you even spacing because Interleaf text is proportionally spaced. The Interleaf software expects only one sentence space, so an occasional blank space may appear at the beginning or the end of a line, particularly when the text is aligned both flush left and flush right. To correct this, you can search for two spaces (nothing will appear on the stickup menu), and replace them globally with one space.

How to Replace Text

There are several methods for starting the replace routine after you have found the search string. We give one set of instructions for a one-instance-at-a-time replace operation and one set of instructions for a global replace operation. Then, we list the alternatives. We think the method we give in detail is usually best be-

cause it does not require you to move your hands very far from their normal position on the keyboard.

To replace the search string one single instance at a time:

- After you find the search string you want to replace, hold down the CTRL key and type *q*. Figure 3-32 shows the Replace stickup menu.

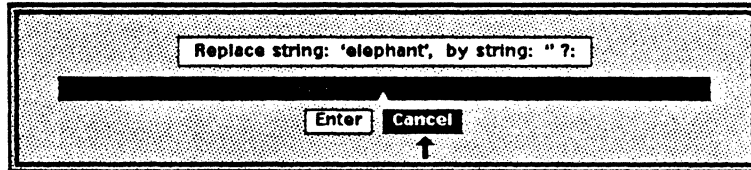


Figure 3-32. Replace stickup menu

- On the stickup menu, type in the replacement text.
- Confirm the entry by again holding down the CTRL key and typing *q*.

The highlighted text is replaced and the program finds the next instance of the search string and highlights it.

- If you want to replace this instance of the search string, hold down the CTRL key and type *q*. If you want to skip this instance, hold down the CTRL key and type *s* or *r* depending on whether you are searching forward or backward.

The program either replaces the search string with the replacement string or leaves the search string as it is. In either case, the program searches for the next instance of the search string and highlights it. The direction of the continuing search depends on whether your last search command was a forward or a backward search command.

To replace text globally:

- After you find the string you want to replace, hold down the CTRL key and type *x*. Still holding down the CTRL key, type *q*.
- Type in the replacement text.
- Confirm the entry by again holding down the CTRL key and typing *q*.

The program will find the search string and replace it with the replacement string until it reaches either the end or the beginning of the document, depending on whether your last search command was a forward or a backward search command.

To wrap and continue replacing the text globally, hold down the CTRL key and type *q*.

The following are alternative replace techniques:

- You can confirm the replacement string and continue a replace operation by pressing the R6 key (not available on the Sun100).
- You can confirm a replacement string by either pressing the RETURN key or by moving the mouse cursor on the Replace stickup menu to **Enter** and clicking the left mouse button.
- You can confirm that you want to continue the combined search and replace operations from the beginning or the end of the document either by pressing the RETURN key or by moving the mouse cursor on the Wrap stickup menu to **Wrap** and clicking the left mouse button.

Terminating a Replace Operation

If you have replaced all the instances of the search string you want to replace, you can terminate a one-instance-at-a-time search and replace operation by starting to type, by moving the editing cursor, or by holding down the CTRL key and typing *g*. The last of these three is useful when you want to begin a search for something else immediately.

You can terminate a global replace operation by holding down the CTRL key and typing *g* or by using the **Cancel** option on the **Interrupt** stickup menu.

The Keyboard

Many of the text processing actions that can be accomplished using the mouse or the mouse and a pulldown or popup menu can also be accomplished using the keyboard or the mouse and the keyboard. On the Sun120 and Sun50 keyboards, there are function keys for most of these actions. With all the Sun workstations, there are also keystroke combinations that accomplish the many of the same results.

In this section we give a comprehensive listing of the keyboard commands—more ways to accomplish a single action than any one person is ever likely to need. As you use the software, you will find various combinations of mouse and keyboard actions that particularly suit you, and you will probably ignore the rest; but you can always turn back to this section when you want to try something different.

The Function Keys

On the Sun120 and Sun50 keyboards (*Figure 3-33*), there are function keys on the left keypad, on the right keypad, and on the top row of the main keypad. The commands that are available using function keys are divided into three groups:

- those that you execute by pressing the unshifted function key—for example, using the right arrow key (R12 on the right keypad) to move the editing cursor *one character* to the right;
- those that you execute by pressing and releasing the BACK SPACE key before you press the function key—for example, using the right arrow key to move the cursor *one word* to the right;
- and those that you execute by pressing and releasing the ESC key before you press the function key—for example, using the right arrow key to move the cursor to the *end of the current line*.

The Left Function Keypad

	L2	suspend cancel
	L4	caps lock
	L8	paste comp paste text
L9	L10	copy comp copy text cut comp cut text

Figure 3-34. Left function keypad

Cancel (L2) cancels other commands in progress (for example, opening or printing a document, and search and replace operations).

Suspend (ESC L2) suspends the publishing software temporarily and returns you to the operating system. This keyboard command can be used only from inside an open document. To suspend from the desktop or a property sheet, use the **Suspend** command on the **Interrupt** stickup menu. To return to the publishing software, at an operating system prompt, type **fg** (for foreground).

Caps Lock (L4) is a toggle key. If you press the key when the keyboard is in lowercase mode, the characters you type will be uppercase until you press the key again.

Paste text (L8) pastes what is selected on the clipboard at the editing cursor position.

Paste components (BACK SPACE L8) pastes what is selected on the clipboard at the position of the component caret.

Copy text (L9) puts a copy of selected text on the clipboard.

Copy component (BACK SPACE L9) puts a copy of selected components on the clipboard.

Cut text (L10) cuts selected text and puts it on the clipboard.

Cut component (BACK SPACE L10) cuts selected components and puts them on the clipboard.

Changing Fonts

		F3 default last	F4 bold	F5 italic			F8 smaller	F9 larger	
--	--	-----------------------	------------	--------------	--	--	---------------	--------------	--

Figure 3-35. The keys for changing fonts

There are keys on the top row of the main keypad that you can use to change font characteristics in a variety of ways. You can use these keys to change fonts while you are typing or you can use the mouse to select text and then use a key to change the font of the selected text. The first action parallels commands on the Font submenu of the Text Location Selected popup menu, and the second parallels commands on the Font submenu of the Text Selected popup menu.

Last (F3) changes the font at the editing cursor position to the last font that you to the last font that you used. Last has little meaning until you have used one font and changed to another in a particular editing session. Until then, a Last command will change the font to the one designated in the font box in the document header when you opened the document.

Default (BACK SPACE F3) changes the font at the editing cursor position to the default font for the component.

Bold (F4) is a toggle key. It changes the font at the editing cursor position to bold if it roman or italic and to roman if it is bold. It changes selected text in the same way.

Italic (F5) is a toggle key. It changes the font at the editing cursor position to italic if it roman or bold and to roman if it is italic. It changes selected text in the same way.

Smaller (F8) changes the font at the editing cursor position to a smaller size of the same font family. It changes selected text in the same way.

Larger (F9) changes the font at the editing cursor position to a larger size of the same font family. It changes selected text in the same way.

The Right Function Keypad

		R3 ← search → search
R4 hyphen	R5 open	R6 replace
	R8 doc comp ↑	
R10 line word ←		R12 line word →
R13 go to page prev wind prev page	R14 doc comp ↓	R15 go to page next wind next page

Figure 3-36. The right function keypad

Moving the Editing Cursor in Text

Most of the commands on the right function keypad involve moving the editing cursor to a particular place in text. There are several ways to use the keyboard to move the cursor.

The movements that do not use the BACK SPACE or ESC key can be repeated by holding down the keys (for example, as long as you hold down the right arrow key, the editing cursor will continue moving forward in text). If you hold down the function key after you have used the BACK SPACE or ESC key with it, the function key repeats its normal, unshifted command.

The arrow keys move the cursor in the direction of the arrows in the following ways:

The **Left Arrow key** ← (R10) in the normal position moves the cursor *backward in text* one character at a time. BACK SPACE R10 moves the cursor one word to the left. ESC R10 move the cursor to the beginning of the line.

The **Right Arrow key** → (R12) in the normal position moves the cursor *forward in text* one character at a time. BACK SPACE R12 moves the cursor one word to the right. ESC R12 move the cursor to the end of the line.

The **Up Arrow key** ↑ (R8) in the normal position moves the cursor up one line. BACK SPACE R8 moves the cursor to the beginning of the component in which it is positioned. ESC R8 moves the cursor to the beginning of the document.

The **Down Arrow** key ↓ (R14) in the normal position moves the cursor down one line. **BACK SPACE** R14 moves the cursor to the end of the component in which it is positioned. **ESC** R14 moves the cursor to the end of the document.

Previous Page (R13) moves the cursor to the beginning of the previous page.

Previous Window (**BACK SPACE** R13) moves the cursor to the previous window.

Next Page (R15) moves the cursor to the beginning of the next page.

Next Window (**BACK SPACE** R15) moves the cursor to the next window.

Go To Page (**ESC** R13 or **ESC** R15) give you access to the **Go To Page** stickup menu.

Search and Replace

There are keys on the right function keypad for all of the search and replace operations except global replace. For details, please see the section, *Search and Replace Operations*.

- To search *forward*: R3
- To search *backward*: **BACK SPACE** R3
- To replace the search string (and continue search): R6
(To replace the search string globally: **CTRL x CTRL q**)

Other Commands on the Right Function Keypad

There are two other commands on the right function keypad:

Hyphen (R4) inserts the hyphen character in text.

Open (R5) clears space where you can insert text. As you have probably seen already, you can insert characters anywhere by positioning the editing cursor in text and beginning to type. The text that is already there moves to the right to make room for the inserted characters. The **Open** command moves the text to the right of the editing cursor down a line and inserts a carriage return. The editing cursor does not move to the next line as it does when you insert a regular carriage return, so this action clears space where you can insert text. When you have inserted as much text as you like, you can delete the carriage return to close up the space.

The Control Key Sequences

All of the **CTRL** key sequences involve holding down the **CTRL** key and typing a character. For example, to move the editing cursor forward one character, you hold down the **CTRL** key and type *f*.

In *Figure 3-37*, the **CTRL** key and the key that are used with the **CTRL** key are shown with white backgrounds.

		F3 default last	F4 bold	F5 italic				F8 smaller	F9 larger				
esc	1	@ 2	# 3	\$ 4	% 5	& 6	' 7	(8	) 9	- 0	- +	- =	back space
tab	replace q	rubout word w	end line e	search ← r	delete word ↑ t		count ↑ y	open line o	↑ line p		word ← f	del	
ctrl	begin line a	search → s	delete char ↑ d	char → f	cancel g		h	delete line ↑ k	center cursor l		↑ window n	return	
shift	inter- rupt z	more x	word → c	window ↓ v	char ← b	line ↓ n		m			shift	line feed	
hard space													
space													

† These commands will be executed multiple times if you precede them with CTRL U.

Figure 3-37. The Control key and the keys that can be used with it to execute commands

Repeating Commands Automatically

You can repeat some of the CTRL key commands automatically if you precede the CTRL sequence for the command with CTRL u (labeled *count* in Figure 3-37). A message in the status line of the document header will tell you what the current count is. The initial default for count is 4, which means that CTRL u followed by CTRL f will move the editing cursor 4 characters to the right.

The CTRL u sequence itself repeats by multiplying whatever the current value of *count* is by 4. For example, if the message in the status line after you execute CTRL u is *Count: 7* and you want to repeat your next command 112 times, you can either type *112* or execute CTRL u two more times—CTRL u CTRL u CTRL u CTRL f would move the editing cursor forward in text 112 characters.

Deleting and Cutting

Deleting and *cutting* are different operations, but you can use the DEL key, CTRL d, and CTRL k to accomplish both.

When you use the DEL key to delete backward in text character by character, CTRL d to delete forward in text character by character, or CTRL k to delete from the cursor position to the end of the line, the text you delete is completely erased.

However, you can also use the DEL key, CTRL d, or CTRL k as you use the Cut command on the Text Selected popup menu. In this case, you select text with the mouse buttons and then use the appropriate keys to delete the selected region.

The text becomes the contents of a *from* '<document name>' icon on the clipboard and is still available to you for pasting. For more details on cutting and pasting, please see the section "Cut, Copy, and Paste" earlier in this chapter.

Additional Control Key Commands

There are some CTRL combinations that involve more than two keystrokes. These begin with CTRL x (labeled *more* for *more commands* in Figure 3-37). Then, you type a character or use the CTRL key and a character. For example, to move the editing cursor to the beginning of the document, you hold down the CTRL key and type x. Then, you release the CTRL key and type <.

The following are the commands that use CTRL x:

- To replace the search string globally: CTRL x CTRL q
- To save a document that has been modified: CTRL x s
- To change font to bold (or to roman if it is bold): CTRL x b
- To change font to italic (or to roman if it is italic): CTRL x i
- To change to the last font used: CTRL x l (*l* as in *last*)
- To change font to a smaller size: CTRL x [
- To change font to a larger size: CTRL x]
- To move the editing cursor to the beginning of the document:
CTRL x <
- To move the editing cursor to the end of the document:
CTRL x >

Special Characters

There are several characters that are available through a combination of Escape sequences. You must repeat the sequence each time you want to use the special character. These characters are available on the standard and Greek keyboards only (see *Font Layouts*).

- To insert a double opening quotation mark ("): ESC ;
- To insert an em dash (—): ESC +
- To insert a hyphen (-): ESC -
- To insert a cent sign (¢): ESC \$
4
- To insert a bullet (•) of the proper size for the font: ESC \

Spaces

There are several different kinds of spaces on the system. The space you get when you press the space bar is a soft space, which means that the words on either side can be separated from each other by a break at the end of a line. If

necessary, soft spaces can stretch or shrink to even out spacing in lines of justified text.

The other spaces are hard spaces, which means that the words on either side are treated as though they were one word. If *word + hard space + word* will not fit together at the end of one line, the whole group moves to the next line.

There are four kinds of hard spaces of different sizes. All hard spaces are available on the standard and Greek keyboards (see *Font Layouts*). The *natural hard space* is available in every font. Hard spaces do not stretch or shrink or break.

- The *natural hard space* (ESC SPACE BAR) is the space that has been determined by Interleaf as the one that gives the best spacing for each font.
- The *thin space* (ESC a) is the width of a punctuation mark.
- The *en space* (ESC s) is the width of the space that a numeral occupies in each font.
- The *em space* (ESC d) is the width of the *em dash* in each font.

Fractions

It is possible to combine superscript and subscript numbers from the 10-point Symbols font with a slash from the Math A font to produce fractions. If you expect to use fractions often, we recommend that you create a document containing the fractions you expect to use frequently. Then you can copy the fractions you need from this document and paste them where you need them.

Here are examples of the most commonly used fractions:

$\frac{1}{2}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{8}$ $\frac{3}{8}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{1}{3}$ $\frac{2}{3}$

and a few that are less common:

$\frac{19}{32}$ $\frac{75}{234}$ $\frac{99}{143}$

The Math A slash has zero width, which means that it is not possible to select it by itself. You must either type it in everytime you need it or create fractions which you can select as a whole.

To make a fraction:

- ✓ Change the font to Symbols 10-point.
- ✓ Type a superscript for the numerator.

In Symbols, the shifted numerals are the superscripts.

- ✓ Type a subscript for the denominator.

In Symbols, the unshifted numerals are the subscripts.

- ✓ Position the editing cursor *between* the superscript and the subscript.
- ✓ Change the font to Math A.
- ✓ Hold down the SHIFT key, and type 2.

Font Layouts

ESCAPE []
 SHIFT []
 NORMAL []

Standard

!	@	#	\$	%	^	&	*	()	-	+	-
1	2	3	4	5	6	7	8	9	0	-	=	.

Q	W	E	R	T	Y	U	I	O	P	{	}
q	w	e	r	t	y	u	i	o	p	[]
q	w	e	r	t	y	u	i	o	p	[]

Spaces

Thin	En	Em									
A	S	D	F	G	H	J	K	L	:	.	
a	s	d	f	g	h	j	k	l	:	.	

Z	X	C	V	B	N	M	<	>	?
z	x	c	v	b	n	m	.	.	/
z	x	c	v	b	n	m	.	.	/

hard space
 space
 (these work with every font)

Symbols

superscript	1	2	3	4	5	6	7	8	9	0	°	∞
subscript	1	2	3	4	5	6	7	8	9	0	_	∞

%	¶	©	®	™	▲	⊠	"	¥	/	†	‡
%	§	©	®	™	▲	⊠	"	¥	/	†	‡
q	w	e	r	t	y	u	i	o	p	[]

1	2	3	4	5	6	7	8	9	10
◀	•	●	◐	◑	◒	◓	★	✳	▶
◀	•	●	◐	◑	◒	◓	★	✳	▶

♠	♥	♣	♠	♥	♣	♠	♥	♣	♠
♠	♥	♣	♠	♥	♣	♠	♥	♣	♠
z	x	c	v	b	n	m	.	.	/

Greek

!	@	#	\$	%	^	&	*	()	-	+	-
1	2	3	4	5	6	7	8	9	0	-	=	.

Θ	Ω	Ε	Ρ	Τ	Ψ	Υ	Ι	Ο	Π	{	}
θ	ω	ε	ρ	τ	ψ	υ	ι	ο	π	[]
q	w	e	r	t	y	u	i	o	p	[]

Spaces

Thin	En	Em									
Α	Σ	Δ	Φ	Γ	Η	Κ	Λ	:	”		
α	σ	δ	φ	γ	η	κ	λ	:	”		

Z	X	Ξ	Β	N	M	<	>	?
ζ	χ	ξ	β	ν	μ	.	.	/
z	x	ξ	β	ν	μ	.	.	/

Math A

↑	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
8	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕

#	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
#	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
q	w	e	r	t	y	u	i	o	p	[]	

.	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
.	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
a	s	d	f	g	h	j	k	l	:	.		

∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
z	x	c	v	b	n	m	.	.	/

Math B

∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
q	w	e	r	t	y	u	i	o	p	[]	

∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
a	s	d	f	g	h	j	k	l	:	.		

∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕	∕
z	x	c	v	b	n	m	.	.	/			

Math Extension

()	[]	[]	[]	[]	{	}	∕
()	[]	[]	[]	[]	{	}	∕
1	2	3	4	5	6	7	8	9	0	-	=	.

√	∕	∑	∏	∫	∫	∫	∫	∫	∫	∫	∫	∫
√	∕	∑	∏	∫	∫	∫	∫	∫	∫	∫	∫	∫
q	w	e	r	t	y	u	i	o	p	[]	

()	[]	[]	[]	[]	[]	[]	[]	[]	[]
()	[]	[]	[]	[]	[]	[]	[]	[]	[]
a	s	d	f	g	h	j	k	l	:	.									

{	}	<	>									
}	{	<	>									
z	x	c	v	b	n	m	.	.	/			



Chapter 4

Page Makeup

Layout and page makeup considerations are an important part of the Interleaf publishing software. There are three primary means of determining how the pages of a finished Interleaf document will look.

- On the **Page Property** sheet, you establish such characteristics as the page margins for a document and the style of the page numbers.
- On the **Component Page Property** sheet, you determine how such matters as page breaks are to be handled.
- With the **Frame** command, you decide where to put illustrations in relation to text, and, with the **Frame Property** sheet, you have the flexibility to change the properties of existing frames.

If you have not already done so, please read *SignPosts*, the first chapter of the *Reference Manual*. It is a short overview of the Interleaf publishing software that provides the essential concepts needed to use this manual effectively.

How the Property Sheets Work

On the three property sheets discussed in this chapter, there are two kinds of boxes. In one kind of box, you type text or a numerical value. In the other kind, you turn properties *on* or *off* with the left mouse button. *Figure 4-1* shows the three property sheets.

The figure displays three distinct property sheets used in page layout software. The first, 'Page Properties', is a large window with a title bar and scrollbars. It is divided into sections: 'Orientation' (Portrait/Landscape), 'Height' (11 inches) and 'Width' (8.50 inches), 'Margins' (Top: 1, Bottom: 1.10, Left: 1.40, Right: 1.40), 'Starting Page #' (1), and 'Headers/Footers'. The 'Page # Style' section includes options like 'Arabic', 'Lowercase Roman', and 'Uppercase Roman'. The 'Page Layout' section has 'Single Sided', 'Double Sided - Right 1st Page', and 'Double Sided - Left 1st Page'. Below these are input fields for 'Header' and 'Footer' on 'Left', 'Center', and 'Right' sides, each with a 'First page' button. The second, 'Component Page Properties', has a title bar with 'Format', 'Tab', and 'Page' tabs. It includes 'Begin New Page' (Yes/No), 'Orphan Control' (Default: 2 lines), 'Widow Control' (Default: 2 lines), and 'Allow Page Break Within' and 'Allow Page Break After' (Yes/No). The third, 'Frame Properties', has a title bar and includes 'Width' (0.41 inches), 'Height' (0.14 inches), 'Placement' (At Anchor, Following Anchor, Following Text), 'Vertical Alignment' (Top of Page, Middle of Page, Bottom of Page), and 'Vertical Alignment' (0.03 inches).

Page Property sheet

The Component Page Property sheet is a smaller window with a title bar containing 'Component Properties:', 'Format', 'Tab', and 'Page' tabs. It features several controls: 'Begin New Page' with 'Yes' and 'No' buttons; 'Orphan Control' with a 'Default' label and a '2' value in a box, followed by 'lines'; 'Widow Control' with a 'Default' label and a '2' value in a box, followed by 'lines'; and 'Allow Page Break Within' and 'Allow Page Break After', each with 'Yes' and 'No' buttons.

Component Page Property sheet

The Frame Property sheet is a window with a title bar 'Frame properties:'. It contains: 'Width' (0.41 inches), 'Height' (0.14 inches), 'Placement' with 'At Anchor' selected and 'Following Anchor' and 'Following Text' as options; 'Vertical Alignment' with 'Top of Page', 'Middle of Page', and 'Bottom of Page' as options; and another 'Vertical Alignment' field with a value of 0.03 inches.

Frame Property sheet

Figure 4-1. Property sheets: page, component page, and frame

Boxes for Text

Boxes into which you can type are represented on the **Page Property** sheet and on the **Frame Property** sheet by **Height** and **Width** and on the **Component Page Property** sheet by **Lines for Widow** and **Orphan Control**.

To enter numbers or text in a box:

- ↑ Point the mouse cursor into the box in which you want to make an entry.
 - ☐ Click the left mouse button to position the editing cursor \wedge in the box.
 - ☐ Type what you want into the box.
If there is anything in the box when you start typing, it is automatically erased.
 - ☐ Press <TAB> to confirm what you have typed and to move the editing cursor to the next box in which you can type.
- or ☐ Press <RETURN> to confirm what you have typed without moving the editing cursor.

Editing the Contents of a Text Box

Sometimes, you may want to edit the contents of one of these boxes rather than completely change it. Using a combination of <CONTROL> key sequences or the arrow keys and the key, you can move the editing cursor and delete individual characters.

All <CONTROL> key sequences involve holding down the <CONTROL> key while typing the appropriate letter.

- <CONTROL> f or the right arrow key \blacktriangleright moves the cursor forward a character
- <CONTROL> b or the left arrow key \blacktriangleleft moves the cursor backward a character
- <CONTROL> d deletes the character to the right of the cursor
- DEL deletes the character to the left of the cursor

Properties That Are Turned On or Off

The second type of property is represented on the **Page Property** sheet by **Orientation**, on the **Component Page Property** sheet by **Begin New Page**, and on the **Frames Property** sheet by **Placement**. When any of these settings is active, the box displaying the active property is in reverse video.

To change a property that can be turned on or off:

- ↑ Point the mouse cursor into the box you want to turn on, and click the left mouse button to select it.

The active property is displayed in reverse video, and the deactivated property is displayed in normal video.

The Popup Menus on Property Sheets

All the property sheets in the Interleaf software have two popup menus, the Apply menu and the Close menu. These menus are slightly different on different kinds of sheets, but their major functions are basically the same: if you have altered any properties on the sheet, when you hold down the middle mouse button you see the Apply menu. Since Apply is the default on all these menus, you can just click the middle button if you want to apply your changes.

All of the Apply menus also have a Cancel command. When you choose Cancel, you are canceling all of the changes you have made to the property sheet since the last time you applied your changes.

On all Close menus, Close is the default, so you can just click the middle button when you want to close a property sheet. Most of the property sheets also have a Reset command. When you choose Reset, you are canceling all of the changes you have made to the property sheet since you opened it.

Options on the property sheet popups that are special cases are discussed with the property sheet they are related to.

Figure 4-2 shows one example of the Apply and Close menus.

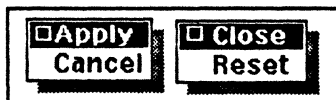


Figure 4-2. Frame property sheet popup menus

Page Properties

On the **Page Property** sheet for a document, you establish such characteristics as margins for every page and the text to be used in the headers and footers. These properties establish the overall format for every page.

To open the Page Property sheet:

- ✓ Open a document.
- ▲ Point the mouse cursor into the **Page** box in the header bar of the document.
- ☐☐☐ Hold down the middle mouse button to see the **Page** pulldown menu (*Figure 4-3*).

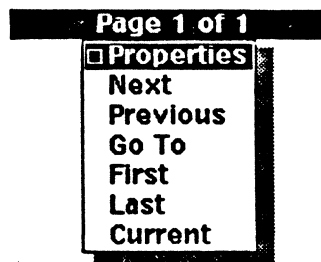


Figure 4-3. Page pulldown menu

- ☐☐☐ Release the button when **Properties** is in reverse video. (Initially, **Properties** is the default on this menu, but the default changes with some of the choices you make. If you choose **Next**, **Previous**, or **Go To**, that choice becomes the temporary default.)

Figure 4-4 shows the **Page Property** sheet with the defaults set. Following the figure is a discussion of each of the properties on the sheet.

Page Properties	
Orientation	<input checked="" type="radio"/> Portrait <input type="radio"/> Landscape
Height	<input type="text" value="11"/> Inches
Width	<input type="text" value="8.50"/> Inches
Margins	
Top	<input type="text" value="1"/> Inches
Bottom	<input type="text" value="1.10"/> Inches
Left	<input type="text" value="1.40"/> Inches
Right	<input type="text" value="1.40"/> Inches
Starting Page #	<input type="text" value="1"/>
Headers/Footers	
Page # Style	<input checked="" type="radio"/> Arabic <input type="radio"/> Lowercase Roman <input type="radio"/> Uppercase Roman
Page Layout	<input checked="" type="radio"/> Single Sided <input type="radio"/> Double Sided - Right 1st Page <input type="radio"/> Double Sided - Left 1st Page
Header	
Left	<input type="text"/> First page
Center	<input type="text"/> First page
Right	<input type="text"/> First page
Footer	
Left	<input type="text"/> First page
Center	<input type="text" value="--"/> First page
Right	<input type="text"/> First page

Figure 4-4. Page Property sheet

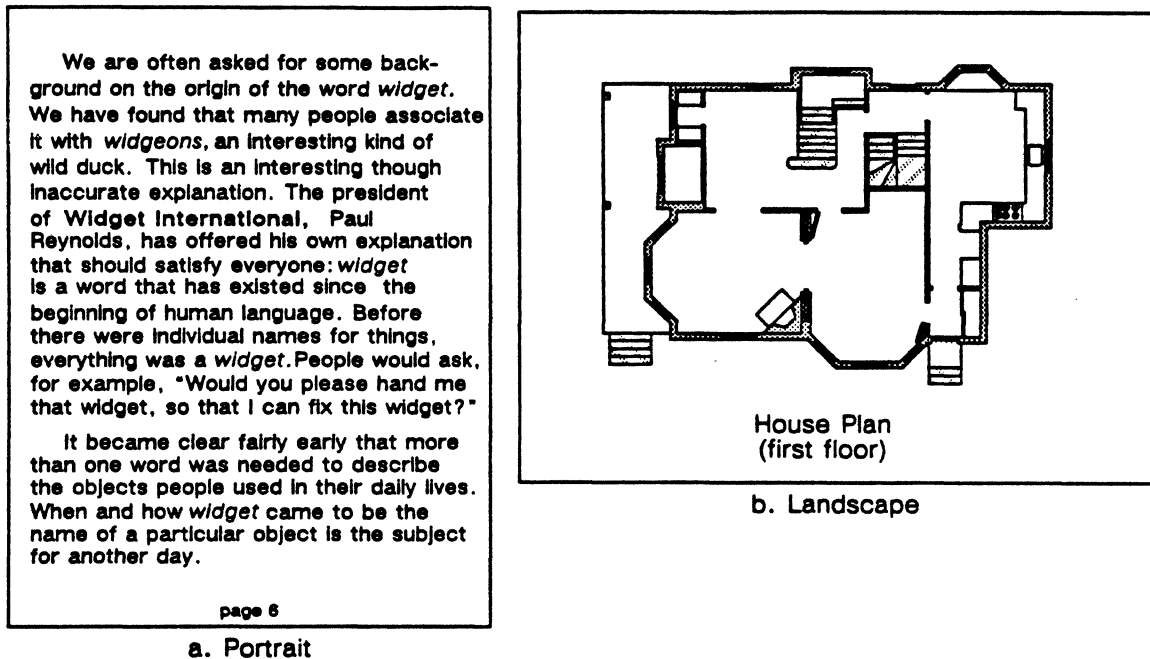
Orientation of the Page

There are two settings that control the **Orientation** of text and graphics on a page when it is printed.

The default setting is **Portrait**, which is the normal orientation for pages of text like the one you are reading (*Figure 4-5a*).

Landscape orientation reverses the way that text and graphics appear on the page when it is printed and is the appropriate setting for tables and diagrams that are wider than 8.5 inches (*Figure 4-5b*).

For your convenience, when you switch from **Portrait** to **Landscape** or vice versa, the **Height** and **Width** settings are reversed to remind you how the orientation will affect the height and width of the document when it is printed.



a. Portrait

Figure 4-5. Orientation of pages

Height and Width of Pages

If you do not want to print a document, you can give it a **Height and Width** of up to 35 inches. If you do want a printed copy, there are some size limitations.

The paper cassette that comes with your cx printer holds paper that is 11 inches by 8.5 inches, and this is the default page size.

You can make the **Height and Width** of your pages smaller and either manually feed smaller paper into the printer or use the cassette for 11 by 8.5 inch paper and trim the pages later to the size you want them.

If you have a legal-size cassette, you can print pages up to 14 by 8.5 inches. If you do not have a legal-size cassette, you must manually feed legal-size paper into the printer.

Page Margins

The default page margins are set so that there is a pleasing amount of white space around text, but you can easily change the margins to suit your own needs.

In order for pages to print correctly, nothing can be within *.25 inches* of the edge of the paper. You can either make the page margins at least *.25 inches* all round, or make sure that you do not put any text or graphic closer than *.25 inches* to the edges of the page.

Starting Page

When you have a long document, it is often a great convenience to break it into sections and then reassemble the sections after you have edited and printed the shorter documents. In the **Starting Page #** box, you can specify any page number you like, so breaking up a long document is very easy.

Starting Page # is linked to both **Page # Style** and *tildes* that appear in the **Header** and **Footer** boxes.

The *tilde* character (-) is used by the software as a page number reference. Any tildes that appear in header or footer boxes are replaced in the document by the appropriate page number. If, for example, you were to change the **Starting Page #** on the property sheet shown in *Figure 4-4* from 1 to 8, the tilde in the center footer box would be replaced with the appropriate **Arabic** page numbers. Because **First page** is turned off for the center footer, the first numbered page would have -9- as its center footer.

Headers and Footers

The rest of the boxes on this property sheet have to do with where **Headers** and **Footers** will appear.

Page Layout

The laser printer prints on only one side of a piece of paper; therefore, it would seem that you should always choose **Single Sided** as the **Page Layout** for your documents. However, using the **Double Sided** choices, you can set up documents so that the laser printer output will be camera-ready for double-sided printing on some other equipment.

Single-Sided Layout

If your final copy is to be printed on only one side of the paper, you will probably choose **Single Sided** because it puts the **Headers** and **Footers** in the same place on every page (*Figure 4-6a*), which makes finding the page number or heading you want easier than it would be if the headers and footers jumped from the right to the left to the right to left.

Double-Sided Layout

In the following discussion of double-sided printing, it is assumed that you always want *page 1* of a document (which could be an entire book or a single chapter) to be a right-hand page since this is the conventional way that American books are arranged.

If you have a document that begins on a page 1 (or on some other odd-numbered page), and you want the document to be printed eventually on both sides of the paper, you should choose **Double Sided — Right 1st Page**. *Figure 4-6b* shows what automatically happens to the header and footer when the layout is changed from **Single Sided** to **Double Sided — Right 1st Page**.

You can see how this works in a real document by looking at where the headers and footers on the page you are reading occur and then looking at where the headers and footers on the facing page occur. This chapter was printed on the ex using the **Double sided — Right 1st Page** option.

When your starting page number is an even number, **Double Sided — Left 1st Page** achieves the same results as **Double Sided — Right 1st Page** does when your starting page number is an odd number.

This option is useful when you want to divide a single chapter into several documents for editing and printing. Sometimes you cannot logically divide a chapter in such a way that all the first pages will be odd-numbered pages. With **Double Sided — Left 1st Page**, you can have sections that begin with even numbered pages that will fit properly into your chapter when you put it back together again. *Figure 4-6c* shows an example of facing pages with *page 6* as the first page.

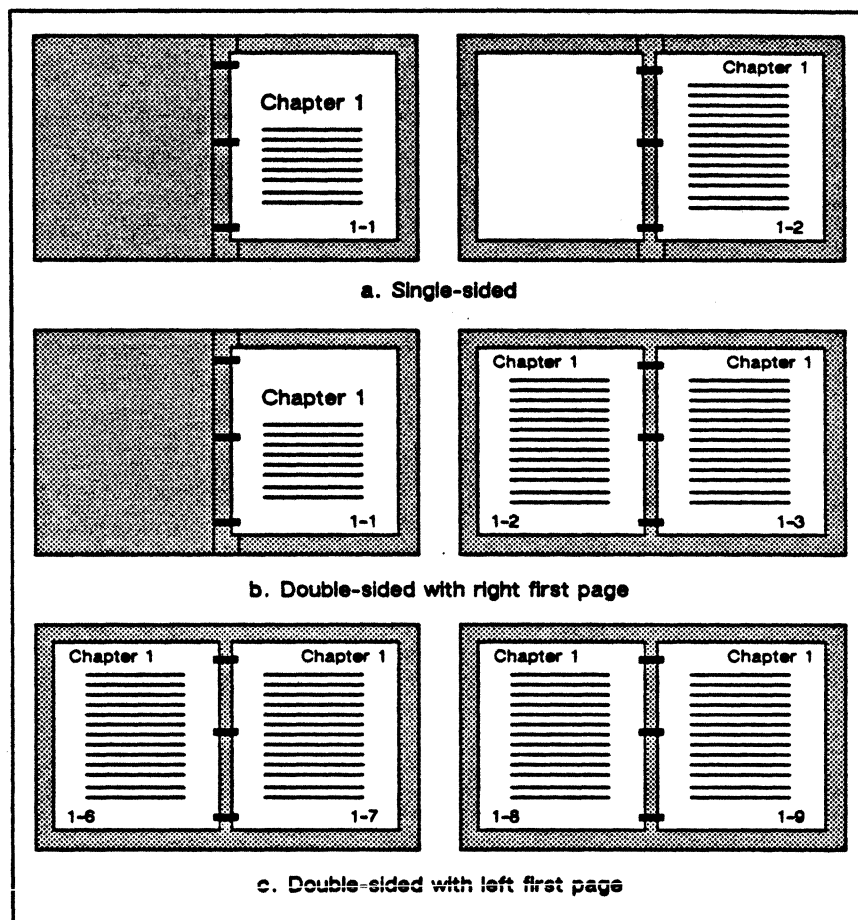


Figure 4-6. Page layout for printing

Entering Text for Headers and Footers

You can have as many as 6 different headers and 6 different footers in a single document. And, although it is hard to imagine that anyone would want this, you can use as many as 12 different fonts in these headers and footers!

As a general rule, it is best to enter all your headers and footers with **Single Sided Layout** turned on. If you then switch to one of the double-sided layouts, the system will automatically enter the text of the headers and footers in the right place for the double-sided layout. If you want to change this text, you can always overwrite the entries.

To enter text of one font:

- ✓ Turn on **Single Sided Layout** on the **Page Property** sheet.
- ✓ Make sure the font you want to use is displayed in the **Font** box in the document header.

- ✓ Type in the text you want and confirm the entry with the <TAB> or <RETURN> key.
- ☐☐ Click the left mouse button to turn on **First page** for any headers or footers you want to appear on the first page of the document.
The First page boxes are used to turn the setting for the Headers or Footers both on and off. If any of the First page settings is in reverse video, its Header or Footer will be printed on the first page of your document.
- ☐☐ If you want **Single Sided Layout**, you are finished and you can click the middle mouse button to apply.
- or ✓ If you want one of the double sided layouts, turn on the one you want and, then, click the middle button to apply.
The headers and footers you have entered for Single Sided are entered automatically in the correct fields of the Double Sided Layout you have chosen.

If you want to use more than one font in your headers and footers, the instructions are basically the same, but you have to go through some of the steps several times.

To enter text for header and footers in more than one font:

- ✓ Make sure the first font you want to use is displayed in the Font box in the document header.
- ✓ Type in the text you want and confirm the entry with the <TAB> or <RETURN> key.
- ✓ Type in any other text you want in this font.
- ✓ Apply.
- ✓ Change the font in the Font box to the next font you want to use.
- ✓ Type in the text you want in this font, confirm, and apply.
- ✓ Continue in this way until you have entered the text in all the fonts you want to use.

Component Page Properties

There are three Component Property sheets: the Format sheet, the Tab sheet, and the Page sheet. The Format and Tab sheets are discussed in the chapter, *Text Processing*.

The settings for the properties on each of these sheets will have an effect on the way a document looks, but the properties on the Component Page Property sheet allow you to make important decisions about page makeup.

As with other component properties, these properties can be applied to a particular component or globally to all the components with the same name.

Figure 4-7 shows the Apply popup menu for the Component Property sheets.

For most component properties, it is possible to apply properties to one component to see how the component looks and then use the Unify command on the Close popup menu (*Figure 4-7*) to apply the properties to all the components with the same name. However, because page properties represent such major alterations in the way a document looks and are often used to make particular pages look better, you cannot use the Unify command with any of the Component Page properties except Orphan and Widow Control.

If you have applied a Component Page property to one component and then want to apply it globally, first, turn *on* the property you *do not want* and, then, turn *on* the property you *do want* and use the Global Apply command.

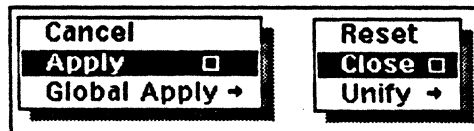


Figure 4-7. Component Property sheet popup menus

To open the Component Page Property sheets:

☞ Move the mouse cursor into the component bar to the left of the document.

☐☐ Select one component.

While, for most commands, you can select as many components as you like, you can open the property sheets for only one component. If you execute the Props command when more than one component is selected, a message will inform you that you need to select a single component.

☐☐ Hold down the middle mouse button to see the Selected Component popup menu (*Figure 4-8*).

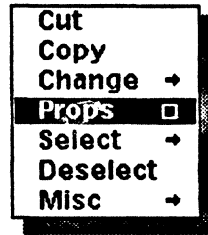


Figure 4-8. Selected component popup menu

- ☐☐☐ Release the mouse button when **Props** is in reverse video. *Props is the default on this menu, but many other commands can become temporary defaults, so you will often need to look at the menu and select Props.*
- ☐☐☐ If the Component Property sheet displayed is not the Component Page Property sheet, point the mouse cursor into the Page box in the property sheet header and click the left mouse button.

Figure 4-9 shows the Page Property sheet with the defaults in reverse video.

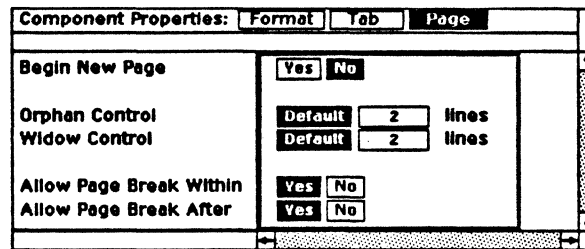


Figure 4-9. Component Page Property sheet

When any of these settings is active, the box displaying the active property is in reverse video.

To change the setting for **Begin New Page**, **Allow Page Break Within**, or **Allow Page Break After**:

- ↑ Point the mouse cursor into the box that is in normal video, and click the left mouse button. *As the new setting is turned on, the previous setting is automatically turned off.*

Orphan and **Widow** control work in a slightly different way from the other properties. When **Default** is in reverse video, a 2 is automatically entered in the **Lines** box. You can type any number between 1 and 16 in the **Lines** box. If you type any number except 2, **Default** will be turned off.

To change the setting for Orphan Control or Widow Control:

- ↑ Point the mouse cursor into the box with a number in it, and click the left mouse button.
 - ☐ Type a number between 1 and 16. Press <TAB> to confirm the number of lines you have typed in and to move the cursor to the other box in which you may type a value.
- or ☐☐☐ Point the mouse cursor into the Default box, and click the left button.
A 2 is entered automatically in the Lines box.

You can apply the changes you make either to a single component or to all the components of a particular name.

To apply the changes you have made to a single component:

- ☐☐☐ Click the middle mouse button.

To apply the changes you have made to all the components with the same name:

- ☐☐☐ Hold down the middle mouse button and select

Global Apply	→	Confirm
--------------	---	---------

.

Begin New Page

The default setting for **Begin New Page** is *No*. If *No* is in reverse video, the component will start wherever it will fit on a page. If you turn on *Yes*, the component will always begin at the top of a page. You can apply this quality to an individual component to make particular pages look better when you are making final page break decisions. You can also apply the quality globally so that each of the components of a particular type—chapter titles, for example—will appear at the top of a new page.

Orphan and Widow Control

An *orphan* is a single line at the bottom of a page, and a *widow* is a single line at the top of a page. These lines can contain text, but they can also be empty lines.

With the Interleaf publishing software, the user can control the number of lines of a component that must appear at the bottom of one page and at the top of the next page before the component can be broken across page boundaries.

Orphan and Widow Control makes aesthetically pleasing page makeup possible. The system default for both *orphans* and *widows* is 2 lines. With these default set-

tings, a component of fewer than four lines cannot be split across page boundaries, and you will never be in a situation in which one line will appear all by itself at the bottom or the top of a page. If both lines of a two-line component or all three lines of a three-line component will not fit at the bottom of one page, the entire component will move to the top of the next page.

A one-line component will be put wherever it will fit unless you give special instructions. See the discussion of **Allow Page Break After** for the way to control the placement of one-line components.

Orphans and *widows* can be set to any number of lines between 1 and 16. The greater the number of lines, the less likely the component is to break across page boundaries.

Allow Page Break Within

If **Allow Page Break Within** is set to *Yes*, the system is allowed to put part of the component on one page and part of it on the next page as long as this does not violate the *widow/orphan settings* for the component.

If **Allow Page Break Within** is set to *No*, the component will not, as a rule, break across page boundaries. The only exception is a component that is longer than a single page. Then the component will break, but the message *Unbreakable line(s) and frame(s) on page <-> are taller than the page* will appear in the status line.

If it is necessary to break such a component, the *widow* setting for the component will be superseded. In other words, the system will fit as many lines of the component as possible on a single page even if this means that the number of lines at the top of the next page will be fewer than the number designated by the *widow* setting.

Allow Page Break After

The default for **Allow Page Break After** is *Yes* because it is normally reasonable to let the system decide where page breaks should occur.

If *Yes* is turned on for *component a*, a page break will be permitted between *component a* and *component b*.

However, **Allow Page Break After** may be set to *No* in some circumstances to make sure that components that should appear together on the same page do appear there (at least in part).

For example, if the heading for this section, *Allow Page Break After*, had appeared all alone at the bottom of the previous page, the relationship between the heading and the section would have been obscured, if not completely destroyed. In order to avoid this kind of break between a heading and the section it heads, the **Allow Page Break After** property for the *heading* components in this document was set to *No*.

Using the Component Page Properties

Because the Interleaf publishing software offers the user so much power and flexibility in determining the properties of a document, it may be tempting to make the layout of every page perfect as you enter it. There is nothing wrong with this, but some of this immediate striving for perfection may be a waste of time and, in many cases, may have to be undone later if the document is revised (as most documents are).

Some page makeup decisions are worth making the moment they come up because they will not change as you revise the document. For example, you will never want a *heading* separated from the section that follows it, and you will always want a *chapter* to begin a new page.

On the other hand, when you first type in a document, you may find that an exceedingly awkward looking, one-line component falls all alone at the bottom of a page. You may want to rush right in and move it to the next page. If you can, restrain this impulse! Editing may well take care of the awkwardness for you. If it does not, you can always move the line later, when the text is more stable and the decisions you make are more likely to stick.

Frames

A *frame* is an area in a document that is reserved for diagramming activities. Just as a picture frame sets off a picture from the wall on which it is hung, a frame in this publishing software sets off the graphic system from text.

Frames can be created in a variety of sizes and types. For example, a frame can be very small and a part of a line of text, or it can be medium-sized and separated from its reference in text or so large that it is the only object on the page.

In some instances, you will use the **Frame** command on the **Text Location Selected** popup menu to create a frame. In other instances, the system will create a frame for you. In either case, you can, at any time change the type of frame and the size of the frame to fit changing circumstances.

This section covers both user-created frames and system-generated frames. It covers the following topics:

- types of frames
- frame anchors
- creating frames yourself
- letting the system create frames for you
- the **Frame Property** sheet

Types of Frames

There are six basic types of frames:

- At Anchor
- Following Anchor
- Following Text
- Top of Page
- Middle of Page
- Bottom of Page

On the **Frame** popup submenu (*Figure 4-10*), there is also the option to create a *Footnote* frame. A *Footnote* frame is a special kind of *Bottom of Page* frame and will be discussed with *Bottom of Page* frames.

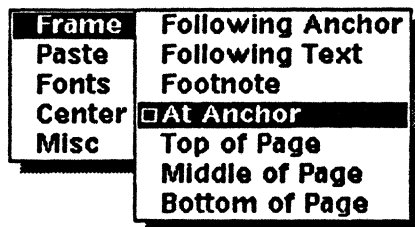


Figure 4-10. Frame popup submenu

Frame Anchors

All frames have *anchors*. A frame anchor is the reference point in text for a frame, and it changes position if you add or delete text before it. The effect of the movement of an anchor on the frame it is associated with depends on the type of frame.

You can choose whether or not you want the anchors in a document to be visible on the screen. It is useful to have them visible at least some of the time because you can use an anchor to select its frame. When a frame and its visible anchor are selected, you can easily see the relationship between the frame and the reference to it in text.

Anchors are placement markers and not characters, which means that they do not print and do not in reality take up room in text. If you have several visible anchors on the same line, characters and anchors may look on the screen as though they are overlapping or crashing into each other. However, the text will *print* correctly. If the frame anchors are visible on the screen and you want to see how your document will look when it is printed, on the Text Location Selected popup menu, execute Misc Show Anchors.

At Anchor frames are placed *at their anchors*, so you *never* see their anchors. An *At Anchor* frame behaves like a character and always moves with the surrounding text and remains in the same relationship to it.


The other kinds of frames are page placement frames, and text can flow around them.

Following Anchor, *Following Text*, and *Bottom of Page* frames are always placed after their anchors.

Top of Page and *Middle of Page* frames can come before or after their anchors. Whether they are placed before or after their anchors depends on where their anchors are and where there is room for them.

The details of all the types of frames are discussed in the following sections.

At Anchor Frames

When you use the **Frame** submenu to create an *At Anchor* frame, space is opened up for the frame at the position of the editing cursor. This grey area  represents a newly created *At Anchor* frame. Its height and width were determined by the point size of the default font for this component, which is 12-point. In *Figure 4-11*, the height and width of the frame have been changed to accommodate the brackets.

When an *At Anchor* frame is created in the middle of text, it moves along with the text around it. For example, in *Figure 4-11* $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is in an *At Anchor* frame.

Example 1

(b). Define a 2x2 real matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ in such a way that $[x,y] \rightarrow [x,y]A$ is the rotation described above.

Example 2

(b). Refer to the previous section, and define a real matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ in such a way that $[x,y] \rightarrow [x,y]A$ is the rotation described.

Example 3

(b). Define a real matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ in such a way that $[x,y] \rightarrow [x,y]A$ is the rotation described above.

Example 4

(b). Define a 2x2 real matrix $A =$ in such a way that $[x,y] \rightarrow [x,y]A$ is the rotation described above.

Figure 4-11. At Anchor frames

Example 1 in *Figure 4-11* shows the original lines of text. The line spacing has been adjusted by the system to accommodate the frame.

Examples 2 and *3* in *Figure 4-11* show how an *At Anchor* frame behaves like a character. If you add text before it, the frame moves forward to make room for the inserted text (*Example 2*).

Similarly, if you delete text before an *At Anchor* frame, the frame moves back to fill up the gap (*Example 3*).

If you delete the frame itself (*Example 4* in *Figure 4-11*), the system automatically readjusts the line spacing.

You should always put a space between an *At Anchor* frame and the text on either side of it, so that the frame will not be considered part of a word for line breaks and hyphenation. If the frame is followed by a punctuation mark, you should not put in a space between the frame and the punctuation mark.

At Anchor Frames in Components by Themselves

There are times when you will want to put a large *At Anchor* frame in a component by itself because you want it to stay in a particular relationship to the text and you do not want text to flow around it.

Also, when *At Anchor* frames are in components by themselves, it is possible to apply some properties to them globally through the **Component Property** sheets. For example, the figures in this reference manual are *At Anchor* frames in separate components, and the components they are in have **Allow Page Break After** turned on, so that the figures will never be separated from their labels.

Following Anchor Frames

Ideally, when you create a *Following Anchor* frame, a space is opened up right below the line with the anchor in it. If the anchor is too close to the bottom of the page, the frame is put at the top of the next page. *Figure 4-12a* shows how two consecutive pages look on the screen when there is room for the frame right after its anchor. *Figure 4-12b* shows how two consecutive pages look when there is not enough room for the frame on the same page with its anchor.

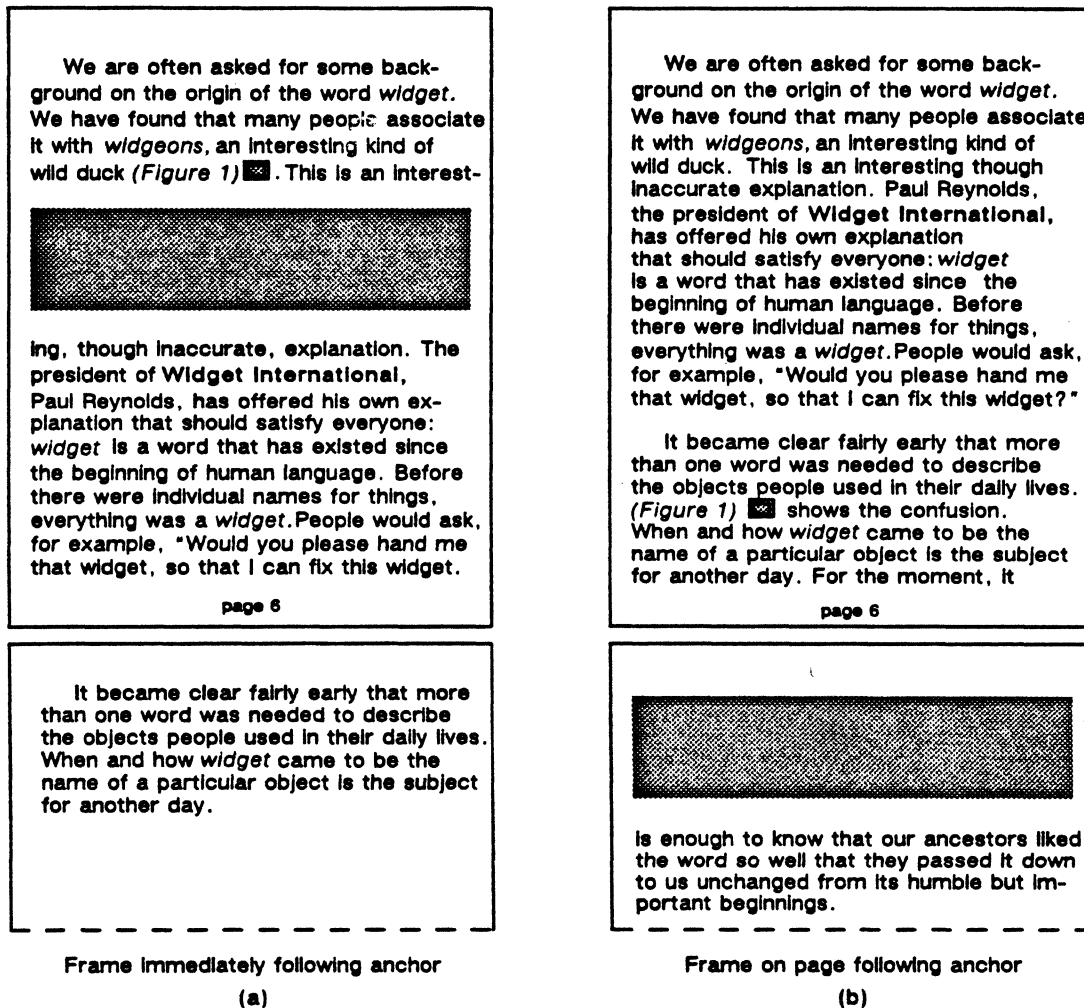


Figure 4-12. Following Anchor frames

Following Text Frames

The best way to understand the placement of a *Following Text* frame is to imagine a one-page document with nothing in it except a *Following Text* frame and its anchor. The anchor is the first thing in the document and frame is just below it. If text is added above the frame, the frame is pushed down the page until no more text is added or until there is no more room for text.

When there is as much text as will fit on the page, the software leaves the frame where it is which may leave some extra vertical white space on the page below the frame. This means that a full page of text with a *Following Text* frame as the last item may not have a justified bottom margin.

There are two situations in which a *Following Text* frame is the preferred type of frame to create: when you want a diagram on the last page of a document *im-*

mediately after all the text and when you want to put a diagram at the bottom of a page that has footnotes on it. In the second case, creating a *Following Text* frame assures you that the diagram will be above the footnotes.

In all other instances, when you want a frame at the bottom of a page, a *Bottom of Page* frame is the better frame to create.

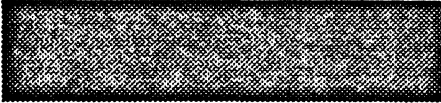
Figure 4-13a shows an example of a *Following Text* frame on the last page of a document, and *Figure 4-13b* shows an example of a *Following Text* frame on a page with a footnote. In *Figure 4-13b*, the extra white space is between the *Following Text* frame and the *Footnote* frame, and the bottom margin of page 6 is justified.

We are often asked for some background on the origin of the word *widget*. We have found that many people associate it with *widgeons*, an interesting kind of wild duck. This is an interesting though inaccurate explanation. The president of Widget International, Paul Reynolds, has offered his own explanation that should satisfy everyone: *widget* is a word that has existed since the beginning of human language. Before there were individual names for things, everything was a *widget*. People would ask, for example, "Would you please hand me that widget, so that I can fix this widget?"

As people became more sophisticated, they found it clumsy and rude to have to point at the things they needed. What, they sometimes wondered, was language good for if it couldn't be more specific.


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page 6

It became clear fairly early that more than one word was needed to describe the objects people used in their daily lives. (Figure 1) shows the confusion. When and how *widget* came to be the name of a particular object is the subject for another day.



page 7

It became clear fairly early that more than one word was needed to describe the objects people used in their daily lives. When and how *widget* came to be the name of a particular object is the subject for another day.

page 7

Frame on last page of document (a)

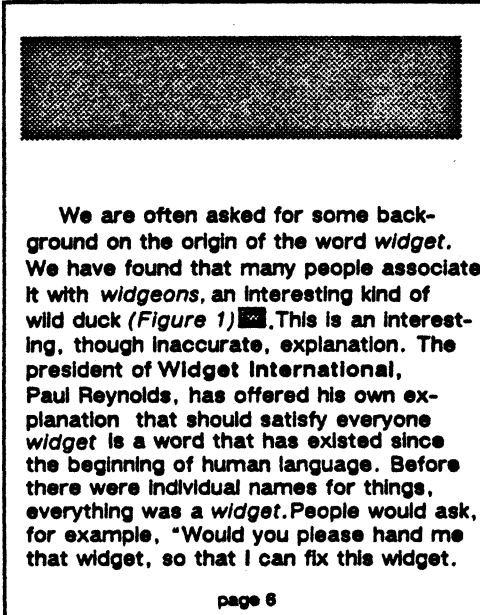
Frame on page with footnote (b)


Figure 4-13. Following Text frames

Top of Page Frames

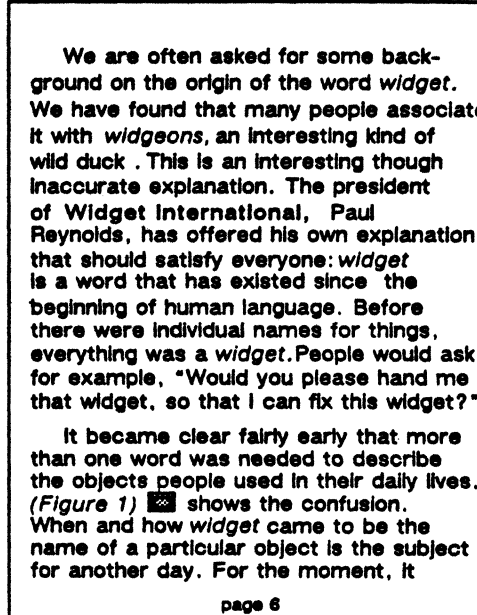
As the name implies, a *Top of Page* frame will appear at the top of a page. If there is room for it on the page with its anchor, it will be at the top of that page

(Figure 4-14a). If there is not room for it on that page, it will be at the top of the next page (Figure 4-14b).




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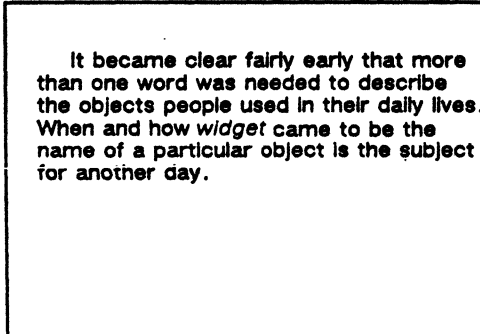
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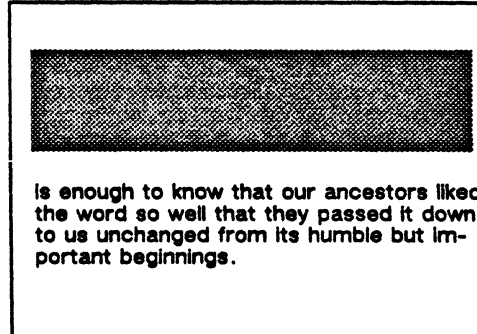
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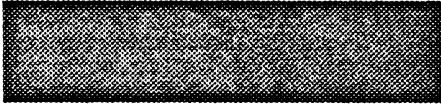
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page 6



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Frame on page with its anchor
(a)

Frame on page after its anchor
(b)


Figure 4-14. Top of Page frames

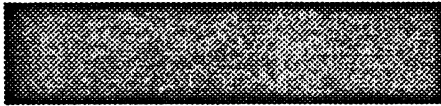
Middle of Page Frames

A *Middle of Page* frame makes it possible for you to place a frame in the middle of a page. There are three possible relationships between a *Middle of Page* frame and its anchor:

- The frame can be below its anchor on the same page with it (Figure 4-15a).
- The frame can be above its anchor on the same page with it (Figure 4-15b).

- The frame can be in the middle of the page following the page with its anchor on it (Figure 4-16). This placement occurs when the anchor is too close to the bottom of a page for both the anchor and the frame to fit on the same page.

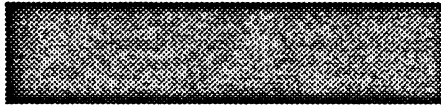
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With anchor above frame
(a)

It became clear fairly early that more than one word was needed to describe the objects people used in their daily lives. When and how *widget* came to be the name of a particular object is the subject for another day.

With anchor below frame
(b)

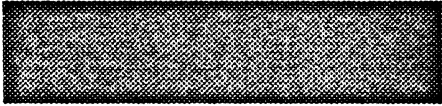
Figure 4-15. Middle of Page frames on page with anchor

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
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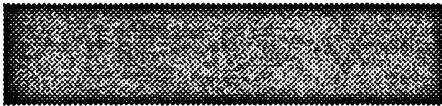
Figure 4-16. Middle of Page frame on page following its anchor

Bottom of Page Frames

A *Bottom of Page* frame is always placed after its anchor and on the same page with its anchor if there is room for it or at the bottom of the following page if there is not room for it on the same page. Figure 4-17a shows a *Bottom of Page* frame on the same page with its anchor, and Figure 4-17b shows it on the next page.


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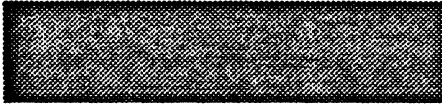
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With anchor and frame on the same page
(a)

With anchor and frame on different pages
(b)

Figure 4-17. Bottom of Page Frames

Footnotes

When you use the Frame submenu to create a *Footnote*, the system creates a *Bottom of Page* frame that has a much smaller default height than the regular *Bottom*

of Page frames, and it sets the frame properties so that the frame will always appear on the same page as its anchor.

Placement of Frames

There are two guidelines that can help you with the placement of frames.

- A frame will always be on a page *following* its anchor unless it can be placed on the same page as its anchor.
- Frames are always placed in the order in which their anchors occur in text. This is usually exactly what you want. However, there is one time when it might present an aesthetic problem: when you have a frame anchor, such as the anchor for a *Following Text* frame, so close to the bottom of a page that there is not enough room for the frame on the page with its anchor, the frame will be placed on the next page. If you have the anchor for a *Footnote* after the anchor for the *Following Text* frame but on the same page, the line with the *Footnote* anchor in it and the rest of the text on the page will move to the next page so that the *Footnote* reference will be on the same page as the *Footnote* frame, leaving extra white space at the bottom of the previous page. To avoid this, you can put the *Following Text* anchor after the *Footnote* anchor.

Creating Frames

There are two ways to create a frame: you can use the **Frame** command on the **Text Location Selected** popup menu, or you can let the system create a frame for you by pasting a graphic object directly into your document as text or as a component.

Using the Frame Submenu to Create a Frame

When you are going to create a diagram from scratch, you will begin by creating a frame using the **Frame** submenu of the **Text Location Selected** popup menu (Figure 4-18).

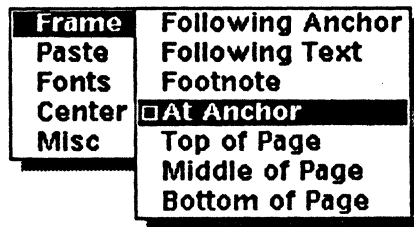


Figure 4-18. Frame popup submenu

The default on this menu is an *At Anchor* frame. If you release the middle mouse button when only the main menu is visible, the system will create an *At Anchor* frame of the appropriate size for the type font at the cursor position.

To create a frame:

- ✓ Position the editing cursor where you want the frame anchor, and hold down the middle mouse button to see the **Text Location Selected** popup menu.
- ✓ Slide off on the **Frame** submenu, and release the mouse button when the type of frame you want to create is in reverse video.

A frame (and anchor, when this is appropriate) of the default size is positioned at the appropriate place on the page. The newly created frame is in reverse video which indicates that it is selected.

Letting the Software Create a Frame for You

It is not always necessary or convenient to create a frame yourself. For example, when you have a graphic object of indeterminate size, such as a plotter object or a screen image, you can paste it directly into text or as a component and let the software create a frame of the correct size for you. If the object is larger than the largest frame that will fit within the page margins of your document, the software will do a further service for you and adjust the object proportionally to fit into the largest frame the page can accommodate. *Figure 4-19* shows the icons for the desktop objects that are suitable for automatic framing.

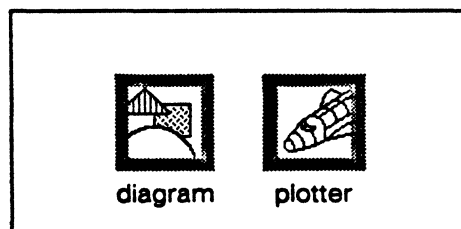


Figure 4-19. Icons for graphic objects

The default type and placement of a software-created frame depends on several conditions. The type and placement can be changed on the **Frame Property** sheet once the object has been pasted.

Pasting a Graphic Object into Text

You can paste a graphic object into the text of a component that already has contents or into the text of an empty component. In both cases the software will create a frame for the object.

If you paste the graphic object in text into a component that already has contents, the software creates either an *At Anchor* frame or a *Following Anchor* frame with **Center Horizontal Alignment**.

An *At Anchor* frame is created if the graphic object is no taller than the height of the font of the component into which you are pasting the object.

If the graphic object is taller than the component font, a *Following Anchor* frame is created. This frame may be wider than the component into which you are pasting the graphic object.

If you paste the graphic object into an empty component, the software creates an *At Anchor* frame with the left edge of the frame at the left margin of the component. This frame will not be wider than the component into which you are pasting the graphic object because an *At Anchor* frame is treated like a character in text, and characters cannot go beyond the component margins.

Pasting a Graphic Object as a Component

If you use paste on the **Component** popup menu, the system first creates a component of the type at the component caret position. Then, it makes the **Alignment** of this component **Centered** and creates an *At Anchor* frame into which it puts the graphic object. Because the frame is an *At Anchor* frame, which is treated like a character, the frame can be no wider than the margins of the component.

If you have a *diagram* of the correct size in a document and you want to use all of its contents elsewhere, it is usually better to copy the *frame* itself—as opposed to the contents of the frame—as a *document* object and paste this *document* object since this ensures that the *frame* remains the same type you began with.

The Frame Property Sheet

On the **Frame Property** sheet, you can change the type of a frame, its size, and its alignment.

To access a Frame Property sheet:

- ✓ Select the frame by pointing at it and clicking the left mouse button or by using the left and right mouse buttons to select its anchor.
- ☐☐ Hold down the middle mouse button to see the **Text Selected** popup menu (*Figure 4-20*).

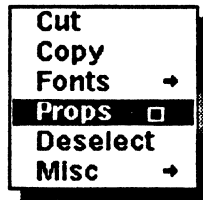


Figure 4-20. Text Selected popup menu

☐☐☐ Release when Props is in reverse video.

Props is the default on the menu, but some of the other options can become temporary defaults.

Figure 4-21a shows the Frame Property sheet for an *At Anchor* frame, and Figure 4-21b shows the Frame Property sheet for all the other kinds of frames.

Frame properties:	
Width	<input type="text" value="0.41"/> Inches
Height	<input type="text" value="0.14"/> Inches
Placement	<input checked="" type="radio"/> At Anchor <input type="radio"/> Following Anchor <input type="radio"/> Following Text
Vertical Alignment	<input type="radio"/> Top of Page <input type="radio"/> Middle of Page <input type="radio"/> Bottom of Page <input type="text" value="0.03"/> Inches

(a)

Frame properties:	
Width	<input type="text" value="8"/> Inches
Height	<input type="text" value="3.88"/> Inches
Placement	<input type="radio"/> At Anchor <input checked="" type="radio"/> Following Anchor <input type="radio"/> Following Text
Horizontal Alignment	<input type="radio"/> Top of Page <input type="radio"/> Middle of Page <input type="radio"/> Bottom of Page <input type="radio"/> Left <input checked="" type="radio"/> Center <input type="radio"/> Right <input type="radio"/> Other
Same Page as Anchor	<input type="radio"/> Yes <input checked="" type="radio"/> No

(b)

Figure 4-21. Frame Property sheets


There are only a couple of differences between the two sheets. The Width, Height, and Vertical Alignment of an *At Anchor* frame are determined by the font of the component in which it is created. You can change any of these by typing new values into the appropriate boxes.

