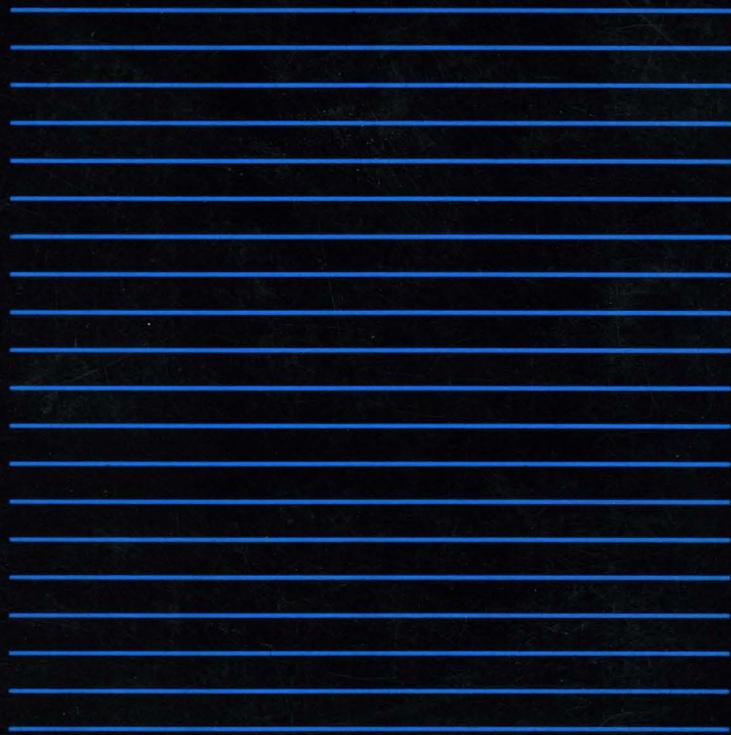


*Xerox GLOBALVIEW*

*Xerox Pro Illustrator  
Reference Manual*



*VP Series Applications*

**Xerox GLOBALVIEW**

**Xerox Pro Illustrator Reference Manual**

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## **Part 2                      Creating and working with objects**

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## Preface

People throughout the world use Xerox GLOBALVIEW software. Xerox, therefore, tailors its software to meet various national requirements. As a result, you may find the default settings and property sheets illustrated in this publication different from those on your workstation. For example, the Page Format property sheet may display international page size default settings or U. S. page size default settings, depending on your national requirements. The functionality of the software, however, remains the same.



**Part 1**  
**Overview**



This reference manual is part of the *VP Series Reference Library*, which is the encyclopedia for VP software applications.

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## Before you begin

---

Several user guides make up the *VP Series Reference Library*. Each user guide provides information about a general category of applications, such as graphics, terminal emulation, or file conversion.

Before you refer to any VP user guide, you should become familiar with the following core documentation:

- *VP QuickStart Tutorial*. Provides training and exercises for basic workstation operations and for creating, editing, printing, mailing, and filing documents.
- *General User Guide*. Introduces the basic operations common to all VP applications. It also describes how to conduct a GLOBALVIEW session and how to use your workstation keyboard, mouse, and color capabilities.
- *Document Editor: Basics User Guide*. Provides complete information on creating and editing a document.

By mastering the basics, you will be able to use other VP applications to perform tasks quickly and confidently.

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## About this reference manual

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This reference manual provides conceptual and procedural information on the following applications:

- *Xerox Illustrator Basics*
- *Xerox Pro Illustrator*
- *Xerox Illustrator Upgrader*
- *Xerox Pro Illustrator Conversion of VP Basic Graphics*.

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## Part 1 – Overview

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**Chapter 1** – The graphic artist's approach to *Xerox Pro Illustrator* introduces Pro Illustrator by comparing it to the traditional drawing board.

**Chapter 2** – Getting started briefly describes how to begin using *Xerox Pro Illustrator*. Topics include required hardware and software, how to install the Pro Illustrator software, and some basics about its use.

**Chapter 3** – Notes to Xerox graphics products users provides information of interest to users of other Xerox graphic products. It contains brief discussions of raster and vector graphics, *VP Freehand*, *Xerox Publishing Illustrator*, *VP Basic Graphics*, a comparison of *Xerox Pro Illustrator* with *VP Basic Graphics*, and *Xerox Pro Illustrator's* unique features.

## Part 2 – Creating and working with objects

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**Chapter 4** – Pro Illustrator frames describes how to insert a Pro Illustrator frame into a VP document.

**Chapter 5** – Softkeys tells you how to use the softkeys and how to customize them to meet your needs.

**Chapter 6** – Creating objects describes how to create points, straight lines, rectangles, and ellipses.

**Chapter 7** – Working with objects contains information a procedures for displaying, selecting, copying, moving, deleting, layering, and clustering objects.

**Chapter 8** – Setting object properties tells you how to set object properties.

**Chapter 9** – Text frames describes how to create and modify text frames within a Pro Illustrator graphic.

**Chapter 10** – Bitmap frames describes how to create and modify bitmap frames within a Pro Illustrator graphic and how to place and move raster images within a bitmap frame.

**Chapter 11** – Chains tells you how to draw and edit more complex shapes, including polygons and shapes containing curves and arcs.

**Chapter 12** – Transformations describes how to transform objects (change their size, shape, or orientation).

## Part 3 – Using Xerox Pro Illustrator tools

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**Chapter 13** – View windows provides information for using View windows to create multiple views of an illustration so that you can work at varying locations and scales (zooming in and out).

**Chapter 14** – Layout tools describes *Xerox Pro Illustrator's* variety of layout tools. Topics include gravity, directional constraints, cross hairs, and geometry.

**Chapter 15** – Measuring tools tells you how to use *Xerox Pro Illustrator's* measuring tools. Topics include Frame Units, the Measures window, and rulers.

## Part 4 – Using Xerox Pro Illustrator with your system

---

**Chapter 16** – Xerox Illustrator Basics describes the viewing, copying, and printing capabilities of the application. Topics include required hardware and software, installation procedures, system messages, and notes and cautions.

**Chapter 17** – Xerox Illustrator Upgrader tells you how to upgrade VP documents containing graphic objects created with *Xerox Pro Illustrator 2.0* or *2.0.15*. Topics included hardware and software and installation procedures.

**Chapter 18** – Xerox Pro Illustrator Conversion of VP Basic Graphics describes how to convert a VP Document containing VP Basic Graphics to a VP document containing Pro Illustrator graphics. Topics include required hardware and software, installation procedures, conversion effects, and notes and cautions.

**Chapter 19** – Printer requirements for Xerox Pro Illustrator provides information on printer requirements and printing limitations.

**Chapter 20** – Xerox Pro Illustrator notes and cautions explains how to solve or avoid known problems with *Xerox Pro Illustrator*.

## Appendices

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**Appendix A** – Quick Art provides a brief description of the Pro Illustrator Quick Art library and tells you how to copy art from the Quick Art library into your illustrations.

**Appendix B** – Tips and strategies for using Pro Illustrator contains information that will enhance your use of *Xerox Pro Illustrator*.

Topics include layout tips for structured graphics, tips and strategies for working with chains, and various tips for performing specific operations.

**Appendix C** – Glossary defines special terms used in this manual.

**Appendix D** – Integrating Pro Illustrator graphics in XPS 700 documents contains procedures for merging Pro Illustrator graphics as Interpress masters into XPS 700 documents.

**Appendix E** – Recovering from problems contains some of *Xerox Pro Illustrator's* user messages, and what to do when you see them.

## References to the keyboard

---

When referring to keys, the *Xerox Pro Illustrator Reference Manual* uses the Xerox 6500 series workstation labels. The 6500 keys are included in procedures and illustrations.

Refer to the *General User Guide* in this library for a complete discussion of the keyboard layouts for Xerox workstations. If you have a different keyboard configuration, refer to your hardware documentation.

## Documentation conventions

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The *VP Series Reference Library* uses the following conventions:

- Square brackets. Names of commands, properties, and options you select with the mouse appear in square brackets, for example, [Close].
- Angle brackets. Names of workstation keys and alternate function keys appear in angle brackets, for example, <Open> and <Props>. This convention applies to alphabetic and numeric keys. It does not apply to keys marked with arrow symbols, such as the tab key.

- Italics. Application names beginning with VP and XWS, user guide names, and the library name appear in *italics*.

Wherever possible, graphic images (such as pointer arrows) are printed in the text as they appear on the screen or on the keyboard.



**CAUTION:** Cautions advise you of actions that can damage your equipment or software or cause loss of data or time.

## Illustration conventions

---

The *Xerox Pro Illustrator Reference Manual* uses the following conventions to illustrate step-by-step procedures:

- ① The circle with a number in it indicates either that you select an item, or that you click (press and release), the left mouse button
- ② The circle with a number in it and with an arrow pointing down indicates that you press and hold down the left mouse button.
- ③ The circle with a number in it and with an arrow pointing up indicates that you release the left mouse button.
- ① The shaded circle with a number in it indicates either that you select an item, or that you click (press and release), the right mouse button.
- ② The shaded circle with a number in it and with an arrow pointing down indicates that you press and hold down the right mouse button.
- ③ The shaded circle with a number in it and with an arrow pointing up indicates that you release the right mouse button.
- ➡ The illustrations also contain a results arrow symbol that indicates the result of a particular operation.

## Software requirements

---

The following software must be installed, enabled, and running on your workstation:

- XWS
- XWS NetCom, RemoteCom, or Standalone
- VP Document Editor.



**CAUTION:** Some applications, such as *Font Manager* and *Workstation Keyboards*, are automatically loaded on your workstation. If they appear in your application loader, do not delete them because other applications depend on them. If you do delete them, system messages direct you to reinstall them when you try to use an application that depends on them.

## Xerox Illustrator Basics

---

For *Xerox Illustrator Basics*, you must install, enable, and run the following applications:

- *Imaging Basics* (for 6500 series workstations only)
- *Xerox Illustrator Basics*.

Refer to Chapter 16 for complete information.

## Xerox Pro Illustrator

---

For *Xerox Pro Illustrator*, you must install, enable, and run the following applications:

- *Imaging Basics* (for 6500 series workstations only)
- *Xerox Illustrator Basics*
- *Xerox Pro Illustrator*.

Refer to Chapter 2 for complete information.

## Xerox Illustrator Upgrader

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For *Xerox Illustrator Upgrader*, you must install, enable, and run the following applications:

- *Imaging Basics* (for 6500 series workstations only)
- *Xerox Illustrator Basics*
- *Xerox Pro Illustrator*
- *Xerox Illustrator Upgrader*.

Refer to Chapter 17 for complete information.

## Xerox Pro Illustrator Conversion of VP Basic Graphics

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For *Xerox Pro Illustrator Conversion of VP Basic Graphics*, you must install, enable, and run the following applications:

- *Imaging Basics* (for 6500 series workstations only)
- *VP Basic Graphics*
- *Xerox Illustrator Basics*
- *Xerox Pro Illustrator*
- *Xerox Pro Illustrator Conversion of VP Basic Graphics*.

Refer to Chapter 18 for complete information.

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## Related documentation

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The following tutorial provides training on *Xerox Pro Illustrator*:

- Xerox Pro Illustrator Tutorial.



---

## 2.

# Getting started

This chapter provides general information about how to begin using *Xerox Pro Illustrator* with your 6500 series workstation or 6085 Series workstation. Topics covered include:

- 6500 series hardware requirements
- 6085 series hardware requirements
- Quick Art and Pro Illustrator Palettes
- Setting Edit/Save to True in your User Profile
- Using the keyboard and mouse with *Xerox Pro Illustrator*.

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## 6500 series requirements

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This section describes the minimum hardware requirements for the 6500 series workstation.

Refer to the “Software requirements” section in Chapter 1 for complete information on the software requirements.

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## Hardware requirements

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The minimum hardware requirements for the 6500 series workstation are as follows:

- Rigid Disk: 207 Megabytes
- Main Memory: 16 Megabytes
- Display: 19–inch.

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## Swap space requirements

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A shortage of memory effects all VP applications and can result in slower workstation performance. To ensure maximum performance from your system, it is recommended that you increase the virtual memory, or swap space, on your workstation. If you use the *Xerox Illustrator Basics* application, you need to add 10–megabytes of swap space to your system.

For complete information on swap space, refer to Appendix D, “Adding additional disk drives and swap space” in the *VP 3.1 Software Installation Guide: 6500 Series*.

---

## 6085 series requirements

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This section describes the minimum hardware requirements for the 6085 series workstation.

Refer to the “Software requirements” section in Chapter 1 for complete information on the software requirements.

---

### Hardware requirements

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The minimum hardware requirements for the 6085 Series workstation are as follows:

- Rigid Disk: 40 Mb (80 Mb recommended)
- Main Memory: 1.1 Mb (3.7 Mb recommended)
- Display: 15–inch (19–inch recommended)
- Floppy Disk Drive: 360 Kb (5.25–inch disk).

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### Effects of main memory shortage

---

A shortage of main memory affects all VP applications and results in slower workstation performance, especially when changing from one activity (such as editing text) to another (such as editing graphics). A shortage of main memory may mean one of the following:

- Not enough memory is physically installed in the machine.
- Incorrect parameters have been set in the System Configuration Utility.

---

### Effects of Virtual Memory backing store shortage

---

A shortage of disk space available for Virtual Memory backing store affects all VP applications and causes the system to run very slowly, with frequent pauses of heavy disk activity.

Unlike the situation with main memory, the effects of low backing store only become apparent when the supply runs out. Thus, if backing store is only marginally low, the system slows down only when many applications are running; when you are editing large documents, large bitmaps, or complex graphics frames (such as large IGES files); or when many documents or View windows are open at the same time. A shortage of disk space available for Virtual Memory backing store may mean one of the following:

- VP has not been installed correctly; most likely, the boot switches are incorrect.
- A problem on the Scavenger volume is using unnecessary space.
- The Illustrator Performance Enhanced Option is required and has not been enabled.
- The disk size is too small for the kind of work you are doing.
- Too many documents or other icons are open at once.

## Effects of Processor Control Store shortage

---

When checking for adequate Processor Control Store, the software determines whether floating point microcode is present. If it is not, either the workstation does not have 8K of Processor Control Store or the supply is not being utilized. The lack of floating point microcode affects only *Illustrator* applications, not the rest of VP. All of *Illustrator* is slowed down, with screen display and computation-intensive activities the most severely affected. A shortage of Processor Control Store may mean one of the following:

- The 4K Processor Control Store Memory Kit (product code 75D) is not installed in the machine.
- Incorrect parameters have been set in the System Configuration Utility.
- The correct microcode has not been installed on the workstation.
- The system was booted directly from the Installer without using the boot button.

## Upgrading your 6085 for the 8K control store

---

The Control Store Memory Kit is a hardware option available for your 6085 workstation that enhances the performance of *Xerox Pro Illustrator* software by adding 4K of Processor Control Store. This option must be installed on your workstation by an authorized Xerox representative.

If the Control Store Memory Kit is installed after GLOBALVIEW is installed, you must follow the procedure below to reinstall system microcode.

If it is installed while you are upgrading to 3.1, you do not have to reinstall system microcode. The installation procedure loads the correct microcode and automatically utilizes the additional 4K control store.

To reinstall system microcode on your workstation, follow the procedures below.

1. Boot your workstation
2. Press <F3> to run the Installer.

If you do not know how to use the Installer, refer to the *VP 3.1 Software Installation Guide: 6085 Series*. You may install from the network, floppy disk, or cartridge tape.

3. Type the number corresponding to [VP: 6085 Special Installation and Error Recovery Commands] from the main Installer menu.
4. Press <Return>.
5. Type the number corresponding to [Install VP Basic Workstation Microcode Only on 6085 Workstation].
6. Press <Return>.
7. Type Y in response to the "Ready to install VP Basic Workstation microcode files only?" prompt.
8. Press <Return>.

Follow the prompts on the workstation display and load the correct floppy disk or tape when requested.

When the Installation of VP Basic Workstation microcode files is complete message appears, continue with Enabling the Illustrator Performance Enhanced Option below, or reboot your workstation.

## Enabling the Illustrator Performance Enhanced Option

---

The Illustrator Performance Enhanced Option makes your 6085 workstation run faster by increasing the amount of disk space allocated to Virtual Memory backing store. This option must be enabled if your rigid disk size is less than 40-megabytes, but it is recommended for all configurations.

To upgrade your workstation for the Pro Illustrator Enhanced Option, follow the procedures below:

1. Boot your workstation.
2. Press <F3> to run the Installer.  
If you do not know how to use the Installer, refer to the *VP 3.1 Software Installation Guide: 6085 Series*. You may install from the network, from floppy, or from tape.
3. Type the number corresponding to [VP: 6085 Special Installation and Error Recovery Commands] from the main installer menu.
4. Press <Return>.
5. Type the number corresponding to [Enable/Disable Xerox Pro Illustrator Performance Enhanced].
6. Press <Return>.
7. When the "Xerox Pro Illustrator Performance Enhanced Option is now enabled" message appears, type the menu option number corresponding to [Start 6085 System].
8. Press <F1> to reboot your workstation.

---

## Quick Art and Pro Illustrator Palettes

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In addition to the software applications, *Xerox Pro Illustrator* provides other documents you may want to use:

- Quick Art
- Pro Color Palette
- Pro Color Palette (with color names)
- Pro Color Palette (for bitmaps with color names)
- Pro Illustrator HighLight Printer Palette
- Pro Illustrator HighLight Printer Palette (with color names)
- Pro Illustrator HighLight Printer Palette (for bitmaps with color names)

*Xerox Pro Illustrator* Quick Art and the Pro Illustrator palettes are provided with the *Xerox Pro Illustrator* applications. These documents are not applications to be run in the loader. They are additional tools to use with the *Xerox Pro Illustrator* applications.

To use *Xerox Pro Illustrator Quick Art* and the Pro Illustrator palettes with *Xerox Pro Illustrator*, you need to copy them to your desktop.

*Xerox Pro Illustrator Quick Art* is a collection of ready-to-use symbols, objects, and shapes that you can copy into your Pro Illustrator drawings and edit (see Appendix A).

The Pro Illustrator palettes enable you to apply color to graphics objects using <Same>. The palettes provide an alternative to using the Object Properties sheet to apply color to graphics objects. Refer to Chapter 8 for complete information.

---

## Setting Edit/Save to True in your User Profile

---

If the Edit/Save option in the [Documents] section of the User Profile is set to False, you may want to change it to True. Automatic backups (Edit/Save set to False) sometimes cancel the current action in a Pro Illustrator frame. For example, if an automatic backup occurs while you are scaling an object in a frame, the action is cancelled.

With Edit/Save set to True, you can go back to previous, saved versions of an illustration if you make a mistake or want to experiment. You can restore your previous illustration by selecting [Reset] in the document window header.

To set Edit/Save to True, follow this procedure:

1. Select [Show User Profile] in the desktop auxiliary menu.
2. Select [Edit] in the User Profile window header.
3. Scroll to the [Documents] section.
4. Select FALSE next to the Edit/Save option, and press <Del>.
5. Type: TRUE.
6. Log off, then log back on to activate the option.

---

## How the keyboard and mouse work with Xerox Pro Illustrator

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You use the keyboard, softkeys and mouse to select objects, text, and commands on your desktop.

---

### Keyboard

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In *Xerox Pro Illustrator*, you use the keyboard to enter commands and to make selections on the softkeys (Chapter 5). You will use the following keys when working with *Xerox Pro Illustrator*:

- <Again>
- <Copy>
- <Del>
- <Find>
- <Move>
- <Next>.
- <Open>
- <Props>
- <Stop>
- <Same>
- <Undo>

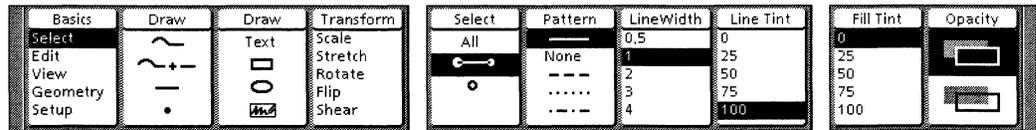
The <Shift> key has a special use in *Xerox Pro Illustrator*. You use <Shift> to select individual control points on graphic objects (Chapter 7), and temporarily disable gravity, geometry, and grids (Chapter 14).

When referring to keys, the *VP Series Reference Library* uses the 6500 workstation labels. Refer to the *General User Guide* in this library for a complete discussion of the keyboard layouts for Xerox workstations. If you have a different keyboard configuration, refer to your hardware documentation.

## Softkeys

---

When you select anywhere within a Pro Illustrator frame, your workstation displays the Pro Illustrator softkeys on the screen. The softkeys correspond to the function keys at the top of the keyboard. You can make selections on the softkeys with either the function keys or the mouse.



## Mouse

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You use the mouse to create and modify objects (Chapters 6 through 12), make selections on the softkeys (Chapter 5) and on property sheets (Chapter 8), and perform the usual GLOBALVIEW desktop and window management functions.

The mouse on a 6500 workstation has three buttons. You use the left and right mouse buttons when you work in GLOBALVIEW. The middle button is not active.

The mouse on a 6085 workstation has two buttons. You use the left and right mouse buttons when you work in GLOBALVIEW.

## Cursor shapes

---

The cursor shows the current location of the mouse. It changes shape to indicate what command is being executed or what mode the system is in. In many cases, when the cursor changes shape, a prompt appears in the desktop message area to remind you of the next action you should take. Following are the cursor shapes for *Xerox Pro Illustrator*.



Normal cursor – for selecting on the softkeys or property sheets, and for desktop operations and window management.



Select cursor – for selecting anywhere within the Pro Illustrator frame.



Draw and Edit cursor – for drawing and modifying objects (including transformations).



Define View Area cursor – for the first step in creating a View window (selecting the portion of the illustration to be included in a View window).



Place View window cursor – for the second step in creating a View window (indicating where on the desktop the View window is to be located.)



Wait cursor – indicates that the system is performing an operation.

For the cursor shapes associated with the standard VP commands, refer to the *VP Series Reference Library*.



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## 3. Notes to users of Xerox graphics products

This chapter contains information of interest to users of Xerox graphics products. Topics include brief discussions of:

- Raster and vector graphics
- *VP Freehand*
- *Xerox Publishing Illustrator*
- *VP Basic Graphics*
- *Xerox Pro Illustrator*
- Comparison of *Xerox Pro Illustrator* and *VP Basic Graphics*
- Unique features of *Xerox Pro Illustrator*.

---

### Raster and vector graphics

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This section provides a very brief description of how raster and vector graphics systems work.

#### Raster graphics

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Raster graphics systems work by associating each pixel (dot) on the screen with a corresponding location in memory. As you paint using a variety of tools and brushes, you turn pixels on (black) or off (white) to create the image.

You can think of raster graphics as being like oil or sand painting. Objects on top of one another become intermingled with each other (and with the background, if there is one) so there is always one layer in the illustration. Editing is difficult, because when you edit an object, you also edit what is underneath it. The resolution of the final image is limited to that of the original canvas used.

*VP Freehand* and *Xerox Publishing Illustrator* are raster graphics systems.

#### Vector graphics

---

Vector graphics systems use descriptions of line segments to draw images. As you draw, you combine objects (points, lines, curves, rectangles, and so on) to construct the image.

You can think of vector graphics as object-oriented drawing, where the objects are like electronic rubber bands connecting dots that define the objects.

Objects in a vector graphic are layered like a collage before it is glued; they are not intermingled with one another as objects in a raster graphic are. Editing is easy because you can move and edit each object independently. The final image is printed at the

maximum resolution of the printing device. *VP Basic Graphics* and *Xerox Pro Illustrator* are vector graphics systems.

---

## VP Freehand

---

*VP Freehand* is the basic raster graphics application in GLOBALVIEW. It is a separately loadable application.

You can integrate illustrations created with *VP Freehand* into Pro Illustrator frames or Basic Graphics frames. To do so, move the bitmap frame containing the *VP Freehand* canvas into a Pro Illustrator or Basic Graphics frame.

You can also use *VP Freehand* to edit scanned canvas.

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## Xerox Publishing Illustrator

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*Xerox Publishing Illustrator* is the advanced raster graphics application in GLOBALVIEW. It is a separately loadable application.

*Xerox Publishing Illustrator* software allows you to create an illustration and edit it. It also enables you to edit an illustration that was created elsewhere and sent via the 150 GIS II scanner or the 7650 Pro Imager scanner to *Xerox Publishing Illustrator*.

You can integrate illustrations created with *Xerox Publishing Illustrator* into Pro Illustrator frames. To do so, move the bitmap frame containing the *Xerox Publishing Illustrator* canvas into a Pro Illustrator frame.

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## VP Basic Graphics

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*VP Basic Graphics* is the basic vector graphics application for GLOBALVIEW. It is a separately loadable application. You create and edit a VP Basic Graphics illustration in a frame in its final place on the page of a VP document. A VP Basic Graphics frame can contain other frame types and objects:

- Bitmap frames
- VP Data-Driven Graphics frames
- Text frames
- Image frames
- Form fields
- Table frames
- Nested VP Basic Graphics frames
- CUSP buttons.

You can convert illustrations created with *VP Basic Graphics* to *Xerox Pro Illustrator* by using the *Xerox Pro Illustrator Conversion of VP Basic Graphics* application.

---

## Xerox Pro Illustrator

---

*Xerox Pro Illustrator* is the advanced vector graphics application for GLOBALVIEW. Like *VP Basic Graphics*, you create and edit a Pro Illustrator illustration in a frame in its final place on the page of a VP document.

In order to use *Xerox Pro Illustrator* you also need to have *Xerox Illustrator Basics* software running on your workstation.

Pro Illustrator frames can contain embedded text frames and bit map frames but not any other type of VP document frames. A separate conversion application is available to convert VP Basic Graphics frames into Pro Illustrator frames.

You can create a VP document containing a mixture of Basic Graphics and Pro Illustrator frames. To distinguish between the frame types, once they are created, you can select inside the respective frames; the appearance of the softkeys and cursor differs.

---

## Comparison of Xerox Pro Illustrator and VP Basic Graphics

---

This section contains a brief comparison of *Xerox Pro Illustrator* and *VP Basic Graphics*. In comparison with Basic Graphics, Pro Illustrator provides a richer set of objects, properties, and commands. Moreover, Pro Illustrator provides a number of layout tools and features that accelerate the creation and revision process.

The following sections describe in detail the differences between *Xerox Pro Illustrator* and *VP Basic Graphics*.

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### Softkeys

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The softkeys are one of the most significant differences, both in their appearance and functional use.

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#### Xerox Pro Illustrator

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The Xerox Pro Illustrator softkeys provide much more functionality than the VP Basic Graphics function keys. The softkeys are the principle user interface mechanism in *Xerox Pro Illustrator*. Using the softkeys, you can perform most of the system operations, including:

- Creating objects
- Setting object properties
- Specifying directional constraints
- Accessing various layout tools
- Transforming objects
- Changing relationships among objects.

The four left most softkeys, the Command Softkeys, display the commands that allow you to operate the system. These commands are always the same.

The six right most softkeys, the Changing Softkeys, display the properties and constraints for each command you select on the Command Softkeys. These softkeys change depending on which command you select. See Chapter 5 for more information.

### **VP Basic Graphics**

---

The VP Basic Graphics function keys are more limited in their functionality. You can use them to:

- Stretch and magnify
  - VP Basic Graphics frames
  - Graphic objects within the frames
  - Embedded graphic and text frames
- Activate the grid
- Draw lines and curves
- Join and split clusters of objects
- Layer objects.

### **Transfer symbols libraries**

---

Both *VP Basic Graphics* and *Xerox Pro Illustrator* come with symbols libraries containing objects that can be copied into your documents for editing or for using as is.

#### **Xerox Pro Illustrator Quick Art**

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*Xerox Pro Illustrator Quick Art* is a graphics library that contains many more objects and symbols than the VP Basic Graphics Transfer Document. For example, Quick Art includes:

- Borders and boxes
- Electronic and flowchart symbols
- Display type
- Forms elements
- Rulers and protractors.

You need to copy objects from the Quick Art documents rather than move them into your documents. If you move them, they are deleted from the Quick Art documents. See Appendix A for more information.

#### **VP Basic Graphics**

---

*VP Basic Graphics* provides two ways to obtain symbols.

Basic Graphics Transfer Document – *VP Basic Graphics* comes with a Transfer Document containing the following basic objects:

- Point
- Horizontal, vertical, and 45 degree lines
- Triangle
- Square
- Curve
- Ellipse
- Circle.

It also contains embedded text frames and other graphic frames that you can copy into an anchored VP Basic Graphics frame.

Special graphics keyboard – The basic objects contained in the Basic Graphics Transfer Document are also available through the Special graphics keyboard.

## Selecting objects

---

Selecting objects within the graphics frame is very similar in the two systems. The various methods are called by different names. In addition to the features described in the following sections, Pro Illustrator also offers three selection levels.

### Xerox Pro Illustrator

---

In *Xerox Pro Illustrator*, the methods for selecting individual objects and multiple objects differ.

Individual objects – You select individual objects by placing the cursor on the boundary of the object and clicking the left mouse button.

Multiple objects – You have two ways to select multiple objects: object-by-object election and draw-through box selection. Both ways are referred to as extended selection.

To use object-by-object selection, you select the first object using the left mouse button and the additional objects using the right mouse button.

With the draw-through box selection, you select the first object with the left mouse button and then, using the right mouse button, you draw a box around the remaining objects to be selected. See Chapter 7 for more information.

### VP Basic Graphics

---

In *VP Basic Graphics*, the methods for selecting individual objects and multiple objects differ from those of *Xerox Pro Illustrator*.

Individual objects – You select individual objects by placing the cursor near or on the boundary of the object and clicking the left mouse button.

Multiple objects – Again, there are two ways to select multiple objects: select-adjust method and draw-through method. The select-adjust method works the same way extended selection does in *Xerox Pro Illustrator*. The draw-through method works the same way draw-through box selection does in *Xerox Pro Illustrator*.

## Deselecting objects

---

The methods for deselection objects differs in the two systems.

### Xerox Pro Illustrator

---

In *Xerox Pro Illustrator* the methods for deselecting individual objects and multiple objects differ from those of *VP Basic Graphics*.

Individual objects – To deselect a single object, move the cursor off the object to a blank area in the Pro Illustrator frame and click the left mouse button.

Multiple objects – To deselect all objects in a group, move the cursor off the objects to a blank area in the Pro Illustrator frame and click the left mouse button. To deselect specific objects in a group, place the cursor on the boundary of the object and click the right mouse button.

### **VP Basic Graphics**

---

In *VP Basic Graphics* the same method is used for deselecting individual objects and multiple objects.

To deselect an object, move the cursor off the object to a blank area in the *VP Basic Graphics* frame and click the right mouse button.

## **Layering objects**

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Xerox Pro Illustrator provides you with more flexibility in layering objects.

### **Xerox Pro Illustrator**

---

In *Xerox Pro Illustrator* you can specify whether an object is on the top or bottom of all other objects or above or below a specified object.

To place an object on the top or bottom, you select the object and then select either Top or Bottom on the Layer softkey.

Follow these steps to place an object above or below a specified object:

1. Select the object to be placed above or below another object.
2. Select Above or Below on the Layer softkey.
3. Select the object that the first object will be above or below.

### **VP Basic Graphics**

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In *VP Basic Graphics* you layer objects by selecting the object and selecting the Top function key.

## **Clustering objects**

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Clustering objects differs in the two systems.

### **Xerox Pro Illustrator**

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In *Xerox Pro Illustrator* you can create nested clusters (clusters within clusters). When you split a cluster made up of subclusters, the subclusters remain intact until you split them.

To create a cluster, select the objects and select Joined on the Cluster softkey. To split a cluster, select the cluster and select Split on the Cluster softkey. See Chapter 7 for more information.

## VP Basic Graphics

---

You cannot create nested clusters in *VP Basic Graphics*.

To create a cluster, select the objects and select the Join function key. To split a cluster, select the cluster and select the Join function key.

## Drawing objects

---

You will notice some differences in the way you draw objects in the two systems.

### Xerox Pro Illustrator

---

You draw basic objects (point, line, rectangle, square, ellipse, circle, text frame, and bitmap frame) by selecting them on the softkeys and drawing them (sizing them as you place them) in the frame.

To draw them, you click the mouse button two times, once for the starting point and once for the ending point. Rectangles, squares, ellipses, and circles can be drawn from corner to corner or from the center outward. Text frames with two or more adjacent free sides are drawn with a single mouse click.

There are directional constraints (Horizontal, Vertical, and Lock angle) available that constrain lines to be horizontal. You can fill any basic object that is a closed shape (i.e., any basic object except a line or point), and you can fill any closed chained shape. You can also copy objects from the Quick Art documents into your illustration and modify them.

Drawing in *Xerox Pro Illustrator* is more easily controlled because of the precision tools the system provides. These include:

- View window
- Directional constraints
- Linear and angular fixed grids
- Linear, angular, paraline, and perspective moving geometry
- Cross hairs
- Pin Point
- Gravity
- Frame Units
- Measures window.

Refer to the section in this chapter titled, "Unique features of Xerox Pro Illustrator" for more information on the precision tools listed above. See Chapter 6, Chapter 9, and Chapter 10 for additional information.

### VP Basic Graphics

---

To create objects in your illustration, you can copy them from the Basic Graphics Transfer Document and stretch and magnify them or draw them using the Line and Curve softkeys. When you draw them, the starting point is where the current cursor location is. You click the mouse button once in the *VP Basic Graphics* frame to draw the ending point.

VP Basic Graphics also has a fixed angle/shape property (similar to the Lock angle constraint in *Xerox Pro Illustrator* available on the

properties sheets. When drawing more complex shapes, you need to line up the segments; the system does not provide tools to aid in precise layouts. You can also draw objects using the Special graphics keyboard or the Transfer Document.

You cannot fill the objects you create with the Line and Curve softkeys. Only geometric objects copied from the Basic Graphics Transfer Document can be filled.

## Setting object properties

---

Both systems allow you to set object properties.

### Xerox Pro Illustrator

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In *Xerox Pro Illustrator* there is a larger set of properties with more user-specified values. You can set object properties using the softkeys, the object property sheet, or the <Same> key. *Xerox Pro Illustrator* uses one object property sheet for all objects.

You do not need to call up a separate object property sheet for each object. And, you can continue drawing with the property sheet open. Using the softkeys or the object property sheet, you can set the object properties before or after you draw the object. See Chapter 8 for more information.

### VP Basic Graphics

---

In *VP Basic Graphics*, you can set object properties using only the object property sheets. Each object type has its own property sheet, and you can only have one property sheet open at a time. You cannot continue drawing with a property sheet open.

## Object transformation

---

*Xerox Pro Illustrator* provides more object transformation operations than *VP Basic Graphics*.

Magnify in *VP Basic Graphics* is like *Xerox Pro Illustrator's* Scale, that is, the object's size is changed, but its overall proportions remain the same.

Stretch in both systems changes the object's size and can also change the shape of the object. One difference is that you need to specify the fixed point (the center of the transformation) in *Xerox Pro Illustrator*. In *VP Basic Graphics*, the system automatically positions the fixed point. *Xerox Pro Illustrator* permits you to define transformations numerically; it also provides alignment tools.

### Xerox Pro Illustrator

---

In addition to being able to stretch and scale objects, *Xerox Pro Illustrator* allows you to flip, rotate, and shear objects.

Another way to stretch an object in *Pro Illustrator* is to select one or more control points on the object and move them. *Xerox Pro*

*Illustrator* allows you to transform parts of objects as well as whole objects. See Chapter 7 for more information.

### **VP Basic Graphics**

---

In *VP Basic Graphics*, you can stretch and magnify (scale) whole objects using the function keys.

## **Linear grids**

---

Both systems have linear grids, but there are differences in the way the grids appear and operate.

### **Xerox Pro Illustrator**

---

In Pro Illustrator you have more control over the linear grid. You can set the distance between grid dots to any interval, and in a choice of units (points, inches, and so on). You can control the grid in x and y directions independently, including the distance between the dots and whether or not the grid is active.

When the grid is active, it acts like gravity (the cursor snaps to the grid dots). You can also move the grid (like shifting grid paper beneath a drawing). Separate selections determine whether the grid is displayed and whether it is active.

### **VP Basic Graphics**

---

In *VP Basic Graphics* when the grid is active, the grid is always active in both x and y directions; you cannot control the grid in x and y directions independently.

When the grid is active, it acts like gravity (the cursor snaps to the grid marks). You can select from five grid sizes and three grid styles.

## **Unique features of Xerox Pro Illustrator**

---

This section describes some of the unique features of *Xerox Pro Illustrator*.

### **Chains**

---

You can draw more complex shapes by selecting the chain command on the softkeys and drawing each segment (straight lines, single and double curves, and arcs) that makes up the shape. The system automatically connects the segments. You can fill (with tint and texture) any closed shape drawn with chain segments.

Existing chains can be edited in various ways. You can delete chain segments, cut chains apart or link them together, edit the smoothness of chain joints, and move and transform chain joints. Refer to Chapter 11 for additional information.

## Cutting and linking objects

---

In *Xerox Pro Illustrator*, you can cut and link (connect) all objects except for points, text frames, and bitmap frames. Refer to Chapter 7 and Chapter 11 for additional information.

## View window

---

The View window enables you to create multiple views of an illustration. These views allow you to work at varying locations and scales (zooming in and out) within an illustration.

You can have any number of View windows open at a time, showing views of one or more Pro Illustrator frames. When you change the illustration in one View window, all of the View windows are updated to show the change.

Two commands allow you to alter the Display mode in the View window. You can elect to show the raster images inside bitmap frames in light gray instead of black. This feature is useful when you want to trace the outlines of the raster image.

A second command allows you to display the contents of the View window in a thin black outline only, with no dashed lines, line ends, tints, or fills. This feature is useful when you want to speed up display time. (You can select Outline mode for the entire document from the document auxiliary menu.)

## Selection levels

---

*Xerox Pro Illustrator* provides the following three selection levels:

- Control point selection level – When you select inside the Pro Illustrator frame, only individual object control points are selected. This feature allows you to modify parts of objects in various ways.

You use control point selection to change the shape of objects (in conjunction with the <Move> key) and to link and cut objects.

- Object selection level – When you select inside the Pro Illustrator frame, only whole objects are selected.
- All selection level – When you select inside the Pro Illustrator frame, all objects on the infinite drawing pad are selected.

Refer to Chapter 7 and Chapter 11 for additional information.

## Measuring and layout tools

---

*Xerox Pro Illustrator* provides you with many types of measuring and layout tools for precise control when drawing and editing objects.

- Directional constraints – The directional constraints allow you to draw, copy, move, and transform objects exactly horizontally, vertically, or at any angle you specify. Refer to the appropriate chapter for the desired operation to find a discussion of how directional constraints work when performing that operation.

- Geometry – Geometry is a mode that provides consistent geometric orientation while drawing and editing objects. Geometry can take two forms. It can appear as moving geometry and as fixed grids. See Chapter 14 for more information.
  - Moving geometry – All geometries (linear, angular, paraline, and perspective) are available as moving geometry. Moving geometry provides correct angles and/or distances for the specified geometry in the form of a moving pattern of dots. When you draw and edit objects, the pattern of dots moves as you work so that the origin of the pattern is at the most recent mouse button-up location. This provides the set of constraint angles wherever you are working.
  - Fixed grids – Linear and angular geometries are also available as fixed grids. These grids provide correct angles and/or distances in the form of stationary patterns of dots, like having a piece of graph paper on the screen. Movement of the cursor does not affect the location of the grid.
- Cross hairs – Geometry and alignment cross hairs are available to help you draw, align, and transform objects. See Chapter 14 for more information.
- Pin Point – The Pin Point is a non-printing tool used to cut, measure, and transform objects. Refer to Chapter 7, Chapter 12, and Chapter 15 for more information.
- Gravity – Gravity enables you to control how objects are positioned with respect to one another. Gravity provides snap or magnetism at the points where it is active. This makes it easier to line up objects and connect chain joints to form closed chains (shapes). Gravity is provided along object edges, at control points, and at intersections of objects. See Chapter 14 for more information.
- Frame Units – Nine different frame units are available to make your drawing accurate. Refer to Chapter 15 for more information.
- Measures window – The Measures window is used to measure the positions and sizes of objects, and to move objects and control points. Refer to Chapter 15 for more information.
- Rulers – The Pro Illustrator Quick Art contains rules that you place in your illustrations as measuring tools. the rules can be printing or non-printing objects. Refer to Chapter 15 for more information.



## **Part 2**

### **Creating and working with objects**



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## 4. Pro Illustrator frames

Every illustration you create with *Xerox Pro Illustrator* is contained in a Pro Illustrator frame. A Pro Illustrator frame is an anchored frame you insert in a VP document. You can copy, move, and delete Pro Illustrator frames. Pro Illustrator frames have the same properties as other anchored frames (border style and width, margins, and captions); however, you cannot embed them inside other frames.

This chapter tells you how to create Pro Illustrator frames and how to modify their properties. Topics covered include:

- The infinite drawing pad
- Creating a Pro Illustrator frame
- Pin Point
- Modifying frame properties.

If you need more information on anchored frames, refer to *Document Editor: Basics User Guide* in the *VP Series Reference Library*.

---

### The infinite drawing pad

Each time you create a Pro Illustrator frame, you create a drawing pad that extends without limit in all directions. The frame itself is a cropping boundary that surrounds an area of the drawing pad. Cropping means eliminating unwanted portions of a photo or illustration.

Only the part of the drawing pad within the frame appears on the document page. You can draw, copy, and move objects anywhere on the drawing pad but only those objects within the frame appear in the printed document.



6. Release <Keyboard> and <Special>.

If you have only the Pro Illustrator application running, the system creates a Pro Illustrator frame in the next available space on the page.

If you have more than one Illustrator graphics application running (for example, *Xerox Pro Illustrator* and *Xerox Chemical Illustrator*) the system creates an Illustrator frame, and an option sheet appears.

Select the Pro Illustrator frame type from the option sheet. The frame type automatically highlighted corresponds to the first Illustrator graphics application you run after running *Xerox Illustrator Basics* software.

7. Paginate the document.

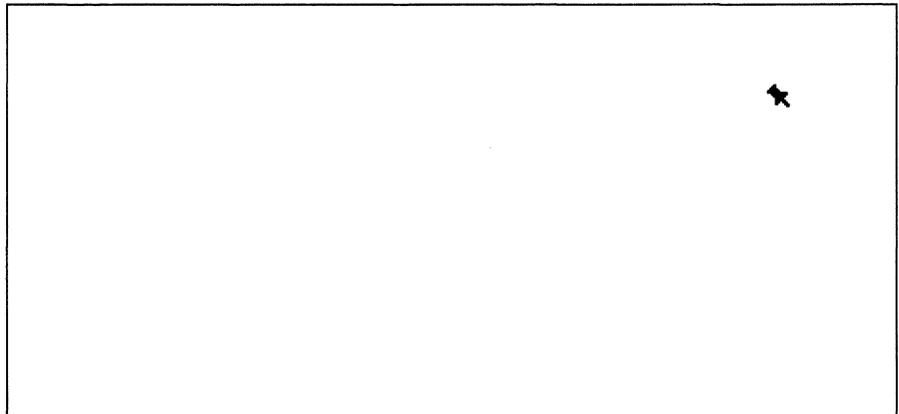
This allows you to see where the system places the frame in the document. If an adjustment is needed (for example, if the system forces the frame onto the next page), you can change the size of the frame, move the frame, insert a page break, or move text to another page.