The default Vertical Alignment setting for an *At Anchor* frame centers the frame in the line of text and maintains the line spacing of the component. If you enter a larger value, the frame will drop below the line of text and change the line

spacing between the line with the frame in it and the following line. If you enter a smaller value (for example, a negative value), the frame will rise above the line and change the line spacing between the line with the frame in it and the previous line.


Except for different **Placement** settings, the default property sheets for all the other kinds of frames except a *Footnote* frame look like the one in *Figure 4-21b*. The *Footnote* frame is a small *Bottom of Page* frame with **Same Page as Anchor** set to *Yes*.

Because the default **Width** of all frames except *At Anchor* frames is the width of the page minus the left and right page margins, the only way to see a difference in the **Alignment** settings is to make the **Width** smaller. *Figure 4-22* shows the different alignments. *Figure 4-22d* shows an **Other** setting, which is the only one you have to enter a value for. **Other** permits you to choose the distance from the left-hand margin of the component to the left-hand edge of the frame.

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page 6

(a) Left

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(b) Center

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(c) Right

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(d) Other (Indented 2 inches from left-hand margin of the component)

Figure 4-22. Frame alignment

To set an Other Alignment:

- ☐☐☐ Use the left mouse button to turn on the **Alignment** that is closest to the setting you want.

In the case of Figure 4-22d, this would be Center.

- ☐☐☐ Use the left mouse button to turn on **Other**.

Figure 4-23 shows how the Horizontal Alignment line might look.



Figure 4-23. Horizontal Alignment line with Other turned on

- ☐ Type a number in the ins. box, confirm, and apply.

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Chapter 5

Introduction to the Diagramming System

If you have not already done so, please read *SignPosts*, the first chapter of the *Reference Manual*. It is a short overview of the Interleaf publishing software that provides the essential concepts you need in order to use this manual effectively.

This section of the *Reference Manual* describes the diagramming part of the publishing software you have purchased. It is divided into three chapters: this introduction, which covers general issues; *Commands and Concepts*, descriptions of all the diagramming commands organized according to concept; and *Techniques*, ways to combine the commands described in the previous section to get specific effects.

The *Commands and Concepts* chapter is divided into essays, each covering a command or set of commands in detail. The essays begin with a one- or two-sentence summary of the command, followed by two or three suggestions for using the command. Then we show the popup menu on which the command appears, and last, we explain the workings of the command in detail.

Many of the illustrations in the *Commands and Concepts* chapter show simple examples of the kinds of transformations you can effect with a command. You may want to try out these examples: it will help you to a more thorough understanding of the command.

The *Techniques* chapter has a very different orientation. The diagramming system contains such a wide set of tools that there is almost always more than one way to do any task. The techniques in the last chapter of this section show you the most efficient way to do some tasks, and will, we hope, help you figure out the best way to do the tasks you need to do. Since the techniques are laid out step by step, you might also want to use them as exercises in diagramming.

The rest of this introduction covers two subjects. First, there is a characterization of the diagramming system. Second, there is a discussion of printer and screen resolution, and of the issues the difference raises.

Characteristics of the Diagramming System

Here are some of the ways in which this diagramming system can be identified.

The diagramming system is an *object editor*. There are two fundamentally different kinds of graphic editors, object editors and raster editors. To an object editor like this one, a line is "the shortest distance between two points". To a

raster editor, a line is a series of dots arranged between two points. Once you have created a line in a raster editor, it loses its “lineness” and becomes simply those dots. A line created in an object editor will always be a line.

The diagramming system is *extendable* in three important ways. First, it is designed so that new features can be added naturally and easily. Second, it is designed to be independent of the resolution of any specific display screen or printer. Third, it is designed to support a wide variety of graphic objects: we will be able to add new kinds of graphics easily. These considerations ensure that the diagramming system will not quickly become obsolete.

The diagramming system is *hierarchical*. You can associate the objects you create to form groups, and you can make groups of the groups, too. This allows you to manipulate a complicated diagram conveniently.

The user interface for the diagramming system is based on *progressive disclosure*. The commands that are most difficult to use tend to be clustered on submenus of submenus. The new user can ignore the submenus, concentrating on the main popup menus. As he or she becomes comfortable with the system, the user can add one new command at a time.

Printer and Screen Resolution

The Interleaf publishing software, like all high quality publishing software, is not completely “what you see is what you get”. The printed copy looks *better* than the screen copy does. The only software that can truly be considered “what you see is what you get” is software that compromises final quality to make it match the quality that can be displayed on the screen.

The reason printed output looks so much better than screen output is that, with current technology, printers can have much higher resolution than screen displays can.

Most computer hardware for displaying and printing information show information not in continuous form (as you do when you write or draw) but in dots. The number of dots the particular piece of hardware has per linear inch is called its resolution.

For example, the screens on some displays have a resolution of 75 dpi (dots per inch). The laser printer used with this publishing software has a resolution of 300 dpi.

If you look very closely at the screen of your workstation, you will be able to see the dots. You would have to look much more closely at a printed piece of output to see the dots because there are so many more dots per inch, and the dots are so much smaller.

This difference in resolution has affected the design of the publishing software. Many features in the diagramming system exist only to help you use the full

resolution of the printer even though you cannot see on the screen that the features have made a difference.

If you want to understand why we recommend certain procedures in the manual, or why we have included a certain feature, please read the next section. It will help you create the best diagrams possible. However, if you are just learning the diagramming system, you may want to skip this section and return to it later.

☞ Explaining Resolution Issues

The first part of this section explains why higher resolution produces better looking diagrams. The second part covers the Interleaf solution to the problem of resolution.

A Concrete Example

Let us look at two imaginary hardware devices, one with a resolution of two dots to a linear inch, and one with sixteen dots to an inch. *Figure 5-1* shows one square inch on each of these imaginary devices.

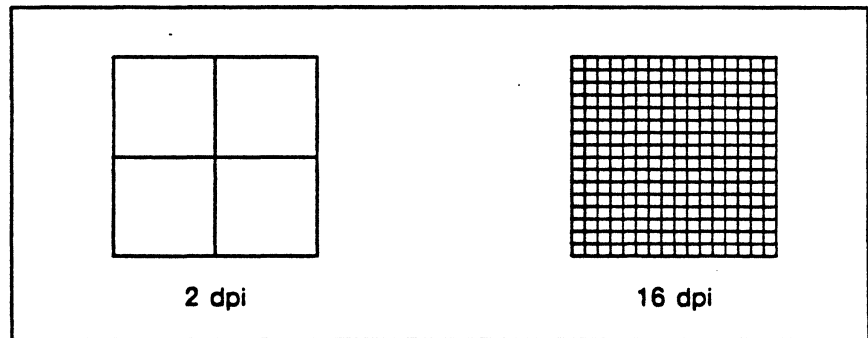


Figure 5-1. Two low resolution devices

Already you can see that you could represent much more complicated information on the 16 dpi device than you could on the 2 dpi device. But let's take a specific example. Suppose you wanted to draw a diagonal line at a 120 degree angle on each of these devices.

On the 2 dpi device, there are only two possibilities, and neither looks at all like the ideal line (*Figure 5-2*).

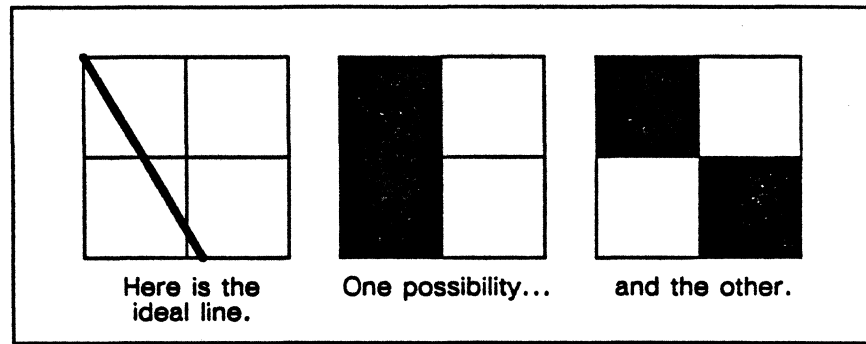


Figure 5-2. A 120° line shown on a 2 dpi device

On the 16 dpi device, you have many more dots to work with, and, therefore, you can get a much closer representation of the line (Figure 5-3).

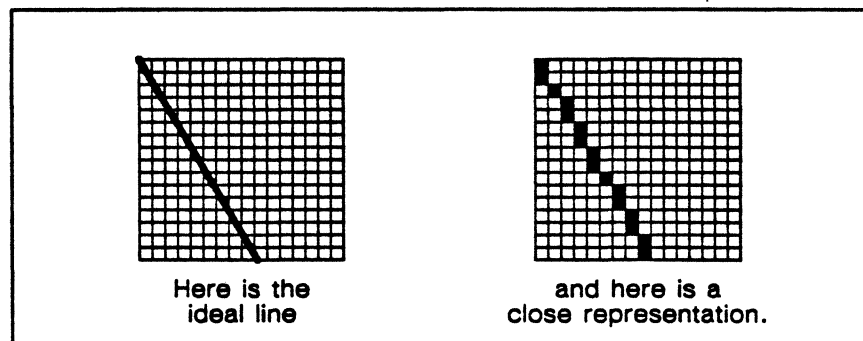


Figure 5-3. A 120° line shown on a 16 dpi device

It still isn't perfect, but if you had a 32 dpi device you could improve it, and on a 64 dpi device it would look even better. For that reason, most people want to use devices (displays and printers) that have the highest resolution possible.

But because the highest possible resolution is much lower for a screen than it is for a printer, the designers of a computer graphics system must make a choice.

Solving Resolution Problems

One possibility is that the designers can restrict the printers, forcing them to use the same unit as the display, and therefore guarantee exact correspondence between the drawing you see on the screen and the one you see on the printer. You can easily make a higher resolution device simulate a lower one (Figure 5-4).

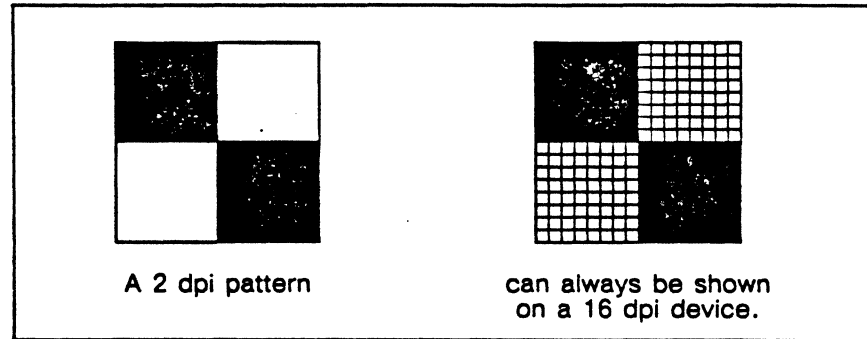


Figure 5-4. Simulating a lower resolution device

The other possibility is that the designers can use the full resolution of both display and printer, permitting differences between screen and printer versions, but allowing the user the full advantage of the higher resolution on the printer.

The designers of *this* diagramming system have chosen the second alternative. Instead of limiting drawings to the relatively coarse resolution of the screen, we store information about drawings at incredibly high resolution: one million dots per inch. Then the drawings are shown, on the screen or on the printer, at the best resolution that is available. Because your drawings are always shown at the highest resolution possible, they always look as good as possible.

One advantage to this method is that as technology improves—as higher resolution printers become available—the appearance of your work will also improve.

In addition, the designers have built into the diagramming system many aids to help you use the full resolution of the printer. For example, a feature called “Gravity” makes sure that lines that look connected on the screen are also connected on the printer. The **Rotate Numeric** command allows you to distinguish between angles that look the same on the screen, but subtly different on the printer. As you read through the rest of this manual, you will see references to the difference between screen and printer resolution, and techniques for creating the best drawings the printer will allow.

Chapter 6

Commands and Concepts

In this chapter of the *Diagramming Manual*, the commands on the popup menus and the concepts that control their use are discussed. Each section of the chapter covers a set of commands that is related both conceptually and practically. These commands do not necessarily appear on the same menu. For example, Cutting, Copying, and Pasting are discussed in one section even though they are found on three separate popup menus, because all three use the clipboard.

Although every section will refer you to others, each can also stand alone. When you need information on a specific subject, look it up in the Table of Contents or the Index. Then read only the sections that apply.

Fundamentals

In this section, we cover opening and closing a frame, the diagramming popup menus, and methods for selecting objects in the diagramming system.

Opening a Frame

All diagrams are contained in frames. (A frame is basically a container for a diagram.) Frames are complex enough that they are covered in another chapter of the *Reference Manual*. If you need information on creating frames and adjusting their sizes, please look in that chapter. So that you do not have to refer back and forth constantly, the information on frames that you need to work in diagramming is repeated in this section.

To open a frame:

- Move the mouse cursor into the diagram area.
- ☐ Click the left mouse button once to select the frame that contains the diagram.
- ☐ Click the left mouse button again to open the frame.

Figure 6-1 shows two pictures of the same page. Figure 6-1a shows a selected frame on the page. Figure 6-1b shows an open frame.

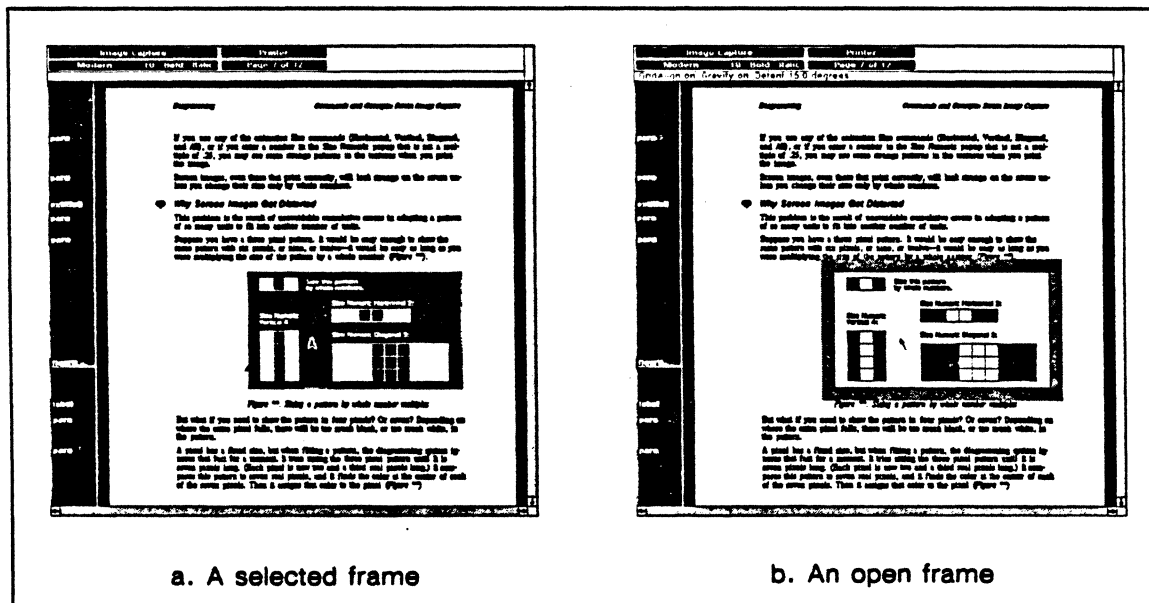


Figure 6-1. Opening a frame

When you open a frame, the status line, near the top of the document, shows the message in *Figure 6-2*.

GridAlign on, Gravity on, Detent 15.0 degrees

Figure 6-2. The status line when you open a frame

This message describes the current state of the diagramming environment (see *Defaults in Diagramming*), and it will be displayed unless there is more immediately relevant information to be displayed. Check the status line for information about SubEdits (see *Editing and Grouping*), about text, (see *Entering and Using Text Objects*), and about Locks (see *Locks*).

Closing a Frame

There are two ways to close a frame. You can use the **Close** command (*Figure 6-3*), or you can close it with a mouse button click.

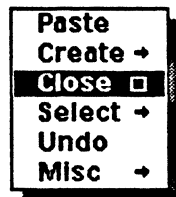



Figure 6-3. The Diagramming Nothing Selected popup menu

To close a frame using the popup menu command:





- ✓ Make sure the mouse cursor looks like this: .
- ☐☐☐ Hold down the middle mouse button, and make sure that **Close** is in reverse video.
- ☐☐☐ Release the middle mouse button.

The frame is still selected when you close it, so it is displayed in reverse video.

You can also close a frame by moving the mouse cursor outside the frame and clicking the left button. The editing cursor will move to the position in text that is closest to the mouse cursor. The frame will not be selected unless the closest position was immediately before the frame.

The Diagramming Cursors

The mouse cursor may assume any of four shapes in the diagramming system:

-  is the basic diagramming cursor. If you have a frame open in the active window, you will see this cursor as long as you keep the cursor in the document or component bar. If you move the cursor into the scroll or header bars, or if you move it out of the window altogether, it will assume a new shape appropriate to the new situation.
-  is the selection cursor. It selects the object at which it is pointing. If you hold down the left or right mouse button, you will see this cursor.
-  is the selection box. It selects all objects that are completely contained in it. To see the selection box, move the mouse cursor while you hold down the left or right mouse button.
-  is the popup cursor that you see everywhere in the Interleaf publishing software. You use it to select commands on the diagramming popup menus.

Selecting and Deselecting

As in other parts of the publishing software, in the diagramming system you select an object with the left mouse button and extend or modify the selection with the right.

There are four methods for selection and deselection:

- pointing and clicking
- using the selection box
- holding down either button while clicking the other
- popup menu commands

The first three of these methods use the left and right mouse buttons. The fourth uses a special set of commands on the diagramming popup menus. All four of these methods are described in detail below.

The methods of selection overlap. You will find that there are usually several methods that will give you the results you want. Subtle distinctions—and personal preference—will govern the method you choose.

Pointing and Clicking

Pointing and clicking is used to select or deselect a single object at a time. It is most useful in three circumstances.

- It is useful when you want to select a single object.
- It is useful if you want to select several objects that are widely separated.
- It is the best method of selection when you want to select objects that are mixed with other objects that you do not want to select.

The only disadvantage of pointing and clicking is that it requires more care than some of the other methods because you must position the mouse cursor carefully before you can select an unfilled object or a line.

Using pointing and clicking

To select a single object:

- ☞ Point the mouse cursor at the object you want to select.
- ☑ Click the left mouse button.

The object will flash to show that it has been selected. Any objects that were previously selected will be deselected automatically.

To select additional objects:

- ☞ Point the mouse cursor at each object.
- ☑ Click the right mouse button.

To deselect a single object:

- ☞ Point the mouse cursor at the object you want to deselect.
- ☑ Click the right mouse button.

Positioning the cursor

You do not have to position the cursor exactly. If the object is within a few pixels in any direction of the current cursor position, it will be selected.

The interior of an unfilled object is not considered to be part of the object. If you are selecting a line, or an oval, a box, or a polygon that isn't filled, you must

position the tip of the diagramming cursor within a few pixels of the border of the object before clicking the mouse button (*Figure 6-4*).

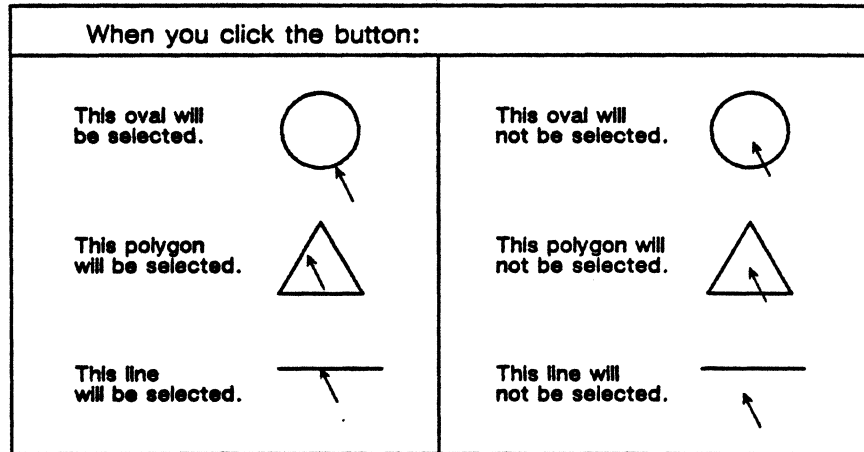


Figure 6-4. Selecting unfilled objects

The inside of a filled object is considered part of it. If you are selecting a filled object or a chart, you can point anywhere inside the object or at its border (*Figure 6-5*).

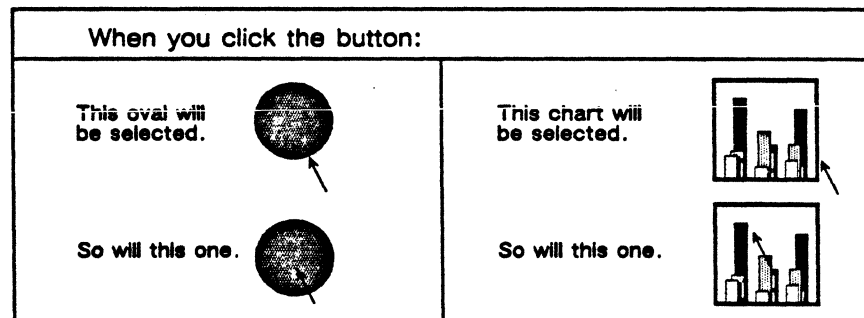


Figure 6-5. Selecting filled objects

Selecting text is like selecting a filled object or a chart: you can point the mouse cursor anywhere inside the text object and click the button to select it. The “inside” of a text object is the region inside the imaginary bounding box around it. *Figure 6-6* shows the bounding box on a text object.

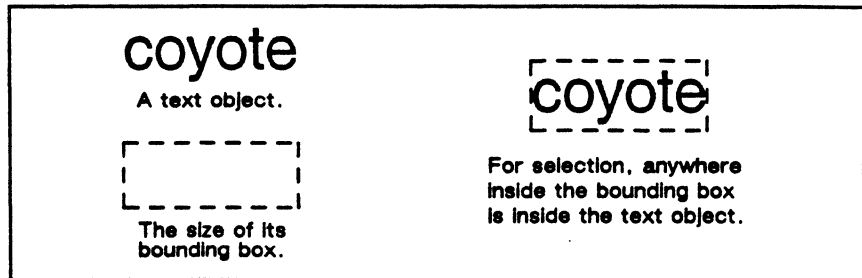


Figure 6-6. The "inside" of a text object

Figure 6-7 shows some of the places you can point with the mouse cursor to select a text object, and some of the places you cannot point.

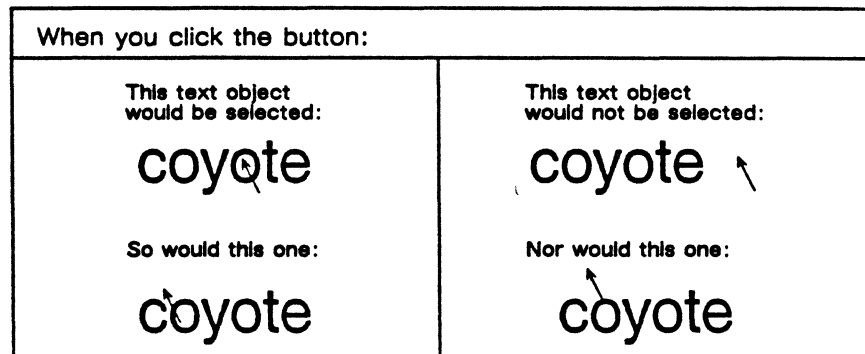


Figure 6-7. Selecting text

Pointing at nothing

Pointing at nothing and clicking the left button is a quick way to deselect everything because it selects nothing, and anything already selected is deselected.

Pointing and nothing and clicking the right button has no effect. It adds nothing to the current selection.

The diagramming order

If you point and click, and there are several objects within a few pixels of the cursor, the diagramming system will select the one that is in front.

Diagramming objects do not all exist in the same plane: they are stacked according to which object was most recently created. The first object you created is in back of the stack, the next is on top of the first object, the next on top of it, and

so on until the most recently created object, which is in front. This order exists whether the objects are currently overlapping or not.

You can change this order with the **Front** and **Back** commands (more about them in the section called *Front and Back*).

Stacking order affects selection. In *Figure 6-8*, the mouse cursor is within selection distance of a box and of a text object. Because the box is on top, it will always be selected.

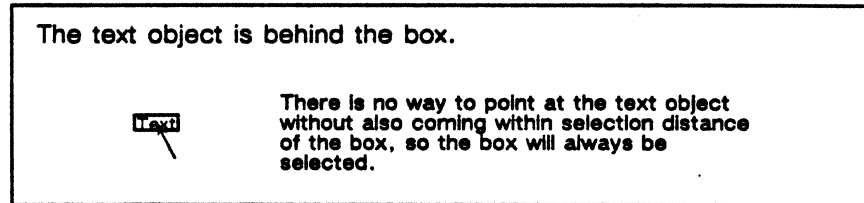


Figure 6-8. Selecting the top object

If you are having a hard time selecting an object because some other object is on top of it, use the **Back** command to move the top object to the back of the stack of objects. (The **Back** command is described in detail in the section called *Front and Back*.)

Holding vs. clicking

Although we usually talk about clicking the mouse button, this method of selection will work just as well if you hold down the mouse button for a while before you release it. If you do hold down the left or right mouse button, you will see the selection cursor (▲), which does not get a chance to appear when you click a button.

If you move the mouse cursor while holding down the left or right mouse button, the selection cursor will disappear and be replaced by the selection box. The selection cursor will reappear if you make the selection box so small that it is invisible (*Figure 6-9*).

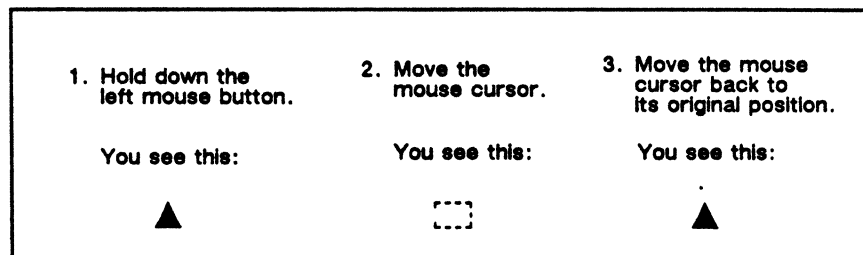


Figure 6-9. From selection cursor to selection box and back

As long as you see the selection cursor, you are using pointing and clicking, and you will select (or deselect) the object at which you are pointing.

The Selection Box

The selection box selects (or deselects) all the objects that are completely contained in the box. It is most useful under three circumstances.

- It is useful when you want to select all the objects in a rectangular region.
- It is often the best method for selecting small objects because you can make the selection box small enough that no other objects are completely included in it.
- It is a quick method for selecting a group of objects because it requires very little precision.

The third advantage of the selection box—that it requires so little precision—is also its primary drawback. If you are working in a complicated diagram, you may find that the selection box too often includes objects you did not want to select. In that case, you would probably be better served by pointing and clicking.

Using the selection box

To select a group of objects:

- ✓ Imagine a box that surrounds the objects you want to select.
- ☞ Position the mouse cursor at one corner of the imaginary box.
- ☐☐ Hold down the left mouse button.
- ☐☐ Move the mouse to create a selection box the size of the imaginary box.
- ☐☐ Release the left mouse button.

The objects that are completely contained in the selection box will be selected.

To toggle the selection of a group of objects (that is, select the ones that are not selected and deselect the ones that are), use the right mouse button to create the selection box instead of the left.

To toggle the selection of a group of objects:

- ✓ Imagine a box that surrounds the objects whose selection you want to toggle.
- ☞ Position the mouse cursor at one corner of the imaginary box.
- ☐☐☐ Hold down the right mouse button.
- ☐☐☐ Move the mouse to create a selection box the size of the imaginary box.
- ☐☐☐ Release the right mouse button.

All the objects that are completely contained within the bounding box will be toggled. If they were selected, they will be deselected. If they were not selected, they will be selected.

Figure 6-10 shows how to use toggling.

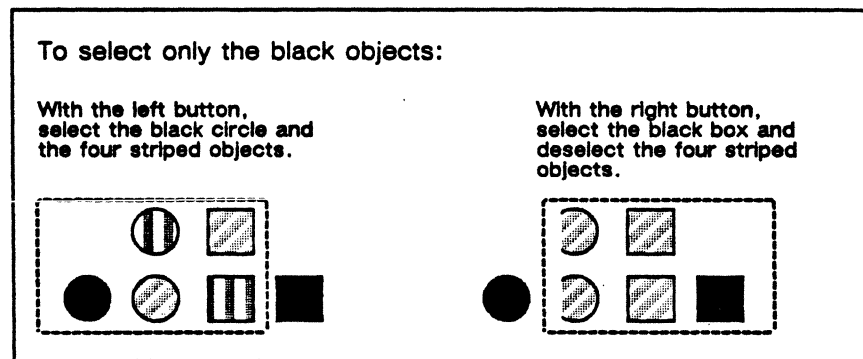


Figure 6-10. Toggling selection with the selection box

If you were presented with the situation in Figure 6-10, you would probably use pointing and clicking, but you can imagine that in a situation involving more objects, this method would be useful.

Selection Box Problems

The primary difficulty with the selection boxes is that you will often accidentally include objects in the box you do not want to select. Figure 6-11 shows such a difficulty—and one resolution.

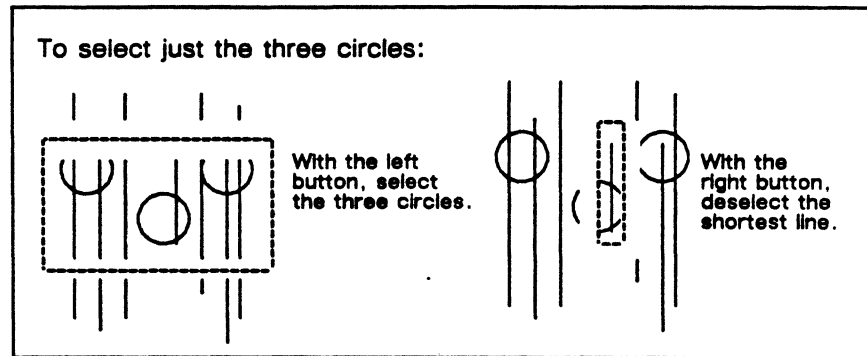


Figure 6-11. Using the selection box to correct a selection problem

Another difficulty is that you may not completely include an object in the bounding box. This happens particularly often with groups. If part of a group is outside the bounding box, the group will not be selected. (A group is a set of objects that you have associated. There is a longer definition of *group* at the beginning of the section called *Creating Objects*.)

Drag selection

Using the selection box is often called “drag selection” because you are moving the mouse while holding down a button. Drag selection is also used on the desktop to select groups of icons, in the component bar to select multiple components, and in text to select regions of text.

Holding and Clicking

Holding and clicking selects all the objects in the diagram, or toggles the selection of all the objects. This method of selection is useful in two situations.

- It is useful if you want to select all the objects in the diagram.
- It is useful if it would be easier to deselect the objects you do not want than to select the ones you do.

Figure 6-12 shows one situation in which holding and clicking is a valuable selection method.

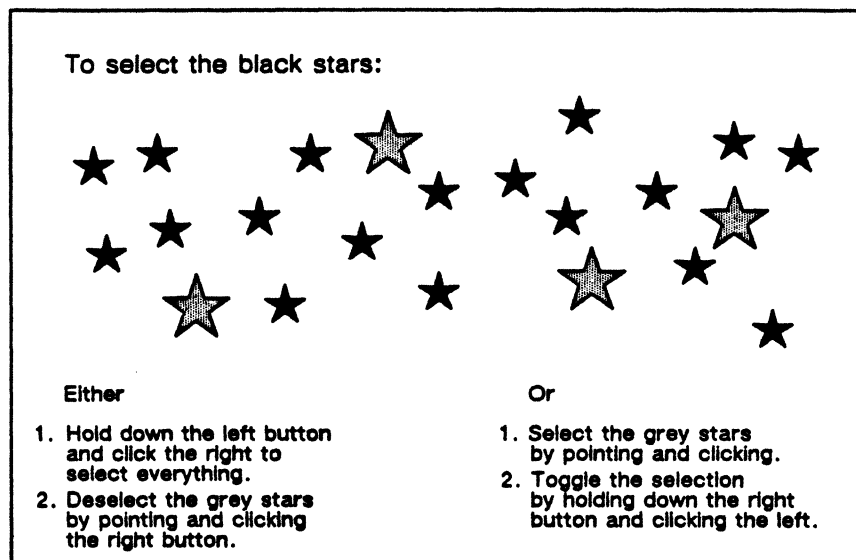


Figure 6-12. Using holding and clicking

Using holding and clicking

To select all the objects in a diagram:

- ■ ■ Hold down the left mouse button.
- ■ ■ Click the right mouse button.

Every object in the diagram, including objects you may not be able to see, will be selected.

To toggle the selection of all the objects in a diagram:

- ■ ■ Hold down the right mouse button.
- ■ ■ Click the left mouse button.

All the objects in the diagram that were selected when you held the right button and clicked the left are deselected, and all the objects that were not selected are selected.

Position

Position does not matter with this form of selection. As long as the mouse cursor is inside the diagram, you can hold and click.

The Popup Menu Selection Commands

The popup menu selection commands allow you to deselect your current selection, to select everything in the diagram, to select objects that are selection locked, and to select again the last group of objects you modified. The popup commands are particularly useful in three circumstances.

- The **Select Locked** command is the only way to select objects that are locked against selection. (See the section called *Locks* for a definition of selection locking.)
- The **Select Again** command is the easiest way to repeat the last selection.
- The **Deselect** command is often the easiest way to deselect something, because it is the default on the **Object Selected** popup menu. You just click the middle mouse button instead of pointing at nothing and clicking the left button.

Using the popup selection commands

The three **Select** commands are on the **Select** submenu on the **Nothing Selected** popup, shown on the left in *Figure 6-13*.

The **Deselect** command is the default command on the **Object Selected** popup menu, shown on the right in *Figure 6-13*.

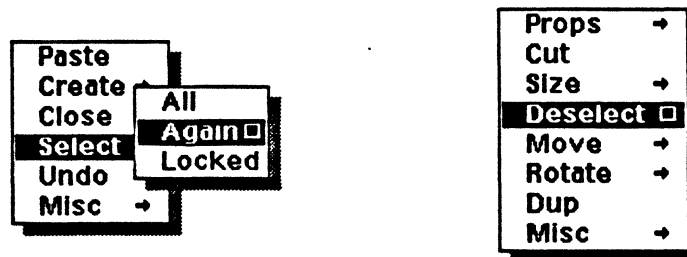


Figure 6-13. The Select submenu and the Deselect command

The popup selection commands are executed like any other menu command. For example, to select the last set of objects that you changed, execute the

Select → **Again** command.

◀ **Select Locked**

The **Select Locked** command is the only way you can select an object that is locked against selection (unless you have just selected it, in which case **Select Again** will also work). None of the usual selection methods can be used with such objects because the purpose of selection locking an object is to prevent it from being selected. (Selection locking and all other kinds of locks are described in the section called *Locks*.)

Select Again

The **Select Again** command is the easiest way to repeat a complicated selection (although you can always select each object again using point and click or the selection box).

When you execute the **Select Again** command, the last object or set of objects on which you performed an action is selected again.

Changing the properties of an object is performing an action on it, as are sizing, moving, rotating, grouping, and all the other commands that change an object. Creating an object is also performing an action on it.

If you cut an object, you are performing an action on it, but you cannot select it again, because it is gone.

Just selecting an object does not perform an action on it. If you have just rotated a group of boxes, and you select an oval and immediately deselect it, the **Select Again** command will select the boxes you rotated, because you did not perform an action on the oval. Commands that do not affect objects—the grid commands and the commands on the **Defaults** submenu, for example—do not affect the selection.

There is more information on the **Select Again** command in the section called *Undo and Select Again*.

Select All

The **Select All** command selects every object in the diagram. It does exactly what holding down the left button and clicking the right does. The function is provided through the popup menu because it is an important one. The new user of the system can use **Select All** until he or she learns to use holding and clicking. Once you know about holding and clicking, though, there is no advantage to the popup command.

Deselect

One disadvantage to the **Deselect** command is that it deselects everything. If you have five objects selected and you want to deselect only the last one, point at it and click the right mouse button. This leaves the other four selected. If you used **Deselect**, you would have to reselect the first four objects.

The Diagramming Popup Menus

The diagramming system, like the other parts of the publishing software, has a double popup menu system. Which menu you see depends on whether or not you have selected objects in the diagram. If there are no objects selected, you will see the **Nothing Selected** popup menu. If you have selected objects, you will see the **Object Selected** popup menu.

Figure 6-14 shows the **Nothing Selected** popup menu with all its submenus.

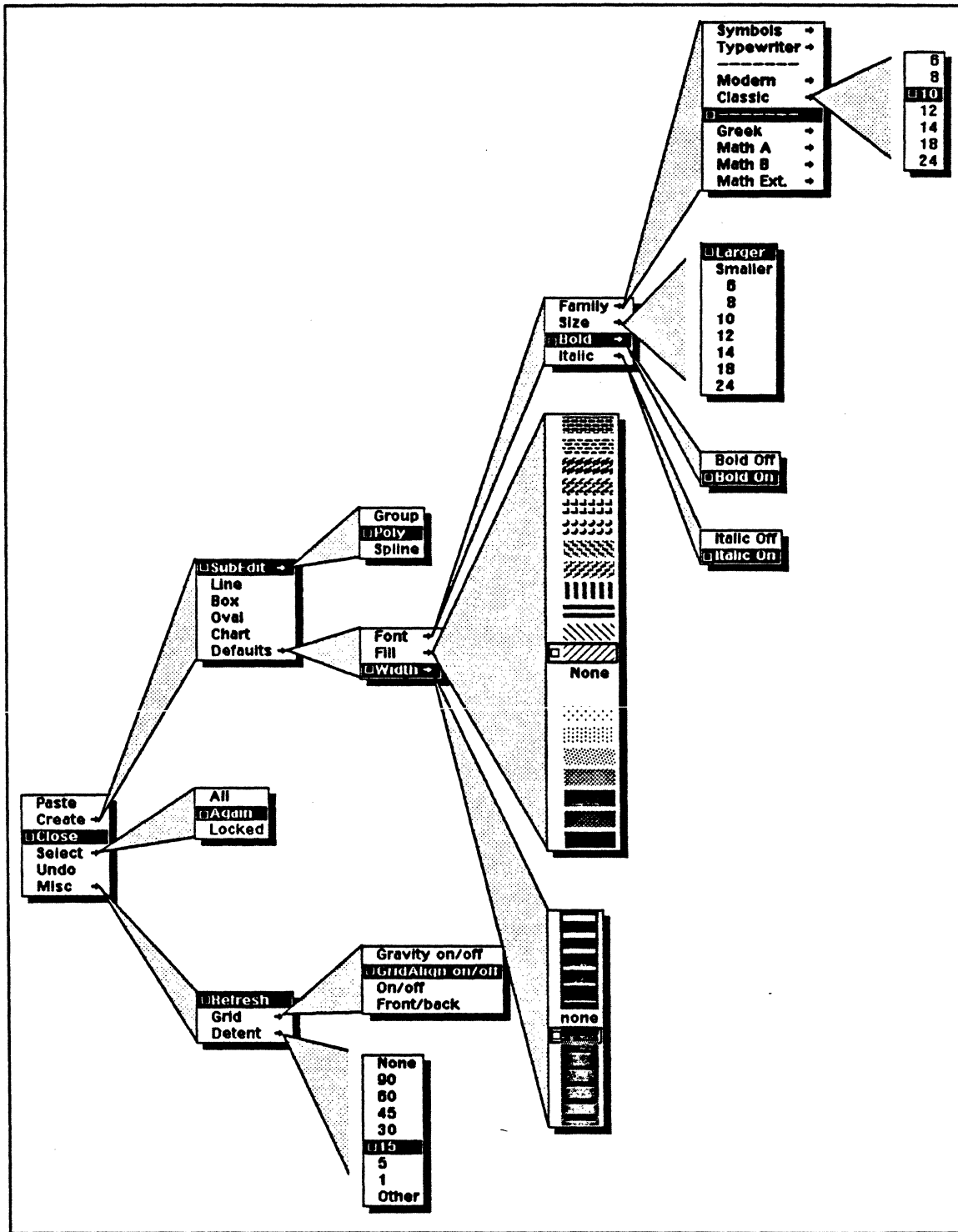


Figure 6-14. The Nothing Selected popup menu and submenus

The popup menu cursor is placed on the system default command for each menu, except for the Font submenus. The default command on these menus is

not fixed: it depends on the font currently displayed in the text box in the top left corner of the document. For more information about system and dynamic defaults, see the section called *Defaults in Diagramming*.

Figure 6-15 shows the Object Selected popup menu and most of its submenus. The exceptions are the Props submenu and its submenus, which are shown in Figure 6-16. Just as in Figure 6-14, the commands shown in reverse video are the system defaults, except for the Font submenus. Like the Font submenus off the Nothing Selected popup menu, these menus have no defaults. The current default depends on the font displayed in the text box in the window header.

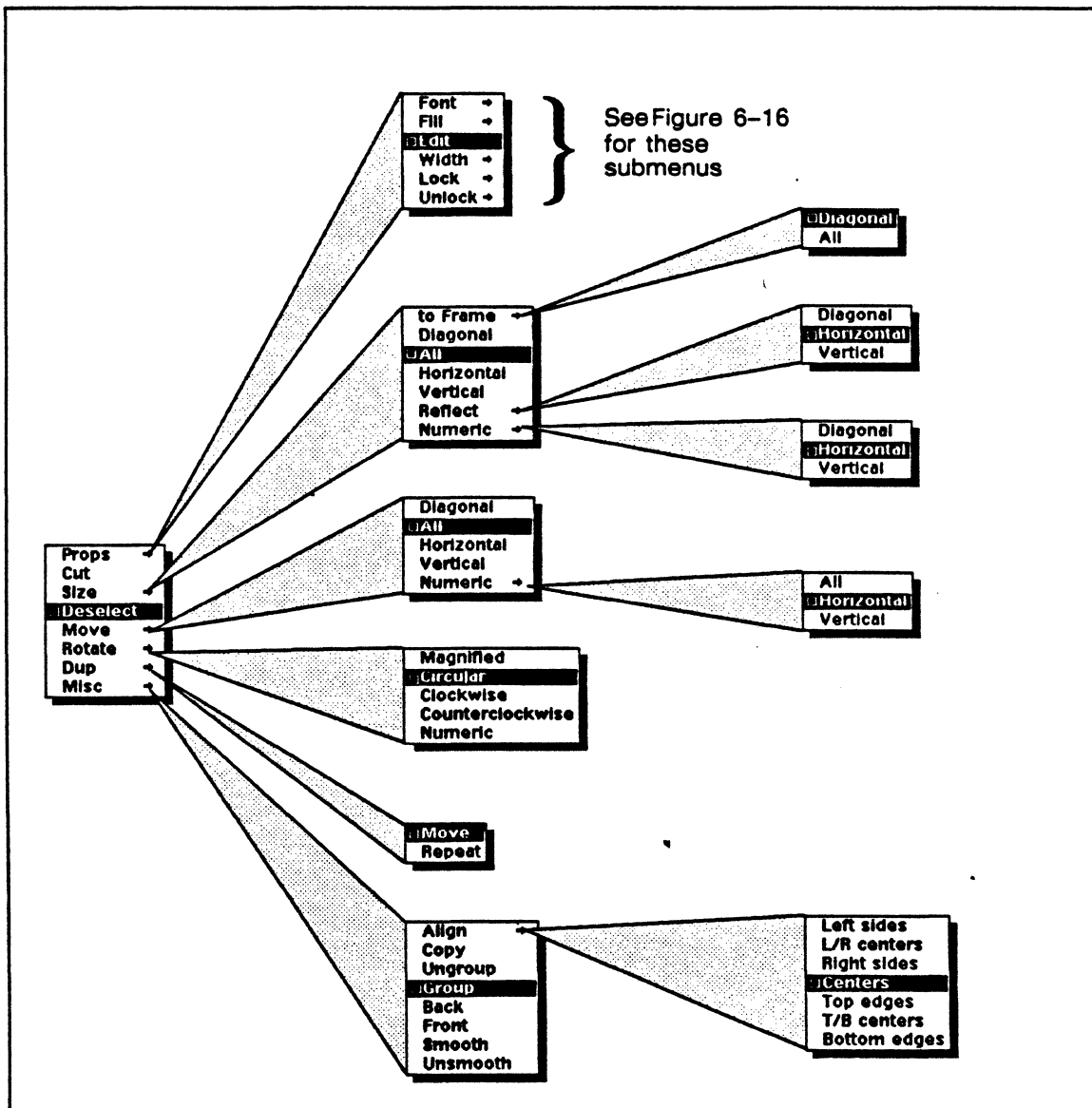


Figure 6-15. The Object Selected popup menu and submenus

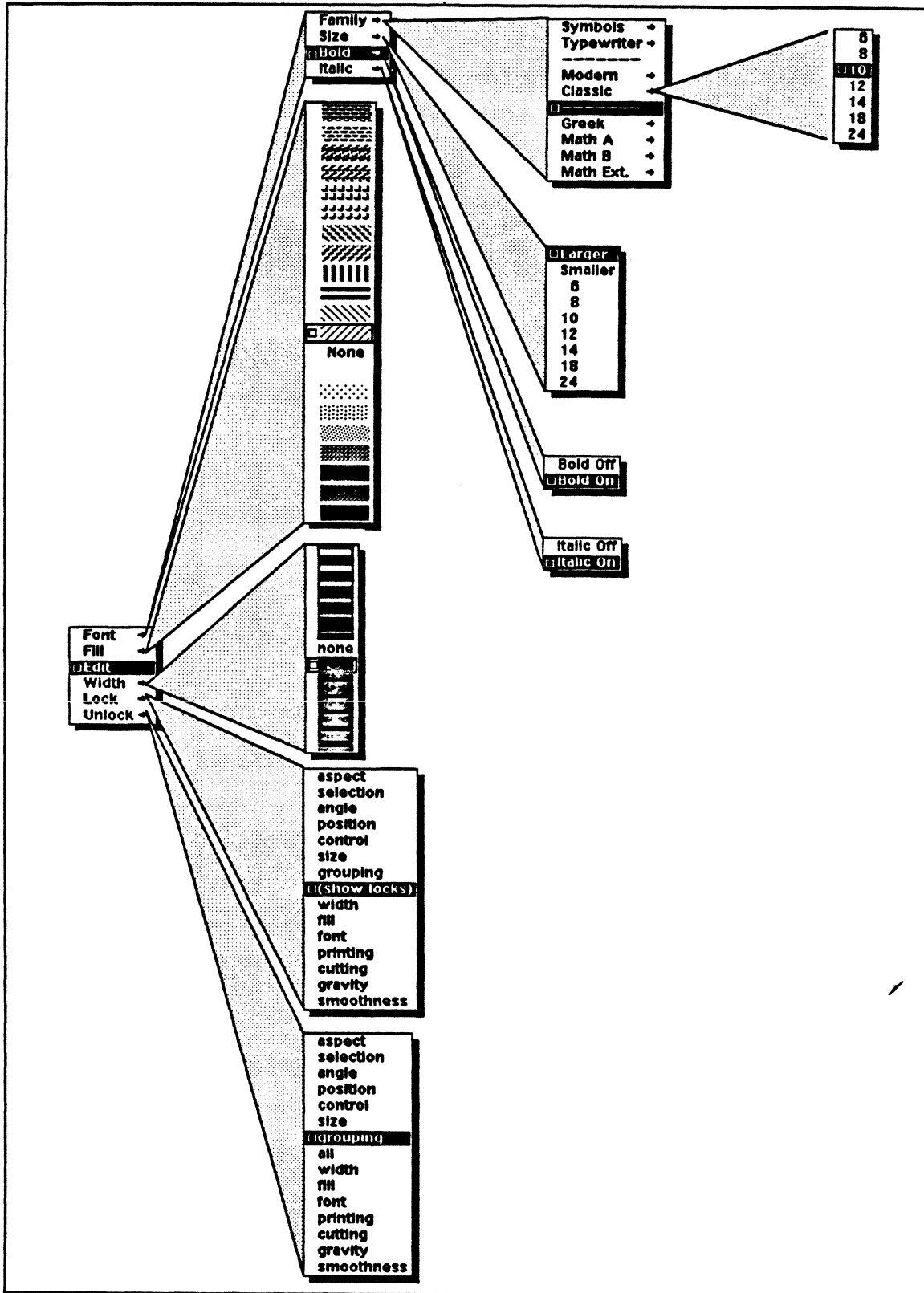


Figure 6-16. The Props submenu and all its submenus

Executing a Command on a Popup Menu

The commands on the diagramming popup menus are executed in the same way as popup commands in any part of the system.

To execute a popup command:

- ☐☐ Hold down the middle mouse button.
- ☐☐ Move the mouse cursor until the command you want to execute is displayed in reverse video.
- ☐☐ Release the middle mouse button.

In this chapter, the location of each command in the diagramming popup menu trees will be included in the detailed description of the command. By combining that information with the procedure above, you can execute any command.

Animation and Deselection Commands

There are two kinds of commands on the **Object Selected** popup menu: animation commands and deselection commands.

- When you execute an animation command, the object is ready to be changed, and stays selected until you deselect it. If you hold down the middle mouse button without deselecting the object, you see the **Object Selected** menu.
- When you execute a deselection command, the object is changed and then automatically deselected. If you hold down the middle mouse button, you see the **Nothing Selected** popup menu.

As examples, take the **Move All** command and the **Props Fill** command. After you execute the **Move All** command, the object is not changed, it is just ready to be changed. You have to move your mouse to change the position of the object, and when you are satisfied with the position, you must deselect the object. In contrast, after you execute **Props Fill**, the pattern with which the object is filled is immediately changed to the pattern you chose and the object is deselected.

Figure 6-17 shows the animation commands. All commands not shown within the dark boxes are deselection commands.

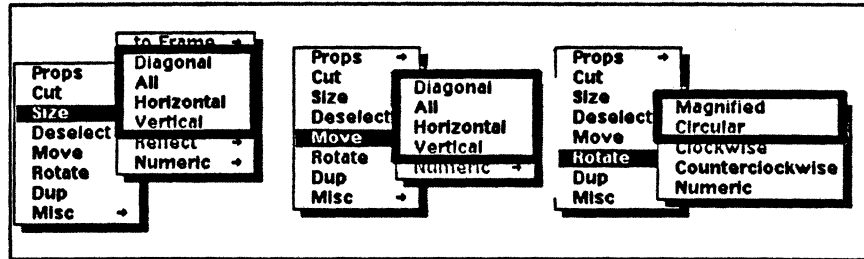


Figure 6-17. The animation commands are inside the dark borders.

There is one command that bridges the two groups: **Dup**. **Dup** is not really an animation command or a deselection command.

Animation state

After you execute an animation command, the objects you had selected are put in animation state. It is very easy to tell the difference between an object in animation state and an object that is just selected.

- If an object is in animation state, you will see only its outline. The outline will not flash, and you will see the control point marker (:).
- If an object is selected, it will flash. You will be able to see the pattern it is filled with, and you will not see a control point marker.

Figure 6-18 shows an object, the same object when it is selected, and the same object in animation state.

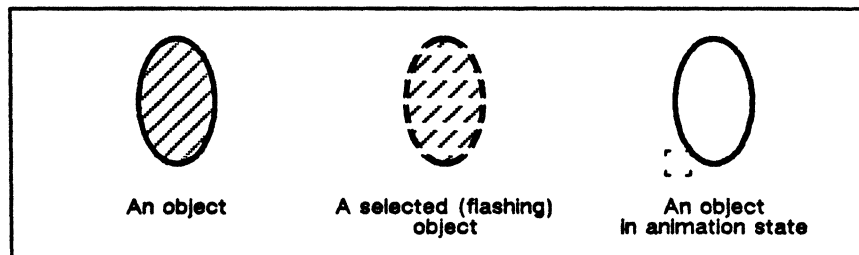


Figure 6-18. The difference between selection state and animation state

To use the animation commands:

- ✓ Select the object.
- ✓ Execute the animation command.
- ☰ Move the mouse cursor to make the changes you want.
- ✓ Finish by choosing another command from the **Object Selected** popup.

The kinds of changes that result from moving the mouse cursor depend on the command that got you into animation state. For example, when you execute the **Size Horizontal** command on a box, moving the mouse cursor would make the box wider or narrower.

When you are satisfied with the changes you have made, you continue by selecting another command on the **Object Selected** popup menu. You can select either another animation command or a deselection command.

Selection State

When you select an object, it flashes to show that it is selected. The borders of the object display alternately in white and black. *Figure 6-19* shows a black line and below it, the image of it you would see alternating with the line if you selected it.

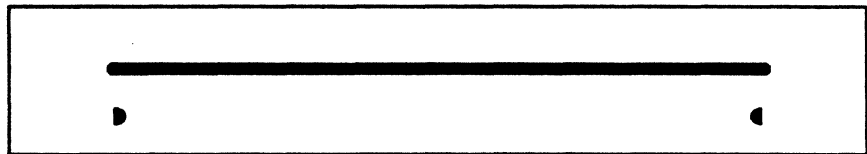


Figure 6-19. A selected line, flashing black, then white

If you select two objects that overlap, the blinking will not always be apparent, because when one is white, the other will be black, and they will cancel each other (*Figure 6-20*).

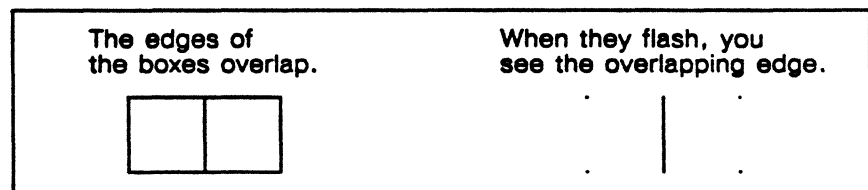


Figure 6-20. Overlapping selected objects cancel out flashing

Creating Objects

An object in the diagramming system is one working unit. There are two kinds of objects, primitive objects and groups.

- A primitive object is one that is built into the diagramming system.
- A group is a collection of primitive objects and other groups that is selected as a single unit.

Figure 6-21 shows one of the primitive objects (a line) and a group constructed from that primitive object (a triangle).

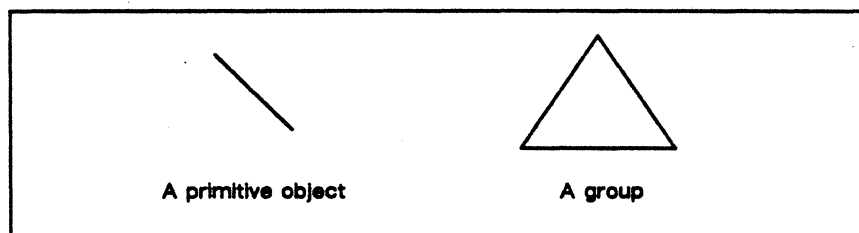


Figure 6-21. A primitive object and a group

You cannot tell by looking whether a set of objects is a group or not. The only way to tell whether the triangle in Figure 6-21 is a group or just a set of three lines is to point at one of the lines and select it. If the other two lines are also selected, then the triangle is a group. If only the one line is selected, the triangle is three separate lines.

Users can create groups in several ways. You can create the objects and then group them together (see *Creating Groups* later in this section), or you can create a group and then create objects to put in the group (see *The SubEdit Submenu*, which comes after *Creating Groups*).

The Primitive Objects

There are five primitive objects: boxes, lines, ovals, charts, and text.

One of the five primitive objects, text, is separated from the other four. Many of the ordinary commands—size and rotate, for example—do not work on text, and text has entirely different properties. It is not even created in the same way. For that reason, creating a text object, manipulating it, and changing its properties are all discussed in another section, called *Entering and Using Text*.

- ⑤ The diagramming system has a built-in understanding of the primitive objects. For example, it knows that, initially, the four sides of a box are at right angles to each other. It knows that a line is defined by its two endpoints. Because text is not sized smoothly, the diagramming system knows that the **Size** command has no effect on it. Primitive objects are the building blocks in the diagramming system.
- ⑤ From the primitive objects, you can create a group—a flower, for example. When you size the flower, or rotate it, the diagramming system uses its knowledge of the behavior and position of the primitive objects in the group in order to determine the behavior of the group.

The Default Properties of the Primitive Objects

A newly created object has a set of default properties associated with it.

Size

When you create a primitive object, it has a default size associated with it.

Figure 6-22 shows the default sizes for the box, the line, the oval, and the chart.

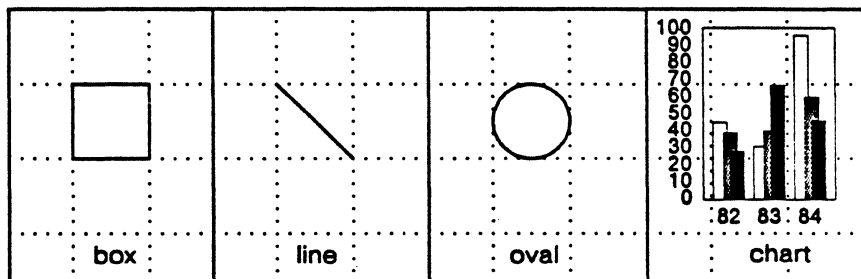


Figure 6-22. The default sizes of the primitive objects

The default sizes for three of the primitive objects are based on one grid square. The box is exactly the size of a grid square. The line is just long enough to run from one corner of a major grid square to the opposite corner. The oval fits exactly into a grid square.

The default size for a chart is three major grid units high, and three wide, including the space that is reserved for labels. The default chart size is larger than the default size for other primitive objects because of the reserved label space. If it were as small as the default for other objects, the label space would take up the whole area, and you would not be able to see the the chart itself.

Width and Fill

Boxes, lines, and ovals all have *width*. When you create one of these three objects, the width will be narrow and black (—), unless you have previously changed the default.

Boxes and ovals also have fill patterns. The default fill pattern is **None**.

To change the default line width or fill pattern, use the **Defaults** submenu, off the **Create** submenu. The **Defaults** submenu is discussed in the section called *Defaults in Diagramming*.

Chart Properties

Charts have the most elaborate properties. The default chart is a vertical bar chart consisting of three groups of three bars each. The patterns filling the bars, the arrangement of the bars, the absence of background lines and the presence of a data border are some of the properties of the default chart. Because charts are complex, an entire chapter of the *Reference Manual*, called *Making Charts*, is devoted to them.

Grouping Lock

A box is grouping-locked. You cannot ungroup it—change it back into four lines—unless you unlock grouping on it first. There is information about grouping locks in the section called *Locks*.

The Create Submenu

All primitive objects in the diagramming system except text are created through the **Create** submenu on the **Nothing Selected** popup menu (*Figure 6-23*).

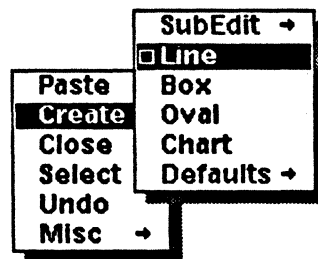


Figure 6-23. The Create submenu

There are six commands on the **Create** submenu.

- The **SubEdit** command has its own submenu of three objects you can create by opening a subedit level: polys, splines, and groups.
- The next four commands, **Line**, **Box**, **Oval**, and **Chart**, are used to create four of the five primitive objects.

- The last command, **Defaults**, is used to set the default properties for the primitive objects.

The **Defaults** command is explained in the section called *Defaults in Diagramming*. The rest of the commands are discussed in this section.

Creating a Primitive Object

Primitive objects are created with the commands on the **Create** submenu, off the **Nothing Selected** popup menu. To create an oval, for example, execute the

Create → **Oval** command.

The **Create** command is linked to the **Size** command. When you create an object, the **Size** command is automatically executed so that you can immediately change the size of the object.

Location of the Object

The anchor point (:) of a newly created object is positioned where your mouse cursor was when you created the object. The control point (::) is below and to the right of the anchor point.

- Ⓜ The actual position of the object will be affected by **Gravity** and **GridAlign**. If **Gravity** is on, and if the mouse cursor is within one grid unit of a gravity point on another object, the anchor point of the object will be superimposed on that gravity point. If **GridAlign** is on, the anchor point of the object will be superimposed on the nearest grid point. See the sections called *Gravity and Gravity Points* and *Grid and GridAlign*.

A box or a line will show up below and to the right of your cursor position, because the anchor point is at one corner of the object and the control point at the opposite corner. An oval will be centered over your cursor position, because the anchor point of a newly created oval is at the center of the oval. *Figure 6-24* shows the anchor and control points on a box, a line, and an oval.

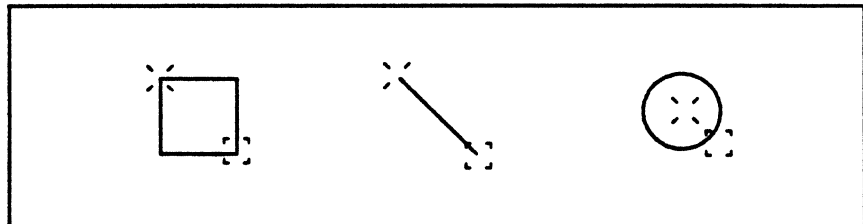


Figure 6-24. Control and anchor points on three primitive objects

The control and anchor points for a chart are the same as those for a box.

By sizing the newly created box, line, or oval, you can change the relative positions of the control and anchor points (*Figure 6-25*).

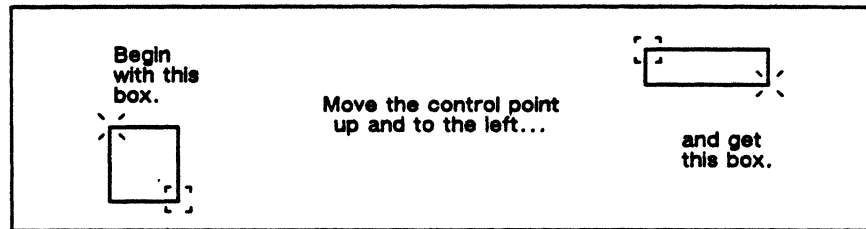


Figure 6-25. Changing the position of the control point.

If you select a previously created object, its control and anchor points will not necessarily be in the same places as they are on a newly created object. See the section called *Control Points and Anchor Points* for the rules about control and anchor point positions.

Creating Groups

As you work in diagramming, you will find that you always want to manipulate certain objects together. For example, you might always want to move the eyes, nose, and mouth of a face at the same time. When you recognize a set of objects that you want to belong together, you can make them into a group.

A group is a set of objects that are treated by the diagramming system as if they were a single object.

Groups are created using the **Group** command on the **Misc** submenu of the **Object Selected** popup menu (*Figure 6-26*).

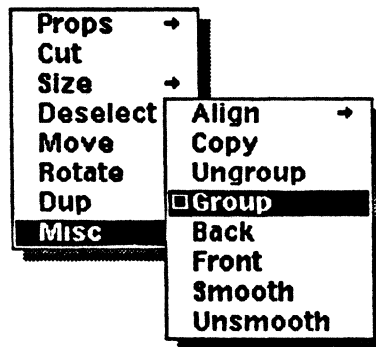


Figure 6-26. The Group command on the Misc submenu

To create a group, select the objects that will be in the group and execute the **Misc →** **Group** command.

If you decide that you do not want a set of objects to be grouped, you can always ungroup them, using the **Ungroup** command, which is on the **Misc** submenu just above the **Group** command.

To ungroup a set of objects, select the group and execute the **Misc →** **Ungroup** command.

If you select more than one group, each group will be broken down into its parts.

Polygons

One kind of group is the polygon.

A polygon is at least two connected lines that can be filled with a pattern.

A box is actually a polygon. It is included on the **Create** submenu because it is such a useful shape that you would not want to have to build it again every time you used it.

Polygons are used constantly. In the *Graphics* cabinet, we have used them for

- arrows
- triangles, pentagons, hexagons
- flowchart symbols

and many other things. Most of the techniques also use polygons. See particularly Techniques 8 and 9, making a pinwheel and making a regular polygon.

Rules for Creating Polygons

Polygons must be constructed according to particular rules.

- The ends of the lines in the polygon *must* be connected.
- Only two lines can be connected at any one corner.
- The diagramming system will close one side of the polygon for you, if it is necessary.

Here are the details for each rule.

The ends of the lines in the polygon **must** be connected.

The lines on the left in *Figure 6-27* do not make a polygon, because the ends of the lines are not connected. The lines on the right do make a polygon.

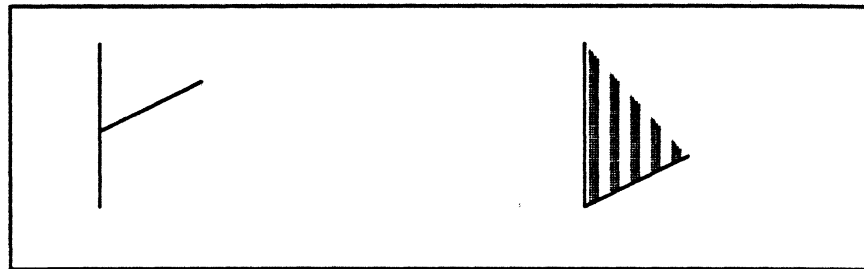


Figure 6-27. Two lines and a polygon

Unless you use the **Poly** command (see *The SubEdit Submenu*) to create the polygon, you cannot be sure that the ends of the lines are connected unless you connect them when **Gravity** is on. If **Gravity** is not on, the lines may be separated by a very small space, not visible on the screen, and you will not be able to fill the polygon. (See the section called *Gravity and Gravity Points*.)

Only two lines can be connected at any one corner.

If there are more than two lines at a corner, the diagramming system will not consider the collection of lines to be a polygon.

Figure 6-28a is a collection of lines that is not a polygon. The figures to the right of it show some ways to make it into a polygon, and how the diagramming system would fill each.

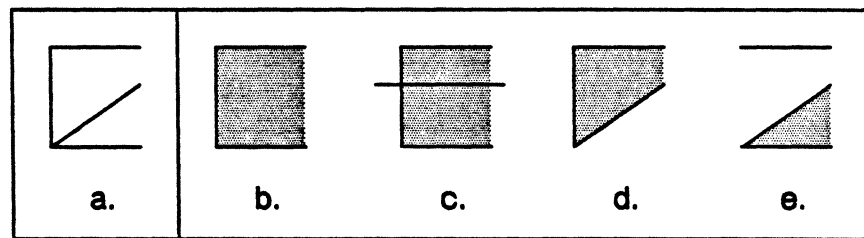


Figure 6-28. Four lines and four polygons

Although you cannot have three lines meeting at a corner, you can have additional lines crossing the polygon, as shown in *Figure 6-28c*. These extra lines are ignored when the polygon is filled.

The diagramming system will close one side of the polygon for you.

If your polygon is not closed—if it is missing a side—the diagramming system will close it for you. It will imagine one line that joins the endpoints of the two single lines. It will fill the polygon up to that line, but the line itself will not be visible

because it is imaginary. If you want all sides of the polygon to be visible, you must close the polygon.

All of the polygons we have shown so far are open polygons, with one edge added by the diagramming system. *Figure 6-29* shows an open polygon on the left, and a closed one on the right.

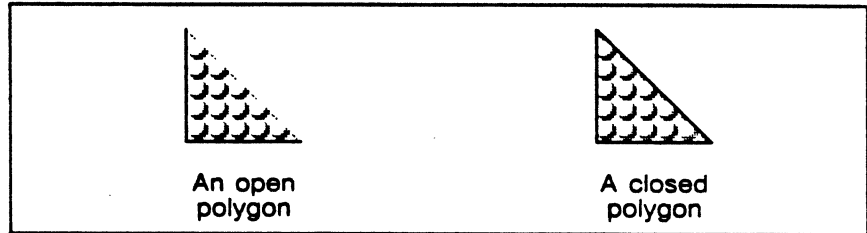


Figure 6-29. An open polygon and a closed one

Finishing the Polygon

Once you have a collection of lines that fills all the requirements for a polygon, you can make it into a polygon in either of two ways.