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## Pin Point

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When you create a Pro Illustrator frame, you will see an object shaped like a push pin in the upper right corner of the frame. This object is called the Pin Point.



The Pin Point is not part of the illustration (it is non-printing). It can be selected and moved, but it cannot be copied, deleted, or transformed.

The Pin Point has the following four uses:

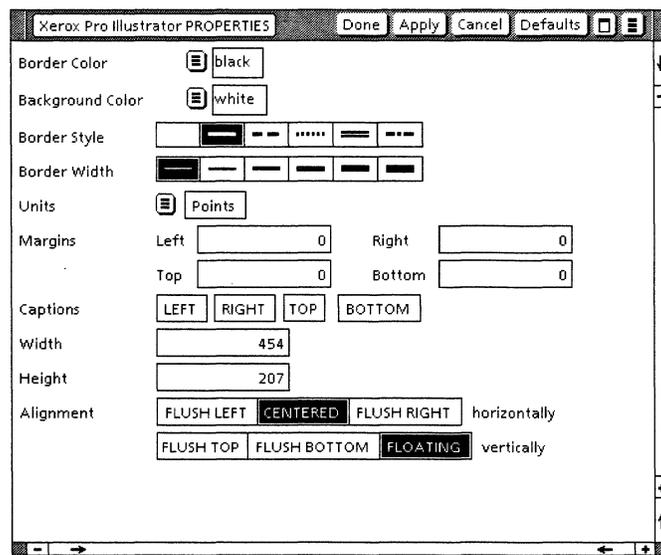
- It helps you transform objects (see Chapter 12).
- It allows you to change the origin of the linear or angular grid (see Chapter 14).
- It allows you to specify the location of vanishing points when drawing objects in perspective (see Chapter 14).
- It is the starting point for measuring objects with the Measures window (see Chapter 15).

## Modifying frame properties

Like other VP anchored frames, Pro Illustrator frames have properties you can modify. These properties include the following:

- Border Color
- Background Color
- Border Style
- Border Width
- Units
- Captions
- Width and Height
- Alignment
- Span (visible with certain alignments)
- Margins.

You modify these properties on the *Xerox Pro Illustrator* Properties sheet.



Follow these steps to modify frame properties:

1. Press and hold down the left mouse button.
2. Move the cursor to the border of the frame and release the mouse button. The frame becomes a solid black rectangle.
3. Press <Props>.
4. Change any of the properties as desired.
5. Select [Apply] or [Done].

## 5.

# Softkeys

The softkeys enable you to use *Xerox Pro Illustrator*. They provide the commands and options that enable you to create and revise illustrations.

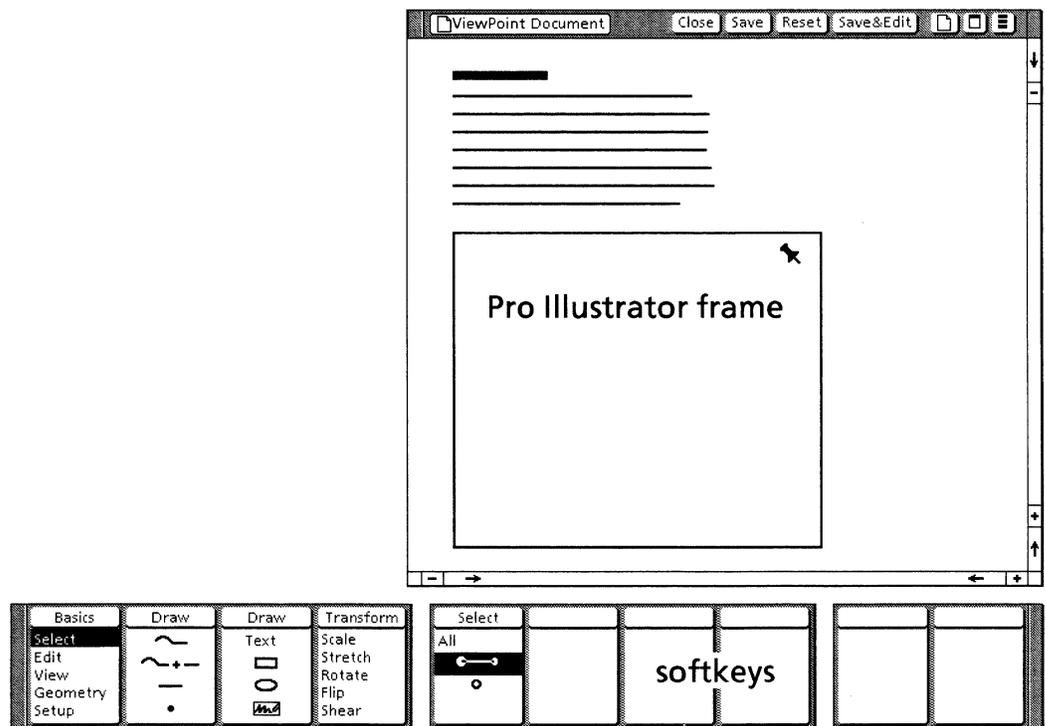
This chapter tells you how to use the softkeys and how to customize them to meet your needs. Topics covered include the following:

- Viewing and hiding the softkeys
- Selecting the softkey choices
- Command softkeys
- Changing softkeys
- Moving and repositioning the softkeys
- Customizing the softkeys.

### Viewing and hiding the softkeys

To view the softkeys, move the pointer inside the Pro Illustrator frame, and click the left mouse button.

The softkeys displayed on the screen correspond to the ten function keys, <F1> to <F10>, at the top of your keyboard.



To hide the softkeys, move the pointer outside the Pro Illustrator frame, and click the left mouse button.

## Selecting the softkeys choices

There are two ways to select choices on the softkeys: using the mouse or using the function keys.

### Using the mouse

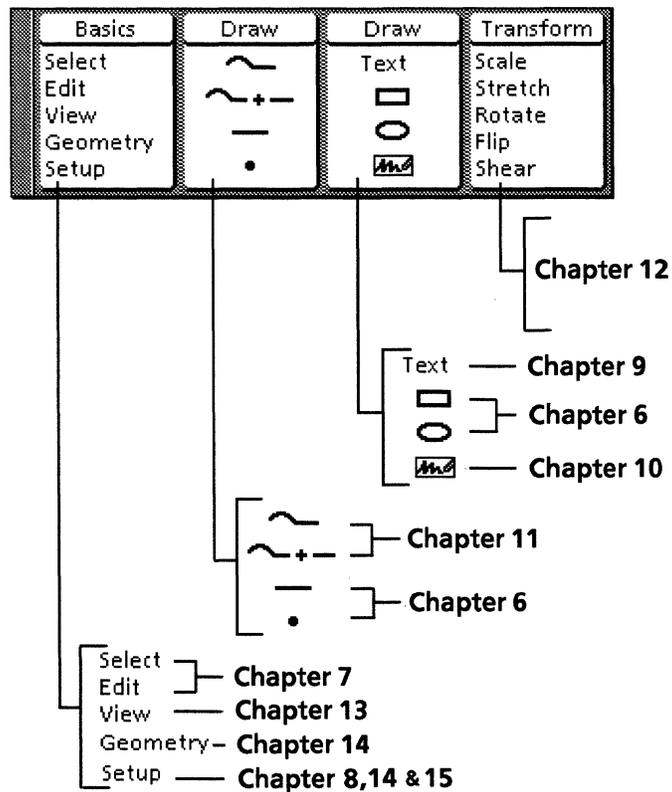
1. Move the pointer to the desired choice on the softkey.
2. Click the left mouse button.

### Using the function keys

1. Press the top row function key corresponding to the desired choice.
2. Press the softkey repeatedly to cycle through the softkey choices.

## Command softkeys

The four left softkeys are called the Command softkeys. They include the Basics softkey, Draw softkeys, and Transform softkeys. The Command softkeys provide commands that enable you to use *Xerox Pro Illustrator*.



This section describes the function of each softkey. You will learn how to use these softkeys in other chapters in this reference manual.

## Basics softkey

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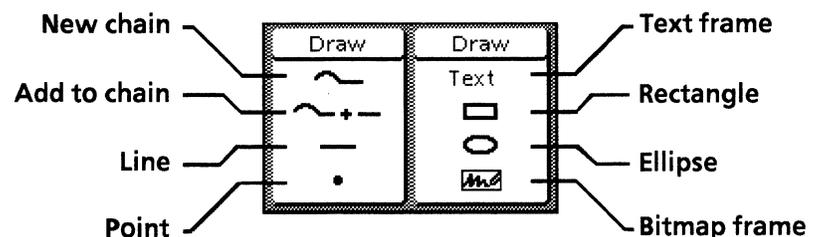
The Basics softkey contains five commands.

- **Select** – Allows you to select objects in the frame and change their properties on the softkeys. The system automatically returns to the select mode after it completes a command, or after you press <Stop>. See Chapter 7 for details.
- **Edit** – Enables you to place an object on top of or beneath other objects (layering), or to join several objects into a single object (clustering). See Chapter 11 for complete information.
- **View** – Lets you to set up View windows with enlarged or reduced views of portions of the frame, the entire frame, or the infinite drawing pad outside the frame. See Chapter 13 for details.
- **Geometry** – Provides a set of grids and angle constraints which you can use to draw and position objects. You can use geometry with fixed grids or moving geometry and pre-set or user-specified angles to create axonometric and perspective projections. See Chapter 14 for complete information.
- **Setup** – Allows you to set the properties of points lines, fills, and text frames before creation. This softkey also allows you to use a variety of support tools that help you draw and position objects, including Frame Units, the Measures window, cross hairs, and gravity. See Chapter 15 for information.

## Draw softkeys

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The Draw softkeys allow you to draw graphic objects, including chains, text frames, and bitmap frames. The objects are identified by icons.



Chapter 6 describes how to draw points, lines, rectangles, and ellipses. Chapter 9 discusses how to create and use text frames. Chapter 10 explains how to create and use bitmap frames. Chapter 11 describes how to draw chains.

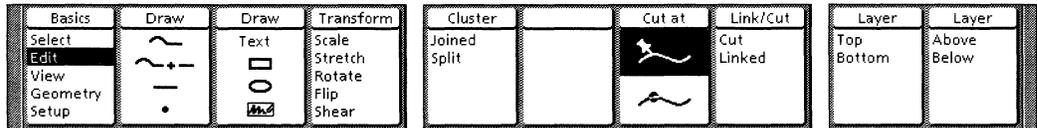
## Transform softkeys

The Transform softkeys allows you to transform objects by changing their size, shape, or angle. See Chapter 12 for details.

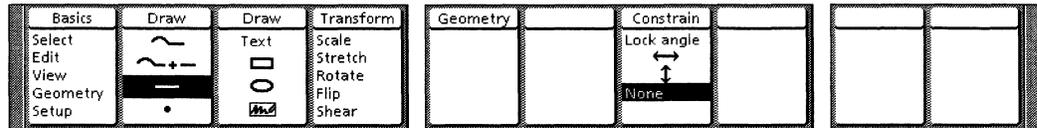
## The Changing softkeys

Each time you select a command on one of the Command softkeys, the system gives you a set of choices that apply to that command. These choices are displayed on the six rightmost softkeys – the Changing softkeys. These keys are called changing because the information they display is different for each command you select.

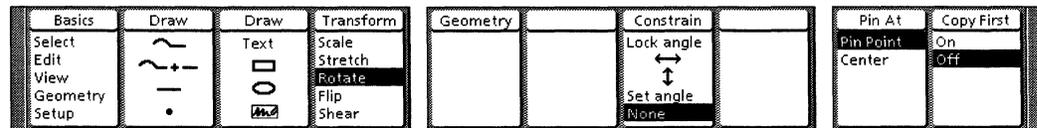
When you select one of the commands on the Basics softkey, the Changing softkeys display the available options for that command. For example, the following illustration shows the appearance of the Changing softkeys when Edit is selected.



When you select one of the icons on the Draw softkeys, the Changing softkeys display the available constraints for creating that object. For example, the illustration below shows the appearance of the Changing softkeys with the line icon selected.

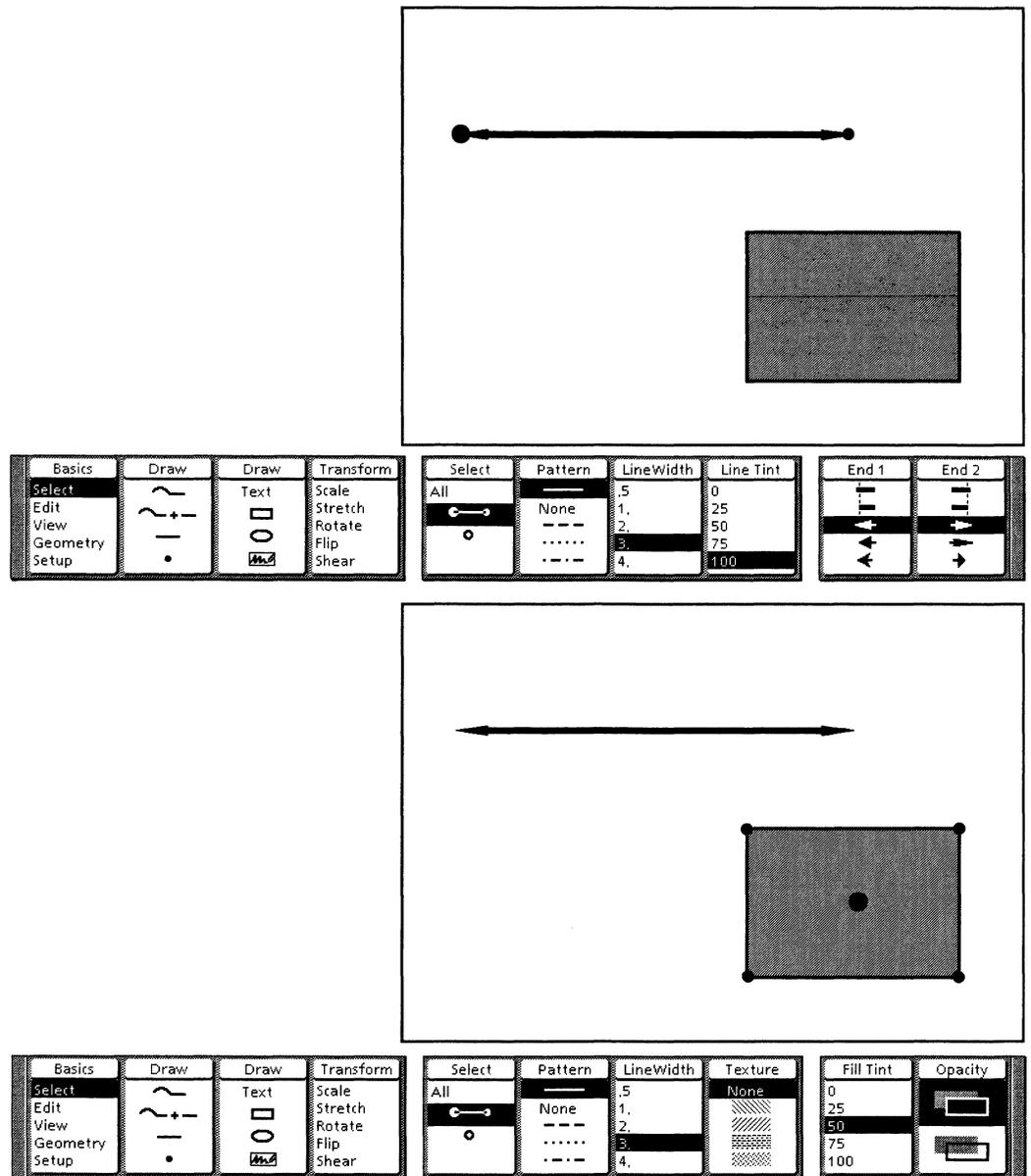


When you select an object and then select a command on the Transform softkey, the Changing softkeys display the available options and constraints for that transformation. The following illustration shows the appearance of the Changing softkeys with Rotate selected.

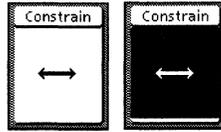


When you copy or move an object, the Changing softkeys display the constraint options. See Chapter 7 for information and examples.

When you select an object that has already been drawn, the Changing softkeys display that object's properties. The currently selected choices are highlighted so you can see and change the values that have been assigned to the object.

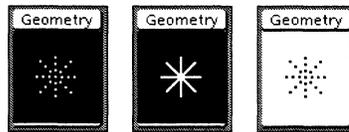


Some of the changing softkeys work as toggles. There are two kinds of toggling softkeys: two-state and three-state. The two-state toggle softkey is on when it is selected (highlighted) and off when it is not selected. The following illustration shows a two-state toggle softkey.



A three-state toggle softkey works like a menu where you can only see one choice at a time. You select your choice by clicking on the softkey or pressing the function key.

Geometry is an example of a three-state toggle softkey. When drawing or transforming an object with Linear or Angular Geometry turned on, you can choose to have the grid on, moving geometry on, or both the grid and moving geometry off. The following illustration shows Geometry for angular geometry in the three different states.

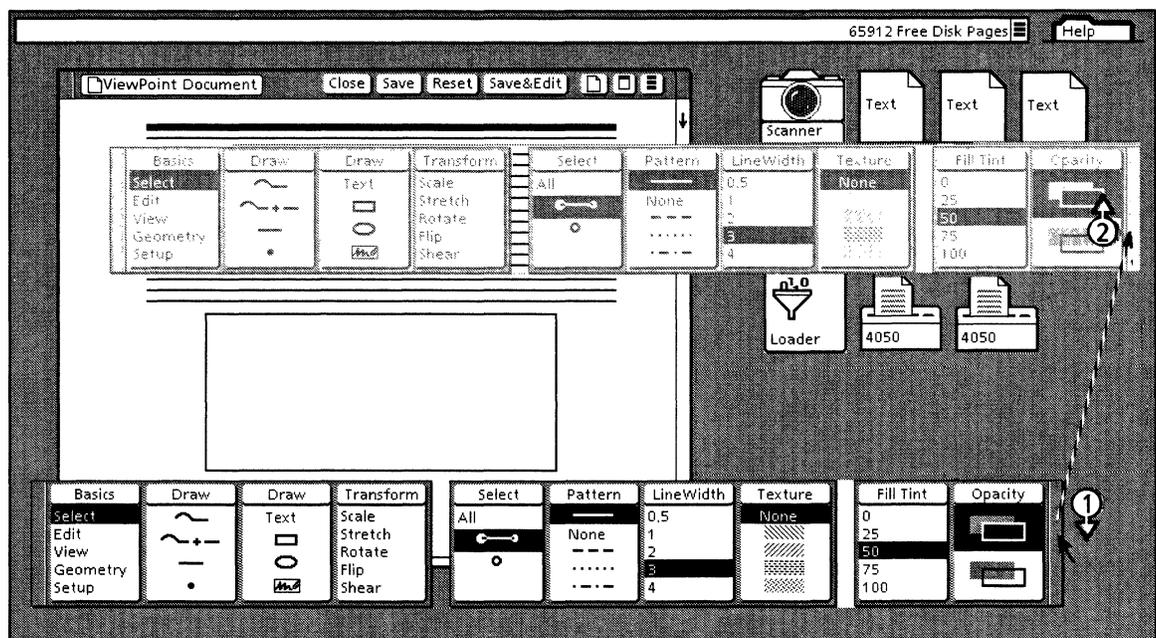


## Moving and repositioning the softkeys

The softkeys are contained within their own window. You can move the softkey window around on the screen, and you can position it above or below another window. You cannot, however, change the size of the softkey window or scroll its contents.

### Moving the softkeys

The following illustration shows an example of moving the softkeys.



Follow these steps to move the softkeys:

1. Position the pointer anywhere within the vertical bar at either the left or right side of the softkey window.
2. Press and hold the left mouse button.
3. Move the pointer until the softkeys are in the desired position.
4. Release the left mouse button.

The two gaps in the softkeys are wide enough to allow the vertical scroll bar in the document window to show through. If you position one of the gaps over the scroll bar, you can vertically scroll the document while the softkeys are displayed.

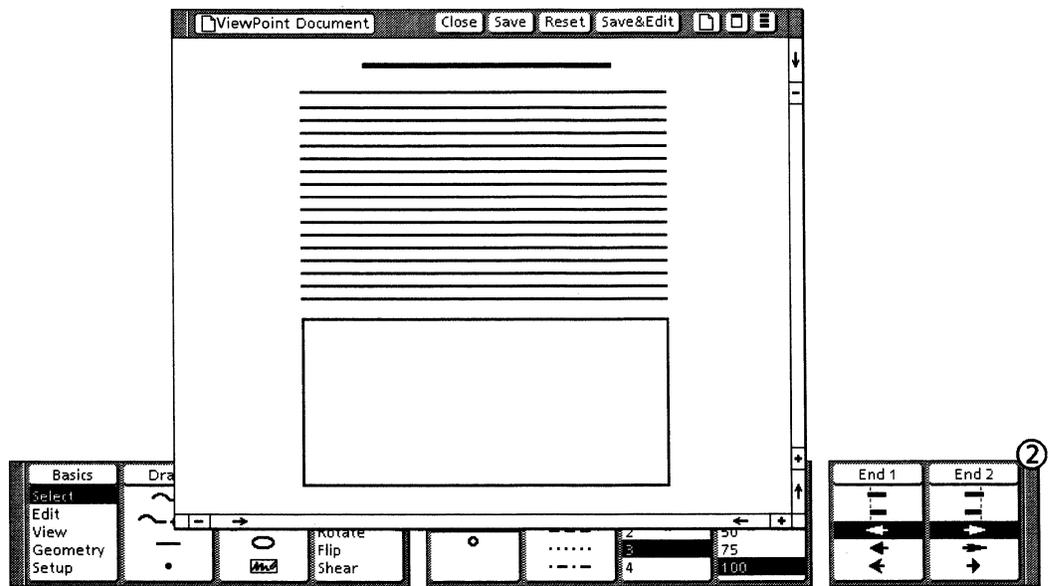
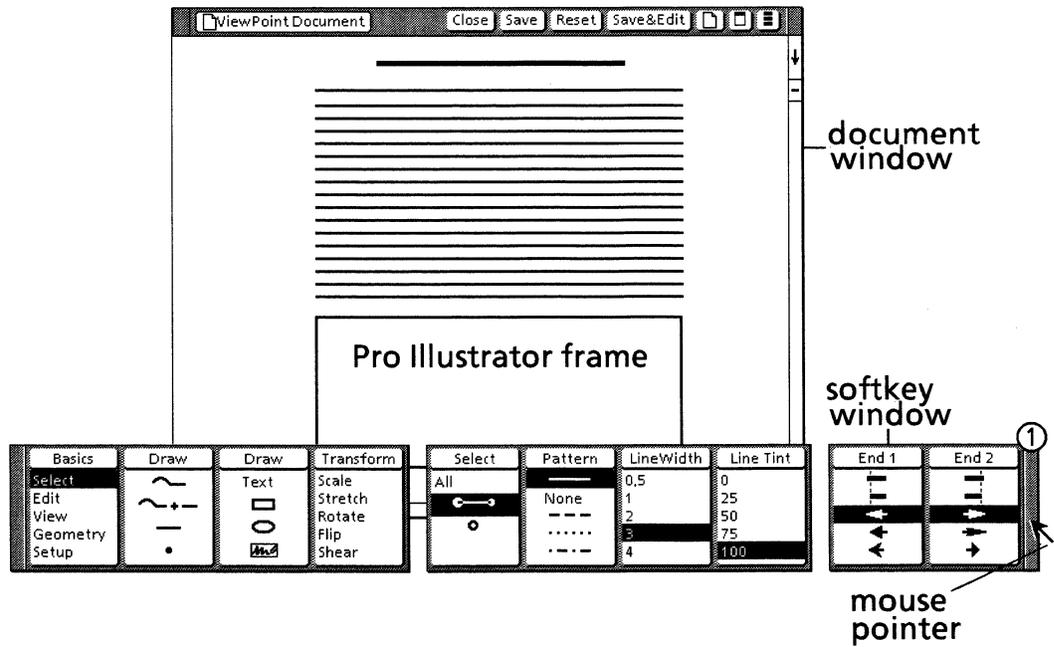
## Repositioning the softkeys

Follow these steps to reposition the Pro Illustrator softkeys above or below a window:

1. Position the pointer within the vertical bar at either the left or right side of the softkey window.
2. Click the left mouse button.

The softkeys move above or below the window (depending on where the softkeys were to start).

The following illustration shows an example of repositioning the softkeys on top of a window and underneath a window.



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## Customizing the Pro Illustrator softkeys

---

*Xerox Pro Illustrator* allows you to customize each Changing softkey so it displays the choices you use most often. You can delete and add choices, change the order in which choices appear, or edit numerical choices.

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### Deleting and adding softkey choices

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Each Changing softkey has a property sheet. You can use the softkey property sheets to customize the choices that appear on the softkeys.

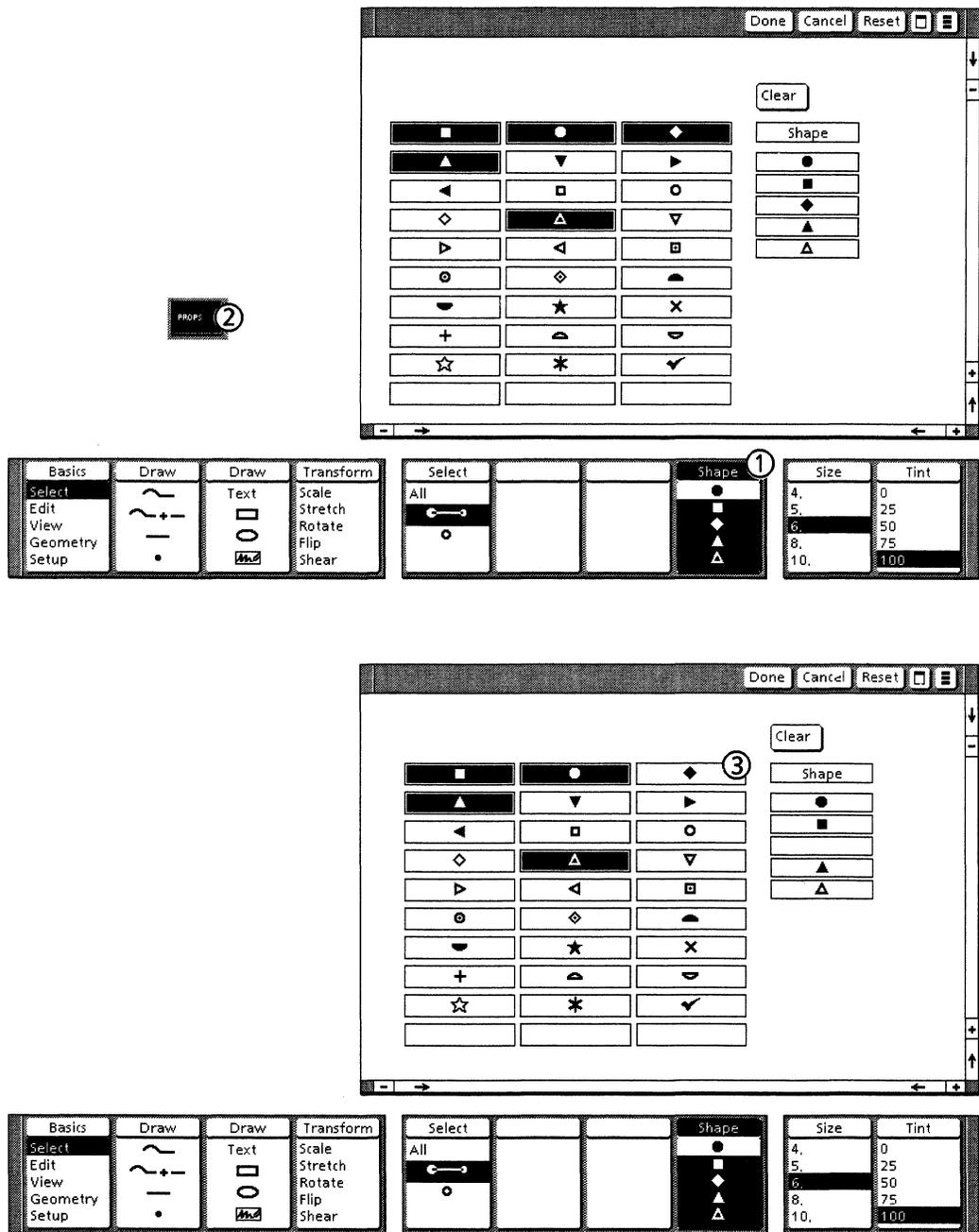
When you open a softkey property sheet, the left side displays all the possible choices. The currently selected choices are highlighted. The right side of the property sheet displays a diagram of the softkey. The diagram shows the currently selected choices in the order (top to bottom) in which they will appear on the softkey.

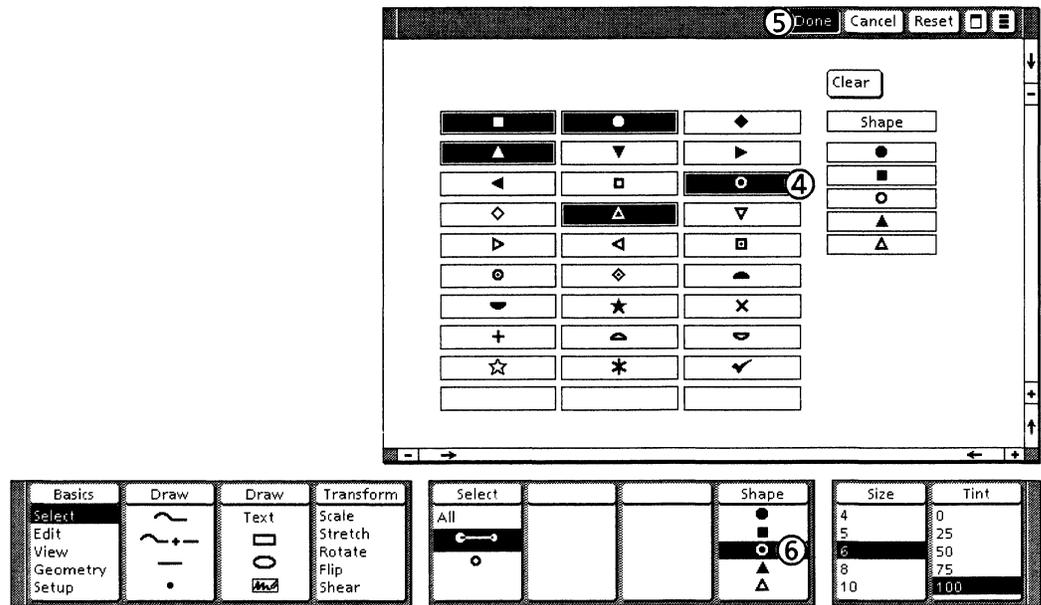
As you delete and add choices on the property sheet, the softkey diagram changes. However, the softkey itself does not change until you close the property sheet.

If you are going to make several changes, you can select [Clear] on the property sheet. Clear deselects all the current choices and blanks out the softkey diagram. You can then add choices in the desired order; the system places them in the softkey diagram from the top down.

If you make a mistake or change your mind, you can select [Reset] on the property sheet. Reset restores the choices that were selected when you opened the property sheet.

The following illustrations and procedures show an example of deleting and adding choices to a softkey.





Follow these steps to delete and add softkey choices:

1. Display the Pro Illustrator softkeys.  
If you do not see the softkey you want to modify, select an object in the Pro Illustrator frame whose properties were created with the softkey.
2. Select the header of softkey you want to modify, and press <Props>. The softkey is highlighted and the softkey property sheet displays.
3. Delete a choice: Move the cursor to the choice and click the left mouse button. The choice is no longer highlighted and a blank space opens up on the softkey diagram.
4. Add a choice: Move the cursor to the choice and click the left mouse button. The choice is highlighted and it fills the blank space on the softkey diagram.
5. Select [Done].
6. The softkey appears with the choice deleted.

## Editing numerical choices

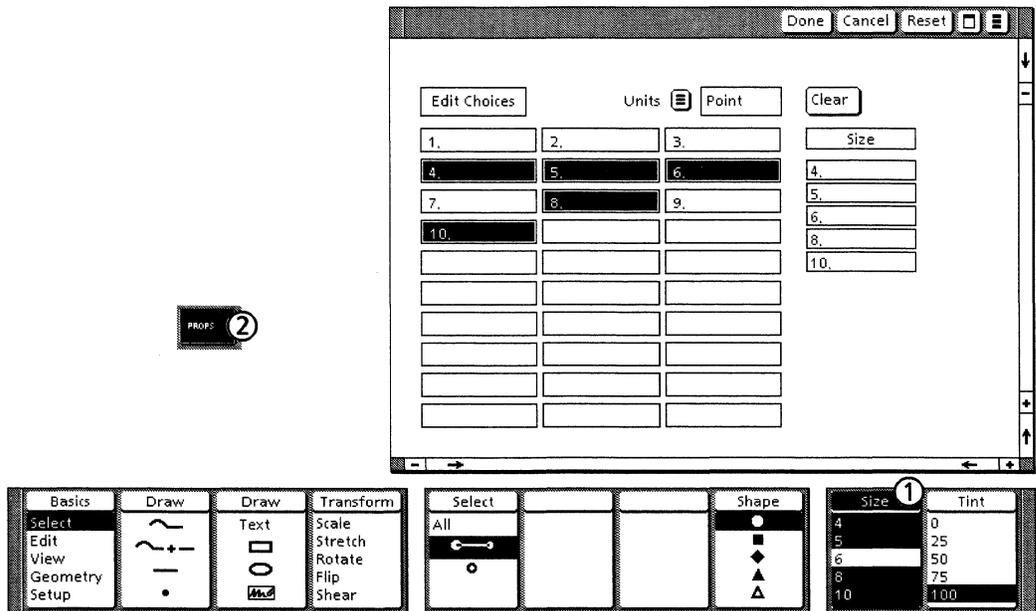
If a softkey contains numerical choices (for example, Line Width), its property sheet has an Edit Choices property sheet. Edit Choices allows you to modify the available choices or add your own.

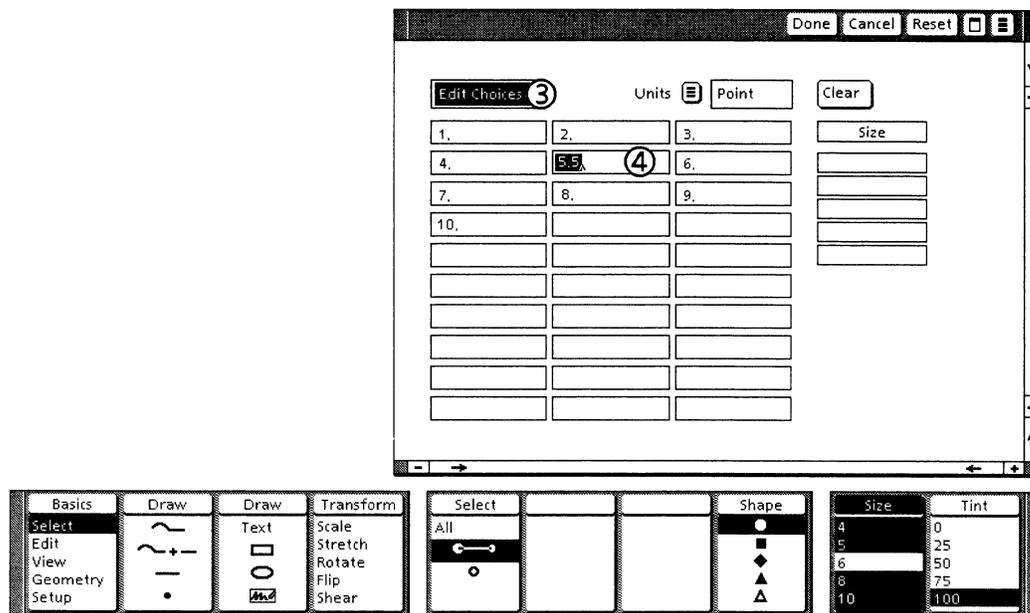
The property sheets for numerical softkeys also contain a Units menu. Units allows you to convert the numbers from one unit of measure to another. The menu affects only the softkey property sheet, not the softkey itself.

The numbers on the softkey are in Frame Units, the unit of measure for everything inside the frame (see Chapter 15). When you close the property sheet, the choices are displayed on the softkey in the same units as when you opened it (the Frame Units). If you want to change the units on the softkey itself, you must change the Frame Units.

For example, suppose the Line Width softkey displays the line widths in points (1, 2, 3, 4, and 8). When you open the property sheet, the values are displayed in points. If you select "Mm" on the Units menu, the values are then displayed on the property sheet in millimeters (.35278, .70556, 1.0583, 1.4111, and 2.8222). When you close the property sheet, the values are still displayed on the softkey in points (1, 2, 3, 4, and 8).

The illustrations and procedure below show how to edit numerical choices.





Follow these steps to edit numerical choices:

1. Select the header of the softkey that you want to modify, and press <Props>.
2. Select [Edit Choices] on the softkey property sheet.
3. Select the value you want to change, and press <Del>.
4. Type the new value.  
You can also add a new value to any blank box on the softkey property sheet.
5. Deselect [Edit Choices] to stop editing.  
The change displays on the softkey property sheet.
6. Select [Done].  
The new value appears on the softkey.



---

## 6.

## Creating objects

You create *Xerox Pro Illustrator* drawings by combining the following objects:

- Points
- Straight lines
- Curves and arcs
- Rectangles (including squares)
- Ellipses (including circles)
- Shapes and polygons
- Text frames
- Bitmap frames.

Topics covered in this chapter include the following:

- Using the Geometry feature
- Drawing objects
- Drawing points
- Drawing lines
- Applying constraints when drawing
- Drawing rectangles (and squares)
- Drawing ellipses (and circles).

---

### Using the Geometry feature

---

*Xerox Pro Illustrator* offers the Geometry feature to help you create, transform, measure, and position objects.

This chapter describes how to create objects without using Geometry. In order for you to follow the procedures as described in this chapter, the Geometry Type should be set to None.

Follow these steps to change the Geometry Type:

1. Select inside the Pro Illustrator frame.
2. Select Geometry from the Basics softkey.
3. Select None from the Type softkey.

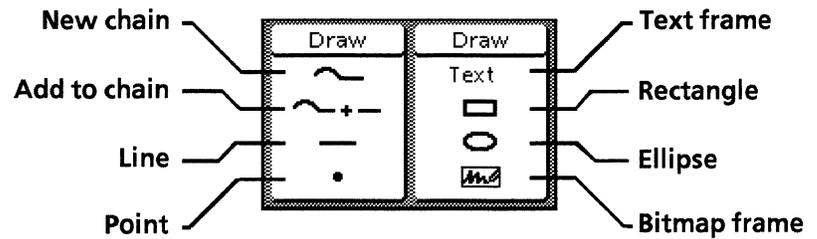
For information about Geometry, see Chapter 14.

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## General procedure for drawing objects

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1. Select the icon for the object you want to draw on one of the Draw softkeys.



2. Specify the starting point of the object by clicking the left mouse button.
3. Use the mouse to draw the object to the desired size.
4. Change the object properties, if required.

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## Stopping drawing activity

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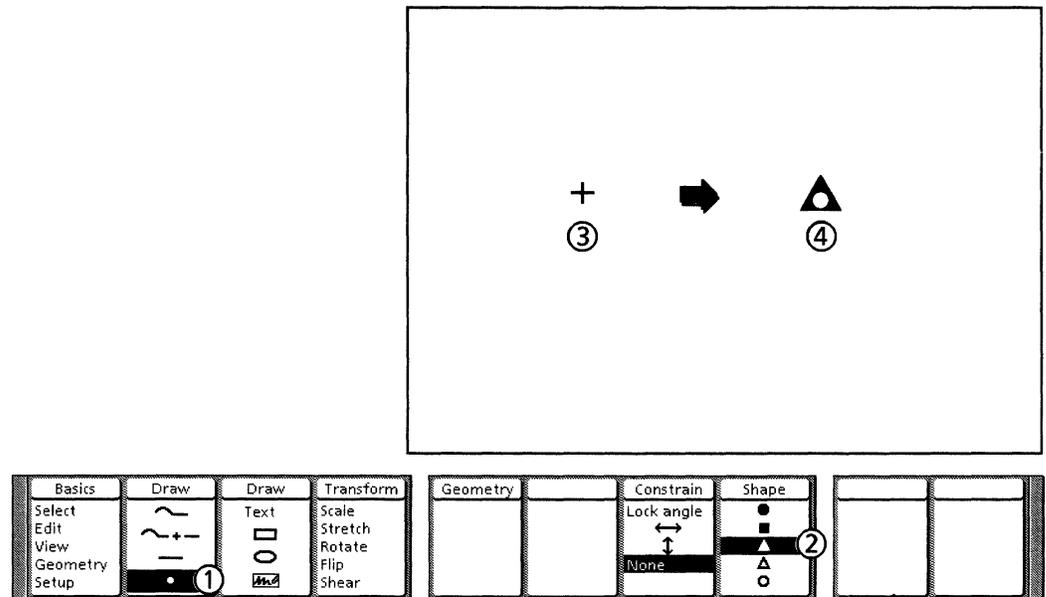
You can to stop the current drawing action at any time by pressing <Stop>.

*Xerox Pro Illustrator* deletes the graphic object and returns to Select on the Basics softkey.

## Drawing a point

This section shows you how to draw points. You select the point shape before you draw the point. For information about other point properties, see Chapter 8.

The following illustration and procedure show how to draw a point.



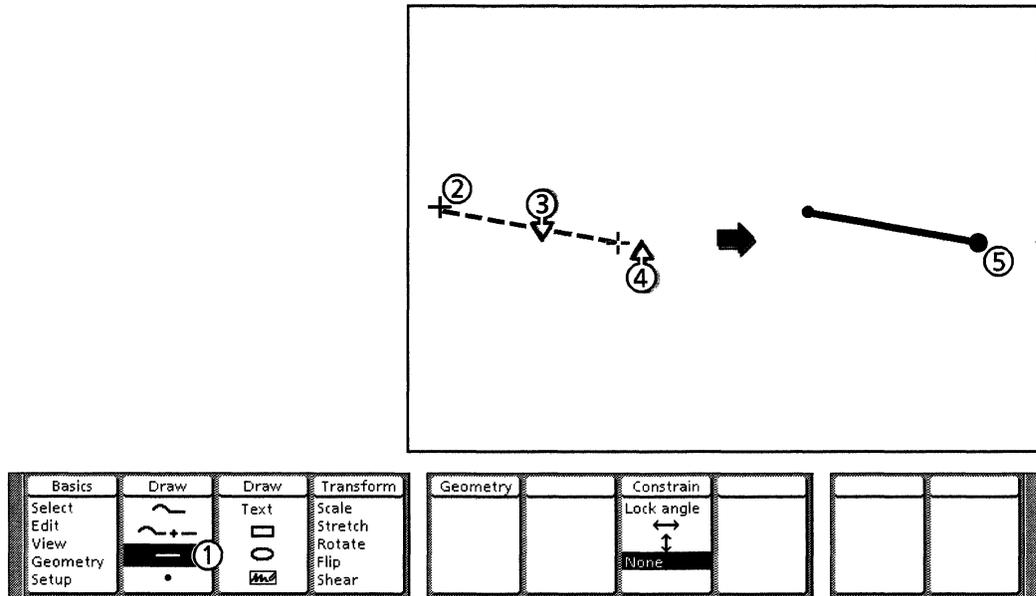
Follow these steps to draw a point:

1. Select the Point icon on the Draw softkey.
2. Select a point shape.
3. Move the cursor into the frame; it becomes a plus-shaped drawing cursor. Position the cursor where you want to place the point and click the left mouse button.
4. The system draws the point and returns to Select mode with the point selected.

## Drawing a line

This section shows you how to draw a line. For information on line properties, refer to Chapter 8.

The illustration following illustration and procedure show how to draw a line.



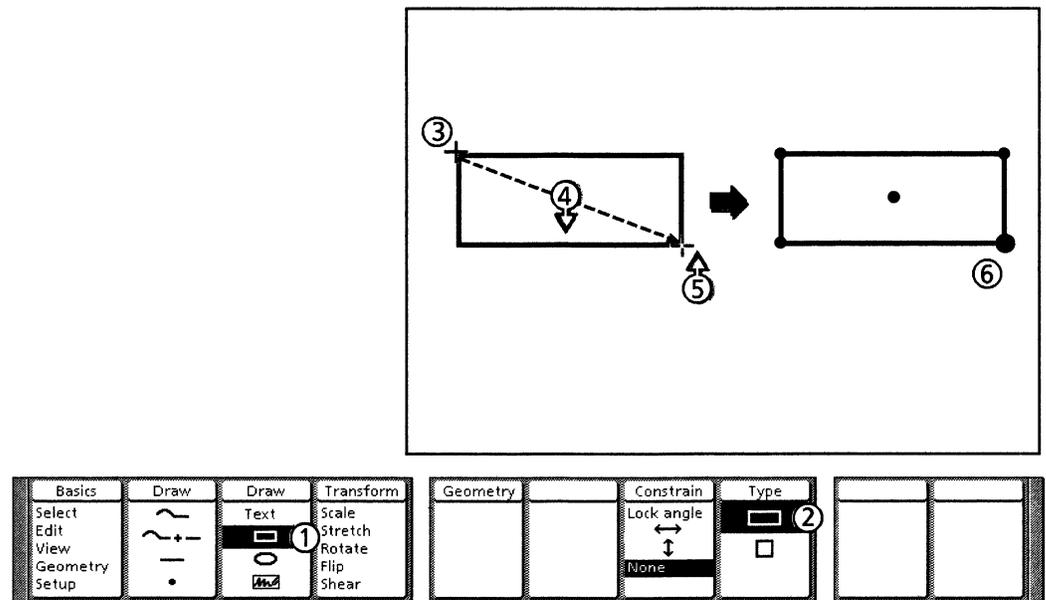
Follow these steps to draw a line:

1. Select the Line icon on the Draw softkey.
2. Move the cursor into the frame; it becomes a plus-shaped drawing cursor. Position the cursor where you want to place the first endpoint (End 1) of the line and click the left mouse button. A plus-shaped temporary marker indicates the first endpoint of the line.
3. Hold down the left mouse button. A temporary image of the line appears. Move the cursor to where you want the second end point (End 2) of the line.
4. When the line is the correct length and position, release the left mouse button.
5. The system draws the line and returns to Select mode with the line selected.

## Drawing a rectangle or square

This section contains the procedure for drawing rectangles or squares. It also includes a procedure for applying constraints when you are drawing rectangles.

You can choose to draw a rectangle or square on the Type softkey. Selecting Square constrains the sides of the rectangle to equal sizes, regardless of your cursor position.



Follow these steps to draw a rectangle or square:

1. Select the Rectangle icon on the Draw softkey.
2. Select the Rectangle or Square icon on the Type softkey.
3. Move the cursor into the frame; it becomes a plus-shaped drawing cursor. You can select the rectangle corner with the left mouse button, or the rectangle center with the right mouse button. Position the cursor and click the left or right mouse button.
4. Hold down the left mouse button. Move the mouse to change the size of the rectangle.  
You can change between Rectangle and Square on the Type softkey while you are holding down the mouse button.
5. When the rectangle is the desired size, release the left mouse button.
6. The system draws the rectangle and returns to Select mode with the rectangle selected.

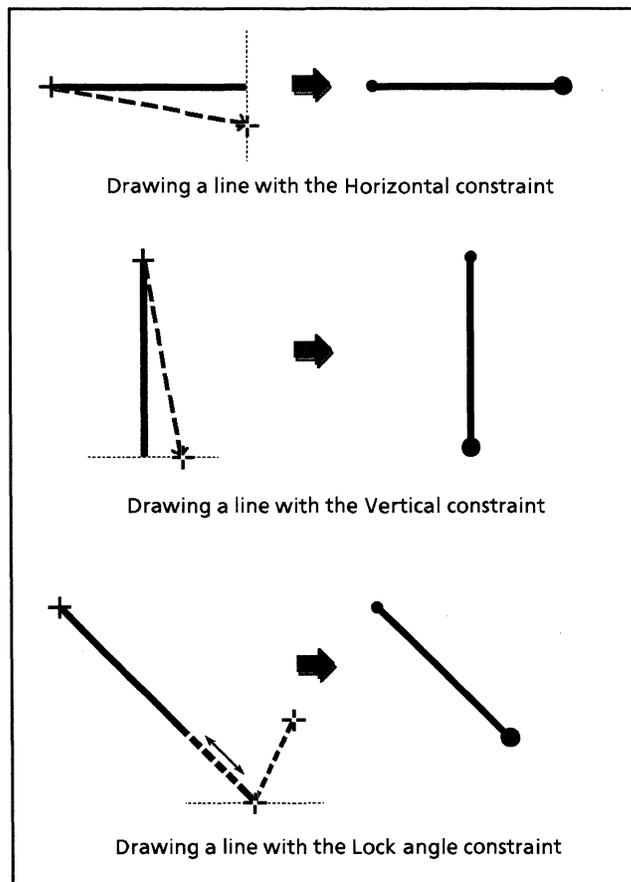
## Applying constraints when drawing

Constraints are special softkey choices that help you draw objects more easily and accurately. They restrict drawing by causing the system to respond only to horizontal or vertical mouse movement, or to a specified angle.

For example, when you draw a line, the Horizontal and Vertical constraints help you to draw a horizontal or vertical line. The Lock angle constraint allows you to lock an object's angle while you are drawing so the angle is maintained during further drawing.

You can use the Horizontal and Vertical constraints to align the object you are drawing with another object in the frame. You use the Horizontal constraint to align objects vertically, and the Vertical constraint to align objects horizontally.

The illustration below shows how the Horizontal, Vertical, and Lock angle constraints work when you are drawing a line. Notice how the position of the cursor does not affect the angle.

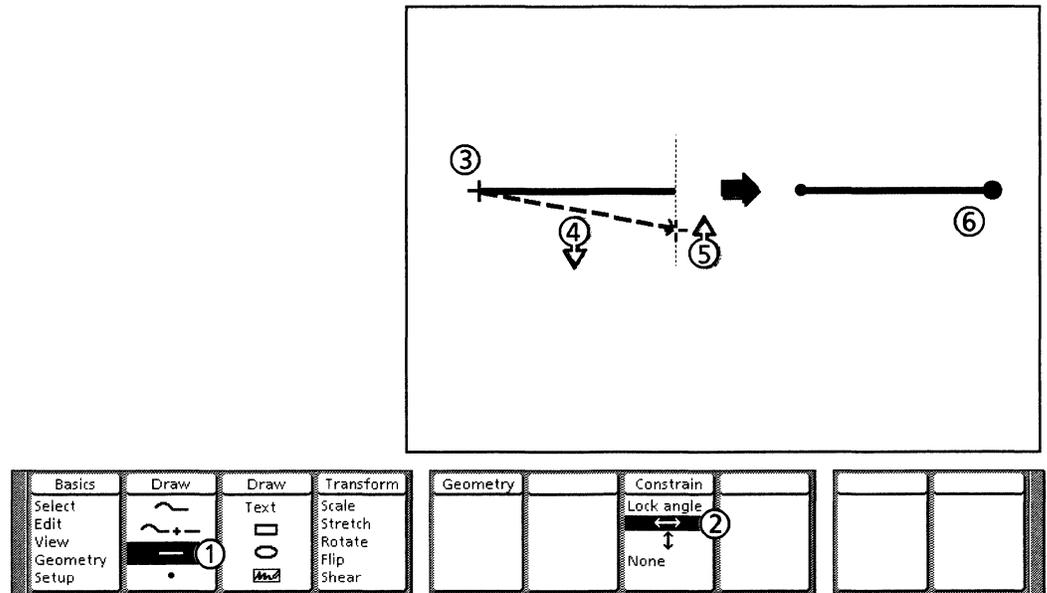


Constraints are available only on the softkeys, not on the object property sheet. They are active only while you are drawing or transforming an object. You can automatically apply previously used constraints to the next object you draw by pressing <Again>. Only one constraint can be active at a time.

## Drawing a line with vertical or horizontal constraints

The horizontal and vertical constraints allow you to draw lines at only horizontal and vertical angles, regardless of the cursor position. All you do is adjust the line length.

When you select the Horizontal or Vertical constraint, a cross hair appears in the opposite direction of the constraint to help you with alignment.



Follow these steps to draw a line with vertical or horizontal constraints:

1. Select the Line icon on the Draw softkey.
2. Select the Horizontal or Vertical icon on the Constrain softkey.
3. Move the cursor into the frame; it becomes a plus-shaped drawing cursor. Position the cursor where you want the first endpoint and click the left mouse button. A plus-shaped temporary marker indicates the first end point.
4. Hold down the left mouse button. A temporary image of the line appears along with a cross hair in the opposite direction of the constraint.

Note that the line remains at the angle you specified regardless of where you position the cursor. You can select a different constraint by pressing <F7>.

5. Move the cursor to adjust the length of the line. When the line is the desired length, release the left mouse button.
6. The system draws the line and returns to Select mode with the line selected (the control points are visible).

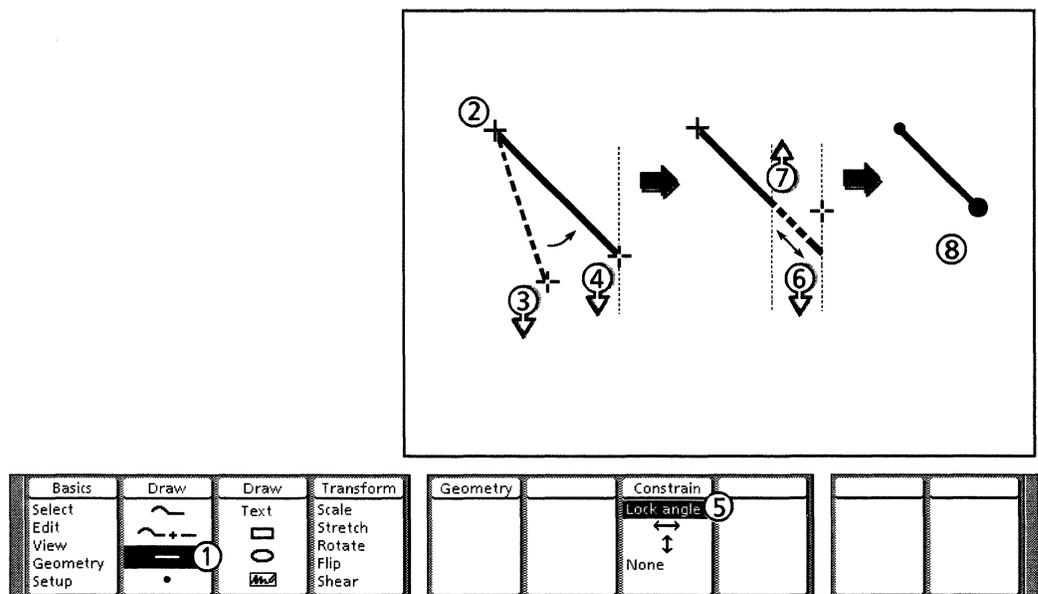
## Drawing a line with the Lock angle constraint

The Lock angle constraint allows you to lock a line at an angle that you specify from the first end point of the line.

If you select Lock angle before you draw the first endpoint, the cursor is constrained to the angle set when you draw the second endpoint.

If you select Lock angle while you are pressing and holding the left mouse button to position the second endpoint, the cursor is constrained to the current angle between the first and second endpoints. You can also select Lock angle by pressing and releasing <Same> on the keyboard.

You can turn the Lock angle constraint on or off at any time while you are drawing by pressing the <Same>, or pressing <F7> to select None on the Constrain softkey.



Follow these steps to draw a line with the Lock angle constraint:

1. Select the Line icon on the Draw softkey.
2. Position the cursor where you want the first endpoint and click the left mouse button.
3. Press and hold down the left mouse button.
4. Determine the angle of the line by moving the cursor.
5. Press <Same> to activate the Lock angle constraint or select Lock angle on the Constrain softkey.

Note that the line remains at the angle you specified regardless of where you position the cursor. If you need to unlock the angle, press <Same> again, or select None on the Constrain softkey.

6. Move the cursor to adjust the line length. You can also change the direction of the line by moving the cursor back beyond the first endpoint.

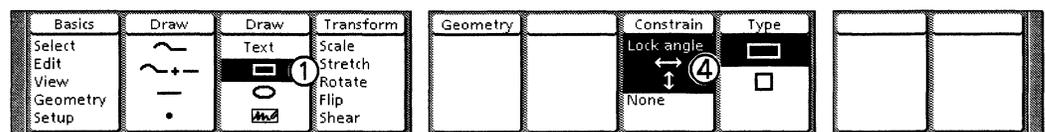
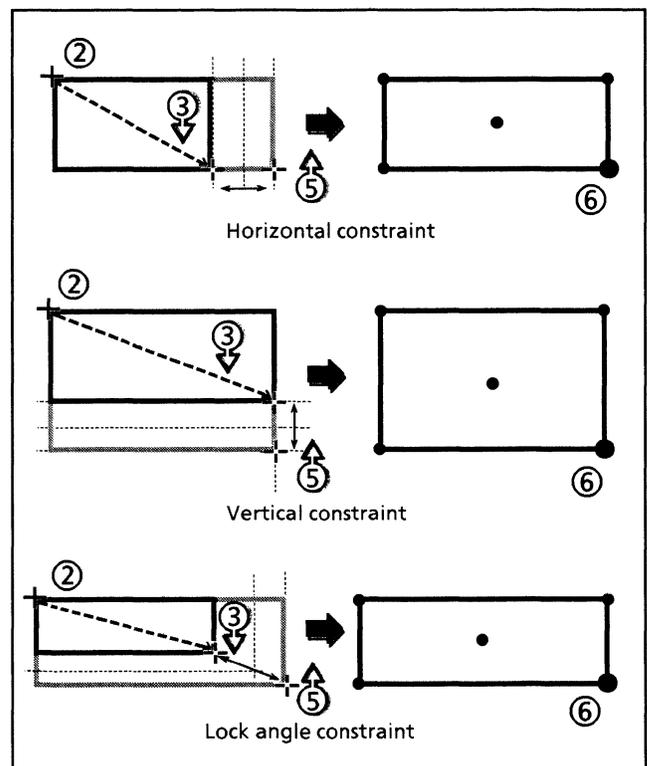
7. When the line is the desired length, release the left mouse button.
8. The system draws the line and returns to Select mode with the line selected.

## Drawing a rectangle with the Lock angle constraint

When used with rectangles, the constraints allow you to modify either the height or width, or both the height and width once the proportions are set.

For example, if you determine a rectangle's height but still want to modify the width, you can set the Horizontal constraint and stretch the rectangle to the desired width while leaving the height constant. With the Vertical constraint on, you can set a rectangle's width, and then modify its height. The Lock angle constraint allows you to set a rectangle's proportions so they remain constant while you modify the size.

You can turn the constraints on or off at any time while you are drawing by selecting None on the Constrain softkey. You can turn the Lock angle on and off by pressing <Same>.



Follow these steps to draw a rectangle with the Lock angle constraint:

1. Select the Rectangle icon on the Draw softkey.
2. Move the cursor into the frame; it becomes a plus-shaped drawing cursor. You can draw the rectangle corner with the left mouse button, or the rectangle center with the right mouse button. Position the cursor and click the left or right mouse button. A plus-shaped temporary marker indicates the location of the corner or center.
3. Press and hold down the left mouse button. A temporary image of the rectangle appears. Move the mouse to set the rectangle proportions.
4. With the mouse button still down, select one of the constraints on the Constrain softkey. You can use the SAME key to select the Lock angle constraint.
5. When the rectangle is the desired size, release the left mouse button.
6. The system draws the rectangle and returns to Select mode with the rectangle selected.

---

## Drawing an ellipse or circle

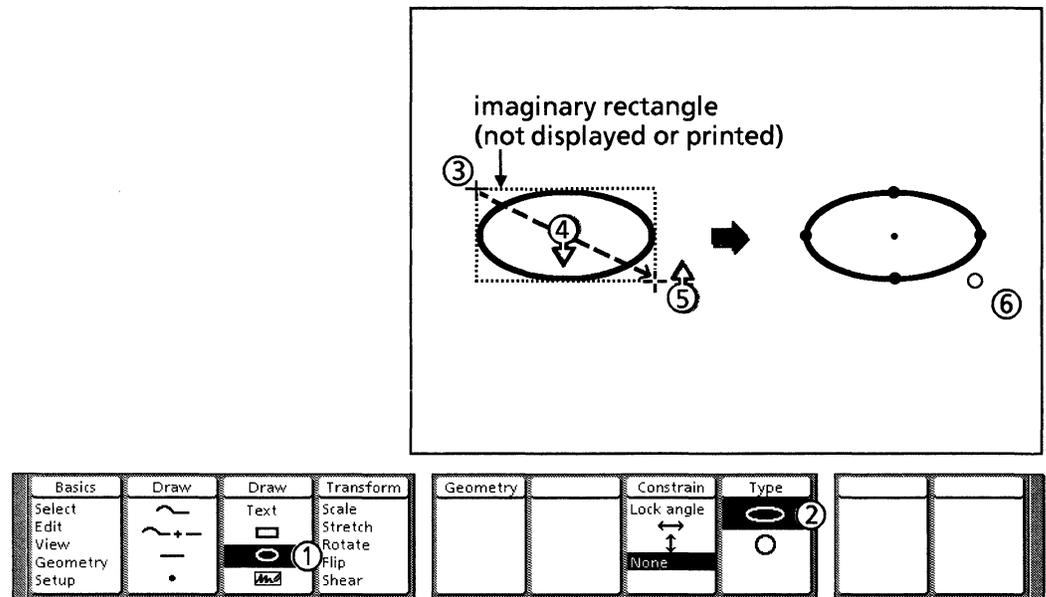
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This section contains the procedure for drawing ellipses or circles. You can choose to draw a circle or ellipse on the Type softkey. Selecting Circle constrains the ellipse to be a circle, regardless of the cursor position

You can also apply constraints when drawing ellipses. The constraints allow you to modify either the height or width, or both the height and width of an ellipse once the proportions are set.

For example, if you determine an ellipse's height but still want to modify the width, you can set the Horizontal constraint and stretch the ellipse to the desired width while leaving the height constant. With the Vertical constraint on, you can set an ellipse's width, and then modify its height. The Lock angle constraint allows you to set the proportions of an ellipse so they remain constant while you modify the size.

The procedure for drawing constrained ellipses is the same as that for drawing constrained rectangles.



Follow these steps to draw an ellipse or circle:

1. Select the Ellipse icon on the Draw softkey.
2. Select the Ellipse or Circle icon on the Type softkey.
3. Move the cursor into the frame; it becomes a plus-shaped drawing cursor. As shown in the illustration, the system draws an ellipse as if it were contained in an imaginary rectangle. You can draw from the ellipse corner with the left mouse button, or from the ellipse center with the right mouse button. Position the cursor and click the left or right mouse button. A plus-shaped temporary marker indicates the corner or center.
4. Press and hold down the left mouse button. A temporary image of the ellipse appears. Move the mouse to change the size of the ellipse.

Note: You can change between the Ellipse and Circle icons on the Type softkey while you are holding down the mouse button.

5. When the ellipse is the desired size, release the left mouse button.
6. The system draws the ellipse and returns to Select mode with the ellipse selected.



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## 7.

# Working with objects

This chapter contains information and procedures for working with graphic objects created with *Xerox Pro Illustrator*. Topics covered in this chapter include the following:

- Displaying
- Selecting
- Moving
- Copying
- Layering
- Clustering
- Cutting
- Deleting.

*Xerox Pro Illustrator* offers many different constraints to help you create, transform, measure, and position objects. This chapter also describes how to work with objects using the Horizontal, Vertical, and Lock angle constraints.

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## Displaying

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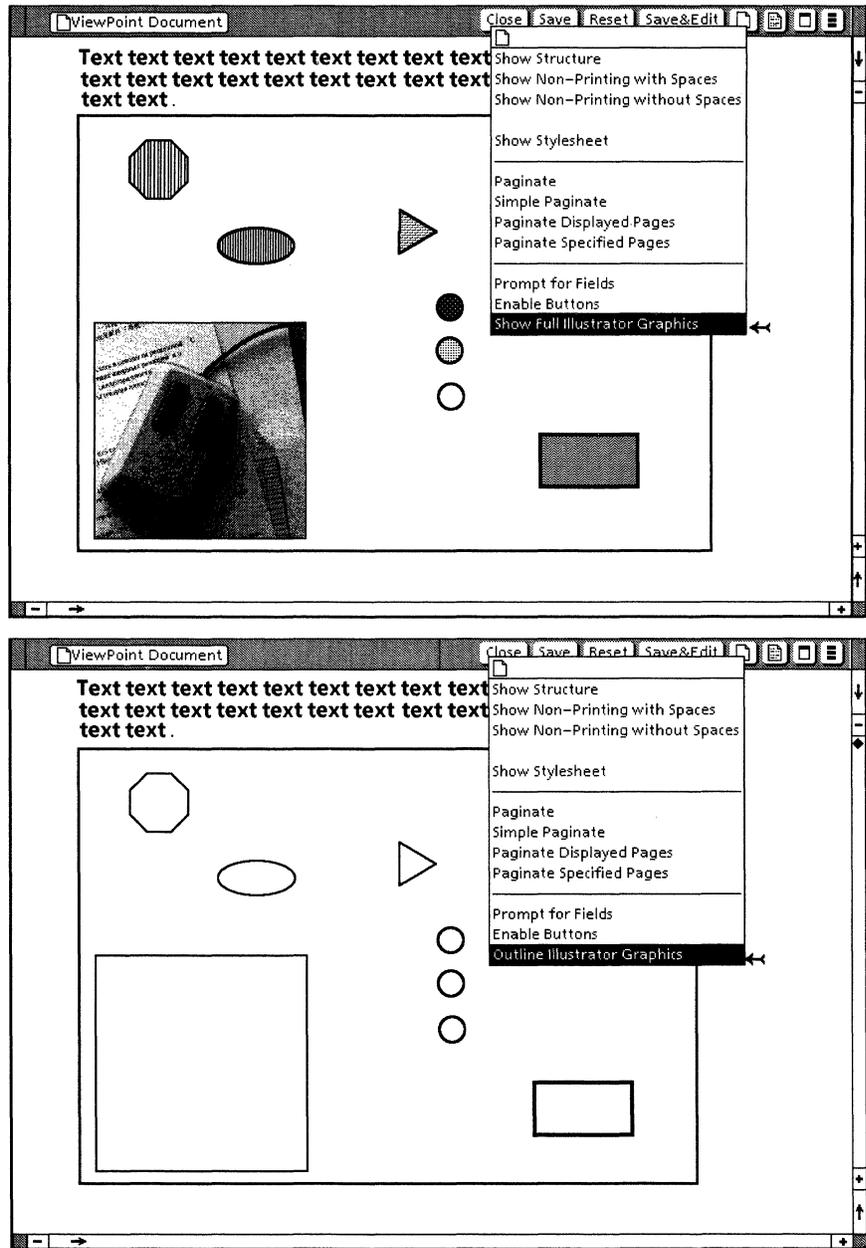
The document auxiliary menu in the document window header contains the [Outline Illustrator Graphics] and [Show Full Illustrator Graphics] commands. These commands change the way objects display in the Pro Illustrator frame.

When you select [Outline Illustrator Graphics] in the document auxiliary menu, all the objects in the Pro Illustrator frame show as thin, black outlines without dashed lines, line ends, tints, or fills. Points show as small dots regardless of actual point shape. The raster images inside bitmap frames do not show. (The outline feature works the same in View windows, except that bitmap frames retain their raster images.

This feature speeds up the screen display time and can make editing easier. The object properties themselves are not changed; only the screen appearance is changed.

To show all the object properties again, select [Show Full Illustrator Graphics] on the document auxiliary menu.

The following illustration shows objects in two Pro Illustrator frames, one with [Show Full Illustrator Graphics] selected and the other with [Outline Illustrator Graphics] selected.



This display feature is also available in View windows. One way you can use this feature is to set the main document view to [Outline Illustrator Graphics] for faster performance while paging through the document. Then use View windows set to [Show Full Illustrator Graphics] if you need to see the full view for editing. See Chapter 13 for more information on View windows.

## Using control points

You use control points to manipulate objects. Each object has one or more control points. Control points are visible only when the object or the control points themselves are selected.

When you select an object, the control points appear as small solid circles on the outline of the object. When you select a control point, it appears as a black circle with a white interior. The control point nearest to the pointer location when you release the mouse button becomes the guide point.

The guide point appears as a larger circle than the other control points. You can think of the guide point as the handle of the object. All editing operations are related to the guide point.

The following illustration shows the control and guide points for various objects. Notice that the number and position of the control points depend on where you select the object. All of the objects shown were selected with the Object icon highlighted on the Select softkey.

<p><b>Rectangle (Square):</b></p> <p>select a corner      Guide Point      select a side</p>	<p><b>Text frame:</b></p> <p>TEXT GOES HERE      TEXT GOES HERE</p> <p>with center control pts      with baseline control pts</p>
<p><b>Ellipse (Circle):</b></p> <p>major axis      minor axis</p> <p>select on minor axis      select off curve</p>	<p><b>Chain:</b></p>
<p><b>Bitmap frame:</b></p>	<p><b>Bezier Curve:</b></p>
<p><b>Line:</b>       <b>Point:</b> </p>	

The following list describes the control points for each type of object depending on where you select the object. (The Object icon is selected on the Select softkey.)

- Rectangle and square – When you select near a corner or the object center, the four corner control points and the center control point are visible. When you select a side, the control point at the center of that side is also visible.
- Ellipse and circle – When you select near the ends of the major and minor axes or the object center, the four axis points and the center control point are visible. When you select midway between the axis control points, the nearest off-curve control point (the corner of the invisible rectangle) is also visible.
- Point – When you select a point, the control point at the center of the point is visible.
- Line – When you select a line, the control point at both ends of the line are visible.
- Chain – A chain has control points in three locations: end points, joints, and bend points. When you select a chain anywhere, all joint and end point control points are visible. When you select a curve or arc segment midway between joints, its bend point control points are also visible.
- Text frames – When you select at a corner of the text frame, the four corner control points and specified center control points are visible. The center control point is either at the baseline (for the first line of text) or at the text frame center, whichever you specify in the Align Point property. When you select a side, the specified control point at the center of that side is also visible.
- Bitmap frames – The control points on bitmap frames work the same as those on rectangles. When you select the frame near a corner or the object center, the four corner control points and the center control point are visible. When you select a side, the control point at the center of that side is also visible.

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## Selecting objects

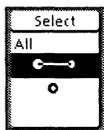
---

Before you can work with an object, you need to select it. You can select objects after creating them if you choose Select, Edit, Geometry, or Setup on the Basic softkey. The system automatically return to Select after you have completed operations in most other modes. For example, after you have finished drawing an object, the object is automatically selected. During other operations, you can quickly return to the Select mode, the five right-most softkeys display a selected object's properties. If nothing is selected, then these softkeys are blank. The choice highlighted on the first changing softkey, the Select softkey, determines which items you can select: objects, control points, or all objects.

## Select softkey

---

The Select softkey allows you to choose the selection level: only individual objects, only individual control points, or all objects.



If you choose the Object icon, which looks like a short, selected line, you will be able to select individual objects in the Pro Illustrator frame using the mouse. The system automatically assumes the object selection level.

If you choose the Control point icon, which looks like a selected control point, you will be able to select individual control points on an object, but not the whole object at once.

If you choose All, every object on the infinite drawing pad is automatically selected. This means that objects which are visible in the Pro Illustrator frame and objects which are outside the cropping boundary are selected. You can use a View window to see objects outside the cropping boundary. When you choose All, the changing softkeys display the properties of the guide point object.

## Selecting a single object

---

The procedure below shows how to select a single object. If you have the Object icons selected on the Select softkey, you can select individual control points by using the <Shift> accelerator described in the section titled, "Selecting control points." When using the <Shift> method, the Object icon remains highlighted. When you release <Shift>, the system will be in the object selection mode.

When selecting objects, you must place the pointer on the outline or close to the exact center to select. You cannot select a filled object by placing the pointer on the filled area.

Follow these steps to select a single object:

1. Select the Object icon on the Select softkey.
2. Place the pointer on the outline or center of the object you want to select.
3. Click the left mouse button.

If you have the Object icon selected on the Select softkey, you can select individual control points by using <Shift> accelerator described in the Selecting control points section in this chapter.

When using <Shift>, the Object icon remains highlighted. When you release <Shift>, the system will be in the object selection mode.

## Deselecting a single object

Follow these steps to deselect a single object:

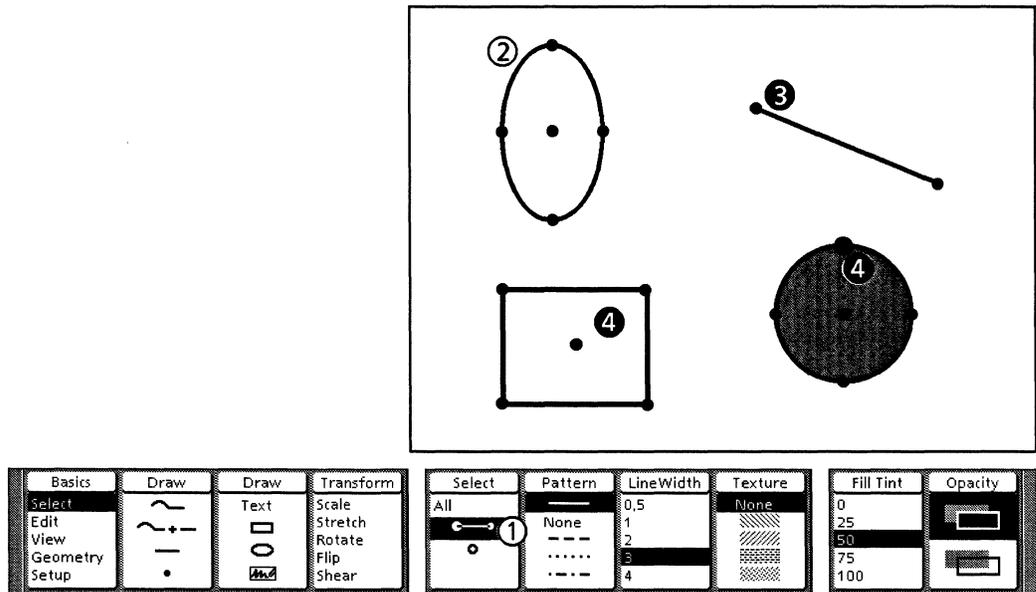
1. Move the pointer off of the object.
2. Click the left mouse button.

## Selecting a group of objects (extended selection)

This section contains information on selecting a group of objects, also known as extended selection. There are two methods of extended selection: object-by-object and draw-through box. They are available for objects, control points, text frames, and bitmap frames and only work when one item is already selected. The section titled, "Selecting All" in this chapter describes an alternate method for selecting large groups of objects.

### Selecting object-by-object

The following illustration and procedure show how to select multiple objects one at a time. As you select additional objects, only the last selected object has a guide point, and the five right-hand softkeys change to show the properties of the guide point object.



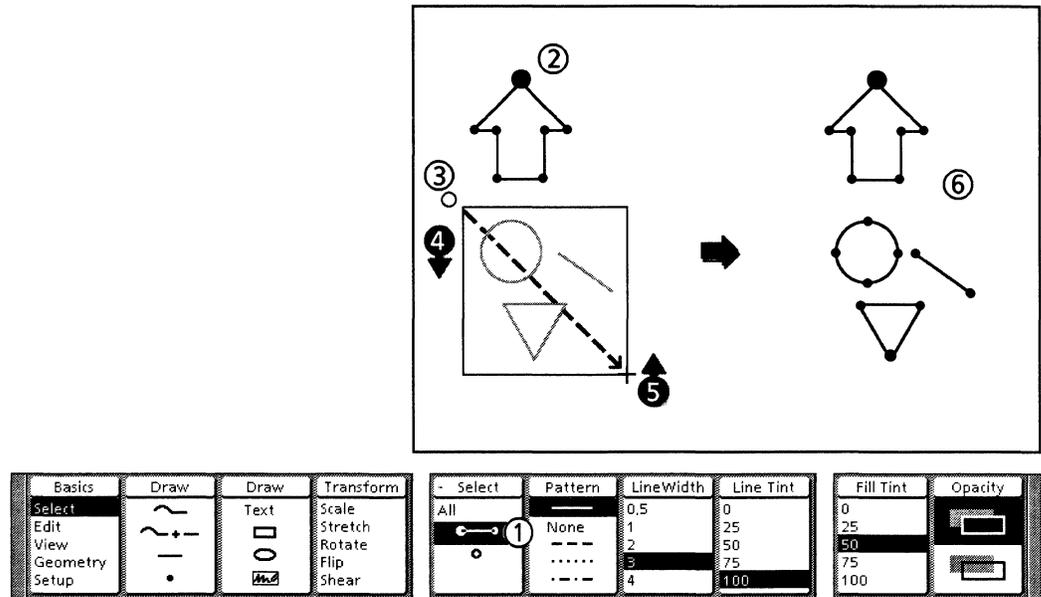
Follow these steps to select object-by-object:

1. Select the Object icon on the Select softkey.
2. Select one object using the left mouse button.
3. Place the pointer on the additional object you want to select, and click the right mouse button.
4. Repeat step 3 until you have selected all desired objects.

## Selecting with draw-through box

The following illustration and procedure show how to select multiple objects using the draw-through box. When you use this method, you need to enclose the entire object in the draw-through box in order to select it.

To select an arc, you need to include the arc center control point as well as the visible arc. The guide point remains on the control point of the object which you selected first.



Follow these steps to select with draw-through box:

1. Select the Object icon on the Select softkey.
2. Select one object using the left mouse button.  
The guide point remains on this object.
3. Position the pointer near one or more objects to be selected.
4. Press and hold down the right mouse button.
5. Move the pointer so that the draw-through box stretches to enclose the objects. Release the right mouse button.
6. The objects enclosed in the box are selected.

## Deselecting a group of objects

---

There are two ways to deselect objects from a group: deselect all of the selected objects at once or deselect specific objects one at a time.

### Deselecting all objects in a group

---

This procedure describes how to deselect all selected objects on the infinite drawing pad.

Follow these steps to deselect all object in a group:

1. Move the pointer off of the objects.
2. Click the left mouse button.

### Deselecting specific objects in a group

---

This procedure describes how to deselect specific objects. If you want to deselect specific objects which are outside the cropping boundary, you will need to use a View window to see the objects.

Follow these steps to deselect specific objects in a group:

1. Place the pointer on a selected object.
2. Click the right mouse button.

---

## Selecting control points

---

In addition to selecting an entire object or a group of objects, you can also select one or more control points on an object or on a group of objects.

When you select a control point, it appears as a black circle with a white interior. The guide point appears larger than the other selected control points.

When you select a control point midway in a chain curve segment, the segment's nearest bend point is visible.

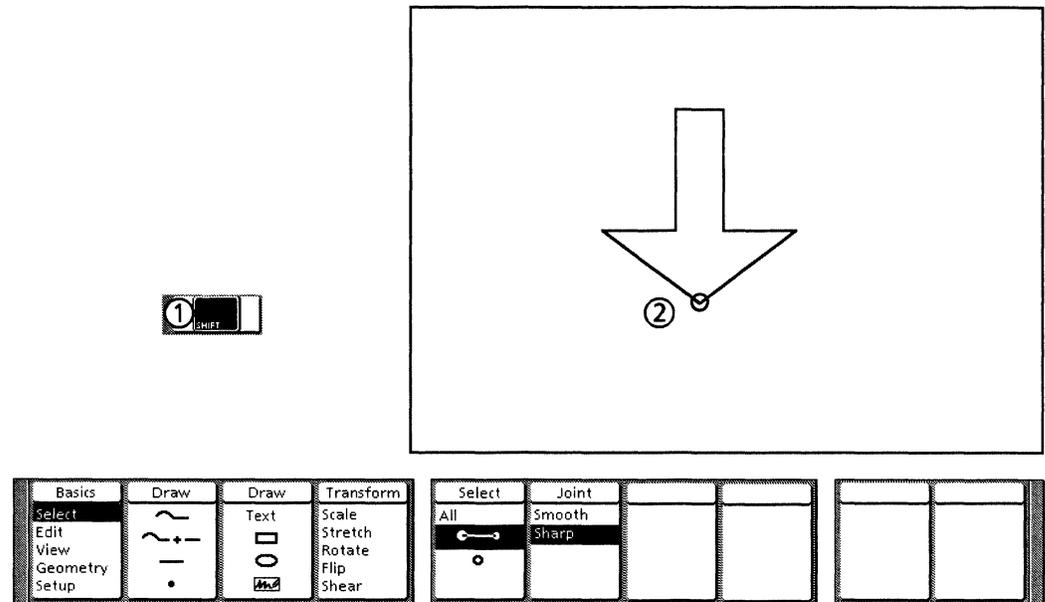
When you select a control point on an ellipse midway between two axis points, the off-ellipse bend point is visible.

When you use the right mouse button to extend select multiple control points, the guide point is the control point nearest the location of the mouse when you release the mouse button.

When you use the draw-through box to select multiple control points, the guide point remains on the first control point selected.

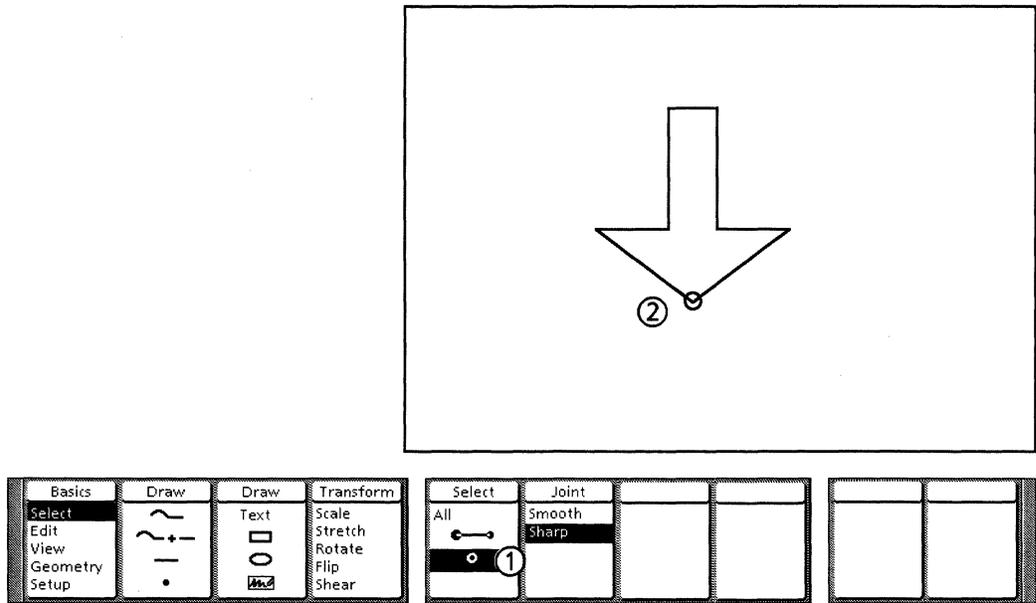
## Selecting one control point

The procedures below describe the two methods for selecting control points. If the Object icon is highlighted on the Select softkey, you can temporarily change to control point selection by using the <Shift> accelerator. When using <Shift>, the Object icon remains selected. When you release <Shift>, the system will still be in object selection mode.



Follow these steps to select using <Shift> accelerator (Object icon selected):

1. Press and hold down <Shift>.
2. Move the pointer to the control point you want to select, and click the left mouse button.
3. Release <Shift>.



Follow these steps to select using the Control point icon:

1. Select the Control point icon on the Select softkey.
2. Move the pointer to the control point you want to select, and click the left mouse button.

## Selecting multiple control points

To select multiple control points, you use a method similar to that used for selecting multiple objects. When using the Control point icon to select multiple control points, the properties which are common to all of the control points are shown on the object properties softkeys and the property sheet.

Follow these steps to select using multiple control points:

1. Select one control point by:
  - using the <Shift> select method, or
  - selecting the Control point icon on the Select softkey and clicking on a control point using the left mouse button.
2. Select additional control points either by:
  - clicking on the control points using the right mouse button, or
  - using the draw-through box.

A fast way to select all of the control points on one object is to select the Object icon on the Select softkey, select the object, then select the Control point icon. This causes all of the control points on the selected object to appear, and is useful for finding the bend points of a curve.