- You can select all the lines and **Group** them.
- You can select all the lines and fill them. Even if you choose to fill the lines with **None**, you will still have created a polygon, because the **Fill** command automatically groups the lines.

If you want to modify a polygon—change a triangle to a pentagon, for example—use the **Edit** command. If you want to destroy the polygon and leave only the lines from which it was made, use the **Ungroup** command. Both of these commands are described in the section called *Editing and Grouping*.

Splines

A spline is a polygon that has curved edges and rounded corners instead of straight edges and pointed corners (*Figure 6-30*).

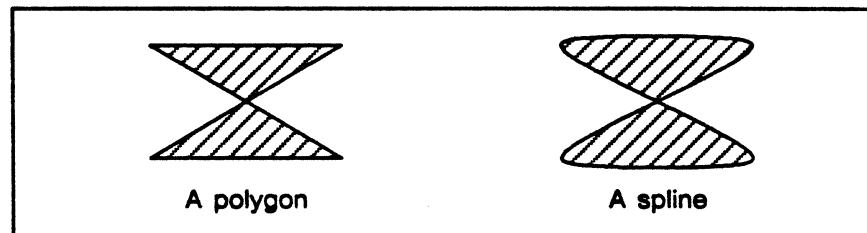


Figure 6-30. A polygon and a spline

Use a spline whenever you need a curve in a diagram. Use them for

- cables and wires
- folds of cloth
- snakes, grand pianos, octopi

Figure 6-31 shows an octopus created with splines.

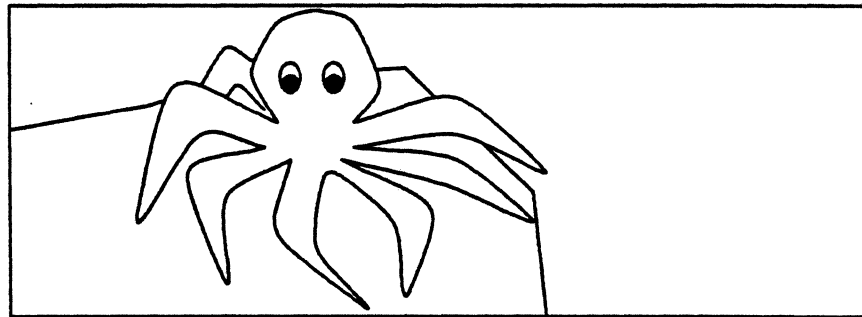


Figure 6-31. A spline octopus

Creating a Spline

Splines are created using the Smooth command, on the Misc submenu, off the Object Selected popup menu (Figure 6-32).

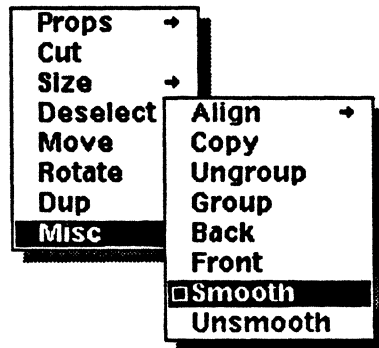


Figure 6-32. The Smooth command on the Misc submenu

To make a spline out of a polygon, or out of a set of lines that meets the requirements for a polygon, select the polygon and execute the **Misc → Smooth** command.

Destroying a Spline

The **Unsmooth** command on the **Misc** submenu turns splines into polygons (Figure 6-33).

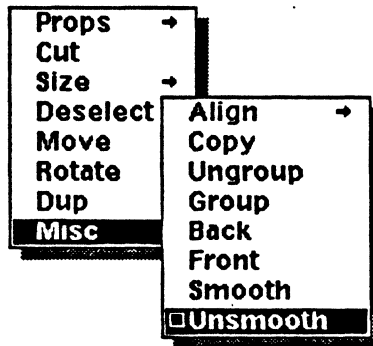


Figure 6-33. The **Unsmooth** command on the **Misc** submenu

To make a polygon from a spline, select it and execute the **Misc** → **Unsmooth** command.

Details

You can smooth either a polygon or a set of lines that fulfill the conditions for a polygon. If you smooth a set of lines, they will automatically be grouped together, so that if you unsmooth them, they will have become a polygon.

If you try to smooth a set of lines that do not meet the conditions for a polygon, nothing will happen. If you select several sets of lines or several polygons and smooth them, each set will become a spline.

When you smooth a polygon, the diagramming system finds the best curve that will go through the corners of the polygon.

Manipulating a Spline

All of the popup commands except the font changes can be performed on a spline.

However, when you change the size of a spline, you change the height or width of the whole object. You cannot change the relative positions of the endpoints of the curves. To do that, you must ungroup the spline, change the lines, regroup them, and then smooth them (Figure 6-34).

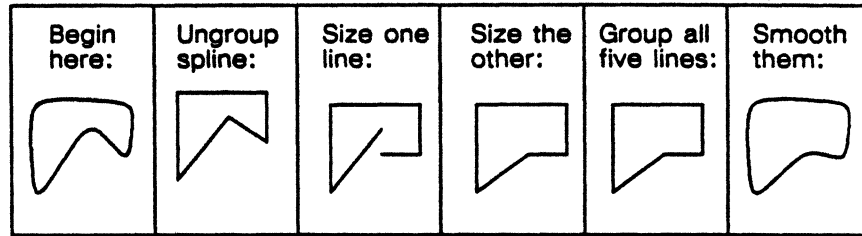


Figure 6-34. Changing the position of the endpoints in a spline

A spline has gravity and control points at the corners of the polygon it was made from.

⬠ The SubEdit Submenu

The three commands on the **SubEdit** submenu, **Group**, **Poly**, and **Spline**, are shortcuts to creating groups, polygons, and smoothed objects. They are based on the subedit levels described in *Editing and Grouping*, and are designed primarily for expert users.

The **SubEdit** commands make it easier to do many things. They allow you to

- create a polygon or spline efficiently
- create a polygon or spline when Gravity is off
- create objects that in temporary isolation from the rest of your diagram

In *Figure 6-35*, the overlaid arrow and label were created using the **Group** command on the **SubEdit** menu.

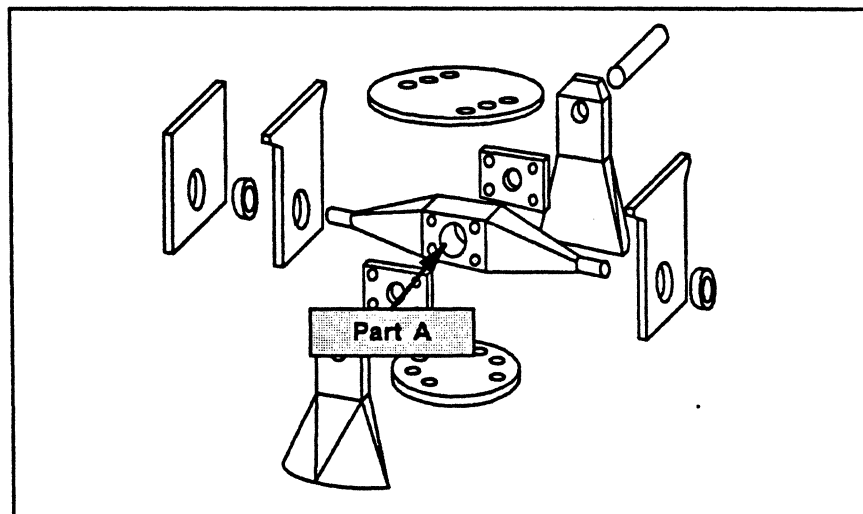


Figure 6-35. Using the Create SubEdit Group command

Because the **Group** command isolates the objects you create with it from the rest of the diagram, the artist did not have to worry about accidentally selecting parts of the underlying assembly.

Using the SubEdit Submenu

Figure 6-36 shows the **SubEdit** submenu, with the default command, **Poly**, in reverse video.

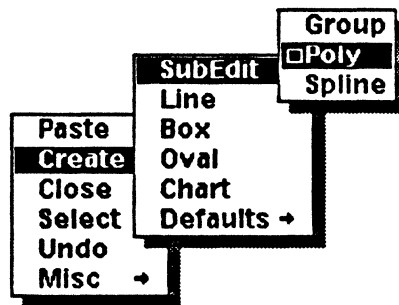


Figure 6-36. The **SubEdit** menu

To create a polygon, for example, execute either the **Create** → **SubEdit** → **Poly** command or the **Create** → **SubEdit** → **Poly** command.

Because the commands on this submenu are for experts, before they are executed, you are asked to confirm your choice with the **SubEdit** stickup (Figure 6-37).

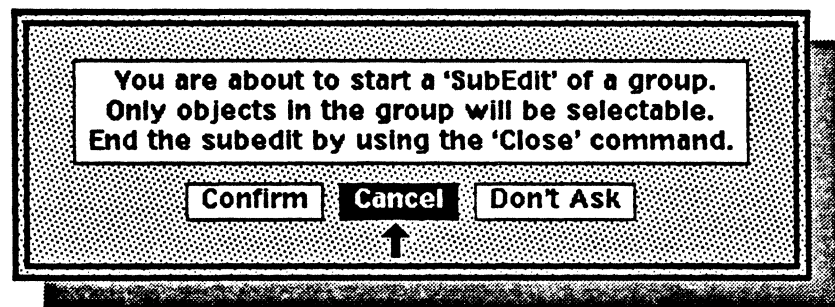


Figure 6-37. The **SubEdit** stickup

This is the same stickup you see if you select a group and execute the **Edit** command. See the section called *Editing and Grouping* for more information on subedit levels and groups.

If you do not want to open a subedit level, select the **Cancel** command. If you do want to open a subedit level, select **Confirm**. The diagramming system will open

a new subedit level for you, displaying information about it in the status line (Figure 6-38).

Level 1 SubEdit: GridAlign on, Gravity on, Detent 15.0 degrees

Figure 6-38. The status line in a subedit

If you choose **Don't Ask**, you will not see the SubEdit stickup again until you have closed and reopened your desktop. Even if you work in another document, you will not see it.

Use the **Don't Ask** command on the SubEdit stickup when you are completely at ease with subedit levels and groups. This command opens a new subedit level for you, just as **Confirm** does. In addition, it instructs the diagramming system not to ask you to confirm again. When you become an expert, you will find that you will always be opening a subedit level on purpose, and your answer to the stickup will always be **Confirm**. By selecting **Don't Ask**, you are saving yourself the time it takes to answer the stickup.

When you are using one of the SubEdit commands, all of the commands on the diagramming popup menus are available to you. You can even create another group in the group. (In that case, the status line will be changed to read *Level 2 SubEdit:*) The only limitation is that you cannot select objects that are not part of the current group until you close the edit.

From this point, the details of operation differ, depending on which of the SubEdit commands you executed.

The Group Command

There are two ways to create a group.

- You can make the objects first and then group them together.
- You can make the group and then create the objects in it.

The first method uses the **Group** command that is on the **Misc** submenu, off the **Object Selected** popup menu. It will be familiar to you, since it is discussed in the previous section, *Creating Groups*. The second method uses the **Group** command on the **Create** submenu.

Using the Create Group command

Figure 6–39 shows the SubEdit menu, with the Group command in reverse video.

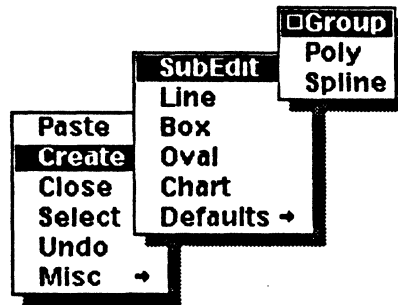


Figure 6–39. The Group command on the SubEdit menu

To create a group, execute the **Create** → **SubEdit** → **Group** command.

To return to the top level of the diagramming system and to group together the objects you have created, execute the **Close** command.

Figure 6–40 shows the Nothing Selected popup menu with the Close command in reverse video.

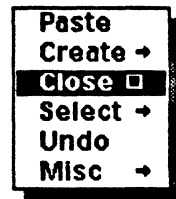


Figure 6–40. The Close command on the Nothing Selected menu

Subedit levels are discussed in more detail in the section called *Editing and Grouping*.

The Poly Command

When you execute the Poly command, you are placed in a special polygon entry mode in which holding down the middle button automatically deselects the line you have just created and releasing the button creates another.

Two advantages of this method:

- You can create a polygon when Gravity is off, so that the lines in the polygon are not attracted to other objects.
- For each line in the polygon, you need to click the button only once.

Figure 6-41 shows the difference between expert-oriented polygon creation and ordinary polygon creation. On the left in each column are the number of button clicks, and on the right is the drawing that would result.

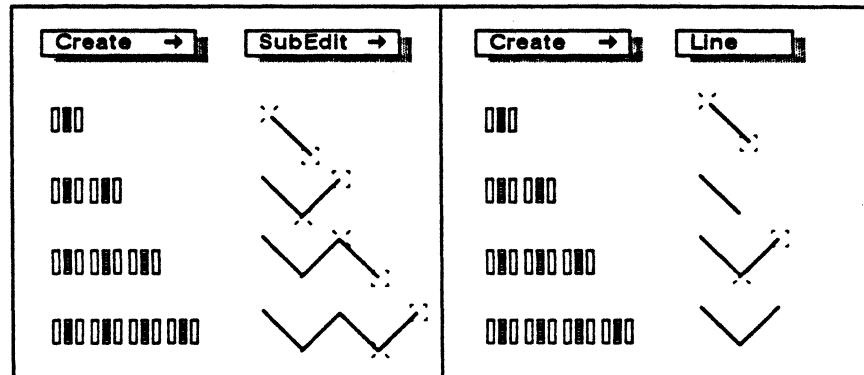


Figure 6-41. Polygon entry mode vs. ordinary polygon creation

Using the Create Poly command

The Poly command is the default command on the SubEdit submenu (Figure 6-42).

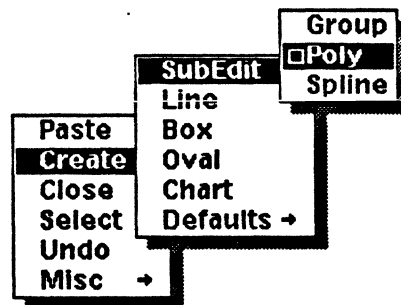


Figure 6-42. The Poly command on the SubEdit menu

To create a polygon with the Poly command:

- ✓ Execute the Create SubEdit command or the Create Sub-Edit Poly command.
- ☰ Size the line until it has the correct angle and size.
- ☑ Hold down the middle mouse button. You will see the Create submenu, with the Line command in reverse video.

- ☐☐☐ Release the middle button. Size the new line until it has the correct angle and size.
- ☐☐☐ Click the middle button to create new lines, size them, then click again, until your polygon is complete.
- ✓ Hold down the middle button, select the **Close** command, and release the button.

The subedit level you had entered will be closed, and the lines will be grouped together. If you have set the default pattern fill, the polygon will automatically be filled.

As long as you are in polygon entry mode, you will not see the **Object Selected** popup menu. Instead, you will always see the **Nothing Selected** menu and the **Create** submenu, with the **Line** command in reverse video.

⊞ *Correcting mistakes in polygon entry mode*

Especially when you first begin to use the **Poly** command, you may find that you have created lines you do not want, or lines that are in the wrong places. In such a case, you can temporarily put aside the special entry mode, correct the problems, and then re-enter it.

To suspend polygon entry mode:

- ☐☐☐ Hold down the middle mouse button.
- ☐☐☐ Slide the popup cursor entirely off the menu and release the button.

You will now be able to select lines and cut, size, or move them. When you are ready to continue with your polygon, use this procedure.

To reenter polygon entry mode:

- ☞ Point the mouse cursor at the end of an existing line.
- ✓ Execute the **Create Line** command.

⊞ *Other operations in polygon entry mode*

While you are in the special polygon entry mode, only a few of the diagramming commands really make sense: **Create Line** and **Close**, and when you are correcting mistakes, **Cut**, **Size**, and **Move**.

You are not restricted to those commands, though. If you have suspended the entry mode, you can execute any of the commands on any kind of object.

When you **Close** the subedit level, the diagramming system will group all of the objects together, but within that group, it will group each set of lines that fulfill the requirements for a polygon.

☞ The Spline Command

The **Spline** command is just like the **Poly** command, except that when you close the **SubEdit** level, the objects you have created are automatically smoothed. It has the same advantages that **Poly** does, and one more.

- You can create a spline without **Gravity**, so that the lines in it are not attracted to other objects.
- For each line in the spline, you need to click the button only once.
- You do not have to execute the **Smooth** command.

☞ Using the Create Spline command

The **Spline** command is on the **SubEdit** submenu (*Figure 6-43*).

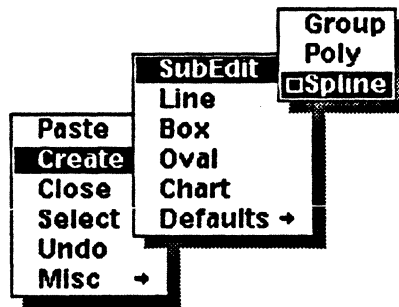


Figure 6-43. The Spline command on the SubEdit menu

To use the special spline entry mode, execute the **Create** → **SubEdit** → **Spline** command.

The spline entry mode is identical to the polygon entry mode. You will find that holding down the middle mouse button deselects the line you just created and that releasing the middle button creates another line. When you have a polygon you are satisfied with, execute the **Close** command. The polygon will be smoothed, and, if there is a default pattern fill, it will be filled.

Please refer to the subsection above, on the **Poly** command, for information on suspending the spline entry mode.

Entering and Using Text Objects

The fifth primitive object is text. Text is not like the other primitive objects. It is entered with the keyboard, not the mouse. The **Size** and **Rotate** commands have no effect on it, although they do affect groups that contain text. (In such a case, the size and angle of the text will be preserved, but its relation to other objects in the group will change. See *Figure 6-53*.) Text has two properties it does not share with any of the other primitive objects: font and alignment.

To enter a text object:

- ↘ Point the mouse cursor where you want the text object to be.
- ☐ Begin typing.

As soon as you begin typing, the cursor position at which you pointed is marked with an invisible text anchor.

Text Anchors

The anchor is the text object.

The characters you type are merely properties attached to the anchor: they can be changed without affecting the basic object in the same way that the pattern and size of a box can be changed without changing the fact that it is a box.

The text anchor is invisible as long as there are characters in the text object. If, however, you delete the characters, you will be able to see the anchor on the screen. Text anchors do not print. There are three kinds of anchors: one for flush left text, one for flush right, and one for centered. *Figure 6-44* shows the text anchors, much larger than life.

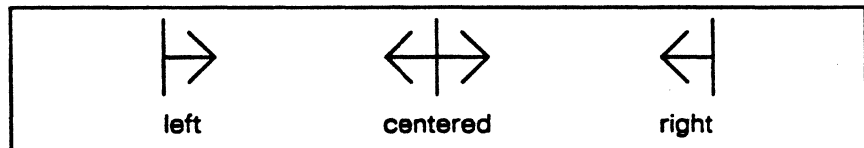


Figure 6-44. Left, Centered, and Right Text Anchors

Each anchor is composed of a vertical line whose lowest point marks the precise cursor position and an arrow head pointing in the direction that text will move as you type it.

Text Properties

A text object has two kinds of properties associated with it: font and alignment. If you try to apply any other kind of property to a text object, **Width**, for example, nothing will happen.

Font

Each text object can have only one font and one point size.

The default font for a text object is the font that is displayed in the text box in the document header. The default font changes every time you select a text object in a different font.

Setting the font before entering a text object

There are three ways to change the default font before you enter a text object.

- Select a text object of the correct font and deselect it.
- Use the **Font** submenu off the **Defaults** submenu. (See the Section called *Defaults in Diagramming*.)
- Set the font in the text box in the document window header.

Figure 6-45 shows the **Defaults** and the **Font** submenus.

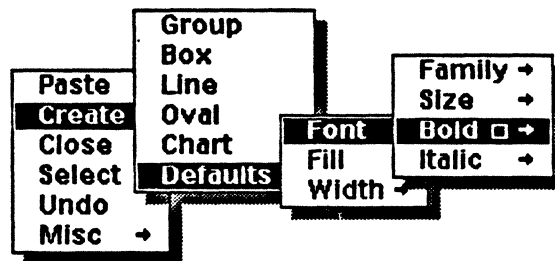


Figure 6-45. Changing the font before creating the text object

Changing the font after entering a text object

There is only one way to change the font of an existing text object: with the **Font** submenu off the **Props** submenu, off the **Object Selected** menu (Figure 6-46).

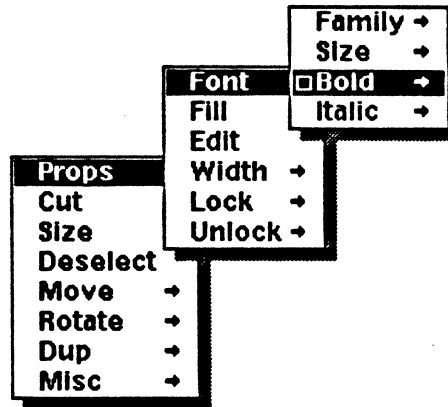


Figure 6-46. Changing the font of an existing text object

To make a text object italic, for example, select the object and execute the **Props → Font → Italic →** command.

All of the font families, sizes, and weights are available in the diagramming system through the **Font** submenu.

When you enter text objects, the space between the lines of text is equal to the height of the current font. However, if you change the size of the text objects, the space between lines of text will not be changed.

To change the spacing between lines of text:

- ✓ Select the text objects.
- ✓ Execute the **Size Vertical** command.

The **Size Vertical** command does not change the size of the text objects themselves; it just increases the amount of vertical space between them.

Alignment

Generally, alignment is a property that objects have relative to other objects. For example, three boxes that are left aligned have their left sides lined up vertically. A text object, though, can be aligned all by itself. In that case, you are aligning the characters in the text object with the text anchor.

Changing the alignment of a text object changes the kind of text anchor it has. If you use the keyboard commands to change the alignment, the position of the text anchor also changes.

There are three possible alignments for a text object:

- flush right (right sides aligned)
- centered (L/R centers aligned)
- flush left (left sides aligned)

Figure 6-47 shows a sample of each text object alignment.

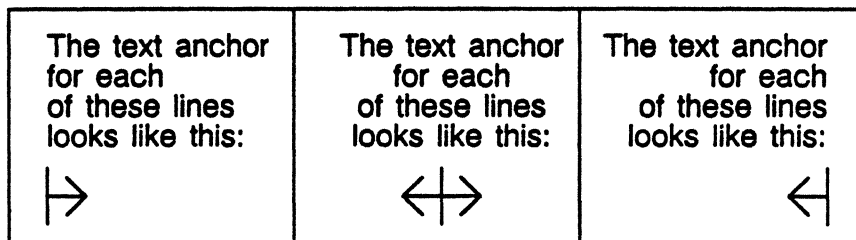


Figure 6-47. Flush left, centered, and flush right text

There are two ways to change the internal alignment of a text object:

- with the commands on the **Align** submenu
- with the keyboard commands CTRL l (for flush left), CTRL r (for flush right), and CTRL c (for centered)

Although both of these methods change the kind of text anchor, there are differences between them.

The Align commands

Generally, the **Align** commands move the text anchors and leave the characters attached to the anchor in place (Figure 6-48).

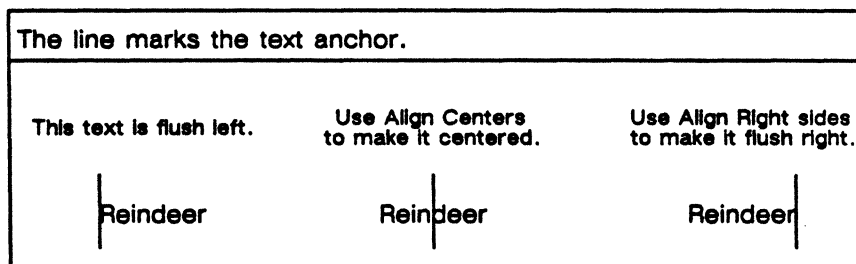


Figure 6-48. Using **Align** commands changes the position of the text anchor.

The **Align** commands also will work on more than one text object at a time. Of course, if you align several text objects at once, the text will also move, but the movement will be minimized.

Use the **Align** commands

- when you want to change the anchor type of a single text object, but you do not want it to move
- when you want to align a text object with other objects, including other text objects

Since they are on a submenu of the **Object Selected** popup menu, the **Align** commands can only be used to change the internal alignment of an existing text object.

Using the **Align** commands

Figure 6-49 shows the **Align** submenu.

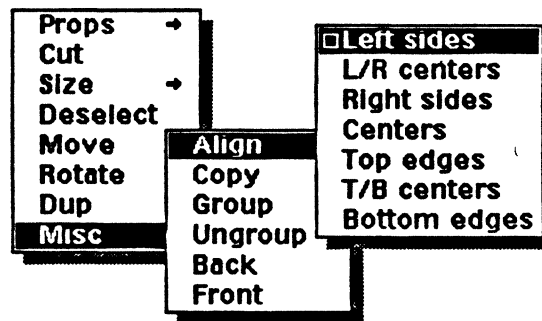


Figure 6-49. The **Align** submenu

To change the internal alignment of one or more text objects, select the text object and execute the appropriate **Misc** → **Align** command.

Only the first four commands on the **Align** submenu change the kind of text anchor belonging to a text object.

- The **Left sides** command changes the text object(s) you have selected to flush left.
- The **Right sides** command changes the text object(s) to flush right.
- The **L/R centers** command and the **Centers** command both change the text object(s) to centered.

The **Align Centers** command will align the top/bottom centers of the text objects as well as the left/right centers. In other words, it will put all the text objects on top of one another. For this reason, it is really only useful when you are working with a single text object. The **Align L/R centers** command changes only the horizontal alignment of the objects, so it can be used when you want to center a column of text objects.

The **Align** commands are fully discussed in the section called *Alignment*.

The keyboard commands

The keyboard commands leave the text anchor in place, but move the text around it (Figure 6-50). They can be used either before or after you enter the text object.

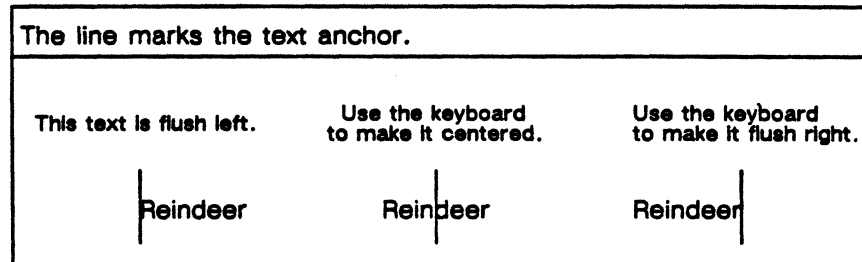


Figure 6-50. Using keyboard commands to change text alignment

Use the keyboard commands

- when you do not want the text anchor to move (if you have lined it up with something else in your diagram, for example)
- when you want to set the type of anchor in a text object before you enter it

The keyboard commands can be used on only one text object at a time. If you select several text objects and enter a keyboard command, only the last one you selected will be changed.

Using the keyboard commands

There are three keyboard commands for changing internal alignment.

- Hold down the CTRL key and type l to change the alignment to flush left.
- Hold down the CTRL key and type c to change the alignment to centered.
- Hold down the CTRL key and type r to change the alignment to flush right.

To change the alignment of an existing text object, select the object and type the appropriate keyboard command.

To change the alignment of a text object before you enter it, type the appropriate command and then enter the text object.

Entering and Editing Text

To enter a text object:

- ☞ Point the mouse cursor where you want the object to be.
- ☑ Begin typing.

While you are entering or editing a text object, the diagramming system will display a message in the status line, to indicate that you are working in a special mode. The exact wording of the message will depend on the alignment of the text object you are working on. *Figure 6-51* shows the message you will see if you are working on a text object that is aligned flush left.

entering flush left text (ctrl-R flush right, ctrl-C centered)

Figure 6-51. The status line when you enter a text object

Details

If the mouse cursor is outside the diagram when you begin typing, the diagramming system will position the anchor inside the border of the frame, as close to the cursor as it can get. The text you enter will extend from the anchor just as it would from any other anchor. Centered text will be centered around the anchor, flush right text will grow to the left, and flush left text will grow to the right.

A text object you are entering is automatically selected, so that you can move it around or change its font if you want to. The text doesn't flash while you type because that would be distracting. If you stop typing and move the diagramming cursor, the text will begin to flash. As long as the text object is selected, you can edit it.

Any of the deselection methods you have learned will work with text objects. In addition, all the keyboard editing commands described in the next section, except DEL, will also deselect the text object they are applied to.

Editing Commands in Diagramming

All of the characters in each font are available to you in diagramming. However, the only editing commands that are available to you in diagramming are DEL, RETURN, LINE FEED, CTRL n, CTRL p, and TAB.

DEL deletes the last character in the selected text object.

- RETURN** deselects the current text object and moves down the point size of the current font. The diagramming cursor is aligned with the anchor of the previous text object. If there is no text object selected, the cursor just moves down the point size of the current font.
- LINE FEED** on a Sun workstation, does exactly the same thing that RETURN does. On an Apollo workstation, use the AGAIN key instead of LINEFEED.
- CTRL n** does exactly the same thing that RETURN does.
- CTRL p** deselects the current text object and moves *up* the point size of the current font. The diagramming cursor is vertically aligned with the anchor of the text object below it. If there is no text object selected, the cursor just moves up the point size of the current font.
- TAB** deselects the current text object and moves the diagramming cursor right to the next major grid point (defined in *The Grid and GridAlign*) after the text object. The cursor does not move up or down.

Figure 6-52 shows approximately the height of the point size for a text object that is 24 point.

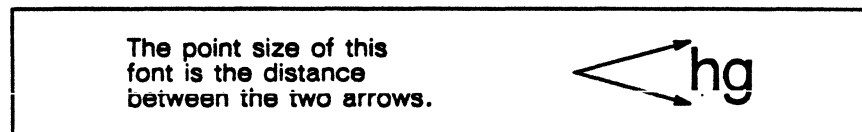


Figure 6-52. The point size of a font

It is equivalent to a line spacing of 1 in a component, which is usually a little too small.

To increase or decrease the line spacing between text objects:

- Enter all the text objects.
- ✓ Select all the text objects.
- ✓ Execute the Size Vertical Command.

It is better to enter all the text in a diagram, and then adjust the line spacing on them all at once, so that the line spacing is the same for every text object. If you entered and sized two or three text objects at a time, you could not be sure that you had sized all the text objects the same amount.

Manipulating Text

Not all the diagramming commands have an effect on a lone text object. You can cut, copy, duplicate, or paste a text object, and you can move it around, but you cannot size it or rotate it.

You can size or rotate a group that contains text. You can also size or rotate two or more text objects. Such a command does not affect the text objects themselves, but only their relationships to each other. *Figure 6-53* shows three text objects: first as they were entered, separated from each other by the natural font height; second after they had been sized vertically to increase the line spacing; and last after they had been rotated 45 degrees.

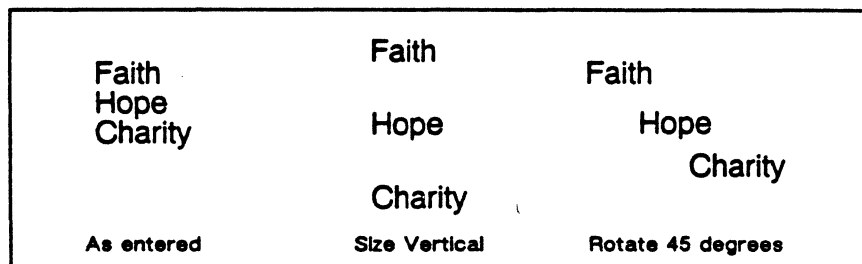


Figure 6-53. Sizing and rotating text

You can select a text object using any of the usual selection methods. You can deselect it with the usual methods or with one of the editing commands. All the editing commands except DEL deselect the current text object.

Control Points on Text Objects

When you move a text object, its control point is at the bottom of the vertical line in the text anchor. *Figure 6-54* shows the control point on each kind of text.



Figure 6-54. Text object control points

The text control point is like a control point on any other object. If GridAlign is on, the control point is attracted to grid points. If Gravity is on, the control point is attracted to other objects (see *The Grid and GridAlign* and *Gravity and Gravity Points*).

Text Objects and Gravity

A text object also exerts gravity on other objects. Objects are attracted to the baseline of the text object.

“Baseline” is the typographer’s name for the imaginary line on which a text object sits. The descenders on certain lower-case letters (the tail on a *q* or *y* is a descender) go below the baseline, but the rest of the letters sit on the baseline. The horizontal line in *Figure 6–55* marks the baseline on a text object.

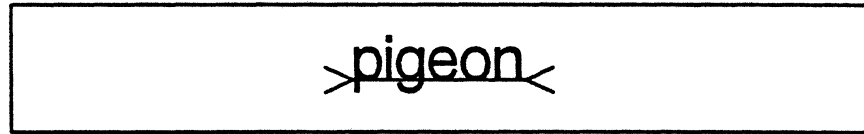


Figure 6–55. Baseline on a text object

Objects moving horizontally are attracted to a text object at the endpoints of the baseline. Objects moving vertically are attracted along the length of the baseline.

Gravity for a text object is not terribly useful because the screen and printer resolutions of the fonts are not exactly alike. Even if the control point of one text object lines up with the gravity point at the end of the baseline of another text object on the screen, the text in one may overlap the other when they are printed.

The only point in a text object that you can count on printing exactly where it is displayed is the point marked by the text anchor.

You can use this fact to make two text objects line up correctly, and print as if they were one object.

To connect two text objects so they print correctly:

- ✓ Turn **GridAlign Off**.
- ✓ Make the first text object right aligned.
- ✓ Make the second text object left aligned.
- ✓ Select the second text object again.
- ✓ Execute the **Move** command and allow gravity to bring the anchor points of the two objects together.

You can be sure that the anchor points will print exactly where they display and that your two text objects will print as one. On the left in *Figure 6–56*, there are two pairs of text objects, *Phantasm* and *agoria*. The members of the first pair were connected using the procedure described above. The members of the second pair are both left aligned; they were moved into place manually, so that they looked correct on the screen.

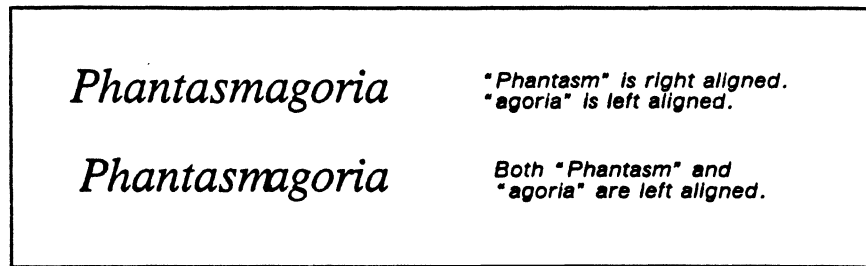


Figure 6-56. Aligning Text objects

Notice that the *m* and the *a* in the second pair overlap.

There is no way to be sure that more than two text objects on a line will be spaced correctly. If you must use three separate text objects on a single line in a diagram, you will have to adjust the spacing by eye.

The Grid and GridAlign

The grid, like the squares on graph paper, marks off even segments of a diagram, and helps you create neat and uniform objects. You can make the grid visible or invisible. By default, the grid is invisible.

Figure 6-57 shows the grid and some of the terms used to refer to and measure it.

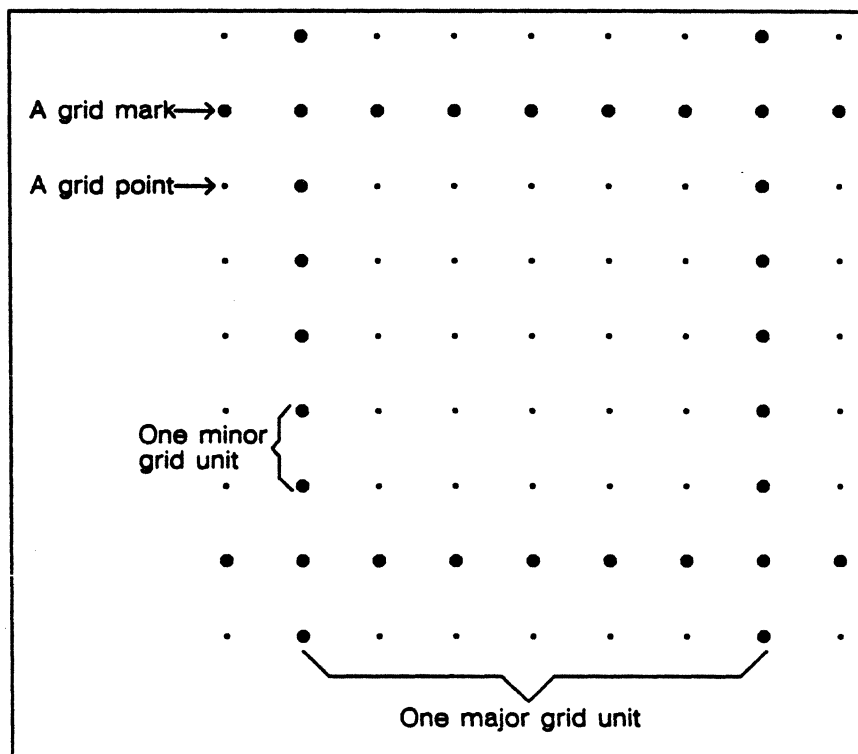


Figure 6-57. An enlargement of the grid, showing its parts

Each of the dots you see on the screen is called a grid mark. All the grid marks along one horizontal or vertical line make up a grid line.

Inside each of the squares on the grid there are invisible grid points (shown in Figure 6-57 with the smaller black dots). If you were to draw in all the horizontal and vertical lines between the grid marks, the intersections of those lines would be the grid points.

The distance between one grid mark and another along a grid line is called a minor grid unit. A minor grid unit is one-fifteenth of an inch long. The distance between one grid line and another is called a major grid unit; it is six-fifteenths of an inch. Five grid squares are equal in length to two inches.

The grid does not print, whether it is visible on the screen or not.

The Grid Submenu

The grid and the GridAlign command are controlled through the Grid submenu, shown in *Figure 6-58*.

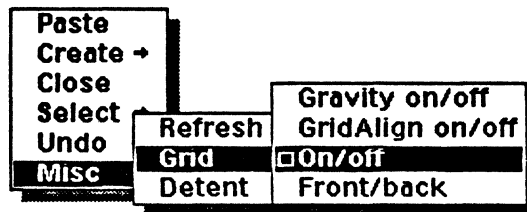


Figure 6-58. The Grid submenu

This submenu is also used to control Gravity: Gravity is discussed in the section called *Gravity and Gravity Points*.

All of the commands on this menu are toggle commands. Each switches a feature between off and on. For example, executing the **GridAlign on/off** command will turn GridAlign on if it is off, and off if it is on.

GridAlign on/off

GridAlign is an alignment aid. It forces objects to align themselves to the grid when you are moving or sizing them. When GridAlign is on, you can only move objects so that their control points line up with the grid, and you can only size objects in minor grid unit increments. *Figure 6-59* shows the restrictions on size and on movement.

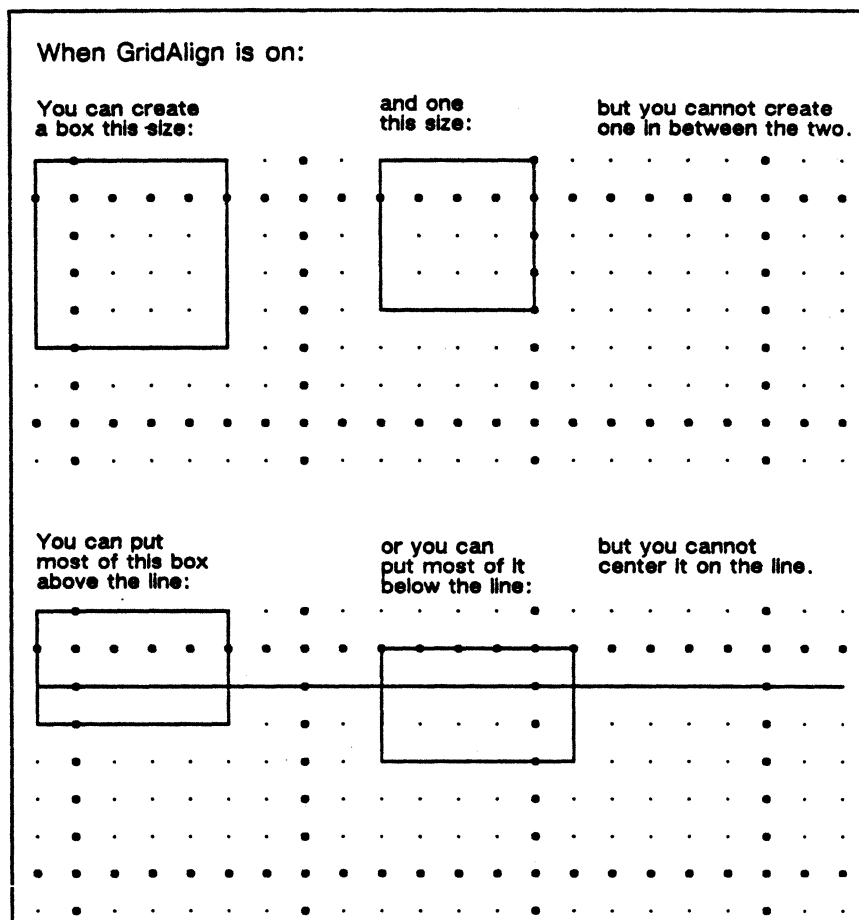


Figure 6-59. GridAlign restrictions on the Size and Move commands

GridAlign can be restrictive, but for much technical illustration, it is indispensable. Use it when you want to

- draw horizontal and vertical lines easily
- create uniformly sized objects
- draw to scale

When you do not want any grid restriction to govern your work, you can turn GridAlign off.

To change the state of GridAlign, execute the **Misc → Grid → GridAlign on/off** command.

On/off

The default command on the Grid submenu is On/Off. The On/Off command changes the visibility of the grid: it does not affect GridAlign at all.

Make the grid visible

- with GridAlign on when you want to see what the objects you work with are aligning to
- with GridAlign off when you want to position objects between grid points, but you want to use the grid as a guide

Make the grid invisible if it is distracting you.

To change the visibility of the grid, execute the **Misc → Grid → On/off** command.

Front/Back

The **Front/Back** command changes the position of the grid relative to the objects in the diagram. The grid can be under the objects or over them. By default, the grid is in front of the objects. *Figure 6-60* shows a grid in front of an oval on the left, and behind an oval on the right.

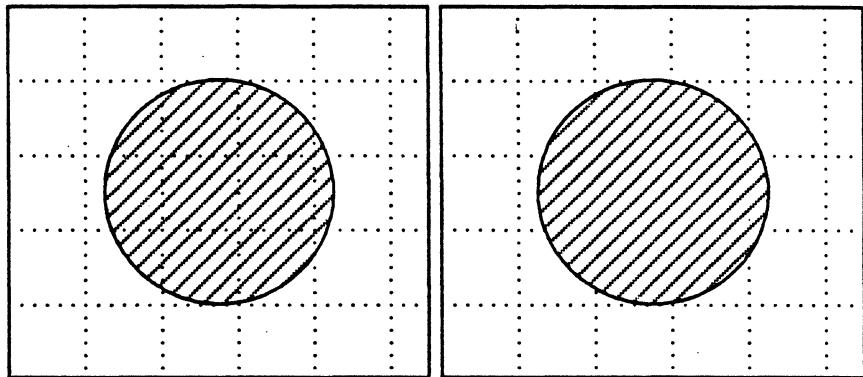


Figure 6-60. The grid in front and in back of an object

The diagram objects have their own order (discussed in the section called *Front and Back*). This order has nothing to do with the position of the grid. If the grid is in front, and you create a new object, that new object will be put at the top of the stack of objects, but in back of the grid. If the grid is in back and you put an object at the back of the stack, that object will still be in front of the grid.

Use the grid:

- in front of the objects to see the grid when creating objects on top of existing objects.
- behind the objects to prevent the grid from obscuring your diagram.

To change the position of the grid relative to the objects, execute the **Misc → Grid → Front/back** command.

Gravity and Gravity Points

Gravity is a force that causes objects to attract one another, in the diagramming system as well as in the real world. In diagramming, it has two main uses.

- It helps you overcome the differences between screen and printer resolutions.
- It makes it possible to create polygons.

Techniques 8 and 9, creating a pinwheel and making a regular polygon, both require Gravity to succeed.

Turning Gravity On and Off

By default, Gravity is on. If you do not want objects to be attracted to each other, you can turn Gravity off. Gravity is controlled with a toggle switch on the Grid submenu, off the Nothing Selected popup menu (*Figure 6-61*).

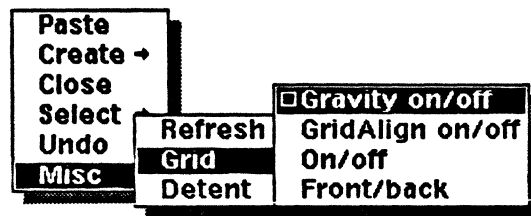


Figure 6-61. The Gravity on/off command

To change the state of Gravity, execute the **Misc →** **Grid →** **Gravity on/off** command.

Gravity Points and Gravity Units

Gravity points are the points on an object to which the control point on another object is attracted. Not every point on the border of every object is a gravity point.

A gravity unit is the distance to which the control point of one object can approach a gravity point on another without snapping to it. For convenience, a gravity unit is the same length as a minor grid unit.

When you move the control point of an object in animation state within one gravity unit of a gravity point on another object, the control point snaps onto the gravity point so that the two occupy the same position (*Figure 6-62*).

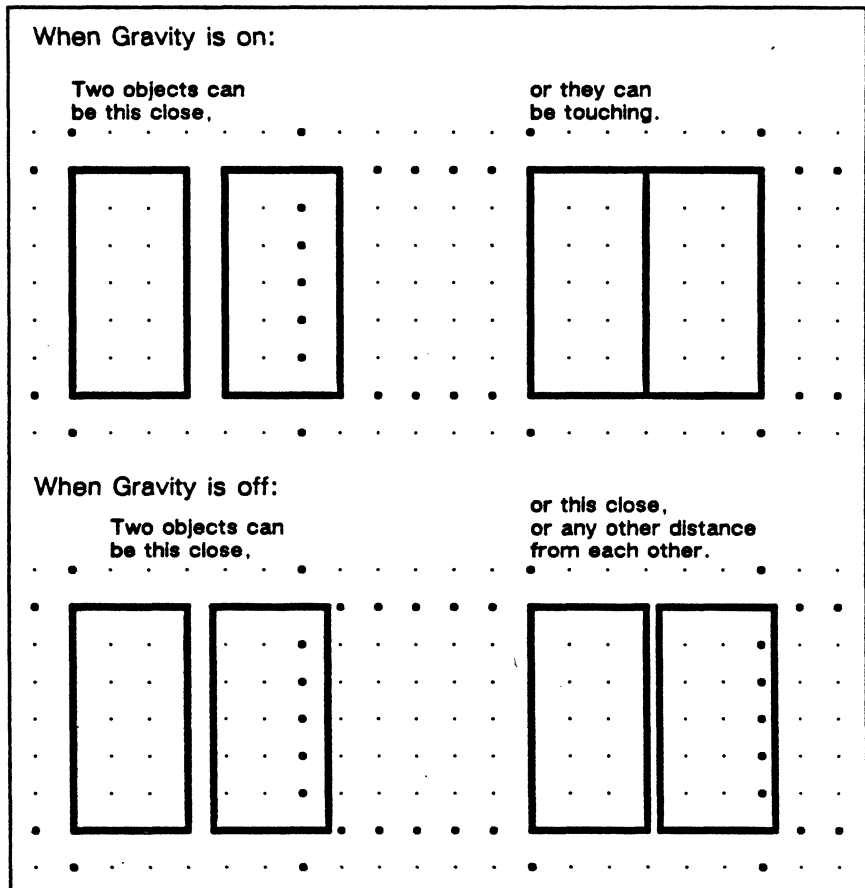


Figure 6-62. The effects of Gravity (when GridAlign is off)

Locations of the Gravity Points

Objects have gravity points in the following places:

- Lines have gravity all along their lengths. At their endpoints, they have stronger gravity so that you can easily attach lines together to make polygons.
- Polygons have the gravity points associated with the lines they are made of. They have gravity all along their edges with stronger gravity at the endpoints.
- Splines have gravity points only at the end of the lines they are made of.
- A newly created box is really a polygon, so it has gravity all along its border and stronger gravity at its corners.
- A chart, like a box, has gravity along its edges and stronger gravity at its corners.

- Ovals have eight gravity points, one at each of the four corners of the bounding box and one at each of the points that touch the bounding box. *Figure 6-63* shows the gravity points on an oval.

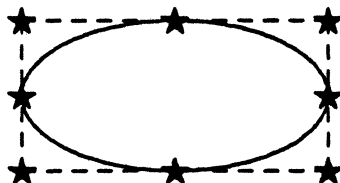


Figure 6-63. Gravity points on an oval

- Text** Text objects have gravity along their baselines, with stronger gravity at the ends of the baseline.

Gravity with GridAlign

When a control point is attracted to both a gravity point and a grid point, it will snap to the gravity point, not to the grid point.

The minor grid unit—used with GridAlign—and the gravity unit are the same length. If you create an object when GridAlign is on, its gravity points will fall on grid points (with this exception: since lines and objects made of lines have gravity all along their lengths, only some of the gravity points along a line will be on grid points).

- ☞ Because the endpoints of the lines *will* be on grid points when GridAlign is on, it is possible to create polygons using GridAlign without Gravity (*Figure 6-64*).

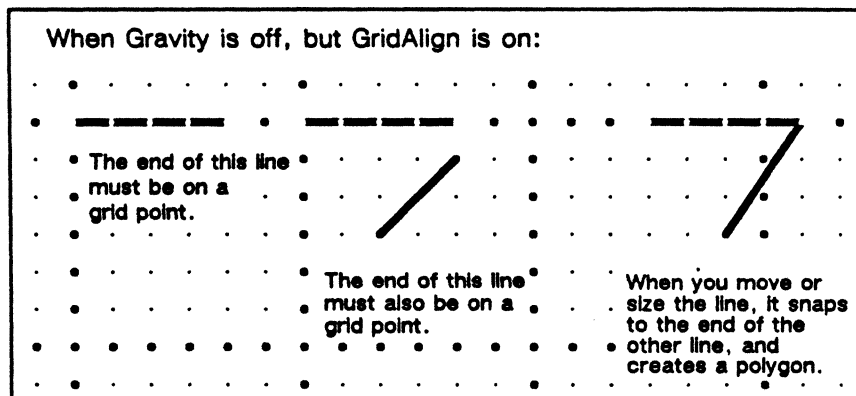


Figure 6-64. Using GridAlign to create a polygon

- ⊞ We recommend that you do not create polygons using only GridAlign for this reason. If you have sized a polygon, the chances that the grid and gravity points are the same are slim (*Figure 6-65*).

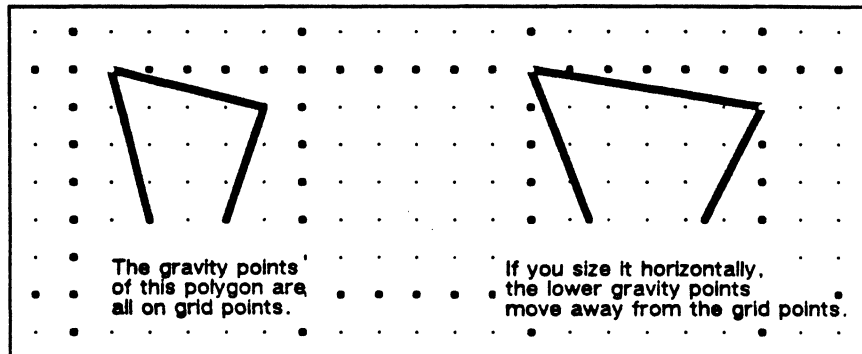


Figure 6-65. Sizing moves gravity points away from grid points.

The only way to guarantee that the endpoints of two lines overlap is to connect them with Gravity on.

- ⊞ If Gravity and GridAlign are both on, you will be able to edit a polygon whose gravity points are not on grid points, because Gravity is stronger than GridAlign, and a line that is torn between a gravity and a grid point will choose the gravity point (shown on the left in *Figure 6-66*).
- ⊞ If Gravity is off and GridAlign is on, you will not be able to edit the polygon because the lines you add will be attracted to the grid points, not to the ends of the existing lines (shown on the right in *Figure 6-66*).

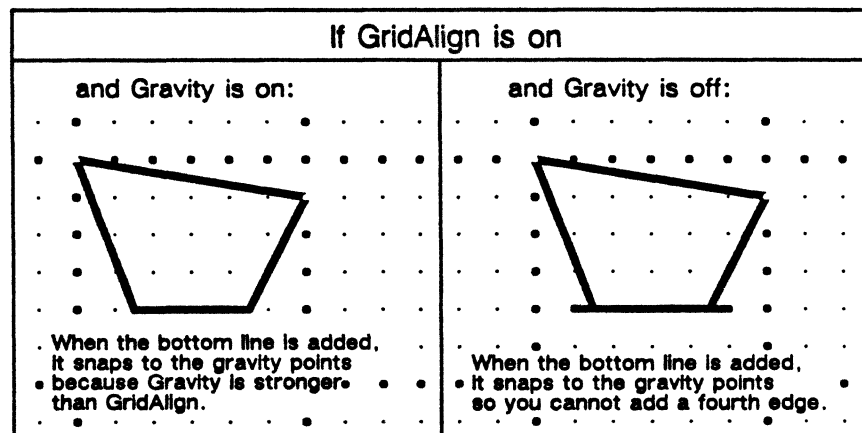


Figure 6-66. When the grid and gravity points do not match up

Gravity and Polygons

The diagramming system does not consider a collection of lines to be a polygon unless the endpoints of the lines are exactly overlapping. Because of the difference between screen resolution and printer resolution (discussed in the *Introduction*), lines that appear on the screen to be overlapping may not actually be.

If you are having trouble filling a polygon, it may be the result of a tiny space between two of the ends.

To see a space that is smaller than one screen pixel:

- ✓ Select the object.
- ✓ Size the object numerically to make it much larger.
- ✓ If necessary, move the object out of the diagram except for the corner you are examining and size it numerically again.

As the size of the object increases, the size of the space increases, too, until it is large enough that it can be seen at screen resolution. *Figure 6-67* shows an object that looks as if it is closed, and an enlargement that shows the gap.

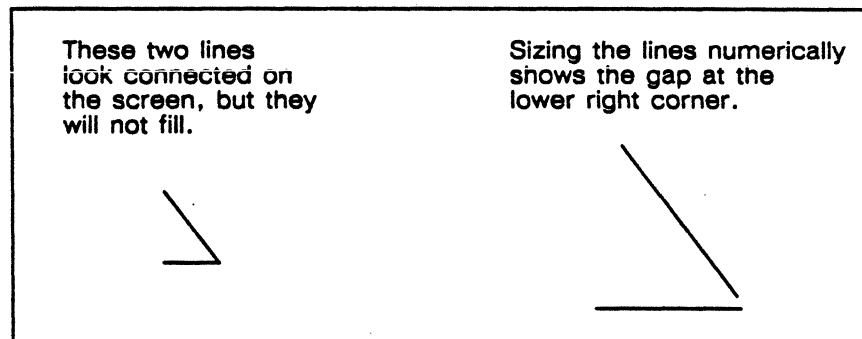


Figure 6-67. Examining tiny spaces

To close a space that is not visible on the screen:

- ✓ Make sure that Gravity is on.
- ⇨ Move the mouse cursor to the end of one of the lines, near the space.
- ✓ Select the line.
- ✓ Execute the **Size All** command.
- ✓ Size the line towards the space. Allow Gravity to snap the end of the line into place.

Control Points and Anchor Points

The control and anchor points are used with the three animation commands, **Move**, **Size**, and **Rotate**. They allow you to predict the changes to an object you are moving, sizing, or rotating, and, therefore, to control the changes.

- The active control point is the point on an object through which changes (moving, sizing, or rotating) are controlled.
- The anchor point marks the point on the object that is fixed when you size or rotate an object. An object that is being moved has no fixed point, so it has no anchor.

The active control point is marked with a box, shown on the left in *Figure 6-68*. The anchor point is marked by four small lines at 45 degree angles, shown on the right in *Figure 6-68*.

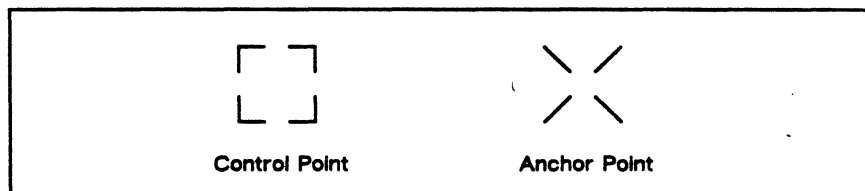


Figure 6-68. The control and anchor points

Figure 6-69 shows how the control and anchor points help you control changes to an object.

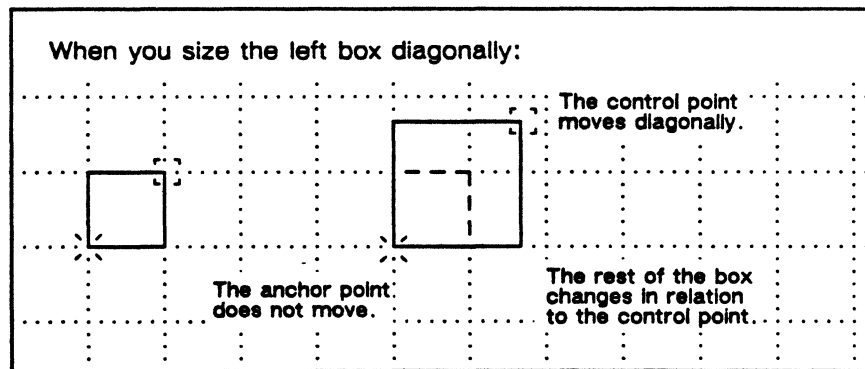


Figure 6-69. Using the control and anchor points

Location(s) of the Control and Anchor Points

To use the control and anchor points to your best advantage, you need to know where you can expect to see them.

There are only a few places on an object that can reasonably be used to control changes to the object. All of the reasonable places are called control points. Whenever you move, size, or rotate an object, the diagramming system chooses one point from the set of possible control points to be the active control point.

In general, the active control point is the control point that is closest to the mouse cursor when you execute the animation command.

If, for example, you select an object at its lower right corner and then move the mouse cursor to the upper left corner before choosing the Move command, the active control point will be the control point that is closest to the upper left corner of the object.

Possible Locations on a Primitive Object

The active control point can be at either end of a line or at any of the corners of a box or chart. The active control point on an oval can be at any of the four corners of the oval's bounding box or at its center. The stars in *Figure 6-70* mark the possible control points on each of these objects.

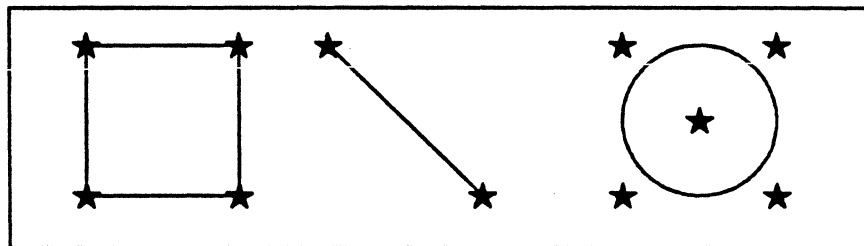





Figure 6-70. Possible locations for the active control point

The anchor point is also limited to a few positions. Its location is further restricted by the control point. The active control point is always determined first, and the anchor is chosen to complement the control point, according to these rules:

- When you size a line or when you rotate and magnify it, the control point is at the end closest to the mouse cursor, and the anchor point is at the opposite end. When you rotate a line (except when you rotate and magnify it), the control point is again at the end closest to the mouse cursor, but the anchor point is halfway between the two ends.

 When you size a box or when you rotate and magnify it, the control point is at the corner of the box that is closest to the mouse cursor, and the anchor point is at the opposite corner. When you rotate a box (except when you rotate and magnify it), the control point is at the closest corner, and the anchor point is in the center of the box.

 When you size a chart, the control point is at the corner of the chart that is closest to the mouse cursor, and the anchor point is at the opposite corner. Charts cannot be rotated.

 If you are sizing an oval, the position of the control and anchor point depends on where the mouse cursor was when you selected the **Size** command. If you were pointing at the border of the oval, the control point will be at the nearest corner of the bounding box, and the anchor point will be at the center of the oval. If you were pointing at the interior of the oval, the control point will be in the center of the oval, and the anchor point will be at the corner of the bounding box nearest the mouse cursor.

If you are using any of the **Rotate** commands except **Rotate Magnified** on an oval, the control point will be at the nearest corner of the oval's bounding box, and the anchor point will be in the center. If you are using **Rotate Magnified**, the active control point will be the nearest control point. The anchor point will be in the center if the control point is at a corner of the bounding box, and at the nearest corner if the control point is in the center.

Text There is only one control point on a text object: it is at the text anchor. On a flush left object, the control point is at the lower left corner; on a flush right object, it is at the lower right corner; and on a centered object, it is at the center of the baseline.

Possible Locations on a Group

All of the control points for the individual objects in a group are also control points for the group.

Figure 6-71 shows the control points on a group consisting of three boxes. There are twelve control points in this group because each of the three boxes has four, one at each corner.

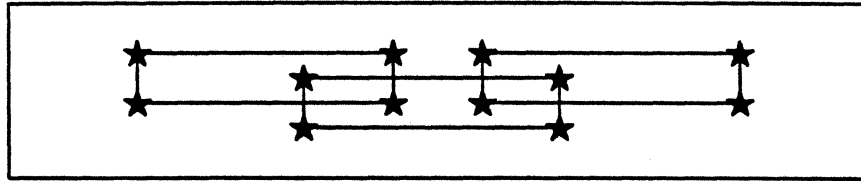


Figure 6-71. Control points on a group

As with a primitive object, the active control point usually is the control point that is closest to the mouse cursor when you execute the command, and the anchor point is a complementary point.

Here are the specific rules (details are in the three following sections):

- If you are rotating the group, the active control point is the control point nearest the mouse cursor. The anchor point is at the point that is closest to the largest number of control points (the complexity center).
- If you are moving the group, the active control point is the control point nearest to the mouse cursor, and there is no anchor point.
- If you are sizing the group, the active control point is at the nearest corner of a bounding box drawn through the four control points farthest from the center of the group. The anchor point is at the opposite corner. (See Figure 6-73.)

Rotating a group

If you are rotating a group, the active control point is the point (selected from all possible control points) that was nearest the mouse cursor when you executed the **Rotate** command.

For the anchor point, the diagramming system chooses a point near the center of the group, based on the distribution of control points in the group. If the control points are evenly distributed, the anchor point will be in the middle. If more of the control points are on one side, the anchor point will be closer to that side.

Figure 6-72 shows some groups, and the points around which they would rotate.

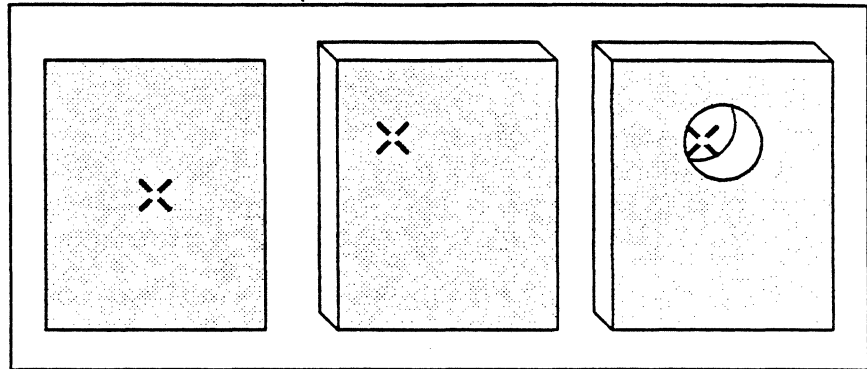


Figure 6-72. Anchor points for rotating groups

Moving a group

If you are moving a group, the diagramming system simply chooses the control point on an object in the group that is nearest to the mouse cursor. There is no anchor point.

Sizing a group

When you size a group, the diagramming system draws a bounding box around the group, through the four outermost control points. Then it chooses the corner of the bounding box that is nearest to the mouse cursor as the active control point, and the corner that is farthest as the anchor point. *Figure 6-73* shows the control and anchor points that would be used if you were sizing a simple group.

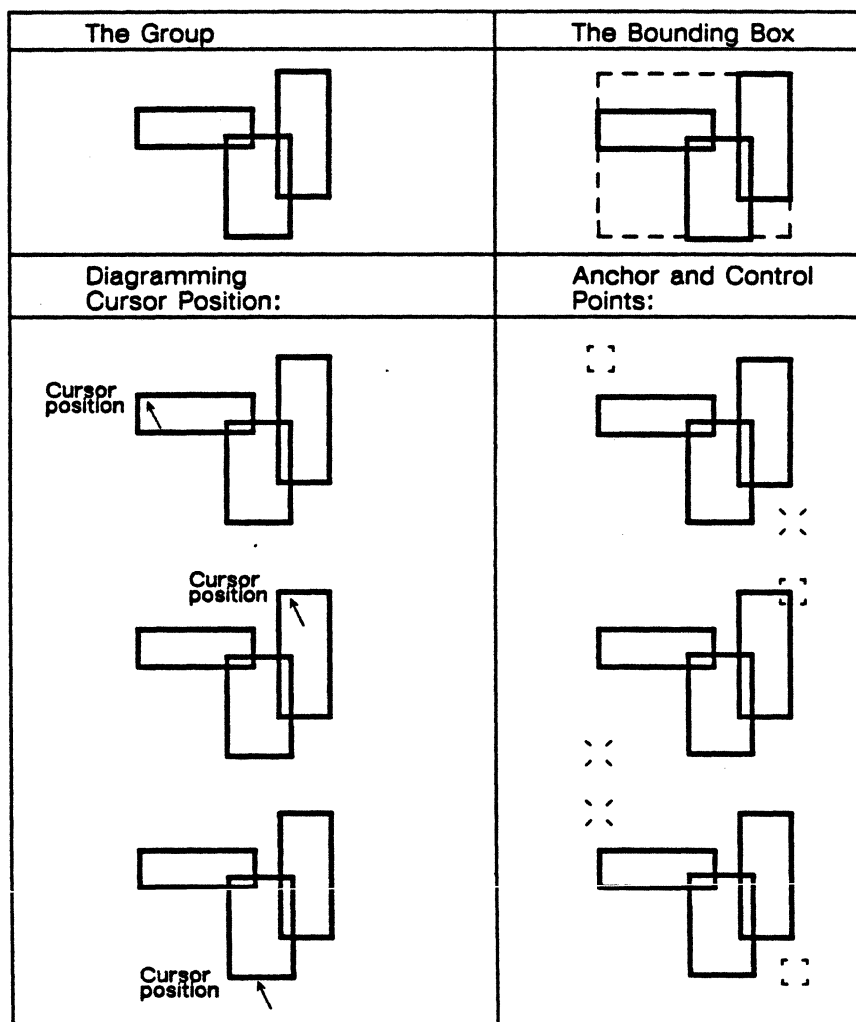


Figure 6-73. Anchor points for sizing groups

Control Points, Detents, Gravity, and GridAlign

All of the restrictions on motion that can be applied in the diagramming system affect the active control point. The active control point is

- attracted to the grid points
- attracted to the gravity points of other objects
- constrained to rotate according to the specified detent

When you are moving or sizing an object, only the active control point is attracted to other objects.