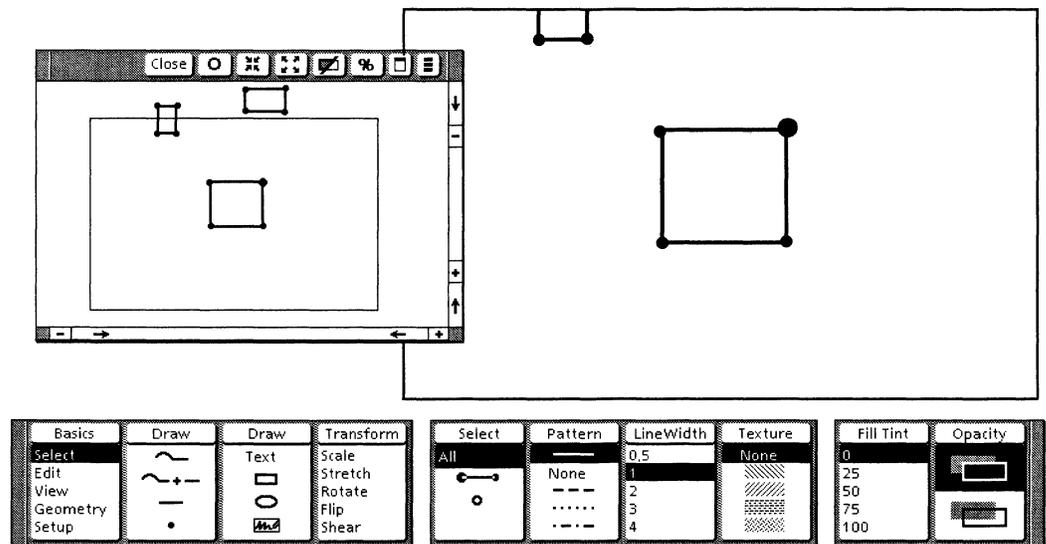
## Deselecting control points

To deselect control points, follow the procedures for deselecting objects.

## Selecting All

The All choice on the Select softkey allows you to select all objects at one time. When you choose All, every object on the infinite drawing pad is automatically selected. This means that objects which are visible in the Pro Illustrator frame and objects which are outside the cropping boundary are selected.

You can use a View window to see objects outside the cropping boundary as shown in the following illustration. When you choose All, the changing softkeys display the properties which every object has in common.



The following procedures describe shortcuts for selecting most, but not all, of the objects or control points on the infinite drawing pad.

All is also useful for quickly scaling very large illustrations such as IGES standard graphics which have been converted to Pro Illustrator graphics.

Follow these steps to select large groups of objects:

1. Select All on the Select softkey. Every object is selected.
2. Select the Object icon on the Select softkey.
3. Use the right mouse button to deselect the desired objects.
4. Use the right mouse button to deselect the desired control points.

Follow these steps to select large groups of control points:

1. Select All on the Select softkey.
2. Select the Control point icon on the Select softkey.
3. Use the right mouse button to deselect the desired control points.

---

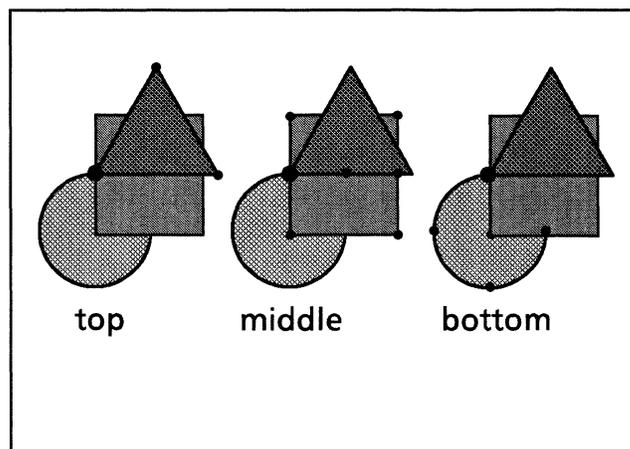
## Cycle-through selection

---

You can select the Pin Point, text frames, bitmap frames, and graphic objects within a Pro Illustrator frame. If you are selecting an object that is very close to or in the same location as other objects, cycle-through selection allows you to select exactly the object you want.

As you select the objects, the system cycles through the objects from the top to the bottom. The object at the top is selected first, the object just below it is selected next, and soon through the objects to the one at the bottom. Selection then begins again at the top object.

The following illustration shows the cycle-through selection feature.



You can also use the properties shown on the changing softkeys to help you know which object is selected.

Text within a text frame does not cycle the way graphic objects do. You can select objects that are on top of text; however, once you have selected a text item (characters, paragraphs, and so on), you cannot select objects below it. The reason for this is that once you select the text, any further selections apply to text items.

Bitmap frames act like rectangles during cycle-through selection.

---

## Moving

---

Using <Move>, you can move objects within a Pro Illustrator frame, between Pro Illustrator frames in the same document, or between Pro Illustrator frames in different documents.

You can move control points or the Pin Point only inside a Pro Illustrator frame, not between frames. Placement of the selection depends on the location of the guide point when you release the mouse button. When you move an object, the original image remains on the screen in addition to the one being moved until the move is complete.

You can also move an object or control point by specifying the motion numerically using the Measures window.

The Horizontal, Vertical, and Lock angle constraints are not available when you move objects between frames. For details on using constraints, see the procedures described in "Moving objects using constraints" within this section.

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### Moving objects between frames

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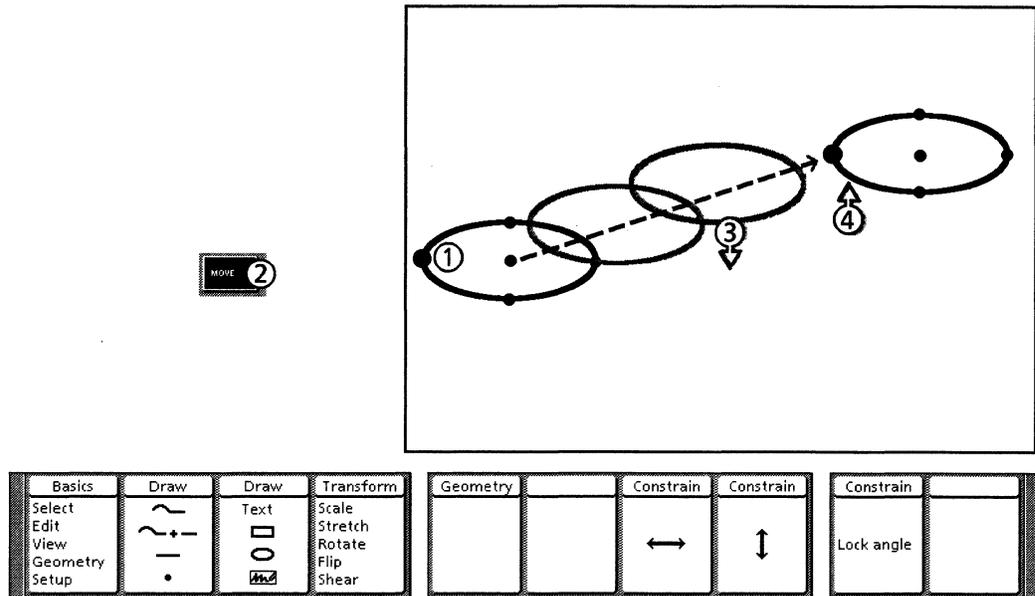
Use the following procedure to move objects between frames in the same document or in different documents.

Follow these steps to move objects between frames:

1. Select the object you want to move.
2. Press <Move>.
3. Move the pointer to the desired location in the frame.
4. Click the left mouse button. The moved object appears on the screen and is automatically selected.

## Moving objects within the same frame

The following illustration and procedure show how to move objects within the same frame.



Follow these steps to move objects within the same frame:

1. Select one or more objects.
2. Press <Move>.
3. Press and hold down the left mouse button. A temporary image appears. Move the pointer to the desired location.
4. Release the left mouse button. The selection appears in the new location and is automatically selected.

## Moving objects using constraints

When you move an object or control point, the three Constrain softkeys appear. These softkeys allow you to use Horizontal, Vertical, or Lock angle constraints during the move operation. These constraints force the object to move horizontally, vertically, or at a user-specified angle.

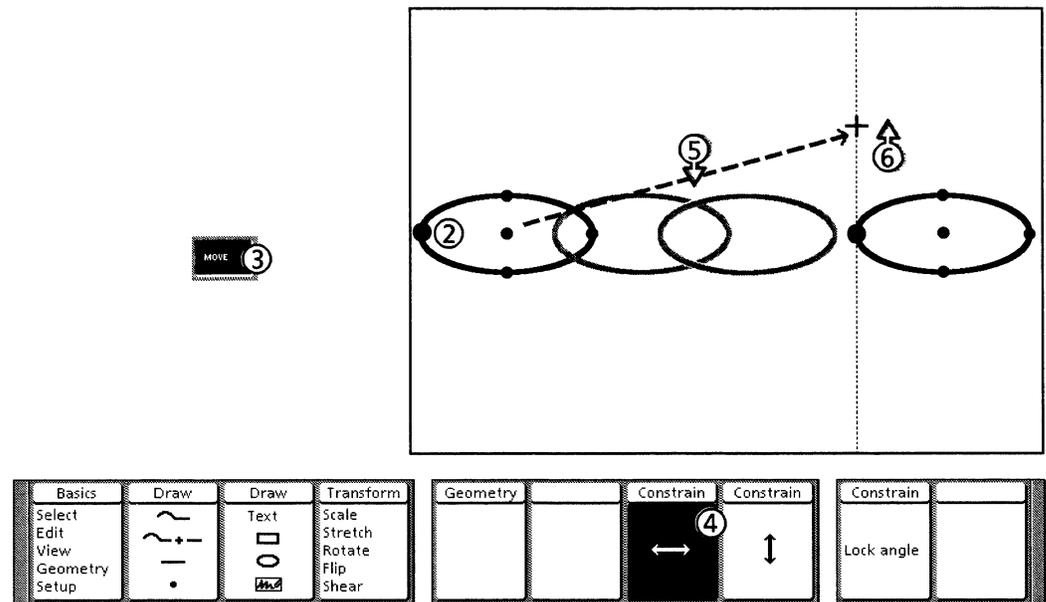
The Constrain softkeys toggle either on or off. You can use only one form of constraint at a time. If one is highlighted, the others are not. If you do not choose a constraint, the system applies no constraints to the move operation. The system returns to unconstrained when you finish a constrained move operation.

When the Horizontal constraint is selected, you can move only in the horizontal direction. When the Vertical constraint is selected, you can move only in the vertical direction. When the Lock angle constraint is selected, you can move only along the angle which you specify.

You can change the type of constraint as long as you are still holding down the mouse button. If you change the constraint after you have moved the object or control point but not yet released the mouse button, the object or control point is constrained from its new position. The constraints work with all types of geometry. You can also use the constraints to align objects.

### Moving objects using Horizontal/Vertical constraint

This procedure describes moving an object using the Horizontal or Vertical constraint. The illustration shows a horizontal move.

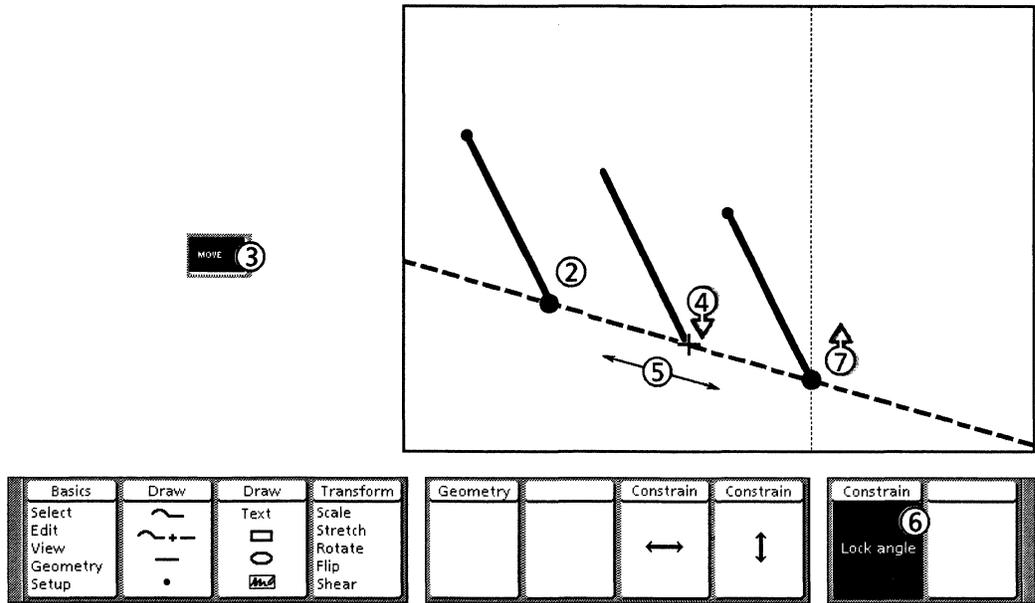


Follow these steps to move objects using Horizontal or Vertical constraint:

1. Select the Object icon on the Select softkey.
2. Select the object you want to move.
3. Press <Move>.
4. Select the desired Constrain softkey.
5. Press and hold the left mouse button. Move the object to the desired location.
6. Release the left mouse button. The object appears on the screen and is automatically selected.

### Moving objects using Lock angle constraint

You can use <Same> as an accelerator for the Lock angle constraint softkey. Instead of using the function key to select the Lock angle constraint, you can press <Same> to toggle the Lock angle constraint on or off.



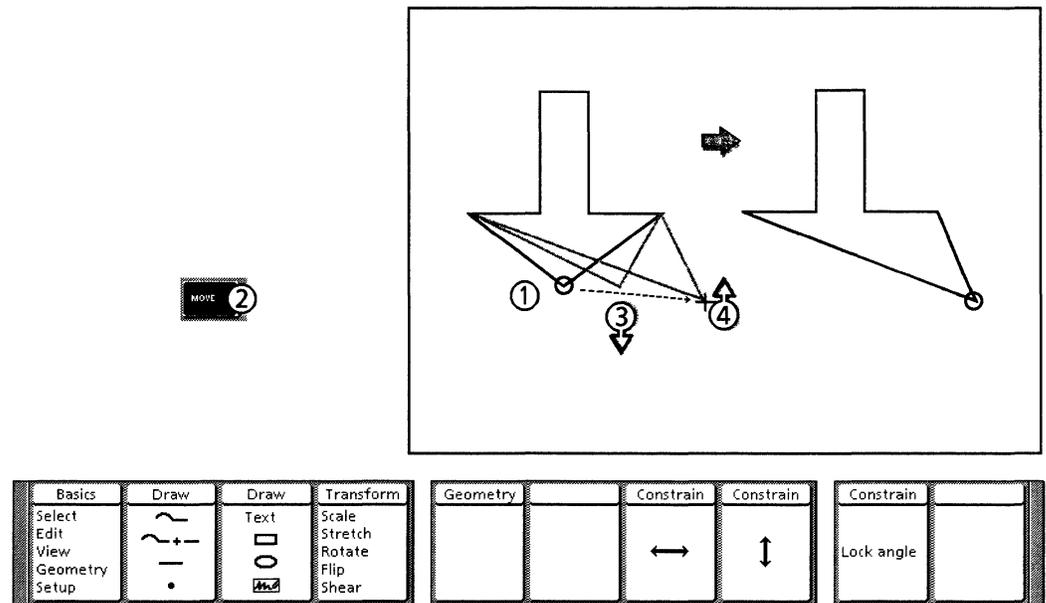
Follow these steps to move objects using Lock angle constraint:

1. Select the Object icon on the Select softkey.
2. Select the object you want to move.
3. Press <Move>.
4. Press and hold the left mouse button. The temporary image of the object appears.
5. Move the object to indicate the angle at which you want the movement of the object locked. The illustration shows the angle as a dashed line. You will not actually see this line on the screen.
6. When you have the angle determined, press the function key or <Same> to select the Lock angle constraint. As long as you hold down the mouse button, you can move the object back and forth along the imaginary line that marks the locked angle.
7. When you have the object positioned where you want it, release the left mouse button. The moved object appears on the screen and is automatically selected.

If you want to change the locked angle before you have released the left mouse button, turn off the Lock angle constraint using the function key or <Same>, change to the new angle, and select the Lock angle constraint again.

## Moving control points

You can move control points to change the basic appearance of an object (similar to the Stretch transformation). Horizontal, Vertical, and Lock angle constraints work in the same way as they do when you move an object. For details on how to use the constraints while you move an object, see the section titled, "Moving objects using constraints." The following illustration and procedure describe the control point move without any constraints.



Follow these steps to move control points:

1. Select the desired control point(s).
2. Press <Move>.
3. Press and hold down the left mouse button. Move the pointer to the desired location.
4. Release the left mouse button. The control point appears in the new location and remains selected.

## Copying

Using <Copy>, you can duplicate an object within a Pro Illustrator frame, between Pro Illustrator frames in the same document, or between Pro Illustrator frames in different documents. You cannot copy the Pin Point or control points.

Placement of the duplicated object depends on the location of the guide point when you release the mouse button. You can also copy and transform objects at the same time using the Copy First softkey. See Chapter 12 for details.

## Constraints

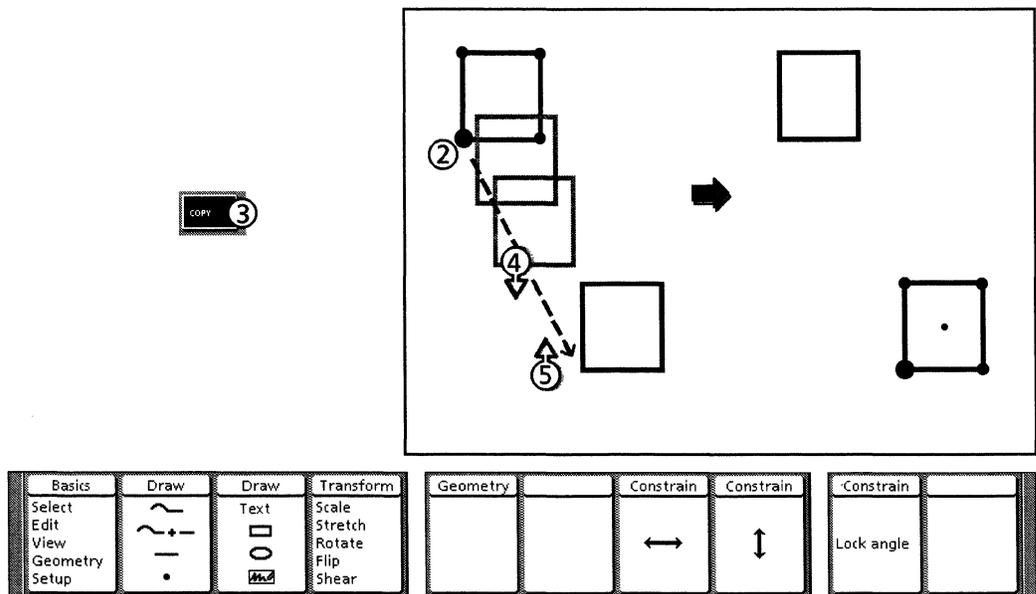
When you copy an object, the three Constrain softkeys appear. These softkeys allow you to use Horizontal, Vertical, or Lock angle constraints on the object if you move the duplicate object when you copy. These constraints force the duplicated object to move horizontally, vertically, or at a user-specified angle with the original object. The Constrain softkeys toggle either on or off. If one is selected, the others are not. You can use only one form of constraint at a time.

When the Horizontal constraint is selected, you can copy the object only in the horizontal direction. When the Vertical constraint is selected, you can copy the object only in the vertical direction. When the Lock angle constraint is selected, you can copy the object only along the angle which you specify. For details on using the constraints see the sections on moving objects with the Horizontal, Vertical and Lock angle constraints discussed in this chapter.

Horizontal, Vertical and Lock angle constraints are not available when you copy objects between frames.

## Copying objects within the same frame

The following illustration and procedure show how to copy objects within the same frame. In the illustration below, no constraints are selected.



Follow these steps to copy objects within the same frame:

1. Select the Object icon on the Select softkey.
2. Select the object you want to duplicate.
3. Press <Copy>.
4. Press and hold down the left mouse button. The temporary image appears. Move the pointer to the desired location.

5. Release the left mouse button. The duplicated object appears on the screen and is automatically selected.

## Copying objects between frames

---

This section discusses copying objects between frames in the same document or in different documents.

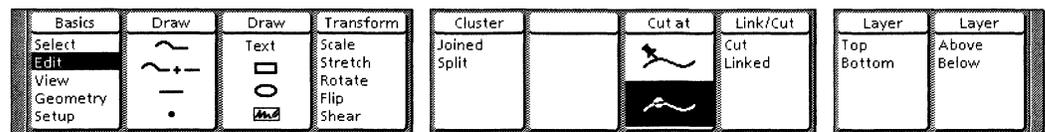
Follow these steps to copy objects between frames:

1. Select the Object icon on the Select softkey.
2. Select the object you want to duplicate.
3. Press <Copy>.
4. Move the pointer to the desired location in the frame.
5. Click the left mouse button. The duplicated object appears on the screen and is automatically selected.

## Edit softkeys

---

When you select Edit on the Basics softkey, additional softkeys appear.



The Edit softkeys enable you to alter the relationships between objects and alter the form of basic objects. You use the two Layer softkeys and the Cluster softkey to arrange objects. You use the Cut at and Link/Cut softkeys to break apart and connect basic objects and chains.

## Layering

---

Objects are layered according to the order in which they are drawn in the Pro Illustrator frame. The first object drawn is on the bottom. The last object drawn is on the top. An object overlaid by another either shows through or is covered, depending on whether the top object is opaque or clear. Objects beneath a clear object are visible, while objects beneath an opaque object are not visible. The fill properties for a transparent object (tint and texture) appear combined in the areas where the object overlays another object with tint and/or texture.

## Layer softkeys

You use the Layer softkeys to position objects in relation to each other. You can manipulate objects (for example, move, copy, or transform them) so that they overlap one another, then change their relative positions using the choices on the Layer softkeys.

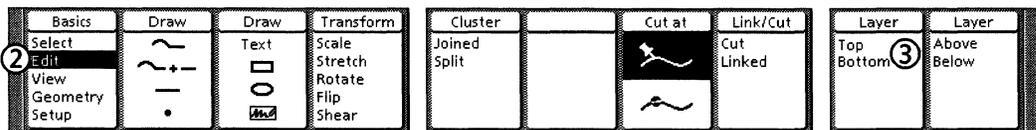
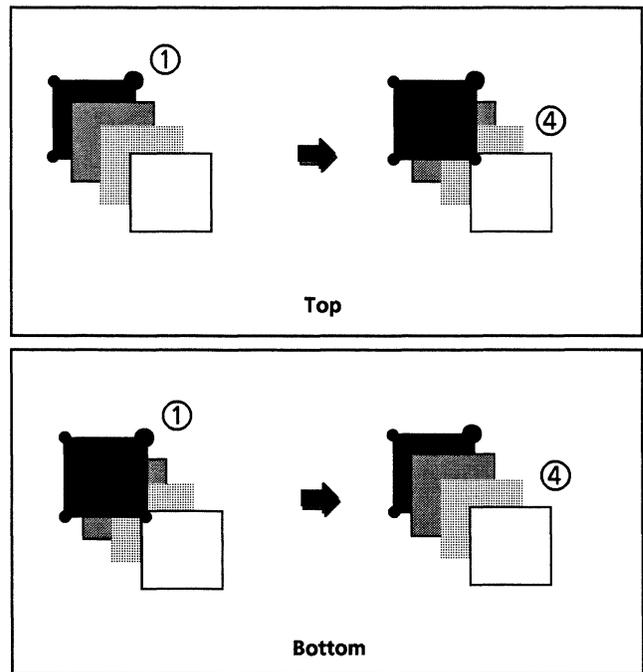
The softkey choices are the following:

- Top – places the object on top of all objects
- Bottom – places the object on the bottom of all objects
- Above – places the object above another specified object
- Below – places the object below another specified object.

## Layering top and bottom

The following illustration shows two layering operations: one placing the black square on the top of the other objects and one placing the black square on the bottom of the other objects.

The starting position of the object which you want to place on top or bottom can be any position in the stack. For example, the dark gray square could be repositioned to the top or the bottom of the stack instead of the black square.



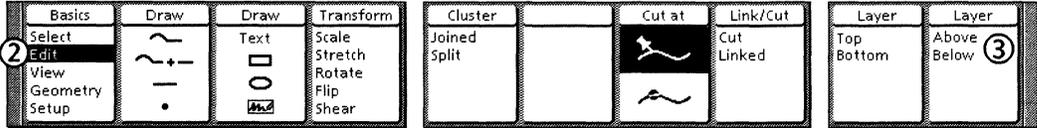
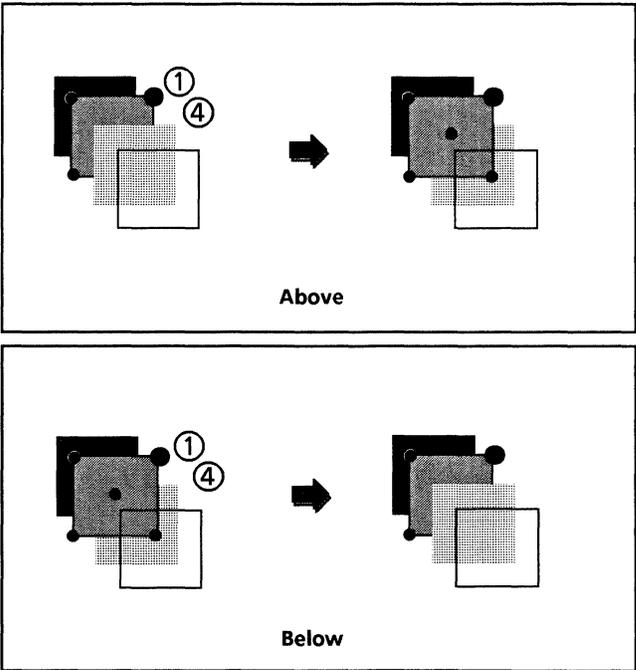
Follow these steps to layer objects top and bottom:

1. Select the object to be placed on the top or bottom.
2. Select Edit on the Basics softkey.
3. Select Top or Bottom on the Layer softkey.
4. The selected object is automatically placed on the top or bottom of all other objects in the frame.

**Layering above and below**

To place an object above or below, you need at least two objects. The first object you select is the one that changes position. The second object you select determines where the first object goes. The first object changes position in relation to the second object.

The following illustration shows two layering operations. The first places the dark gray square above the light gray square (and underneath the clear square). The second places the dark gray square below the light gray square (and on top of the black square).



Follow these steps to layer objects above or below:

1. Select the object to be placed above or below another object.
2. Select Edit on the Basics softkey.
3. Select Above or Below on the Layer softkey.
4. Select the second object. The system automatically places the first object above or below the second object, and selects the first object again.

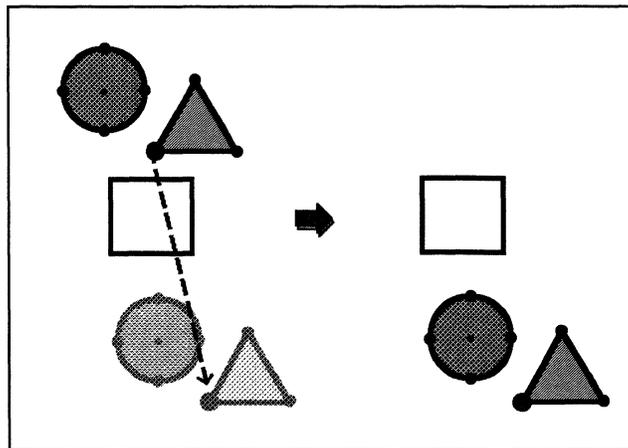
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## Clustering

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A cluster is a set of separate objects which act like a single object. When you select one object in a cluster, all of the objects in the cluster are selected.

*Xerox Pro Illustrator* allows you to group a cluster with other clusters or objects to create nested clusters. When a cluster made up of other clusters is split, its subclusters remain intact until they are split. The illustration below shows how you can move a cluster as though it were one object.



Immediately after you join objects in a cluster, they appear the same on the screen. You need to deselect and select them again to see their new relationships. After you split objects in a cluster, all the objects remain selected. Deselect them, or select one of them (note that it may still be part of a subcluster).

## Cluster softkey

You use the Cluster softkey to specify whether the selection is joined (a cluster) or split (several separate objects or clusters).

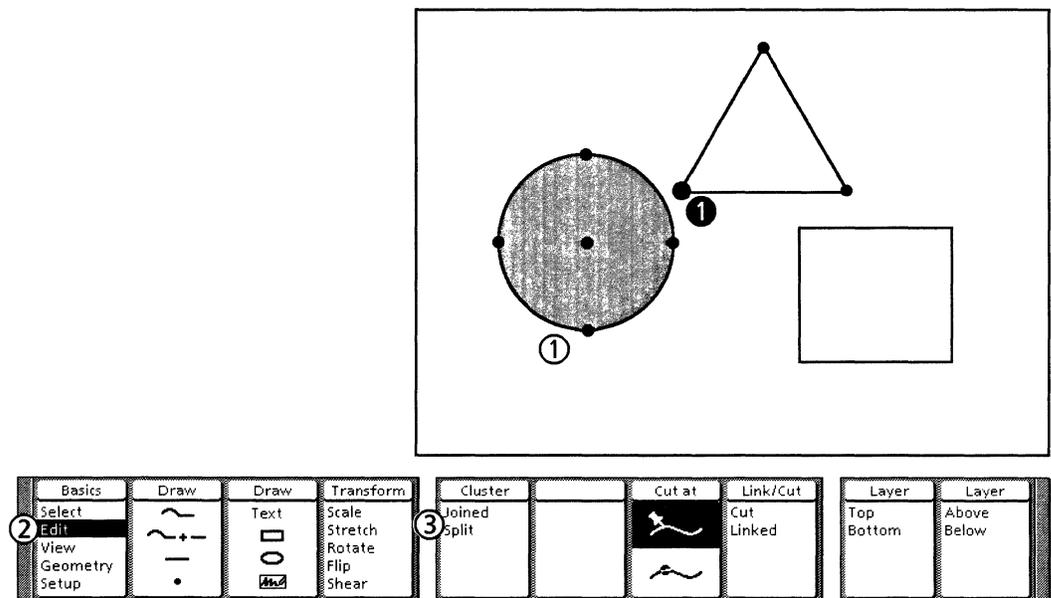
The softkey choices are the following:

- Join – combines separate objects into a cluster
- Split – separates clustered objects into their component parts.

## Clusters vs. chains

A chain is an object made up of different segment types, including lines, arcs, and curves. When a chain is completely closed so that its segments form a chained shape, you can fill it.

You can have chains as objects in a cluster, but you cannot link two chain segments together using the Cluster softkey. If you only cluster chains together, they cannot be filled. Because of this difference, you can fill a chained shape but you cannot fill a cluster. Refer to Chapter 11 for information on chains.



Follow these steps to cluster or uncluster objects:

1. Select the objects to be joined or split.
2. Select Edit on the Basics softkey.
3. Select Joined or Split on the Cluster softkey. The system automatically clusters or unclusters the items you selected.

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## Cutting

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This section describes how to cut basic objects: rectangles, squares, ellipses, circles, and lines. All of these basic objects except for lines must be cut before they can be linked. Points, text frames, and bitmap frames cannot be cut or linked. Basic objects in clusters can be cut without unclustering them. After you cut a basic object, it becomes a chain.

You can cut a basic object anywhere along its edge or outline. A line becomes two separate chain segments. A closed object (rectangle, square, ellipse, or circle) becomes an open chain. When you cut a basic object, the center control point disappears. If you cut a filled object, the fill disappears. You can fill an open chain by linking the end points. When you cut an ellipse or circle, it becomes a 360 degree arc so that all the control points disappear except for one at the cut.

You can use <Open> as an accelerator for the Cut command on the Link/Cut softkey when using the Pin Point. Instead of selecting Cut on the Link/Cut softkey, you press <Open>. If you want to use <Open> to cut an object at a control point, place the Pin Point on the control point using <Find>, then press <Open>.

If you have problems cutting an object consider the following rules:

- To use the Guide point icon on the Cut at softkey, the selected guide point must be on a basic object, not an end point, a text frame, or a bitmap frame.
- To use the Pin Point icon on the Cut at softkey, the Pin Point must be placed exactly on the outline of the object.

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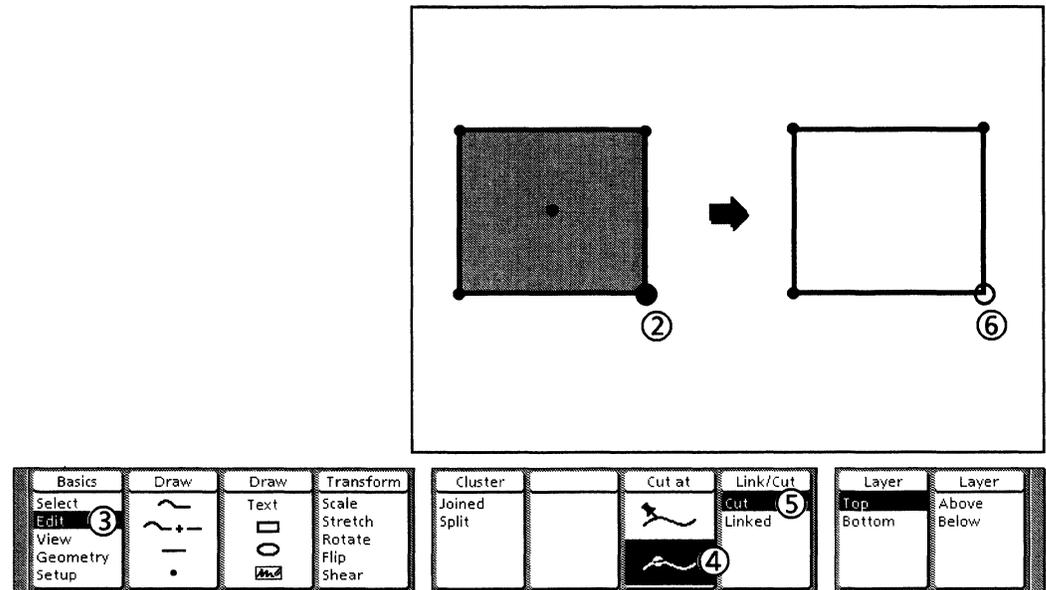
### Cutting objects at a guide point

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The illustration and procedure below describes how to cut an object at a guide point using the Cut command on the Link/Cut softkey.

Follow these steps to cut objects at a guide point:

1. Select the desired icon on the Select softkey.
2. Select the object on the control point where you want to cut the object.
3. Select Edit on the Basics softkey.
4. Select the Guide point icon on the Cut at softkey.
5. Select Cut on the Link/Cut softkey.
6. The object is cut and becomes an open chain.



## Cutting objects using the Pin Point

This section contains procedures for placing the Pin Point, cutting an object on the outline, and using the <Open> accelerator.

### Placing the Pin Point

To cut the object outline, you have to place the Pin Point exactly on the outline. To do this, you select and move the Pin Point to the object outline with Gravity activated.

You cannot use <Find> to place a Pin Point on the object outline. However, you can use <Find> to place the Pin Point on a guide point if you want to use the Open accelerator instead of the Cut command at the guide point. You must use the Pin Point if you want to use the Open accelerator on the outline or at the guide point. For more information on the Pin Point, see Chapter 12.

Follow these steps to select and move the Pin Point:

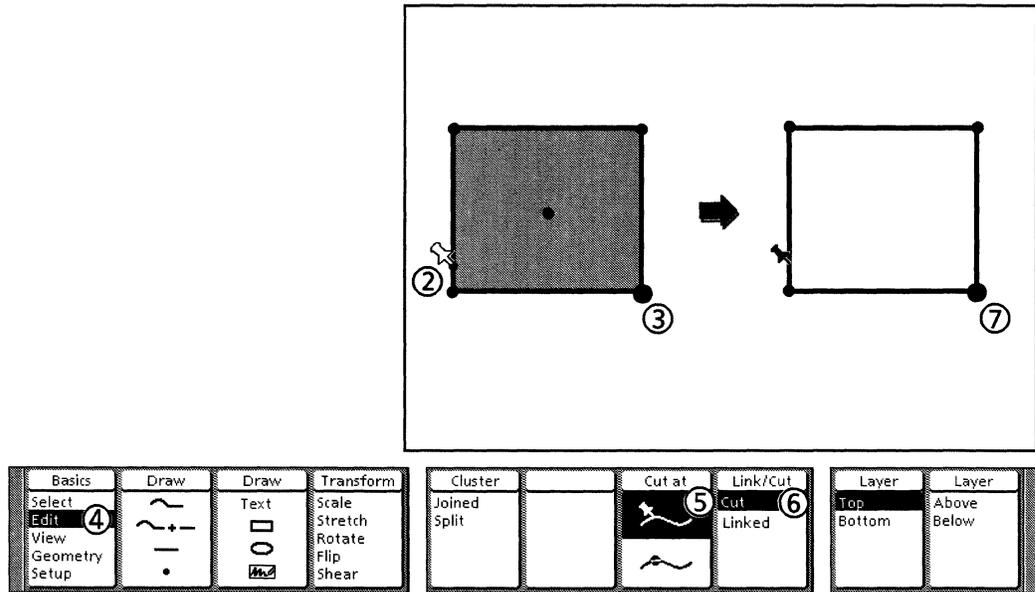
1. Selecting Setup on the Basics softkey and Object on the Gravity softkey. This activates Object gravity.
2. Select the Pin Point with the left mouse button.

The Pin Point turns white with a black outline when it is selected.

3. Press <Move>.
4. Press and hold down the left mouse button.
5. Move the Pin Point slowly to the object outline. When the Pin Point touches the outline, a small dot appears at the tip of the Pin Point.
6. Release the left mouse button.

### Cutting an object on the outline

The illustration and procedure below describe how to cut an object on the outline.



Follow these steps to cut an object on the outline:

1. Select the Object icon on the Select softkey.
2. Place the Pin Point (using object gravity) on the object outline.
3. Select the object.
4. Select Edit on the Basics softkey
5. Select the Pin Point icon on the Cut at softkey.
6. Select Cut on the Link/Cut softkey. The object is cut at the Pin Point and becomes an open chain.

### Cutting objects using <Open>

This procedure describes a faster way to cut objects at the Pin Point using <Open> as an accelerator.

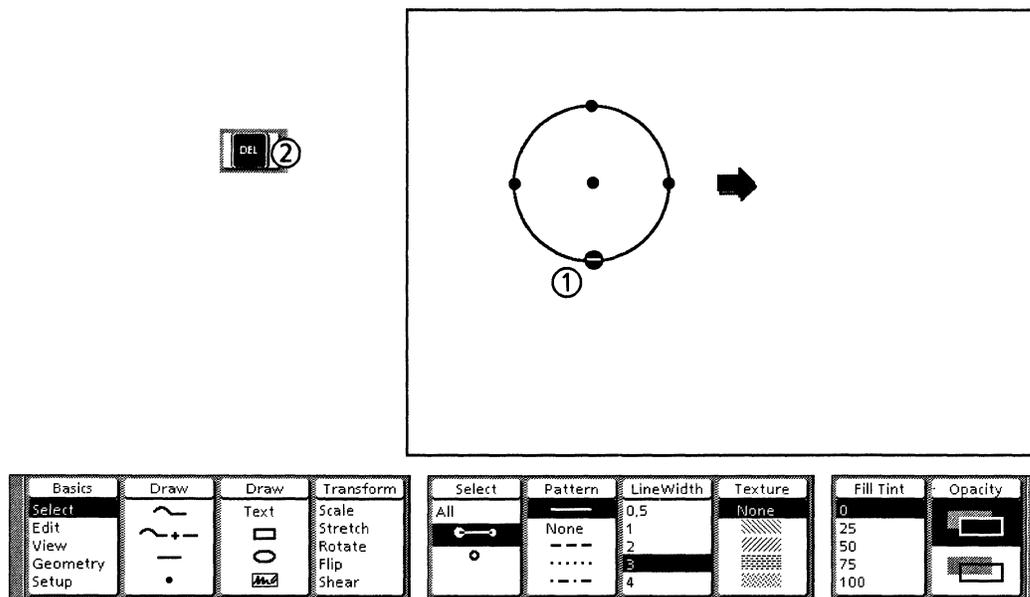
Follow these steps to cut objects using <Open>:

1. Select the Object icon on the Select softkey.
2. Place the Pin Point on the object outline (using object gravity) and select the object  
 You can also place the Pin Point on a guide point using <Find>.
3. Press <Open>. The object is cut and becomes a chain.

## Deleting

You can delete basic objects and chain segments using <Del>. After the selected item is deleted, nothing is selected, and the system returns to the Select mode. You can delete objects in clusters without unclustering if you select all of the control points on the object that you want to delete. For more information on clusters, see the section titled, "Clustering" in this chapter.

Please note that you cannot recover an object that has been deleted.



Follow these steps to delete objects and chain segments:

1. Select the object or chain segment.
2. Press <Del>. The system automatically deletes the object or segment.

A fast way to cut and delete part of a basic object or a chain is to cut the segment using the <Open> accelerator, then press <Del>.



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## 8. Setting object properties

This chapter contains information on object properties and how to set them. You can set properties for points, lines, open chain, rectangles, squares, circles, ellipses, closed chains, text, and bitmaps. Each object has its own group of properties that you can set before or after you draw the object.

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### Setting object properties

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There are four ways you can set object properties:

- Using Setup mode softkeys (before you draw an object)
- Using Object Properties sheets (before or after you draw an object)
- Using object property softkeys (after you draw an object)
- Using <Same> (after you draw an object).

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### Using Setup mode softkeys

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Before drawing an object, you can set the system default properties for that object using the Setup mode softkeys. To access these softkeys, you select Setup on the Basics softkey, then select the desired property group on the Setup softkey, and then select the desired properties on the property softkeys.

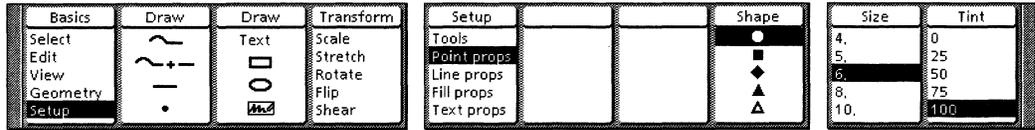
Not all object properties are displayed on these softkeys. You can customize the softkeys to display your commonly used values for these properties (see Chapter 5). A complete selection of object properties appears on the Object Properties sheet.

Follow these steps to use the Setup mode softkeys:

1. Select Setup on the Basics softkey.
2. Select the desired property group (Point, Line, Fill, or Text) on the Setup softkey. The property softkeys for that group are displayed.
3. Select the desired properties on the property softkeys. All objects will be drawn with these properties.

## Point properties softkeys

When you select Point props on the Setup softkey, the following Setup mode softkeys appear:

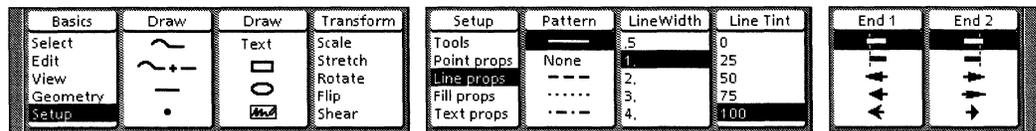


Point properties apply to points.

- Shape softkey – Use the Shape softkey choices displayed on the Shape softkey, the Object Properties sheet displays all the available choices for shape.
- Size softkey – Use the Size softkey to set the size of the point in Frame Units (see Chapter 15 for a discussion of Frame Units). In addition to the choices displayed on the Size softkey, the Object Properties sheet allows you to enter your own value for size.
- Tint softkey – Use the Tint softkey to set the shade (lightness or darkness) of the point. The numbers on the softkey are percentages of black: 0 (0%) means white, 100 (100%) means solid black, and the other numbers are gray shades in between. In addition to the choices displayed on the Tint softkey, the Object Properties sheet allows you to enter your own value for tint.

## Line properties softkeys

When you select Line props on the Setup softkey, the following Setup mode softkeys appear:



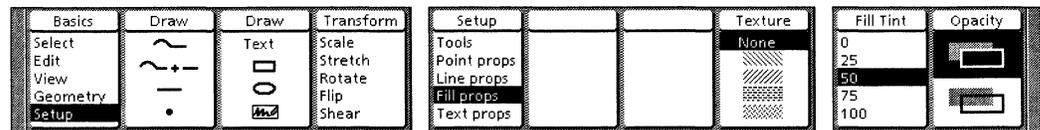
Line properties apply to lines, open chains, and to the borders of rectangles, ellipses, text frames, bitmap frames, and closed chains.

- Pattern softkey – Use the Pattern softkey to set the line pattern. In addition to the choices displayed on the Pattern softkey, the Object Properties sheet displays all the available choices for pattern.
- Line Width softkey – Use the Line Width softkey to set the width (thickness) of the line in Frame Units (see Chapter 15 for a discussion of Frame Units). In addition to the choices displayed on the Line Width softkey, the Object Properties sheet allows you to enter your own value for width.

- Line Tint softkey – Use the Line Tint softkey to set the shade (lightness or darkness) of the line. The numbers on the softkey are percentages of black: 0 (0%) means white, 100 (100%) means solid black, and the other numbers are gray shades in between. In addition to the choices displayed on the Line Tint softkey, the Object Properties sheet allows you to enter your own value for tint.
- End 1 and End 2 softkeys – Use the End 1 and End 2 softkeys to set the properties of the two end points. In addition to the choices displayed on the End 1 and End 2 softkeys, the Object Properties sheet displays all the available choices for shape. The property sheet also allows you to specify the size of the end points. Size is either Varying (the system matches the size with the line width) or Fixed (you enter an exact value for size on the Object Properties sheet).

## Fill properties softkeys

When you select Fill props on the Setup softkey, the following Setup mode softkeys appear:



Fill properties apply to the interiors of rectangles, squares, ellipses, circles, and closed chains.

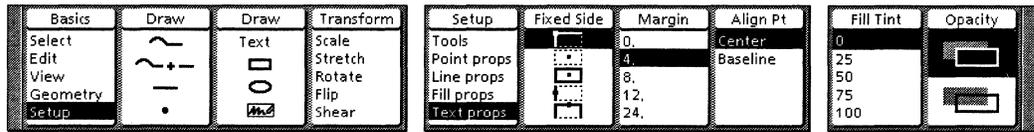
- Texture softkey – Use the Texture softkey to set the fill pattern(s) for the object’s interior. In addition to the choices displayed on the Texture softkey, the Object Properties sheet displays all the available choices and allows you to combine two or more textures.
- Fill Tint softkey – Use the Fill Tint softkey to set the shade (lightness or darkness) of the object’s interior fill. The numbers on the softkey are percentages of black: 0 (0%) means either white or transparent, depending on the Opacity (see below); 100 (100%) means solid black; the other numbers are gray shades in between. In addition to the choices displayed on the Fill Tint softkey, the Object Properties sheet allows you to enter your own value for fill tint.

Pro Illustrator allows you to create any gray shade from 0% to 100%. However, the number of visibly different gray shades you can use depends on your printing device. We have provided an illustration of 100 different gray shades in the Quick Art document titled “Tints, Textures, Points, and Lines” (see Appendix A). If you want to experiment, print this illustration. The resulting printout will give you an idea of your printer’s capabilities and help you select the best-looking gray shades to use in illustrations.

- Opacity softkey – Use the Opacity softkey softkey is the opaque setting; it sets a white base. The second choice is the clear setting; it sets a transparent base. The fill tint and texture are added to this base. Thus, 0% tint on an opaque base is white; 0% tint on a clear base is transparent.

## Text properties softkeys

When you select Text props on the Setup softkey, the following Setup mode softkeys appear:



Text properties apply to text frames. Refer to Chapter 9 for detailed information on text frame properties.

- Fixed Side softkey – Use the Fixed Side softkey to set the properties of the sides of the text frame. Each of the four sides can be either fixed or free to expand and contract with the text.
- Margin softkey – Use the Margin softkey to set up a margin between the text boundary (the imaginary rectangle that surrounds the text) and the text frame.
- Align Pt softkey – Use the Align Pt softkey to activate either the Center or Baseline control points of the text frame.
- Fill Tint softkey – Use the Fill Tint softkey to set the shade (lightness or darkness) of the object's interior fill. The numbers on the softkey are percentages of black: 0 (0%) means either white or transparent, depending on the Opacity (see below); 100 (100%) means solid black; the other numbers are gray shades in between. In addition to the choices displayed on the Fill Tint softkey, the Object Properties sheet allows you to enter your own value for fill tint.

*Xerox Pro Illustrator* allows you to create any gray shade from 0% to 100%. However, the number of visibly different gray shades you can use depends on your printing device. We have provided an illustration of 100 different gray shades in the Quick Art document titled "Tints, Textures, Points, and Lines" (see Appendix A). If you want to experiment, print this illustration. The resulting printout will give you an idea of your printer's capabilities and help you select the best-looking gray shades to use in illustrations.

- Opacity softkey – Use the Opacity softkey to set the base beneath the fill tint. The first choice on the softkey is the opaque setting; it sets a white base. The second choice is the clear setting; it sets a transparent base. The fill tint and texture are added to this base. Thus, 0% tint on an opaque base is white; 0% tint on a clear base is transparent.

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## Using the Object Properties sheet

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You use the following Object Properties sheet to:

- Set properties before drawing an object
- Set properties of an existing object
- Get properties for a selected object

Before or after you draw an object, you can use the Object Properties sheet to set object and color properties. All properties appear on the Object Properties sheet. Once you set the properties on the property sheet in Setup or Draw mode, all subsequent objects that you draw will have the same properties (for the properties they have in common with those set on the property sheet) until you change them.

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### Basic operation

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This section contains information about the basic operation of the Object Properties sheet.

Selecting [Reset] restores the numbers to their settings when you first opened the property sheet or when you last selected [Apply] or [Apply All], whichever occurred later. When you change Frame Units, they are not updated on the property sheets until you select [Apply], [Apply All], or [Done].

If you have one property sheet open and you select another object and press <Props> a second time, a second property sheet will open on top of the first one, showing the properties of the now current selection.

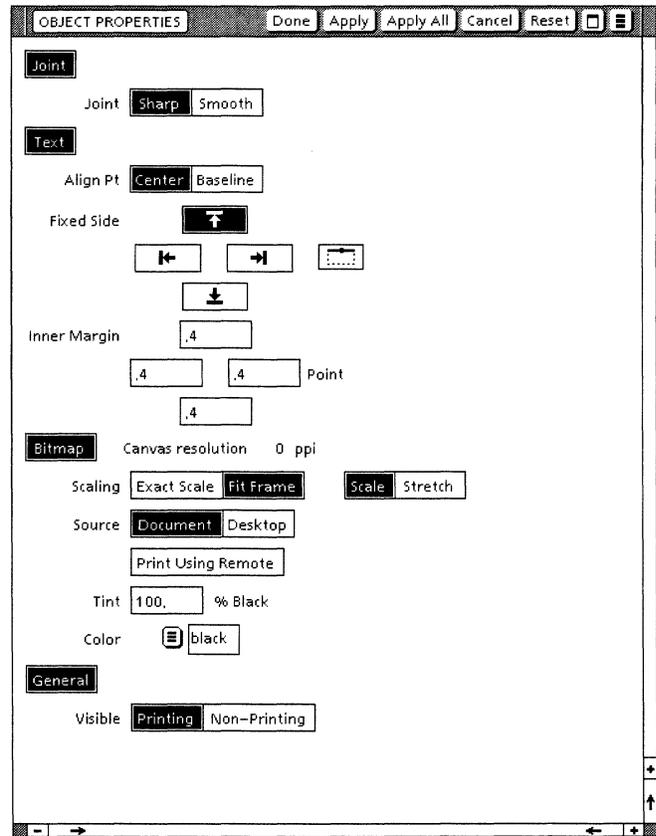
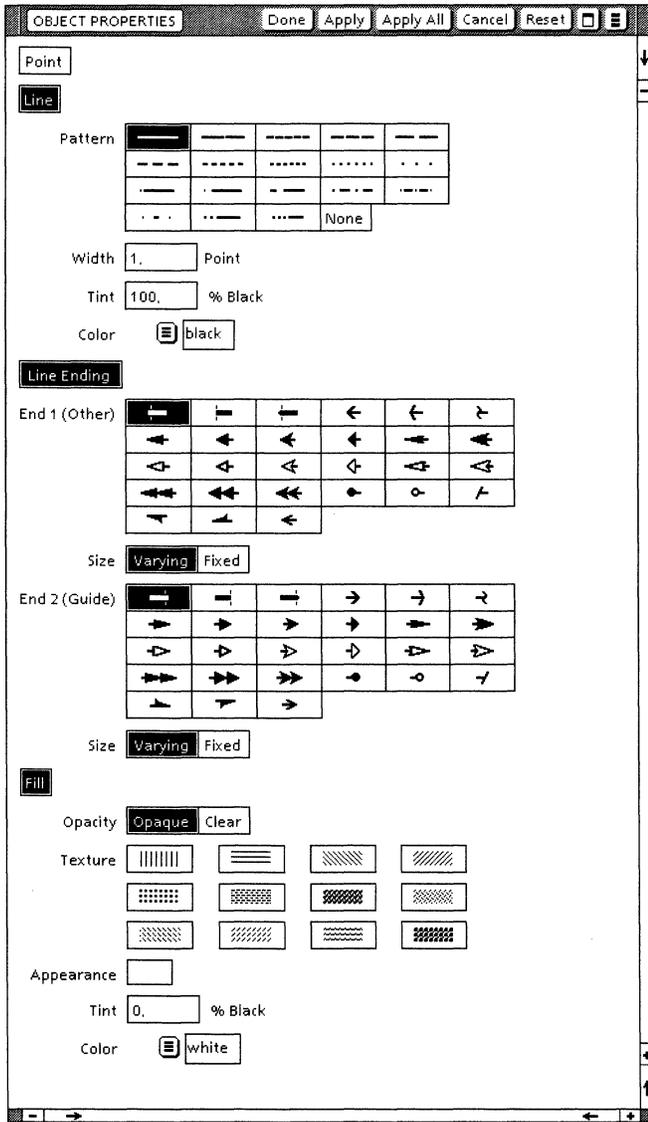
When you select [Apply All], every applicable property specified in the Object Properties sheet is applied to the current selection, regardless of whether you have just set the properties or not. This is a powerful command that allows you to quickly set many different types of properties in one action.

When you select [Get Props], the properties of the current selection are displayed in the Object Properties sheet.

## Object Properties sheet

The following illustration shows the Object Properties sheet with all property groups open

The appearance of the properties on the Object Properties sheet may differ depending on the color capabilities of your workstation.



Xerox Pro Illustrator has one Object Properties sheet with the following properties available for all object property groups:

- Point – Point properties apply to points only. They include point shape, tint, color, and size.
- Line – Line properties apply to lines, open chains, and to the borders of rectangles, ellipses, text frames, and closed chains. They include pattern, width, tint, and color.
- Line Ending – Line ending properties apply to lines and open chains. They include end and size.

- **Fill** – Fill properties apply to the interiors of rectangles, squares, ellipses, circles, text frames, bitmap frames, and closed chains. They include opacity, texture, tint, and color. The property sheet contains 12 textures. You can combine the available textures to create additional textures. The combined texture is displayed in the Appearance field of the property sheet.
- **Joint** – Joint properties apply to the joints between segments in an open or closed chain. Smoothness is the only joint property.
- **Text** – A text frame has all the properties of a rectangle. The line properties apply to the text frame border. The fill properties apply to the entire text frame, including the inner margins. A text frame also has align point, fixed side, and inner margin properties.
- **Bitmap** – A bitmap frame has all the properties of a rectangle. The line properties apply to the bitmap frame border. The fill properties apply to the interior of the bitmap frame. A bitmap frame also has canvas resolution, scaling, source, tint, and color properties.
- **General** – General properties apply to all graphic objects. Printing/non-printing is the only general property.

Because all the object properties are available on one property sheet, you can keep one property sheet open and use it to set the properties of all the objects in your illustration. There is no need to close and open different property sheets or to close one while you work. Instead, you open and close object property groups within the property sheet.

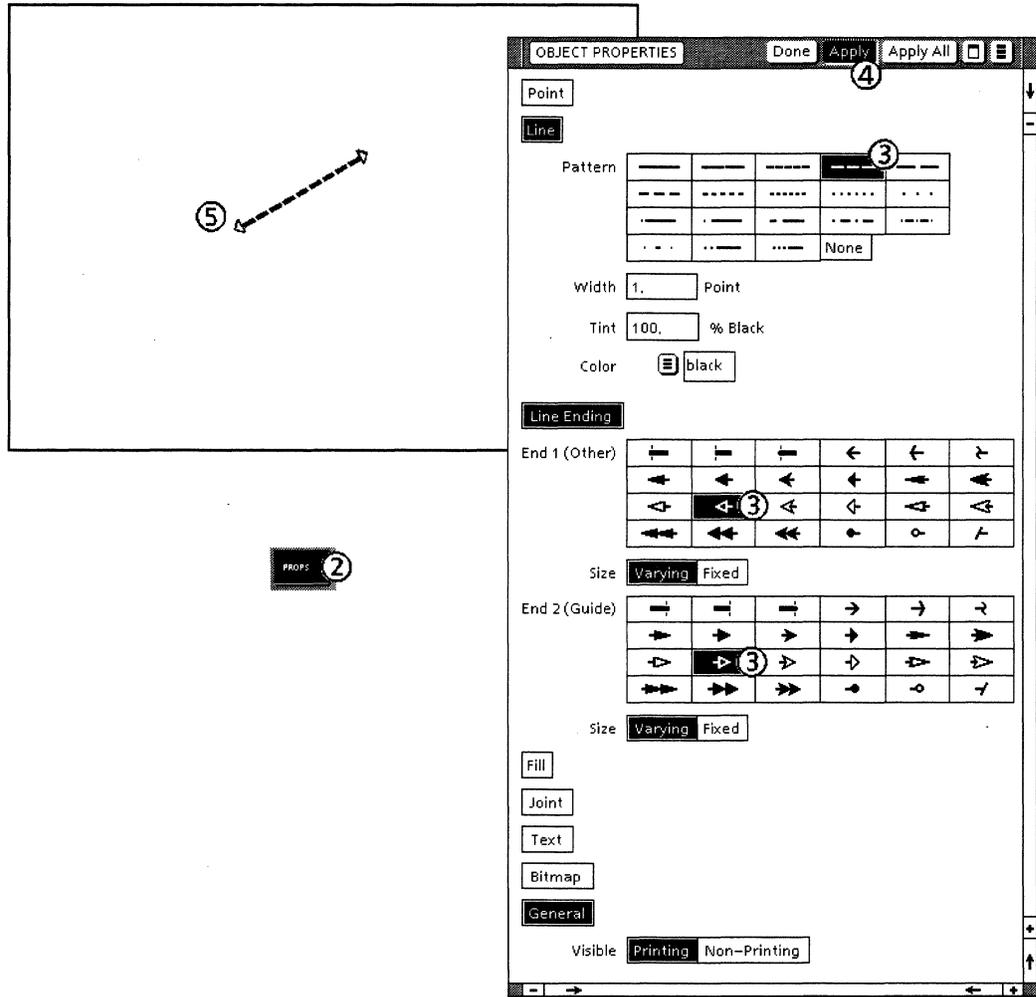
## Setting object properties before drawing objects

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You can set the properties of an object before you draw it by displaying the property sheet before you begin to draw.

Follow these steps to set object properties before drawing an object:

1. On the Draw softkey, select the icon for the object you want to draw.
2. Press <Props>.
3. Select the desired properties in any property group.
4. Select [Apply] or [Apply All].
5. Draw the object.



## Setting color properties before drawing objects

You can set the color properties of an object before you draw it by displaying the property sheet before you begin to draw.

If your workstation has color capabilities, you can use either the color chip menu or the color name menu to apply color properties. With a color display screen, you can apply and view color properties. If you have a access to a color printer, you can also print documents in color.

If your workstation does not have color capabilities, you can use the color name auxiliary menu to apply color properties. Although you will not be able to view color on a monochrome display screen, you can still apply the color properties. If you have a access to a color printer, you can also print documents in color.

### Using the color chip menu

---



The color chip menu displays a menu of color choices. This menu is available on color workstations only. The color pointed to with the mouse appears as a circle outlined in black. The color currently in effect is outlined in white.

Follow these steps to use the color chip menu to apply color to objects before drawing them:

1. On the Draw softkey, select the icon for the object you want to draw.
2. Press <Props>.
3. Move the pointer to the color chip you want to change.
4. Press and hold the left mouse button down. Do not release the mouse button until you are ready to choose a color. A set of colored squares appears.
5. While holding the mouse button down, move the pointer to the color you want. As you point to a color chip, the square appears as a circle.
6. Release the mouse button. The color chip box displays the color you selected.
7. Select [Apply] or [Apply All].
8. Draw the object.

### Using the color name menu

---



The color name auxiliary menu displays a menu of color name choices. This menu is available on both color and monochrome workstations. The primary menu contains a list of color groups (reds, yellows, blues, and so on). When you move the pointer to the right of a color group, a secondary menu, containing specific color choices appears.

On a color workstation, a color sample appears along with the color name. The color names in this menu are based on the names defined in *COLOR – Universal Language and Dictionary of Names* by the Inter-Society Color Council, National Bureau of Standards (ISCC–NBS).

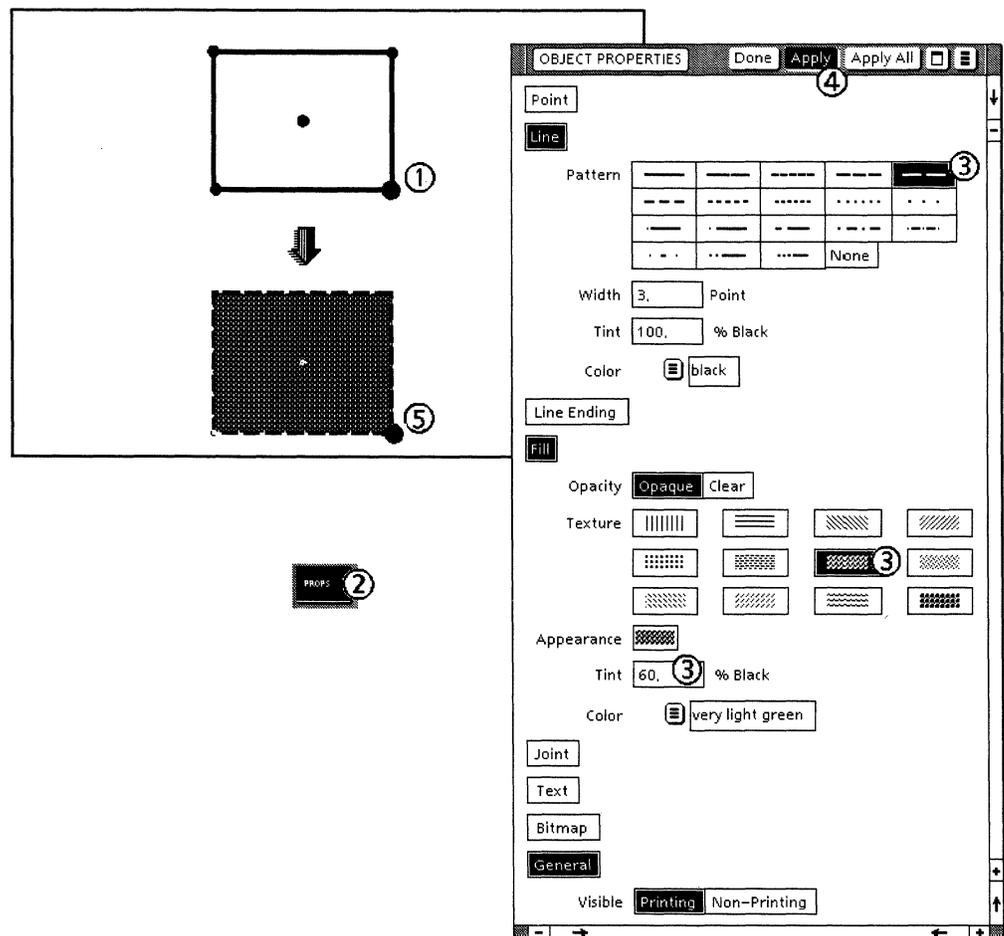
Follow these steps to use the color name menu to apply color to objects before drawing them:

1. On the Draw softkey, select the icon for the object you want to draw.
2. Press <Props>.
3. Move the pointer to the color name you want to change.

4. Press and hold the left mouse button down. Do not release the mouse button until you are ready to choose a color.  
A list of color groups appears.
5. While holding the mouse button down, move the pointer to the color you want.
6. To see specific color names, slide the pointer to the right of a color name.
7. Move the pointer to the color name you want and release the mouse button.  
On a color workstation, the color chip box displays the color you selected.
8. Select [Apply] or [Apply All].
9. Draw the object.

### Setting object properties after drawing object

The following illustration and procedure show how to set object properties after you have drawn an object.



Follow these steps to set object properties after drawing an object:

1. Select the object.
2. Press <Props>.
3. Select the desired properties.
4. Select [Apply] or [Apply All].
5. The object is displayed with new properties.

## **Setting color properties after drawing objects**

---

You can use the Object Properties sheet to set the color properties of an object after you draw it.

If your workstation has color capabilities, you can use either the color chip menu or the color name menu to apply color properties. With a color display screen, you can apply and view color properties. If you have access to a color printer, you can also print documents in color.

If your workstation does not have color capabilities, you can use the color name auxiliary menu to apply color properties. Although you will not be able to view color on a monochrome display screen, you can still apply the color properties. If you have access to a color printer, you can also print documents in color.

### **Using the color chip menu**

---

Follow these steps to use the color chip menu to color objects after drawing them:

1. Select the object you want to color.
2. Press <Props>.
3. Move the pointer to the color chip you want to change.
4. Press and hold the left mouse button down. Do not release the mouse button until you are ready to choose a color.

A set of colored squares appears.

5. While holding the mouse button down, move the pointer to the color you want. As you point to a color chip, the square appears as a circle.
6. Release the mouse button.  
The color chip box displays the color you selected.
7. Select [Apply] or [Apply All].
8. The object is displayed with new color properties.

### **Using the color name menu**

---

Follow these steps to use the color name menu to color objects after drawing them:

1. Select the object you want to color.
2. Press <Props>.

3. Move the pointer to the color name you want to change.
4. Press and hold the left mouse button down. Do not release the mouse button until you are ready to choose a color.  
A list of color groups appears.
5. While holding the mouse button down, move the pointer to the color you want.
6. To see specific color names, slide the pointer to the right of a color name.  
A second menu appears.
7. Move the pointer to the color name you want and release the mouse button.  
On a color workstation, the color chip box displays the color you selected.
8. Select [Apply] or [Apply All].
9. The object is displayed with new color properties.

### Using an already open property sheet

---

Because all object property groups are on one property sheet, you can select objects and set their properties using the property sheet that is already open for a previously selected object (even if the previously selected object has different kinds of properties). Only the properties you set are applied if you select [Apply]. The following procedure illustrates how to do this.

Follow these steps to use the open Object Properties sheet to set object properties:

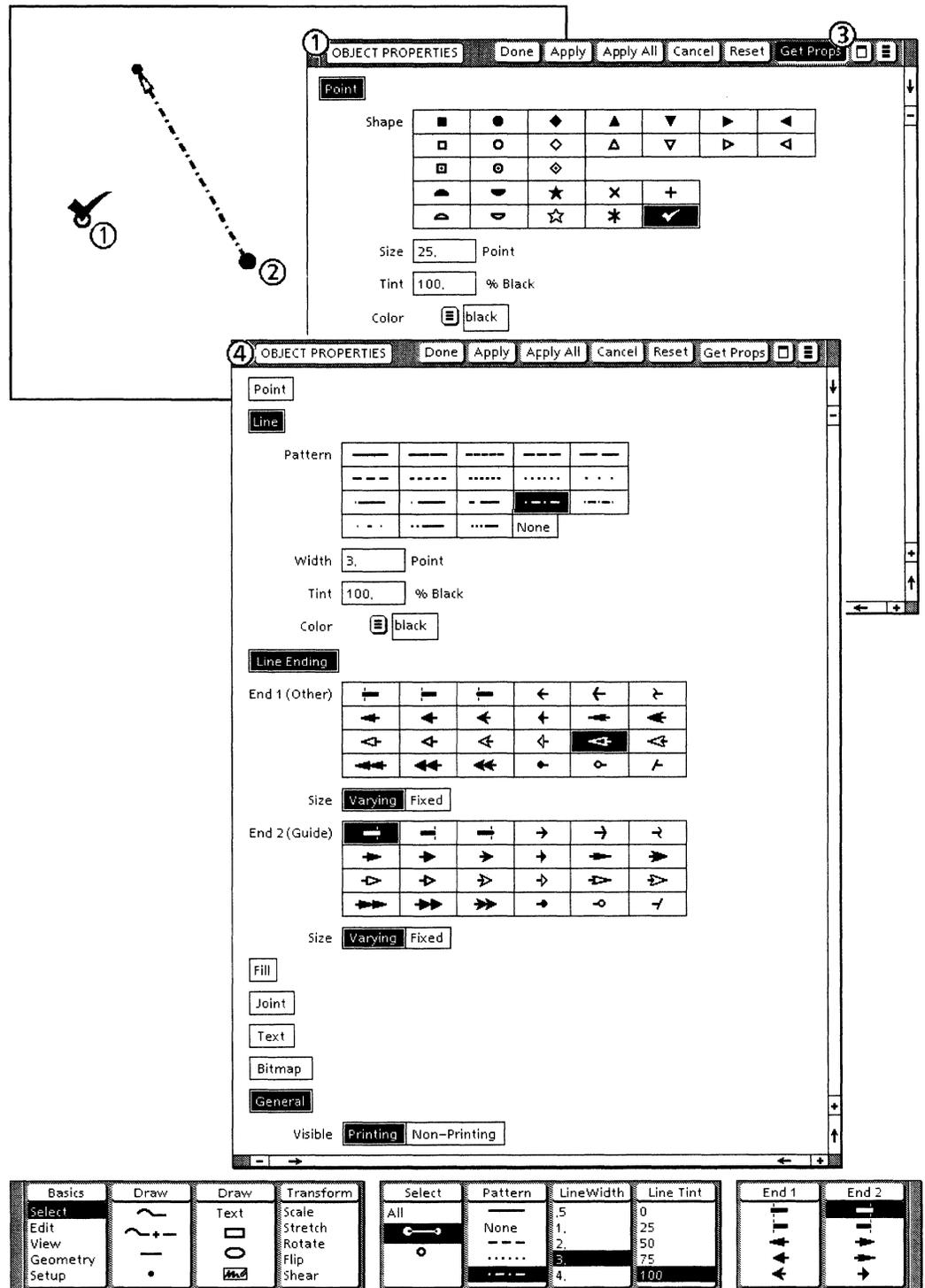
1. Select the object.
2. If the property group is not open for the current selection, open it by selecting the name of the property group, that is, Fill Joint, and so on. The property group appears shaded with diagonal gray lines. See the section "Neutral properties" later in this chapter for more information.
3. Select the desired properties.
4. Select [Apply] or [Apply All].
5. The object is displayed with new properties.

### Getting an object's properties

---

When you already have the property sheet open, use the following procedure to get the properties of an object. The properties shown on the open property sheet change to reflect the properties of the currently selected object.

In the following illustration, two property sheets are shown. On the screen, only one property sheet appears at a time. On the screen, the first property sheet changes to look like the second property sheet when you select [Get Props].



Follow these steps to get the properties of an object:

1. An object is already selected, and an Object Properties sheet is open.
2. Select another object.
3. Select [Get Props], which can appear in the header of the property sheet window or in the Floating Item Auxiliary Menu icon, depending on the width of the property sheet window.
4. The property sheet changes to show the properties of the current selection. You can then set the current selection's properties.

## Property sheet for a group of objects

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You can open an Object Properties sheet when more than one object is selected. The selection can be an extended selection or a cluster.

### Extended selection

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If the selection is an extended selection, the properties of the object containing the guide point are shown on the property sheet and softkeys. When you set any property, the property will be applied to all objects in the extended selection that have that property. For example, if the extended selection includes objects that have the property Line Width and you change the Line Width property, all of the objects' line widths will change.

### Cluster

---

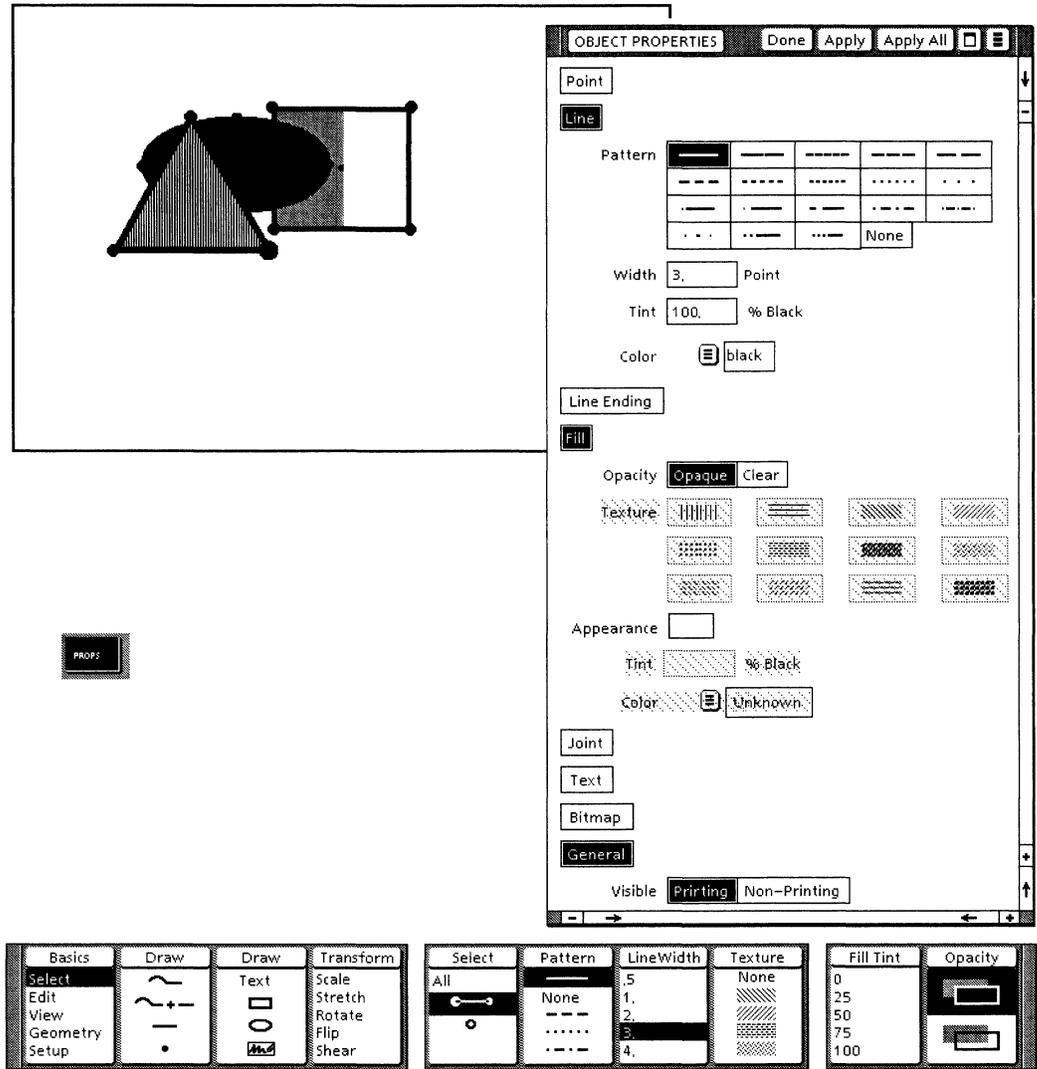
If the selection is a cluster, only property values common to all the cluster objects are shown on the property sheet and softkeys. When you set any property, the property will be applied to all objects in the cluster which have that property.

### Neutral properties

---

Property choices are neutral if they are not common to all objects in a cluster selection or if they do not apply to the object currently selected. Neutral choices appear shaded with diagonal gray lines on the property sheet. Neutral numeric items, for example, Fill Tint, are blank.

The following illustration shows the appearance of neutral property choices for a selected cluster. Notice that the texture and tint are neutral because they are not the same for all of the objects. Only the line and general properties are the same.



## Using object property softkeys

After you have drawn an object, you can select the object and change its properties using the object property softkeys. Not all of the object properties are displayed on these softkeys. To set properties not visible on the softkeys, use the Object Properties sheet. You cannot use the Setup mode softkeys to set the properties of an existing object.

Follow these steps to set properties on existing objects using the softkeys:

1. Select the object.
2. On the softkeys, select the desired properties.

---

## Copying properties using <Same>

---

You can copy properties from one object to another using <Same>. <Same> transfers only the properties held in common by the source and destination objects.

You can also use <Same> to copy color properties to graphics objects and Pro Illustrator bitmap frames. You use the Pro Color Palette documents to apply color properties to objects. See the section titled "Setting color properties" in this chapter for more information.

In addition, you can use <Same> to copy properties from one line ending to another. See the section titled "Setting line ending properties" in this chapter for more information.

---

## Clusters

---

If the destination is a cluster, <Same> applies the source properties in the same way as for a single object, that is, each object in the cluster with properties in common with the source is changed.

If the source is a cluster, <Same> applies the cluster properties to the destination. Cluster properties are those that are common to all of the objects in the cluster. In this case, the objects in the destination that have properties in common with the cluster properties are changed.

---

## Extended selections

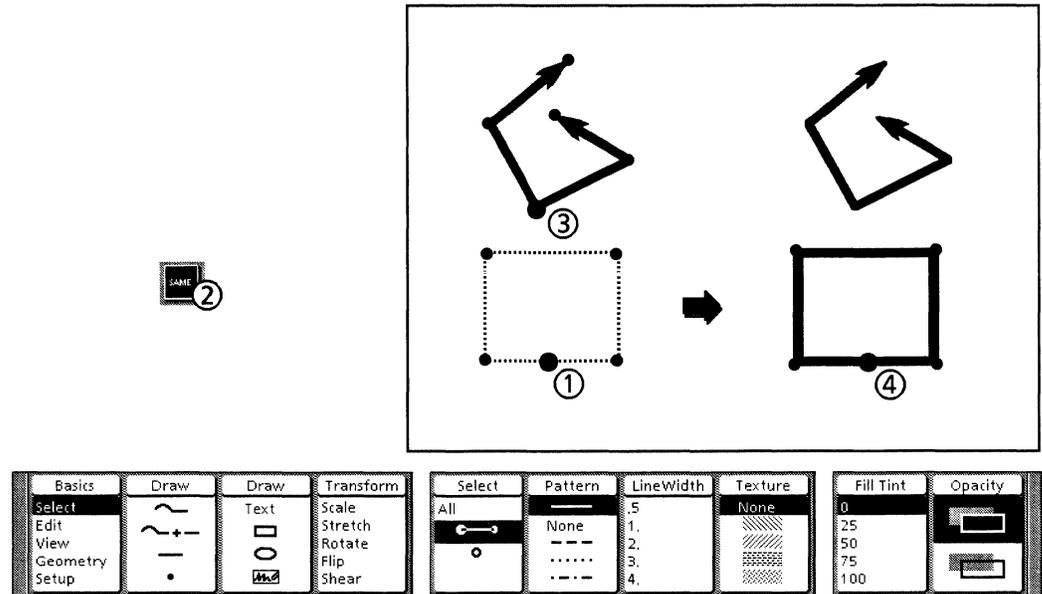
---

If the destination is an extended selection (more than one object selected), <Same> applies the source properties as if it were operating on each destination object separately. Each object in the destination with properties in common with the source is changed.

The source cannot be an extended selection.

## Setting object properties

The following illustration and procedure show how to use <Same> to set an object's properties.



Follow these steps to use <Same> to copy object properties:

1. Select the destination object.
2. Press <Same>.
3. Select the source object.
4. The destination object is selected and displayed with the properties of the source object. Only the properties common to the objects can be transferred.

In the accompanying illustration, only the line properties are transferred. The line endings are not transferred because the rectangle does not have line endings.

## Setting line ending properties

You can also use <Same> to set the properties of line endings.

Follow these steps to use <Same> to copy line ending properties:

1. Control point select the destination line ending. See Chapter 7 for the procedures for selecting control points.
2. Press <Same>.
3. Select the source line ending.
4. The destination line ending is selected and displayed with the properties of the source line ending.

## Setting color properties

You can apply color to graphics objects using Pro Illustrator Color Palettes, Pro Illustrator Highlight Printer Palettes, and the <Same> key. The Pro Illustrator Color Palettes and Pro Illustrator Highlight Printer Palettes offer an alternative to using the Object Properties sheet to apply color to objects.

The Pro Illustrator Color Palettes and Pro Illustrator Highlight Printer Palettes are provided with the *Xerox Pro Illustrator* applications. These palettes are VP documents you copy to your desktop from floppy disk, cartridge tape, or the network. They are not applications to be run in the Loader.

The following table lists the types of color palettes that are available, Pro Illustrator objects that can be colored with the palettes, and the hardware requirements for using the color palettes.

Palette	Pro Illustrator objects	Requirements
Pro Illustrator Color Palette	Graphics objects	Color display screen
Pro Illustrator Color Palette (with color names)	Graphics objects	Color or monochrome display screen
Pro Illustrator Color Palette (for bitmaps with color names)	Bitmaps	Color or monochrome display screen
Pro Illustrator Highlight Printer Palette	Graphics objects	Color display screen and Xerox 4850 Highlight Color Laser Printing System
Pro Illustrator Highlight Printer Palette (with color names)	Graphics objects	Color or monochrome display screen and Xerox 4850 Highlight Color Laser Printing System
Pro Illustrator Highlight Printer Palette (for bitmaps with color names)	Bitmaps	Color or monochrome display screen and Xerox 4850 Highlight Color Laser Printing System

The Pro Illustrator Color Palettes and Pro Illustrator Highlight Printer Palettes are VP documents made of Pro Illustrator frames. The frames contain graphics objects in every available color choice. You use the <Same> key to apply color properties from the palette to your selected object.

The palettes enable you to color the following objects:

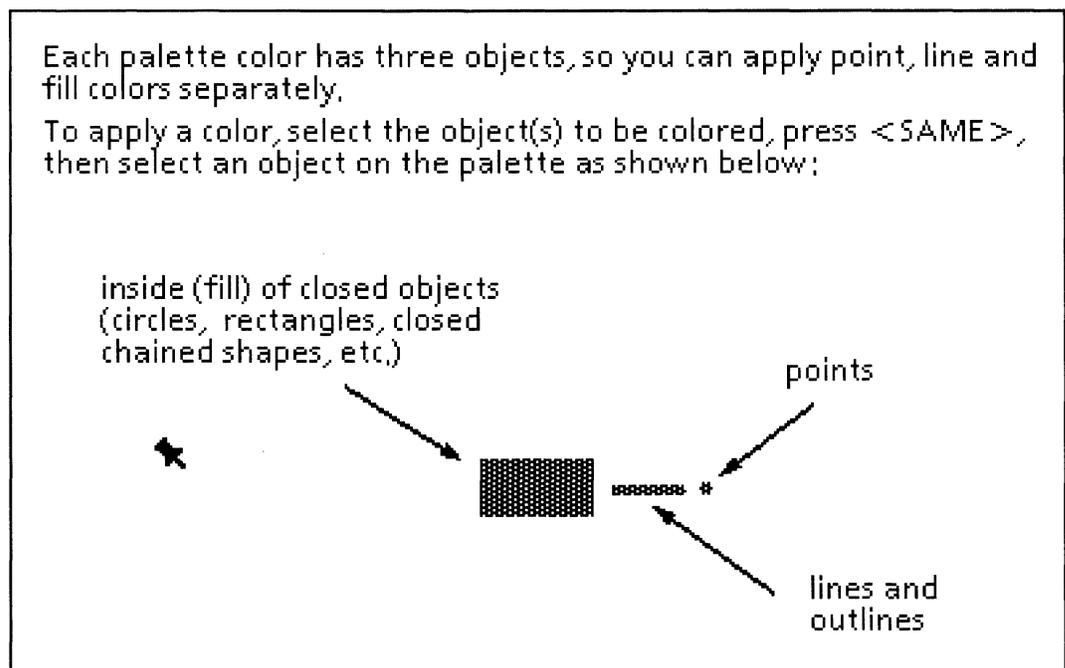
- Points
- Lines
- Fills (for squares, rectangles, circles, and ellipses)
- Bitmap frame bits.

### Using a palette

The Pro Illustrator Color Palette and the Pro Illustrator Highlight Printer Palette are VP documents with colors and objects.

Each palette contains colors represented in three objects: point, line, and fill. The colors are arranged vertically, by hue and horizontally by value, based on how they will look when printed.

Each palette also contains a set of instructions on its use. To view the instructions, scroll to the last page of the palette. The illustration below shows a set of instructions for the Pro Illustrator Color Palette.



Follow these steps to use a palette:

1. Display the palette on your desktop.
2. Select the object you want to color in the Pro Illustrator frame.
3. Press <Same>.
4. Select the color chip for your object, as follows:
  - Use the point object to color points.
  - Use the line object to color lines.
  - Use the fill object to color squares, rectangles, circles, and ellipses.
5. The object is displayed in its new color.

### **Using a palette (with color names)**

---

The Pro Illustrator Color Palette (with color names) and the Pro Illustrator Highlight Printer Palette (with color names) are VP documents with colors, color names, and objects.

Each palette contains colors represented in three objects: point, line, and fill objects. Color names are provided so you can use the palettes on workstations with monochrome display screens.

Each palette also contains a set of instructions on its use. To view the instructions, scroll to the last page of the palette.

Follow these steps to use a palette (with color names)

1. Display the palette on your desktop.
2. Select the object you want to color in the Pro Illustrator frame.
3. Press <Same>.
4. Select the color chip for your object, as follows:
  - Use the point object to color points.
  - Use the line object to color lines.
  - Use the fill object to color squares, rectangles, circles, and ellipses.
5. The object is displayed in its new color.

### **Using a palette (for bitmaps with color names)**

---

You use the Pro Illustrator Color Palette (for bitmaps with color names) or the Pro Illustrator Highlight Printer Palette (for bitmaps with color names) to apply a single color to the bits in an Illustrator bitmap frame.

Each palette contains color chips with accompanying color names. Color names are provided so you can use these palettes on workstations with monochrome display screens.