When you are constructing a polygon from several separate lines, be sure the active control point is on the end that is to be connected and that Gravity is on. Otherwise, the lines may appear to be lined up exactly when in fact there is a space smaller than one screen pixel between them.

See the section called *Gravity and Gravity Points* for procedures for examining such spaces and for correcting them.

Very Small Objects

You will notice that when you size, move, or rotate a very small object, the markers for the control and anchor points are not displayed. Beyond a certain point, the markers obscure the object rather than highlight it. For that reason, the markers are displayed only if the control point and the anchor point are at least three grid units apart either horizontally or vertically (*Figure 6-74*).

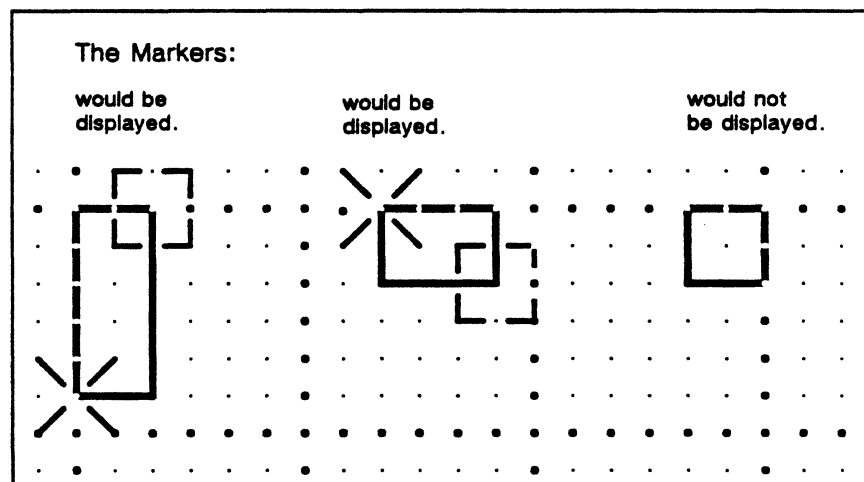


Figure 6-74. Control and anchor point markers on very small objects

Defaults in Diagramming

Before you open a diagram, the diagramming system makes assumptions about the kind of work you want to do and the environment in which you want to do it. These assumptions are called the system defaults.

The system defaults are divided into three classes.

- Environment defaults affect the diagramming environment and are controlled through the **Misc** submenu, off the **Nothing Selected** popup menu.
- Object defaults affect the properties of the objects you create and are controlled through the **Defaults** submenu, off the **Create** submenu.
- Popup menu defaults affect the actions you take by default and are automatically changed in response to your actions.

In the rest of this section, each of the system defaults is discussed in turn.

Environment Defaults

The default environment is **GridAlign** and **Gravity** on, grid invisible and in front, and **Detent** set to 15 degrees. You can, of course, change this environment, but if you close the diagram and reopen it, the environment will have been reset to the system defaults.

Information about the environment is displayed in the status line of the document as long as the diagram is open, and as long as there is nothing more important to report.

Figure 6-75 shows the status line from a sample document, just after a diagram in it was opened.

GridAlign on, Gravity on, Detent 15.0 degrees

Figure 6-75. The default status line

If you change the detent to 90 and turn **GridAlign** off, the status line will change (*Figure 6-76*).

GridAlign off, Gravity on, Detent 90.0 degrees

Figure 6-76. Changed information on the status line

The grid and **GridAlign** are discussed in the section with the same name. **Gravity** is discussed in the section called *Gravity and Gravity Points*, and detents are discussed in the section called *Rotation and Detents*.

Object Defaults

The object defaults affect the fill, the width, and the font associated with the objects you create. The system default setting for fill is None (not filled). The system default width is the thinnest black line (—). The default font is the font that is currently displayed in the text box in the document header bar.

All of these can be changed, through the Defaults submenu (*Figure 6-77*).

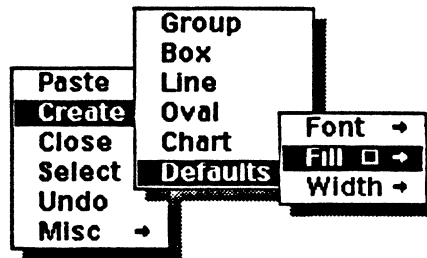


Figure 6-77. The Defaults submenu

To change the default fill pattern to stripes, for example, execute the **Create** → **Defaults** → **Fill** → command. The three submenus off the Default's submenu are shown in *Figure 6-79*.

The fill pattern or line width you choose becomes the default for any objects you create during the current diagramming session. For example, suppose you choose the thickest black line (—) as the default width. Until you close the diagram or change the default, every object you create will begin its existence with the thickest black line as its width. Of course, you can always change the properties of any object. When you reopen the diagram, the default fill and width will have been reset to the system default values.

If you set the default line width to none, you will be able to create completely invisible objects. To make sure you don't create invisible objects accidentally, the diagramming system will ask you to confirm your action on a stickup (*Figure 6-78*).

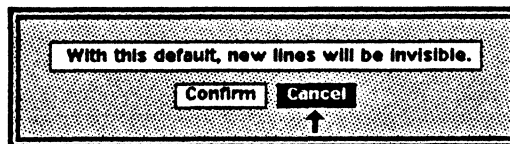


Figure 6-78. The invisible line width stickup

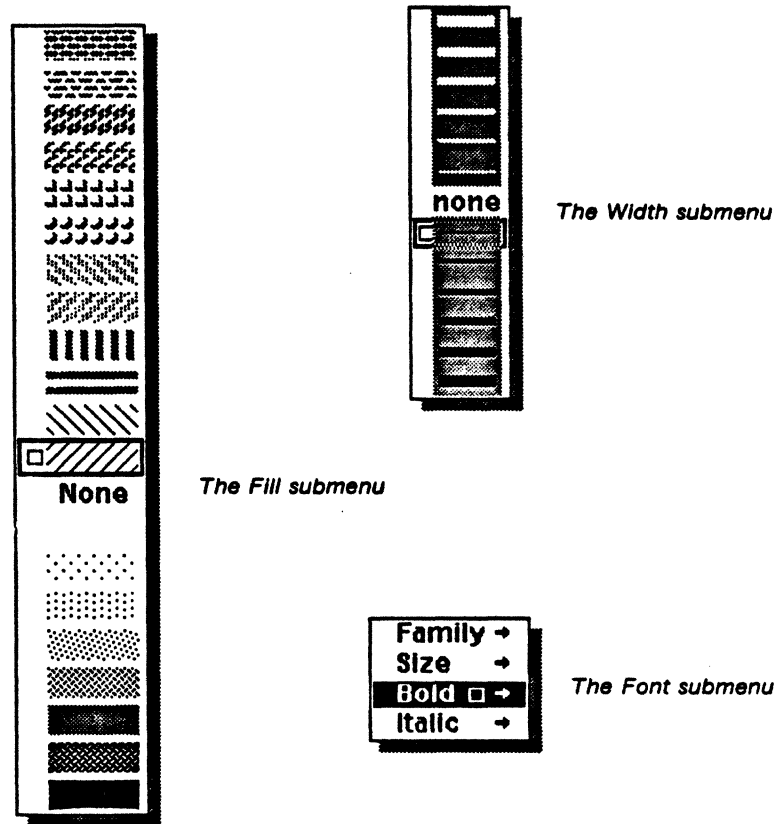


Figure 6-79. The submenus off the Defaults submenu

Font Defaults

Font defaults do not work like the other object defaults.

The default font for a text object is the font displayed in the text box at the top of the document window.

The font displayed in the header changes every time you select a text object of a different font. If there is no text in the diagram yet, the font displayed in the text box will be the font of the character just before the diagram, or the default font for the component if the only thing in the component is the diagram. If you change the font of a text object, the text box will show the new font, and the default will change to that font.

There is no way to establish a font to which all text objects will default when they are first created. The Font submenu, off the Default submenu, only sets the font for the next text object you create. If, after you have changed the default,

you select a text object that has a different font, you will have changed the default again, to the font of the selected text object.

Here is an example. Suppose that you are working in a frame that contains one text object in 12 point Classic roman. The font displayed in the text box will be Classic 12. If you set the default font to 18 point Modern italic, the text box will change to Modern 18 italic, and if you immediately type in a new text object, it will be in 18 point Modern italic. If you then select the 12 point text object, the font in the text box will change to Classic 12.

Popup Defaults

The popup defaults are the commands on the popup menus that get executed if you do not specifically choose a command.

Figure 6-80 shows the popup defaults for three commands.

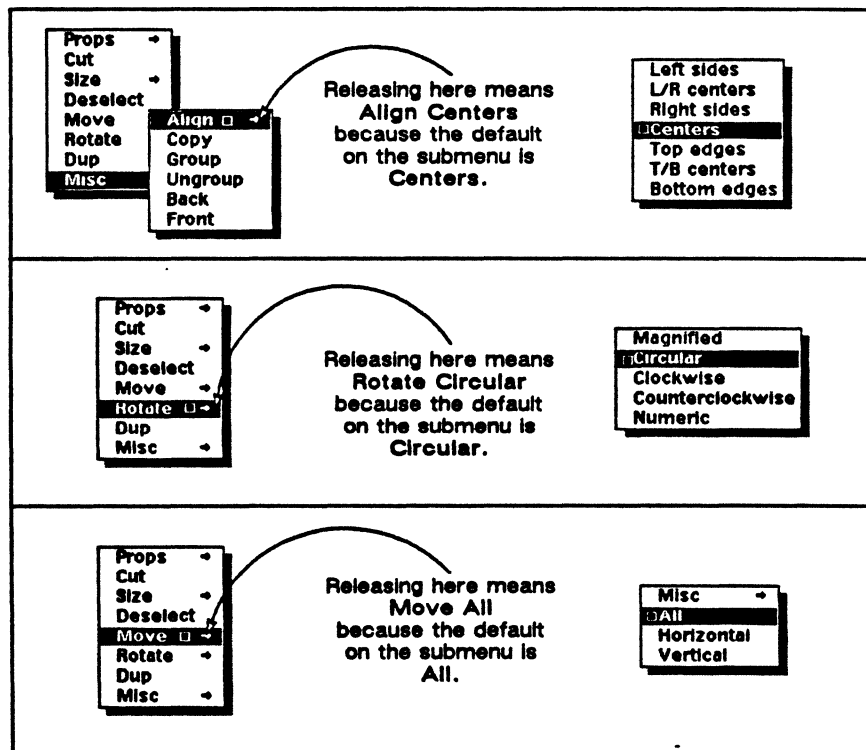


Figure 6-80. Popup defaults for three sample submenus

Before you begin diagramming, there is a system default for each popup menu except for the ones that change text. As in the rest of the diagramming system, text is a special case. Figures 6-13, 6-14, and 6-15 in the section called *Fun-*

damentals show every diagramming submenu, and the default commands on all except the submenus off the **Fonts** submenu.

Defaults on the Fonts Submenus

There is no default on the **Fonts** submenu. If you try to execute the **Fonts** command without displaying the submenu, nothing will happen. However, if you display the submenu, the **Bold** command will be displayed in reverse video, because one of the commands must be so displayed.

There are four commands on the **Fonts** submenu: **Family**, **Size**, **Bold**, and **Italic**. Each of them has its own submenu.

There is no default on the **Family** submenu: nothing will happen if you execute the **Family** command without displaying the submenu. The command that is displayed in reverse video depends on the angle at which you rolled onto the menu. It will be either **Classic** or the dashed line.

Figure 6-81 shows the two possible reverse video commands on the **Family** submenu.

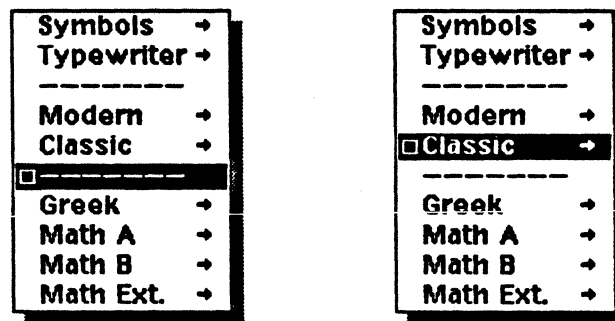


Figure 6-81. Defaults on the Family submenu

The default on the **Size** submenu is **Larger**.

The defaults on the **Italic** and **Bold** submenus depend on the font currently displayed in the text box. The default on these submenus is always the command that will change the current state. For example, if the font currently displayed in the text box is 10 point **Modern italic**, the default on the **Italic** submenu will be **Italic Off**.

Dynamic Defaults

As you diagram, the default commands on the menus change to help you work efficiently.

Unless you have reset the system defaults, the default on a popup menu is the last thing you did using that menu.

The only exception is that some commands cannot be the default in some circumstances. The defaulting system is intuitive, but, if you want to be able to predict exactly what the default will be in all cases, you will need to learn some new and technical concepts. If you do not want to be able to predict all defaults, please skip over the next two subsections to *Defaults on Submenus*.

☞ *The two level Object Selected popup menu*

The Object Selected popup menu is the menu you see if you hold down the middle mouse button when you have something selected (*Figure 6-82*).

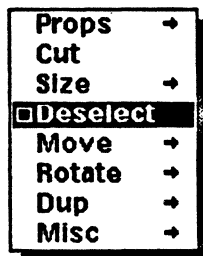


Figure 6-82. The Object Selected popup menu

There are really two Object Selected popup menus: the Selected popup menu and the Animation popup menu.

- You see the Selected menu when you hold down the middle mouse button just after selecting an object.
- You see the Animation menu when you execute one of the animation commands on the Selected menu, when you create an object, or when you duplicate an object.

Refer to the section called *Fundamentals* for a list of the animation commands.

The two menus look exactly alike. The only difference between them is in the way the defaults work.

◆ Patterns for defaults

The defaults on the two main popup menus are maintained separately. When you do something that changes the default on the **Nothing Selected** popup menu, you do not affect the **Object Selected** popup menu.

The default on the **Nothing Selected** menu is the last command you used on that menu.

When you open a diagram, the default on the **Nothing Selected** popup menu is **Close**. If you click the middle mouse button, you will close the diagram. If you hold down the middle mouse button to see the menu and create an oval instead, the default for the **Nothing Selected** menu will change to **Create Oval**. The next time you click the middle mouse button without anything selected, you will automatically create another oval.

The defaults on the **Object Selected** menu are more complicated than on the **Nothing Selected** menu because it is really two menus, and because not all the commands on the **Animation** menu are sticky.

Stickiness is a quality of a command that determines whether or not it can become the dynamic default. Not all commands are sticky, although all the commands on the **Nothing Selected** and **Selected** menus are.

On the **Animation** popup, only **Deselect** and **Dup Repeat** are sticky.

The system default, that is, the default when you begin diagramming, is **Deselect** on both the **Selected** and the **Animation** popup menus. If you click the middle mouse button after selecting an object, you will deselect it.

Defaults on the **Selected** popup menu are like the defaults on the **Nothing Selected** popup menu. If you select an object and apply one of these commands to it, that command will be the default next time you select an object.

Defaults on the **Animation** popup menu are different in two ways.

- There are only two sticky commands, **Dup Repeat** and **Deselect**. If you choose any other command, **Size**, for example, the next time you display the **Animation** popup menu, the default will still be **Deselect**.
- The default on the **Animation** popup is reset to **Deselect** as soon as you deselect the object, no matter what method of deselection you use.

Here are two examples you may want to try. They show the patterns of defaulting, first on the **Selected** menu, then on the **Animation** menu.

1. Select a line and hold down the middle button to see the **Selected** menu. If you haven't done any work yet, the default will be **Deselect**. Choose the **Rotate** command. Now **Rotate** is the default on the **Selected** menu. Without deselecting the line, hold down the middle mouse button to see the **Animation** menu. The default on that menu is **Deselect**. Next, deselect the line and select something else. When you hold down the middle mouse button, you see the **Selected** menu, and the default on it is still **Rotate**.
2. Create an oval and hold down the middle button to see the **Animation** menu. The default on that menu is **Deselect**. Execute the **Move Vertical** command, move the oval, and hold down the middle mouse button again. The default is still **Deselect**, because **Move Vertical** is not sticky. Now, execute the **Dup Repeat** command, and move the duplicate. If you hold down the middle mouse button again, you will see that the default on the **Animation** popup is now **Dup Repeat**. If you wanted to, you could make a whole column of ovals, just by clicking the middle mouse button and moving the duplicates.

Defaults on Submenus

The dynamic default does not have to be on the main popup menu—it can be many submenus away. The dynamic default could be **Move Horizontal** or **GridAlign on/off**.

If the dynamic default is on a submenu, and you switch to another branch of the popup menu tree, the default on that submenu is reset to to the system default.

Here is an example. The system default on the **Size** submenu is **All**. If you size a box diagonally, the dynamic default is **Size Diagonal**, and if you hold down the middle button, you will see **Diagonal** in reverse video on the submenu instead of **All**. If you then rotate the box, the dynamic default is **Rotate**, and the default on the **Size** submenu is set back to **All**.

A restriction

The system default on a popup menu must be a command that does not have a submenu of its own. That is why **Refresh** is the default on the **Nothing Selected Misc** submenu and **Edit** is the default on the **Props** submenu.

All the commands on the **Fonts** submenu have submenus, so the **Fonts** submenu has no default. If you execute the **Fonts** command without displaying the submenu, nothing happens. Of course, the mouse cursor has to be somewhere on the menu, so if you display the **Fonts** submenu, the **Bold** command will be in reverse video.

Resetting the Defaults

There are four methods for resetting the popups to the system defaults:

- closing and reopening the frame
- closing and reopening the document
- moving entirely off the popup menu
- clicking the left button under certain circumstances

If you want to reset the defaults, use the third set of actions, moving off the popup menu. Although the other three will work, only the third was designed to be used specifically for that purpose. It is faster than the first two and easier to use than the fourth (which is a side effect of one of the selection methods).

Here is the procedure for moving off a popup menu, and resetting the system defaults.

To reset the system defaults on a popup menu:

- ☐☐☐ Hold down the middle button to see the menu you want to reset.
- ☐☐☐ Move the mouse cursor entirely off the popup menu, so that no commands are displayed in reverse video.
- ☐☐☐ Release the middle mouse button.

Moving off a popup menu affects only that menu. If you move off the **Nothing Selected** menu to reset it to **Close**, you will not affect the **Selected** menu, and vice versa.

For information about closing and opening a frame, look in the section called *Fundamentals*. For information about closing and opening a document, look in the chapter of the *Reference Manual* called *Document Management*.

Clicking the left button

Clicking the left button will reset the defaults, but only when you have an object in animation state. For that reason, it is not as useful as moving off the popup menu. The information on it is included here for your reference, so that if you click the left button by mistake, you will know what happened.

When you have an object in animation state, clicking the left button will deselect the object and reset the system defaults on either the **Nothing Selected** or the **Selected** popup menu, whichever preceded the **Animation** popup menu. *Figure 6-83* shows an example in which clicking the left button resets the default on the **Nothing Selected** menu, and one in which it resets the default on the **Selected** menu.





Resetting the Create menu	Resetting the Selected menu
<p>1. Create an oval.</p>  <p>The default is Create Oval.</p> <p>2. Click the left button.</p>  <p>The default is Close.</p>	<p>1. Size an oval.</p>  <p>The default is Size.</p> <p>2. Click the left button.</p>  <p>The default is Deselect.</p>

Figure 6-83. Clicking the left button to reset defaults

Object Properties

Properties are the characteristics that identify an object. The shape of a circle and the pattern with which it is filled, the number of lines in a polygon and their arrangement, the font of a text object and its alignment are all properties.

The Props Submenu

Many of the properties are controlled through the **Props** submenu, off the **Object Selected** menu. *Figure 6-84* shows the two menus.

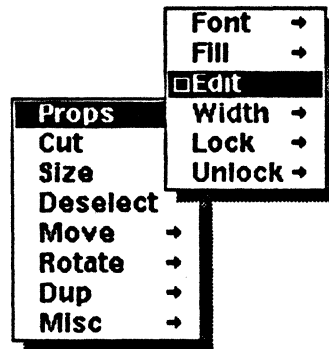


Figure 6-84. The Props submenu

The Edit Command

The default command on the **Props** submenu is **Edit**. The **Edit** command breaks complex objects into their component parts, so that you can change the properties of the parts independently of the whole.

It is so powerful a command that it is discussed in its own section. Please refer to *Editing and Grouping* for information on using the **Edit** command.

Other Commands

The other commands on the **Props** submenu can be divided into two categories. The commands in the first category control the basic properties. The basic properties are **Fill**, **Width**, and **Font**, and the commands that control them go by the same names.

The commands in the second category control the hidden properties of objects—things such as whether or not the object prints, or whether you can change the fill pattern. These properties are called locks, because they either set something (like a fill pattern) or prevent something from happening (like printing or cutting). The two commands that control them are **Lock** and **Unlock**. Locks are discussed in the Section called *Locks*.

The Basic Properties

The basic properties of an object are

- the pattern it is filled with
- the width of the line (or border)
- the text font in which it is displayed

No primitive object has all three of these properties. Text and charts have a font, but boxes, ovals, and lines do not; boxes and ovals have pattern fills, but lines, charts, and text do not; and lines, boxes, and ovals have widths, but charts and text do not (*Figure 6-85*).







			font
	✓	✓	
	✓	✓	
text			✓
		✓	
			✓

Figure 6-85. Basic properties and primitive objects

Groups, of course, can have all properties because they may contain objects of all types.

The Fill Property

The fill property of an object is the pattern with which it is filled. It is useful in many situations. Here are two examples. With Fill you can

- add shadows to your drawings
- create legends for your business charts

Techniques 5 and 6, which show you how to create a half circle and a cylinder, use the fill property.

Changing the pattern fill

The fill property of an object is changed through the Fill submenu, shown in Figure 6-86.

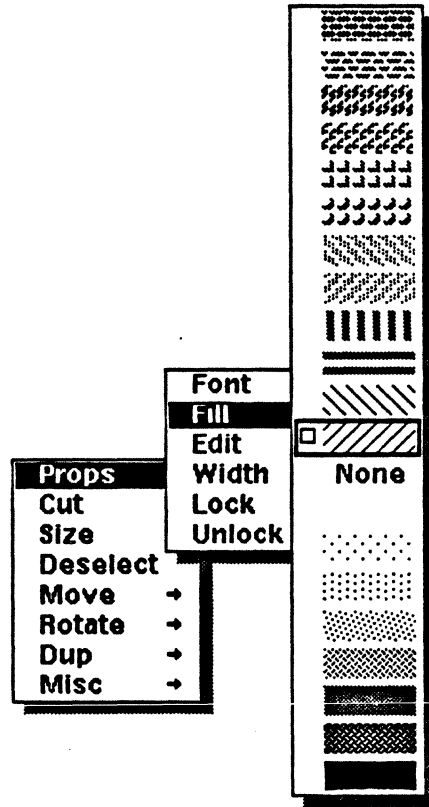




Figure 6-86. The Fill submenu

To change the pattern of an object to stripes, execute the **Props** → **Fill** →  command.

The Fill submenu is one of only two popup menus in the diagramming system that do not use reverse video to mark the currently selected command. Reverse video would obscure the patterns, so instead this menu uses a selection box ().

Screen patterns vs. printer patterns

Because of the difference between the resolution (number of dots per inch) of the screen and of the printer, the patterns you see on the screen are not exactly like the ones that are printed. Figure 6-87 shows the patterns you see on the screen on the left and the printed patterns on the right.

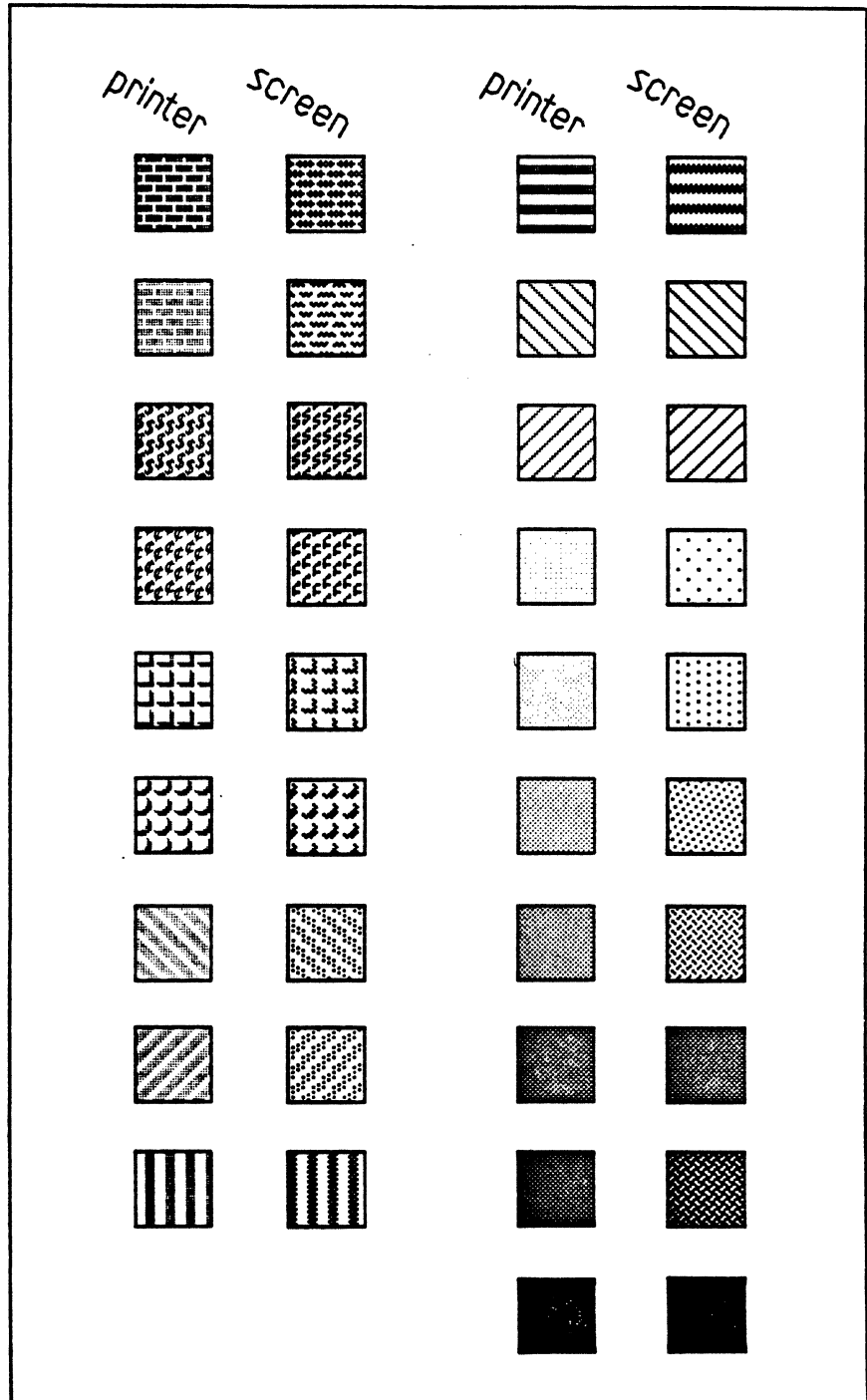


Figure 6-87. Printer and screen fill patterns

None and white

Figure 6-87 does not show two of the fill patterns, **None** and **white** (white). These two patterns look the same on the screen and on the printer, as

long as there are no objects behind them. The difference between the two is that objects behind an oval or box filled with are hidden, while objects behind an oval or box filled with are visible. Figure 6-88 shows the difference between and .

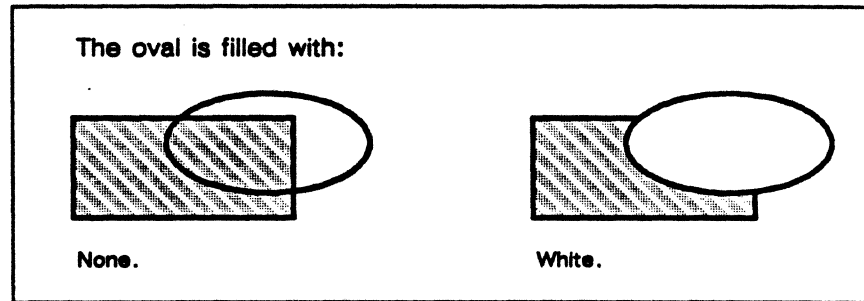


Figure 6-88. The difference between and .

Tidbits

The fill patterns are exactly the same as the patterns that are available to you when you are filling the wedges of a pie chart or the bars of a bar chart. You can use this fact to create legends for your business chart very simply.

Turn to the chapter called *Making Charts* for details.

The fill patterns are laid out relative to the screen of your workstation, not the boundaries of the window or object. As a result, if two objects filled with the same pattern are overlaid, the patterns will match up (Figure 6-89).

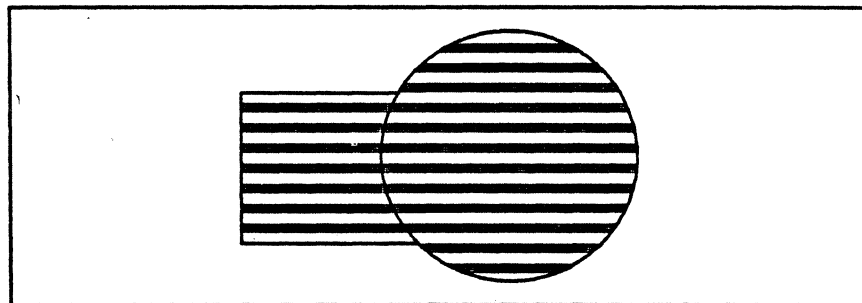


Figure 6-89. Matching patterns

The Width Property

Lines and the borders of ovals and polygons can have the property of width. There are thirteen possible widths, from thick black to thick white, passing through none on the way. Each width is one screen pixel wider (or narrower) than its neighbor.

Figure 6-90 shows twelve lines, one of every width except none.

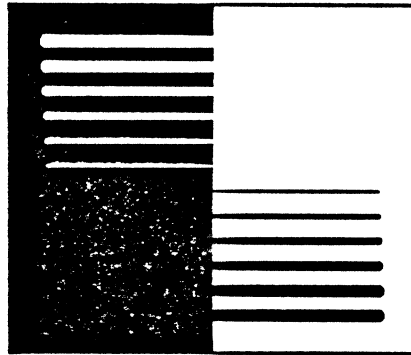


Figure 6-90. Examples of widths

Using widths

The width of a line or border is changed through the Width submenu, shown in Figure 6-91. The top half of the menu shows the white lines that are available; the bottom half shows the black lines.

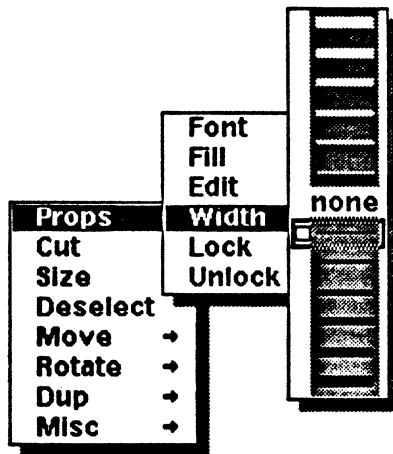
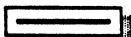



Figure 6-91. The Width submenu

To make a line thin and black, execute the **Props** → **Width** →  command.

The Width submenu, like the Fill submenu, does not use reverse video to mark the currently selected command. Reverse video would obscure the lines, so instead this menu uses a selection box ().

Using invisible lines

A line width of **none** is used to allow two objects to flow together. Figure 6-92 shows two picture of a ring, on the left with narrow lines, on the right with lines that have a width of **none**.

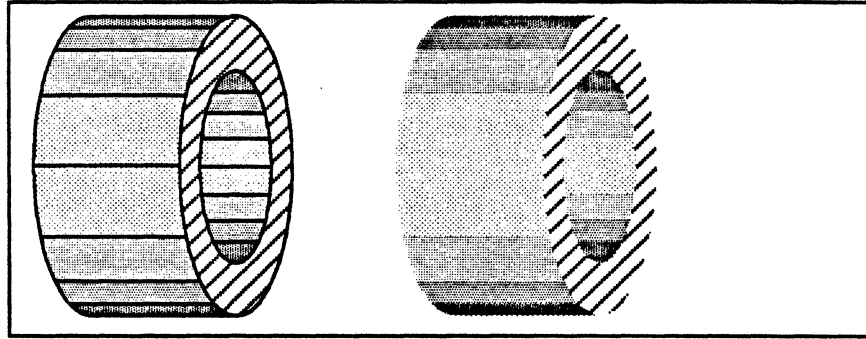


Figure 6-92. Using widths of none

Using thick lines

Despite the appearance of some thick lines, a line really has only one dimension—length. The control point of a line, therefore, is always at the center of its width. One result is that the bounding box the diagram uses for sizing goes through the edges of a group made of wide lines, instead of around them. Figure 6-93 shows such a group, with the bounding box that would be used superimposed.

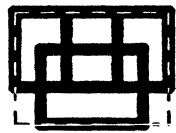


Figure 6-93. Bounding box for sizing objects made from wide lines

When you are using thick lines, be conscious of the fact that it is the control point that is aligned with grid and gravity points. Otherwise, you may think two objects are matched up that are not, and you may have trouble creating polygons.

For this reason, it is better to create the polygon first and then change its width than it is to begin with thick lines and then create the polygon.

To create a polygon with a wide border:

- ✓ Create the polygon using thin lines.
- ✓ Change the widths of the lines.

The Font Submenu

Charts and text objects can have fonts. Fonts allow you to choose the size, weight, or font family that is most appropriate for the text in your diagram. Here are two of the ways to use fonts.

- Add a caption to your business chart.
- Label parts of a blueprint.

Using the Font Submenu

Fonts are controlled through the Font submenu (Figure 6-94).

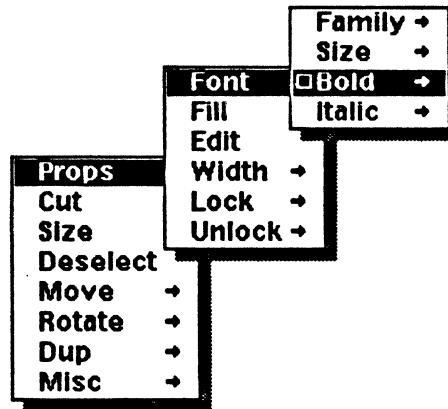


Figure 6-94. The Font submenu

To make a text object italic, execute the **Props** → **Font** → **Italic** command.

Details

Two of the commands that are on the text processing **Font** submenu are missing from the diagramming submenu: **Last** and **Pick Up**. However, some of the functions of these commands is available. Instead of pointing at a text object that has the font you want and executing a command, you just select the text object. The current font is switched to the font of that object.

All of the fonts, sizes, and weights that are available to you when you are working in the text processing system are also available in the diagramming system. However, each text object can have only one font. If you want to create a sentence that contains words in different fonts, you will have to create a new text object whenever you switch fonts.

Because the screen and the printer resolutions differ, you may have difficulty connecting text objects so that they print correctly. See the subsection called *Text Objects and Gravity* in *Entering and Using Text* for one way to avoid problems.

Front and Back

Diagramming objects are ordered from front to back. When you create an object, it is automatically placed at the front of the order.

A newly created object will be in front of existing objects.

You can alter this order with the **Front** and **Back** commands.

The diagramming order is useful because it allows you to cover parts of some objects with other objects. Here are some possible applications.

- You can get the effect of an arc by covering part of a circle.
- You can put white boxes behind labels to make the labels more readable.
- You can create a shadow by duplicating an object, filling the duplicate with a gray pattern, moving it a little, and putting it in back of the original.
- When you have trouble selecting an object because of other objects near it, you can move the other objects to the back of the order.

These are just four uses—you will find many more as you work with the diagramming system.

Using Front and Back

The **Front** and **Back** commands are on the **Misc** submenu, off the **Object Selected** popup menu (Figure 6-95).

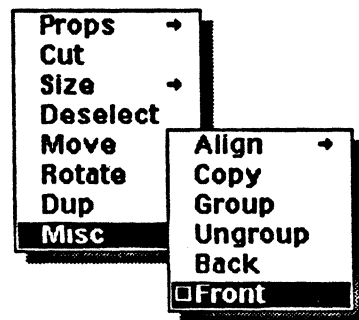


Figure 6-95. The **Misc** submenu, off the **Object Selected** menu

The **Front** command brings the object you select to the front of the order, so that it covers the other objects. To bring objects to the front of the order, execute the **Misc → Front** command.

The **Back** command puts the selected object at the back of the order, so that other objects cover it. To put objects in the back of the order, execute the **Misc → Back** command.

An Example of Front and Back

Figure 6-96 shows three overlapping objects: a box, an oval, and a triangle, created in that order. Because the box was created first, it is at the back of the order, and the other two objects cover part of it. Because the triangle was created last, it is in front of the other two objects.

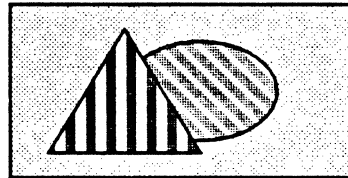


Figure 6-96. Overlapping objects

If you select the oval, and execute the **Front** command on it, it will be moved to the front of the order, and it will cover part of the triangle. *Figure 6-97* shows the three objects as they appear after this manipulation.

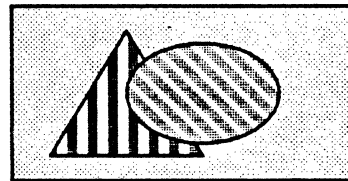


Figure 6-97. A change in the order of overlapping objects

Using Front and Back on More than One Object

The **Front** and **Back** commands can be executed on more than one object at a time.

When you change the position of several objects at once, the order of these objects in relation to each other is maintained.

If you select two objects and bring them to the front of the order, the one that was closer to the front will become the first object, and the one that was farther back will become the second (Figure 6-98).

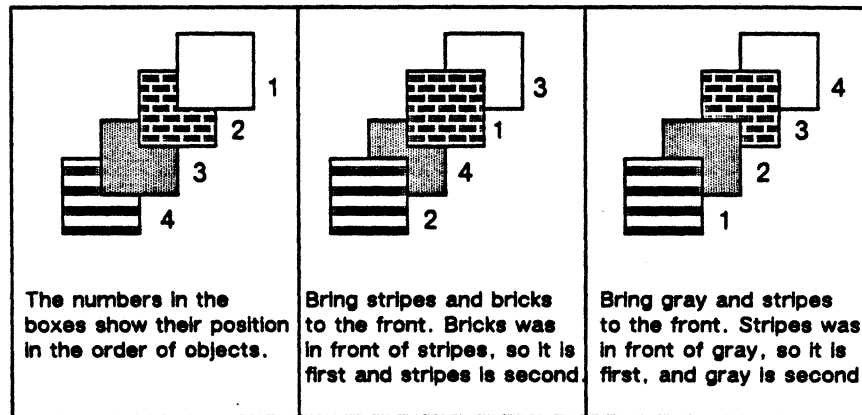


Figure 6-98. Using Front and Back on more than one object

Using Back as a Selection Aid

When objects overlap, it is always easier to select the object that is on top. If you keep selecting an object that is in front of the one you actually want, put the object you can select in back. Then you will be able to select the object you want.

To select an object that is behind another object:

- ✓ Select the object that is in front.
- ✓ Execute the Back command on the Misc submenu.
- ✓ Select the object you want.

Undo and Select Again

The **Undo** command and the **Select Again** command are discussed in one section because both are based on the last change you made to your diagram.

Undo

The **Undo** command reverses all the changes you have made to the last set of objects that you changed. Here are two situations in which **Undo** is especially useful.

- If you accidentally align the centers of everything in your diagram, **Undo** will put all the objects back in their proper places.
- If you **Size All** an object you meant to **Size Diagonally**, **Undo** will restore it to its original proportions.

Of course, it is useful in many other situations, too.

Using Undo

Undo is on the **Nothing Selected** popup menu (*Figure 6-99*).

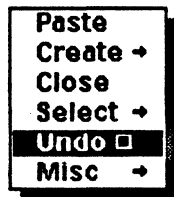


Figure 6-99. The Undo command on the Nothing Selected menu

To undo the last set of changes you made, execute the **Undo** command.

How Undo Works

At all times, the diagramming system has a record of what would be undone if you executed the **Undo** command.

There are two refinements to the **Undo** command.

- If you execute more than one command on a set of objects without deselecting them, those commands are *added* to the system's record of what to undo. If you execute **Undo**, the system will undo all of them.
- If you execute a command that does not change an object (if you change the default pattern fill, for example), you do not affect the system's record of what to undo.

If you select an object, size it, move it, and duplicate it before you deselect it, when you undo, the box will be resized and moved back to its original position, and the duplicate will be removed.

The commands that do not change an object, and therefore do not change the record of what to undo, are **Deselect**, off the **Object Selected** menu, and the commands on the **Misc** and **Defaults** submenus, off the **Nothing Selected** popup menu.

Here is an example. If you size a box, then turn **GridAlign** off, then undo, you will return the box to its original size. You will not turn **GridAlign** on again, because **GridAlign on/off** does not change an object, and does not affect the record of what to undo.

The record of what can be undone is kept until you close the document that contains the diagram. You can even close the diagram, open another, and work in it, and when you go back to the first, you can still undo the last set of changes you made there.

Undoing Undo

Because **Undo** reverses the *last* changes you made, executing the **Undo** command again immediately leaves the diagram as it was before you executed it for the first time. It undoes the effects of the first **Undo** (*Figure 6-100*).

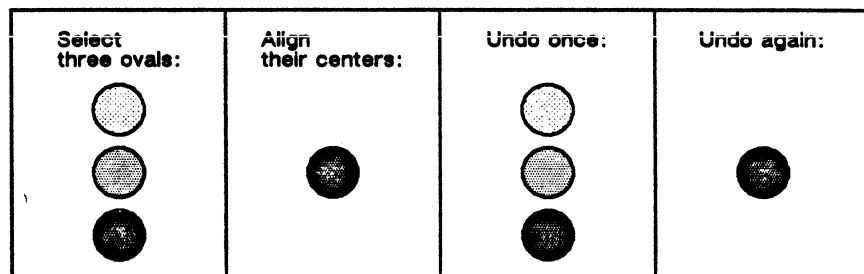


Figure 6-100. Using Undo twice in a row

Undo and the Clipboard

The **Undo** command does not affect the clipboard.

When you cut an object from a diagram, it is moved onto the desktop clipboard. If you then execute the **Undo** command, the object you cut will be redisplayed, but the diagramming object on the clipboard is not affected at all (*Figure 6-101*).

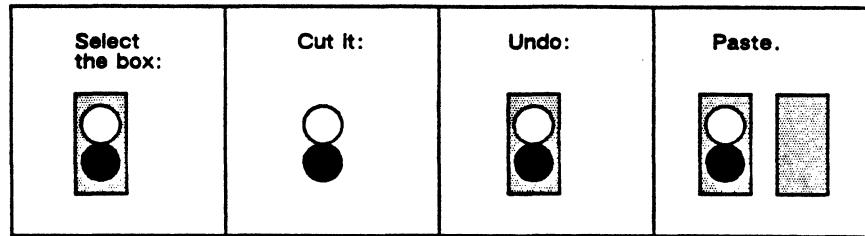


Figure 6-101. The Undo command and the clipboard

The Copy command affects only the clipboard: it causes no change to the diagram you are working in at all. For that reason, executing Undo after you have copied something has no effect, and if you paste after undoing, you will be pasting the copy you made.

Editing and Undo

Undo executed after closing a group tells the diagramming system to put the group back the way it was before you edited it. You are undoing the Edit.

With the Undo command, you can play around with a group until you have it exactly the way you want it, even undoing commands within the edit. If at any time you decide you want to start over, you can close the group and Undo the Edit.

You can even change a group within a group and then undo all your changes at the top level. Please refer to the section called *Editing and Grouping* for more information.

Select Again

The Select Again command reselects the last object or group of objects that you changed. For example, if you have just changed the width of a line, Select Again would reselect that line.

Select Again is valuable when

- you want to change more than one of the properties of a single object
- you want to perform a series of operations on several objects that are not grouped
- you want to select a set of objects that you have just placed over other objects that you do not want to select

Select Again is often the most efficient method of selection. Sometimes it is the only way to achieve a particularly tricky selection. See Technique 15 for one example of such a selection.

Here is another example of a tricky situation in which **Select Again** is useful. If you have moved one set of objects over another set, and you want to select that other set, use **Select Again** to select the objects you moved, then hold down the right mouse button and make a selection box around both sets. When you release the button, the objects you moved will be deselected, and the objects underneath them will be selected.

Because **Select Again** is so useful, it is a good idea to use it whenever possible, to get in the habit.

Using Select Again

Select Again is the default command on the **Select** submenu, shown in *Figure 6-102*.

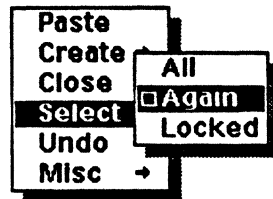


Figure 6-102. The Select Again command

To select the last set of objects you changed, execute the **Select → Again** command.

The record of what should be reselected is kept until you close the document that contains the diagram, even if you close the diagram and work in another.

How Select Again Works

The diagramming system keeps a record of which objects to reselect when you execute the **Select Again** command. Whenever you change an object, the record is updated so that the object to be reselected is the object you just changed.

Just selecting an object is not performing an action on it, and does not affect the record. If you have just sized a box, and you select an oval and immediately deselect it, the **Select Again** command will select the box you sized, because you did not perform an action on the oval.

Commands that do not affect objects—the grid commands and the commands on the **Defaults** submenu, for example—do not affect the record.

If you execute the **Select Again** command when there is nothing in the record, nothing will be selected. This can happen after you have cut an object or when you first open a document.

Editing and Grouping

If a complicated diagram—showing a piece of machinery, for example—consisted only of primitive objects, modifying it would be extremely difficult. There would be so many little pieces that getting the only ones you wanted to work with would require much effort.

To avoid this problem, the diagramming system allows you to associate primitive objects in groups, and even to associate the groups together. Each part of your complicated diagram can be a single group. You can work on this group without affecting any other group or primitive object in the diagram.

Think of a diagram as a hierarchy of objects, organized into groups, and groups of groups, and so on. There are two advantages to using this hierarchical system, and they are complementary.

- It allows you to change only one set of objects at a time, without worrying about all the other objects in your diagram.
- It allows you to change all the objects in a group by executing only a single command.

Techniques 6 and 13, making a cylinder and creating a shadowed polygon, both rely on the properties of groups.

There are two ways of creating and accessing the hierarchy of objects. You can use the **Ungroup** command and the two **Group** commands to arrange the objects in a hierarchy, or you can use the **Edit** and **Close** commands to modify the groups in a hierarchy without changing the hierarchy itself.

The **Edit** command is primarily for experts. We have marked the subsections in this section that describe it and its use. If you do not want to learn about **Edit** now, just skip those subsections.

This section is organized as follows:

- a discussion of groups and hierarchies
- two ways to create a group
- manipulating a group
- changing the components of a group
- destroying a group you no longer need

Groups and Hierarchies

What Is a Group?

A group is two or more objects that are selected as if they were one. It can contain other groups, which in turn can contain groups, and so on.

Any command you execute on a group is executed on all the objects in the group. But that is also true of any collection of objects that is selected but not grouped (*Figure 6-103*).

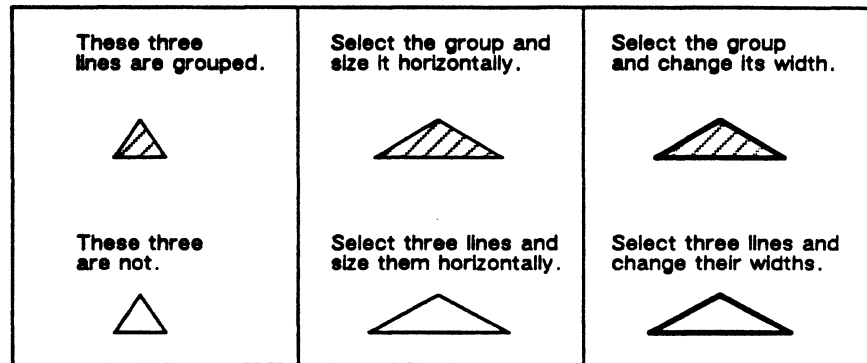


Figure 6-103. Changing a group vs. changing three objects

There is one exception: the **Align** commands do not change the alignment of objects inside groups, only of the groups themselves (*Figure 6-104*).

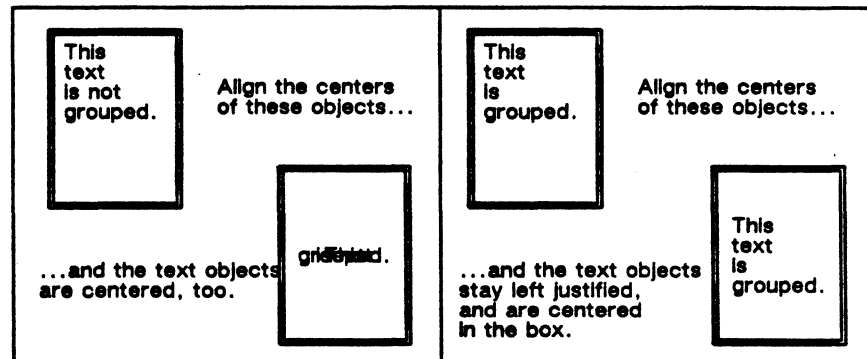


Figure 6-104. Alignment within a group is preserved.

The Hierarchical Structure of a Group

Saying that the diagramming system is hierarchical means that the objects in a diagram can be arranged from top to bottom, and that the objects at the bottom of the hierarchy will be controlled by the objects at the top. Such an organization is often called a tree structure because the diagrams drawn to show them bear a resemblance to upside-down trees. Most businesses are hierarchical, and their organization charts reflect this.

The objects and groups in a diagram are arranged in a tree structure. This arrangement has nothing to do with the physical locations of the objects in the diagram. *Figure 6-105* shows the tree structure for one object.

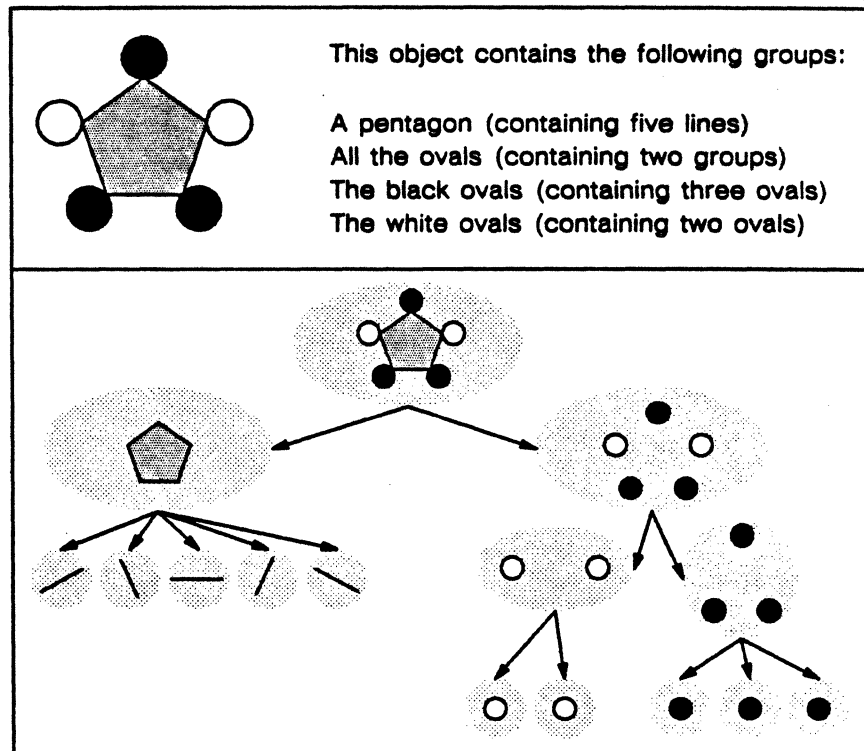


Figure 6-105. Conceptual arrangement of groups

If you group a set of objects, you are adding a level to this tree structure.

If you ungroup a group, you are removing one level. For example, if you were to ungroup the pentagon in Figure 6-105, you would have five separate lines.

Creating a Group

Deciding to Create a Group

There are two reasons to create a group:

- to preserve a particular alignment you have set up
- to aid you in selecting only the correct objects

You will use the **Group** command both to create particular alignments of objects and to preserve alignments you have already made. There is more information about using **Group** to control the **Align** commands later in this section, and also in the section called *Alignment*.

The second reason above—to help you select the objects you want—is the more important reason. Groups can make it easier to select the objects you want and also to avoid selecting the objects you do not want.

Suppose, for example, that you are working on a floor plan of your new office building. You may have one collection of objects that represents a door. If these objects are grouped together, then you do not have to select each one of them every time you want to make a duplicate for another part of the building.

- ◊ Another advantage is that you can more easily modify the door. When you edit the group, you will be able to change the door but you will not be able to select pieces of the wall. You are protected from selecting objects you do not want to disturb.

Creating the Group

There are two ways to create a group.

- Create the group and then create the objects in it.
- Create the objects and then group them together.

The first method is more efficient, but because it involves a special entry mode, we recommend that new users of the diagramming system avoid it.

Even experts using the diagramming system often find they do not realize that a set of objects belong together until after they have created and perhaps even modified them several times. Once they do realize the objects belong together, they use the second method to create the group.

◊ *Creating the group first*

The first way to create a group uses the SubEdit submenu, off the Nothing Selected submenu (*Figure 6-106*).

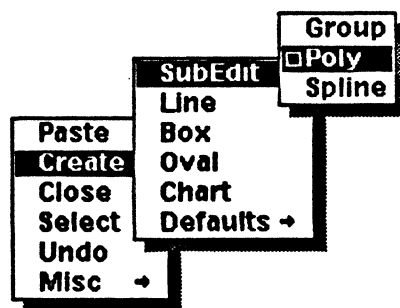


Figure 6-106. The SubEdit menu

There are three commands on this submenu, and all three will open a SubEdit level for you. Closing the subedit will form a group. Each of the commands opens the SubEdit level for a different kind of group. For example, when you close a SubEdit level opened by the Spline command, the objects you have created will be smoothed as well as being grouped together.

To create a spline before you create the lines in it, execute the **Create →** **SubEdit →** **Spline** command. Then use the **Close** command to close the SubEdit level.

There is more information on the SubEdit submenu in the section called *Creating Objects*.

Creating the object, then the group

Figure 6-107 shows the Group command on the Misc submenu, off the Object Selected popup menu.

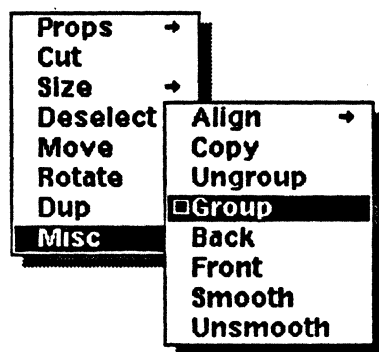


Figure 6-107. The Group command on the Misc submenu

To create a group after you have created the objects, select the objects and execute the **Misc →** **Group** command.

Please refer to the section called *Creating Objects* for detailed information about Group and Ungroup.

Manipulating Groups

When you execute a command on a group, the internal structure of the group is ignored. At this level, there is no difference between a group that contains four objects, and a group that contains two groups of two objects each.

You can execute any of the diagramming commands on a group. You can change the pattern it (or the objects in it) is filled with, you can change the width of the lines in it, you can size it, move it, rotate it, and duplicate it.

As long as you are working on the group, though, the changes you make will affect all the objects in the group (Figure 6-108).

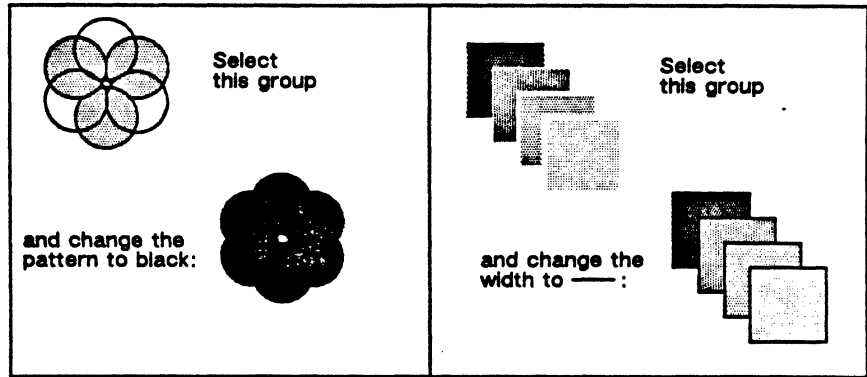


Figure 6-108. Manipulating a Group

Alignment in Groups

Although commands executed on a group affect all the objects in it, no command affects the relative spatial relationships of the objects in the group.

Changes to the group do not affect the alignment of objects in the group.

This is one of the real advantages of groups. You can set up a fancy alignment and be sure that it will not be destroyed later. Figure 6-109 shows one example.

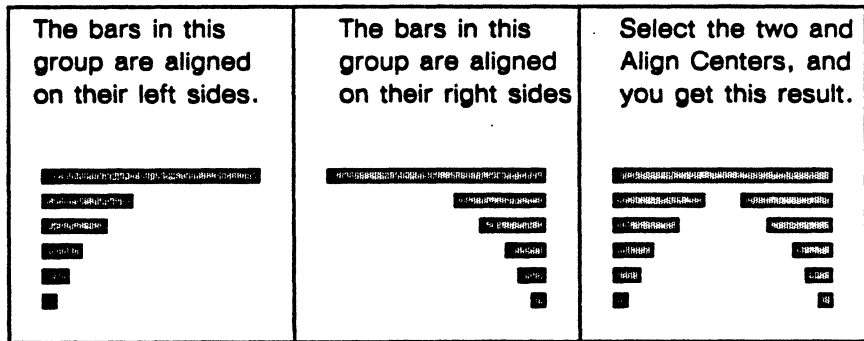


Figure 6-109. The groups are aligned, not the objects in them.

Figure 6-110 shows the diagram you would get if the bars in Figure 6-109 were not grouped when you aligned centers.

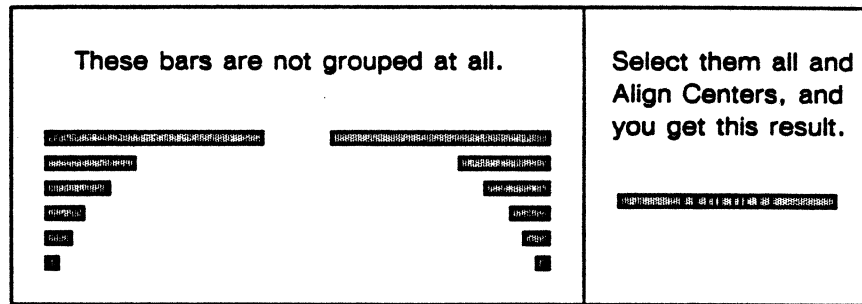


Figure 6-110. Objects are centered because they are not grouped.

Polygons

One of the effects of this preservation of alignment is that it is impossible to destroy a polygon—which is one kind of group—by changing its size, angle, or position.

The endpoints of the lines in a polygon must overlap, or the lines do not make a polygon (see the section on polygons in *Creating Objects*). Because they overlap before they are made part of a group, they continue to overlap no matter what changes you make to the group.

If you have grouped two or more lines together but their endpoints do not overlap, the size of the space between them will increase or decrease proportionally to the changes in the size of the lines, but it will never disappear.

Figure 6-111 shows a polygon and a set of lines whose ends do not quite meet.

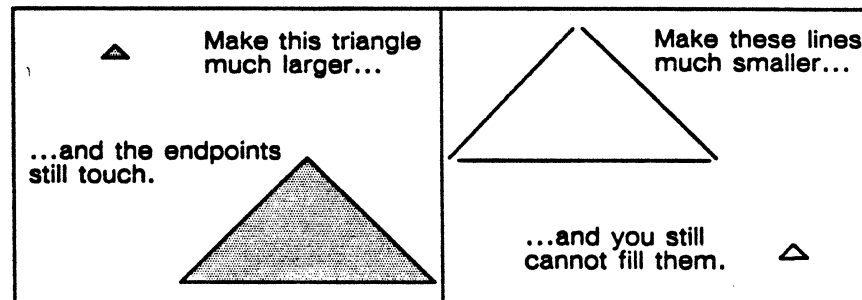


Figure 6-111. Spatial relationships in a polygon and in a group of lines

Editing Text in Groups

When several text objects are grouped together you can change the text that each one contains.

To change one text object in a group:

- ☞ Point the mouse cursor at the line you want to edit.
- ☞ Click the left mouse button to select the group.
- ☞ Begin editing.

However, you cannot change the font of a single text object in a group that contains more than one object: you must either change the font of all the text objects in the group or edit the group, select the single text object, and then change its font.

☞ *Editing a Group*

The **Edit** command allows you to change the individual parts of a group while preserving the association between the parts. You are placed in a special mode called a subedit, where you can change the parts of the group, but where you cannot even select anything that is not part of the group.

Use the **Edit** command when you want to modify the objects in a group. Here are some examples of the changes you would make when editing a group:

- adding a side to a polygon
- changing the alignment of the objects in a group
- moving an object from one group into another

Because subedit levels can be confusing to the new user, you must confirm the **Edit** command in the **SubEdit** stickup. (The **SubEdit** stickup also appears when you use one of the commands on the **SubEdit** submenu, which is described in *Creating Objects*.) If you are new to diagramming, we recommend that you avoid editing until you are comfortable enough with the rest of diagramming to experiment.

If you execute the **Edit** command on a chart, however, you will open the **Chart Edit Sheets** and you will not have to confirm the command. Entering or modifying a chart is not considered an expert activity. Please refer to the chapter of the *Reference Manual* called *Making Charts* for information on editing a chart.

☞ *Using the Edit Command*

The **Edit** command is on the **Props** submenu, off the **Object Selected** popup menu (*Figure 6-112*).

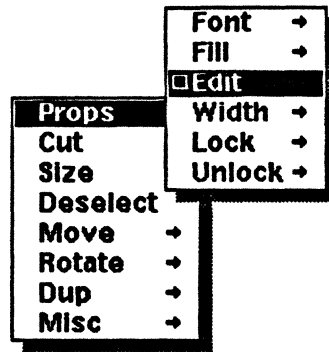


Figure 6-112. The Edit command on the Props submenu

To edit a group, execute the **Props → Edit** command. You will see the Sub-Edit stickup (Figure 6-113).

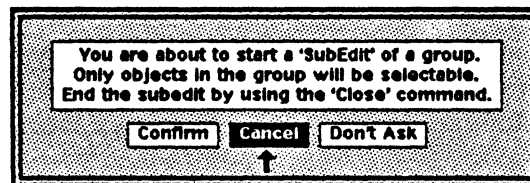


Figure 6-113. The SubEdit stickup

If you choose **Confirm** at this stickup, you will enter a subedit level. If you choose **Don't Ask**, you will also enter a subedit level, but if you open another subedit level, the diagramming system will not ask you to confirm your action. Choose the **Don't Ask** option only if you are very comfortable with editing and subedit levels.

Ⓜ The SubEdit Levels

When you work on the objects in a group instead of on the group as a whole, you are working in a subedit level. Since groups are hierarchical, edit levels are also hierarchical.

The top level is the diagram itself. If you edit a group, you move into the first subedit level. If, while in the first subedit level, you edit another group, you move into the second subedit level, and so on. The number of edit levels is finite, but there should be enough for any diagram.

You move into a subedit with the **Edit** command. You move back to the previous level with the **Close** command. If you are already at the top level, the **Close** command closes the frame you are working in.

Ⓜ Working in A SubEdit

While you are in a subedit, you can select only the objects that are part of the group you are editing. If any of those objects are groups, you can only change

them in the ways described above in *Manipulating Groups*. If you want to change the individual objects, you must move down one more edit level.

In other words, at a particular edit level, you can only manipulate the objects that are part of that level. On the objects at the current level, you can execute any of the commands on the diagramming popup menus (*Figure 6-114*).






	On the top level, you can change the object as a whole.
	<i>Level 1 SubEdit</i> Edit the object, and you can change the ovals or the pentagon, as wholes.
	<i>Level 2 SubEdit</i> Edit the pentagon, and you can add a side (but you can't change the ovals).
	<i>Level 2 SubEdit</i> Close the hexagon, edit the ovals, and you can cut the black ovals (but you can't change the hexagon).
	<i>Level 1 SubEdit</i> Close the ovals and you can move the group back over the hexagon.

Figure 6-114. Editing an object

☞ *The status line*

When you enter a subedit level (by executing the **Edit** command or one of the **SubEdit** commands), the number of the level is added to the beginning of the status line. *Figure 6-115* shows the status line as it would look if you were at the top level when you executed the **Edit** command.

Level 1 SubEdit (Use 'Close' to exit): GridAlign on, Gravity on, Detent 15.0 degrees

Figure 6-115. The status line in the first subedit

If you were already at level 1 when you executed the **Edit** command, you would be entering the second subedit level, and the status line would read *Level 2 SubEdit...* If you were at level 2, you would be entering level 3 and the status line would read *Level 3 SubEdit...*, and so on.

☞ **Defaults and SubEdits**

In the section called *Defaults in Diagramming*, three kinds of defaults were discussed: environment defaults, object defaults, and popup menu defaults. These

defaults are reset according to specific rules when you open or close a subedit level.

Environment defaults

Environment defaults (GridAlign, Gravity, and Detent) are inherited from the previous level each time you open a new subedit level. As you close subedits, though, the environment defaults are reset to the values at that level when you last passed through it.

This pattern can be very useful. It allows you to set up the environment you need most of the time, to deviate from it when you are working on one particular object, and to return to it as soon as you stop working on that object.

Figure 6-116 shows one example of the flow of environment defaults between three edit levels.

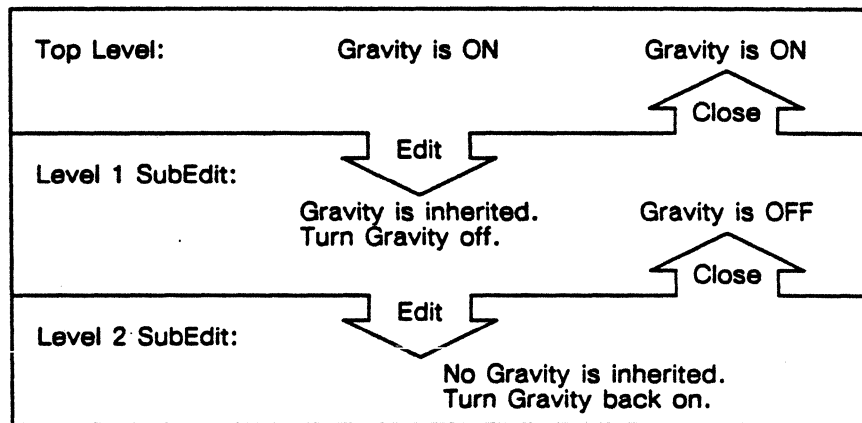


Figure 6-116. Resetting environment defaults across edit levels

Object defaults

If you are editing anything except a polygon or a spline, object defaults are inherited and reverted to in the same way that environment properties are.

When you edit a polygon, though, changes to the defaults are considered to be changes to the whole polygon, so they are carried across any edit levels in the polygon that you might open.

For example, if the default pattern fill is bricks and you edit a polygon that is filled with black, any object you create in that subedit will be filled with black. The new object is considered an extension of the polygon. If, while in the subedit, you change the default pattern fill to stripes, you are changing the polygon fill from black to stripes. Any objects you create will be striped, and as you close subedit levels, the objects at that level will become striped, also.