Each palette also contains a set of instructions on its use. To view the instructions, scroll to the last page of the palette.

Follow these steps to use a palette (for bitmaps with color names):

1. Display the palette on your desktop.
2. Select the Pro Illustrator bitmap you want to color.
3. Press <Same>.
4. Select the color chip you want to use.
5. The object is displayed in its new color.

Text frames enable you to include text in *Xerox Pro Illustrator* drawings. A text frame is a rectangular area that contains one or more lines of text. The text inside a text frame is standard VP text that you create and edit with the *VP Document Editor*.

For information about how to create and edit text, refer to *Document Editor: Basics User Guide* in the *VP Series Reference Library*.

In this chapter, when we say text frames, we are referring specifically to text frames.

This chapter describes how to create and use text frames. Topics covered include the following:

- Overview
- Text frame softkeys
- Text frame properties
- Creating text frames
- Centering and aligning text frames
- Selecting and editing text
- Transforming text frames.

---

## Overview

---

This section provides an overview of text frames.

- Text frames and GLOBALVIEW – Like other types of VP frames, Pro Illustrator text frames can be copied, moved, deleted, and stretched. However, they can be created only within a Pro Illustrator frame; they cannot be anchored in document text or embedded in another VP frame. Other types of frames cannot be embedded in text frames.
- Using [Show Structure] – If you turn on [Show Structure] in the window header document menu, the system displays the fixed and free sides of each text frame. Fixed and free sides are described in “The Fixed Side softkey” section in this chapter. Fixed sides are shown as solid lines, free sides as dotted lines. [Show Structure] applies only to the display screen; when printed, each text frame has the properties you assign it using the softkeys and the property sheet.
- Layering and selecting – Text frames can be layered with other graphic objects (see Chapter 7 for a discussion of layering). However, you cannot select an object that is completely hidden beneath a text frame by selecting the space inside the frame. The system assumes that when you select within a text frame, you are selecting text for editing. Therefore, you cannot reach through a text frame to select an object below it. You can select an object which is on top of or underneath a text frame without selecting the text if you select on the object outline (not in the center). See

the section titled “Cycle-through selection” in Chapter 7 for more information.

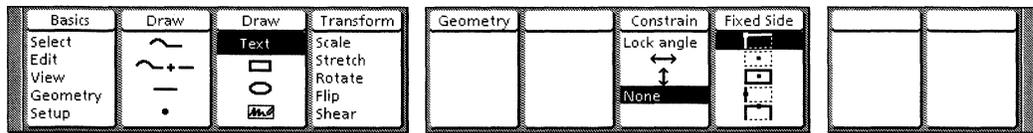
- View windows – Text frames inside View windows are visible and can be selected, but the text inside the frames cannot be selected or edited. The text is visible only if the View window scale is 90%. View windows are described in Chapter 13.
- Printing text frames – Xerox Pro Illustrator will not print text frame contents if any portion of the text frame is outside the Pro Illustrator frame boundary.

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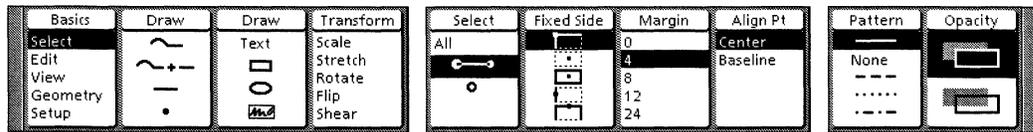
## Text frame softkeys

---

The following illustration shows how the softkeys look when you create or modify text frames. The system displays different softkeys depending on whether you are creating a new text frame or modifying an existing text frame. Additional text frame properties are available on the object property sheet, which is described in Chapter 8.



**Text softkeys: Creating a new text frame**



**Text softkeys: Modifying an existing text frame**

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## Text frame properties

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Text frames share many properties with other objects and they also have some unique properties.

---

### Properties shared with other objects

---

Text frames share the following properties with other objects:

- Line (Pattern, Width, Tint, and Color)
- Fill (Opacity, Texture, Tint, and Color).

See Chapter 8 for descriptions of these properties. The Pattern and Opacity softkeys appear only when you edit existing text frames, not when you create new text frames. Additional choices for these two properties, and all of the choices for the other common properties, are available on the object property sheet.

## Unique text frame properties

---

Text frames also have some unique properties. These properties are:

- Fixed Side
- Margin
- Align Pt.

These properties are described in this chapter. The Fixed Side softkey appears both when creating a new text frame and when editing an existing text frame. The Margin and Align Pt softkeys appear only when editing an existing text frame. You can change the unique properties on the softkeys or in the property sheet. The unique property softkeys which appear when you create and modify text frames are described in the following sections.

## Setting properties

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You can set the common or unique properties before creating a text frame on the object property sheet or on the softkeys. To make the object property sheet appear, select Text on the Draw softkey, press <Props>, and change the properties on the object property sheet. Make sure you select [Apply] when you are finished.

To make the text frame softkey appear, select Setup on the Basics softkey, then select Text props on the Setup softkey. After selecting Text props on the Setup softkey, you can press <Props> and an object property sheet with only default text frame properties will appear. You can use this object property sheet when the properties you want to change are not on the softkeys.

To change all of the common or unique properties of an existing text frame, select the frame, then change the softkeys which appear, or select the frame and press <Props> to see the property sheet. For more information on property sheets, see Chapter 8.

When you change the Texture, Fill Tint, and Opacity properties, the system saves these property settings separately for text frames. This means that text frames can have different settings than other objects such as rectangles.

## Fixed Side softkey

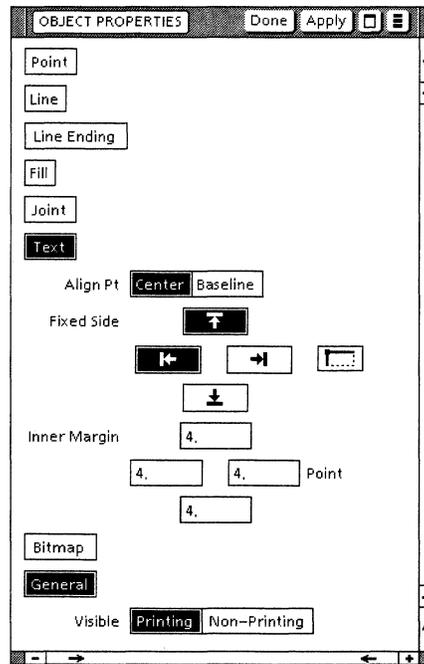
---

The Fixed softkey appears both when you create a text frame and when you edit an existing text frame. Each of the four sides of a text frame can be either fixed in place or left free to expand and contract with the text. If a side is fixed, it does not move as text is added or modified. If a side is free, it hugs the text as text is added, deleted, made larger or smaller, or otherwise changes the amount of space it occupies.

There are 16 possible combinations of fixed and free sides. The Fixed Side softkey displays five combinations; all 16 are available on the softkey property sheet. To see the softkey property sheet, highlight the softkey and press <Props>.

You can customize the Fixed Side softkey to display the combinations you use most often. See Chapter 5 for more details on changing the softkey choices.

Both the Fixed Side softkey and the object property sheet use text frame icons to show fixed and free sides. Fixed sides are shown as heavy solid lines; free sides are shown as dotted lines. The following illustration shows the object property sheet opened for a text frame with the top and left side fixed.



To open the property sheet, select the text frame and press <Props>. Then select each side that you want to be fixed.

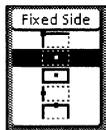
As you make your selections, the system updates the text frame icon to show the fixed and free sides.

The system does not prevent free sides from expanding beyond the frame; they continue to expand into the infinite drawing pad that surrounds each frame. However, the system displays and prints only text frames whose sides are contained entirely within the Pro Illustrator frame.

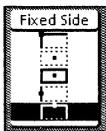
If all sides of a text frame are fixed, the system clips text at the text boundary; it prints only the part of the text that fits within the boundary.

The following illustration demonstrates three different combinations of fixed and free sides: all free sides; left, top, and right sides fixed; and all fixed sides.

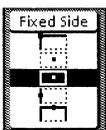
The text frames are shown as they appear when [Show Structure] is on: fixed sides are solid lines, free sides are dotted lines. The same text appears in all three text frames. Carriage returns are indicated so you can see how the text was entered. Notice how the different choices of fixed and free sides affect how the text is arranged within the text frames.



Each side of a text frame can be either ↵  
 fixed or free. Fixed sides do not move as text ↵  
 is entered, deleted, or modified. Free ↵  
 sides move so that they always hug the text.



Each side of a text frame can be either ↵  
 fixed or free. Fixed sides do not move as text ↵  
 is entered, deleted, or modified. Free ↵  
 sides move so that they always hug the text.



Each side of a  
 text frame can  
 be either ↵  
 fixed or free.  
 Fixed sides do

↵ - Indicates carriage return

## Margin softkey

The Margin softkey appears only when you edit an existing text frame. If you want to set the margins before creating a text frame, select Setup on the Basics softkey, select Text props on the Setup softkey, then change the choices on the softkeys that appear. You can also set the margins before creating a text frame by opening the property sheet. See the section in this chapter titled "Setting properties" for details.

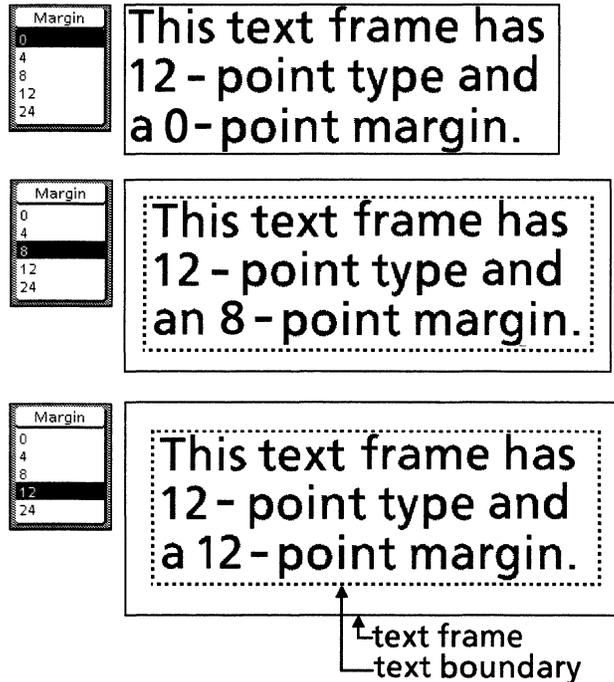
The Margin softkey allows you to set a margin between the text boundary and the text frame. The text boundary is an imaginary rectangle that surrounds the text within a text frame. It extends from the top of the highest character in the first line to the bottom of the lowest character in the last line, and from the left edge of the leftmost character to the right edge of the rightmost character.

If the margin is zero on all four sides, the text boundary and the text frame are in the same place.

There are two ways to set the margin.

- On The Margin softkey, the value you select is used for all four sides.
- On the object property sheet, you can select a different value for each of the four sides.

The following illustration demonstrates setting margins with The Margin softkey. The text boundary (dotted line) does not appear on either the display screen or the printed illustration. It is shown here only to illustrate the text margin.



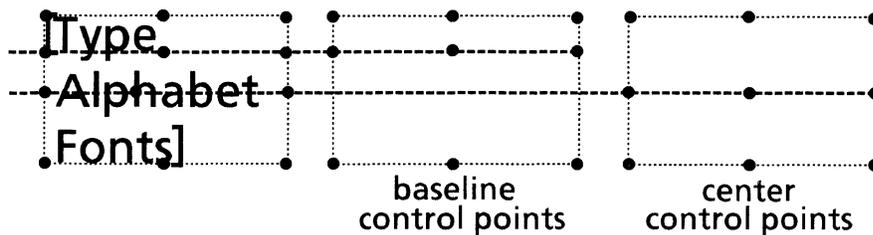
## Align Pt softkey

The Align Pt softkey appears only when you edit an existing text frame. If you want to set the control point alignment before creating a text frame, select Setup on the Basics softkey, select Text props on the Setup softkey, then change the choices on the softkeys that appear. You can also set the control point alignment before a text frame by opening the object property sheet. See the section, "Setting properties" for details.

A text frame has twelve possible control points, nine of which are active at any one time. See Chapter 7 for more information on control points and the Select softkey. In addition to the top, bottom, and four corner control points on a text frame, there are two sets of three control points (left side, middle, right side). You choose which control point set you want to appear when the text frame is selected by highlighting Center or Baseline on the Align Pt softkey.

The three Center control points are aligned horizontally at the center of the text frame. They are located at the midpoints of the left and right edges of the text frame and at the center of the frame.

The three Baseline control points are aligned horizontally along the baseline of the first line of text. They are located where the baseline meets the left and right edges of the text frame and at the horizontal center of the baseline.

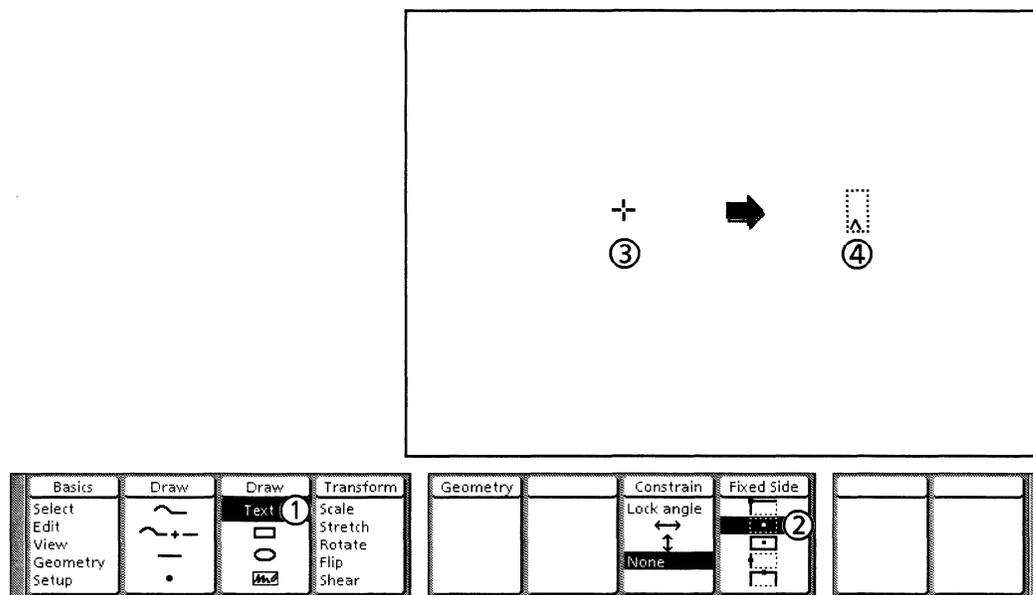


See the sections titled “Centering a text frame inside another object” and “Aligning text baseline with an object” for procedures that demonstrate how to use the Center and Baseline control points.

## Creating text frames

Xerox Pro Illustrator provides two ways to create text frames. Use the first procedure to create text frames with two or more adjacent free sides. Use the second procedure to create text frames with no adjacent free sides.

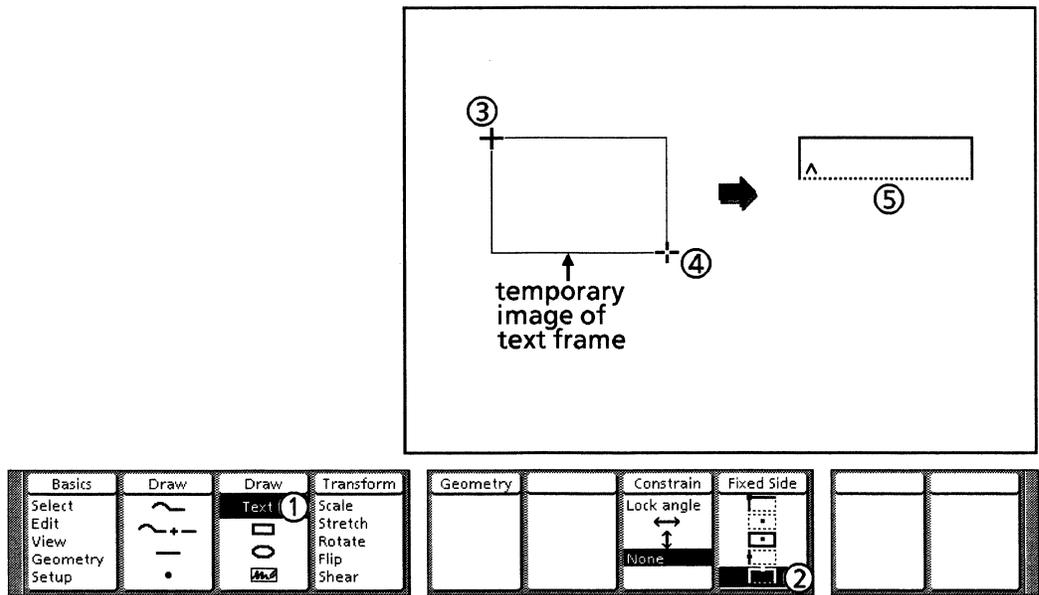
The Changing softkeys which appear when you create a text frame are: Geometry, Constrain, and Fixed Side. The Geometry softkey is described in Chapter 14. The Constrain softkey is described in Chapter 7. The procedures in this section do not use constraints or geometry. The Fixed Side softkey is described in the section titled “Fixed Side softkey” in this chapter.



Follow these steps to draw text frames with two or more adjacent free sides:

1. Select Text on the Draw softkey. The system displays the text frame softkeys.
2. Select an appropriate text frame icon on the Fixed Side softkey.
3. Position the cursor where you want to place the Attachment Point (see the note at the end of this procedure), and click the left mouse button.
4. The system creates a text frame with its Attachment Point at the mouse location. When the VP Document Editor caret appears inside the text frame, you can enter and modify text.

Note: The Attachment Point is a special control point the system uses during transformations. It is located opposite the free sides, at the most fixed point of the text frame. If a text frame has all free sides, the Attachment Point is at the center. For more information, see "The Attachment Point" under "Transforming text frames" in this chapter.



Follow these steps to draw text frames with no adjacent free sides:

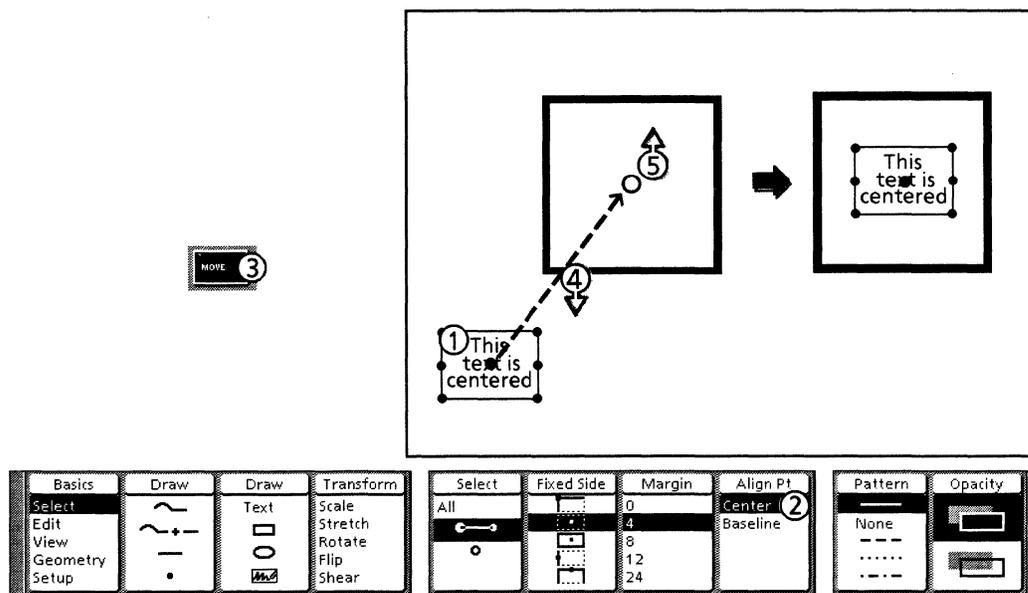
1. Select Text on the Draw softkey.
2. Select an appropriate text frame icon on the Fixed Side softkey.
3. Position the cursor where you want to place one corner of the text frame and click the left mouse button.
4. Position the cursor where you want to place the opposite corner of the text frame and click the left mouse button.
5. The VP Document Editor caret appears inside the text frame. You can now enter and modify text.

## Centering a text frame inside another object

The following procedure demonstrates how to use the Center control points to center a text frame inside another graphic object. You can tell when the two items are centered because the center control point of the graphic object will appear as a black circle with a white interior when it meets the center control point of the text frame.

Also, with gravity on, you will see the control points snap together when they get close. This process is sometimes easier to see with an empty text frame. If the text frame contains text, it may be difficult to see the control points in the center. If you are centering the text frame on an object with fifty percent or more fill tint, the control point will appear as a circle with a white outline.

No geometry or constraints are used in this procedure.



Follow these steps to center a text frame inside another object:

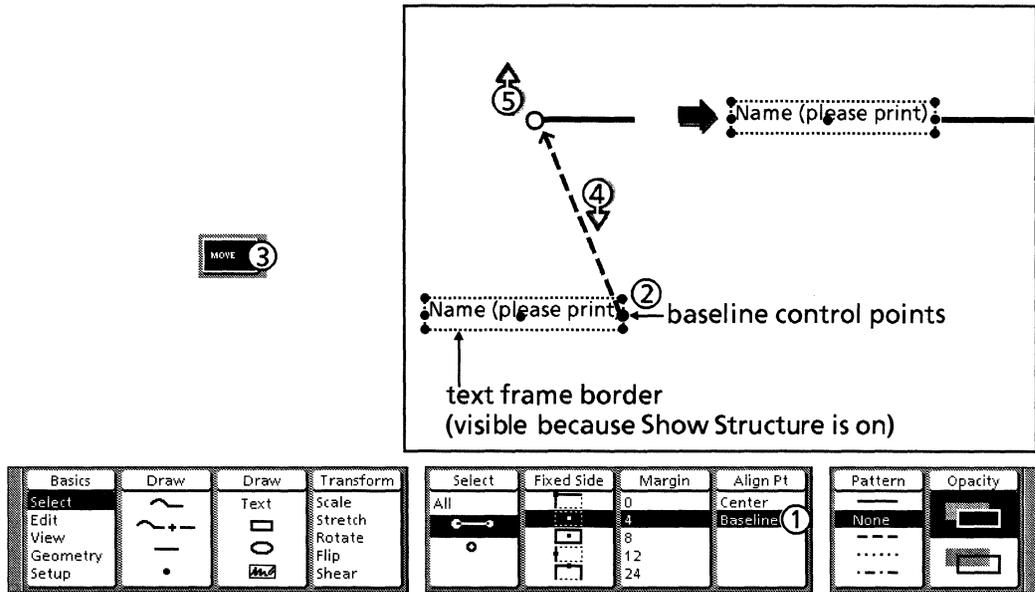
Note: Gravity should be turned on when you perform this procedure. If you have turned it off, select Setup on the Basics softkey and Intersection on the Gravity softkey.

1. Select the control point at the center of the text frame.
2. Make sure that Center is selected on the Align Pt softkey.
3. Press <Move>. The Geometry and Constrain softkeys appear.
4. Hold down the left mouse button and move the cursor to the center control point of the rectangle. When the text frame center touches the object center, the gravity dot appears.
5. Release the left mouse button. The text frame remains selected.

## Aligning text baseline with an object

The following procedure demonstrates how to use the Baseline control points to align text with an object. You can tell when the two items are aligned because the control point of the graphic object will appear as a black circle with a white interior when it meets the baseline control point of the text frame. Also, with gravity on, you will see the control points snap together when they get close.

No geometry or constraints are used in this procedure.



Note: Gravity should be turned on when you perform this procedure. If you have turned it off, select Setup on the Basics softkey and Intersection on the Gravity softkey.

Follow these steps to align text baseline with an object:

1. Select the text frame anywhere to make the control points visible. Make sure that Baseline is selected on the Align Pt softkey.
2. Select the right or left Baseline control point.
3. Press <Move>.
4. Hold down the left mouse button and move the cursor to the left end point of the line. When the baseline control point touches the object, the gravity dot appears.
5. Release the left mouse button. The text frame is selected.

---

## Selecting and editing text

---

Text inside text frames is standard text that you create and edit using *VP Document Editor*. The text must be single column and cannot contain fields or anchored frames. When you create a text frame, the Document Editor caret appears and you can begin entering and modifying text.

For information about how to use the Document Editor, refer to the *Document Editor: Basics User Guide* in the *VP Series Reference Library*.

To select text within a text frame, position the cursor over a character and click the left mouse button. You can then enter, modify, copy, or move text in the usual way using *VP Document Editor*.

---

## Transforming text frames

---

Text frames, like other graphic objects, can be transformed (transformations are described in Chapter 12). However, text frames behave differently from other objects when they are transformed. The layout of the text (line breaks) may change, but the text itself does not change size or shape, and the text frame always remains horizontal.

A text frame may also be affected if it is clustered with another object that is transformed (see Chapter 7 for a discussion of clustering).

---

## Attachment Point

---

The Attachment Point is the control point where the system pins the text frame to the drawing pad during a transformation. The system locates the Attachment Point opposite the free sides of the text frame, at its most fixed point. The exact location depends on the number of free sides.

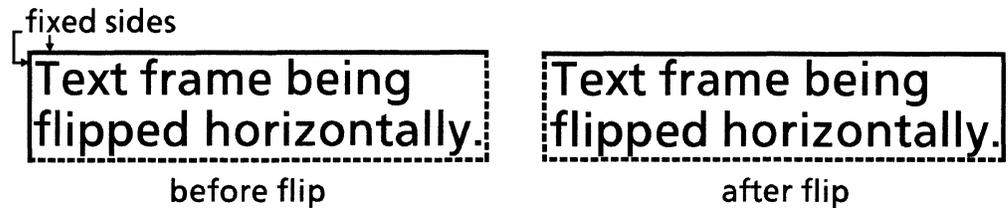
- One free side - the Attachment Point is at the middle of the fixed side directly opposite the free side.
- Two adjacent free sides - the Attachment Point is at the corner where the two fixed sides meet. Two non-adjacent free sides: The Attachment Point is at the center of the text frame.
- Three free sides - the Attachment Point is at the middle of the fixed side.
- All free or all fixed sides - the Attachment Point is at the center of the text frame.

The text frame icons that appear on the Fixed Side softkey and on the object property sheet show the Attachment Point as a small dot.

## Flip

---

When you flip a text frame, the text frame itself flips but the text inside does not. For example, the following illustration shows a text frame with fixed top and left sides (solid lines) being flipped. The resulting frame has fixed top and right sides; the text inside is unchanged.



## Rotate and shear

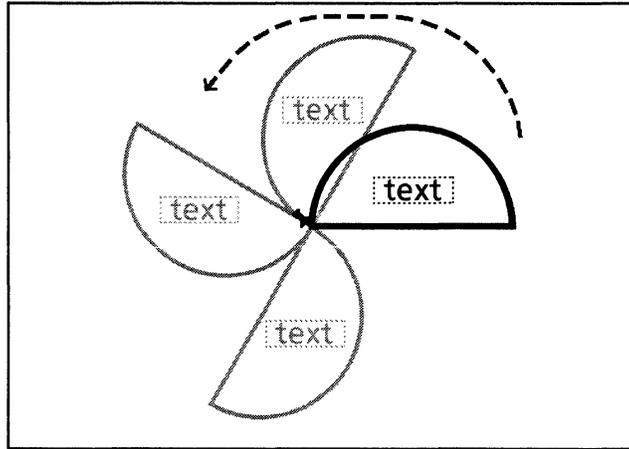
---

When you rotate or shear a text frame, only its Attachment Point rotates or shears; the rest of the text frame follows along. The text frame always remains horizontal, and the text inside is unchanged.

To clarify how rotation affects a text frame, imagine viewing a ferris wheel from the side. The text frame is a seat on the ferris wheel, attached to the wheel at a single point. As the ferris wheel turns, the Attachment Point moves in a circle, carrying the text frame with it. The text frame pivots about its Attachment Point so it always stays horizontal.

For shearing, imagine the text frame is a picture hanging from a single nail driven into a wall. As the wall is slanted, the nail moves, carrying the text frame along with it. The text frame pivots about its Attachment Point so it always stays horizontal.

The following illustration demonstrates text frame rotation. The text frame has all free sides (indicated by the dotted lines), so it is attached by its center control point to the rotating object. As the object rotates, the text frame's Attachment Point moves with it, causing the text frame to move in a circle. The text frame remains horizontal and the text inside is unaffected.



## Scale and stretch

---

When a text frame is scaled or stretched, only the fixed sides are affected; the free sides always hug the text. You can visualize the transformation as a two-step process: first the text frame is scaled or stretched as if it were a rectangle with all fixed sides, then the free sides adjust to hug the text. If a text frame has all fixed sides, it scales or stretches just like a rectangle.

The text inside a text frame does not change size or shape. However, the line breaks may change depending on the length of each line and the placement of carriage returns.



Pro Illustrator bitmap frames are rectangular objects that contain raster (bitmap) images. These images come from various sources, such as canvases created in *VP Freehand* or scanned in with the 7650 Pro Imager. You do not have to be running the bitmap creation software application to create a bitmap frame in *Xerox Pro Illustrator* or to place the raster image. You cannot use *Xerox Pro Illustrator* to edit the raster image.

Pro Illustrator bitmap frames are very similar to Basic Graphics bitmap frames, but they are not interchangeable. You cannot copy a Basic Graphics bitmap frame directly into a Pro Illustrator frame. However, you can place the image from a Basic Graphics bitmap frame into a Pro Illustrator bitmap frame. See the section in this chapter titled "Placing raster images in bitmap frames" for details.

In this chapter, when we say "bitmap frames," we are referring specifically to Pro Illustrator bitmap frames. Topics covered include the following:

- An overview of bitmap frames
- Bitmap frame properties
- Creating bitmap frames
- Placing raster images in bitmap frames
- Repositioning raster images
- Transforming bitmap frames.

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## Overview

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This section provides an overview of bitmaps.

Bitmap frames and VP - Bitmap frames can be created only within a Pro Illustrator frame; they cannot be anchored in VP document text or embedded in another VP frame. Other types of frames cannot be embedded in bitmap frames. An embedded bitmap frame does not have margins or captions.

For general information about how to work with frames, refer to the *Document Editor: Basics User Guide* in the *VP Series Reference Library*.

Working with bitmap frames - Bitmap frames share many characteristics with rectangles. You can select, delete, copy, move, layer, and cluster bitmap frames as you do rectangles. They share common control points: four corners, center, and the middle of each side. See Chapter 7 for details on working with objects.

One difference between bitmap frames and rectangles is that bitmap frames cannot be cut or linked. Also, when you transform bitmap frames, they act like text frames, not rectangles. For more information, see the section titled "Transforming

bitmap frames” in this chapter and the section titled “Transforming text frames” in Chapter 9.

Using [Show Structure] - If you select [Show Structure] in the window header document menu, the system displays invisible bitmap frame borders. [Show Structure] applies only to the display screen. When printed, each bitmap frame has the properties you assign it using the softkeys and the property sheet.

Printing bitmap frames - If a bitmap frame is partially outside of a Pro Illustrator frame (the cropping boundary), the entire raster image, including the part outside the boundary, shows when you print the document. Bitmap frames that are totally outside the cropping boundary do not show when you print the document.

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## Bitmap frame properties

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Bitmap frames share many properties with other objects. They also have some unique properties that affect the image inside the bitmap frame.

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### Properties shared with other objects

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Bitmap frames share the following properties with other objects:

- Line (Pattern, Width, Tint, and Color)
- Fill (Opacity, Texture, Tint, and Color).

These properties are described in Chapter 8. They can be applied to bitmap frames from the softkeys or from the property sheet.

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### Unique bitmap image properties

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Bitmap frames also have some unique properties.

- Scaling
- Source
- Bitmap Color
- Print Using Remote.

These are described in detail later in this chapter. The unique properties affect the image inside the bitmap frame, not the frame itself. You can change the unique properties on the property sheet after you create the bitmap frame. You can also change the color properties using the color palette (for bitmaps with color names). Refer to Chapter 8 for additional information.

The Canvas resolution of the image is displayed in pixels per inch (ppi) on the property sheet in the Bitmap category. This information is displayed only; you cannot change it on the property sheet. The bitmap properties for a cluster which includes bitmap frames will show shared scaling properties, but no source information since each image has a different source.

## Setting properties

---

You can set the line properties (tint, width, and pattern) before creating a bitmap frame using two methods. One method is to select the Bitmap frame icon on the Draw softkey, press <Props>, and change the line properties on the property sheet.

The other method is to select Setup on the Basics softkey, select Line props on the Setup softkey, and change the line properties on the softkeys which appear. When you change the line properties using either method, the system will automatically apply these properties to any object you create afterward, not just bitmap frames. You cannot set the other properties before creating a bitmap frame.

To change the properties of an existing bitmap frame, select the frame, then change the softkeys that appear, or select the frame and press <Props> to change the property sheet. For more information on changing softkey choices, see Chapter 5. For more information on changing the property sheet, see Chapter 8.

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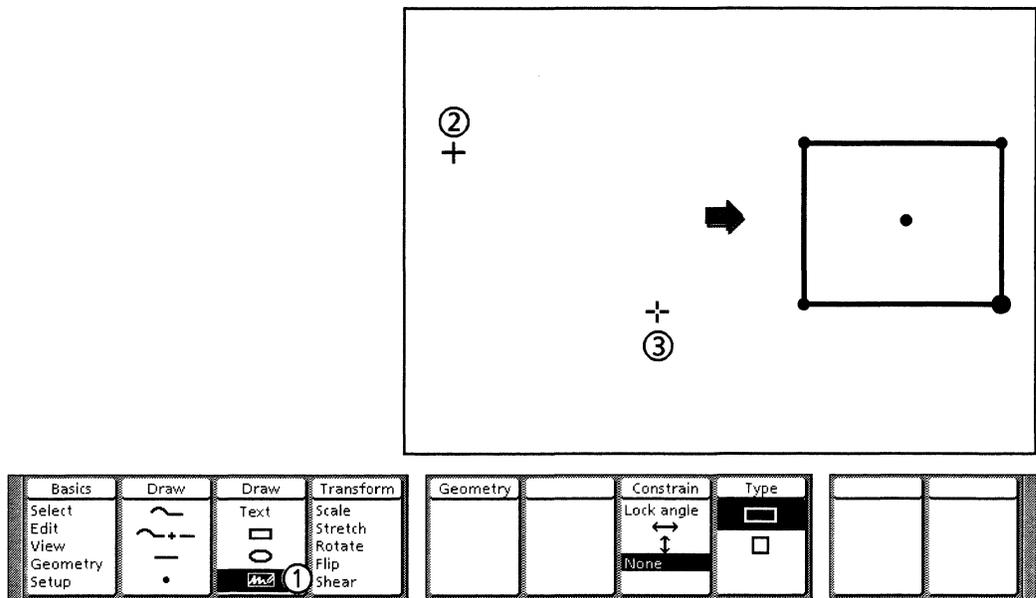
## Creating bitmap frames

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This section describes how to create a bitmap frame. In general, the effects of geometry and constraints on bitmap frames are the same as on text frames. Bitmap frames always draw as rectangular shapes. They cannot be drawn in paraline or perspective planes.

The Geometry, Constrain, and Type softkeys are used to control the way you draw bitmap frames. The Geometry softkey is described in Chapter 14. The Constrain softkey is described in Chapter 7. The Type softkey allows you to specify whether you want your bitmap frame to be a rectangle or a square.

The following illustration and procedures show how to create a bitmap frame. The constraints and geometry are set to None in the procedure.



Follow these steps to draw a bitmap frame:

1. Select the Bitmap frame icon on the Draw softkey.
2. Position the cursor where you want to place one corner of the bitmap frame and click the left mouse button.
3. Position the cursor where you want to place the opposite corner of the bitmap frame and click the left mouse button.

---

## Placing raster images in bitmap frames

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You include raster images in your bitmap frames by specifying the image source in the bitmap category of the object property sheet. Then, you either copy the image directly into the frame, or the system places the image from a referenced source. A Basic Graphics bitmap frame cannot be copied directly into a Pro Illustrator bitmap frame.

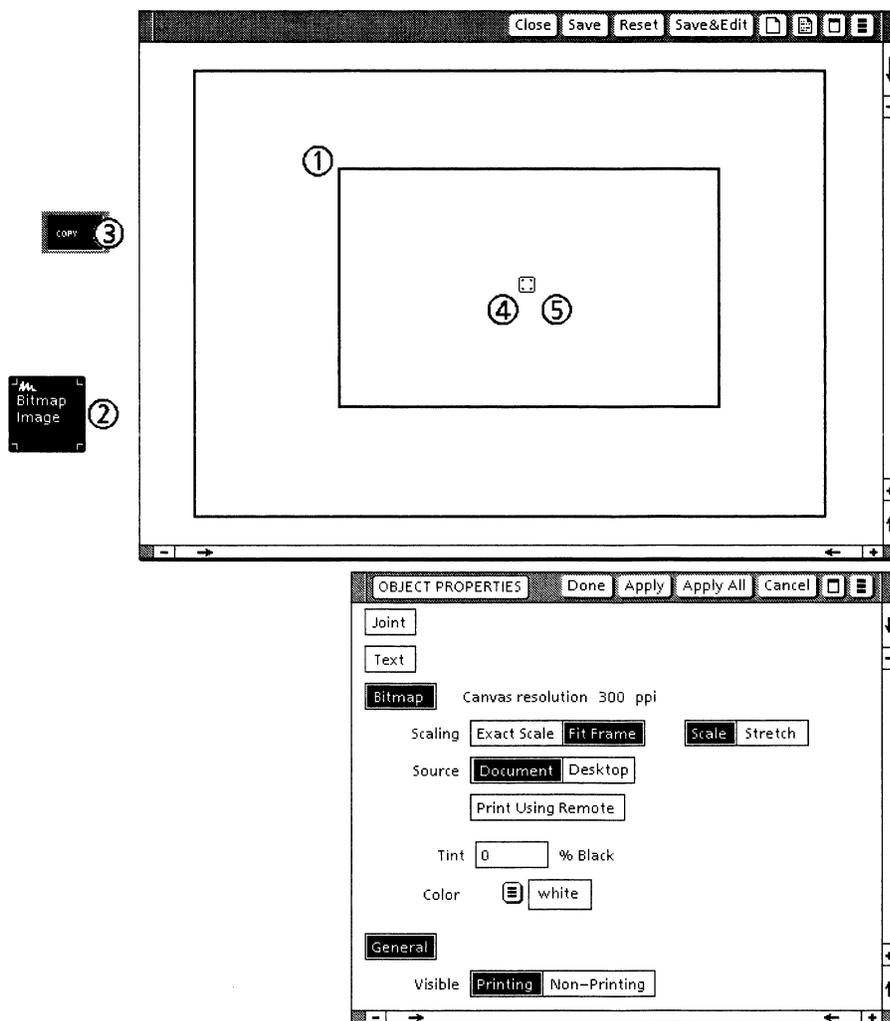
You can convert the Basic Graphics bitmap frame to a Pro Illustrator bitmap frame, or the Pro Illustrator bitmap frame can reference the same desktop file as the Basic Graphics bitmap frame.

---

## Document source

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When you create a bitmap frame, the system assumes the choice of Document in the Source category. This option allows you to copy a raster image directly into a bitmap frame from a canvas icon on your desktop. You can also copy bitmap frame contents from the bitmap frame onto the desktop if the Source is set to Document. This action creates a raster canvas on your desktop.

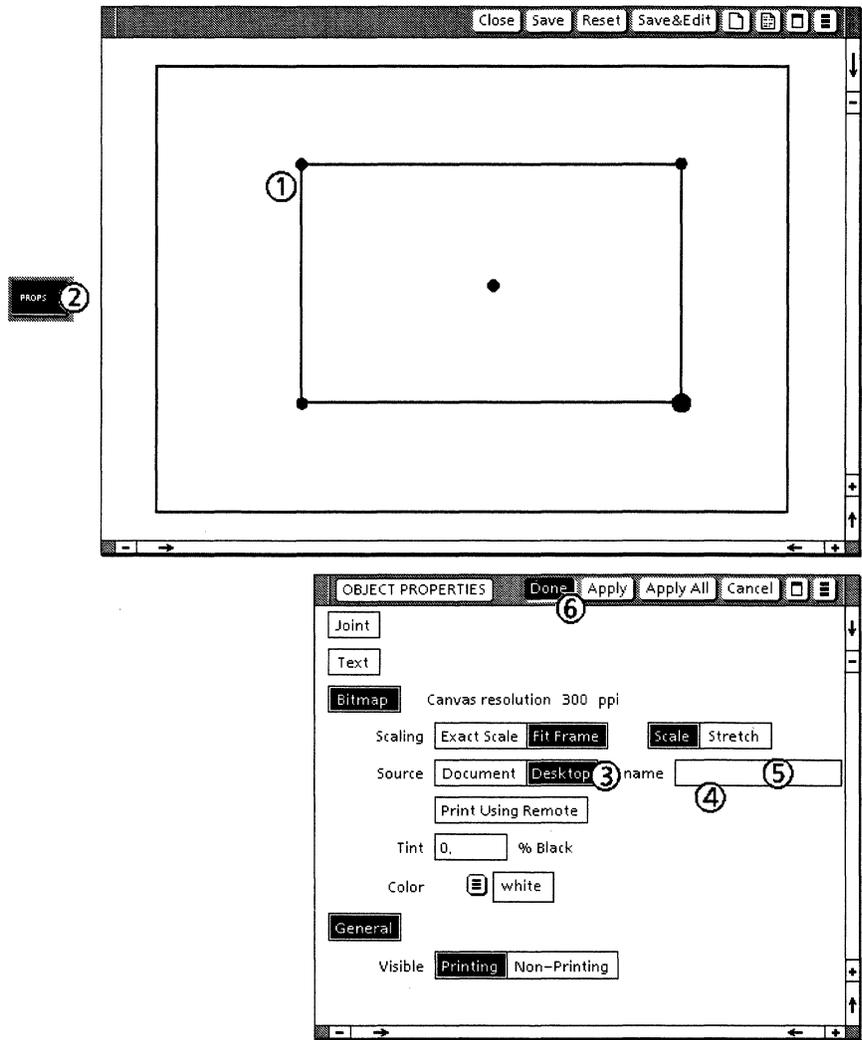


Follow these steps to place a raster image using Document Source:

1. Create a bitmap frame.
2. Select the canvas icon on your desktop which you want to place in the bitmap frame.
3. Press <Copy>.
4. Move the bitmap frame cursor inside the empty bitmap frame.
5. Click the left mouse button.

## Referenced source

You can reference or call in a raster image from your desktop by entering the name of the canvas in the name box in the property sheet. This box appears when you choose Desktop in the Source category. If the canvas is contained inside a folder on the desktop, you need to enter the folder name and the canvas name. The correct syntax for this entry is: Folder name/Canvas name.



Follow these steps to place a raster image using a referenced source:

1. Create a bitmap frame.
2. Press <Props> to open the property sheet.
3. Select [Desktop] in the Source category.
4. Click in the name box to insert the flashing caret.
5. Enter the name of the canvas or file in the name box.
6. Select [Apply] or [Done] on the property sheet. The image will be placed automatically in the bitmap frame.

## Specifying bitmap frame size

---

You cannot specify the length and width of Pro Illustrator bitmap frames on the property sheet. However, you can make them a specific size after creation by using the Measures window.

Follow these steps to specify bitmap frame size:

1. Create a bitmap frame.
2. Press <Props>.
3. Select [Exact Scale] by Resolution.
4. Select [Print Source] in the ppi category.
5. Select [Done].
6. Open the Measures window. (Select Setup on the Basics softkey, then highlight the Measures window icon on the Measures softkey.)
7. Place the Pin Point at one corner of the bitmap frame. (For details, see Chapter 15.)
8. Select the Control point icon on the Select softkey.
9. Select the control point on the bitmap frame diagonally opposite the Pin Point.
10. Enter the values for X and Y in the Measures window. (For details, see Chapter 15.)
11. Select [Apply] in the Measures window header.

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## Repositioning raster images

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After you have placed the raster image in the bitmap frame, you can change the way the image fits in the frame by changing the properties on the object property sheet.

The Canvas resolution shows the resolution of the original source image. It is displayed for your information; you cannot change this property. Before you place an image in the bitmap frame, the Canvas resolution is 0 pixels per inch (ppi). The four properties which you can change in the bitmap category are the following:

- Scaling
- Source
- Color
- Print Using Remote.

## Scaling

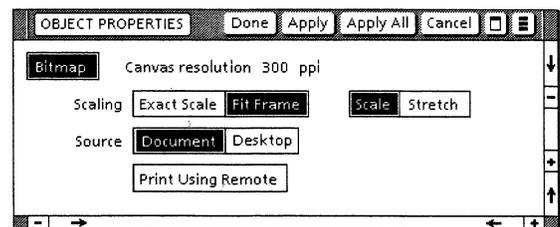
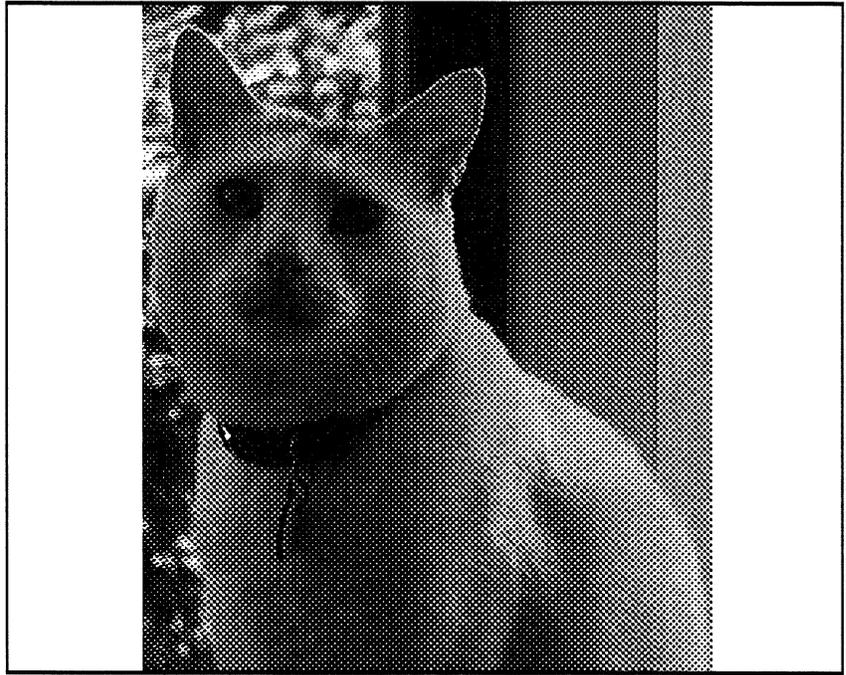
---

Scaling allows you to resize the raster image inside the bitmap frame in two ways: Fit Frame and Exact Scale. Fit Frame scales the image to fill the frame either proportionally or not proportionally to make the image look as good as possible. It is a visual, not a precise, setting. Exact Scale scales the image by the numbers you specify. It is a precise, numerical setting. The Scaling features in the bitmap property group affect only the contents of the bitmap frame, not the frame itself. By changing

the selection on the property sheet, you can change the way the image inside the frame looks in relation to the size and shape of the frame.

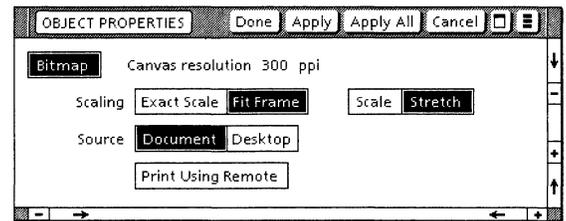
### Fit Frame

When you choose [Fit Frame] in the Scaling mode, you can then choose the option to either Scale or Stretch the image in the frame.



**Scale** – If you choose [Fit Frame/Scale], the raster image is resized proportionally so that one direction (horizontal or vertical) of the image fits the frame (touches the edges) and the other direction spreads as far as necessary to make the image look right.

The image retains its original proportions so it is not distorted, but the overall size will be larger or smaller (compared to the original image) depending on the frame size. The system assumes the [Fit Frame/Scale] choice for all bitmap frames if you do not specify a different choice.

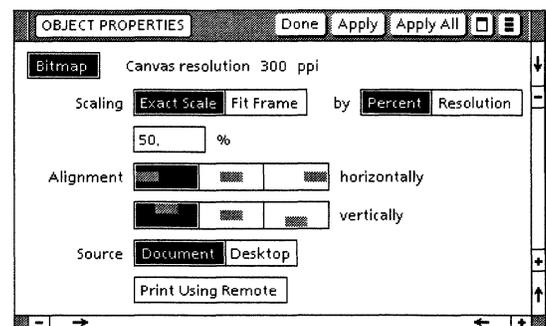


[Stretch] – If you choose [Fit Frame/Stretch], the raster image is resized non-proportionally so that the image, fills the frame both horizontally and vertically (all four edges touch). This means that the image may not retain its original proportions and may look stretched out or squashed if the frame does not have the same proportions as the original image.

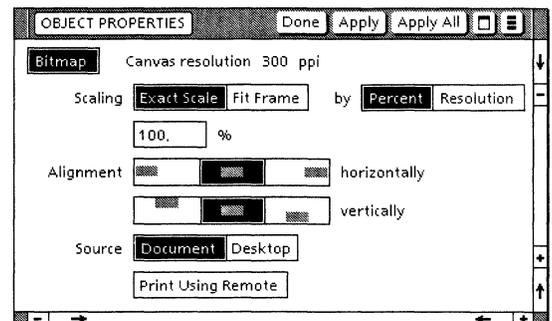
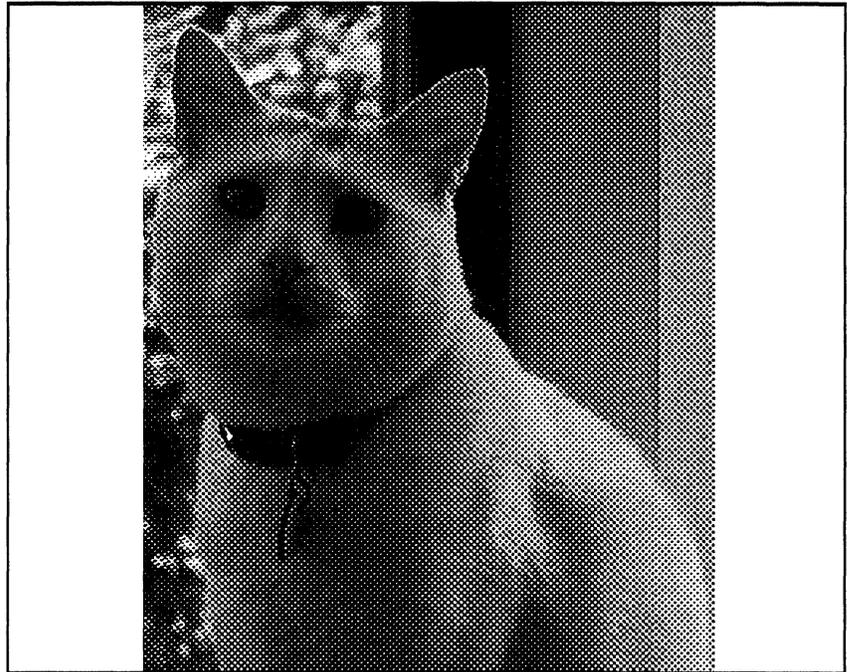
## Exact Scale

When you choose [Exact Scale] in the Scaling mode, you can then choose the option to scale the image in the frame by either [Percent] or [Resolution]. These options allow you to proportionally resize (scale) the raster image to a specific value either as a percentage of the original image size, or in terms of the original image resolution.

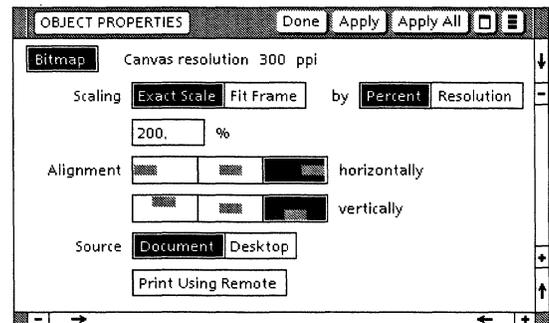
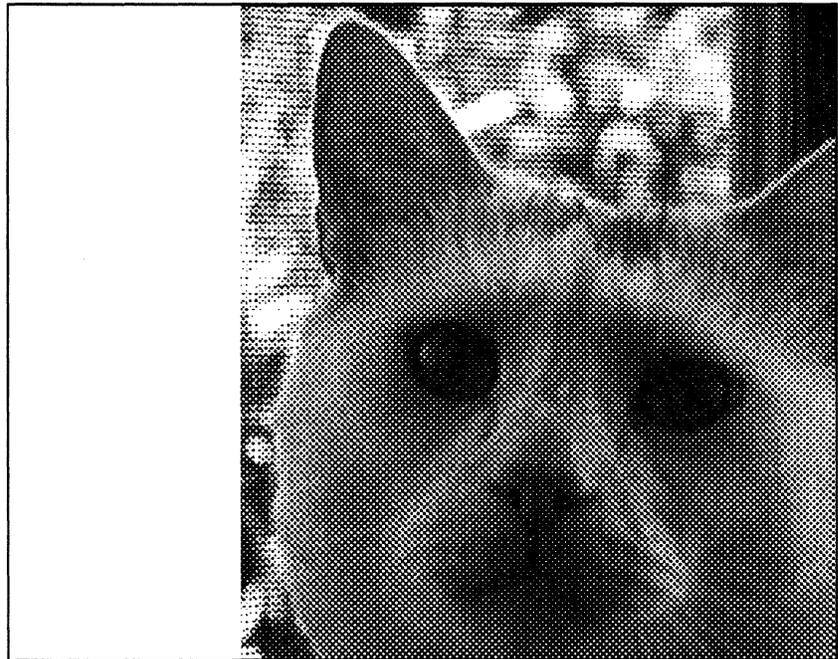
The following illustration shows a bitmap frame set at [Exact Scale] by 50%.



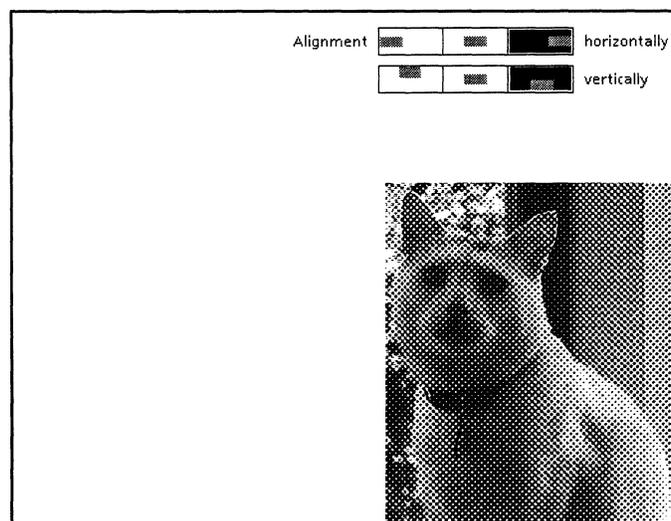
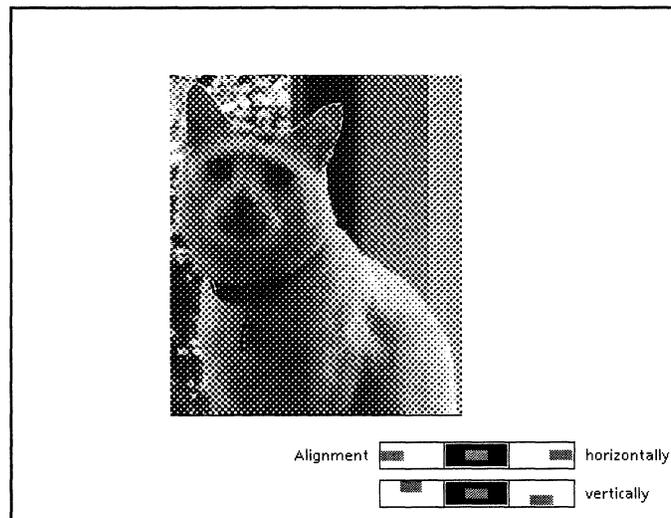
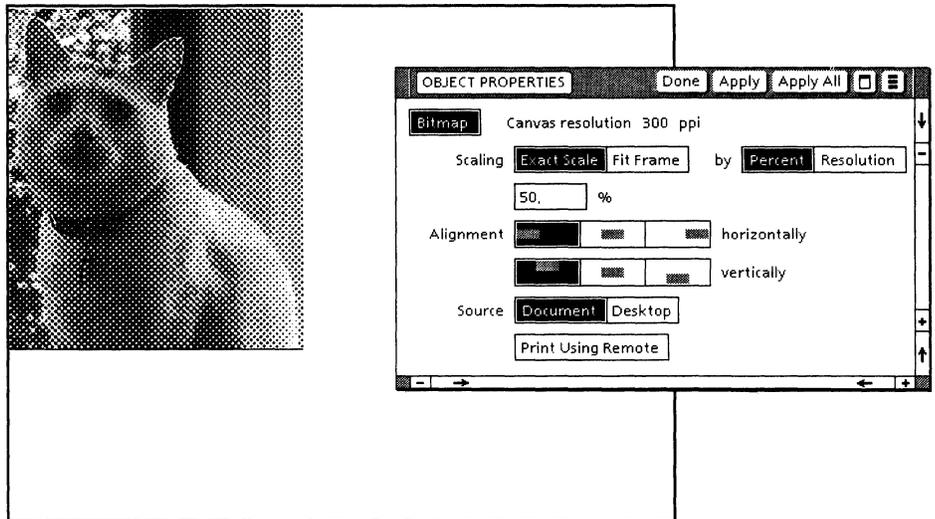
The following illustration shows a bitmap frame set at [Exact Scale] by 100%.



The following illustration shows a bitmap frame set at [Exact Scale] by 200%.



Percent – If you choose [Exact Scale/Percent], you can scale the image by entering the number in the % box. The scaling percentage is based on the percent of the original image size (100%) and can be any single percent increment between 1% and 1000%. For example, a 50% reduction will reduce both the height and width of an image by half. Therefore, the image will cover only a quarter of the area that it did originally. The three previous illustrations show the same bitmap image set at 50%, 100%, and 200%, respectively.



When you select [Percent], the Alignment options appear in the property sheet below the type-in box. These options allow you to specify where in the bitmap frame you want your image placed. You can choose any combination of horizontal placement (right, center, left) and vertical placement (top, center, bottom). The previous illustration shows three possible combinations of horizontal and vertical alignment.

Resolution – If you choose [Exact Scale/Resolution], you can scale the image by changing the effective resolution. You have three ways to change the resolution in the ppi category: Print Source, Other, or the number values.

If you choose [Print Source], the system will scale the image at the resolution displayed in the Canvas resolution category to the right of the Bitmap label. (This is the resolution of the original raster image.) For example, if your Canvas resolution is 300 ppi and you choose the Print Source option, your bitmap frame image will be set at 300 ppi. This is the same as a 100% scale.

If you choose one of the number values, the image will change its resolution in terms of the original image resolution. For example, if the Canvas resolution is 300 ppi and you select the 150 number value, the raster image is enlarged at 200%. Because 150 divides evenly, the resulting size change does not distort the image.

If you choose [Other], you can enter a specific number of pixels per inch in the box which appears. The ppi value displayed in the Canvas resolution category will help you determine a desirable ppi. You will get the best results if you enter a number that is a factor of the printer resolution.

## Source

---

The Source option indicates the source from which the raster image is displayed and printed. If you select Document, the raster image is located in your VP document, within the bitmap frame itself. (You place the image in the bitmap frame by copying the canvas icon from the desktop into the bitmap frame.)

If you select [Desktop], the raster image comes from a canvas located on the desktop. When you select Desktop, a Name box appears in which you enter the name of the canvas. If the canvas is contained inside a folder on the desktop, you need to enter the folder name and the canvas name. The correct syntax for this entry is: Folder name/Canvas name.

If you edit a canvas that is the source of your bitmap frame contents, *Xerox Pro Illustrator* does not automatically update the bitmap frame with the revised raster image. Use either of the following procedures to make the revised bitmap image appear in your bitmap frame:

Follow these steps to place a revised raster image (method 1):

1. Select the bitmap frame.
2. Press <Props> to open the property sheet.
3. Select [Document] in the Source category.
4. Select [Apply] on the property sheet.
5. Select [Desktop] in the Source category.

6. Click in the Name box to insert the flashing caret.
7. Enter the name of the canvas or file in the name box.
8. Select [Apply] or [Done] on the property sheet. The revised image will be placed automatically in the bitmap frame.

Follow these steps to place a revised raster image (method 2):

1. After revising the raster image, close the canvas.
2. Close and reopen the document containing the Pro Illustrator bitmap frame. The revised image will be placed automatically in the bitmap frame.

## Color

---

You can apply color to bitmap images using the Object Properties sheet or the Color Palette documents. The colors you can apply include white, black, yellow, orange, red, pink, purple, blue, green, brown, and gray, as well as many others.

Refer to the sections titled "Setting color properties before drawing objects," "Setting color properties after drawing objects," and "Setting color properties using Color Palettes" in Chapter 8 for complete information on applying color using the Object Properties sheet and the Color Palette documents.

## Print Using Remote

---

If you select [Print Using Remote], the raster image is printed from an image (IMG) file stored remotely on a centralized printer, instead of from a display source. When you choose this option, a Name box appears in which you enter the name of the remote file.

## Displaying bitmap frames and images

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*Xerox Pro Illustrator* offers two ways to alter the display of bitmap frames and images: [Outline Illustrator Graphics] and [Show Gray Bitmaps].

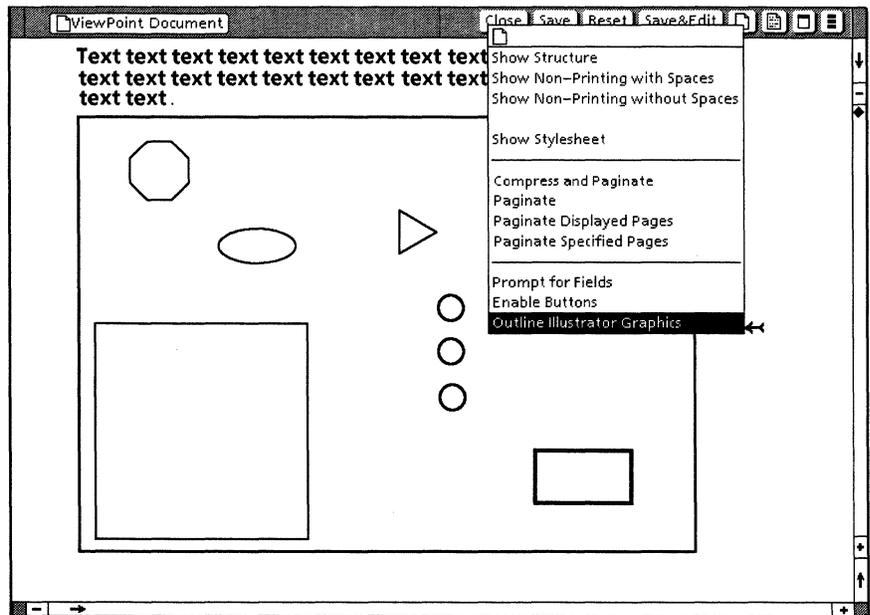
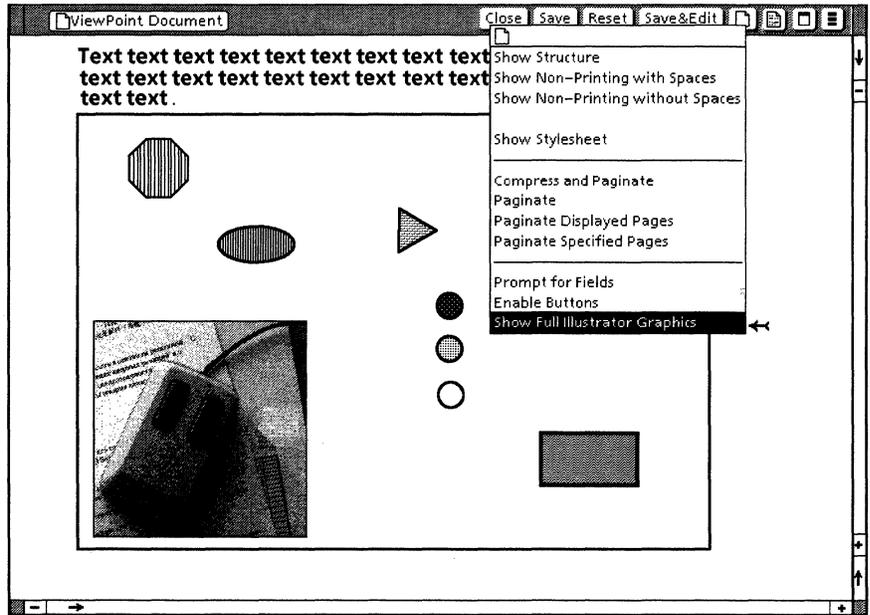
### [Outline Illustrator Graphics]

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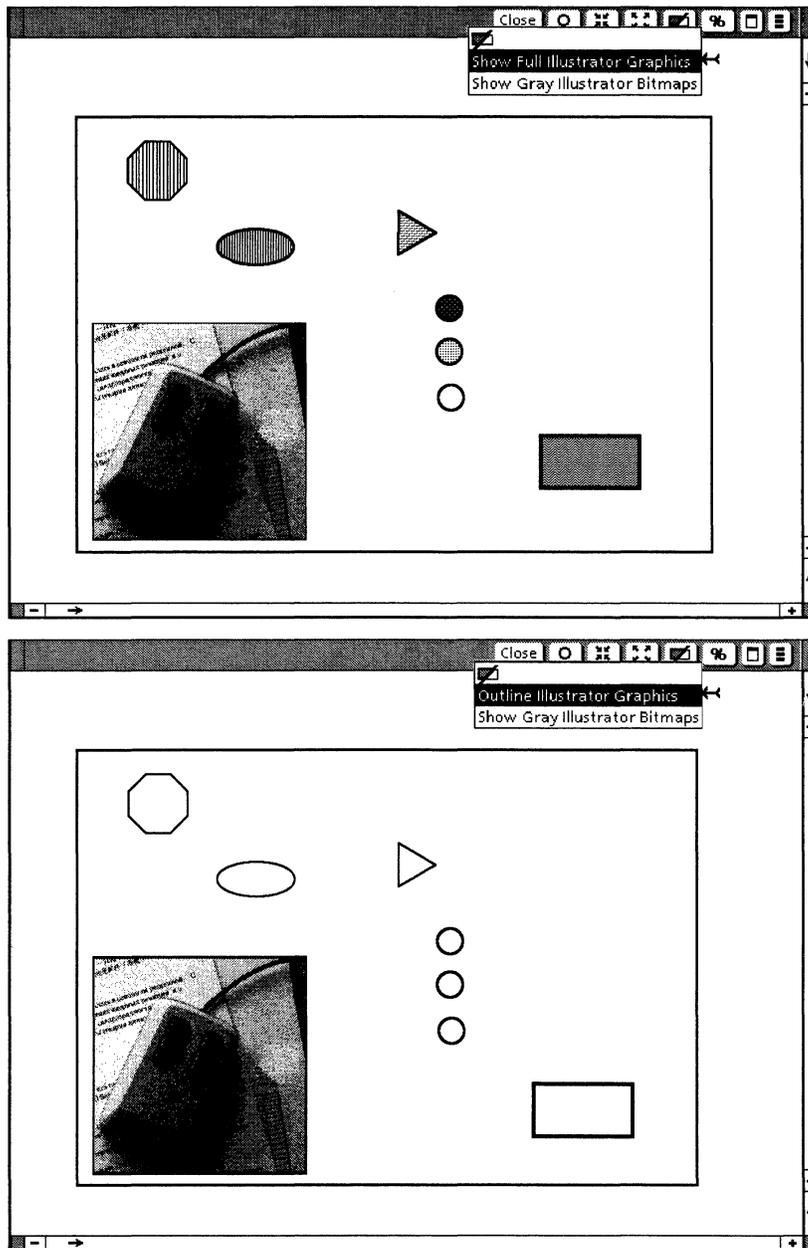
In the main document view, [Outline Illustrator Graphics] is in the document auxiliary menu. In a View window, this command is on the Display menu. When you select [Outline Illustrator Graphics], the bitmap frame shows as a thin black outline without tints, fills, or line patterns.

The raster image does not show in the main document view; however, the image does show in a View window as shown in the following illustrations. This feature speeds up the screen display time. The object properties themselves are not changed; only the screen appearance is changed. To show all the object properties again, select [Show Full Illustrator Graphics] from the menu.

The following illustration shows objects in the main document view with [Show Full Illustrator Graphics] selected and [Outline Illustrator Graphics] selected.



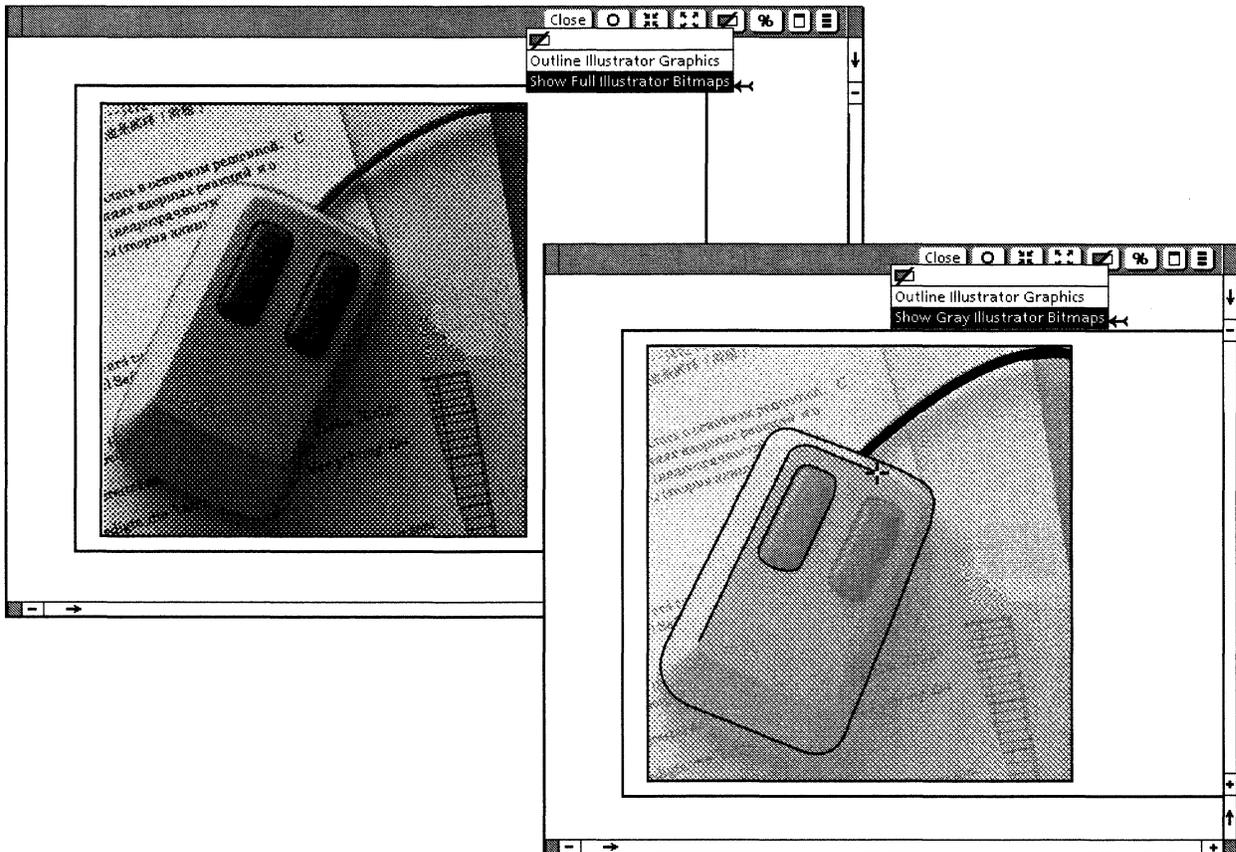
The following illustration shows objects in a View window with [Show Full Illustrator Graphics] selected and [Outline Illustrator Graphics selected].



One way you can use this feature is to set the main document view to [Outline Illustrator Graphics] for faster performance while paging through the document. Then use View windows set to [Show Full Illustrator Graphics] if you need to see the full view for editing.

## [Show Gray Illustrator Bitmaps]

This command is only available in View windows. When you select [Show Gray Illustrator Bitmaps] on the Display menu, the raster images inside bitmap frames which appear in the View window show at a light gray shade instead of black. This feature is useful if you want to trace the outlines of the raster image. To show the raster image as black again, select [Show Full Illustrator Bitmaps] on the Display menu.



## Transforming bitmap frames

Bitmap frames can be scaled, stretched, flipped, rotated, and sheared. During transformations, bitmap frames act basically like text frames with all-fixed sides. The raster image inside the bitmap frame does not change size or shape, and the frame itself always retains its horizontal and vertical orientation. The frame contents are not visible during transformations.

Using *Xerox Pro Illustrator* you can draw shapes, from simple to complex, made up of combinations of straight line segments, single and double curve segments, and arc segments. These shapes are drawn using a *Xerox Pro Illustrator* feature called chains. You can think of chains as being similar to connect the dots drawings, except that when you draw chains, the dots are drawn at the same time as the lines that connect them. This chapter contains information on drawing the various chain segments that can be combined to create shapes. Included are procedures for:

- Drawing chain segments without constraints
  - Straight lines
  - Single and double curves
  - Arcs
- Closing chains (to form chained shapes)
- Deleting (undoing) chain segments as you draw
- Editing chains
  - Adding to a chain
  - Linking chains together
  - Cutting a chain at a joint
  - Cutting a chain segment anywhere
  - Deleting chain segments
  - Editing joint smoothness
  - Moving or transforming control points
- Drawing chain segments with constraints (Smooth, Horizontal, Vertical, and Lock angle).

*Xerox Pro Illustrator's* Geometry offers features to help you create, transform, measure, and position objects. This chapter describes how to create and edit chains without using Geometry. In order to follow the procedures as described in this chapter, the Geometry Type should be set to None. For information about Geometry, refer to Chapter 14.

Refer to Appendix B for tips and strategies to use when working with chains.

## Drawing chains without constraints

Curved shapes are among the most complex and time-consuming forms an illustrator must create. At the drawing board, after making a pencil layout, the illustrator trace-inks the final shape, drawing straight and curved segments with French curves, templates, and a straightedge (with the difficult task of making the connections between segments appear smooth).

Similarly, using *Xerox Pro Illustrator*, you create curved shapes as a chain of straight and curved segments, creating the segment curvature as each segment is drawn. Making smooth connections between segments is no longer a task because you can specify that the system do it automatically.

This section contains the following information:

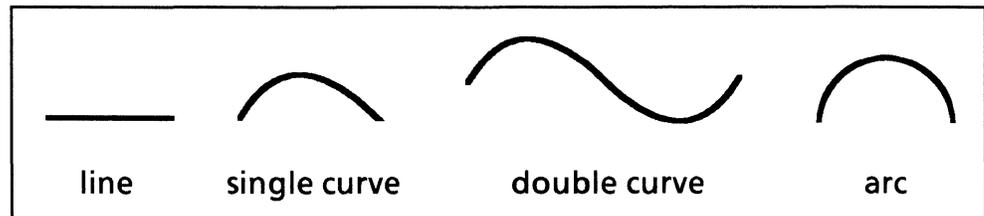
- Drawing chain segments without constraints
- Closing chains (to form chained shapes)
- Deleting (undoing) chain segments as you draw
- Editing chains.

### Types of chain segments

The various types of chain segments available in Pro Illustrator are as follows:

- Straight lines
- Single curves
- Double curves
- Arcs.

The illustration below shows examples of chain segments.



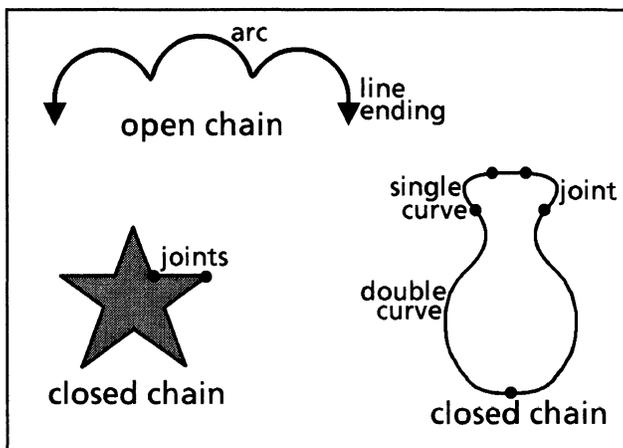
### Open and closed chains

You can link all four types of segments to make open and closed chains.

An open chain is made up of one or more segments and has two end points.

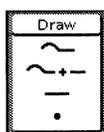
A closed chain is a shape made up of chain segments which you can fill with tints and textures.

The illustration below shows examples of open and closed chains.



### Choices on Draw softkey

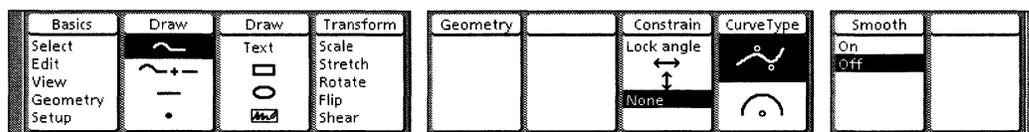
The first two choices on the first Draw softkey are used to draw chains. They are represented as icons (or symbols) on the Draw softkey.



- Chain – The first icon on the first Draw softkey is used to draw a new chain.
- Add to chain – The second icon on the first Draw softkey is used to add chain segments to an existing chain or to draw a new chain.

### Chain softkeys

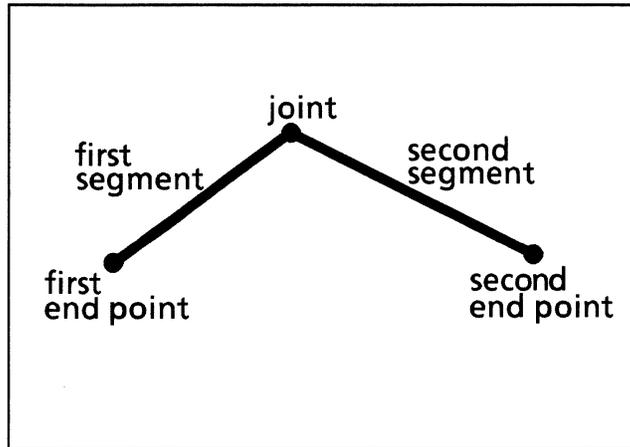
The Changing softkeys are the same when you select the Chain icon or the Add to Chain icon on the first Draw softkey. These softkeys display the available drawing constraints for the current selection on the Draw softkey.



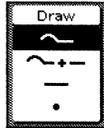
## General procedure

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When you draw a chain, the second end point of the first segment becomes the first end point of the second segment. This shared control point is called a joint.



The following procedure details the overall steps for drawing a chain. Subsequent sections of this chapter contain specific procedures for drawing each type of chain segment.



Follow these steps to draw a chain:

1. Select the Chain icon on the Draw softkey.
2. Select desired constraints.
3. Draw the chain segments in any combination: lines, curves, arcs.
4. Press <Stop> to complete the chain.

## Chain properties

---

Like other *Xerox Pro Illustrator* objects, chains have properties that you can control. Refer to Chapter 8 for descriptions of object properties and procedures telling how to set them.

## Chain constraints

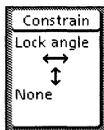
---

Constraints are special softkey choices that help you draw objects more easily and accurately. For example, when you draw a curve, you can set the angle of the curve to be horizontal, vertical, or locked at any angle you specify.

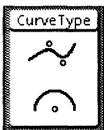
Constraints are available only on the softkeys, not on the object property sheet. They are in effect only while you are drawing or transforming an object. When you finish drawing, the system turns them off. You must reselect constraints each time you need them.

Chain constraints include the following:

- **Constrain** – sets drawing constraints for the chain segment to be Lock angle (any angle you specify), Horizontal, Vertical, or None. Horizontal and Vertical constraints appear as icons on the softkey (in the forms of horizontal and vertical arrows). The effect of each constraint on each type of chain segment is described in subsequent sections of this chapter.

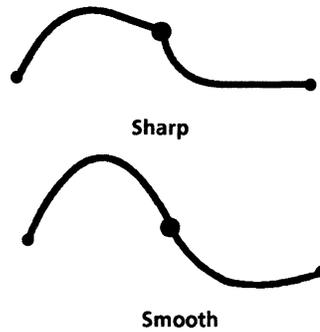


- **Curve Type** – is a shape constraint. It specifies whether the curve is a single or double curve or a circular arc. Select the Curve icon (the first icon) on the softkey to draw a single or double curve. Select the Arc icon (the second icon) on the softkey to specify an arc. You can also draw straight lines with either curve type specified.



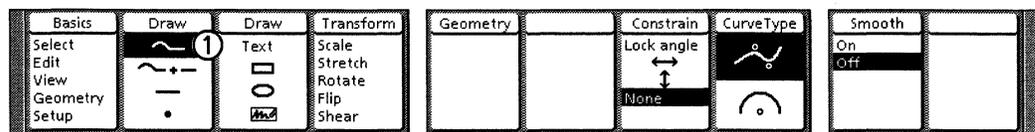
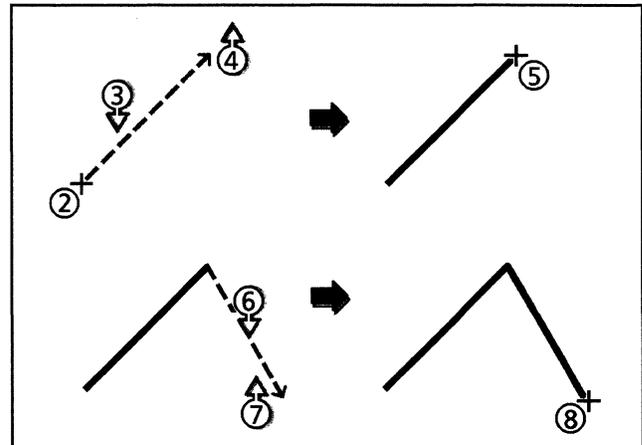
- **Smooth** – specifies whether or not the joint between chain segments is smooth.

The illustration below shows examples of joint segments.



### Drawing straight line segments in a chain

To draw straight line segments in a chain, select the Chain or Add to Chain icon on the Draw softkey. When you are drawing line segments in a chain, you do not select the Line icon on the Draw softkey.



Follow these steps to draw straight line segments in a chain:

1. Select the Chain icon on the Draw softkey.
2. Position the cursor where you want to begin drawing the straight line segment. Click the left mouse button to draw the first end point.
3. Press and hold the left mouse button. Move the cursor to the location where you want the second end point to be.
4. Release the left mouse button.
5. A straight line segment is drawn.
6. Press and hold the left mouse button. Move the cursor to the location where you want the next control point to be.
7. Release the left mouse button.

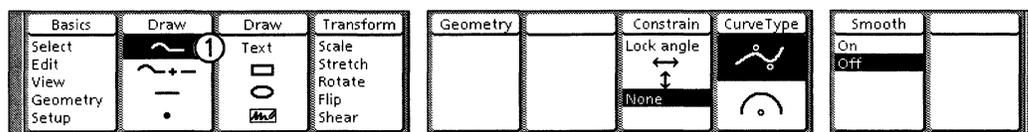
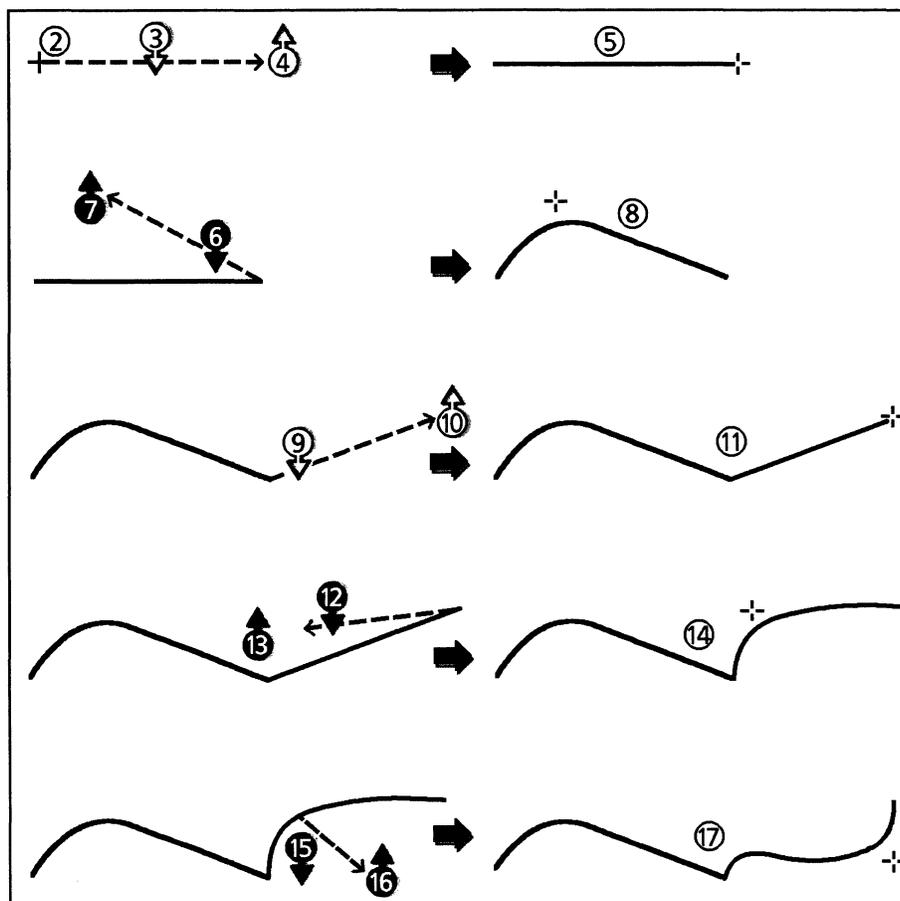
8. A second straight line segment is drawn.
9. Repeat steps 6 and 7 to draw additional straight line segments. When you want to stop drawing, press <Stop>.