☞ Popup menu defaults

While you are in a subedit level, dynamic defaults are set on the popups just as they are at the top level of a diagram. However, when you close the subedit level, or if you open a new one, the default commands on the popup menus will be reset to the system defaults.

☞ Moving Objects Between Groups

You may find that an object, or a copy of the object, that is part of one group should be in another group. For example, in *Figure 6-117*, you might like a copy of one of the stars in the snowflake to be associated with the tree. Duplicating the star and moving it to the top of the tree would work all right, until you tried to move the snowflake. Because the star on top of the tree was still part of the snowflake group, it would move with the snowflake instead of staying with the tree.

Objects can be moved between groups using the clipboard.

To move an object from one group to another:

- ✓ Edit the first group.
- ✓ Select the object you want to move and Cut it.
This step disassociates the object from its original group.
- ✓ Close the first group and open the second.
- ✓ Paste the object.
This step makes the object part of the second group.
- ✓ Close the second group.

The same strategy will work if you want to put a copy of an object in another group. *Figure 6-117* shows one example of a situation in which this procedure is useful.

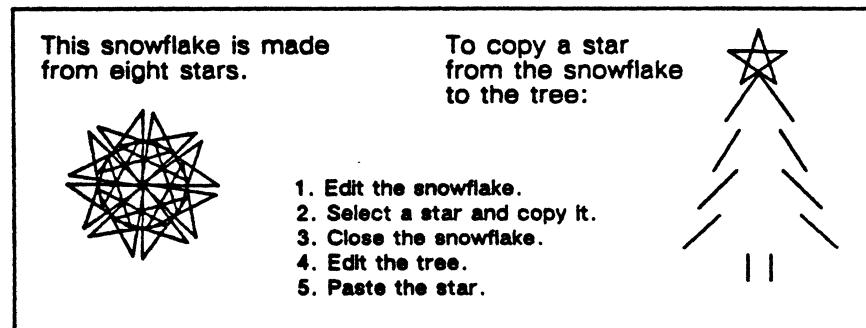


Figure 6-117. Moving objects between groups

Destroying a Group

The **Ungroup** command disassociates the objects in a group. It is useful

- for merging two groups
- for getting rid of groups you no longer want

The **Ungroup** command is on the **Misc** submenu, off the **Object Selected** menu (Figure 6-118).

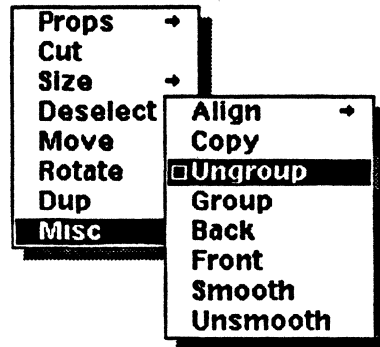


Figure 6-118. The *Ungroup* command

To remove the association that makes a set of objects a group, select the group and execute the **Misc → Ungroup** command.

Details

If you select several groups, each of the groups will be disassociated. If you select some groups and some primitive objects, the groups will be disassociated, and the objects will be left intact.

If you try to ungroup a grouping-locked object, nothing will happen. To ungroup such an object, you must first unlock grouping. Please see the section called *Locks* for information on locks and unlocking.

Moving Objects

The **Move** command allows you to change the position of an object in your diagram. It is so constantly useful that it is unnecessary to list its possible uses.

Figure 6-119 shows the **Object Selected** menu and the **Move** submenu.

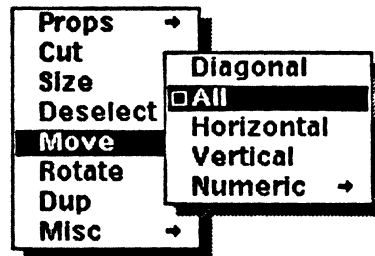


Figure 6-119. The **Move** submenu

There are five variations on the **Move** command:

- **Move Diagonal** allows you to move an object along a diagonal line drawn through two corners of a bounding box around it.
- **Move All** allows you to move an object in any direction.
- **Move Horizontal** allows you to move an object left or right without moving it up or down.
- **Move Vertical** allows you to move an object up or down in the diagram without moving it left or right.
- **Move Numeric** and the commands on its submenu allow you to move an object a specific number of minor grid units right, left, up or down.

The first four **Move** commands are animation commands: they are discussed in the next section. **Move Numeric** is a deselection command. It is discussed after the animation commands.

Using *Move All*

The default command on the **Move** submenu is **All**. If you execute the **Move** command without choosing one of the other submenu commands, you will be able to move the selected objects in any direction. The only time you will have to choose **All** explicitly is just after you execute some other **Move** command.

To move an object in any direction, select it, execute either the **Move →** or the **Move → All** command, and move the mouse.

Using Move Horizontal and Move Vertical

These two commands allow you to change the position of an object along one axis only. They are useful when

- the horizontal position of the object is correct and you want to change its vertical position
- the vertical position of the object is correct and you want to change its horizontal position

To change the vertical position of an object without affecting its horizontal position, select it, execute the **Move → Vertical** command and move the mouse.

To change the horizontal position of an object without affecting its vertical position, select it, execute the **Move → Horizontal** command and move the mouse.

Using Move Diagonal

The **Move Diagonal** command is used to move an object or group of objects along a diagonal line through two corners of a bounding box drawn around the objects. The corner of the bounding box that is closest to the mouse cursor becomes the active control point. *Figure 6-120* shows some of the lines along which you could move a simple group.

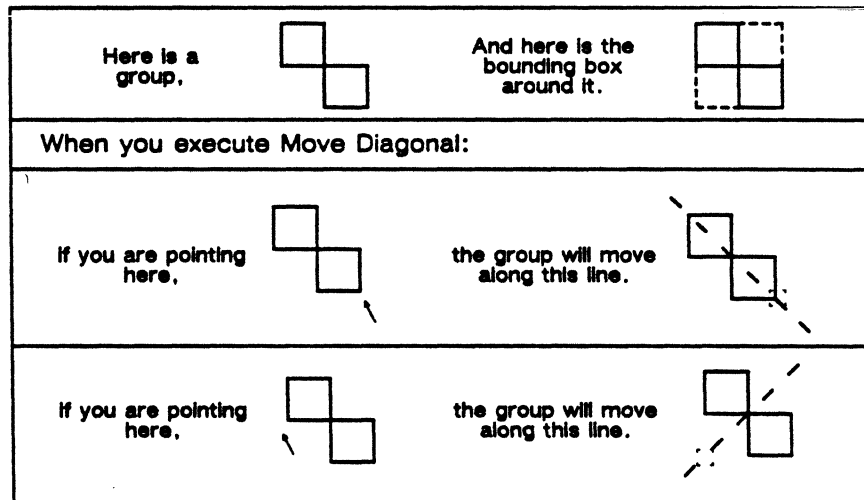


Figure 6-120. Moving a group along a diagonal

Move Diagonal is useful

- for maintaining the connection between a diagonal wall and another wall in a floor plan while adjusting the position of the diagonal one
- for creating dashed lines at any angle

Technique 4 shows you the most efficient way to create dashed lines.

To move an object along a diagonal line, select the object, execute the **Move → Diagonal** command and move the mouse.

Using Move Numeric

The Move Numeric command allows you to move an object an absolute number of minor grid units left, right, up, or down. It is useful

- for moving complex objects, when moving the mouse would require too much patience
- for creating rows or columns of evenly spaced objects
- for positioning objects precisely

A minor grid unit is one-fifteenth of an inch. Using this information, you can determine exactly how far apart you want two objects to be. You might decide to move a box exactly half an inch (7.5 grid units) to the right, for example.

Figure 6-121 shows the Move Numeric submenu.

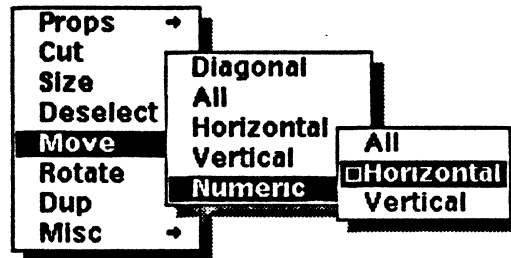


Figure 6-121. The Move Numeric submenu

There are three options on the Move Numeric submenu:

- **Move Numeric Horizontal** allows you to move an object either left or right in the diagram.
- **Move Numeric Vertical** allows you to move an object up or down in the diagram.
- **Move Numeric All** allows you to move an object both horizontally and vertically in one operation.

To move an object an absolute amount either left or right, execute the **Move →**, **Numeric →**, **Horizontal** command. The Move Numeric Horizontal stickup will be displayed (*Figure 6-122*).

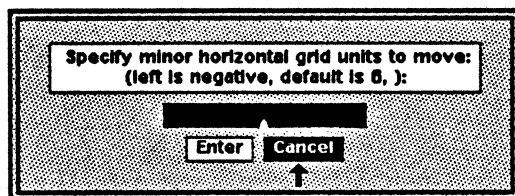


Figure 6-122. The Move Numeric Horizontal stickup

To move an object right, type a positive number in this stickup. To move an object left, type a negative number. The number you type may be as many as nineteen digits long, including a decimal point. Then, choose the Enter command on the stickup.

The first time after opening your desktop that you see this stickup, the default value is 6. In other words, that is the number of grid units the selected objects would move if you just selected Enter without typing a value in the stickup.

If you do type in a number, that number will be the default next time you see this stickup. For example, if you type in 4.75, then the next time you see the Move Numeric Horizontal stickup, the default will be 4.75.

To move an object an absolute amount up or down, execute the **Move →**, **Numeric →**, **Vertical** command. The Move Numeric Vertical stickup will be displayed (*Figure 6-123*).

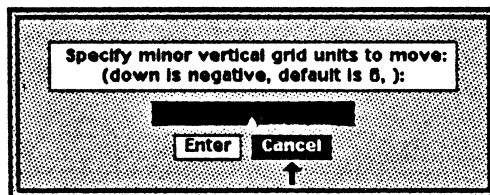


Figure 6-123. The Move Numeric Vertical stickup

This stickup accepts the same values that the Move Numeric Horizontal stickup does.

To move an object both horizontally and vertically, execute the **Move →**, **Numeric →**, **All** command. You will see first the Move Numeric Horizontal stickup, and after you have entered a value in it, the Move Numeric Vertical stickup.

Control Points and the Move Command

When you move an object, the diagramming system chooses the control point that is closest to the mouse cursor as the active control point. That active control point is the part of the object that will be subject to the influences of Gravity and GridAlign as you move the object around your diagram.

If you move several objects at a time, the same rule holds. There is one active control point—the control point closest to the mouse cursor when you execute the **Move** command.

There is more information about Control Points and how they are chosen in the section called *Control Points and Anchor Points*.

Sizing Objects

The **Size** command allows you to change the size and shape of an object. Like **Move**, it is used continually. *Figure 6-124* shows the **Object Selected** menu and the **Size** submenu.

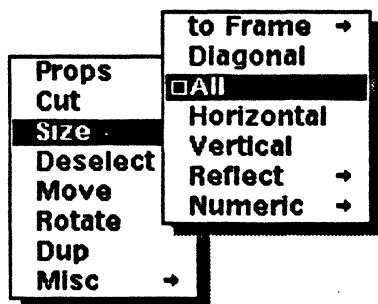


Figure 6-124. The Size submenu

The seven commands on the **Size** submenu can be divided into two groups: the animation commands and the deselection commands.

- The animation commands allow you to change the size of an object by any amount.
- The deselection commands change the size of an object by some predetermined amount and then deselect the object.

The Animation Commands

There are four commands in this group: **Size Diagonal**, **Size All**, **Size Horizontal**, and **Size Vertical**.

- **Size All** allows you to change the size of an object both horizontally and vertically without preserving the proportions of the object.
- **Size Diagonal** preserves the proportions of the object you are sizing.
- **Size Horizontal** allows you to change the width of the object without changing its height.
- **Size Vertical** allows you to change the height of the object without changing its width.

Figure 6-125 shows a square, and then the kinds of changes each of these commands would allow you to make.

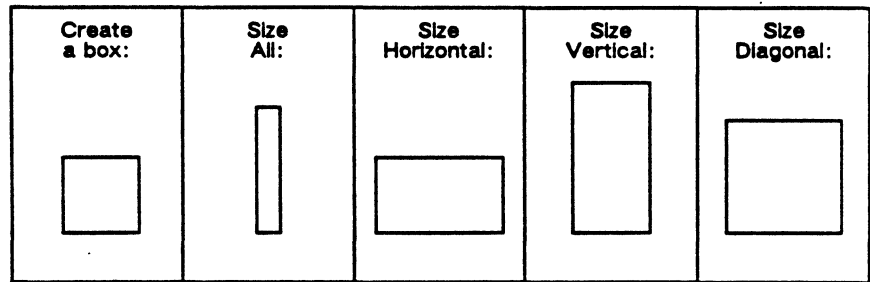


Figure 6-125. Using the Size commands

Executing one of the animation commands does not change the size of the object in itself. It just puts the object in animation state, and you must move the mouse to change its size.

Using Size All

Size All is the default on the **Size** submenu. You will only have to choose it explicitly when you have just executed another **Size** command.

To change both the horizontal and vertical dimensions of an object, select it, execute either the **Size →** or the **Size → All** command, and move the mouse.

Using Size Horizontal and Size Vertical

The **Size Horizontal** and **Size Vertical** commands allow you to change only one dimension of an object at a time. You will find them useful when

- the object is the correct size in one dimension and you want to change the other
- you are not interested in one of the dimensions of the object, and do not want the distraction of seeing it change

Technique 14, dividing things into equal parts, shows some of the special uses of **Size Horizontal** and **Size Vertical**.

To change the height of an object without affecting its width, select it, execute the **Size → Vertical** command, and move the mouse.

To change the width of an object without affecting its height, select it, execute the **Size → Horizontal** command, and move the mouse.

Using Size Diagonal

Sizing an object diagonally preserves its proportions—it doesn't change the relative height and width of the object. **Size Diagonal** is useful for any kind of technical illustration. With it you can

- enlarge a part of a drawing and change some small detail, knowing you will be able to shrink it back to fit
- create concentric circles or nested boxes
- preserve the angles of lines when you are sizing them near gravity or grid points

You will find many more uses.

To change the size of an object while preserving its proportions, select it, execute the **Size → Diagonal** command, and move the mouse.

The Deselection Commands

There are three deselection commands, **Size to Frame**, **Size Reflect**, and **Size Numeric**.

- **Size to Frame** makes the selected objects big enough to fill the frame.
- **Size Reflect** leaves the center of the object where it was and flips the rest of the object around that center.
- **Size Numeric** allows you to change the size of the object by a multiple of its current size.

Each of these commands is discussed separately in the sections that follow.

Sizing to Frame

The **Size to Frame** command changes the size of the object so that the outermost points on it touch the edges of the frame. If the object is smaller than the frame, it will become larger; if it is larger than the frame, it will become smaller.

If you have more than one object selected, the **Size to Frame** command will use the outermost points of the whole set, not of the individual objects in the set.

Here are three situations in which **Size to Frame** is useful:

- creating a large business chart
- creating a border around the rest of your diagram
- fitting a large plotter file or screen image into an existing frame

Figure 6-126 shows the Size submenu and the to Frame submenu.

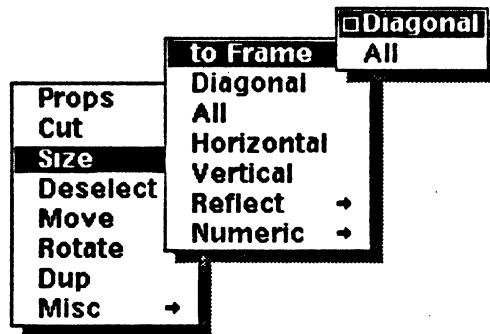


Figure 6-126. The Size to Frame submenu

There are two variations on Size to Frame.

- **Size to Frame Diagonal** preserves the proportions of the objects on which it is executed. Depending on the shape of the frame and of the object, only the left and right edges will touch the frame, or only the top and bottom edges.
- **Size to Frame All** does not preserve the proportions of the object. The points on the object that are left-most, right-most, top-most, and bottom-most will touch the left, right, top, and bottom edges of the frame.

Using the Size to Frame commands

Size to Frame Diagonal is the default command on the **Size to Frame** submenu. You will only have to choose it if you have just sized another object to **Frame All**.

To make an object big enough to fit the frame without destroying the object's proportions, select it and execute either the **Size → to Frame →** command or the **Size → to Frame → Diagonal** command.

To make an object big enough both horizontally and vertically to fill the frame, select it and execute the **Size → to Frame → All** command.

Figure 6-127 shows the difference between **Size to Frame Diagonal** and **Size to Frame All**.

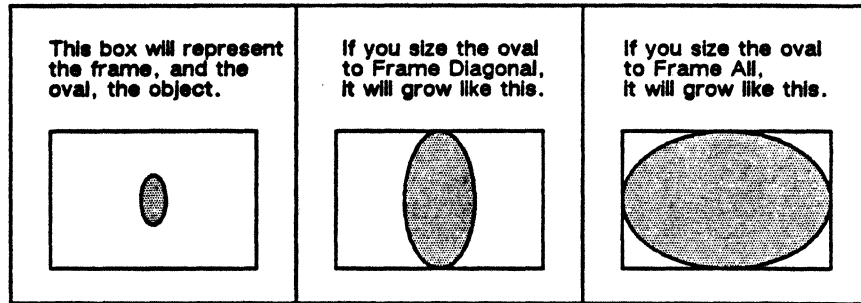


Figure 6-127. Sizing to Frame

The Reflect Submenu

The **Reflect** command flips the selected object(s) around either the vertical, the horizontal, or the diagonal axis. It is on the **Size** submenu because flipping an object is equivalent to sizing it through itself.

You will find **Reflect** useful when you create anything that has mirror image sides. Here are examples of such objects:

- arrow heads
- diamonds

How Reflect works

The **Reflect** command flips the objects you have selected around one axis. Each of the commands on the **Reflect** submenu represents one of the axes around which an object can be reflected.

Figure 6-128 shows the horizontal, vertical, and diagonal axes through a sample object.

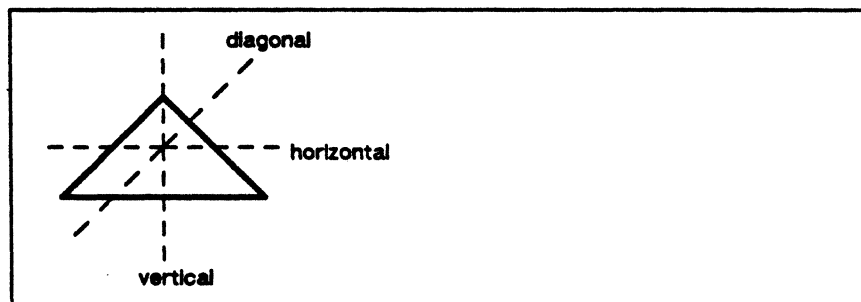


Figure 6-128. The axes around which an object can be reflected

When you reflect an object, its center does not move.

Using Reflect

Figure 6-129 shows the **Reflect** command on the **Size** submenu and the **Reflect** submenu.

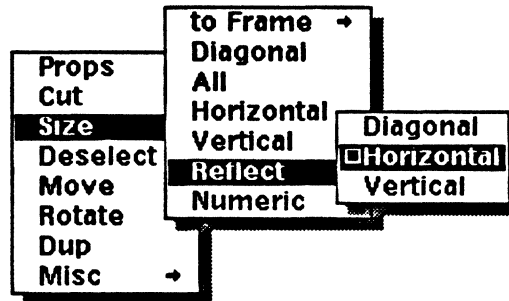


Figure 6-129. The Reflect Submenu

The default command on the **Reflect** submenu is **Horizontal**. You need to choose this command explicitly only when you have just reflected an object around another axis.

To reflect an object around its vertical axis, select it and execute either the **Size → Reflect →** command or the **Size → Reflect → Horizontal** command.

To reflect an object around its horizontal axis, select it and execute the **Size → Reflect → Vertical** command.

Reflecting an object diagonally gives you the same results that reflecting an object *both horizontally and vertically* would give. To reflect an object around its diagonal axis, select it and execute the **Size → Reflect → Diagonal** command.

Figure 6-130 shows the result of each reflection on a simple object.

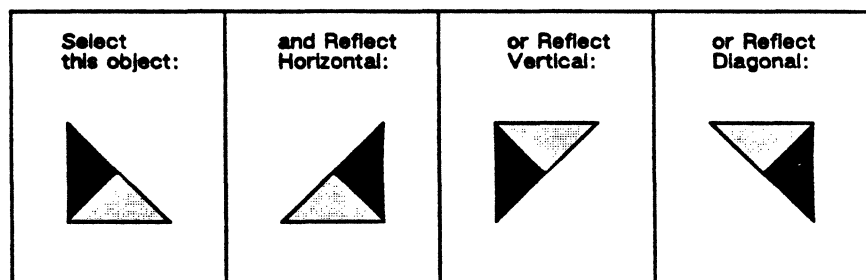


Figure 6-130. The effects of Reflect

Size Numeric

Size Numeric allows you to change the size of an object by a multiple of its current size. For example, with **Size Numeric**, you can make an object exactly three times bigger than it originally was—or only half as big.

It is most useful in two situations:

- when you are working to scale, and you know exactly how much larger or smaller you want an object to be
- when you are sizing a very complicated object and using the mouse is too slow

There are three variations on **Size Numeric**:

- The **Horizontal** command changes the width of an object, but not its height.
- The **Vertical** command changes the height of an object, but not its width.
- The **Diagonal** command allows you to change proportionally the height and width of an object.

Figure 6-131 shows some of the changes you could produce in an object using **Size Numeric**.

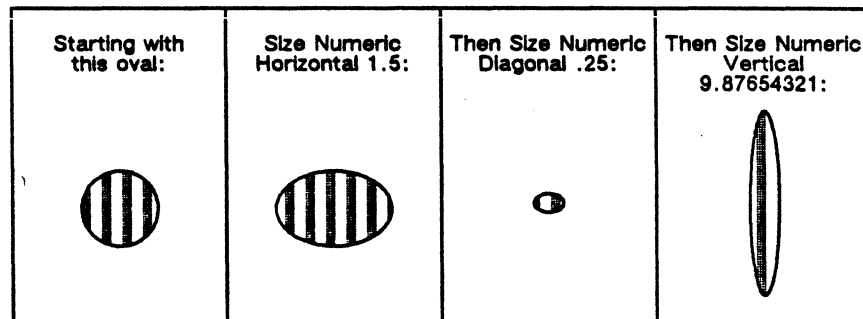


Figure 6-131. Using Size Numeric

Using Size Numeric

Figure 6-132 shows the Size Numeric submenu.

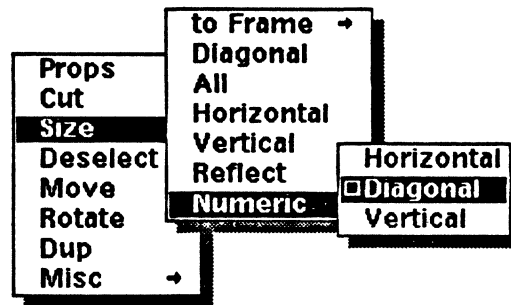


Figure 6-132. The Size Numeric submenu

Figure 6-133 shows the Size Numeric stickup. The first time after opening your desktop that you see this stickup, the default will be 2. If you select Enter without typing in any value, the objects you have selected will be made twice as big as they were. The default changes as you enter new values. For example, if you entered .5, the next time you saw this stickup, the default would be .5.

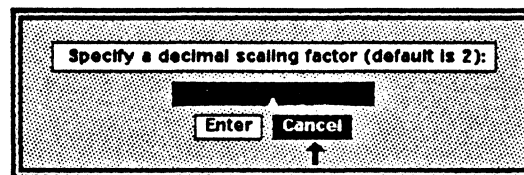


Figure 6-133. The Size Numeric stickup

The stickup will accept any decimal number, up to nineteen places long. If you type in anything other than digits or a period, the size of the selected objects will change unpredictably.

To multiply the size of an object by a decimal number:

- ✓ Select the object and execute the **Size → Numeric →** or the **Size → Numeric → Diagonal** command.
- ✓ Enter the amount by which you want to multiply the size.

If you want to change only the width, follow the above procedure, but execute the **Size → Numeric → Horizontal** command.

If you want to change only the height, follow the above procedure, but execute the **Size → Numeric → Vertical** command.

Control Points and the Size Command

When you size an object, the changes you make are controlled through a single point on it, called the active control point. The active control point is the one that is snapped to gravity or grid points, and the rest of the object just changes in relation to the active control point.

The same thing is true when you size more than one object at a time. Because of this, points that used to be on grid points can move away from them (Figure 6-134).

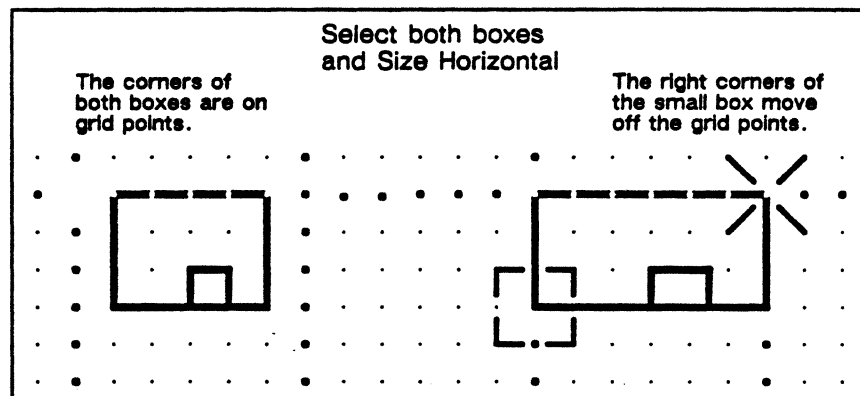


Figure 6-134. Moving Gravity Points away from Grid Points

You will need to be particularly conscious of this effect when you are vertically sizing text objects to increase the space between them.

When you size text objects, the space you add to the size is distributed between the text objects, because the text objects themselves do not change size (Figure 6-135). If you make a group of two text objects two grid units higher, both grid units will be added to the space between the two objects. If you make a group of three text objects two grid units higher, one grid unit will go between the first and second text object, and one between the second and third.

<p>Here are two lines of text.</p>	<p>- 0 - - - - - - - - - - - 1 -</p>	<p>And here are three.</p>	<p>The line spacing in both groups is the same.</p>
<p>Here are two lines of text.</p>	<p>- 0 - - - - - - - - 1 -</p>	<p>And here are three.</p>	<p>Size each group one half inch.</p> <p>The line spacing is much bigger for two objects than it is for three.</p>
<p>Here are two lines of text.</p>	<p>- 0 - - - - - - - - 1 -</p>	<p>And here are three.</p>	<p>Select both groups and size one half inch.</p> <p>The line spacing in both groups is the same.</p>

Figure 6-135. Sizing text objects

See the section called *Entering and Using Text* for more on this subject.

Rotation and Detents

When you rotate an object, its center stays fixed, and the control point nearest the mouse cursor moves around the center in a circle. *Figure 6-136* shows some examples of objects that were rotated 45 degrees clockwise.

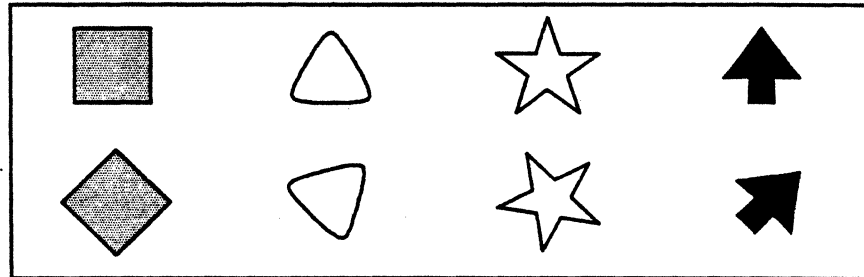


Figure 6-136. Rotating objects

Rotation has many uses. For example,

- you can create one arrow, and make it point in any direction
- you can make a single leaf shape, and duplicate and rotate it to make all the leaves on a plant

Many of the techniques use rotation. Look particularly at Technique 7, rotating objects around a point, and Techniques 9 and 10, making regular polygons.

Detents

Most of the **Rotate** commands use detents, so before explaining each of the **Rotate** commands, we will look at detents.

A detent is a place to which something that is turning is attracted. When you turn the dial on your television set to change the channel, the detents make the dial stop at the channels, not in between.

In the diagramming system, a detent is one of the places to which you can turn an object. Detents are expressed in number of degrees. For example, if the detent is set to 45 degrees, then an object you are rotating will be attracted to every point at 45 degrees in a circle around the object (*Figure 6-137*).

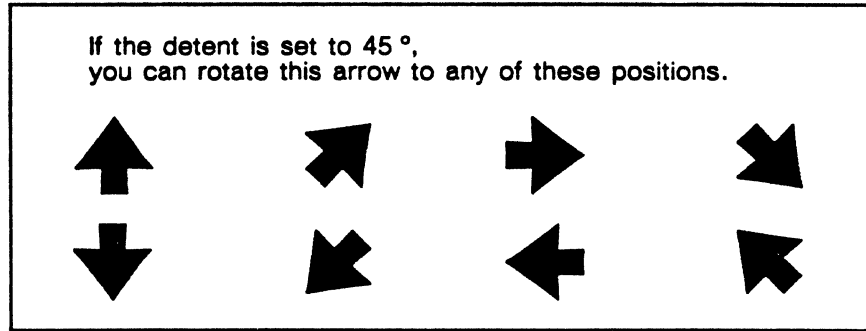


Figure 6-137. All the possible angles in one situation

Detents are not set absolutely: they are measured from the current angle of the object (Figure 6-138).

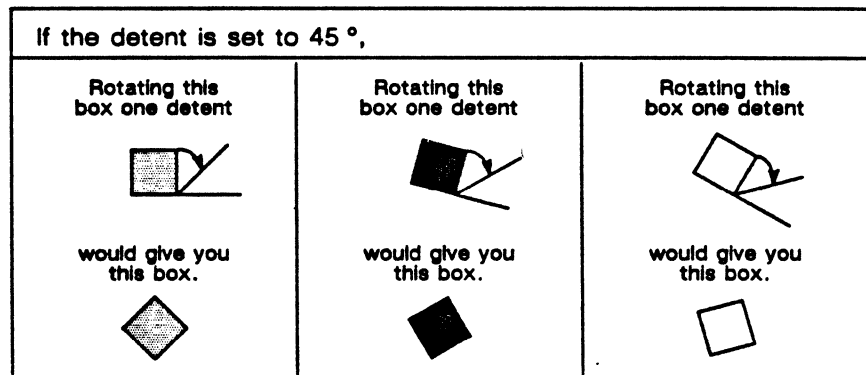


Figure 6-138. Detents are set relative to the current angle

Here are some of the reasons that detents are useful.

- You can distinguish between a one degree difference in angle—between, say, 30° and 31°, which might look exactly alike on the screen, but significantly different on the printer.
- You can easily return an object to its original angle.
- You can rotate an exact number of degrees.

Techniques 9 and 10, creating regular polygons, use a specified detent.

Setting the Detent

The default detent is 15 degrees. If you want another detent, you must set it through the Detent submenu, off the Misc submenu, off the Nothing Selected popup menu (*Figure 6-139*).

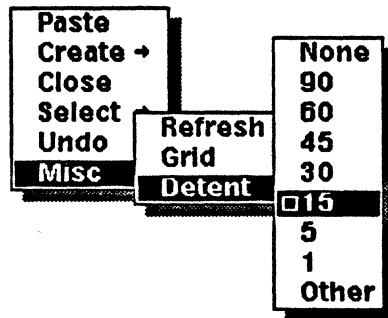


Figure 6-139. The Detent submenu

To set the detent to 5, for example, execute the **Misc → Detent → 5** command.

If you choose None, you will be able to rotate the object freely, to any angle that pleases you.

If you choose Other, you will see the stickup in *Figure 6-140*.

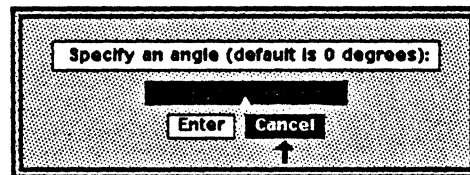


Figure 6-140. The Detent Other stickup

You can type in an angle, using as many as nineteen digits (including the decimal point).

To set the detent to a specific number:

- ✓ Select the object and execute the **Misc → Detent → Other** command.
- ☐ Enter the number of degrees to which the detent should be set.

Using the Rotate Commands

Figure 6-141 shows the Rotate submenu.

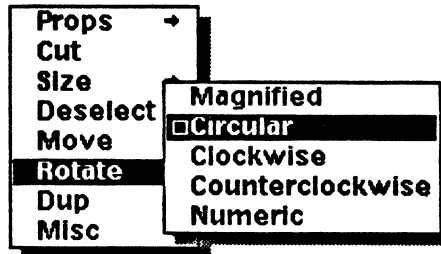


Figure 6-141. The Rotate submenu

The five variations on Rotate are divided into two groups: the animation commands and the deselection commands.

- The animation commands allow you to rotate the object any number of detents, and to move both clockwise and counterclockwise until you have the angle you want.
- The deselection commands rotate the object a specific amount in a specific direction and then deselect it.

The Animation Commands

There are two animation commands on the Rotate submenu: **Circular** and **Magnified**.

- **Rotate Circular** allows you to rotate an object in detent sized steps around its complexity center (defined in *How Rotate Works*).
- **Rotate Magnified** allows you to change the angle and the size of the object at the same time.

Using Rotate Circular

Circular is the default command on the Rotate submenu. You need to choose it explicitly only if you have just used one of the other options.

To rotate an object around its complexity center, select it, execute either the **Rotate →** command or the **Rotate → Circular** command, and move the mouse to rotate the object either clockwise or counterclockwise.

Using Rotate Magnified

To rotate and size an object at the same time, select it, execute the **Rotate → Magnified** command, and move the mouse to rotate the object either clockwise or counterclockwise.

The Deselection Commands

There are three deselection commands on the **Rotate** submenu: **Clockwise**, **Counterclockwise**, and **Numeric**. All three of them are variations on **Rotate Circular**.

- **Rotate Clockwise** rotates the object one detent setting clockwise.
- **Rotate Counterclockwise** rotates the object one detent setting counterclockwise.
- **Rotate Numeric** allows you to rotate an object any number of degrees.

Using Rotate Clockwise and Counterclockwise

To rotate an object one detent setting clockwise, select it and execute the

Rotate → **Clockwise** command.

To rotate an object one detent setting counterclockwise, select it and execute the

Rotate → **Counterclockwise** command.

Using Rotate Numeric

When you use the **Rotate Numeric** command, you type into a stickup the number of degrees you want to rotate the selected object (*Figure 6-142*).

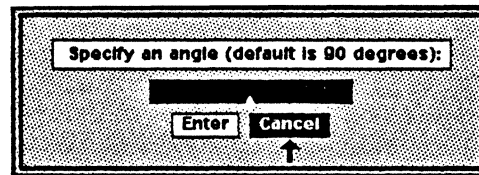


Figure 6-142. The Rotate Numeric stickup

You can type any angle, using up to nineteen digits. Positive numbers rotate the selected object clockwise; negative numbers rotate it counterclockwise.

For example, to rotate a triangle 29.5 degrees counterclockwise, you would type **-29.5** in the stickup.

To rotate an object a specific amount:

- ✓ Select the object and execute the **Rotate Numeric** command.
- ☐ Type the number of degrees you want to rotate the object and select the **Enter** command.

The first time after opening your desktop that you see the **Rotate Numeric** stickup, the default will be set to 90 degrees. In other words, if you do not type any number into the stickup, but just select the **Enter** command on the stickup, the objects you have selected will be rotated 90 degrees.

If you type in another angle, then the next time you see the **Rotate Numeric** stickup, the default will be set to that angle. For example, if you were to type in 47, then the default angle would be set to 47 degrees.

How Rotate Works

The **Rotate** commands allow you to change the angle of an object and its position by turning it around a single point (the anchor point). The critical question is, where is the point?

All of the **Rotate** commands except **Rotate Magnified** use the same principle to determine the point. It is chosen by weighing the distribution of control points in the object and then finding the point that is closest to the most control points. This is called the complexity center, because the number of control points is a measure of the complexity of an object.

If you have a polygon, for example, that has one control point on the left side and nine on the right, the complexity center will be much closer to the right than the left (*Figure 6-143*).

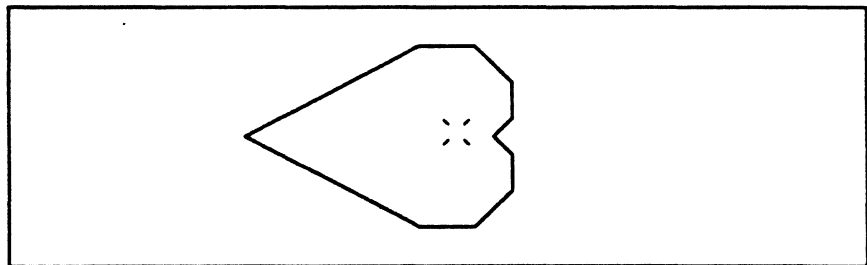


Figure 6-143. The anchor point is at the complexity center.

Try constructing the heart in *Figure 6-143* and then rotating it.

Rotate Magnified

When you do a **Rotate Magnified**, the diagramming system chooses the active control point first. Then it chooses the control point on the bounding box that is farthest from the active control point as the anchor point (*Figure 6-144*).

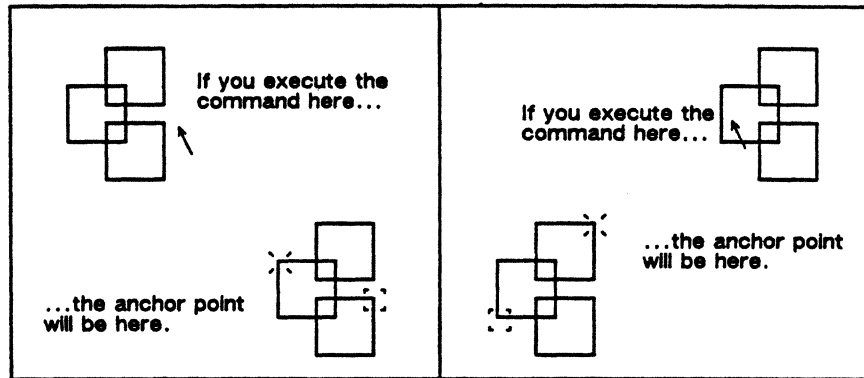


Figure 6-144. The anchor point varies according to execution point.

Depending on where the mouse cursor is when you execute it, the Rotate Magnified command can have widely differing effects. Figure 6-145 shows two objects you can create from the same basic shape, using Dup and Rotate Magnified.

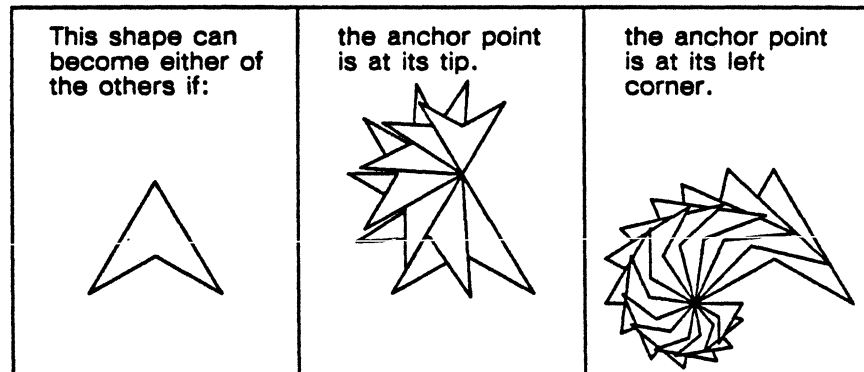


Figure 6-145. Two possibilities using Dup and Rotate Magnified

Figure 6-146 shows the differences between Rotate Magnified and the other Rotate commands.

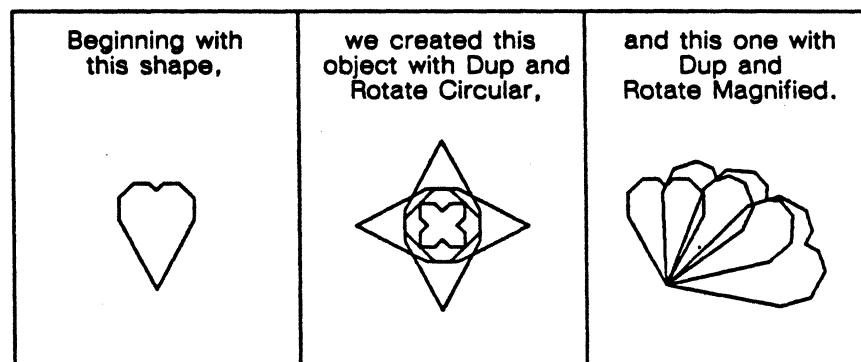


Figure 6-146. Rotate Circular and Rotate Magnified

Objects that Do Not Rotate

Ovals, charts, and text cannot be rotated by themselves. Text is always horizontal, and charts are always rectangular (even pie charts are contained in rectangles).

Groups that contain text objects, ovals, or charts can be rotated. The non-rotating object will keep its angle, but change its position (Figure 6-147).

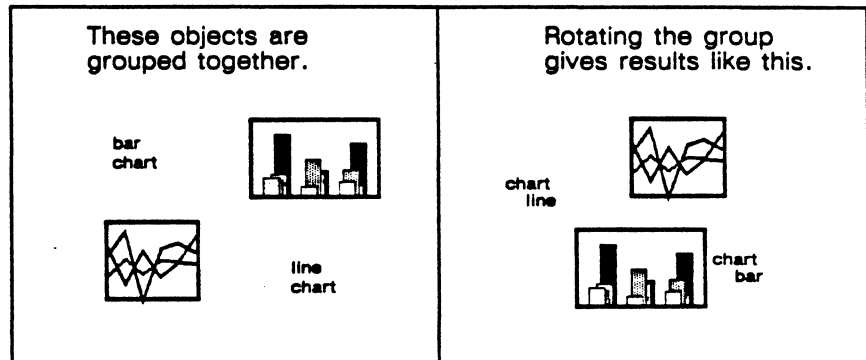


Figure 6-147. Rotating Text and Charts in groups

Duplicating

The **Dup** command makes a duplicate of the selected objects when you execute it. The duplicate is overlaid exactly on the original, but because **Dup** is linked to the **Move** command by default, you can change its position immediately.

Dup has many uses. For example, you can

- create one bolt, and then duplicate it whenever you need to use that bolt again
- create a line, then use **Move Numeric** and **Dup Repeat** to make a grid

Techniques 3 and 14, creating concentric circles and dividing a box into equal parts, use the **Dup** command.

Using Dup

Figure 6-148 shows the **Dup** submenu.

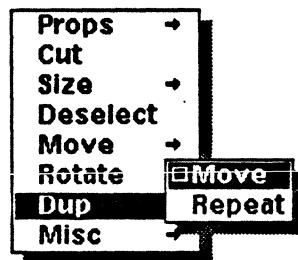


Figure 6-148. The **Dup** submenu, off the **Object Selected** menu

To make a duplicate of an object and then move it, select it, execute either the **Dup →** or the **Dup →** **Move** command, and move the mouse cursor.

To make a duplicate of an object and then execute on it the last **Move**, **Size**, or **Rotate** command you used, select it and execute the **Dup →** **Repeat** command.

Details about Dup Move

Move is the default command on the **Dup** submenu. When you execute it, the duplicate will be exactly overlaid on the original, but it will be in animation state, and by moving the mouse, you will be able to move the duplicate in any direction.

Details about Dup Repeat

Dup Repeat makes a copy of the objects you have selected and then executes the last **Move**, **Size**, or **Rotate** command you used on the copy. If you have just started working in diagramming, and have not yet used any **Move**, **Size**, or **Rotate** command, **Dup Repeat** executes **Move All** on the duplicate.

Dup Repeat is useful whenever you want to make the same change to a series of objects. For example

- use **Move Numeric Horizontal** and **Dup Repeat** to create a series of evenly spaced objects
- use **Rotate Clockwise** and **Dup Repeat** to create snowflake designs

To create a series of evenly spaced objects:

- ✓ Create a box.
- ✓ Without deselecting it, execute the **Dup** command.
- ✓ Execute the **Move Numeric Horizontal** command.
- ☐ Type 8 in the stickup.
- ✓ Select the duplicate, then **Dup Repeat**.
- ☐☐ ☐☐ For each additional box, **Select Again**, then **Dup Repeat**.

You may use other commands in between **Dup Repeat** without resetting the command that will be used. For example, you may want to fill each of the boxes created in the above procedure with a different fill pattern. If you change the fill of a box and then execute **Dup Repeat**, the duplicate will be moved eight minor grid units to the right.

The only commands other than the **Move**, **Size**, and **Rotate** commands that will reset the system's idea of what command to repeat are **Paste** and **Create**. The **Paste** command is linked to **Move All**, and the **Create** command to **Size All**, so by executing either of them, you are also changing the last **Move**, **Size**, or **Rotate** command that you used.

The command to repeat is remembered when you switch to another diagram, or even to another document.

◊ Dup Repeat and Defaulting

Dup Repeat is the only command on the **Animation** menu other than **Deselect** that is sticky. Its stickiness allows you to set up two alternate patterns of defaulting. You can either duplicate several objects once each so that the default is **Dup Repeat** on the **Selection** popup and **Deselect** on the **Animation** menu, or you can

duplicate one object several times, so that the default on the **Animation** menu is **Dup Repeat**.

For example, suppose that you wanted to create several circles arranged irregularly on the page. You could create the first circle, execute the **Dup Move** command, and then without deselecting, execute **Dup Repeat**. **Dup Repeat** would then be the default on the **Animation** menu, so without deselecting, you could continue to make duplicates and move them into position.

Of course, this stickiness is only useful when **Dup Repeat** is linked to an animation command. If it is linked to a deselection command, you will not see the **Animation** menu when you hold down the middle button, you will see the **Selection** menu.

See the section called *The Two-Level Object Selected Popup Menu* for more on **Dup** and defaulting.

The Clipboard: Cutting, Copying, and Pasting

Three commands on the diagramming popup menus reach beyond the frame that contains the diagram and affect other parts of the publishing software. **Cut**, **Copy**, and **Paste** all work with the desktop clipboard.

With these commands, you can

- get rid of objects you do not want any more
- transfer objects from one diagram to another, and from one document to another
- create palettes of commonly used objects—like your company logo, or pictures of your product—that you can then copy into other documents whenever you need them

The Diagram Icon

The diagram icon is the interface between a diagram and the rest of the Interleaf system. When you cut or copy an object in a diagram, it is placed in a diagram icon on the clipboard. When you execute the **Paste** command in a diagram, the diagram icon (if it is selected) is moved from the clipboard into the diagram.

Figure 6-149 shows the diagram icon when it is not selected, and when it is.

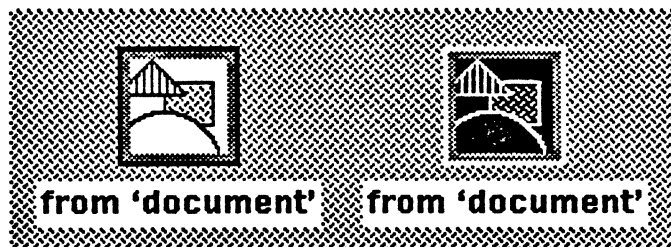


Figure 6-149. The diagram icon

The diagram icon is a graphic icon. There is one other graphic icon: the plot icon. (The plot icon is discussed in the section called *Adding CAD Drawings*.) Both graphic icons are square and have a gray border, reminiscent of the border around an open frame. Within the border they show an example of the kind of graphic that is contained in them. *Figure 6-150* shows a plot icon.

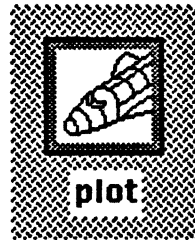


Figure 6-150. A plot icon

The difference between graphic icons and other icons is that graphic icons cannot be opened. To look at their contents, you must paste them in a document. However, all of the other desktop commands can be executed on them.

Creating the Diagram Icon

When you cut or copy something from a diagram, it is placed on the clipboard in a diagram icon. That icon is selected, and any previously selected icons are deselected.

The name of the diagram icon consists of the word "from" and, in quotes, the name of the document the objects came from (*Figure 6-151*).

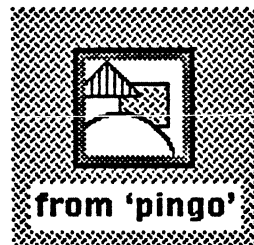


Figure 6-151. A diagram icon containing objects from pingo

The diagramming system reuses diagram icons. When you cut or copy an object, the diagramming system checks the desktop clipboard to see if it contains a diagram icon whose name begins with "from". If there is no icon, one is created, and the cut or copied object is placed in it.

If there is no diagram icon on your clipboard

- you may have pasted the diagram icon into another diagram or document
- you may have pasted the diagram icon into another directory;
- or you may have purged the diagram icon

If there is a "from" icon on the clipboard, its old contents are erased and the newly cut or copied object is placed in it. At the same time, the name of the icon

is changed to show the name of the document from which the cut or copied object came.

Pasting the Diagram Icon

When you paste while in a diagram, the selected icon on the clipboard is transferred to your diagram.

The selected icon may not be a diagram icon. If it is another kind of graphic icon (an image or plotter icon, for example), it will be pasted in the diagram. If it is a document or directory icon, though, the icon will not be pasted, so the diagram will not change.

You can also paste a diagram icon in text, and a frame for it will be automatically created. The properties of the new frame are determined by the position of the mouse cursor when you execute the **Paste** command. For example, if you are pointing at the component bar, the diagram icon will be pasted in an **At Anchor** frame, in an empty component created next to the component cursor. The size of the frame is determined by the size of the object in the diagram icon.

Please refer to the chapter on *Document Management* for full information on the automatic creation of frames.

Other Manipulations of the Diagram Icon

Many of the commands that are applied to other icons can also be used on the diagram icon. You can paste it on your desktop or in a directory. You can open its property sheet and change its name or the permissions on it. You can move it around, and you can copy it.

If you want to preserve an object in a diagram icon so that it is not overwritten the next time you cut or copy from a diagram, you can use the desktop commands to do so.

To save a diagram icon:

- ✓ Paste it in a folder or drawer, or on your desktop.
- ✓ Rename it.

The next time you cut something from that document, the diagramming system will create a new icon. As long as the new name of the icon does not begin with "from", you can put the renamed icon on your clipboard and it will not be overwritten.

The Cut Command

The Cut command removes the selected objects and puts them on the clipboard, in a diagram icon. If there is no diagram icon on the clipboard, the Cut command creates one.

It is useful in two situations:

- when you want to get rid of an object you created
- when you want to move an object from one diagram to another

The Cut command is on the Object Selected popup menu (*Figure 6-152*).

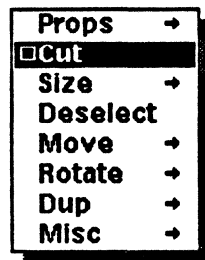


Figure 6-152. The Cut command

To cut an object, select it and execute the **Cut** command.

Details

When you cut an object, it is placed in the diagram icon on the clipboard. The previous contents of the diagram icon are erased. There is no way to retrieve them.

If you want to save something you have cut, paste the diagram icon into another document or onto your desktop immediately after cutting and rename it. The next time you cut or copy an object, a new diagram icon will be created for it.

The Copy Command

The Copy command makes a copy of whatever objects you have selected and puts it in the diagram icon on the clipboard. If there is no diagram icon on the clipboard, the Copy command creates one.

Here are some of the circumstances in which **Copy** is useful.

- Use it when you want to build a diagram that resembles an earlier one.
- Use it to create palettes of commonly used objects and to make copies of the objects later.

The **Copy** command is on the **Misc** submenu, off the **Object Selected** menu (Figure 6-153).

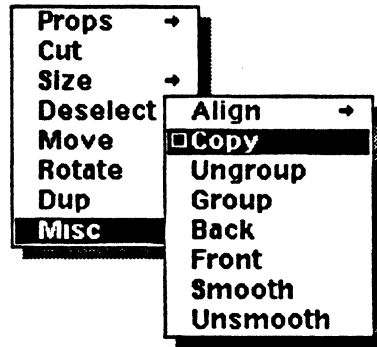


Figure 6-153. The **Copy** command

To copy an object, select it and execute the **Misc → Copy** command.

Details

The **Copy** command works like the **Cut** command, except that instead of moving the object you have selected to the clipboard, it makes a copy and moves that to the clipboard.

The previous contents of the icon are erased, just as they are when you cut an object.

If you want to save something you have copied, paste the diagram icon into another document or onto your desktop immediately after copying. The next time you cut or copy an object, a new diagram icon will be created for it.

The Paste Command

The **Paste** command moves the objects in the selected graphic icon on the clipboard into the diagram and deletes the icon. It allows you to insert objects (or copies of objects) from other diagrams, either within one document or from one document to another.

The **Paste** command is on the **Nothing Selected** popup menu (Figure 6-154).

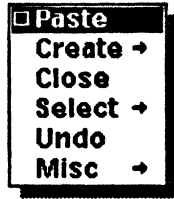


Figure 6-154. The Paste command

To paste the icon that is selected on the clipboard into a diagram, execute the **Paste** command.

Details

The diagramming **Paste** command is linked to the **Move All** command.

When you paste an object in a diagram, it is in animation state so that you can move it to its correct position. The object appears in the diagram according to the following rule. The diagramming system draws an imaginary box around the object. The upper left corner of this box is placed where the mouse cursor was pointing when you pasted. The active control point is the control point on the object that is nearest to the upper left corner of the imaginary box (Figure 6-155).

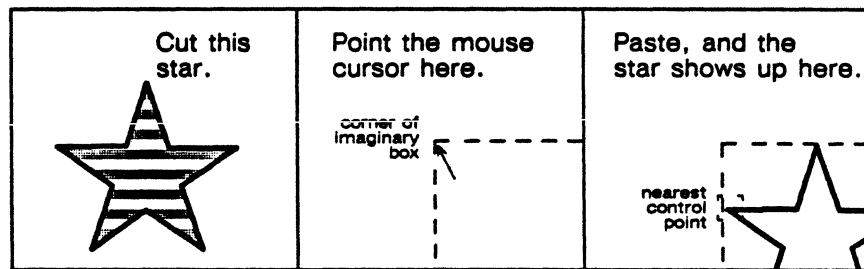


Figure 6-155. Pasting a star

If the mouse cursor is too close to the lower right corner of the diagram, you may not see the pasted object at all until you move the mouse up and left.

Only graphic icons (diagram, plotter, and image icons) can be pasted in a diagram. If you execute the **Paste** command when another kind of icon is selected on the clipboard, neither the diagram nor the clipboard will be changed.

Alignment

The **Align** commands arrange the selected objects along the axis you choose.

Figure 6-156 shows a set of objects, and the positions they would have after each of three of the **Align** commands were executed on them.

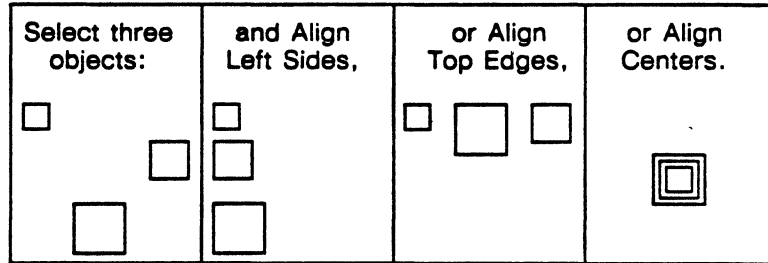


Figure 6-156. Effects of the Align commands.

The **Align** commands have many uses. For example, you can

- left or right justify text objects
- center labels in boxes
- center whole diagrams in their frames
- make sure that objects in tables are horizontally aligned

There are, of course, many other uses. Technique 12, creating shadow lines, shows one of them.

Using the Align Commands

With the **Align** commands you can line up objects along any of six axes, or at their centers. *Figure 6-157* shows the possible axes on a rectangle along which other objects could be aligned.

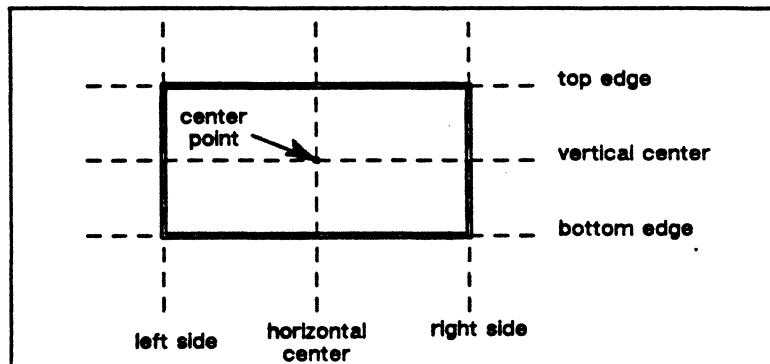


Figure 6-157. Possible alignment axes

To use the **Align** commands, select the objects you want and choose the appropriate command from the **Align** submenu (*Figure 6-158*).

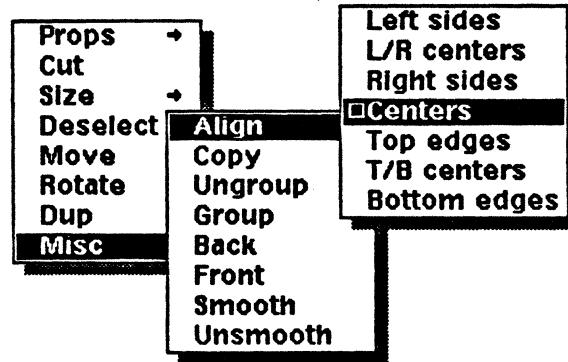


Figure 6-158. The Align submenu

For example, to align the left sides of a set of objects, select them and execute the **Misc → Align → Left Sides** command.

How Align Works

The diagramming system uses an imaginary bounding box around the objects you select in order to determine the position of the objects after the **Align** command is executed.

For example, if you align the top edges of a set of objects, the diagramming system finds the object that is furthest up. That object does not move: the other objects move up until their top edges are lined up with it.

If you choose to align the centers of some objects, the diagramming system finds the center of the bounding box and moves the centers of the objects onto the center of the bounding box.

Figure 6-159 shows this bounding box, and its effect on the position of some objects.

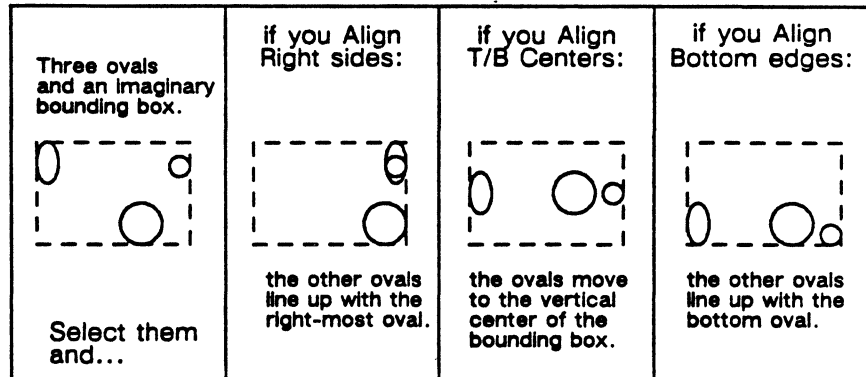


Figure 6-159. How the bounding box works with Align

Here is the effect on position that each of the versions of the **Align** command can be expected to have.

- Left sides** The other objects line up with the left side of the left-most object.
- L/R centers** All of the objects line up along a vertical line that is half way between the left-most and the right-most objects.
- Right sides** The other objects line up with the right side of the right-most object.
- Centers** All the objects are centered around a point that is the center of an imaginary bounding box drawn around the objects.
- Top edges** The other objects line up with the top edge of the upper-most object.
- T/B centers** All of the objects line up along a horizontal line that is half way between the upper-most and lower-most objects.
- Bottom edges** The other objects line up with the bottom edge of the lower-most object.

Alignment Aids

You can use the information in the previous section about positioning to build alignment aids that force objects to line up, not only along a specific axis, but at a specific point.

There are four kinds of alignment aids.

- You can choose the most appropriate command from the **Align** submenu.
- You can move some of the objects you want to align before you align them.

- You can create new objects whose only purpose is to change the size of the bounding box around the objects you want to align.
- You can use Control and Position Locks. This aid is for experts only.

Each of these aids, and each of the possible combinations of them, is best suited to a particular situation.

Choosing the Best Command

Often, there is more than one **Align** command that will achieve your primary goal—to align one edge of several objects—but one of them is more likely to leave the aligned objects in the final position you want.

For example, if you have three text objects that you want to line up horizontally, you have three options: **Align Top edges**, **Align Bottom edges**, and **Align T/B centers**. If the three text objects all have the same point size, these three commands will have the same effect on the relative position of the objects, but different effects on their position in the diagram.

If you like the vertical position of one of the objects, it makes sense to use the command that leaves that object in place (*Figure 6-160*).

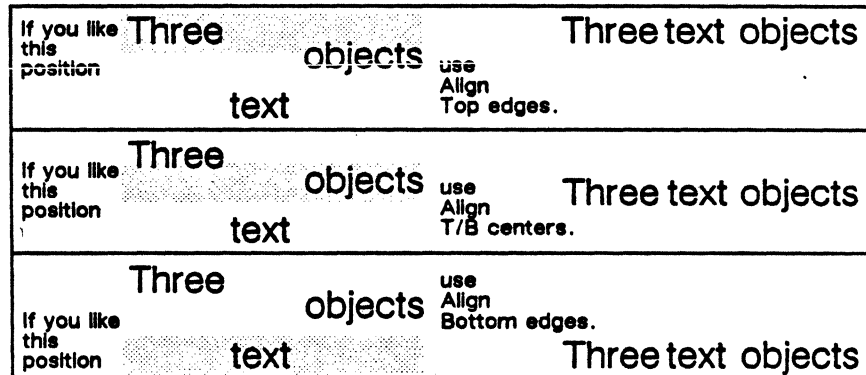


Figure 6-160. Choosing the best Align command

Of course, the **Align T/B centers** command will make the word **objects** move, but it will not move as much as the other objects will.

Moving Some Objects

Suppose you have a text object that you want to center in a box, but you do not want the box to move. One way to get that result is to move the text object so that it is completely contained in the box. Then, when you execute the **Align Centers** command, the bounding box will be the size of the box, and the center of the box will be the center of the bounding box (*Figure 6-161*).

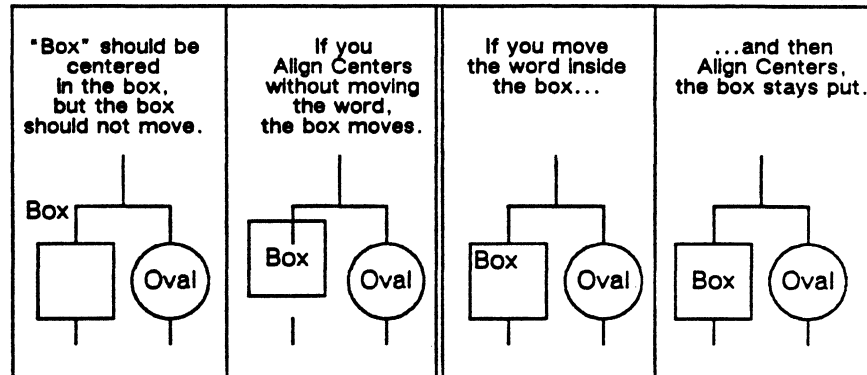


Figure 6-161. Moving some objects before aligning

Creating Alignment Objects

By creating objects in the right places, you can control final positioning. Two of the common applications for this technique are

- centering an object in a frame
- centering columns of objects between a line and the edge of a box

You will find many more uses. Here are detailed directions for achieving the two applications above.

Centering objects in a frame

There is no one command to center an object in a frame, but you can get that result by combining two commands.

To center an object in a frame:

- ✓ Create a box.
- ✓ Select it and execute the **Size to Frame All** command.
- ✓ Select the box and the object and execute the **Align Centers** command.
- ✓ Cut the box.

This procedure will not work correctly if any part of the object you want to center in the frame is outside the frame. In that case, the box will move, too.

Centering columns of objects

Many of the figures in this manual are divided into panels, each of which shows one aspect of a problem, or one step in a solution (*Figure 6-161*, for example).

To get the information neatly centered in each column, we used the following procedure.

To center objects between the side of a box and a line:

- ✓ Duplicate the line.
- ✓ Duplicate it again, and move the second duplicate so that it exactly overlaps the side of the box.
- ✓ Select the two duplicates and **Group** them.
- ✓ Select the group and the objects you want to center.
- ✓ Execute the **Align Centers** command.

If you have more than one column and they are all the same size, you can then select the group again, move it to the next column, and align again. When you are finished, cut the group of lines.

Ⓢ Control and Position Locks

When some of the objects you are aligning are control locked and others are not, the diagramming system draws the bounding box it uses for alignment *only around the control locked objects*. The other objects are aligned to that bounding box (Figure 6-162).

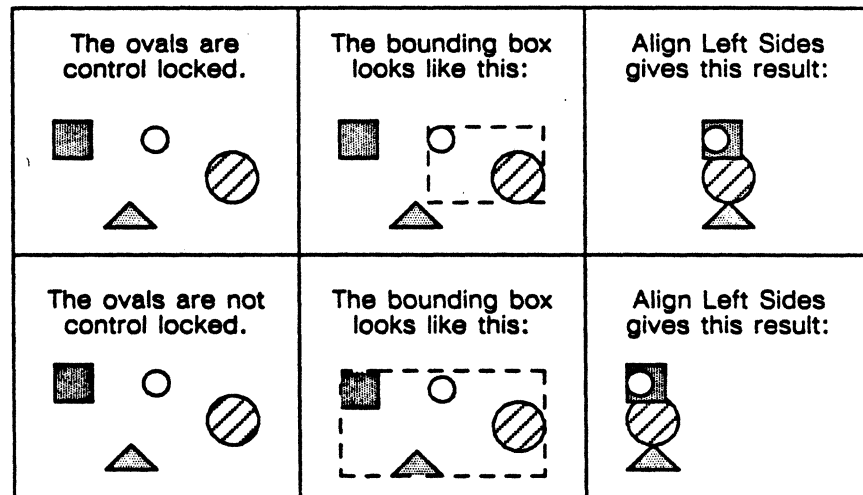


Figure 6-162. Using control locks as an alignment aid

If you also position lock the control locked objects, they will not move, and the objects that are not control locked will be aligned between them (Figure 6-163).

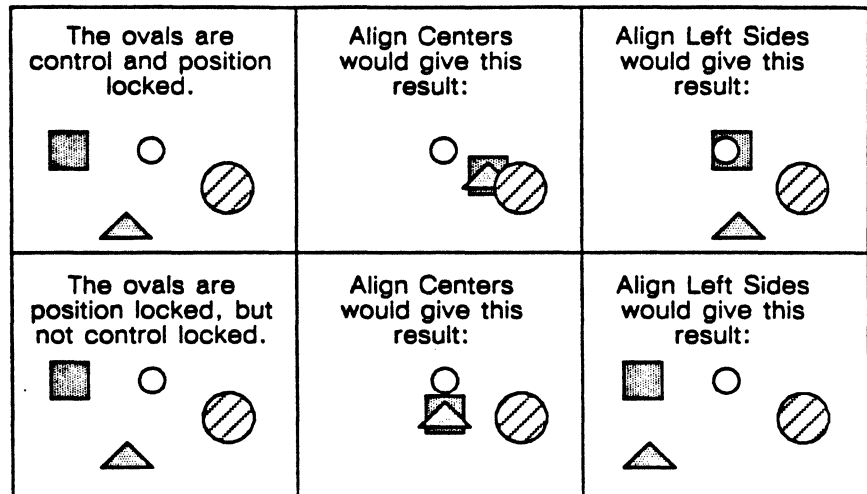


Figure 6-163. Combining control and position locks

Use locks to control alignment when

- you want to align objects around an object that is too small to contain the other objects
- you want to align objects around an object, and you don't want to have to move the other objects inside the first object
- you have several objects that you do not want to group, and you want to align other objects to them

There is more information on control and position locks in the section called *Locks*.

⬠ Locks

The effects you can achieve using locks are wonderful, but locks are designed to be used by experts. Some users of the diagramming system never use locks at all; others use only a few of them.

Even if you never use locks, it is important that you understand the concept of locking. When you come across locked objects, from the *Graphics* cabinet or constructed by other users, you should know what is happening.

In the discussions of locks, we have marked the ones that are particularly difficult. If you do use locks, you might want to begin with those that are less complex, and proceed to the expert locks after you have some familiarity with locking in general.

All locks restrict action. You cannot change the pattern of a fill-locked object; you cannot select a selection-locked object; you cannot print a printing-locked object.

Within that definition, though, there are two major kinds of locks:

- those that protect the current state of a property, like fill, font, and size locks
- those that take away a property, like gravity, printing, or control locks

The locks in the first group allow you to preserve an object that is just the way you want it, without the risk of changing it accidentally. The locks in the second group give you more flexibility, making it easier to create objects that are just the way you want them.

Locks have hundreds of uses. Here are just a few of the things you can do with them.

- You can specify the point around which an object will rotate.
- You can create your own grids that do not print and cannot be selected.
- You can create complex objects that cannot be decomposed and that contain invisible lines whose width will not change when you change the width of the object.

Many of the techniques rely heavily on Locks. Look at Techniques 6 and 7, making a cylinder and rotating objects around a point, to see some of the possibilities.

The objects in the *Graphics* cabinet on your desktop were created using locks. If you are interested, use **Ungroup** and **(show locks)** to examine the locks on a copy of one of the *Graphics* objects. The **(show locks)** command is described later in this section. **Ungroup** is described in the section *Editing and Grouping*.

Using Locks

If you want to prevent a change to an object, you lock one of its properties. For example, if you do not want to be able to cut an object, you lock Cutting. Once an object is locked, you cannot change that property of the object until you unlock it.

It is important to remember that unlocking or locking a property does not change the appearance of the object. If you unlock grouping on a box, for example, the box is not ungrouped, it just becomes possible to ungroup it. You will have to execute the **Ungroup** command to actually ungroup the box.

A copy or a duplicate of an object that has locks on it inherits most of the locks the way it inherits size, pattern, and the other properties. Three of the locks are not passed on: cutting, position, and selection. Making these three locks inheritable would almost always cause you extra work.

Locking a Property

Properties are locked using the **Lock** submenu, off the **Props** submenu (Figure 6-164).

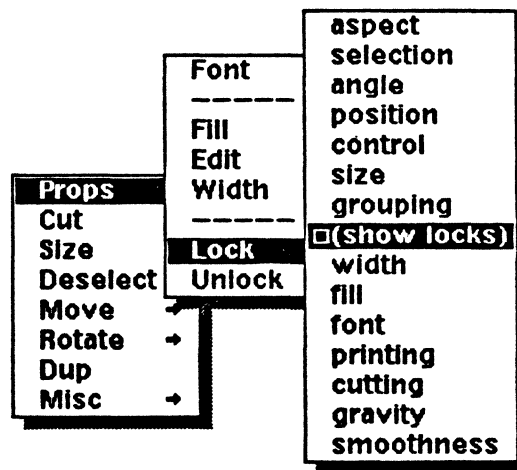


Figure 6-164. The Lock submenu

For example, to prevent changes to the size of an object, you would select it and execute the **Props → Lock → Size** command.

If you select several objects and execute one of the Lock commands, all of the objects will be locked. If one of the objects already has that property locked, it will not change.

Unlocking a Property

Properties are unlocked using the **Unlock** submenu, which is also off the **Props** submenu (Figure 6-165).

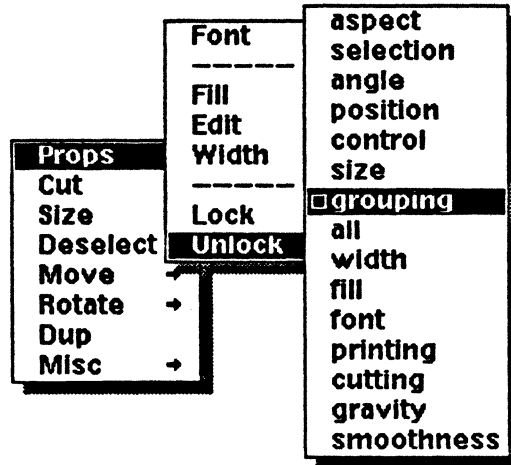


Figure 6-165. The *Unlock* submenu

For example, if you wanted to unlock printing on one of the *Graphics* cabinet rulers, you would select it and execute the **Props** → **Unlock** → **Printing** command.

If you select several objects, the property you choose will be unlocked on all the objects. If one of the objects doesn't have that lock, it will not be changed.

Details About Locks

In this section, you will find detailed discussion of each of the locks, along with some suggestions for using them. The locks are described in the order in which they appear on the popup menu.

Aspect Locks

When you lock the aspect of an object, you are fixing its proportions. The result will be that no matter which **Size** command you use, you will only be able to size the object diagonally. It is a protection lock. The shapes in some of the *Graphics* cabinet borders are aspect-locked so that when you change the size of the border, you do not affect the proportions of the shapes they are made from.

When you size an aspect-locked object horizontally or vertically, it will grow in the other direction, too, in order to keep its proportions. Although it grows in both dimensions, an aspect-locked object being sized any way except diagonally will also move.

The reason it moves is that the center of the aspect-locked object always stays exactly halfway between the anchor and control points.

The anchor and control points are where they would be if the object was not aspect-locked. They show how much you have moved the mouse. The object you are sizing will drift away from the control points, because it can only change proportionally, and you can move the mouse in any direction (*Figure 6-166*).

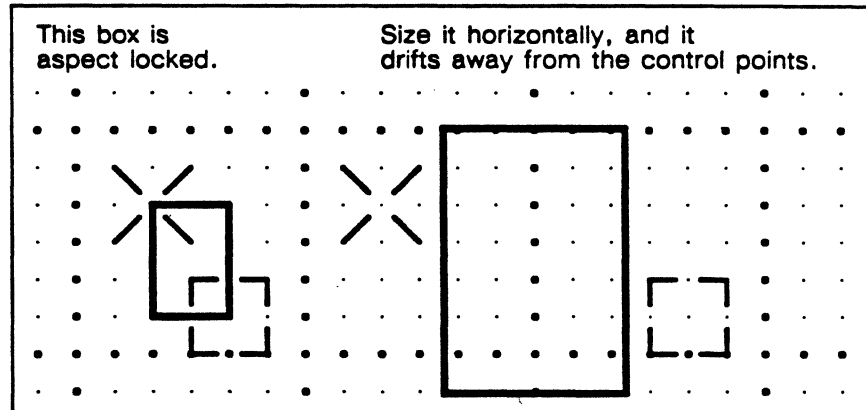


Figure 6-166. Aspect-locked object drifts away from control points.

- Ⓢ The amount the object grows by is equal to the ratio between the distance from the old anchor point to the old control point and the distance from the new anchor point to the new control point (*Figure 6-167*).

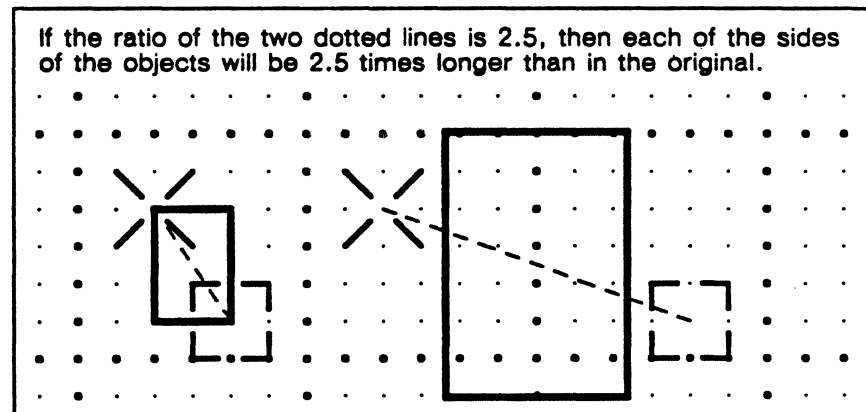


Figure 6-167. Sizing an aspect-locked object horizontally

Ⓢ Selection Locks

An object that is selection-locked cannot be selected by any of the ordinary methods.

One use for this lock is in the creation of forms. If you lock selection on the form after you have created it, you can be sure that users entering information

will not change the form itself. If you need to clear all the fields in the form, you can select all and cut. Since the form is selection-locked, it will not be cut.

The annotation in the *Graphics Cabinet* documents is selection-locked, so that you will not accidentally select it while trying to select an object.

There will be times when you do want to select an object that is selection-locked: for example, you may want to add a field to a form. To select such an object, execute the **Select → Locked** command (*Figure 6-168*).

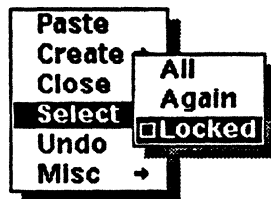


Figure 6-168. The Select Locked command, off the Nothing Selected menu

If you want to unlock selection on an object, you must first use the **Select Locked** command to select it.

If you make a copy or duplicate of a selection-locked object, the copy (or duplicate) will not be selection-locked. If you make a copy of a whole document or frame that contains a selection-locked object in a diagram, the object will still be selection locked in the copy.

Angle Locks

An angle-locked object cannot be rotated by itself. If it is part of a group, its angle will be fixed, but it will move around the rotation center (*Figure 6-169*).

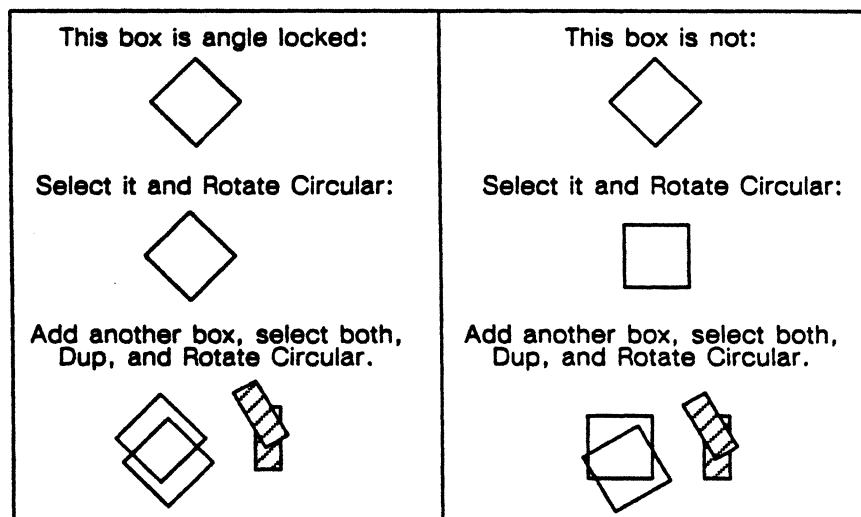


Figure 6-169. Angle locks and rotation

Notice that though the angle-locked box moves, its angle does not change.

Position Locks

A position-locked object cannot be moved, rotated, or sized. You may want to position lock grids or rulers so that you can move other objects around without disturbing them.

A copy or duplicate of a position-locked object will not be position-locked.

Control Locks

When a control-locked object is manipulated as part of a group, or among several selected objects, the diagramming system ignores all the control points on the other objects when choosing the active control point and the anchor point.

This is one of the most important locks, but it is also the most difficult to understand. It is used, among other things, to

- rotate objects around a specified point
- create stroke or polygon characters that will line up correctly
- create arrow heads that rotate and magnify correctly
- add control points to an object wherever you want them
- slide an object along a diagonal line you specify

Techniques 7 and 18 show you how to rotate an object around a point and how to make arrow heads that rotate and magnify.

If you lock control on an object, it will act normally as long as you are manipulating it by itself.

If you select a control-locked object and an object that is not control-locked, the diagramming system will use only the control points on the control-locked object (Figure 6-170).

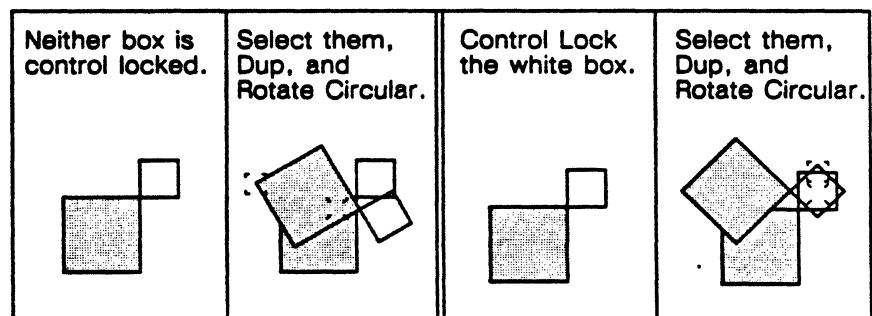


Figure 6-170. Control-locked objects

When neither box is control-locked, the diagramming system chooses the active control point and the anchor point from the control points on both. When the small white box is control-locked, the control points on the gray box are ignored.

Size Locks

You cannot change the size of an object that is size-locked. The arrow heads in the *Linear* document in the *Graphics* cabinet are size-locked so that you can change the length of the tail while preserving the shape of the head.

If you select a size-locked object and some other objects and size them, the size-locked object will move in order to keep the distances between it and the other objects proportional, but it will stay the same size.

If you paste a size-locked object in a document with a page size so small that the object will not fit and if you have a frame automatically created for it, the frame will be made as big as the page size allows, but the object will not be shrunk to fit the frame. It will be rotated, though, if that will allow more of the object to fit in the frame.

Grouping Locks

Objects that are grouping-locked cannot be ungrouped. This lock is useful when you have created complicated groups that you do not want to be able to break up. You may also want to use the grouping lock with polygons. Boxes are automatically grouping-locked so that new users do not accidentally ungroup them. **Grouping** is the default command on the **Unlock** submenu.

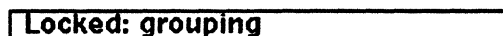
Unlocking All

The **all** command unlocks all locks on the object. If you select more than one object, it unlocks all the locks on all the objects. However, if you select a group, it will unlock only the locks on the group, not locks on the individual objects in the group.

(Show Locks)

The default command on the **Lock** submenu is **(show locks)**. It displays all the locks on the selected objects in the status line, in the order they appear on the **Lock** submenu.

For example, if you select a newly created box and execute the **(show locks)** command on it, the status line will show that the box is grouping-locked (*Figure 6-171*).



Locked: grouping

Figure 6-171. The locks on a newly created box

If you select several objects and execute the (show locks) command, you will see the locks on all the objects displayed. *Figure 6-172* shows the status line you would see if you executed the (show locks) command on a star that is size and control-locked, and a box that is grouping and fill-locked.

Locked: size grouping fill control

Figure 6-172. The locks on two objects

We recommend that you execute the (show locks) on only one object at a time.

However, if you execute the (show locks) command on a group, you will see only the locks on the whole group. To see the locks that individual objects in the group might have, you must edit the group and then execute the (show locks) command on each object.

Width Locks

You cannot change the width of an object that is width-locked.

This lock is most often used when building complex objects that contain invisible lines. By locking the width of the invisible lines, it is possible to change the width of the whole object without changing the width of the invisible lines. Technique 6, making a cylinder, uses width locks.

Fill Locks

You cannot change the pattern with which a fill-locked object is filled.

Here are two examples of fill locking:

- The corner of the symbol for a file of cards in the *Graphics* cabinet is fill-locked.
- The center of a flower is fill-locked, so that you can easily make a bouquet of flowers, all with differently patterned petals, and all with black centers.

Figure 6-173 shows the file card symbol.

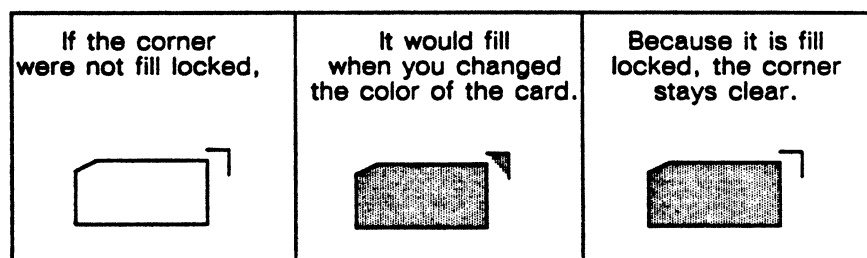


Figure 6-173. Fill lock in a flowchart symbol

Figure 6-174 shows the flower with the fill-locked center.

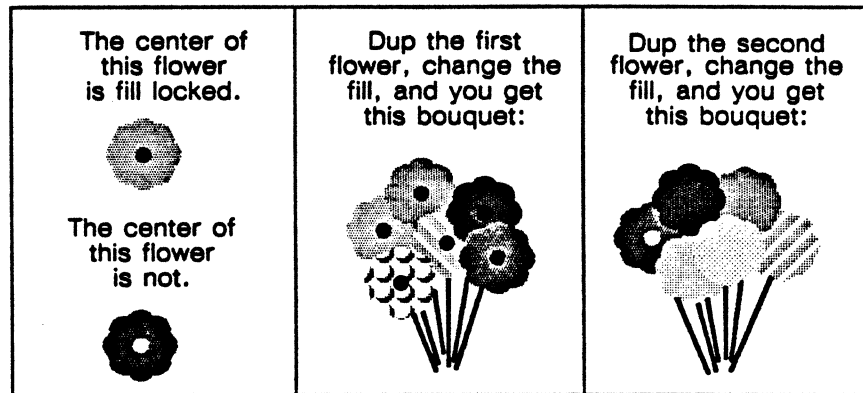


Figure 6-174. Fill lock in a flower

Font Locks

You cannot change the font of an object that is font-locked. Font locks are used

- to preserve the math characters from different fonts that you have entered in equations
- to preserve characters from the Symbols font when they are mixed with ordinary text

Figure 6-175 shows one situation in which you might use font locks.

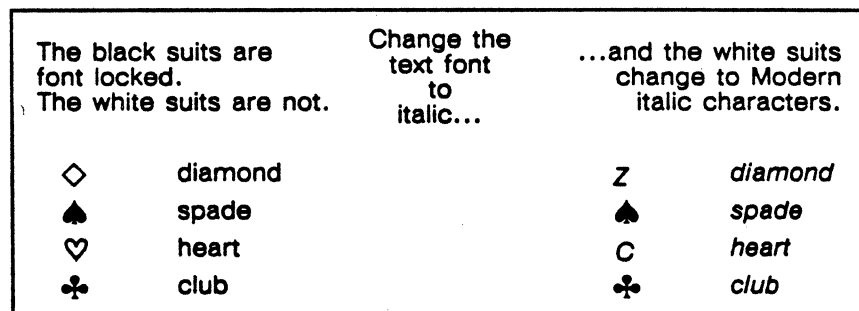


Figure 6-175. Font locking symbols

Printing Locks

An object that is locked against printing will not print.

Printing locks are used

- to create rulers or grids that you can leave in your diagram while you create and revise it
- to create overlays, by print locking and printing successive parts of a diagram.

The printing lock is useful for constructing your own diagramming aids. The rulers in the *Graphics* cabinet are printing-locked, so that you can leave them in your diagram while you create and revise it, and not have to copy them back in every time you make a revision.

Cutting Locks

An object that is cutting-locked cannot be cut. If a user tries to cut such an object, a copy of it will be made and placed on the clipboard, but the object will not disappear. Cutting locks are used

- to create palettes of objects, like the ones in the *Graphics* cabinet
- to create forms that should be preserved when the information in them is manipulated

There are, of course, many other uses. The main reason that cutting locks are used is to prevent people from accidentally damaging something they will want to use repeatedly.

In the case of the *Graphics* cabinet palettes, though, there is another reason. On a cutting-locked object, you can use the **Cut** command instead of **Copy**. Since **Cut** is on the main popup menu, and **Copy** is on a submenu, using **Cut** saves time and effort.

The copy (or duplicate) you make of a cutting-locked object will not be cutting-locked.

Gravity Locks

Other objects are *not* attracted to an object that has gravity locked. Two kinds of objects that are gravity-locked are

- plotter objects, which are automatically gravity-locked because they have so many gravity points that Gravity is usually more of an obstruction than an aid
- lines and polygons in the *Graphics* cabinet fonts, which are gravity-locked so that only the four control points at the corners attract other objects

Smoothness Locks

An object that is smoothness-locked cannot be unsmoothed if it is smooth, or smoothed if it is not smooth. If you have an object that contains both splines and polygons, locking smoothness will ensure that the splines stay splines, and the polygons stay polygons.

Adding CAD Drawings to Your Diagrams

If your company has a Computer Aided Design (CAD) system, you may be able to add the drawings you create on it to the documents you produce in your desktop. Once a drawing has been inserted, you will be able to move, size, and rotate it, and to annotate it with text or other diagramming objects.

This feature of the Interleaf publishing software makes technical documentation much easier.

- You do not have to recreate a drawing inside a document if you already have it on your CAD system.
- You can add callouts (labels) to the drawing just by typing in a text object and moving it into place.
- You can rotate a drawing 180 (or any other number) degrees to make facing pages in your document look balanced.
- You can use different sizes of one drawing in different parts of your documentation.
- You can annotate a drawing, adding arrows, boxes, or ovals to emphasize a specific part, and masking boxes to block out the parts you do not want.

Properties of a CAD Drawing

A CAD drawing is made up of hundreds, often thousands, of line segments. When such a drawing is brought into the diagramming system, all of the line segments are preserved, but the drawing is treated as a single object that cannot be edited.

All of the selection methods work with CAD drawings. However, to select a CAD drawing using point and click, you must point the mouse cursor at one of the line segments in the drawing. If you point at an open space and click the left button, nothing will happen.

Putting a Plotter File in a Document

The diagramming system can interpret and display the output files that CAD systems produce for some popular plotters¹.

Before you can do anything else, the plotter files for the drawings you want to use in your documents must be transported to the workstation running the publishing software. The details of this transferral are different for every CAD system, so they are not documented here.

¹ See Appendix D for a list of the plotters currently supported.

Once the plotter files are in the file structure on your workstation, use the following procedure to place them in documents.

To put a CAD drawing in a document:

- ✓ In the operating system, make sure the plotter file has the correct extension (*.plt*).
- ✓ Copy the file into your desktop directory or one of the folders and drawers in your desktop.
- ✓ Open your desktop.
- ✓ Select the plotter file icon and Cut or Copy it.
- ✓ Paste it in the document.

Now here are each of the steps described in detail.

In the Operating System

Assuming that you have transferred the plotter file to the workstation running the publishing software, the first step is to make sure the file has the correct extension. The correct extension is *.plt*.

If the file does not have an extension, rename it. In UNIX, use the `mv` command. The command line you type will look like this:

```
% mv filename filename.plt <RETURN>
```

In AEGIS, the command line would be

```
$ mvf filename filename.plt <RETURN>
```

The second step is to move the plotter file into your desktop (or one of the folders or drawers in it). In UNIX, the command you type will look like this:

```
% mv filename.plt ~/desktop <RETURN>
```

In AEGIS, the command line would be

```
$ mvf filename.plt ~/desktop <RETURN>
```

The Plot Icon

If you have moved a plotter file into your desktop, you will see it in the upper left corner of the screen when you open your desktop. *Figure 6-176* shows the plot icon.

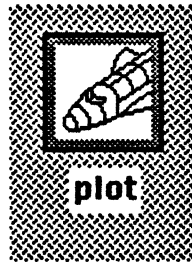


Figure 6-176. A plot icon

The icon will be named after the file it represents. The icon in *Figure 6-176*, for example, represents a file called *plot.plt*.

Getting the Plot Icon into a Document

To move the plotter file into a document, **Cut** or **Copy** the icon. Open the document and execute one of the **Paste** commands.

There are three **Paste** commands you could use. If you use the command on the component menu, the drawing will be inserted in an **At Anchor** frame, in a newly created component. If you use the command on the text popup menu, a frame will be created for the drawing, its properties depending on its size. See *Document Management* for more information about the automatic creation of frames.

Most CAD drawings are too large to fit on an ordinary page. If you paste such a drawing in a document, it will automatically be sized until it will fit. If the layout of the page is such that the drawing would fit better rotated 90 degrees, as long as the drawing is big enough to occupy a full page, it will automatically be rotated.

If you use the **Paste** command on the **Nothing Selected** menu in diagramming, the drawing will be pasted in the diagram. It will be in animation state so that you can move it to its correct position, and it will have its original size. You may need to size it diagonally to make it fit in the diagram.

Manipulating a Plotter Drawing

Once the plotter drawing is in a frame, there are several operations you can perform on it. You can

- size it horizontally, vertically, and diagonally
- rotate it clockwise or counterclockwise
- move it around in the diagram
- cut or copy it and paste in another diagram
- add callouts, arrows, and other diagramming objects to annotate it

You can find information about each of these actions in the section dedicated to the subject. (For example, information about callouts is contained in the section called *Entering and Using Text*, and information about sizing can be found under *Sizing*.)

You cannot edit a CAD drawing, nor can you change fill, width, or font. Interleaf does not support any special CAD text facility (but you can add your own text using either text objects or the *Graphics* cabinet fonts).

Sizing, Moving, and Rotating a Plotter Drawing

All the commands on the **Size**, **Move**, and **Rotate** submenus will work on a plotter drawing.

We strongly recommend that you use only the deselection commands on these submenus (listed below).

Plotter drawings tend to be extremely complicated, containing thousands of short lines. If you execute the animation commands on one, you will need great patience, and great skill with the mouse, to achieve precise results.

If you want to change the size of a plotter drawing, use **Size Numeric**. To change its angle, use **Rotate Clockwise**, **Rotate Counterclockwise**, and **Rotate Numeric**. To change its position, use **Move Numeric**.

Other Commands

In the presence of a plotter drawing, the other diagramming commands work just as they do in its absence. You can use this fact to group the drawing with other objects, for example, or to duplicate it. You can superimpose on it text objects, arrows from the *Graphics* cabinet, or any other object you want.

The Graphics Cabinet

The *Graphics* cabinet contains commonly used graphic symbols: arrows, borders, flow chart symbols, and many others. When you need an arrow, for example, you do not need to make your own. Instead, you can go to the *Arrows* folder in the *Graphics* cabinet and choose an arrow you like.

The symbols in the *Graphics* cabinet are diagramming objects, specially created by Interleaf graphic artists to be easy to manipulate. You can size them to get exactly the size you need for your work. You can rotate them to get the angle you need, and you can change the width and the pattern fill. In the discussions of each document, there are suggestions of appropriate modifications, and techniques for modifying the symbols with the least effort.

The graphic artists at your company will probably want to create additional documents in the *Graphics* cabinet, containing objects specific to your needs.

Using the Graphics Cabinet

The symbols in the *Graphics* cabinet are stored in frames, in documents, like other diagrams in the Interleaf publishing software.

To put a symbol into your document:

- ✓ **Open** the document you want to put the symbol into.
- ✓ **Open** the document in the *Graphics* cabinet that contains the symbol you want.
- ✓ **Select** the symbol and **Cut** it. All the objects in the *Graphics* cabinet are cutting-locked, so the **Cut** command will just make a copy.
- ✓ **Paste** it in the document.

There are three **Paste** commands you could use. If you use the command on the component menu, the symbol will be inserted in an At Anchor frame, in a newly created component. If you use the command on the text popup menu, an At Anchor or Following Anchor frame will be created for the symbol, depending on its size. (See *Document Management* for more information about the automatic creation of frames.)

If you use the **Paste** command on the **Nothing Selected** menu in diagramming, the symbol will be pasted in the diagram. It will be in animation state so that you can move it to its correct position.

Modifying the Graphics Symbols

There are many simple changes you can make to the symbols that may make them more suitable to your application. Try changing:

- the width of the lines
- the pattern fill
- the size—change it in one dimension only, or in both

Many of the symbols are groups of two or more polygons, arranged so that you can change the length of the body without affecting the head or foot of the symbol.

Suppose, for example, that you wanted to increase the height of one of the arrows in the *Graphic* document, in the *Arrows* folder. *Figure 6-177* shows the arrow twice: on the left, as it appears in the *Graphics* cabinet; and on the right, as it would appear if you sized it vertically.

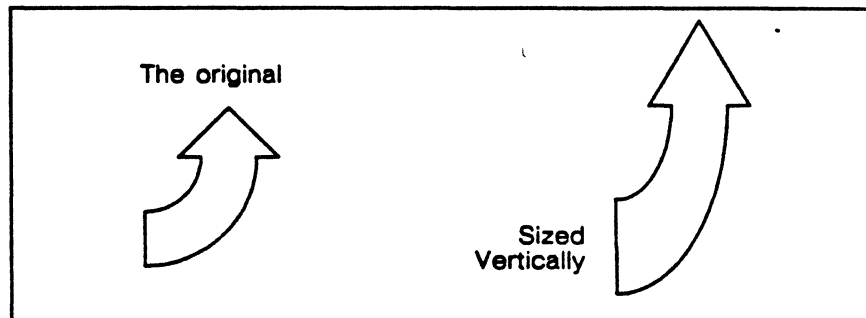


Figure 6-177. The wrong way to modify a Graphics symbol

Notice that the proportions of the arrow are distorted. The following procedure shows you how you can increase the height of a *Graphics* cabinet symbol and preserve the proportions of its top and bottom.

To change the height of a symbol:

- ✓ Edit the symbol.
- ✓ Move the head of the symbol vertically.
- ✓ Select the body and Size it vertically.
- ✓ Close the SubEdit

To change the width of a horizontally oriented symbol, use the same procedure, but move and size the pieces horizontally instead of vertically. *Figure 6-178* shows this procedure, used to change the height of the graphic arrow. The body

of the graphic arrow is invisible as it is given, but it is still selectable, and the procedure will still work.

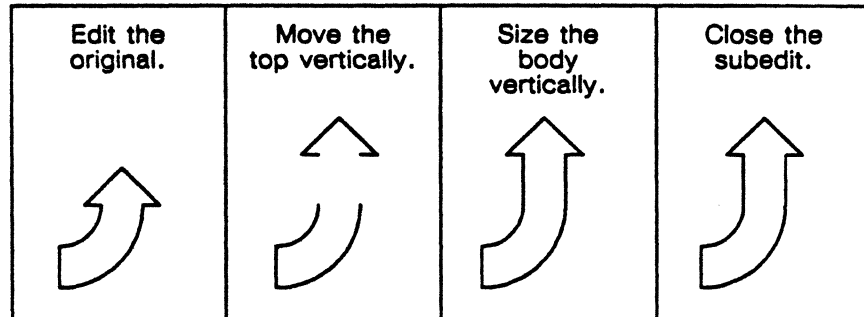


Figure 6-178. The right way to modify a Graphics symbol

This technique works with the graphic arrows, the banners, the speech balloons, the groupers, and some of the borders.

Format of the Graphics Documents

Each of the *Graphics* documents contains a frame as large as the document window. The component bar has been turned off so that the window can be as small as possible.

In most of the *Graphics* documents, you will see a few lines of text. These are annotations, intended to help you use the *Graphics* symbols without referring to the documentation. The text is selection-locked, so that it will not interfere with the symbols.

In the annotation, *H* stands for horizontal and *V* stands for vertical. The phrase *Edit and Customize* means that the symbol contains two or more parts, each of which can be manipulated separately. The **Edit** command is on the **Props** submenu, off the **Object Selected** popup menu. It is considered to be an expert command. The rest of the annotations should be self-evident.

The Graphics Documents

The *Graphics* cabinet contains seven folders and three documents. *Figure 6-179* shows the *Graphics* cabinet and the folders and documents in it.

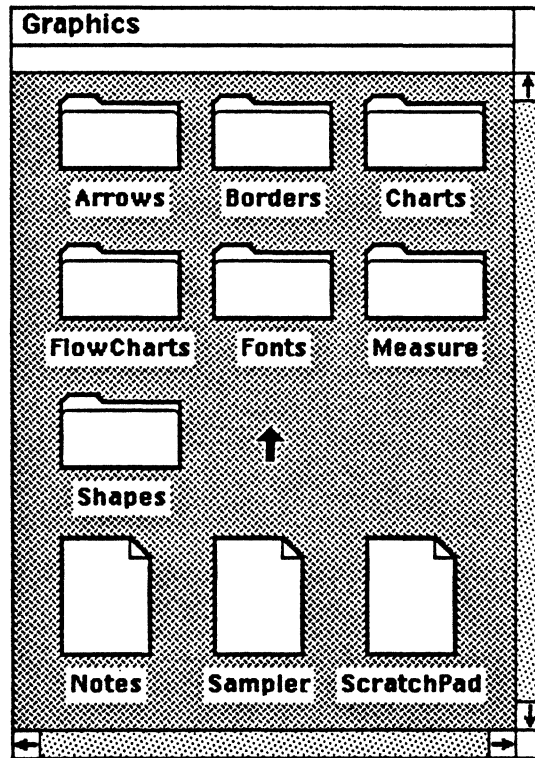


Figure 6-179. The Graphics Cabinet

The next few sections show the contents of each of the folders and documents in the *Graphics* cabinet separately. Special techniques for manipulating particular symbols are also described.

Notes

The *Notes* document contains some brief hints for using the *Graphics* cabinet symbols. There is a general page and a page for each of the six folders. When you begin working with *Graphics*, you might want to leave this document open while you experiment.

Sampler

The *Sampler* document contains one or two symbols from the each of the six folders. If you are just beginning your exploration of the *Graphics* cabinet, the *Sampler* document is a good place to start.

In the *Sampler* document, the names of the folders and the dividing lines are selection-locked.

ScratchPad

The *ScratchPad* document contains an eleven and a half inch square frame, bordered on all four sides by eleven inch rulers. The rulers are selection-locked so that they will not get in your way.

Frequently, it is easier to use the *ScratchPad* document to manipulate—size, rotate, fill, etc.—symbols before you add them to your documents. If you have enough room in your destination diagram to conveniently work there, you will not need the *ScratchPad*.

If, during this manipulation, you come up with a symbol you would like to keep, put it in a palette on your desktop, or get your system administrator to add it to the *Graphics* cabinet.

Arrows

The *Arrows* folder contains two documents, *Linear* and *Graphic* (Figure 6-180).

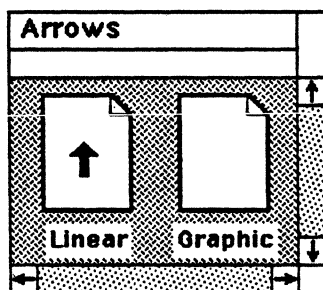


Figure 6-180. The *Arrows* folder

Graphic Arrows

The *Graphic* document contains an assortment of decorative, or graphic, arrows. *Figure 6-181* shows a few of them.

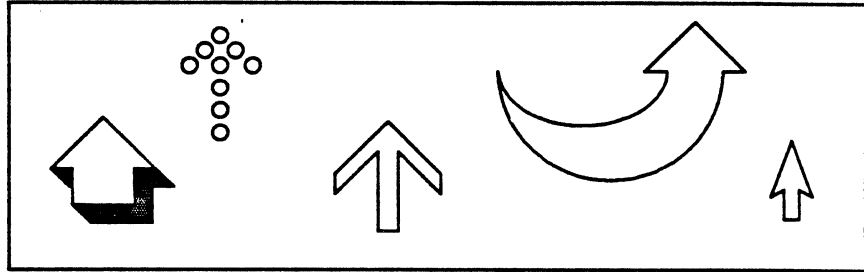


Figure 6-181. Some of the Graphic arrows

You can change the pattern fills of the arrows and the widths of the borders, and you can size them diagonally. You can edit the two-tone arrows and change the fill of each part separately. There are many dramatic possibilities. Technique 16, building a reverse arrow, is one of them.

Two-part arrows

In the upper right quarter of the document there are thirteen arrows, each consisting of two groups, the head and the tail. The arrows are grouping-locked.

The arrows are designed so that the tails can be made longer without changing the proportions of the arrow.

To lengthen the tail of a two-part arrow:

- ✓ Edit the arrow.
- ✓ Select the tail, and with the cursor near the bottom, Size it vertically.

This procedure will also work if you have rotated the arrow so that it is horizontal. Of course, you will have to move the head and size the tail horizontally instead of vertically.

The heads of the nine arrows farthest to the right are the same as the heads used for the linear arrows. However, the heads of the linear arrows are size-locked, and the heads of the graphic arrows are not.

Three-part arrows

The arrows in the bottom half of the *Graphic* document are made from three groups: the head, the tail, and an extension box. Because both the head and the

tail have proportions that can get distorted by sizing, we use the extension box to increase the height of these arrows.

To increase the height of a three-part arrow:

- ✓ Edit the arrow.
- ✓ Move the head vertically.
- ✓ Size the extension box to meet the head.

In some of the three-part arrows, the extension box has no height to begin with. To select it, just drag select at the top of the tail. *Figure 6-182* shows a three-part arrow with an invisible extension box on the left, and a three-part arrow with a visible extension box on the right.

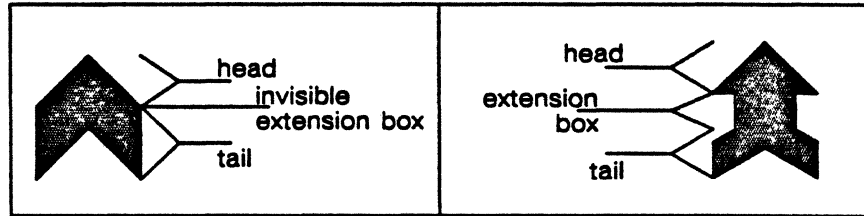


Figure 6-182. Extension boxes, invisible and visible

The circle arrow

Towards the upper left corner of the *Graphic* document there is an arrow composed of circles. These circles are aspect-locked: if you size the arrow, the circles will get larger or smaller, but they will *stay* circles (*Figure 6-183*).

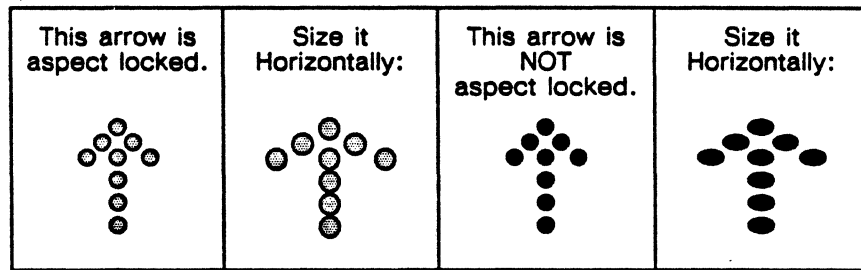


Figure 6-183. The aspect-locked circle arrow

If you want to lengthen the tail of the circle arrow without increasing the size of the circles, use the following procedure:

To lengthen the tail of the circle arrow:

- ✓ **Edit the arrow.**
- ✓ **Select the tail and Dup it.**
- ✓ **Move Vertical.** Line up one of the circles in the duplicate with the bottom circle in the original.
- ✓ **If the tail still isn't long enough, select one or both of the tails and Dup and Move again.**

This procedure is based on the assumption that the arrow is pointing straight up or down. If it is not, use either **Move Horizontal** or **Move Diagonal**.

Rotating two- and three-part arrows

Use the **Rotate Circular** command to change the angle of these graphic arrows, unless you want to change the size of the arrow as well as its angle.

It is possible to change the length of the tail on one of these arrows only *before* it has been rotated. There is no way to increase only one dimension of the tail unless it is horizontally or vertically oriented (*Figure 6-184*).





Rotate an arrow and move the head diagonally: 	Now try to size the tail:		
	Size Diagonal doesn't work: 	Neither does Size Horizontal: 	Neither does Size Vertical: 

Figure 6-184. Lengthen the tail before you rotate.

Linear Arrows

The *Linear* document contains arrows that can be **Rotate Magnified** to change the length of the tail and the angle of the arrow without changing the size of the arrowhead (*Figure 6-185*).

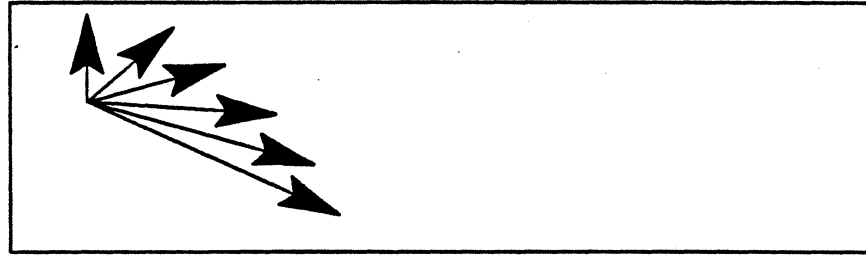


Figure 6-185. A bouquet of Linear arrows

To use a Linear arrow:

- ✓ Select the arrow you want. Cut it and Paste it in your diagram.
- ✓ Position one end of the arrow—it doesn't matter which—where you want it.
- ✓ Select the other end and Rotate Magnified. Move the mouse cursor until that end is where you want it.

The arrows consist of two parts, the arrowhead and the tail. The arrowheads are size-locked, which allows you to change the angle without destroying the head. They are also gravity-locked, so that the end of the tail (which goes up to the tip of the arrowhead) is the only point on the arrow to which objects will be attracted. That makes it easy to position the arrow precisely.

The arrowheads, in turn, contain two more objects. One is the arrowhead itself; the other is a control-locked gravity point. Its purpose is to suppress possible control points at the other corners of the arrowhead.

The arrow heads that are available are the same as the ones used in the nine two-part arrows in the upper right corner of the *Graphic* document. There are three possible tip angles—15°, 20°, and 30°—and three possible base angles—30°, 0°, and -30° (Figure 6-186).

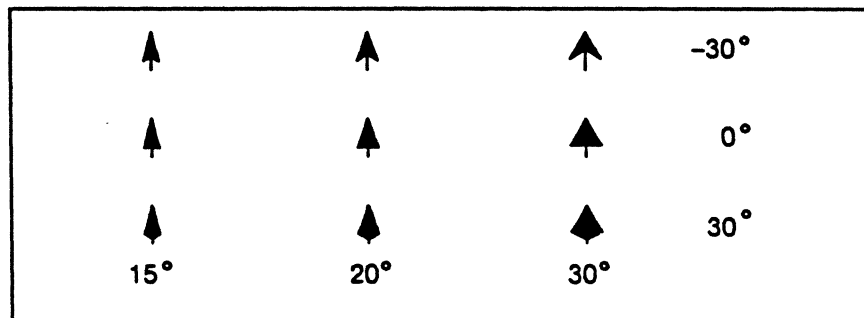


Figure 6-186. The nine Linear arrowheads

There are three different sizes of each arrowhead with straight line tails. Then there is an assortment of double-headed arrows, arrows with feathered tails, arrows with oval tails, and arrows with curved tails. All of these are constructed using the arrowhead with the 15° tip and the -30° base, and are given in three sizes. It is very easy, though, to replace that arrowhead with any of the other chart arrowheads.

To change the head on one of the fancy tail arrows:

- ✓ Select the arrow that has the head you want. **Cut** it and **Paste** it in your working area.
- ✓ Select the arrow that has the tail you want. **Cut** it and **Paste** it in your working area.
- ✓ Edit the arrow that has the head you like, select the head, and **Cut** it. **Close** that subedit level.
- ✓ Edit the arrow that has the tail you like.
- ✓ **Paste** the arrowhead you **Cut** two steps ago.
- ✓ Select the arrowhead you don't like and **Cut** it.
- ✓ **Move** the head you like into position. If Gravity is on, the control point at the tip of the arrowhead will snap to the end of the tail. **Close** the subedit level.

You will notice that all the curved arrows have a counterclockwise orientation. If you would like arrows that arch clockwise, use the **Reflect Horizontal** command *before* you change the angle. Because the arrow heads are size-locked, they do not reflect. For that reason, they must be pointing straight up when you reflect them, so that it doesn't matter whether they reflect or not (*Figure 6-187*).

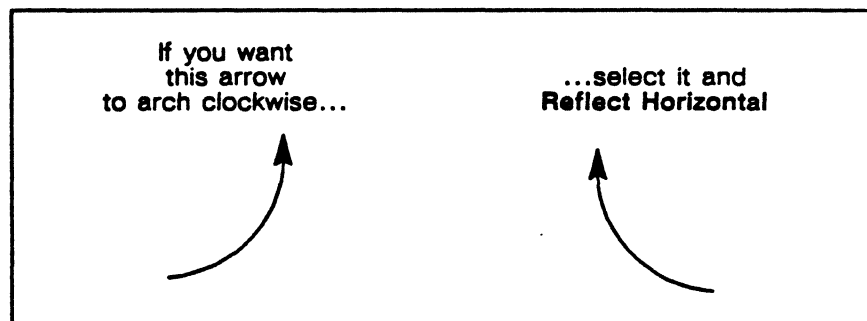


Figure 6-187. Making a clockwise curved arrow

Points

The *Linear* document also contains an assortment of points. A point is an object that has one control point at its center. Points are used to add control and gravity to specific points on an object.

- There is a point at the tip of each of the arrowheads in *Linear*.
- There are points on the flowchart symbols, to provide gravity where lines and arrows should be attached.

Whenever you want to control the location of control or gravity points, cut the points, paste them on the object wherever you want control or gravity, and group them with the object.

There are two kinds of points in the *Linear* document.

The first kind is just a line that has been sized down to one point, and has been size- and width-locked. The gravity point and the first five points in the row were made this way, using different line widths.

The second kind of point consists of a line point that is control-locked and grouped with an oval that is size- and width-locked. Because the point is control-locked, the control points on the oval are suppressed, and the whole group acts just like a line point. However, oval points can be larger than line points can be.

Borders

The *Borders* folder contains five documents (Figure 6-188).

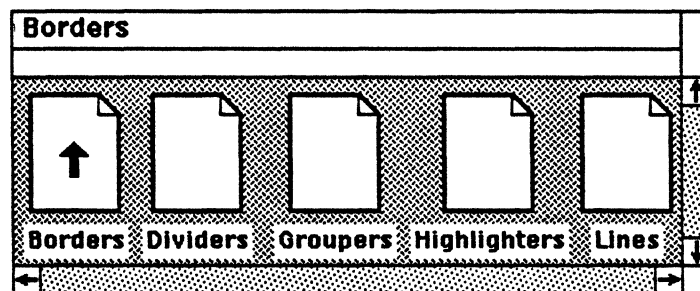


Figure 6-188. The *Borders* folder

Borders

The *Borders* document contains three sets of borders for your diagrams.

- One set is made from patterns of dashed and dotted lines.
- The second set is made from ovals, diamonds, and squares.
- The borders in the third set are polygons that can be filled.

There is a very easy way to make a frame of a certain size with a border fitted into it.

To put a frame containing a border in your document:

- ✓ **Cut** the border and **Paste** it in *ScratchPad*.
- ✓ Make the border the size you want.
- ✓ **Cut** the border and **Paste** it in the component bar of your document.

A centered component containing a frame exactly the size of the border will be created at the position marked by the component caret.

Dashed-line borders

You might want to try changing the width of the lines used in these borders.

Like the other borders, these can be sized. However, if you make them much longer in one direction than in the other, the patterns will be distorted. Compare the square border with the rectangular one in *Figure 6-189*.

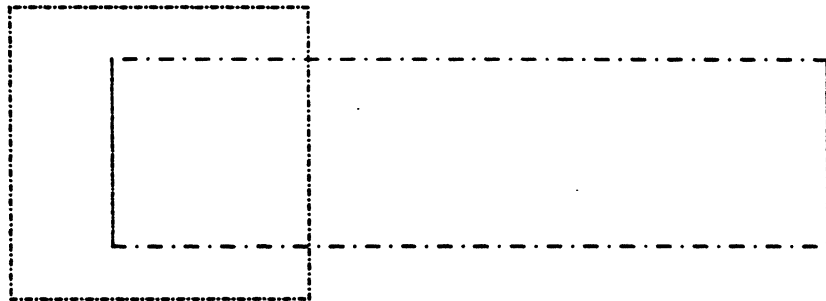


Figure 6-189. Distorting the dashed-line borders

By editing the border and duplicating instead of sizing the lines it is composed of, you can avoid this distortion.

To expand a border horizontally:

- ✓ **Edit** the border.
- ☐☐☐ **Drag** select the right side and as much of the top and bottom as you want to expand the border.
- ✓ **Dup** and **Move Horizontal**. Match the pattern of the duplicate with the pattern of the original.
- ☐☐☐ **Drag** select the original right side and **Cut** it.

Figure 6-190 shows each of the steps in this procedure.

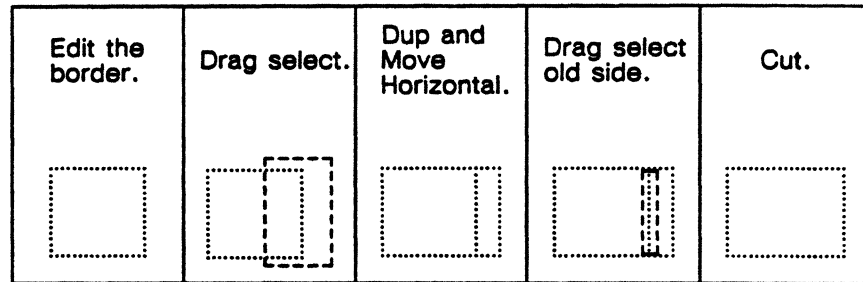


Figure 6-190. Modifying one dimension of a border

To expand a border vertically instead of horizontally, drag select the top or bottom and part of the left and right sides, and move vertically instead of horizontally.

Repeated shape borders

Fill the shapes in these borders with patterns. Try changing the width of the lines around the shapes.

Sizing these borders is very much like sizing the dashed-line borders described above. The only difference is that the ovals or polygons that make up the border are aspect-locked. If you size them much more in one direction than in the other, the spacing between the shapes will increase faster than the size of the shapes (Figure 6-191).

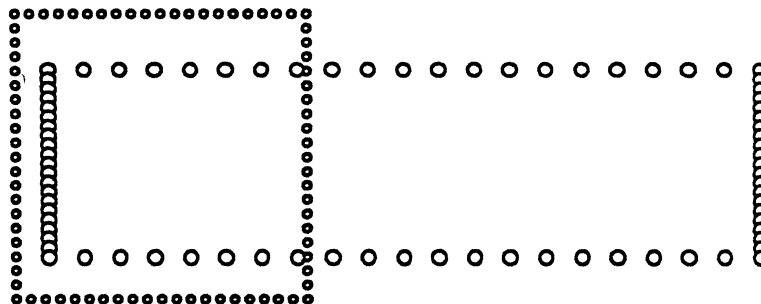


Figure 6-191. Distorting the repeated shapes borders

The procedure described in the previous section, expanding a border vertically, allows you to expand these borders too, without distorting them.

Polygon borders

The polygon borders can be filled, and the width of the lines can be changed. Because each of the borders is constructed of eight polygons (the four corners

and the four sides), you can edit the border and fill the corners with one pattern and the sides with another.

The polygon borders can be sized freely, but if you change one dimension more than the other, the curves at the corners and the width of the sides will be distorted (*Figure 6-192*).

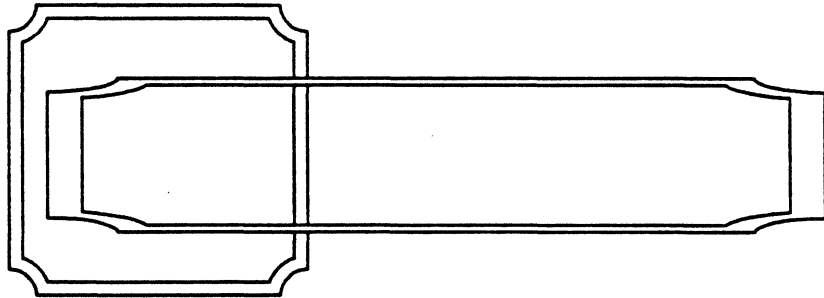


Figure 6-192. Distorting the polygon borders

The following procedure will allow you to change one dimension of a polygon border, while preserving the curve of the corners and the widths of the sides.

To change the height of a polygon border:

- ✓ Edit the border.
- ✓ Select the top side and the two top corners, and Move them vertically.
- ✓ Select the left and right sides, and Size them vertically up to the top.
- ✓ Close the Edit.

Figure 6-193 shows each of the steps in this procedure.

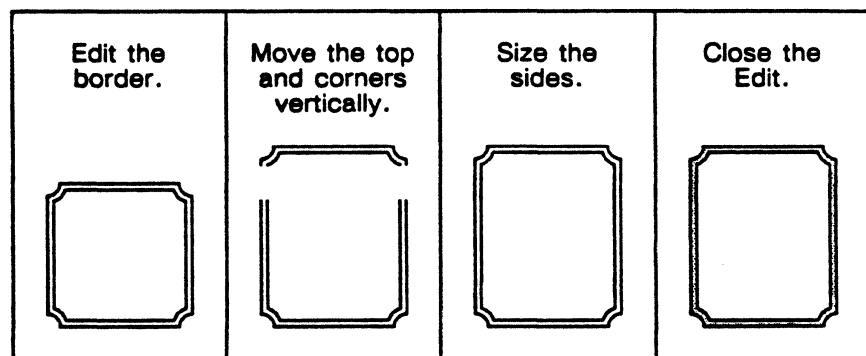


Figure 6-193. Sizing polygon borders

You can change the width of a polygon border instead of its height by moving and sizing horizontally instead of vertically.

Lines

The *Lines* document contains the elements used to build the dashed-line borders and the repeated shape borders. These elements are useful for creating borders of other shapes and for making patterns.

To use them, drag select the length you need, Cut, and Paste. Before you deselect the line, be sure to group the segments of it together—reselecting them can be difficult.

We recommend that you size the lines numerically: that way, you can easily create new lines with the same proportions later.

Groupers

In the *Groupers* document there are four brackets: a square bracket, a curly bracket, a parenthesis with pointed ends, and a parenthesis with squared-off ends.

Only the left bracket of each type is included. To make a right bracket, Select it and execute either the **Size →**, **Reflect →** command or the **Size →**, **Reflect →**, **Horizontal** command.

Try filling the brackets with patterns and changing the widths of the lines.

The height of the brackets can be increased, using the same technique that is used for the polygon borders. The only exception is the curly bracket. To preserve its proportions, you will need to move both the top and the bottom and to size the two middle pieces (*Figure 6-194*).

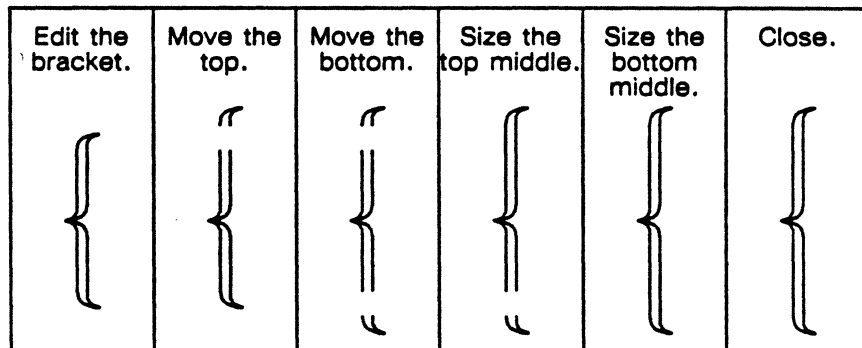


Figure 6-194. Increasing the height of a curly bracket

You can also size the brackets diagonally, to increase or decrease the weight of the bracket as well as its height.

Highlighters

The *Highlighters* document contains five symbols that emphasize text. There are two banners, a box, and two thought balloons.

The text anchor is 18 point Modern Bold by default, which is too large for the highlighters as they are shown, but appropriate for the large sizes at which these highlighters are most often used.

You can, of course, change the font. You can also fill the highlighters, or parts of them (*Figure 6-195*).

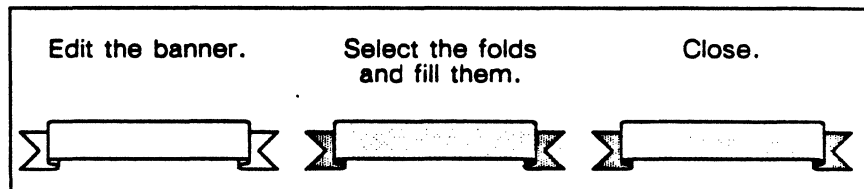


Figure 6-195. Filling parts of a highlighter

It is wise to lock the fill on the parts you change. Otherwise, you will lose the work you have done if you change the fill of the whole object.

Size the highlighters diagonally to increase both dimensions, or use the procedure for increasing the height of polygon borders to change only one dimension.

Dividers

The *Dividers* document contains three fancy dividers that you might want to use between paragraphs of text.

There is an easy way to add to a document a frame exactly the size of the divider you want.

To put a frame the size of the divider in your document:

- ✓ Cut the divider and **Paste** it in *ScratchPad*.
- ✓ Make the divider the size you want.
- ✓ Cut the divider and **Paste** it in the component bar of your document.

A centered component containing a frame exactly the size of the divider will be created at the position marked by the component caret.

The top two dividers can be filled with patterns. The bottom one cannot be filled because of the way it is constructed. To allow you to easily change the line widths, the bottom divider is made from eight separate polygons. Each of those

eight polygons would fill individually. For that reason, it is fill-locked. If you want to fill this divider, you can unlock filling.

On the left side of *Figure 6-196*, we show how you can change the line width of the bottom divider. On the top right, we show how the divider would fill if it weren't fill-locked, and on the bottom right, how you can make it fill normally.

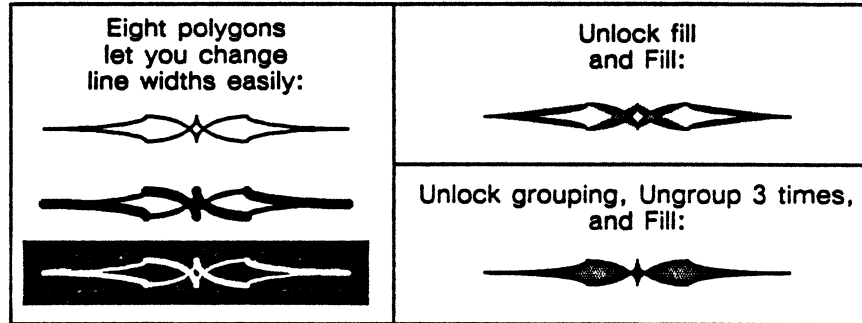


Figure 6-196. Modifying the non-filling divider

If you would like to fill the bottom divider, unlock grouping and fill, ungroup it until it contains only lines (three commands), select all the lines and fill. If you do this, you will not easily be able to change the line widths of the divider.

All the borders can be sized diagonally. The second two can also be sized horizontally without unattractive distortion.

If you want to increase the width of the first divider without changing the circles into ovals, you must size each side separately (*Figure 6-197*).

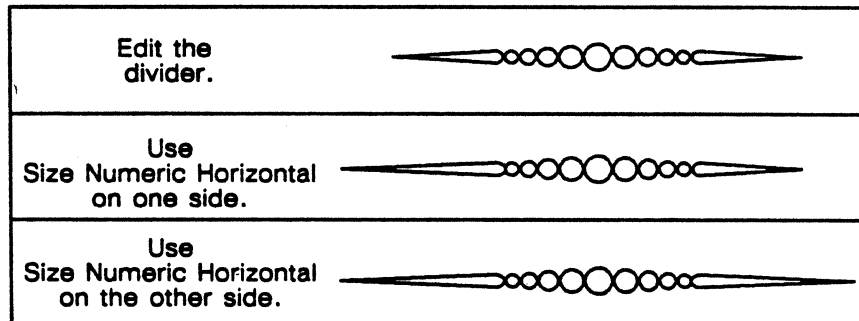


Figure 6-197. Increasing only the width of the first divider

Charts

The *Charts* folder contains four documents (Figure 6-198).

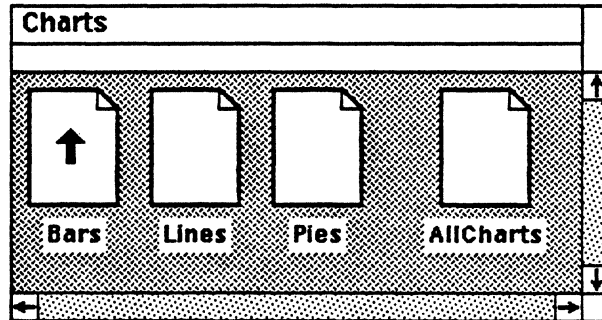


Figure 6-198. The *Charts* folder

The documents contain an assortment of basic business chart styles. *Bars* contains horizontal, vertical, and 100% bar charts; *Lines* contains line charts and scatter charts; *Pies* contains pie charts; and *AllCharts* contains all of the charts from the other three documents.

When you create a chart, begin by opening one of these documents and selecting the chart that comes closest to the style you want. Then cut it and paste it in your own document. For detailed information about creating charts, please consult the chapter called *Making Charts*.

FlowCharts

The *FlowCharts* folder contains only one document, also called *FlowCharts* (Figure 6-199).

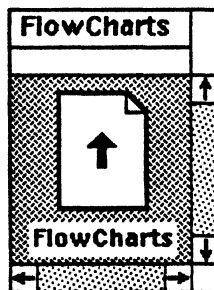


Figure 6-199. The *FlowCharts* folder

This document contains all the standard flowchart symbols, plus an assortment of chart arrows for connecting them. You may want to refer to the section on the *Chart* document, in the *Arrows* folder, for more information on using chart arrows.

Creating a Flowchart

To help you create flowcharts quickly, the flowchart symbols have extra gravity points wherever arrow heads or lines are most likely to be placed (*Figure 6-200*).

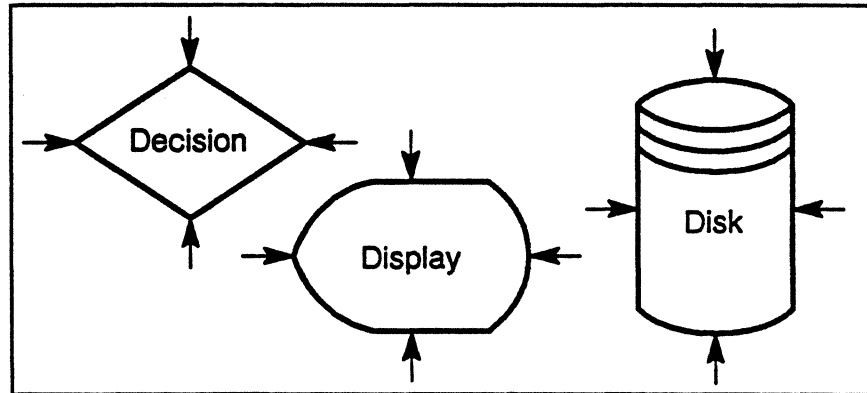


Figure 6-200. Extra gravity points on flowchart symbols

By allowing connecting lines and arrows to snap to the gravity points, you can position your arrow heads quickly and accurately.

To assemble a flowchart:

- ✓ Cut the appropriate flowchart symbols and Paste them in a frame.
- ✓ With Gravity and GridAlign on, arrange the symbols.
- ✓ Turn GridAlign off.
- ✓ Connect the symbols with arrows and lines.

Adding Text to Flowchart Symbols

The flowchart symbols all contain one centered Modern 12 point text anchor. If you want only one line of text in a symbol, simply select the symbol and type in the text.

To add two or more lines of text to a flowchart symbol:

- ✓ Edit the symbol.
- ✓ Select the text anchor and enter the lines of text, using RETURN to begin new lines.
- ✓ Select all the text and Group it.
- ✓ Select the text group and the symbol and Align Centers.
- ✓ Close the SubEdit.

If you want to add a line of text that is longer than the symbol is wide, size the symbol horizontally after entering the text. The text anchor will stay centered in the symbol.

You can also change the font of the text object(s), if you like.

Fonts

The *Fonts* folder contains two documents, *Line* and *Polygon* (Figure 6-201).

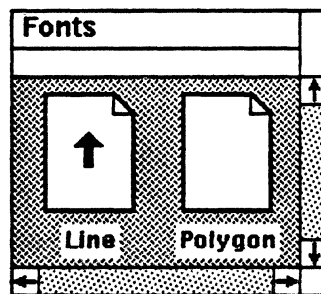


Figure 6-201. The *Fonts* folder

Each of these documents contains a complete character set, the same one we offer in the Modern and Classic fonts. The *Line* document contains characters made from lines. The *Polygon* document contains characters made of polygons that can be filled. Figure 6-202 shows a sample of each.

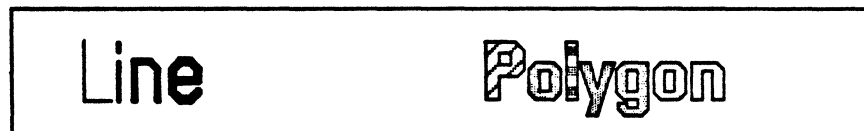


Figure 6-202. Samples of the *Polygon* and *Line* fonts

Construction of the Fonts

Each character in the polygon and line fonts is constructed in the same way. The character itself is gravity-locked, and is surrounded by four invisible control points. The four control points are grouped together, and then the control points and the character are grouped together and grouping-locked, to be sure they are not accidentally ungrouped.

The control points describe a rectangle that is as wide as the character plus its inter-character spacing, and as high as the font height (the distance between the top of a capital letter in the font to the bottom of a descender). The height of the rectangle is the same for every character in the font. *Figure 6-203* shows a few characters, with the control points around them made visible.

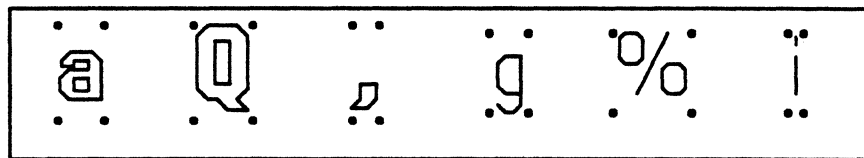


Figure 6-203. The control points on sample characters

The purpose of the gravity lock on the character and the four control points around it is to make lining up the characters easy.

Using the Fonts

The characters in the *Graphics* fonts are used like any other symbol in the *Graphics* cabinet. However, there are a few tricks to getting them lined up neatly to form words.

To assemble a word:

- ✓ Select the characters you want. Cut them and Paste them in *Scratchpad*.
- ✓ Turn GridAlign off, and Gravity on.
- ✓ Move the first character into position.
- ✓ Select the second character. Point the mouse cursor at its upper left corner and Move it to the first character. Let Gravity snap the two control points together.
- ✓ Repeat until all the characters are in place.
- ✓ Select the word. Cut it and Paste it in your diagram. Before you deselect the word, Group the characters.

Of course, you can assemble several words at a time this way, too.

The last character at the bottom of the font window is a word spacing character. Use it between words to guarantee even spacing. Because the spacing character is printing-locked, you can leave it in your diagram, and it will not show up in the printed version.

Manipulating the Fonts

There are many changes you can make to words once you have assembled them.

- Size them diagonally to create larger or smaller sizes. The Line font looks best at smaller sizes than it is shown, and the Polygon font looks best at larger sizes.
- Size them horizontally to create expanded or condensed fonts.
- Rotate them, size them horizontally, and rotate again to create italics.
- Use white line widths to make text stand out against a dark background.
- Create shadows by duplicating and moving the duplicate just a little, and then changing the fills.

The sample sheet in *Figure 6-218* shows all of these and a few other changes you can make.

Measure

The *Measure* folder contains four documents (*Figure 6-204*).

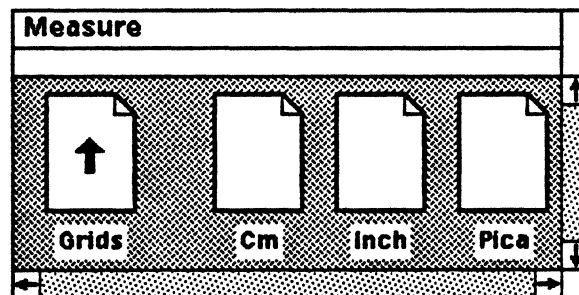


Figure 6-204. The Measure folder

Grids

The *Grids* document contains three grids, one of dots, one of lines, and one isometric grid. The isometric grid makes it very easy to draw cubes, and more complex objects based on cubes. Use the other two grids when you need a grid with units of a specific size. *Figure 6-205* shows some of the objects you can construct on an isometric grid.

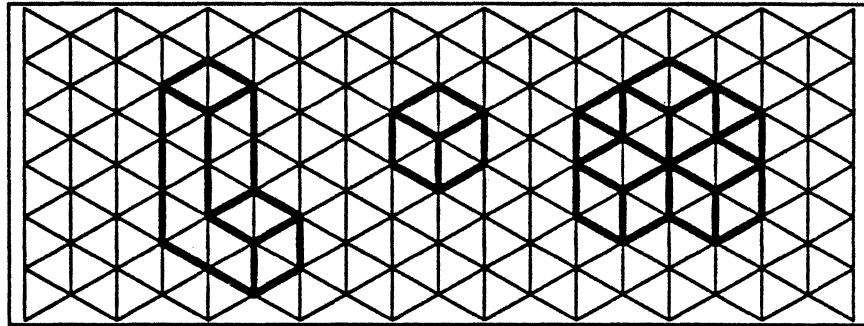


Figure 6-205. The isometric grid

Construction of the grids

All three of the grids have a basic unit of one-eighth of an inch. In the first grid, the dots are one-eighth of an inch apart horizontally and vertically. In the second grid, the line segments are one-eighth of an inch long. In the isometric grid, the vertical line segments are one-eighth of an inch, and they are one-eighth of an inch apart, but the diagonal lines are a little longer than that.

The first two grids are ten units wide and ten units high. The isometric grid is fourteen by eleven.

The second and third grids are constructed from line segments so that there will be gravity at every intersection on the grid.

The line segments are grouped together in the following way. First, all the segments in a single vertical, horizontal, or diagonal line are grouped. Then, all the vertical, horizontal, or diagonal lines are grouped. Finally, the groups of lines are grouped. This structure allows you to change all the vertical lines, for example, to a new width using one command.

The grids are printing-locked. That way, you can leave them in your diagram and use them during revisions without having them show in the printed version.

Using the grids

Here are some hints for using grids effectively.

- Use **Size Numeric** to create a grid that has units exactly the size you want.
- Make sure that **Gravity** is on and **GridAlign** is off.
- Make the default line width wider than the grid line width so that you will be able to see what you create.
- Increase the number of units in the grid with **Dup Repeat**.
- Decrease the number of units in the grid by editing, ungrouping down to the line segment level, selecting, and cutting.

Here are details about each of these hints.

Use the **Size Numeric** command to create a grid that has exactly the units you want. If you need a grid with one-half inch grid units, enter **4** in the **Size Numeric** stickup. If you need one-sixteenth inch grid units, enter **.5** in the stickup.

Because the second and third grids are constructed from line segments, there is gravity at every intersection of the grid. Make sure that **Gravity** is on when you use the grids. The grids are diagramming objects, so the force that will align objects you create with the grid is **Gravity**, not **GridAlign**. If you want to be sure objects are not aligned with the built-in grid, turn **GridAlign** off.

The second two grids are constructed using the narrowest black line. If you do not change the default line width to something else, the parts of objects that line up with the grid will not be visible.

To increase the number of units in a grid:

- ✓ Make sure that **Gravity** is on and **GridAlign** is off.
- ✓ Select the grid and **Dup**.
- ✓ Move the duplicate. Line it up with the original, using **Gravity** to snap the intersections together. Overlap the two grids a lot to increase the size by a little.
- ✓ Continue to **Dup** and **Move** until the grid is large enough.

To decrease the number of units in a grid:

- ✓ **Edit** the grid.
- ✓ **Select All** and **Ungroup**.
- ✓ Repeat the previous step until there are no more groups, only line segments.
- ✓ Drag select the units you do not want and **Cut** them.

This procedure destroys the levels of groups the grid originally possessed. If you wish to preserve those levels, you will need to edit each group of lines and each line, cutting only the line segments you do not want, and then closing before you work on the next group of lines.

The Rulers

The other three documents in the *Measure* folder are three rulers, in three different units: picas, centimeters, and inches.

The rulers are size-locked to prevent them from being distorted. They are printing-locked so that you can leave them in your diagrams and use them over again, without having them show up in the printed copy.

In each document there are actually ten or twelve rulers overlapping, one for each major increment. You select only the number representing the length of ruler you need.

To use the rulers:

- ✓ Open the document and the frame.
- ☐☐☐ Point the mouse cursor at the number that is closest to the length of ruler you want and click the left mouse button.
- ✓ Cut the ruler and Paste it in your document.

Once you have the ruler in your document, use the **Rotate Magnified** command to change the angle of the ruler and its position at the same time. Because the rulers are size-locked, **Rotate Magnified** will not change their size.

Shapes

There are three documents in the *Shapes* folder: *Basic*, *Arcs*, and *Stars* (Figure 6-206).

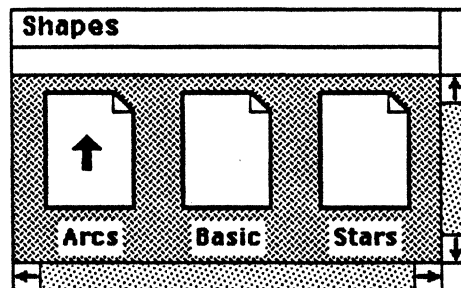


Figure 6-206. The *Shapes* folder

Basic Shapes

The *Basic* document contains five-, six-, seven-, and eight-sided polygons, three triangles, two views of a cube, and two round-cornered boxes.

You can edit the cubes and fill the faces with different patterns (Figure 6-207).

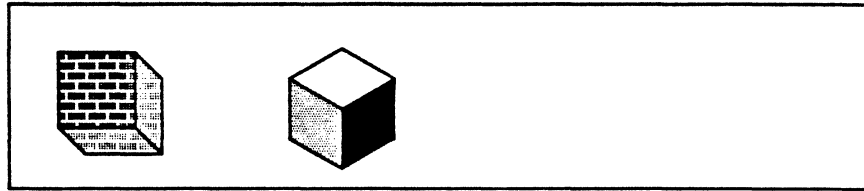


Figure 6-207. Two- and three-toned cubes

And you can stack them (Figure 6-208).

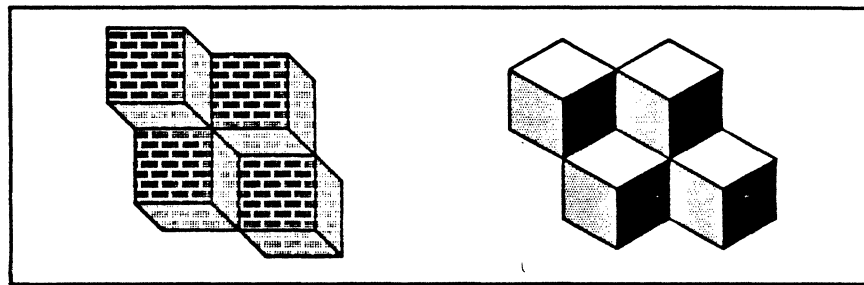


Figure 6-208. Stacking cubes

You can use the round-cornered boxes sized to frame to represent display screen faces in documentation.

Arcs

Although the diagramming system provides true curves through the **Smooth** command, such curves cannot be combined with straight lines to form a single polygon. To add curves to polygons, use the *Arcs* document.

The *Arcs* document contains sets of lines, each set laid out to look like a circle. Selection-locked marking lines divide the sets into eight segments. In the center of each set is a text object showing how many lines the set contains (Figure 6-209).

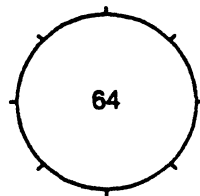


Figure 6-209. An arc

Figure 6-210 shows some of the objects you can create using arcs.

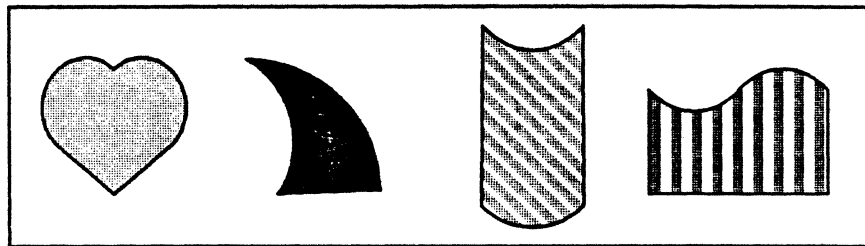


Figure 6-210. Using arcs

Technique 15, creating a heart, uses arcs. In the *Graphics* cabinet, the banner, the curved graphic arrows, and some of the groupers are constructed using arcs.

To add a curve to a polygon:

- ✓ Open the *Arcs* document.
- ✓ Drag select the part of a circle you need.
- ✓ Paste it in your document.
- ✓ Use Gravity to attach lines to either end of the curve.
- ✓ Select all the lines and Fill.

Stars

The *Stars* document contains an assortment of stars and asterisks. Figure 6-211 shows a few of the stars available.

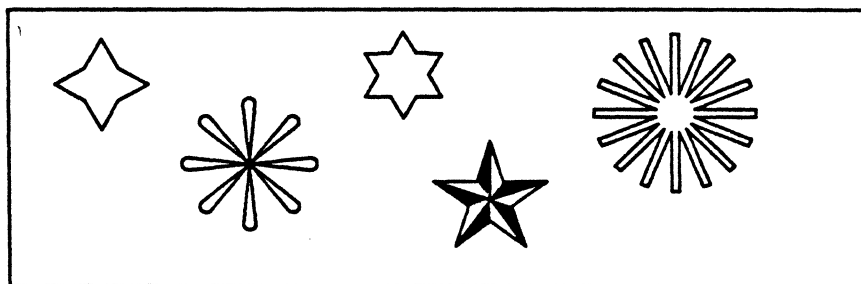


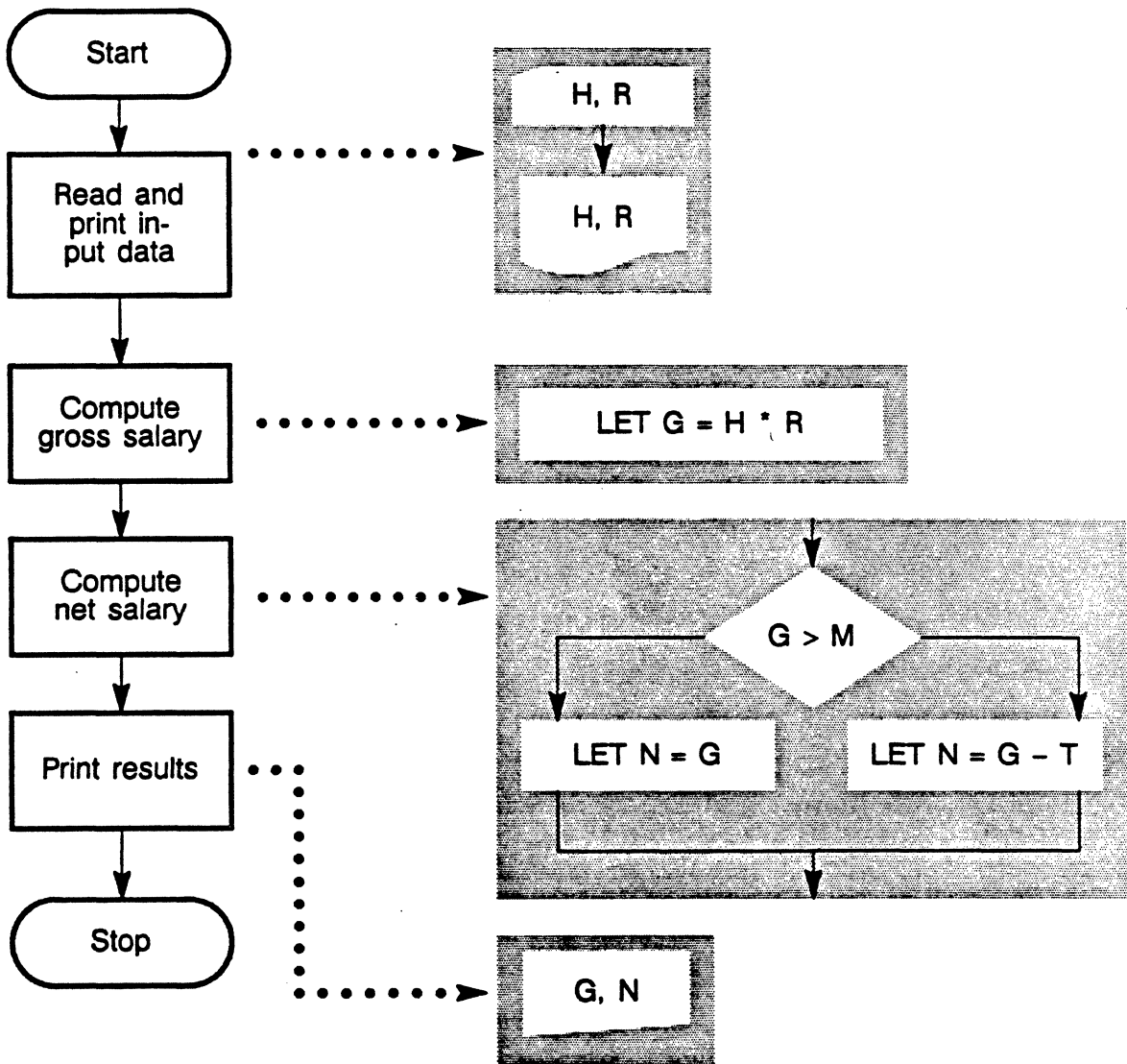
Figure 6-211. Stars and asterisks

You can fill the stars and change their widths. You can edit the two-toned star and fill the sections of it with different patterns.

Sample Variations

There are so many possible variations you can make to the *Graphics* cabinet symbols. Some of them are mentioned in the text describing each of the *Graphics*

documents, but words are not always the best medium for communication. The next seven figures show some of the variations the graphic artists at Interleaf have created, starting with the *Graphics* symbols and working with all the tools of the diagramming system.



Payroll Process

Figure 6-212. A sample flowchart

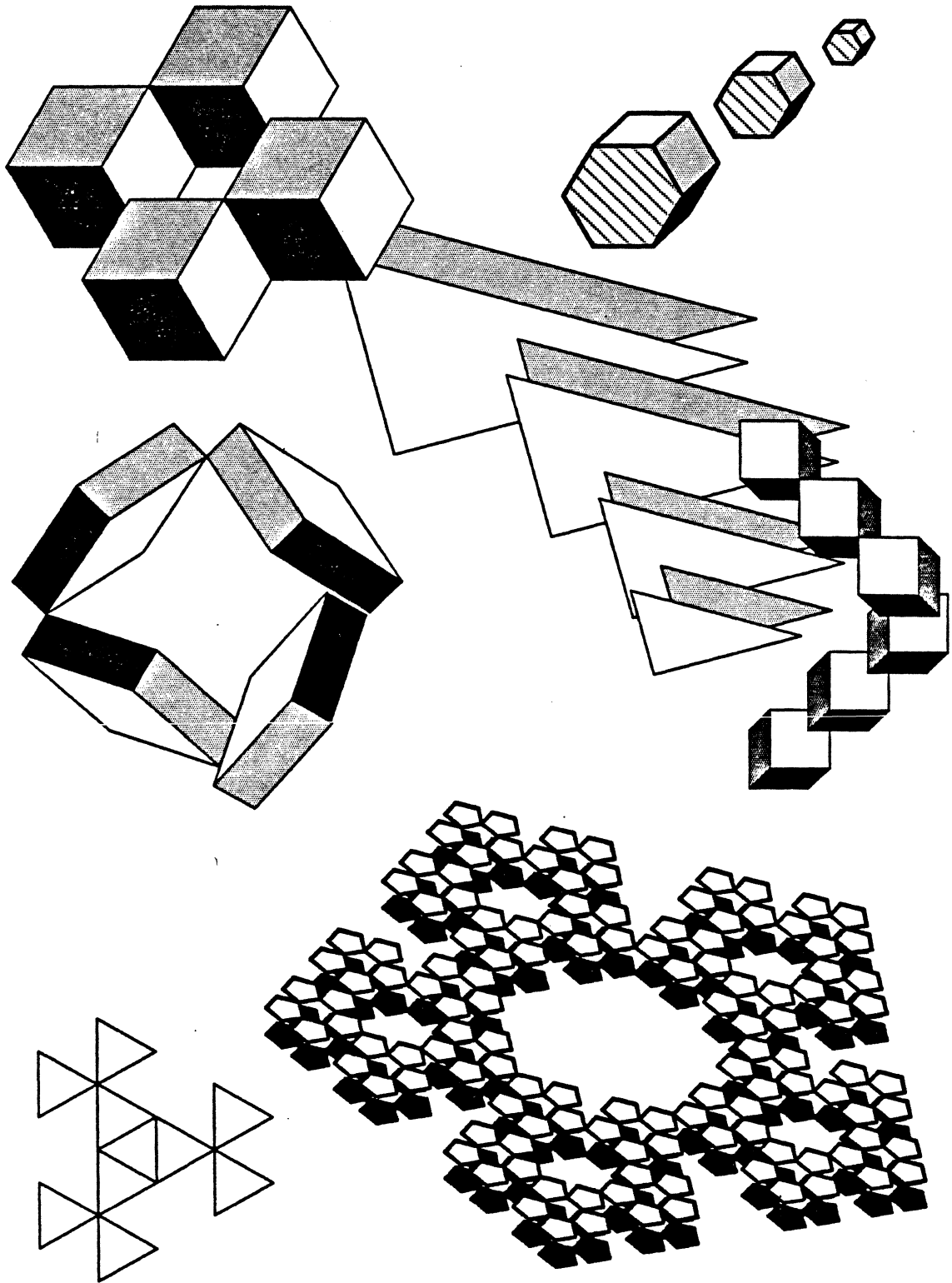
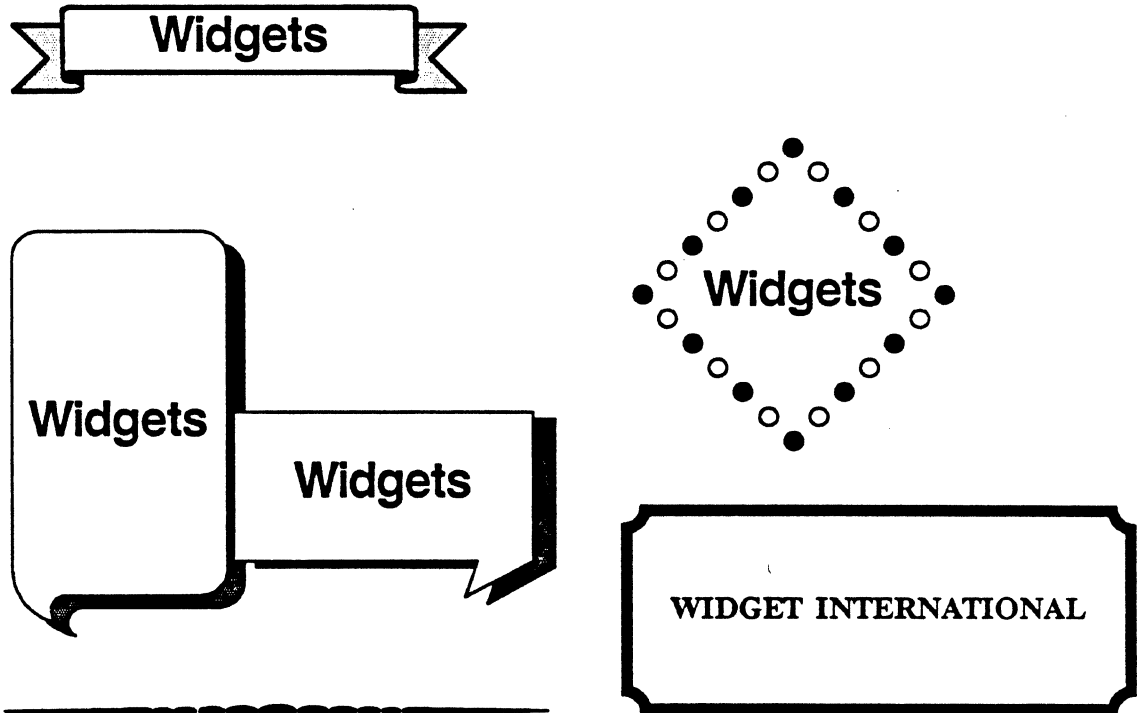


Figure 6-213. A sample of the Shapes



We are often asked for some background on the origin of the word *widget*. We have found that many people associate it with *widgeons*, an interesting kind of wild duck.

This is an ingenious and appealing, though inaccurate, explanation.

{ *Widget* is a word that has existed since the beginning of human language. }



Figure 6-214. A sample of the Borders

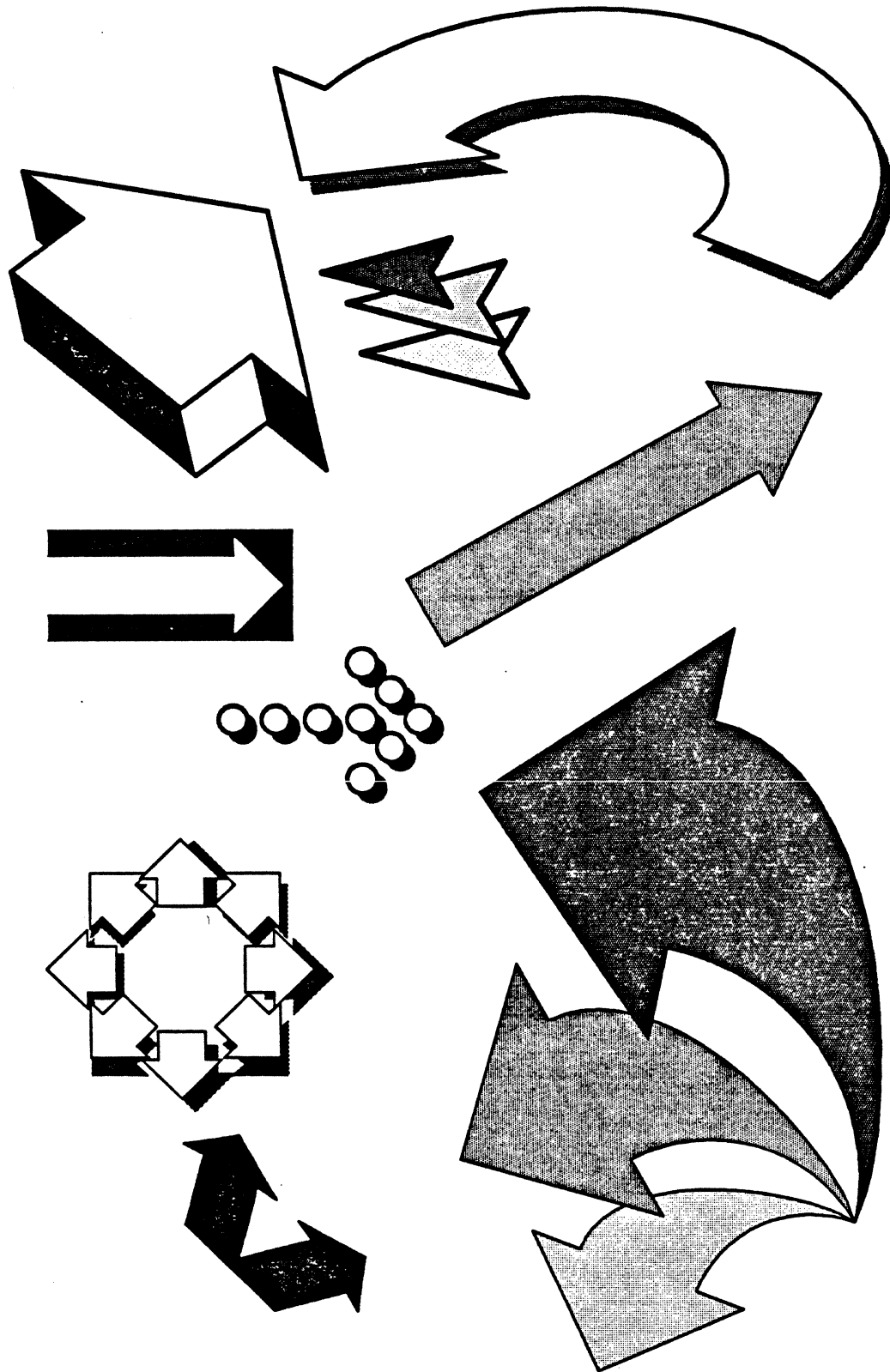
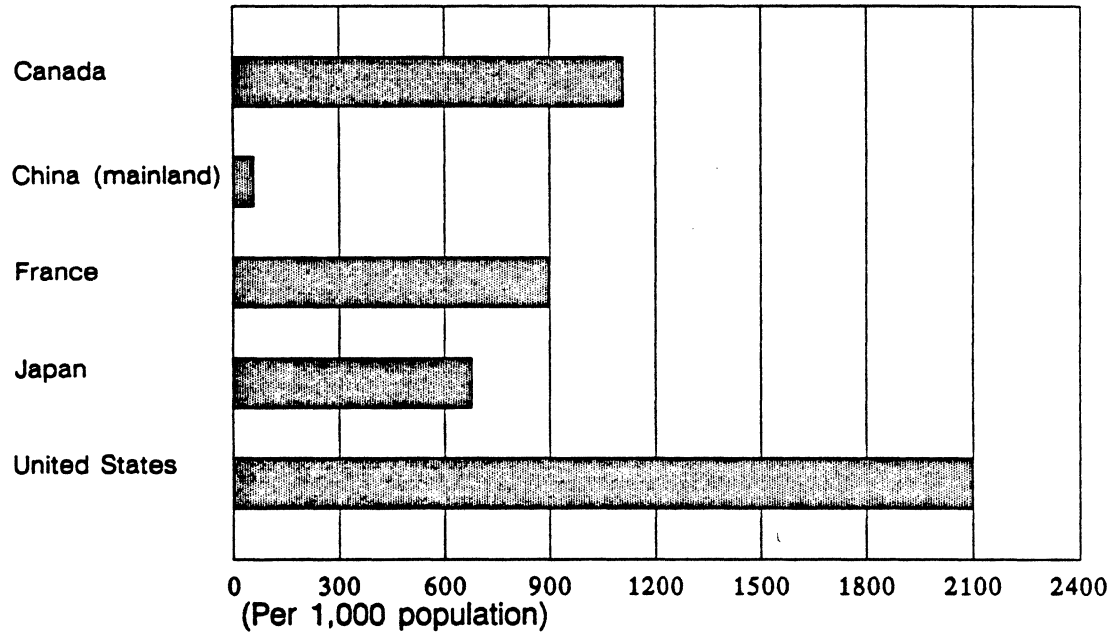


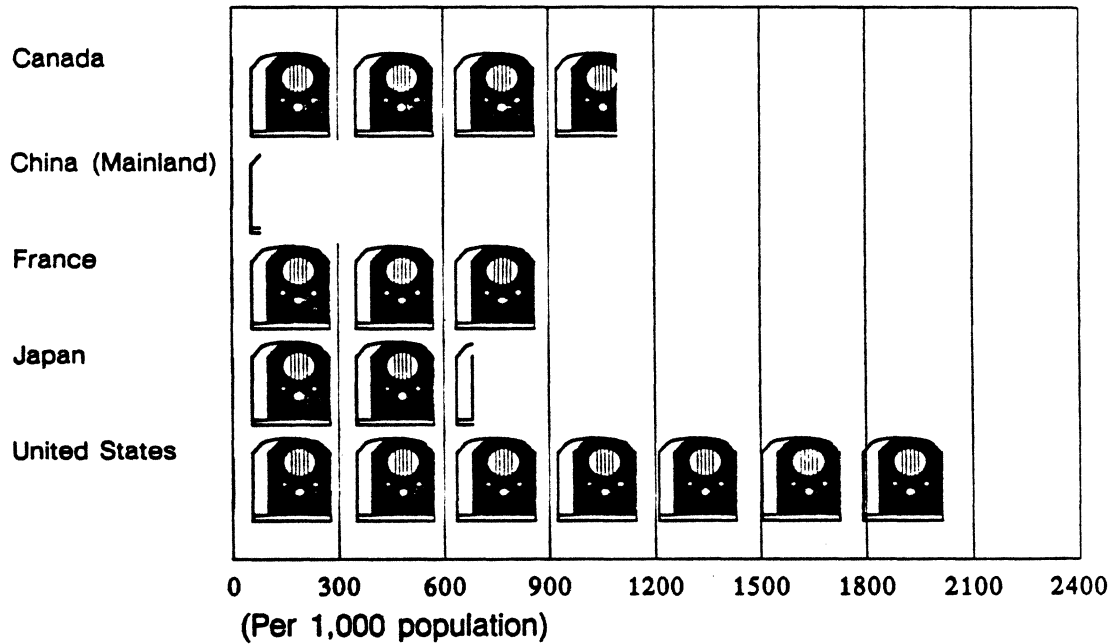
Figure 6-215. A sample of the Graphic Arrows

Radio Receivers by Country

Data Driven Chart



Data Driven Chart and Diagramming



Source: *Statistical Abstract of the United States 1984*, 104th ed. (Washington: Department of Commerce), p. 881

Figure 6-216. A sample of Charts

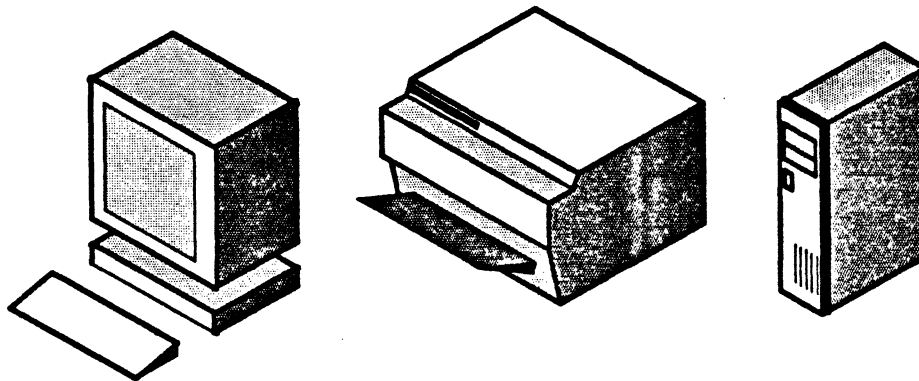
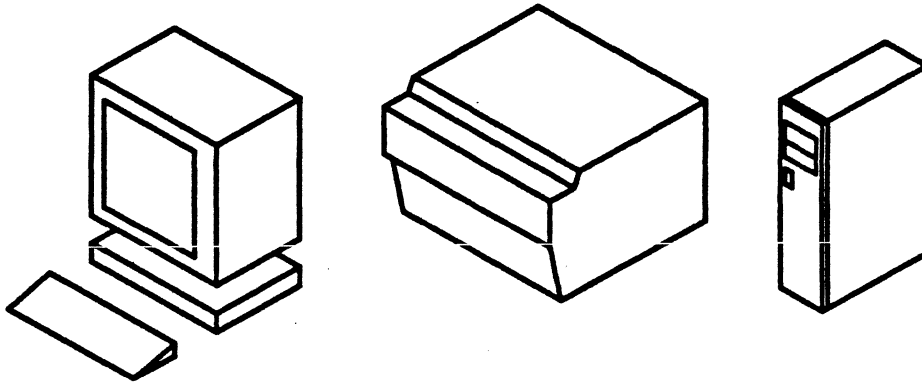
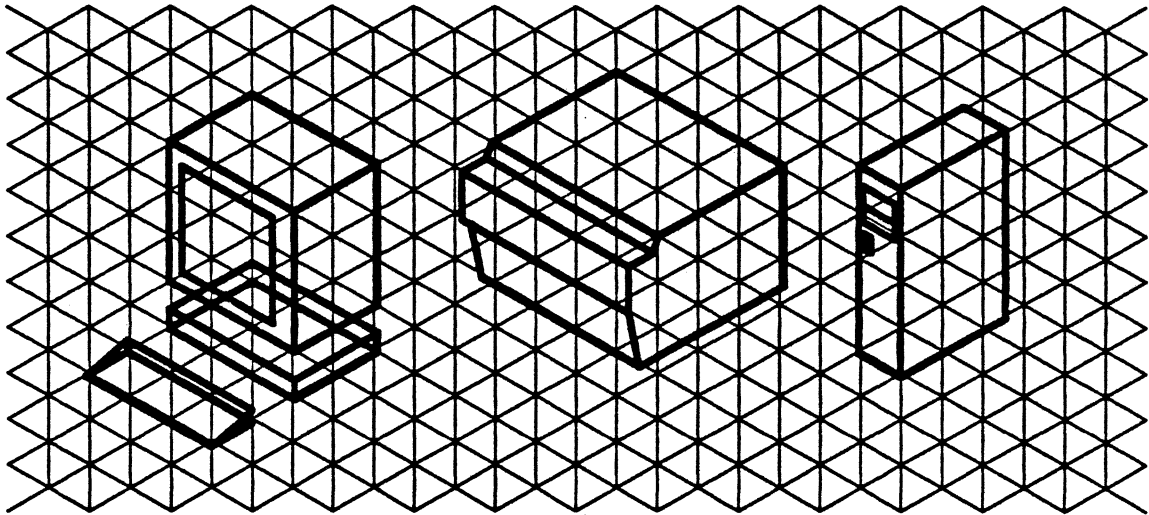


Figure 6-217. A sample using Measure

Condense

Condense

Expand

Expand

Italicize

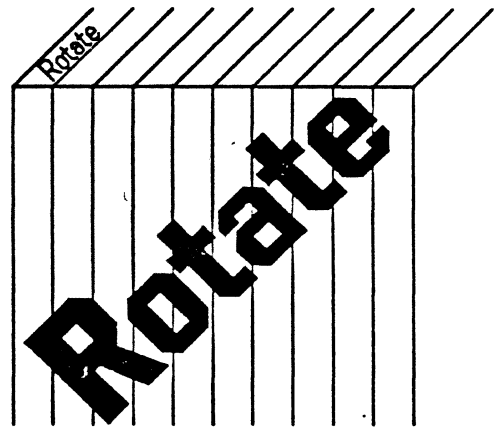
Italicize

1011iM

1011iM

sup_sABC_{sub}

sup_sABC_{sub}



Shadow

Shadow

Outline

Outline

Reverse

Reverse

Embold



Combinations of the above
as well.

Contour

Figure 6-218. A sample of Fonts

Making Your Own Graphics Symbols

You can create your own palettes of symbols that are commonly used in your work. Here are some possibilities:

- drawings of the equipment your company manufactures
- if you do a lot of equations, a palette of text objects, one text object for each character in the math font
- symbols for documentation, like the mouse keys we use at Interleaf

You may also want to copy the symbols in each *Graphics* palette that you use most frequently and paste them in a document to keep on your desktop.

If the symbols are for your use only, create a folder or drawer on your desktop to hold them. If they are to be used by everyone, the system administrator can put them in the *Graphics* cabinet, so that they can be accessed through every desktop. (Refer to the *System Administrator's Guide* for instructions.)

Creating New Symbols

Here are some hints for creating new *Graphics* symbols.

- Do not try to create the symbols in the frame for which they are intended. It is better to use *ScratchPad*, so that you have room to work.
- Create large symbols, then use **Size Diagonal** or **Size Numeric Diagonal** to shrink them down. You will be able to create much finer details than you would be able to if you worked at the final size.
- Use **Groups** to keep parts of the symbol together. For example, the head of an arrow should be one group, and the tail should be another.
- Lock cutting on the symbols in the new palette. That way, other users will not be able to damage the palette accidentally.

Setting Up the Window

Ideally, a *Graphics* palette should be small and unobtrusive. The following procedure will help you make your palettes fit this goal.

To minimize the size of a Graphics document:

- ✓ Open the property sheet for the frame.
- ✓ Make the frame as small as it can be while still showing all its contents. Open the frame.
- ✓ Open the page property sheet for the document.
- ✓ Set all the page margins to 0.
- ✓ Adjust the height and width of the page until it is just big enough to hold the frame.
- ✓ Turn off the component bar.
- ✓ Adjust the size of the window so that only a tiny rim of black shows around the page.
- ✓ Move the window to the place you would like it to open in.
- ✓ Save and Close the document.

Unless the page margins are at least a quarter of an inch, the document will not print correctly. However, since *Graphics* palettes are not intended to be printed, this limitation can be ignored.

The command that is used to turn off the component bar is the **Misc →** **Show →** **Components** command, off the **Unselected Text** popup menu. There is more information about it in the chapter called *Text Processing*.

Chapter 7

Diagramming Techniques

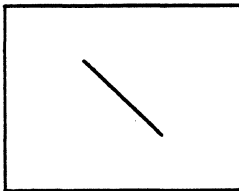
The diagramming commands form a powerful set of tools that can be combined to achieve many effects. This section of the *Diagramming Reference Manual* shows you some of the combinations that have proved most useful. There are many others: as you work with the diagramming system, you will find the techniques that are best for your work. Please send them to Interleaf, and if they have general application we will include them in a future version of this manual.

Each technique is explained on a single, two-sided page, so that you can take the page out of the manual if you want.

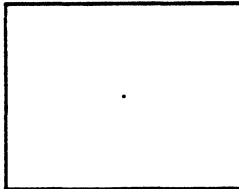
Forcing Horizontal or Vertical Lines



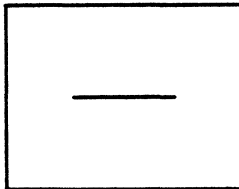
Sometimes you will find that Gravity or GridAlign prevents you from making horizontal or vertical lines in certain positions. If it would not be appropriate to turn off Gravity or GridAlign, try this technique.



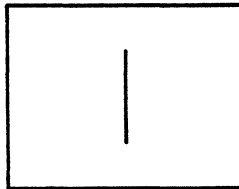
Create a line.



Use **Size All** to make the line into a point.



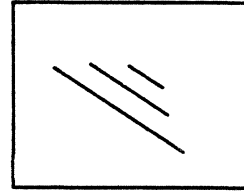
Use **Size Horizontal** to make a horizontal line.



Use **Size Vertical** to make a vertical line.

Preserving the Angle of a Line

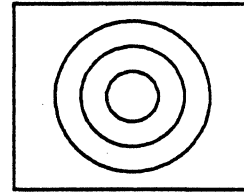
2



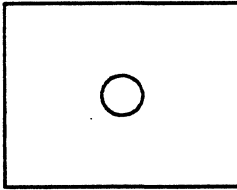
If you want to make a line longer or shorter, but you want to preserve its angle, use the **Size Diagonal** command.

Making Concentric Circles

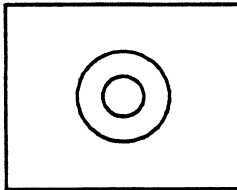
3



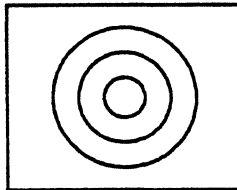
A circle is an oval that is as high as it is wide. Ovals are automatically created as circles that are one grid block square. To make a larger or smaller circle, use the **Size Diagonal** command.



Create an oval.



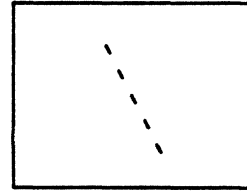
Duplicate the oval, and **Size** the duplicate diagonally.



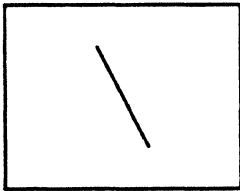
Use the **Dup Repeat** command to create additional circles.

Creating a Dashed Line at an Angle

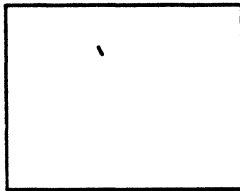
4



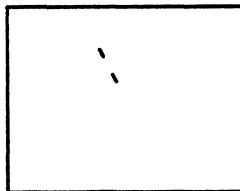
With this technique, you can create a dashed line that follows any angle.



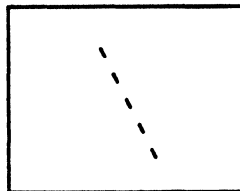
Create a line at the angle you want your dashed line to have.



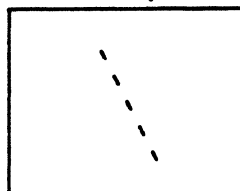
Select the line and **Size Diagonal** until the line is as long as you want a single dash to be.



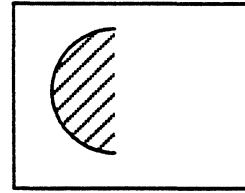
Dup the dash and **Move Diagonal**.



Dup Repeat until you have as many dashes in your line as you want.



Group the dashes together.

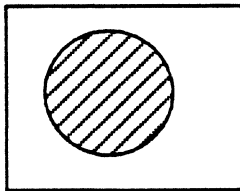


5

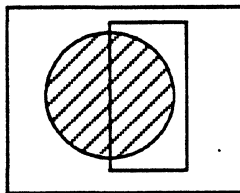
Masked Objects

A masked object is one that is filled with white and has a line width of None. It is useful for covering up parts of other objects, so that you can create curves, for example.

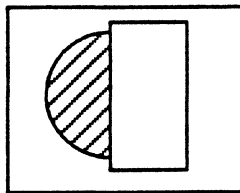
To make a half circle:



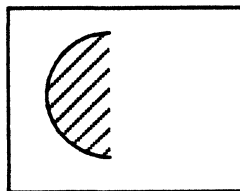
Create a circle that is twice as wide as the half circle will be.



Create a rectangle that covers half the circle.



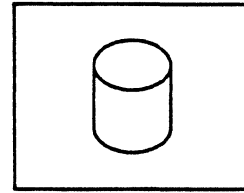
Fill the rectangle with white.



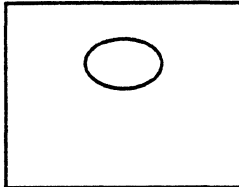
Change the Width of the line around the box to none.

Making a Cylinder

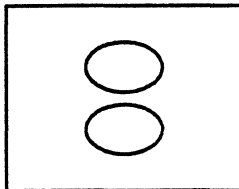
6



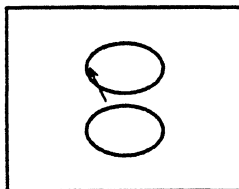
This technique uses masking, grouping, and locking to create a cylinder.



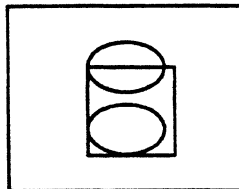
Create an oval that is wider than it is high.



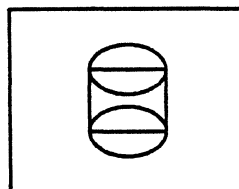
Dup the oval, and Move Vertical. Deselect the duplicate.



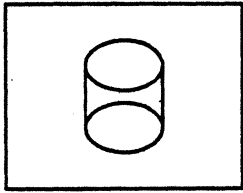
Point the mouse cursor at the left side of the top oval.



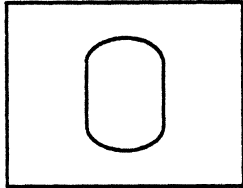
Create a box.



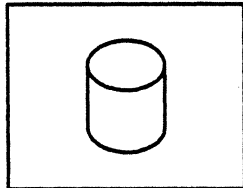
Size the box so that the lower right corner snaps to the control point on the right side of the lower oval.



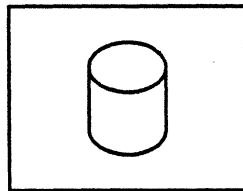
Edit the box. Give the top and bottom sides a width of none, and lock width. Close the edit.



Fill the box with white.

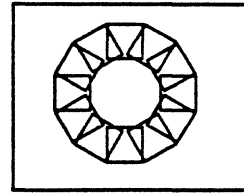


Bring the top oval to the Front.



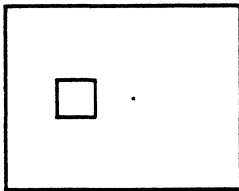
Select the ovals and the box and Group them together.

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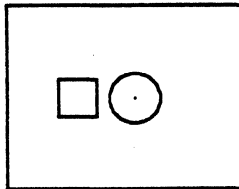


Rotating Objects Around a Point

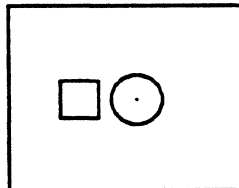
The exact shape you create using this technique depends on the size and position of the box and oval you create. Try it with shapes other than boxes, too.



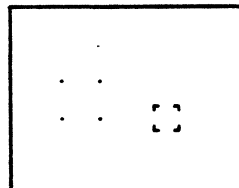
This is the object that will be rotated, and the point around which it will go. You do not need to create the point.



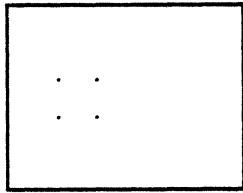
Create a circle centered at the point you want to rotate around. The position of the circle and the size of the box will determine the appearance of the final object.



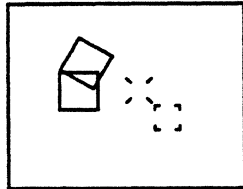
Select the circle and Lock Control on it.



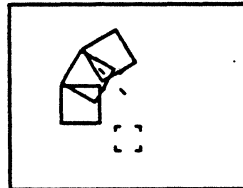
Select the circle and the box and Duplicate them. The display will look like this, although the position of the control point may not be exactly the same.



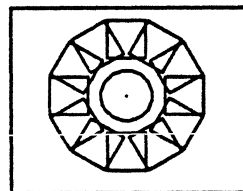
Execute the **Rotate Circular** command.



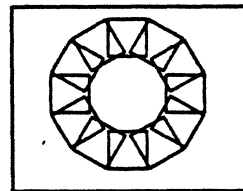
Move the mouse cursor until your display looks like this. (Again, the position of the control point may vary.)



Execute the **Dup Repeat** command. The last animation command you executed was **Rotate Circular**, so you will automatically rotate after duplicating.



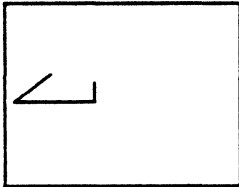
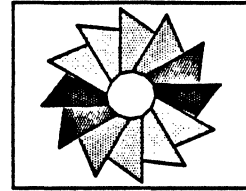
Continue to **Dup Repeat** until the circle is complete.



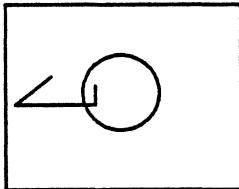
Use drag select to select the circles and the dot, and **Cut** them.

Making a Pinwheel

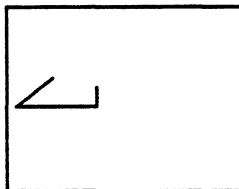
8



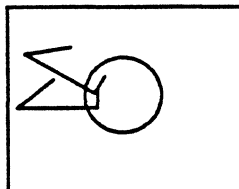
Create three lines that look about like one section of the pinwheel.



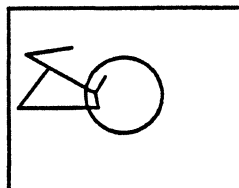
Create a circle around the point that is the center of the pinwheel.



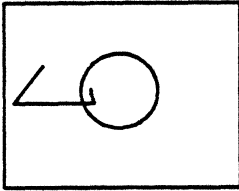
Select the circle and Lock Control on it.



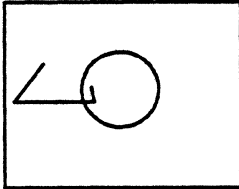
Duplicate the lines and the circle and use the Rotate Circular command on the duplicates.



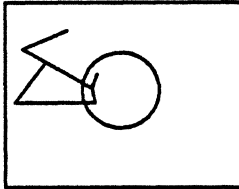
Size the first set of lines so that they meet the second set.



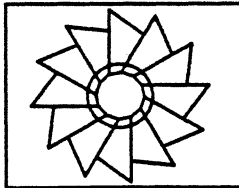
Cut the second set of lines and one of the circles.



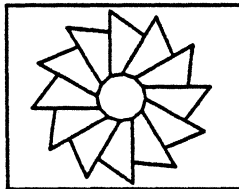
Group the three lines together.



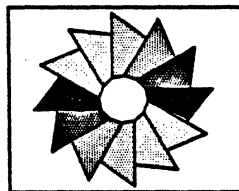
Select the polygon and the circle. Duplicate them and Rotate.



Use Dup Repeat to complete the pinwheel.

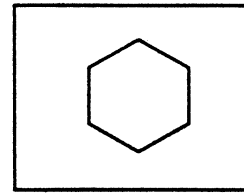


Cut the circles.



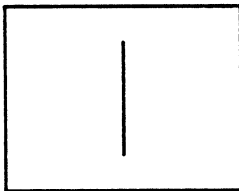
Fill the polygons with patterns.

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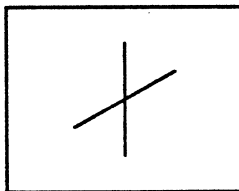


Making A Regular Polygon With an Even Number of Sides

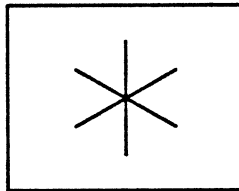
Before you begin, decide how many sides the polygon will have. Divide that number into 360, and set the default detent to the result. We are going to show a six-sided polygon. One sixth of 360 is 60, so we have set the default detent to 60.



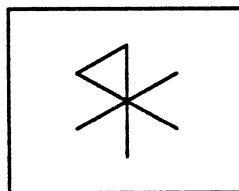
Create a vertical line.



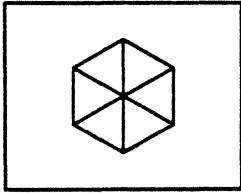
Duplicate the line and Rotate it.



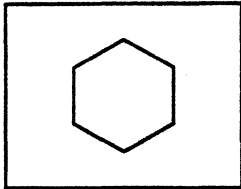
Duplicate and Rotate again.



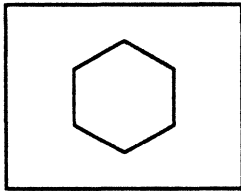
Create a line that connects the end points of two adjacent lines.



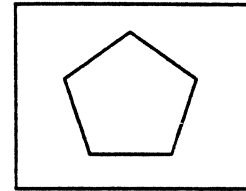
Create five more lines, like this.



Select the three center lines and Cut them.



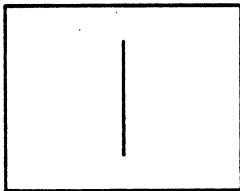
Group the six lines together.



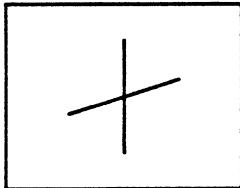
10

Making A Regular Polygon With an Odd Number of Sides

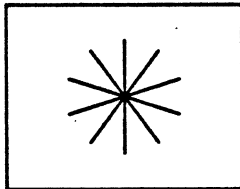
Before you begin, decide how many sides the polygon will have. Divide that number into 360, and set the default detent to the result. We are going to show a five-sided polygon. One fifth of 360 is 72, so we have set the default detent to 72.



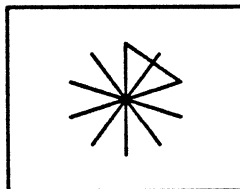
Create a vertical line.



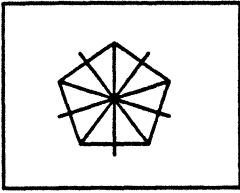
Duplicate the line and Rotate it.



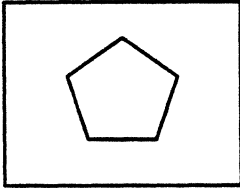
Dup and Rotate the line three more times.



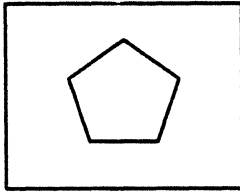
Create a line that connects the end of the vertical line with the end of the second line to the right.



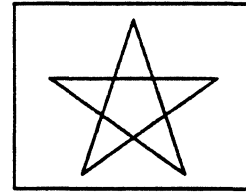
Create four more lines, connecting alternating endpoints.



Cut the five center lines.



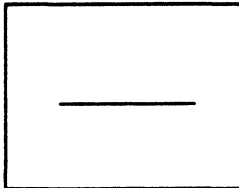
Group the five remaining lines.



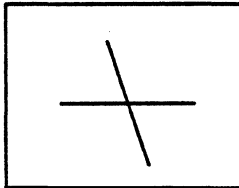
Making a Five-Pointed Star

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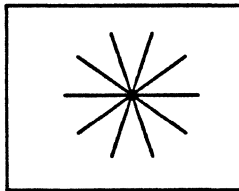
The preparation and the first three steps of this technique are the same as they are in the technique for making a regular polygon with five sides. Before you begin, set the detent to 72 degrees.



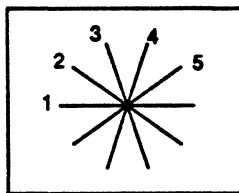
Create a horizontal line.



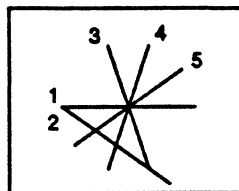
Duplicate the line and Rotate it.



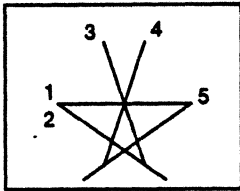
Continue to Dup and Rotate until you have five lines.



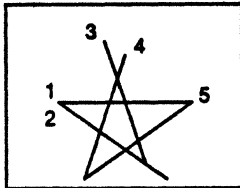
Each of the lines is labeled to help you follow the next steps.



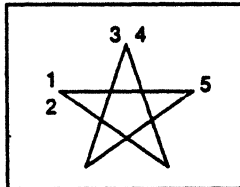
Select the line labeled 2 and Move its end to 1.



Select 5 and Move it to the other end of 1.



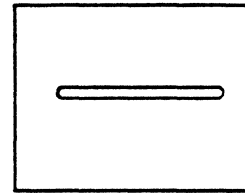
Select 4 and Move its unlabeled end to the unlabeled end of 5.



Select 3 and Move its unlabeled end to the unlabeled end of 4.



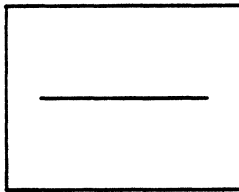
Group the five lines together.



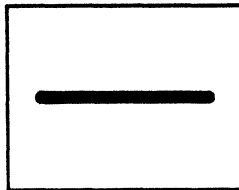
Creating Shadow Lines

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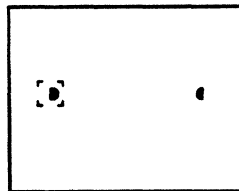
Shadow lines are lines of one color (black or white) overlaid with thinner lines of the other color. They are useful when a line must show up over both dark and light backgrounds.



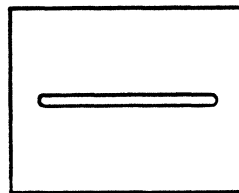
Create a line.



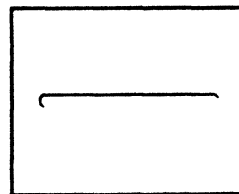
Change the Width of the line, and make it very thick and black.



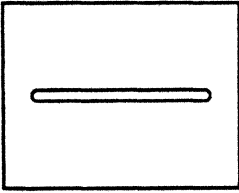
Duplicate the line. Your display will look like this.



Change the Width of the duplicate. Make it white and two widths thinner than the original.



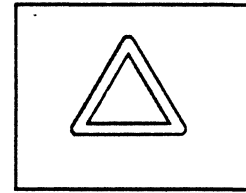
If you make the duplicate one width thinner, the lines will look like this.



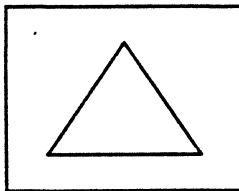
Group the lines together.

Creating Shadow Polygons

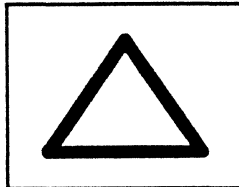
13



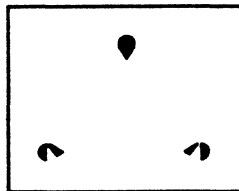
You cannot use shadow lines (Technique 12) to create polygons, because they are not lines, they are groups of lines. Instead, use this technique.



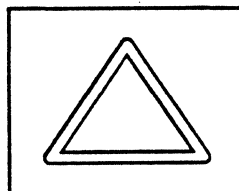
Create a polygon, using thin lines.



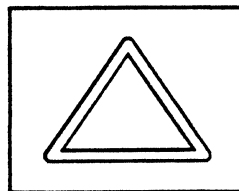
Make the border of the polygon thick and black.



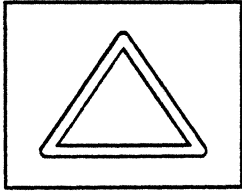
Duplicate the polygon. Your display will look like this.



Change the **Width** of the duplicate. Make it white, and two widths thinner.

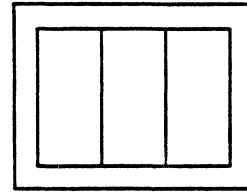


Select the duplicate polygon and **Lock the Fill**.



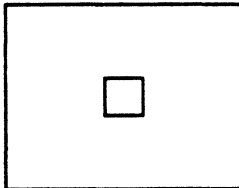
Group the two polygons.

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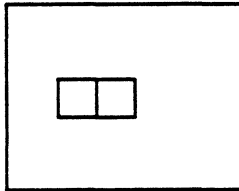


Dividing a Box into Equal Parts

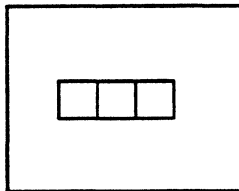
This technique works for dividing boxes either horizontally or vertically. It also works on horizontal or vertical lines.



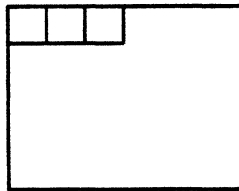
Create a box. Its shape and size do not matter.



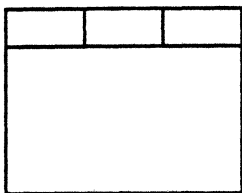
Dup the box and put the duplicate next to the first box.



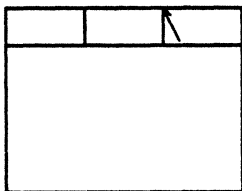
Repeat the previous step until you have as many boxes as you want to have parts to the box you are dividing.



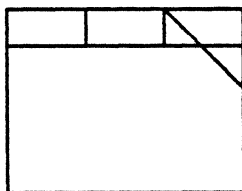
Move the little boxes to the upper left corner of the box you want to divide.



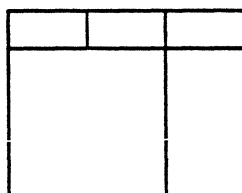
Size them horizontally until the edge of the last little box touches the upper right corner of the box you want to divide.



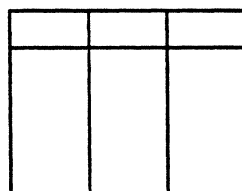
Point your mouse cursor at the top left corner of the last little box.



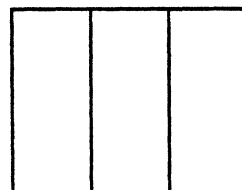
Create a line. Do not deselect it.



Size the line to a point and then Size it vertically to the bottom of the box you are dividing (Technique 1).



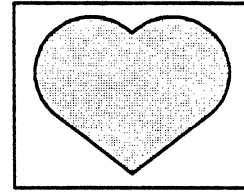
Select the line near its top and Dup it. Move the duplicate until it lines up with the right edge of the first box.



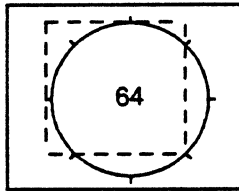
Select the little boxes and Cut them.

Creating a Heart

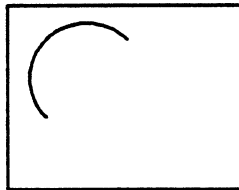
15



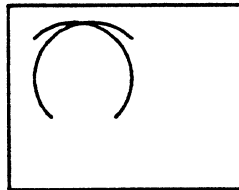
This technique uses the *Graphics* cabinet. Before you begin, open the *Arcs* document, in the *Shapes* folder.



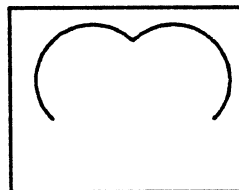
In *Arcs*, drag select and **Cut** the left and top quadrants of the circle labeled 64.



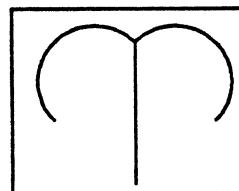
Paste in your diagram.



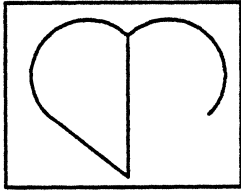
Dup and **Reflect Horizontal**.



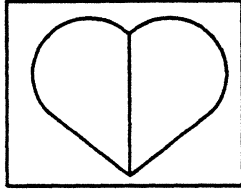
Select Again, point the mouse cursor at the far left corner of the duplicate, and **Move**.



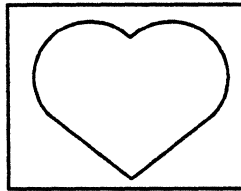
Put the mouse cursor at the intersection of the two arcs and create a vertical line (Technique 1).



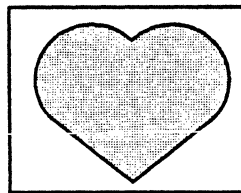
Put the mouse cursor at the bottom of the left curve of the heart and **Create** a line. **Size** the new line to the vertical line.



Create another line from the bottom of the right curve to the bottom of the vertical line.



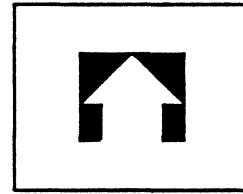
Cut the vertical line.



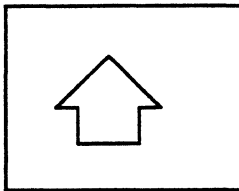
Drag select the heart and **Fill** it with a pattern.

Building a Reverse Arrow

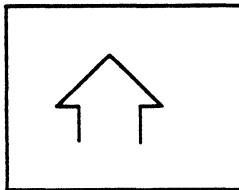
16



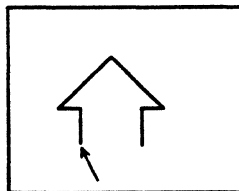
This technique also uses the *Graphics* cabinet. Before you begin, open the *Graphic* document, in the *Arrows* folder.



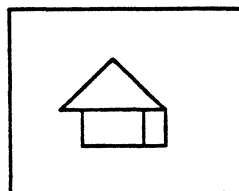
In *Graphic*, select and Cut this arrow. Paste it into your working space.



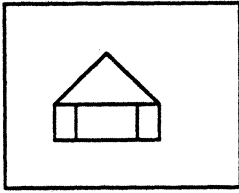
Edit the arrow. Select the tail and Edit it. Select the bottom line and change its width to the thinnest white line. Close and Close again.



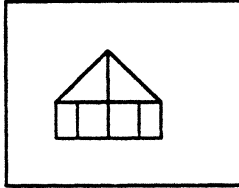
Point the mouse cursor at the lower left corner of the tail.



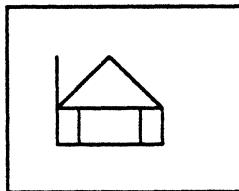
Create a box and Size it to the right corner of the arrow head.



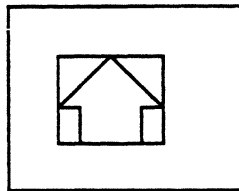
Select the box. With the mouse cursor pointing at its upper left corner, **Size** it horizontally to the left corner of the arrow head.



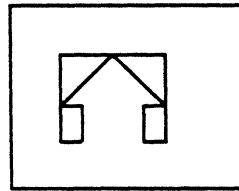
Create a vertical line from the tip of the arrow to the bottom edge of the box (See Technique 1). This line will help you create a box of exactly the right size.



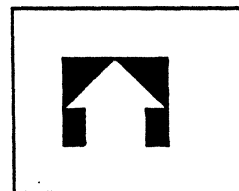
Select the line. With the mouse cursor pointing at its bottom, **Move** the line horizontally until it lines up with the left edge of the box.



Select the box. With the mouse cursor pointing at the upper left corner, **Size** the box vertically so that it snaps to the end of the line. **Cut** the line.



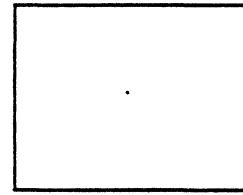
Select the box and execute the **Back** command.



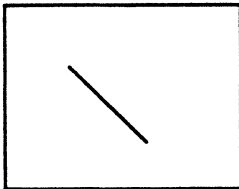
Fill the box with black (or any other pattern).

Creating Control and Gravity Points

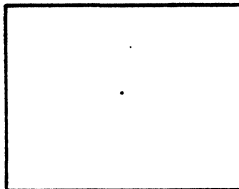
17



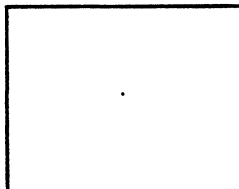
Control points on diagramming objects are the points through which objects are changed. You can also create your own control points to add to objects. These artificial control points will be used instead of the object's own control points.



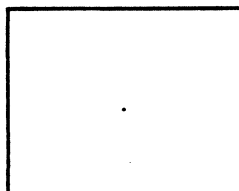
With GridAlign on, Create a line.



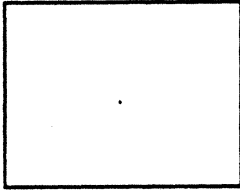
Size the line to a point. GridAlign will help you do this.



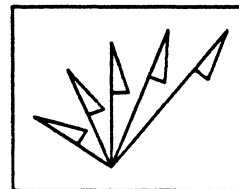
Lock size, width, and control on the point.



Position the point where you want to control the object and group it with the object.



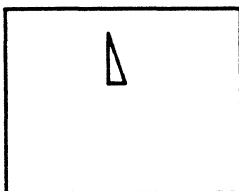
You can also create gravity points. Follow the first three steps above, but do not lock control. When Gravity is on, other objects will be attracted to these gravity points.



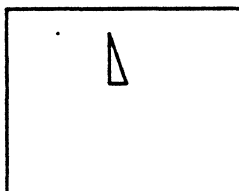
Building a Rotate Magnify Arrow 18

This technique shows you how to build the arrows in the *Chart* document, in the *Arrows* folder of the *Graphics* cabinet. If you want a Rotate Magnify arrow with an arrow head other than the ones we provide, use this technique to create it.

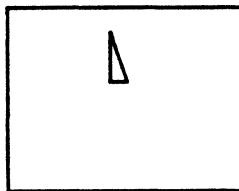
For this technique, Gravity should be on. It doesn't matter whether GridAlign is on or off.



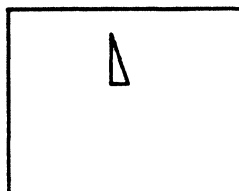
Create the lines in the arrow head first. Group the lines together to make a polygon.



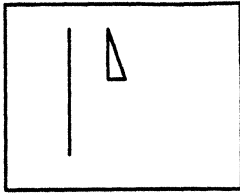
Create a control point (Technique 17), or copy one from the *Chart* document in the *Arrows* folder of the *Graphics* cabinet.



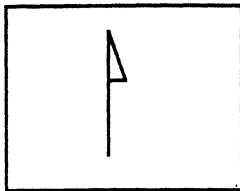
Move the control point to the tip of the arrow head.



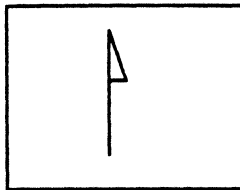
Group the arrow head and the control point together. Lock gravity and size on the group.



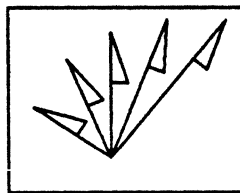
Create the arrow stem.



Move the tip of the arrow stem to the tip of the arrow head.



Group the stem and the arrow head together. Lock grouping.



Use **Rotate Magnified** to change the angle of the arrow and the length of the stem without affecting the size or shape of the arrow head.

Chapter 8

Making Charts

This chapter explains how to create and edit charts with the Interleaf publishing software and how to use various other diagramming features to tailor charts to your needs.

Charts are created and edited within the diagramming system discussed in detail in the *Diagramming* chapters. They are treated separately from the other diagramming objects because they are edited primarily by means of changes made to property sheets rather than by means of commands on the diagramming popup menus.

In this chapter diagramming operations are referred to but not explained. You need to understand the diagramming commands, **Create**, **Move**, **Size**, **Cut**, **Paste**, and **locks**. Please consult the chapters on the diagramming system for detailed explanations of these diagramming commands.

A Chart is a data-driven graphical object. As a part of the diagramming system, a chart is created in a frame. In this chapter, there are several brief references to the creation of frames. For a fuller explanation of frames, refer to *Page Makeup*.

This chapter covers the following topics:

- the types of data-driven charts you can create with the software
- the creation and modification of charts
- the organization and modification of properties on the **Edit Chart Data and Style sheets**
- the **Edit Chart Customize sheet**
- the addition of other diagramming elements to data-driven charts

If you have not already done so, please read *SignPosts*, the first chapter of the *Reference Manual*. It is a short overview of the Interleaf publishing software that provides the essential concepts needed to use this manual effectively.

The Types of Charts

There are three basic kinds of data-driven charts:

- bar charts
- line charts
- pie charts

Within the bar chart category, there are:

- vertical bar charts
- horizontal bar charts
- 100% horizontal bar charts
- surface charts

Figure 8-1 shows an example of each type of bar chart, using the same data and the same textures for the bars, and a surface chart using negative as well as positive values.

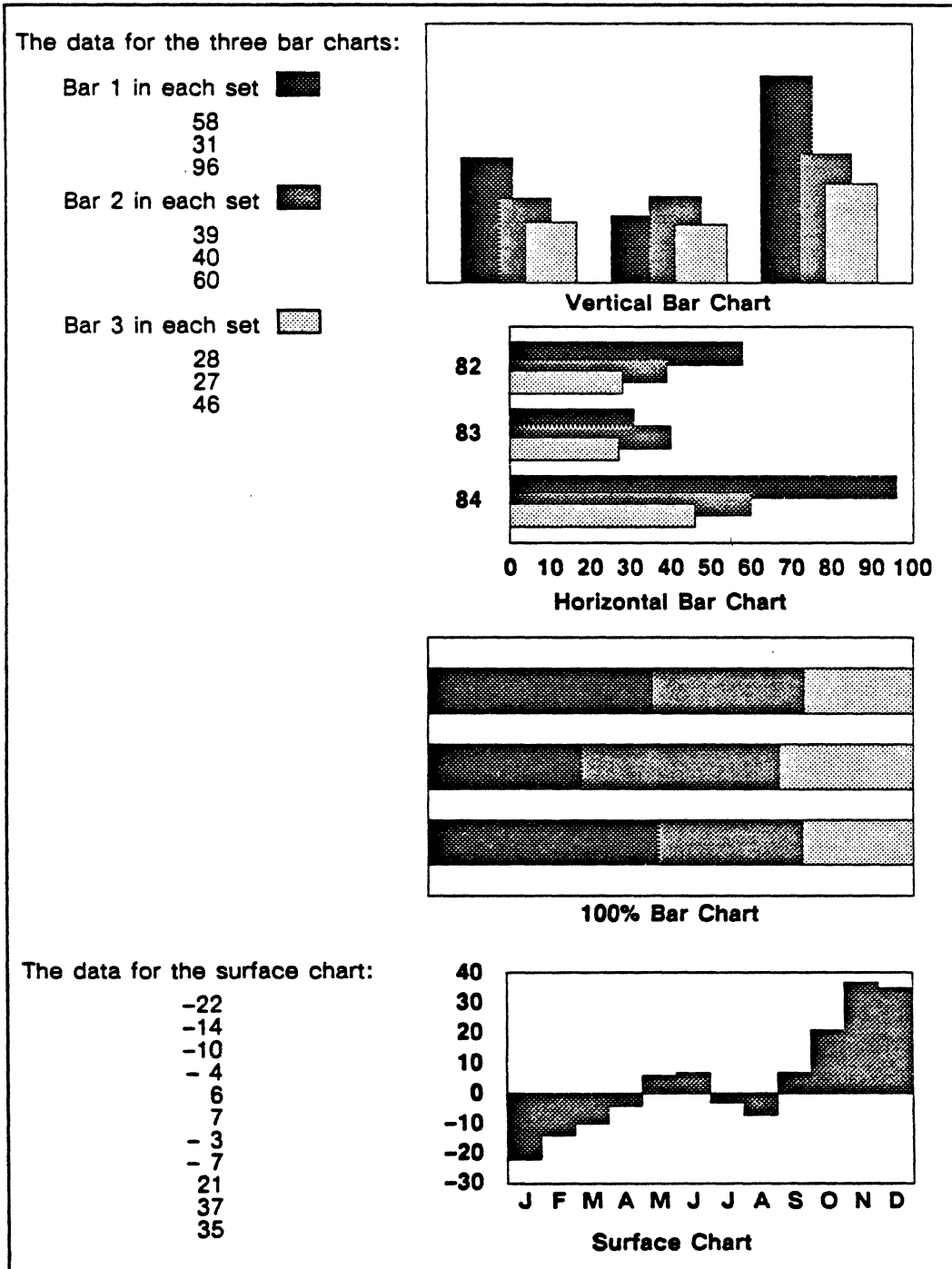
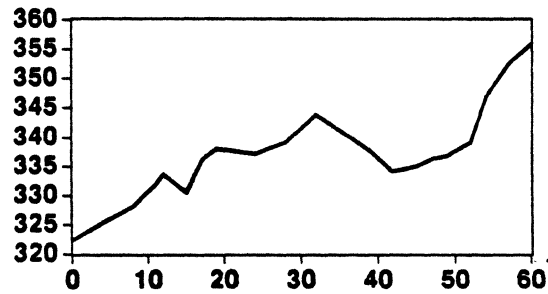


Figure 8-1. Bar and surface charts

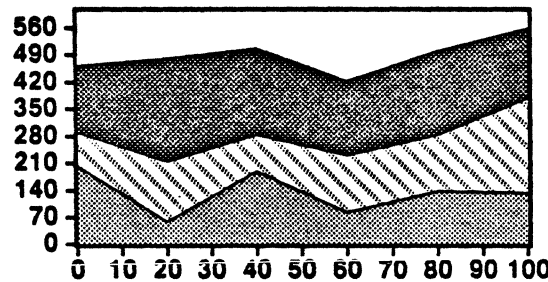
The line chart category includes:

- standard line charts
- filled line charts
- scatter charts

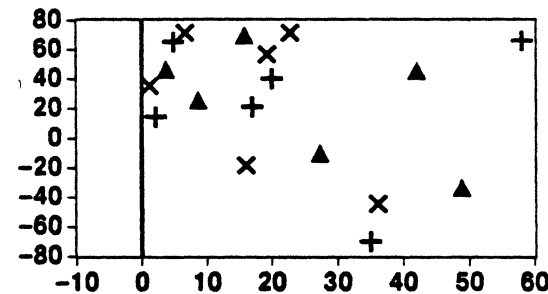
Figure 8-2 shows examples of the three using different data for each.



Line Chart



Filled Line Chart



Scatter Chart

Figure 8-2. Line, filled line, and scatter charts

There is only one kind of pie chart, but a single pie chart can contain more than one pie, and each pie can have one wedge that is exploded. Figure 8-3 shows

two pie charts. In the bottom chart, there are three pies, each with a different wedge exploded.

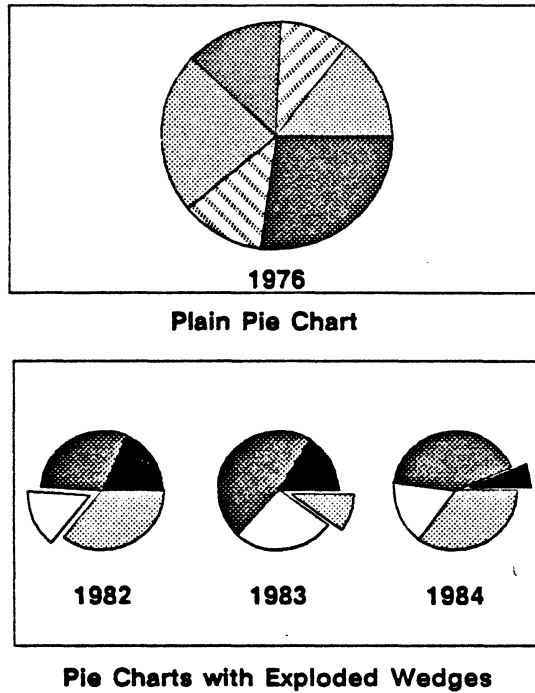


Figure 8-3. Pie charts

Creating a Chart

There are two basic ways to create a chart.

- You can execute the **Chart** command on the **Create** submenu of the **Diagramming Nothing Selected** popup menu (Figure 8-4).

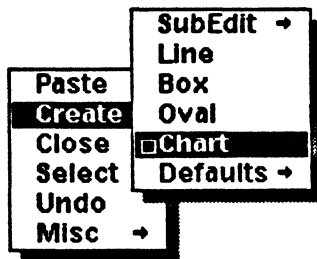


Figure 8-4. Create submenu of the diagramming nothing selected popup menu

- You can copy a chart from somewhere else, usually from one of the documents in the folder named *Charts* in the *Graphics* cabinet on your desktop.

The **Create Chart** command produces a *bar chart*. Since you can edit it, you can use this chart as the basis for any kind of chart, but it is most appropriate if you have data for a bar or pie chart.

If you have other kinds of data or you want to pick a chart to edit that most closely resembles the chart you want to construct, open the *Graphics* cabinet and the *Charts* folder.

In the *Charts* folder, there are four documents. To see the entire range of data-driven charts that Interleaf offers, open *AllCharts*. Each of the other three documents gives you only a specific portion of the charts.

- *Bars* contains bar charts and surface charts;
- *Lines* contains line, filled line, and scatter charts;
- *Pies* contains pie charts.

Using ScratchPad

You can create charts in any document you choose. However, in the *Graphics* folder, Interleaf also provides a document called *ScratchPad*, which is an 11.5 by 11.5 inch frame with rulers along the top and the left side. Because it has rulers to guide you and plenty of room in which to maneuver the various elements, *ScratchPad* is the ideal place to construct a chart and get its margins, text, and legends in the right positions.

When you have a chart in *ScratchPad* that pleases you, you can copy it and paste it into your document and let the software create a frame for it that is exactly the right size.

The discussion of chart-creation that follows assumes that you will create and edit charts in *ScratchPad* and, then, copy them into your documents. Most of the process is the same if you create a chart in a document, but you will have to create a frame in which to put the chart before you begin.

Since the *ScratchPad* in the *Graphics* cabinet is a template document, the individual user cannot change it. The best thing to do is make a copy of *ScratchPad*. This copy will belong to you, and you can do what you want in it and, then, save the changes you make.

To create a frame in ScratchPad:

- ✓ Open a copy of *ScratchPad*.
- ✓ Create a box the size you want the chart plus any surrounding text and legends to be.

- ✓ Inside this box, create another box the size you want the chart itself to be.

At this point, do not worry about the placement of the boxes in relation to each other. Later, after you have edited the chart and when you are adding text and diagramming elements, you can position everything more precisely than you can now.

- ✓ Use the **Chart** command on the **Create** submenu of the **Diagramming Nothing Selected** popup menu.
- or ✓ Use the **Cut** command to copy a chart from one of the documents in the *Charts* folder, and **Paste** it into *ScratchPad*.

The charts in the documents in the Charts folder are cutting-locked, so that you can cut them to make a copy without affecting the chart in the original document.

- ✓ **Size** the chart to the size of the smaller box, and **Deselect**.

*A chart consists not only of the area in which the data is displayed but also of the margins around this data, so the area with the data in it is smaller than the box you sized. In the section on the **Edit Chart Style sheet**, we discuss how to change the data margins.*

Once you have a chart in *ScratchPad*, you can use the **Edit Chart** sheets to fashion it into the right chart for the circumstances.

When you finish editing the chart and adding text and legends to it in *ScratchPad* you can move it to your document.

To move a chart from ScratchPad to a document:

- ✓ **Cut** the larger box and everything inside it.
- ✓ In your document, **Create** an empty component.
- ✓ Use the **Paste** command on the **Text Location Selected** popup menu (*Figure 8-5*).

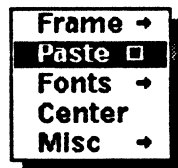


Figure 8-5. Text Location Selected popup menu

*The software creates an **At Anchor** frame the correct size for the box and puts everything into this frame.*

- ✓ If you like, **Cut** the outside box.

The Edit Chart Sheets

There are three **Edit Charts** sheets, the **Data** sheet, the **Style** sheet, and the **Customize** sheet. The **Data** and **Style** sheets are the two that you will use most of the time, and they are the two that are analyzed most thoroughly in this section.

This section covers the following topics:

- an overview of the **Data** and **Style** sheets
- the methods used to enter information on the **Edit Chart** sheets
- a discussion of the **Data** sheet
- a glossary of the information entered on the **Style** sheet
- the **Customize** sheet

To access the Edit Chart Sheets:

Select the chart.

Execute the **Props Edit** command on the **Diagramming Object Selected** popup menu (*Figure 8-6*).

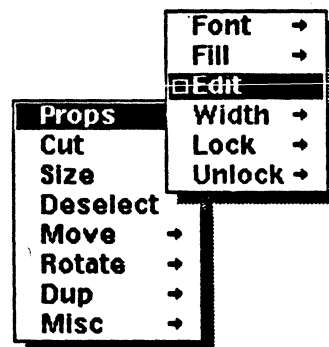


Figure 8-6. Diagramming Object Selected popup menu

The Edit Chart sheets appears in a window in the upper right-hand portion of your desktop. The Edit Chart sheets can be very large. To see all the choices available to you, either Resize the window or scroll the sheet.

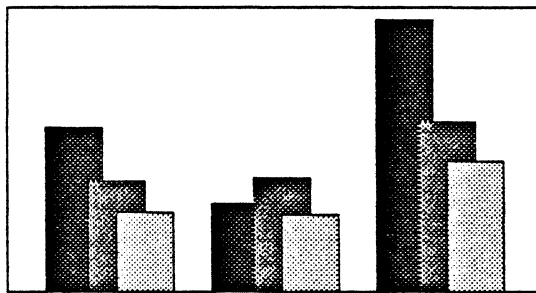
An Overview of the Data and Style Sheets

The **Data** and **Style** sheets for the various types of charts are both similar and different. For example, on the **Data** sheets for all types of charts, you are asked some of the same questions, but on the **Data** sheet for charts of the *line chart*

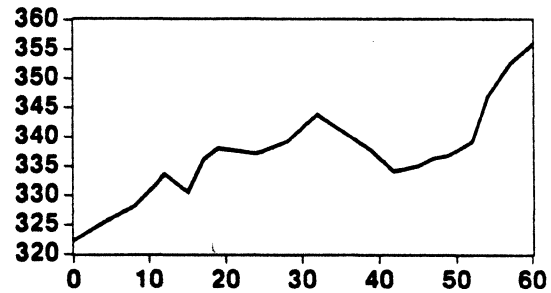
type, you are asked other questions about horizontal values that are appropriate to charts of this type, but not to charts of other types.

There are other obvious differences: The Data sheet for a *bar chart* has only one piece of data for each bar, while the Data sheet for a *line chart* has two pieces of data (the x and y coordinates) for each point on the line. On the Style sheet for a *bar chart*, there is an item called *bar/gap size* that does not appear on the Style sheet for a *line chart*. Similarly, on the Style sheet for a *line chart*, there is an entry for line options that does not appear on the sheet for a *bar chart*.

Figure 8-7 shows the Data sheets for a *vertical bar chart* and a *line chart*, and Figure 8-8 shows their Style sheets.



Vertical Bar Chart



Line Chart

Edit Chart Sheet: **data** style customize

Do you want to erase all data? yes

Do you want to erase all unused data? yes

Do you want to scale axis yourself? yes no

vertical axis: minimum maximum

↑

	text	1	2	3	4
1	82	56	38	28	0
2	83	31	40	27	0
3	84	96	60	46	0
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

Edit Chart Sheet: **data** style customize

Do you want to erase all data? yes

Do you want to erase all unused data? yes

Do you want lines to have same hor. values? yes

Do you want lines to have same hor. increment? yes

Do you want to scale axis yourself? yes no

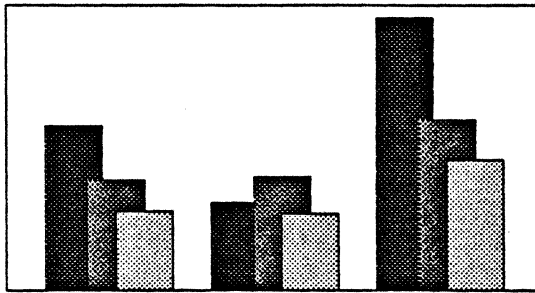
vertical axis: minimum maximum

horizontal axis: minimum maximum

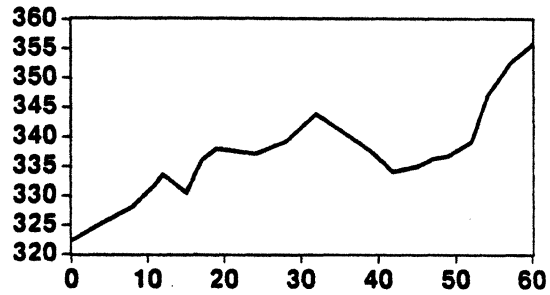
↑

	x	line 1	hor	ver	x	line 2	hor	ver	x	line 3	hor	ver
1	0	322.4										
2	4	325.4										
3	8	328.2										
4	11	332.1										
5	12	333.6										
6	15	330.7										
7	17	336.1										
8	19	336.1										
9	24	337.2										
10	26	338.2										

Figure 8-7. A bar chart and its data and style sheets



Vertical Bar Chart



Line Chart

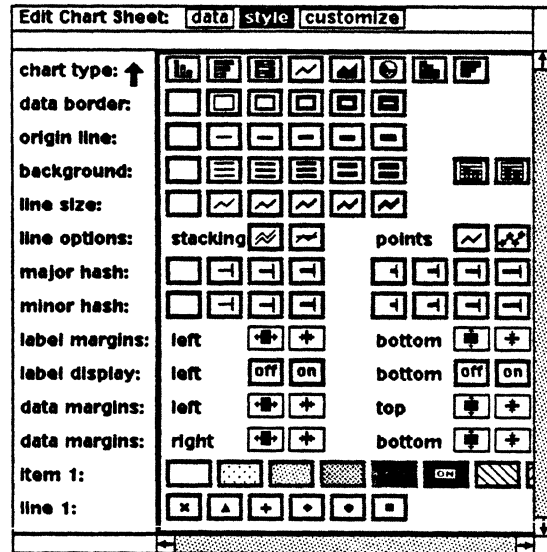
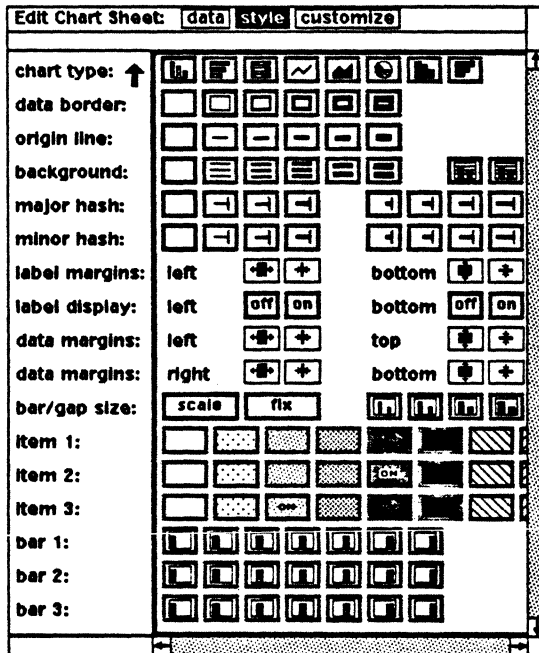


Figure 8-8. A line chart with its data and style sheets

How Changes Are Made on Edit Chart Sheets

On the Edit Chart sheets, some information is entered in the same ways that it is on property sheets elsewhere in this publishing software, but there are also a couple of methods for registering changes that are unique to chart-making. In the following list, you will be familiar with typing in information and turning boxes *on* and *off*, but the other methods may be unfamiliar to you.

- Data can be either typed in or copied from elsewhere and pasted into the Data sheet. Copying data is dealt with in a later section of this chapter, *Pasting and Copying Data*.
- Other numeric values, such as the values for axes if you choose to scale them yourself, must be typed in.

- Much of the information is registered by turning boxes *on* or *off*.
- The size of margins can be adjusted by using the left and right mouse buttons.
- Questions that are followed by a single box containing *yes* can be answered affirmatively by pointing the mouse cursor into the box and clicking the left mouse button.

When you want to apply the changes you have made or to close the **Edit Chart** sheets, you hold down the middle mouse button to see popup menus just as you do on other property sheets.

The **Edit Chart** sheet popups have a few entries on them that do not appear on the other property sheet popups, and there are different popups for the **Data** sheet and the **Style** and **Customize** sheets (*Figure 8-9*). **Paste Data**, and **Copy Data** are dealt with later in this chapter.

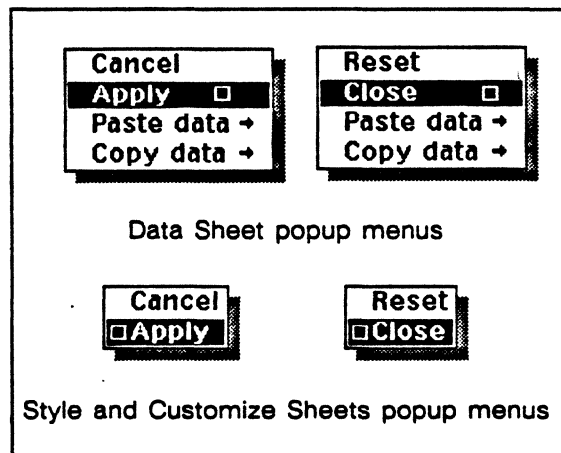


Figure 8-9. The Edit Chart popup menus

Typing In Information

You *can* type data into the **Data** sheet, and you *must* type in some information, such as what you want the axes to be if you want to scale them yourself. As elsewhere on property sheets:

- When you start typing, the contents of the field are automatically erased.
- You confirm an entry by pressing the **TAB** or **RETURN** key.

Sometimes, you may want to edit the contents of one of these boxes rather than completely change it. Using a combination of **<CONTROL>** key sequences or the arrow keys and the ****, you can move the editing cursor and delete individual values. Then, you can type in your changes and confirm.

All <CONTROL> key sequences involve holding down the <CONTROL> key and typing the appropriate letter.

- <CONTROL>f or → moves the cursor forward a character
- <CONTROL>b or ← moves the cursor backward a character
- <CONTROL>n or ↓ moves the cursor down to the corresponding box in the next row
- <CONTROL>p or ↑ moves the cursor up to the corresponding box in the previous row
- <CONTROL>d deletes the character to the right of the cursor
- DEL deletes the character to the left of the cursor.

Entering Information by Turning Boxes On

Most of the information on the *Style* sheet is entered by pointing into a box and clicking the *left* mouse button to turn one choice *on*. Turning one box *on* automatically turns the previous choice *off*. **Chart type** and **data border** are examples of this type of information (*Figure 8-10*).

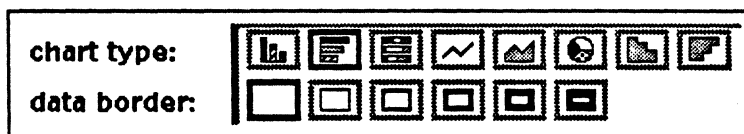


Figure 8-10. Examples of boxes that register information on the Style sheet

In this figure, the border around the icon for the *horizontal bar chart* is black meaning that this is the **chart type**, and the left-most box next to **data border** is black meaning that there will be no border around the data. *Figure 8-11* shows the chart that results from these settings.

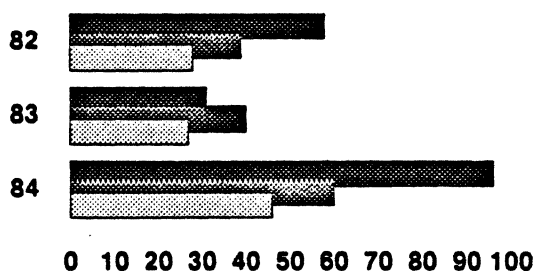


Figure 8-11. Horizontal bar chart with no data border

Entering Information by Turning Boxes On or Off

On the *Data* sheet, it is usually necessary to turn boxes *off* as well as *on* since more than one box can be on in most categories. The numbered boxes above and

to the left of the data are examples of this kind of box. *Figure 8-12* shows the Data sheet for the chart in *Figure 8-11* with the entire entry for 84 turned off and bar 2 turned off in the remaining entries.

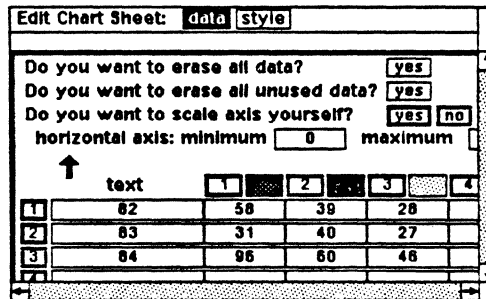


Figure 8-12. Data Sheet with boxes turned off

You turn off a box the same way you turn one on: by pointing the mouse cursor into a box with a heavy black border and clicking the left mouse button.

Altering Margins

Another way you change some of the information on the Style sheet is by using the left and right mouse buttons to alter the size of something, usually a margin. The data margin settings are an example of information that is registered in this way (*Figure 8-13*).

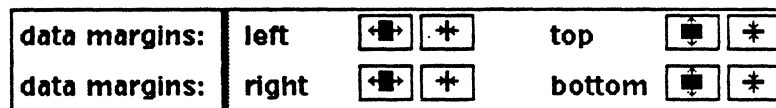


Figure 8-13. Data margins boxes

Pointing the mouse cursor into one of these boxes and clicking the left button causes a large change in the size of margin, while pointing and clicking the right button causes a very small change and is used for making fine adjustments.

Because you need to see how the space is changing in response to your clicking, it is often a good idea to use the Apply command of the Edit Chart popup menu after every click of the left button and ever few clicks of the right button. Since Apply is the default, you can set up a very efficient rhythm of click, click, apply, click, apply.

The pattern for pairs of boxes that look like the ones in *Figure 8-13* is as follows:

- The left-hand box makes the margin larger.
- The right-hand box make the margin smaller.

When you make a data margin larger, you increase the part of the chart outside of the area in which the data themselves are displayed (*Figure 8-14*).

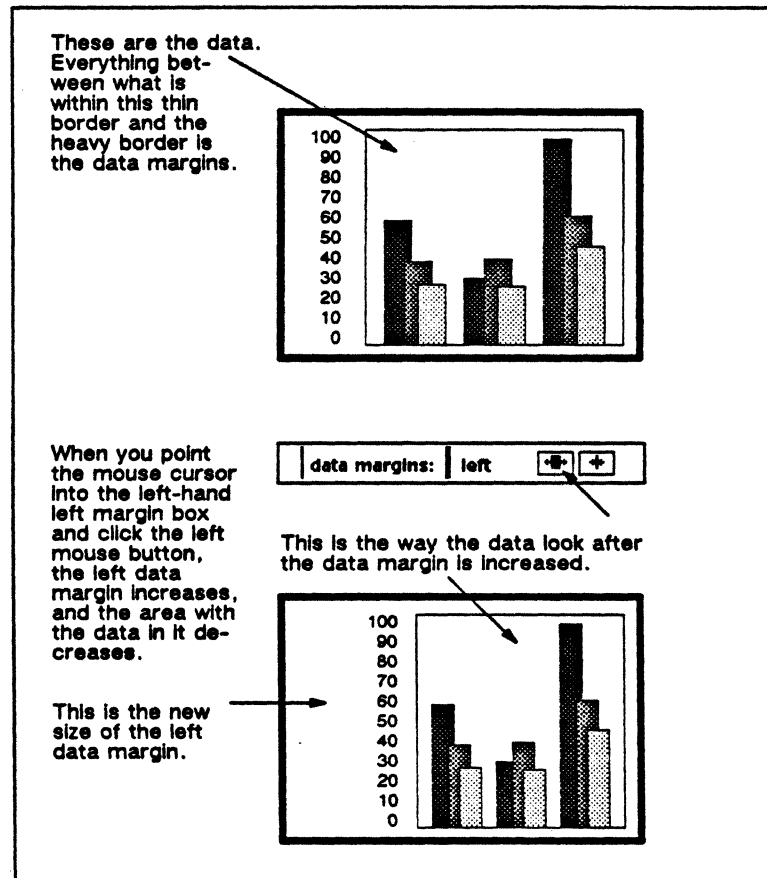


Figure 8-14. Changing data margins

You can manipulate data margins so that they disappear and the area in which the data appears is the same size as the entire chart. This can be very useful when you want all your charts to be exactly the same size. However, if your chart has labels, these labels will disappear from the screen, but they will print unless you turn *off* the label display settings.

Another kind of margin is the label margin (Figure 8-15). A label margin is the distance between the label (often numbers) and the data. Label margins are

changed the same way data margins are. For *pie charts*, only the bottom label margin has any meaning.

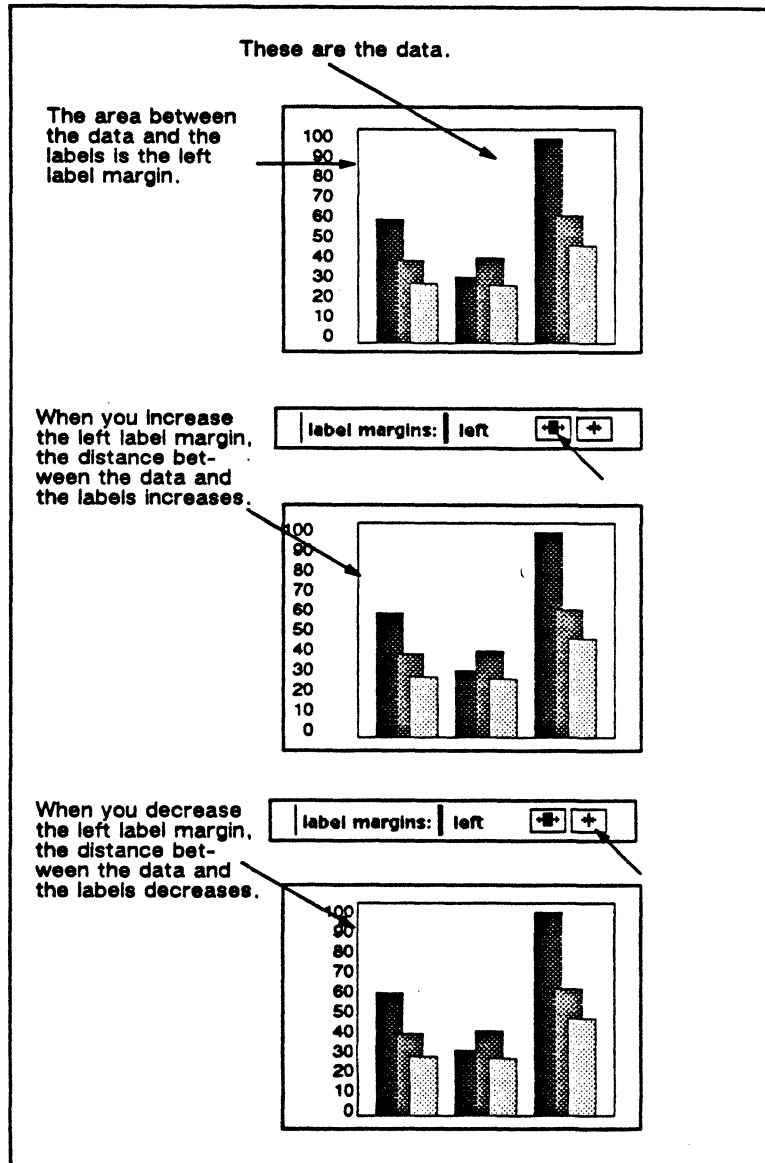


Figure 8-15. Changing label margins

You can increase label margins so much that the labels disappear from your screen because they are outside of the chart, but they will appear when you print the chart. You can decrease label margins so much that the labels appear on top of the data. To avoid both eventualities, make sure that you turn *off* the **label margin** settings if you do not want the labels to print.

Answering Questions

On the **Data** sheet for every kind of chart, there are questions that you need to answer only if your answer is *yes*. *Figure 8-16* shows the two questions that appear on all the **Data** sheets.

Do you want to erase all data?	<input type="checkbox"/> yes
Do you want to erase all unused data?	<input type="checkbox"/> yes

Figure 8-16. Questions on the Data sheet

If you point the mouse cursor into one of these boxes and click the left mouse button, the action will occur immediately. In the second question, “unused data” refers to data in rows and columns that are not active, that is, not turned *on*.

The Data Sheet

The information entered on the **Data** sheet determines the kind of chart that is most suitable because it is the data that are represented visually by the chart.

Next to the horizontal numbered boxes at the top of the data are boxes that show what the texture of the item is.

Pasting and Copying Data

Giving visual representation to data is the purpose of charts. On the **Data** sheet for each of our charts, you can type in the data you want to use, but you can also copy data from text and paste it into the **Data** sheet. This will both save you time and reduce the possibility of error.

Much of the data you will want to paste into a Chart Data sheet may come from a spreadsheet program. This section deals with copying data that are already in a document on your desktop.

On both the Data Sheet popup menus, there are two related commands, Paste Data and Copy Data. They have the same submenu (Figure 8-17).

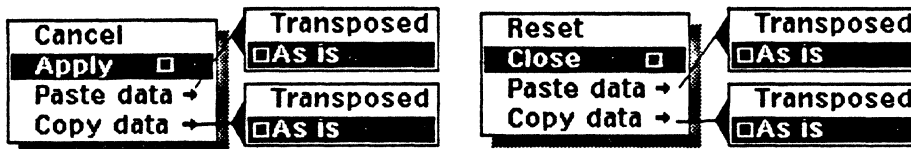


Figure 8-17. Paste Data and Copy Data submenus on the Edit Chart Data sheet

With these commands, you can often avoid the necessity of typing your data into the data sheet. For example, if you have spreadsheet data in an Interleaf document, you can copy the data using the copy command on the Text Selected popup menu (Figure 8-18).

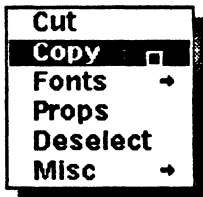


Figure 8-18. Text Selected popup menu

Then, you can paste the data into a data sheet using the Paste Data command.

Similarly, if you have data in one chart that you want to use in another chart or in the text of a document, you can use the Copy Data command on one of the Data Sheet popup menus to copy the data and, then, paste it somewhere else.

The Paste Data Command

The Paste Data command is used to paste data into a Chart Data sheet. Before you paste data into a data sheet, you must do one thing and you may want to do another.

- You must turn on enough numbered boxes across the top and down the left side of the data sheet to accommodate the data. If you do not have enough boxes on, some of the data will be lost.

- You may want to erase all the data already on the sheet. If the data are not part of the chart you are constructing, the numbers on the sheet may get in the way and make it difficult for you to see your own data and the relevant settings.

On the **Paste Data** submenu, there are two choices, **As Is** or **Transposed**. If you paste data **As Is**, the structure of the rows and columns is maintained as it was in the original. If you paste data **Transposed**, the rows and columns are reversed with the row becoming columns and the columns becoming rows. *Figure 8-19* shows examples of the action of both commands.

These data are copied from the text of a document:

18.5	72.9	13.75	11.2
12.87	13	0	92.4
16.23	18.12	74.4	18.7
10.13	0	4.82	-16.12

When they are pasted **As Is**, this is how the Edit Chart Data sheet looks:

When they are pasted **Transposed**, this is how the Edit Chart Data sheet looks:

Figure 8-19. Pasting data

The text in *Figure 8-19* is in an easy form for pasting into a Chart Data sheet because it consists of only digits (including 0's where there is no entry), Tabs, and Returns.

The **Paste Data** command ignores words, so the data would be just as easy to paste into a Chart Data sheet if the text looked like the following:

Administrative	18.5	72.9	13.75	11.2
Professional	12.87	13.	0	92.4
Research	16.23	18.12	74.4	18.7
Manufacturing	10.13	0	4.82	-16.12

You can copy all the text from *Administration* through *-16.12* and paste it into the **Chart Data** sheet.

The **Paste Data** command also interprets parentheses around data as indicating that the number is negative. Therefore, if the last item had been *(16.12)*, it would have been pasted into the **Data** sheet as *-16.12*.

Data in the following form would have to be dealt in a different way:

Administrative 1/1/85	18.5	72.9	13.75	11.2
Professional 1/1/85	12.87	.	.	92.4
Research 1/1/85	16.23	18.12	74.4	18.7
Manufacturing 1/1/85	10.13	.	4.82	-16.12

The **Paste Data** command interprets all numbers as data. Therefore, it would put the numbers in the dates *(1/1/85)* into separate data fields. To avoid this, you can either delete the dates before copying the text or copy and paste the data line-by-line. The first alternative is usually preferable.

Blank fields and decimal points with no numbers next to them are skipped over by the **Paste Data** command, and it moves the data over to fill up the blank fields on the **Data** sheet. To avoid this, type *0*'s into the blank fields and either type *0*'s on one side of each decimal (i.e., *0.* or *.0*) or substitute *0*'s for the decimals before you copy the text.

The Copy Data Command

The **Copy Data** command is used to copy data from a **Chart Data** sheet, so that they can be used elsewhere, for example, in the text of a document or as the data for another chart.

Before you use the **Copy Data** command, you must make sure that only the rows and columns you want to copy are turned on.

On the **Copy Data** submenu, there are two choices, **As Is** or **Transposed**. If you copy data **As Is**, the structure of the rows and columns is maintained in the copy. If you copy data **Transposed**, the rows and columns are reversed in the copy with the rows becoming columns and the columns becoming rows.

Using Paste and Copy on the Same Chart Data Sheet

For *Figure 8-19*, the data was copied from text and pasted into the **Chart Data** sheet using the **As Is** command. Then, the same data was copied from text and pasted into the same **Chart Data** sheet using the **Transposed** command.

An alternative would have been to copy the data from text only once and then use a combination of the **Paste Data** and **Copy Data** commands to transpose the data on the **Chart Data** sheet.

To reverse the rows and column data on a **Chart Data** sheet:

- ✓ Use the **Copy Data As Is** command.
- ✓ Make sure that the rows and columns you want to paste the data into are the *only* ones that are turned on.
- ✓ Use the **Paste Data Transposed** command.

As you undoubtedly realize, the results would be the same if you used the **Copy Data Transposed** command and, then, the **Paste Data As Is** command.

The Elements on the Style Sheets

This section is divided into two parts. In the first part, several settings that have interrelated parts are presented in detail. In the second part, the more self-evident settings are presented in glossary form. In the second section, the definitions are arranged in alphabetical order.

Differing Elements Among Chart Styles

The **Style** sheets are dynamic; that is, they change according to the type of chart selected, and there are several elements of chart style that pertain to one kind of chart, but not to the others. For example, **bar/gap size** appears only on the **Style** sheet for *bar charts*, **line** choices appear only on the **Style** sheet for *line charts*, and **pie** choices appear only on the **Style** sheet for *pie charts*.

These three options are presented in the following sections.

Scaling and Fixing the Size of Bars and Gaps

When you are editing a bar chart, the **scale** and **fix** options will help you make the *bars* the size you want them and help you position the *sets of bars* the distance you want from each other.

What Scale Does

Scale gives you six options represented by icons. If you turn on the left-most icon, you get thin bars with wide gaps between the sets of bars (*Figure 8-20a*). If you turn on the right-most icon, you get wide bars with overlapping sets of bars (*Figure 8-20b*).

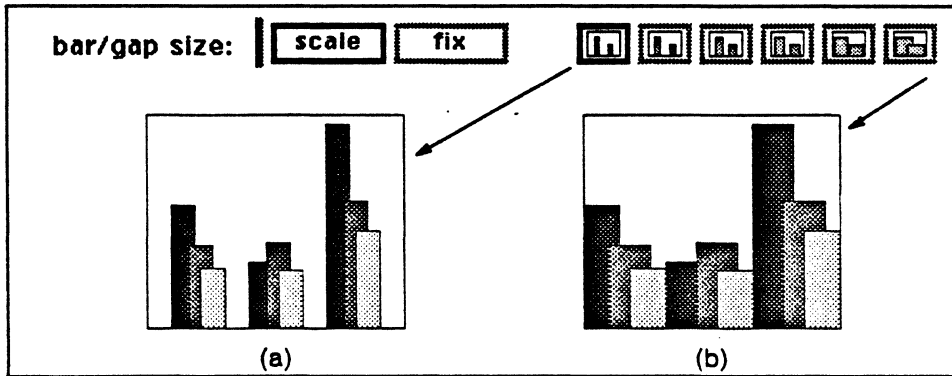


Figure 8-20. Scaling the size of bars and gaps

What Fix Does

If the six scale options do not offer enough variety, you can use **fix** to make even finer adjustments.

When you switch from **scale** to **fix**, use the **Apply** command before you start adjusting the settings, so that you can see the chart you are beginning with.

When **fix** is on, you see three pairs of boxes (Figure 8-21).

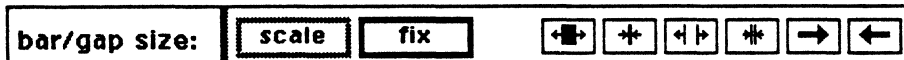


Figure 8-21. Fixing the size of bars and gaps

- Use the left-hand pair to make the bars wider or narrower .
- Use the middle pair to make the gaps between the sets of bars wider or narrower .
- Use the right-hand pair to move all the sets of bars to the right or to the left . (When you are editing a horizontal barAs you chart, will move the bars down, will move the bars up.)

To manipulate any of these settings, you point into a box and click the left or right. Because **fix** is used primarily for fine-tuning, you will probably use the right button more than the left button. Figure 8-22 shows two charts that have been fixed using these boxes.

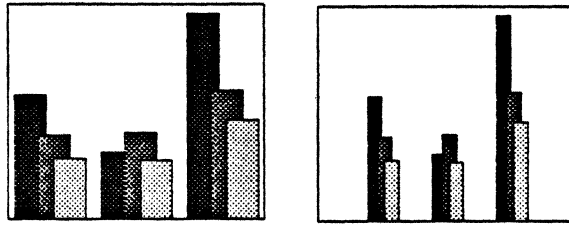


Figure 8-22. Two charts that have been altered using the fix settings

Line Choices

For *line*, *filled line*, and *scatter charts*, the various **line** choices represent different possibilities. They are used in conjunction with one another to produce different results.

The **line size** and the **point** choices determine whether the chart will be a *line chart* or a *scatter chart*. If the left-hand **line size** box and the right-hand **point** box are turned *on*, the chart will be a *scatter chart* (Figure 8-23a). Otherwise, it will be a *line chart* (Figure 8-23b), and the lines will be of the thickness represented by the icon that is turned *on*.

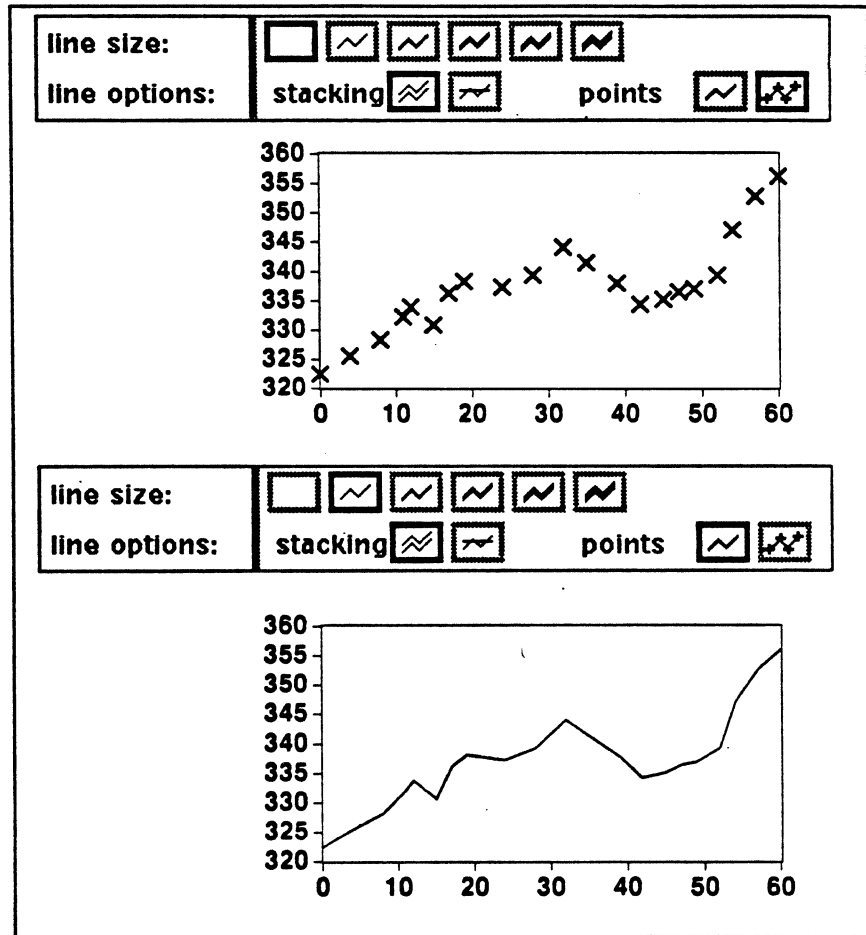


Figure 8-23. Line choices

Stacking has meaning only if there is more than one line in the chart. If there is more than one line and the left-hand box is turned *on*, line 2 will not cross line 1 regardless of the data. If the right-hand box is turned *on*, the lines will cross each other if this is appropriate to the data. Figure 8-24 shows the how the same data looks with *stacking on* and *off*.

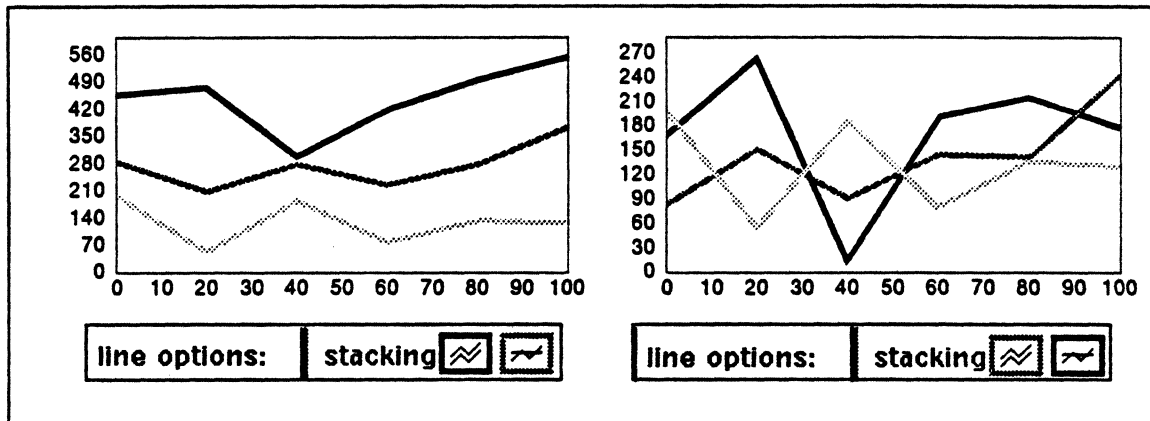


Figure 8-24. Stacked and unstacked lines

Pies and Exploded Wedges

Pie charts have a few properties that do not apply to other charts, such as radius. Figure 8-25 shows a pie chart and the settings for these qualities. The numbers in the boxes next to radius represent adjustments that the software makes depending on the overall size of the chart. The setting of 100 is deemed the most pleasing setting for radius, and the other settings are smaller or larger than this.

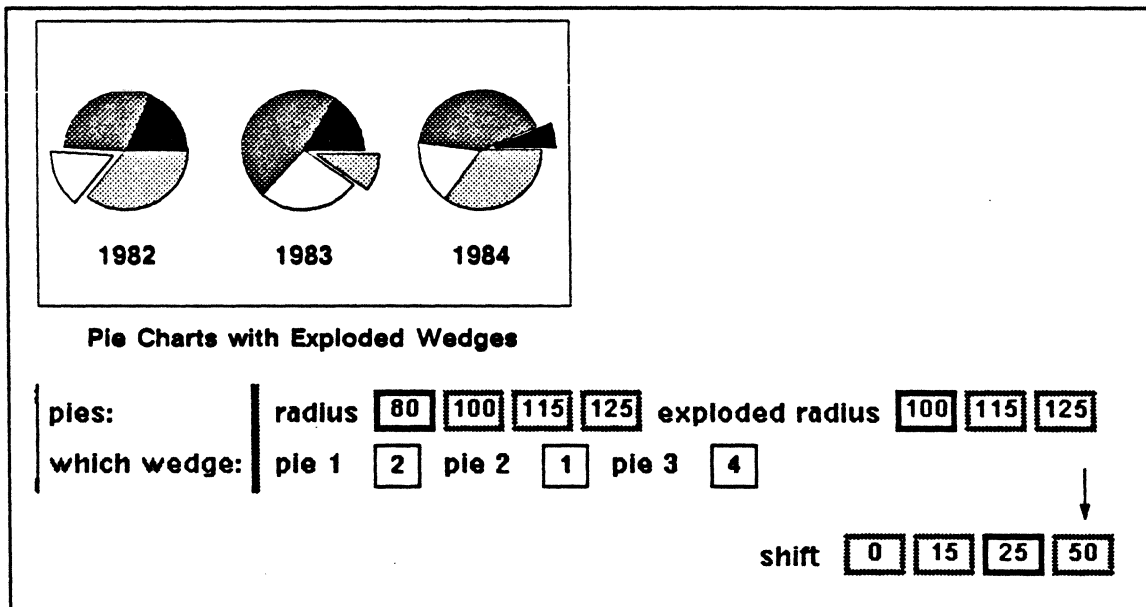


Figure 8-25. Pie charts

The exploded radius and shift settings can be combined with radius in a variety of ways. For example, in the chart in Figure 8-25, different wedges are exploded and shifted.

A Style Sheet Glossary

Background. If the left-most box is *on*, there are no background lines. The next five icons represent the thickness of lines if they do appear. The other two icons are used for determining whether the lines will appear behind the data (the left one) or in front of the data (the right one). *Figure 8-26* shows these icons.



Figure 8-26. Background lines

Bar [1, 2,...]. The icons next to bar represent the placement of each bar within a set of bars in relation to each other. *Figure 8-27* shows the charts that result from three different settings.

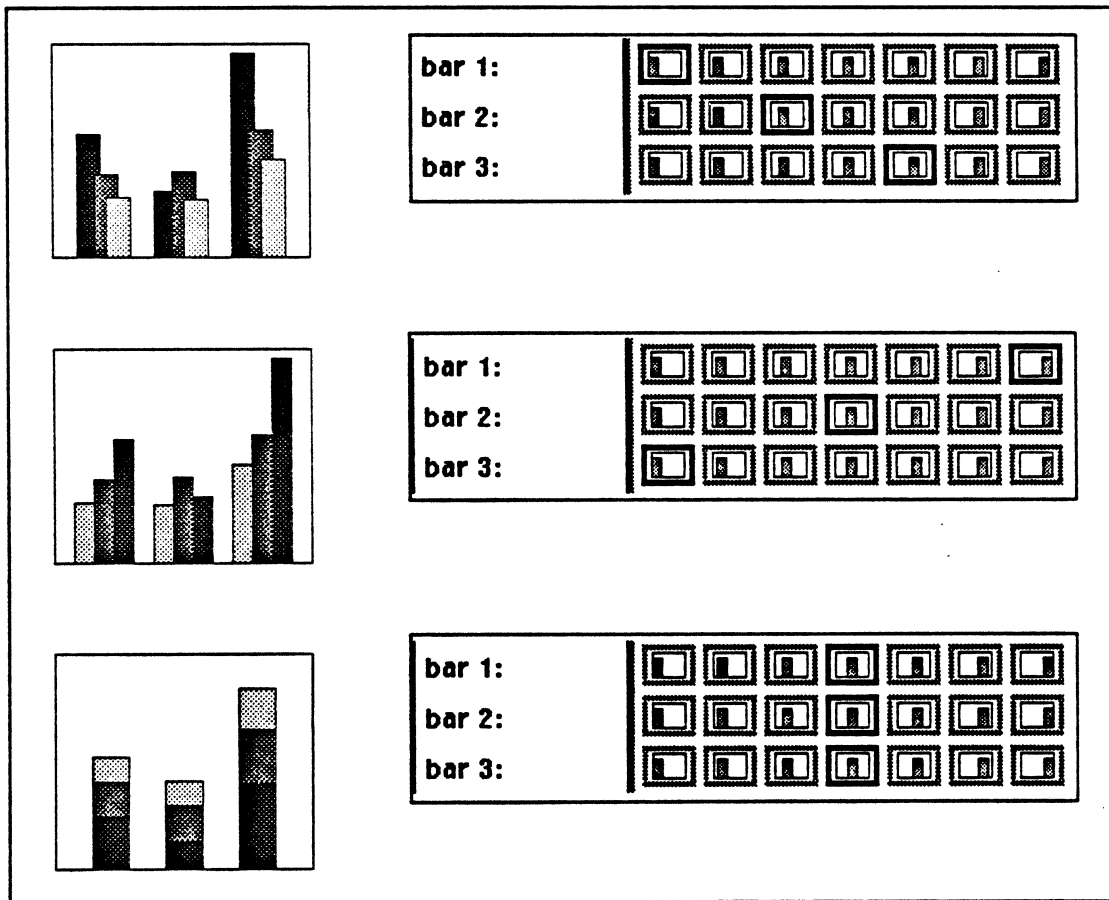


Figure 8-27. Bar settings

Chart type. The icons represent the types of charts (*Figure 8-28*). It is only useful to change chart type if your data is appropriate for the new chart type.

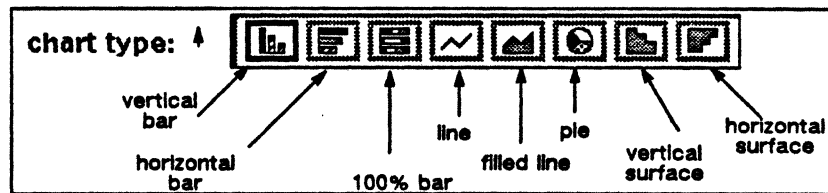


Figure 8-28. Chart types

Data border. The icons represent the thickness of the border around the data. Figure 8-29 shows a chart with no border and one with the third icon on.

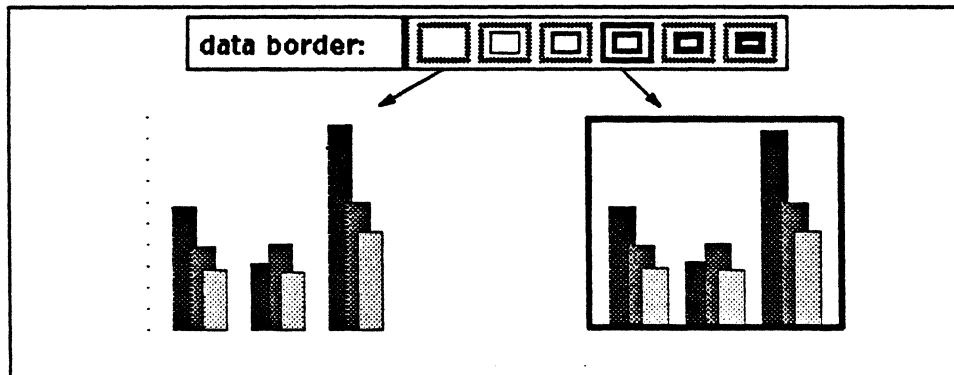


Figure 8-29. Data borders

Data margins. These boxes are used to alter the size of the margins around the data. They are discussed in the section, *Altering Margins*.

Item [1, 2,...]. These icons represent the available textures. Figure 8-30a shows the first seven textures as you see them on your screen, and Figure 8-30b shows the same textures as they appear when printed. There are fourteen more textures that you can see by scrolling the Style sheet horizontally or resizing the sheet.

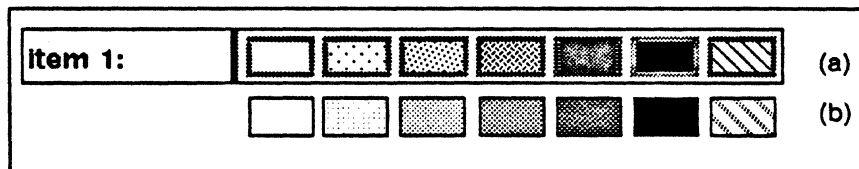


Figure 8-30. Textures

Label display. System-generated labels for the data can be displayed down the left side and along the bottom of most charts. You can turn the labels *off* if you want no labels or if you want to enter your own labels using the diagramming system. *Pie charts* can have only bottom labels.

Label margins. These boxes are used to alter the distance between the data and the labels. They are discussed in the section, *Altering Margins*.

Major hash/minor hash. Hash marks are lines just outside the data that help people interpret the data. They can be turned *off* or be of various lengths and thicknesses (*Figure 8-31* shows two charts with different settings). Hash marks can appear to the left of *vertical bar*, *vertical surface*, *line*, and *filled line charts*. They can appear at the bottom of *horizontal bar*, *100%*, and *horizontal surface charts*. Hash marks do not appear at all on *pie charts*. The first set of four icons indicates thickness, and the second set indicates length.

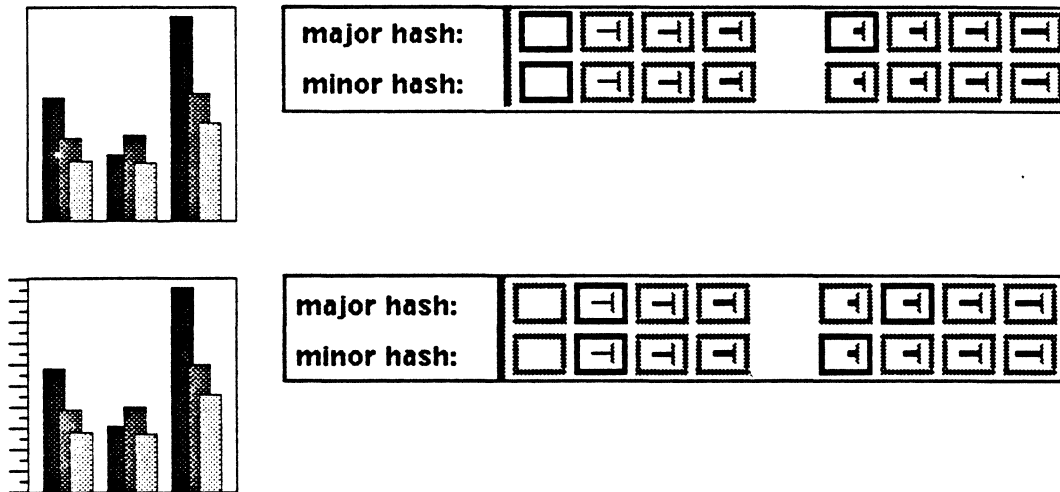


Figure 8-31. Hash marks

Origin line. This line has meaning only if some of the data is negative. The **origin line** is at 0. The icons represent the possible thicknesses of the line (*Figure 8-32*).



Figure 8-32. Origin line

The Customize Sheet

The **Edit Chart Style** sheet makes it possible for you to change the way a chart looks in a variety of ways. You can, for example, combine the **major hash** settings in thirteen different ways, so that you can have anything from no major hash marks to major hash marks that are very long and very thick.

For most users most of the time, these choices are more than sufficient. However, they do not represent the complete range of choices, so we include a third **Edit Chart** sheet, the **Customize** sheet.

The **Customize** sheet does not contain anything that is completely different from what is represented on the **Style** sheet, but it does offer a far greater range in some areas.

If, for example, you want major hash marks that are between the shortest and the second shortest hash marks and thicker than the thickest width represented on the **Style** sheet, you cannot choose these settings on the **Style** sheet, but you can experiment by entering different values on the **Customize** sheet and have hash marks exactly the length and width you want.

The **Customize** sheet is not quite as easy to get to as the **Data** and **Style** sheets nor are we going to describe the items on it because you should use it only after you have exhausted the possibilities of the **Style** sheet. If you ever do need to use the **Customize** sheet, please contact Customer Support for further instructions.

To open the **Customize** sheet:

- ✓ Point the mouse cursor into the box in the **Edit Chart** sheet header, and click the middle mouse button.

*You will see a stickup asking you to confirm that you want to open the **Customize** sheet.*

- ✓ Confirm with the left button. *Figure 8-33* shows the **customize** sheet.

Edit Chart Sheet: data style customize						
offsets:	-12	-3	3	0	0	0
margins:	360000	150000	180000	100000		
brd/br/gp	2	0	0	ratios:	0	67
label margins (h/v)	13335	40005				
hash major width:	0	length:	40001			
hash minor width:	0	length:	0			
background width:	0					
line thickness:	0					
bar1:	0	zerowid:	0			
plered (%):	0	exprad (%):	0	expshf (%):	0	

*Figure 8-33. The **Customize** sheet*

You have to confirm this process only once during an editing session. When you have access to the **Customize** sheet for one chart, you have access to every **Customize** sheet until you exit for the Interleaf publishing software.

Adding Diagramming Elements to Charts

*To come

Chapter 9

Typeface Families from Interleaf

Classic

abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
!@#\$%^&*(1234567890)_+-[]{}|\':;"'"/, < > @ c --.

Classic Roman 6pt

Classic Roman, *Italic* and **Bold** 8pt

Classic Roman, *Italic* and **Bold** 10pt

Classic Roman, *Italic* and **Bold** 12pt

Classic Roman, *Italic* and **Bold** 14pt

Classic Roman, *Italic* and **Bold** 18pt

Classic Roman, *Italic* and **Bold** 24pt

Modern

abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
!@#\$%^&*(1234567890)_+-[]{}|\':;"'"/, < > @ c --.

Modern Roman 6pt

Modern Roman, *Italic* and **Bold** 8pt

Modern Roman, *Italic* and **Bold** 10pt

Modern Roman, *Italic* and **Bold** 12pt

Modern Roman, *Italic* and **Bold** 14pt

Modern Roman, *Italic* and **Bold** 18pt

Modern Roman, *Italic* and **Bold** 24pt

Typewriter

abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
!@#\$%^&*(1234567890)_+-[]{}|\':;"'"/, < > @ c --.

Typewriter 8pt

Typewriter 10pt

Typewriter 12pt

Greek 10 and 12pt

αβγδεφγηκλμνοπθρστυωχψζΑΒΞΔΕΦΓΗΙΚΛΜΝΟΠΘΡΕΤΥΣΩΧΨΖ
!@#\$%^&*(1234567890)_+-[]{}|\':;"'"/, < > @ c --.

ESCAPE
SHIFT
NORMAL

Standard

!	@	#	\$	%	^	&	*	()	-	_	'
1	2	3	4	5	6	7	8	9	0	-	=	'
q	w	e	r	t	y	u	i	o	p	{	}	'
q	w	e	r	t	y	u	i	o	p	{	}	'

Spaces

Thin	En	Em										
A	S	D	F	G	H	J	K	L	:	:	:	:
a	s	d	f	g	h	j	k	l	:	:	:	:
a	s	d	f	g	h	j	k	l	:	:	:	:

Z	X	C	V	B	N	M	<	>	?			
z	x	c	v	b	n	m	.	.	.	.	.	.
z	x	c	v	b	n	m	.	.	.	.	.	.

hard space
space
(these work with every font)

Symbols

superscript
subscript

1	2	3	4	5	6	7	8	9	0	°	∞	∞
1	2	3	4	5	6	7	8	9	0	□	□	□
1	2	3	4	5	6	7	8	9	0	□	□	□

%	¶	©	®	™	▲	■	"	¥	/	†	‡	
%	¶	©	®	™	▲	■	"	¥	/	†	‡	
q	w	e	r	t	y	u	i	o	p	{	}	'

1	2	3	4	5	6	7	8	9	0	∞	∞	∞
▲	●	●	●	■	■	■	*	*	*	*	*	*
▲	●	●	●	■	■	■	*	*	*	*	*	*

◇	♥	□	▼									
◆	♠	♥	♣	♠	♠	♠	♠	♠	♠	♠	♠	♠
z	x	c	v	b	n	m	.	.	.	.	.	.

Greek

!	@	#	\$	%	^	&	*	()	-	_	'
1	2	3	4	5	6	7	8	9	0	-	=	'
1	2	3	4	5	6	7	8	9	0	-	=	'

Θ	Ω	Ε	Ρ	Τ	Ψ	Υ	Ι	Ο	Π	{	}	'
θ	ω	ε	ρ	τ	ψ	υ	ι	ο	π	{	}	'
q	w	e	r	t	y	u	i	o	p	{	}	'

Spaces

Thin	En	Em										
Α	Σ	Δ	Φ	Γ	Η		Κ	Λ	:	:	:	:
α	σ	δ	φ	γ	η		κ	λ	:	:	:	:
a	s	d	f	g	h	j	k	l	:	:	:	:

Z	X	Ξ		B	N	M	<	>	?			
ζ	χ	ε		β	ν	μ	.	.	.	.	.	.
z	x	c	v	b	n	m	.	.	.	.	.	.

Math A

↑	/	+	+	+	+	+	+	+	+	+	+	+
8	4	4	0	∞	∞	∞	∞	∞	∞	∞	∞	∞
1	2	3	4	5	6	7	8	9	0	-	=	'

∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
q	w	e	r	t	y	u	i	o	p	{	}	'

.
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
a	s	d	f	g	h	j	k	l	:	:	:	:

∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
z	x	c	v	b	n	m	.	.	.	.	.	.

Math B

∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
q	w	e	r	t	y	u	i	o	p	{	}	'

∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
a	s	d	f	g	h	j	k	l	:	:	:	:

∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
z	x	c	v	b	n	m	.	.	.	.	.	.

Math Extension

()	[]	[]	[]	[]	{	}	∞	∞
1	2	3	4	5	6	7	8	9	0	-	=	'	

√	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
√	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
q	w	e	r	t	y	u	i	o	p	{	}	'

()	[]	[]	[]	[]	{	}	∞	∞
()	[]	[]	[]	[]	{	}	∞	∞
()	[]	[]	[]	[]	{	}	∞	∞
a	s	d	f	g	h	j	k	l	:	:	:	:	

{	}	<	>			/						
}	{	<	>			/						
z	x	c	v	b	n	m	.	.	.	.	.	.