## Drawing single and double curves

You draw curves by first drawing straight line segments and then adding curve bend points. A single curve has one visible bend point; a double curve has two visible bend points.

Pro Illustrator curves are Bezier curves, that is, curves that always contain two bend points. If you specify only one bend point for a curve, Pro Illustrator puts both of the bend points in the same place so that only one bend point is visible. Using control point selection, you can select the bend points separately for editing.

The following illustration and procedure show how to draw single and double curves whose joints are sharp. Refer to the section in this chapter titled "Drawing chains with constraints" for procedures on how to draw single and double curves whose joints are smooth.



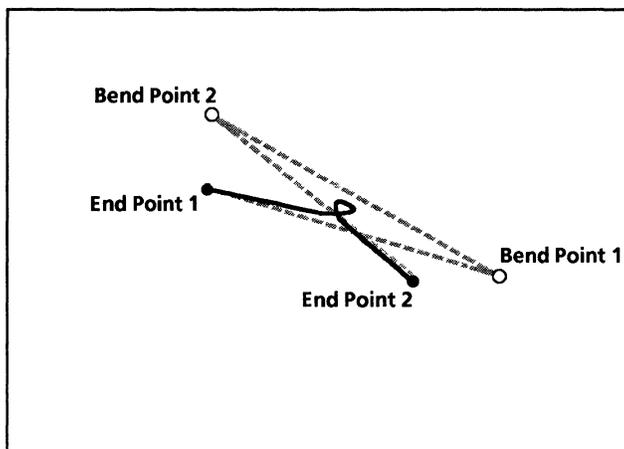
Follow these steps to draw single or double curves:

1. Select the Chain icon on the Draw softkey.
2. Position the cursor where you want to begin drawing the curve segment. Click the left mouse button to draw the first end point.
3. Press and hold down the left mouse button. Move the cursor to where you want the end of the curve.
4. Release the left mouse button to draw the second end point.
5. The system draws a straight line.
6. Press and hold down the right mouse button. Move the cursor to where you want the bend point in the curve. If you want the curve to go up (as in the illustration), place the cursor above the line. If you want the curve to go down, place the cursor below the line. As you move the cursor, the bend point moves, and the curve changes shape.
7. When the curve is the desired shape, release the right mouse button.
8. The system draws a single curve.
9. Press and hold down the left mouse button. Move the cursor to where you want the end of the next curve.
10. Release the left mouse button to draw the second end point.
11. The system draws a single curve followed by a straight line.
12. Press and hold down the right mouse button. Move the cursor to where you want the first bend point in the second curve. As you move the cursor, the bend point moves, and the curve changes shape.
13. When the curve is the desired shape, release the right mouse button.
14. The system draws two single curves joined by a sharp joint.
15. Press and hold down the right mouse button. Move the cursor to where you want the second bend point in the second curve. As you move the cursor, the bend point moves, and the curve changes shape.
16. When the curve is the desired shape, release the right mouse button.
17. A chain containing a single curve followed by a double curve is drawn. The joint between the curves is sharp.
18. Press <Stop> to end chain drawing.

### Position of bend points

---

The following illustration shows a curve segment with two bend points where the bend points are crossed. Bend point 1 is closer to end point 2 and bend point 2 is closer to end point 1. The result of crossed bend points is that the segment forms a loop rather than a curve.



### Drawing arcs

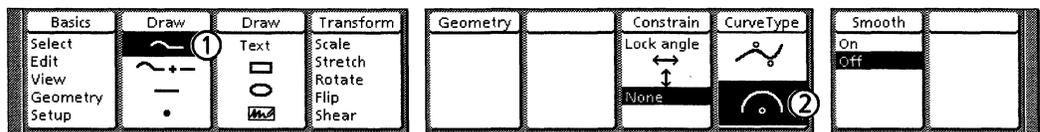
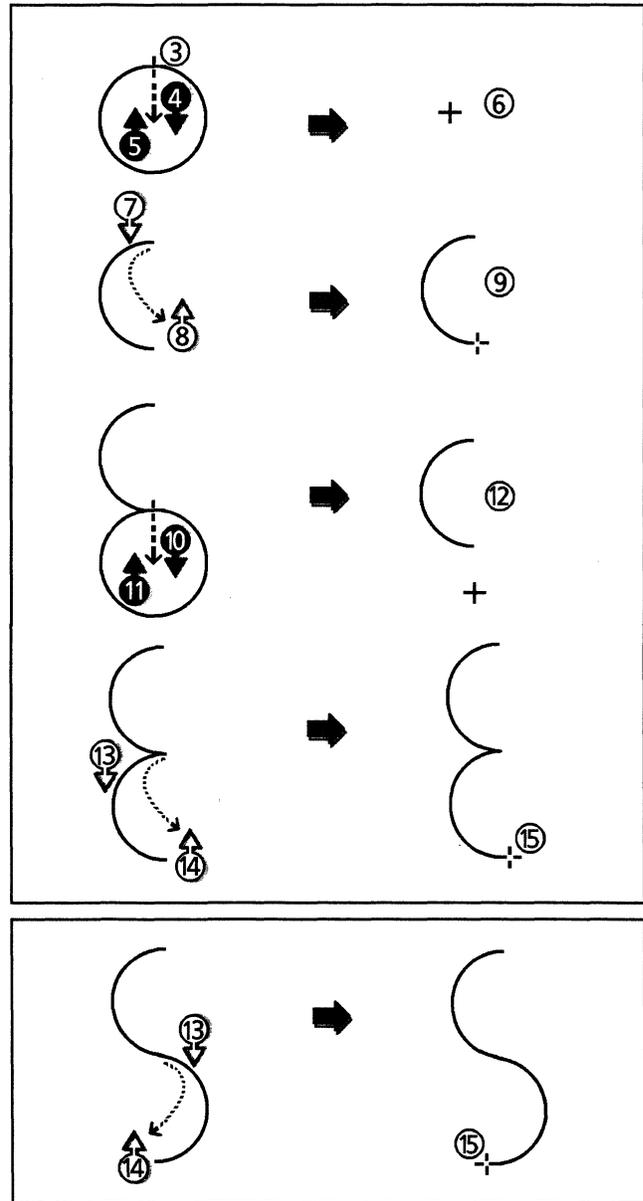
---

You draw an arc by drawing first one end point, then the arc center (the center of the curvature), and then the second end point. You can see the arc size (via the temporary circle that the arc comes from) before you specify the second end point.

Arcs do not loop; that is, they do not go beyond 360 degrees. If you position the second end point on the first end point, a circle is drawn.

The following illustration and procedure show how to draw arcs whose joints are sharp. Refer to the section in this chapter titled "Drawing chains with constraints" for procedures on drawing arcs with smooth joints.

The following illustration shows two appearances of the second arc (depending on where you press the left mouse button in step 13 of the following procedure).



Follow these steps to draw arcs:

1. Select the Chain icon on the Draw softkey.
2. Select the Arc icon on the Curve Type softkey.
3. Position the cursor where you want to begin drawing the arc. Click the left mouse button to draw the first end point.

4. Press and hold down the right mouse button. Position the cursor where you want the center point of the arc. The system displays the center point and a circle passing through the first end point. Moving the cursor changes the location of the center point and the size of the circle.
5. When the center point is at the desired location (the circle is the desired size), release the right mouse button.
6. A temporary marker appears at the center point of the arc.
7. Press and hold down the left mouse button on the side of the first end point from which the arc is to be drawn. When you move the cursor, a temporary arc is drawn where the circle was. Moving the cursor changes the length of the arc.
8. When you have drawn the desired arc, release the left mouse button.
9. An arc is drawn.
10. Press and hold down the right mouse button. Move the cursor to the desired location for the center of the next arc.
11. Release the right mouse button.
12. A temporary marker appears at the center point of the arc.
13. Press and hold down the left mouse button on the side of the first end point from which the arc is to be drawn. When you press it to the left of the first end point, the arc is drawn on the left. When you press it to the right of the first end point, the arc is drawn on the right. When you move the cursor, a temporary arc is drawn where the circle was. Moving the cursor changes the length of the arc.
14. When you have drawn the desired arc, release the left mouse button.
15. A chain containing two arcs is drawn. The joint between the two arcs is sharp.
16. Press <Stop> to end chain drawing.

## Closing chains while drawing

---

This section explains how to close a single open chain by linking its end points. Gravity must be on when you do this.

Refer to the section in this chapter titled “Linking chains” for the procedures showing how to link two chains.

You can fill closed chains with tints and textures. Refer to Chapter 8 for information on how to set object properties, including fill tint and texture.

Follow these steps to close chains while drawing:

1. Be sure that gravity is on.
2. Press and hold down the left mouse button to draw the second end point of the chain’s last segment.
3. Move the cursor so that it is on the first end point of the chain’s first segment. An open circle displays when you have the two end points in the same place.
4. Release the left mouse button.
5. Press <Stop>.

## Deleting chain segments while drawing

---

While drawing a chain, you can delete one or more previously drawn segments. When you press <Undo>, the latest segment drawn is deleted. The next time you press <Undo>, the segment drawn before the latest one is deleted. Each time you press <Undo>, another segment is deleted in descending order of creation. The system remains in the chain drawing mode.

Follow these steps to delete chain segments while drawing:

1. Press the <Undo>.
2. Continue pressing <Undo> to delete additional segments.

## Editing chains

---

You can edit existing chains in the following ways:

- Adding to a chain
- Linking chains
- Cutting a chain at a joint
- Cutting a chain segment anywhere
- Deleting chain segments
- Editing joint smoothness
- Moving or transforming control points.

You can also perform all of these editing operations on chains within clusters without having to uncluster them first.

The following sections contain procedures for each of the chain editing operations. In these procedures, you need to use object and control point selection. Refer to Chapter 7 for information on selecting objects and control points.

## Adding to a chain

---

You can extend or add to an existing open chain by first selecting the chain and then selecting the Add to chain icon on the Draw softkey. This feature works exactly like the Chain feature except it adds segments to an already existing chain.

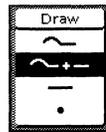
If you do not select a chain end point before selecting the Add to Chain icon, the system starts a new chain where you click the left mouse button.

You cannot add a chain to a joint; you can only add it to an end point.

### Chains in clusters

---

When you finish adding to a chain that is in a cluster, the entire cluster is selected.



Follow these steps to add to a chain:

1. Select a chain at the end point where you want to add a chain segment.
2. Select the Add to Chain icon on the Draw softkey. The chain end point becomes a joint.
3. Move the cursor away from the joint and use the left mouse to draw additional chain segments, as shown in the preceding procedures.
4. Press <Stop> to complete the chain.

## Linking chains

---

The procedures in this section apply to linking all types of objects, including basic objects (lines, rectangles, and ellipses) that have been cut. When you cut basic objects, they become open chain shapes.

You can link two or more existing chains. To do this, the end points to be linked must be in *exactly* the same location. You need to select each control point separately and then link them. You cannot link more than two end points (such as the Y connection of three end points). There are two ways to link chains depending on whether you select the chains or the control points on the chains. Both methods are described in this section.

When you link two chains with different properties, the resulting chain takes on the properties of the second chain selected during the link operation.

### **Chains in clusters**

---

When linking chains, the chains being linked must be in the same cluster.

Refer to the section in this chapter titled "Closing chains while drawing for the procedure describing how to link the end points of a single chain.

### **Positioning end points in the same location**

---

If in the linking chains procedures, neither Linked nor Cut is highlighted on the Link/Cut softkey when you first select Edit on the Basics softkey, the two end points are not in exactly the same location. Use the following procedure for placing the end points in the same location.

Follow these steps to position end points in the same location:

1. Select Intersection or Control pt on the Gravity softkey.
2. Select the first chain with the end point that you want to move as the guide point.
3. Press <Move>.
4. Press and hold down the left mouse button. Move the cursor on top of the end point of the second chain.
5. When you see the open circle, release the left mouse button. The two end points are in exactly the same location.

### **Linking chains by selecting objects**

---

The following procedure shows how to link chains by selecting objects.

Follow these steps to link chains by selecting objects:

1. Select the first chain anywhere.
2. Using extended selection (press the right mouse button), select the second chain near but not directly on the end point you want to link. This end point becomes the guide point.
3. Select Edit on the Basics softkey. Cut should be highlighted on the Link/Cut softkey.
4. Linked on the Link/Cut softkey. The two end points become one joint in a single chain.

### **Linking chains by selecting control points**

---

The following procedure describes how to link chains by selecting control points.

Follow these steps to link chains by selecting control points:

1. Using control point selection, select the end point on the first chain that will be linked. The end point highlights as a large open circle.

2. Press and hold down the right mouse button. Move the cursor so that the draw-through box encloses the end point that will be linked. The end point changes from an open circle to a solid circle.
3. Release the mouse button.
4. Select Edit on the Basics softkey. Cut should be highlighted on the Link/Cut softkey.
5. Select Linked on the Link/Cut softkey. The two end points become one joint in a single chain.

You may find this easier to do in an enlarged View window.

## Cutting a chain at a joint

---

You can cut an existing chain at a joint (the connection points between chain segments) to form one or more chains.

You can also cut a chain segment anywhere. Refer to the section titled "Cutting a chain segment anywhere" for more information.

Follow these steps to cut a chain at a joint:

1. Select the chain with the joint at which you want to cut the chain as the guide point.
2. Select Edit on the Basics softkey. Linked is highlighted on the Link/Cut softkey.
3. Select the Control point icon on the Cut at softkey.
4. Select Cut on the Link/Cut softkey. The chain is cut at the selected guide point.

Follow these steps to cut a chain at a joint using the accelerated method:

1. Select the chain with the joint at which you want to cut the chain as the guide point.
2. Press <Find>.
3. Press <Open>.

## Cutting a chain segment anywhere

---

You can also cut a chain anywhere along a segment, not just at the joints where two segments meet. To do this, you need to use object level gravity and object level selection.

Refer to the section titled "Cutting a chain at a joint" for information on cutting a chain apart at its joints.

When you cut a chain segment, the two resulting chain segments retain the properties of the original segment. One arc segment becomes two arc segments. One straight line segment becomes two straight line segments. One curve segment becomes two curve segments, each with two bend points, the same as every curve in *Xerox Pro Illustrator*. You can select these bend points and move them to change the shape of the curve.

When you cut a chain segment into two segments, the guide point remains where it was before you cut the segment. You can delete the guide point object by simply pressing <Del>. You do not have to reselect it.

Follow these steps to cut a chain segment apart:

1. Be sure that Object gravity is on. (Select Setup on the Basics softkey and Object on the Gravity softkey.)
2. Select the Pin Point.
3. Press <Move>.
4. Move the Pin Point to the location on the chain segment where you want to cut it. Notice the gravity dot that indicates that the Pin Point is directly on the chain segment.
5. Select the chain anywhere.
6. Select Edit on the Basics softkey.
7. Select the Pin Point icon on the Cut at softkey.
8. Select Cut on the Link/Cut softkey.
9. Or, press <Open>.
10. The chain segment is cut into two segments.
11. To delete the guide point object, press <Del>.

If you want more control over the curvature of a curve, cut the curve into two segments and then link the two segments. This will give you four bend points to modify instead of two.

## Deleting chain segments

---

You can delete one or more segments in an existing chain. Deleting chain segments means deleting segments between joints. Use the following method to delete one or more segments at a time. Deleted segments cannot be recovered.

Follow these steps to delete chain segments:

1. Using control point selection, select the joints at either end of the segment(s) you want to delete.
2. Press <Del>. The segment(s) are deleted, and the selected joints become end points.

## Editing joint smoothness

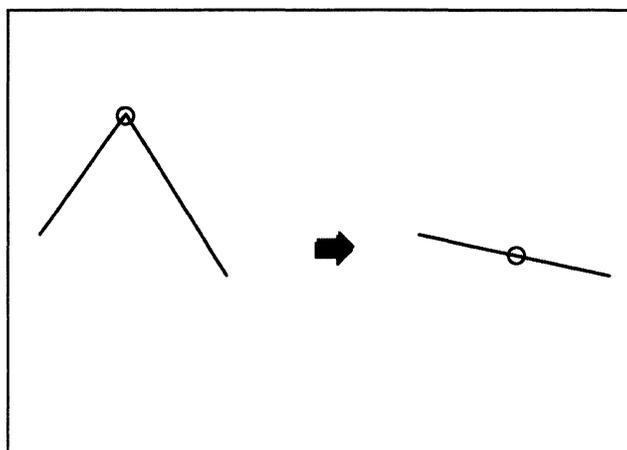
---

You can change the joints of an existing chain from smooth to sharp and vice versa.

When you change a smooth joint to sharp, it appears the same on the screen. However, the two adjacent segments are no longer constrained to keep the joint smooth, for example, when you move any of the control points (joints, end points, or bend points).

When you change a sharp joint to smooth, the system automatically smooths the joint by changing the curvature of the two adjacent segments, if they are curves. If the adjacent segments are straight lines, the two lines change to form one straight line.

The illustration below shows an example of changing a sharp joint to a smooth joint.



You can smooth most joints. You may need to delete and draw the segments again to get the desired appearance. Joint smoothness is not preserved for arcs after they are drawn.

The following procedure shows you how to edit the smoothness of one or more joints.

Follow these steps to edit joint smoothness:

1. Using control point selection, select the joint(s) you want to edit.
2. If you are changing the joint(s) from sharp to smooth, select Smooth on the Joint softkey.
3. If you are changing the joint(s) from smooth to sharp, select Sharp on the Joint softkey.

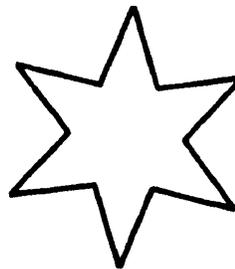
## **Moving and transforming control points**

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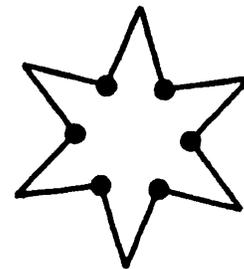
You can change the shape of chains by moving or transforming (scaling, stretching, rotating, flipping, or shearing) any combination of control points (joints, end points, and bend points). When you move a control point, the joint smoothness is maintained at all joints that were drawn with the Smooth constraint, except for arcs. You can move control points anywhere. The system moves nearby control points as needed to maintain smoothness constraints.

Refer to Chapter 7 for more information on moving control points.

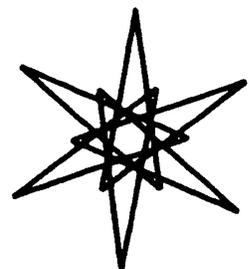
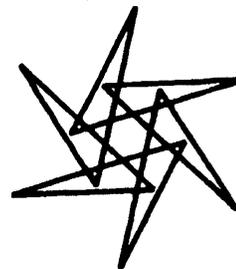
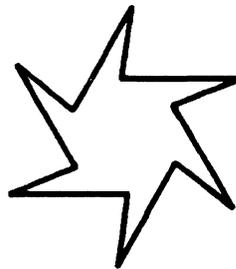
The following illustrations are examples of transformations using control point moves.



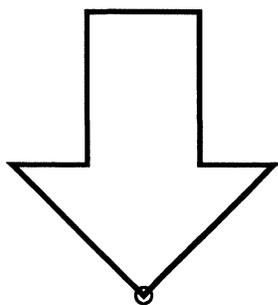
draw



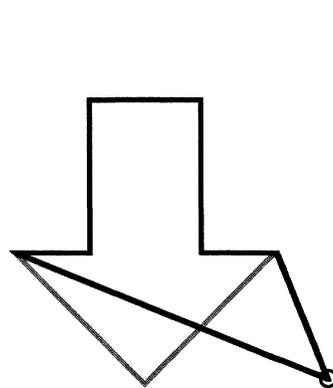
select inner control points



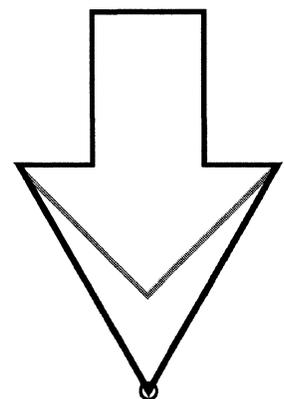
rotate around center



select control point



move control point



---

## Drawing chains with the Smooth constraint

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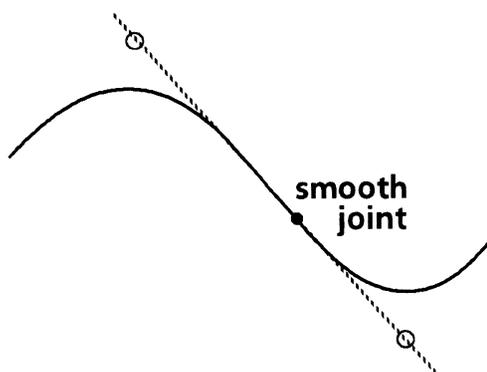
This section contains procedures for drawing chains with the Smooth constraint. The Smooth constraint makes it easier to draw objects containing smooth curves, for example, the human figure.

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### Smooth constraint

---

A smooth joint connects two segments so that the bend points and joints are located on the same straight line.



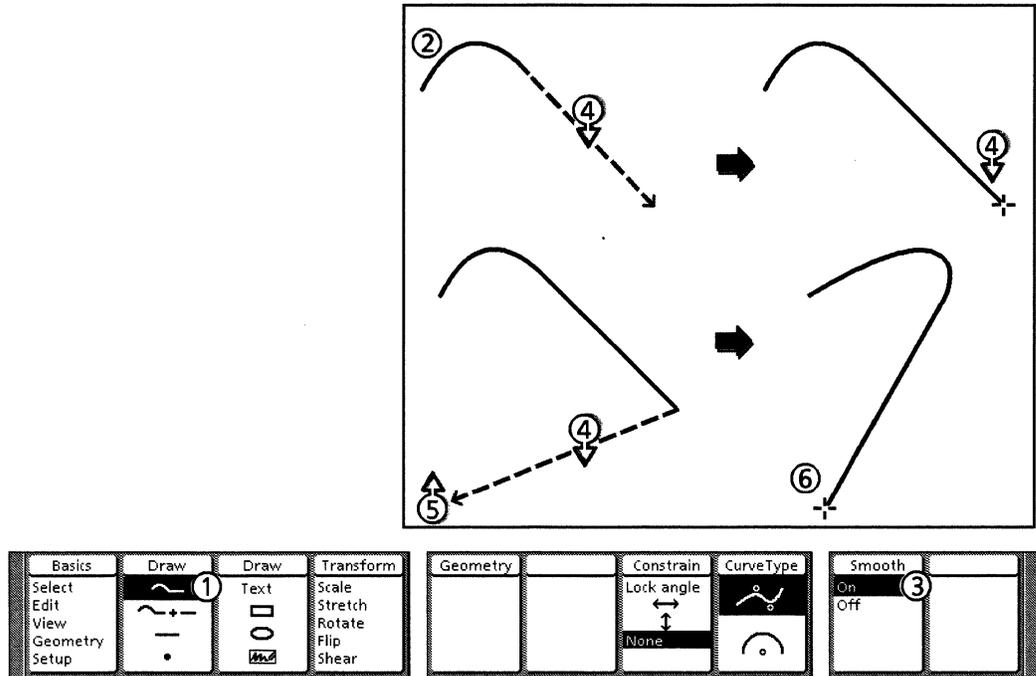
In general, the Smooth constraint operates by adjusting the previous segment as you draw each new segment so that the joint between the segments remains smooth.

The Smooth constraint works differently with straight line segments. Once you draw a line segment, its angle is not adjusted by drawing the next curved segment. Instead the curvature of the next segment is constrained to be smooth with the line. A line following another line is not constrained to be smooth.

Joint smoothness is preserved during all editing operations for lines and curves. It is not preserved for arcs. Refer back to the section in this chapter titled "Editing joint smoothness" for more information.

The following illustrations and procedures show how to combine the various kinds of chain segments (curves, arcs, and lines) and the effect that the Smooth constraint has on them.

## Drawing a curve followed by a line

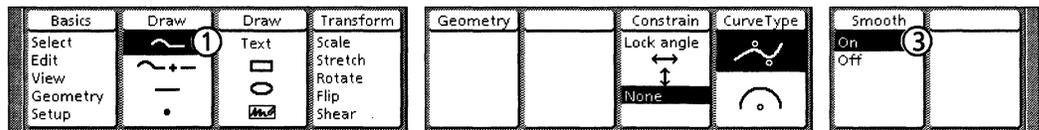
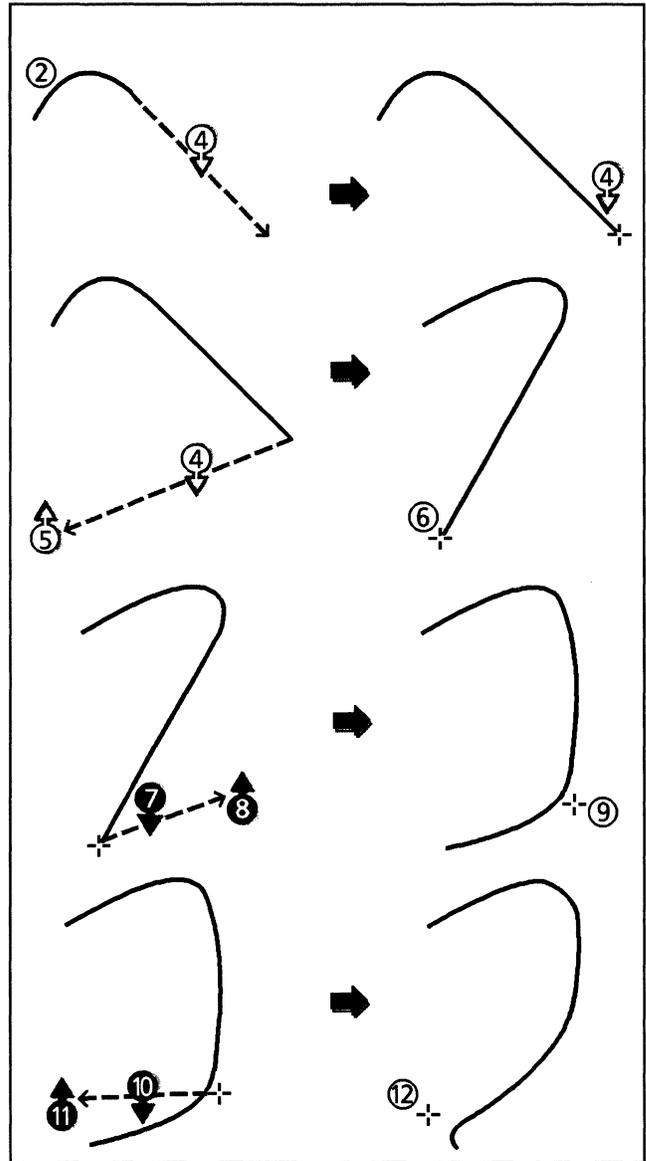


Follow these steps to draw a curve followed by a line:

1. Select the Chain icon on the Draw softkey.
2. Draw a single or double curve.
3. Select On on the Smooth softkey.
4. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the line. As you move the cursor, the curve changes so that the joint between the curve and the line is smooth.
5. Release the left mouse button.
6. A chain containing a curve followed by a line is drawn. The joint between them is smooth.

## Drawing a curve followed by a curve

The following illustration and procedure show how to draw a curve followed by a curve using the Smooth constraint.

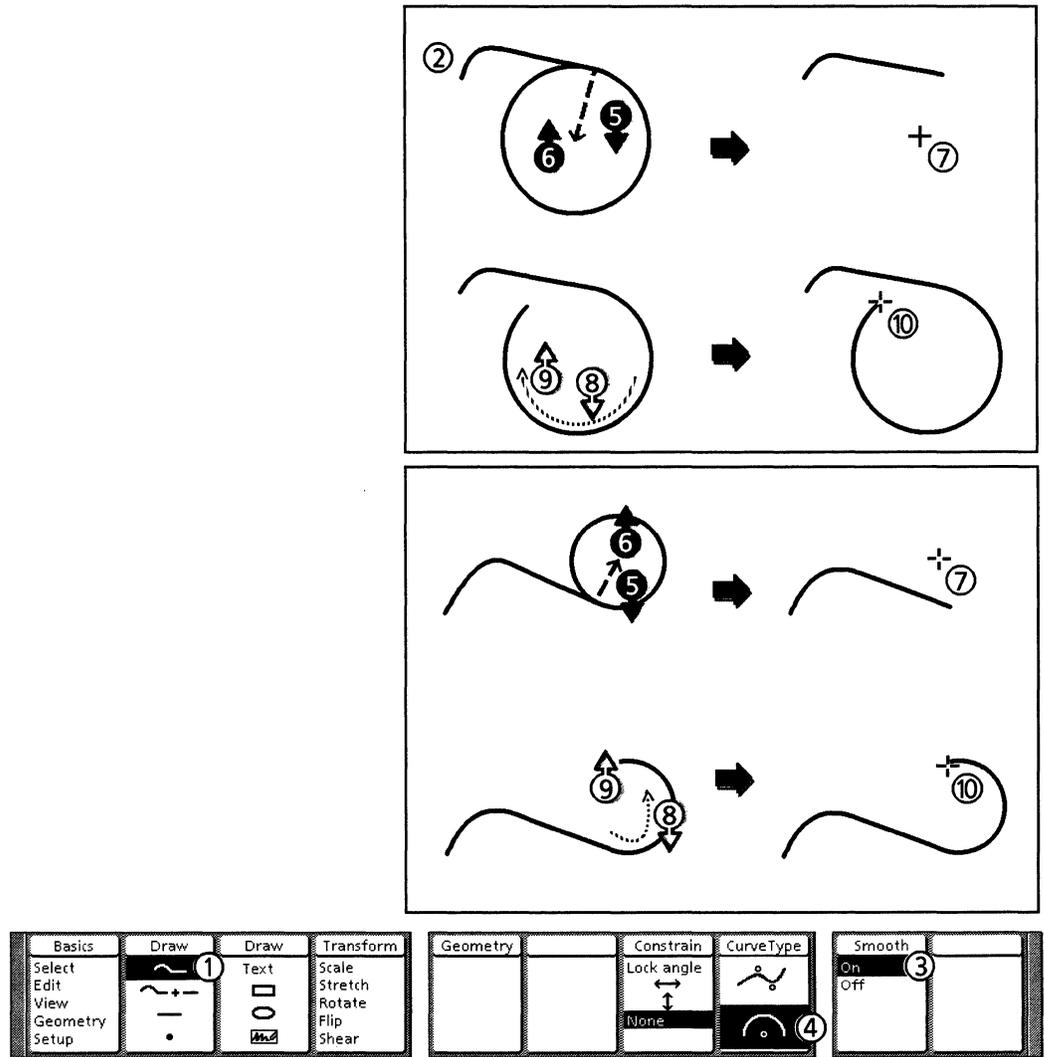


Follow these steps to draw a curve followed by a curve:

1. Select the Chain icon on the Draw softkey.
2. Draw a single curve.
3. Select On on the Smooth softkey.
4. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the next curve. As you move the cursor, the last curve changes so that the joint between it and the line is smooth.
5. Release the left mouse button.
6. A chain with a curve followed by a line is drawn.
7. Press and hold down the right mouse button. Move the cursor to the desired location for the bend point. As you move the cursor, both curve bend points move so that their shared joint remains smooth.  
  
Placing this bend point can dramatically change the shape of your previous curve. Continue moving the cursor to restore the previous curve's shape.
8. Release the right mouse button.
9. A chain containing two single curves is drawn. The joint between them is smooth.
10. Press and hold down the right mouse button. Move the cursor to the desired location of the bend point. As you move the cursor, only the bend points of the curve you are drawing moves.
11. Release the right mouse button.
12. A chain containing a single curve followed by a double curve is drawn. The joint between them is smooth.

## Drawing a curve followed by an arc

The following illustration shows two appearances of the arc depending where you press the right mouse button in step 5 of the following procedure.



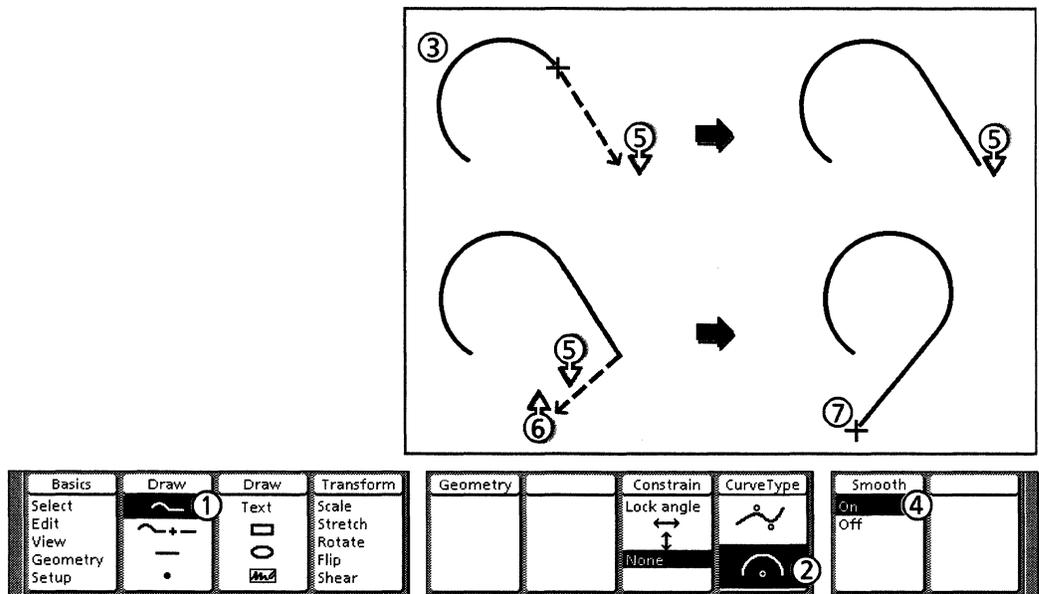
Follow these steps to draw a curve followed by an arc:

1. Select the Chain icon on the Draw softkey.
2. Draw a single or double curve.
3. Select On on the Smooth softkey.
4. Select the Arc icon on the Curve Type softkey.

5. Press and hold down the right mouse button. Move the cursor to the desired location for the center of the arc. As you move the cursor, the bend and end points of the curve move so the joint between the arc and the curve remains smooth. The location of the cursor when you press the right mouse button determines where the arc is drawn. See the two sets of illustrations above.
6. Release the right mouse button.
7. A temporary marker appears at the arc's center point.
8. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the arc.
9. Release the left mouse button.
10. A chain containing a curve followed by an arc is drawn. The joint between them is smooth.

### Drawing an arc followed by a line

The following illustration and procedure show how to draw an arc following by a line using the Smooth constraint.



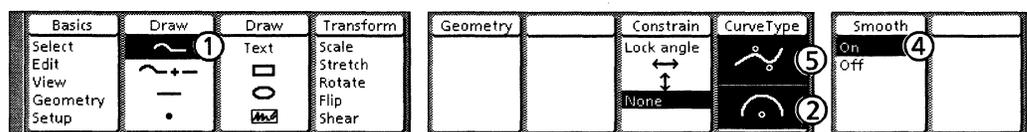
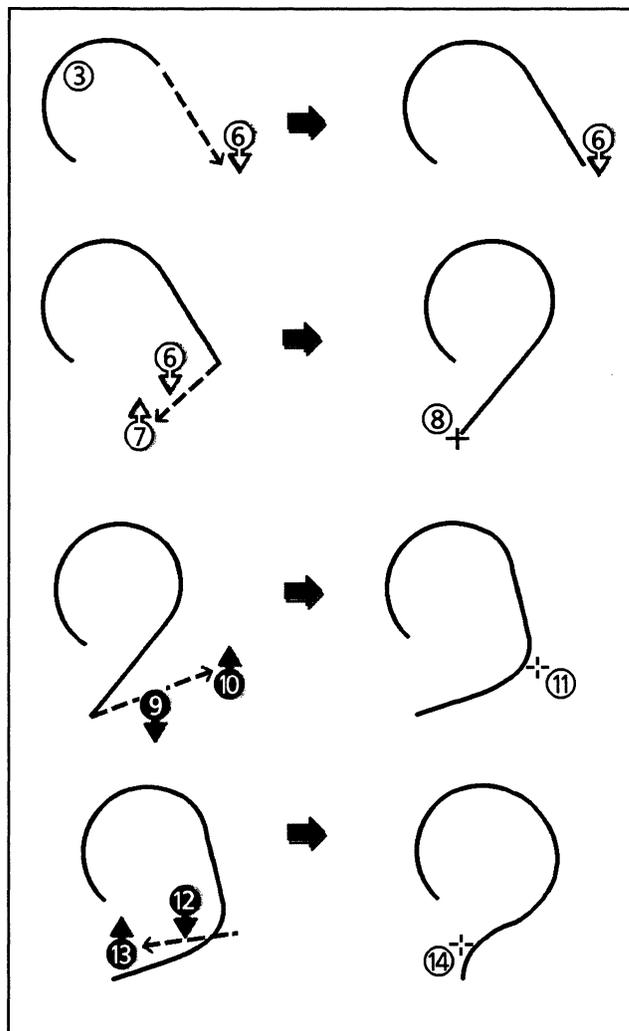
Follow these steps to draw an arc followed by a line:

1. Select the Chain icon on the Draw softkey.
2. Select the Arc icon on the Curve Type softkey.
3. Draw an arc.
4. Select On on the Smooth softkey.
5. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the line. As you move the cursor, the length of the arc changes to stay tangent with the line.
6. Release the left mouse button.

7. A chain containing an arc followed by a line is drawn. The joint between them is smooth.

## Drawing an arc followed by a curve

The following illustration and procedure show how to draw an arc followed by a curve using the Smooth constraint.



Follow these steps to draw an arc followed by a curve:

1. Select the Chain icon on the Draw softkey.
2. Select the Arc icon on the Curve Type softkey.
3. Draw an arc.
4. Select On on the Smooth softkey.
5. Select the Curve icon on the Curve Type softkey.

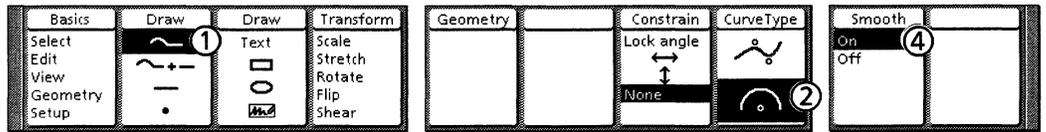
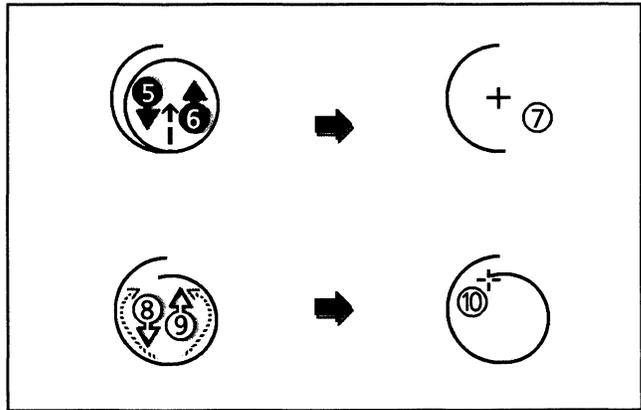
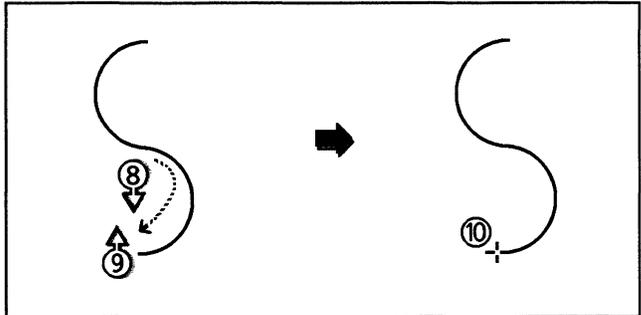
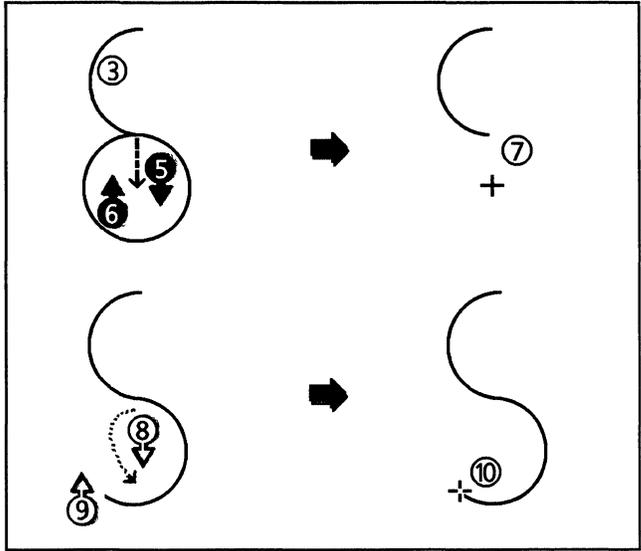
6. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the curve. As you move the cursor, the length of the arc changes to stay tangent with the line.
7. Release the left mouse button.
8. A chain containing an arc followed by a line is drawn.
9. Press and hold down the right mouse button. Move the cursor to the desired location for the bend point of the curve. As you move the cursor, the length of the arc changes to stay tangent with the curve.
10. Release the right mouse button.
11. A chain containing an arc followed by a single curve is drawn. The joint between them is smooth. If you want to draw a double curve, go to the next step.
12. Press and hold down the right mouse button. Move the cursor to the desired location for the second bend point. As you move the cursor, only the bend point of the curve you are drawing moves.
13. Release the right mouse button.
14. A chain containing an arc and a double curve is drawn. The joint between them is smooth.

### **Drawing an arc followed by an arc**

---

The following illustration shows that the arc's temporary circle can be drawn in different locations (step 5 of the following procedure) depending on the size of the original arc and the center point of the second arc. The circle is drawn where it can preserve the smoothness of the joint between the two arcs.

The illustration also shows the results of pressing the left mouse button in different locations in step 8 of the following procedure. Whether you press it on the left or right side of the first end point, the second arc flips to keep the joint between the arcs smooth.

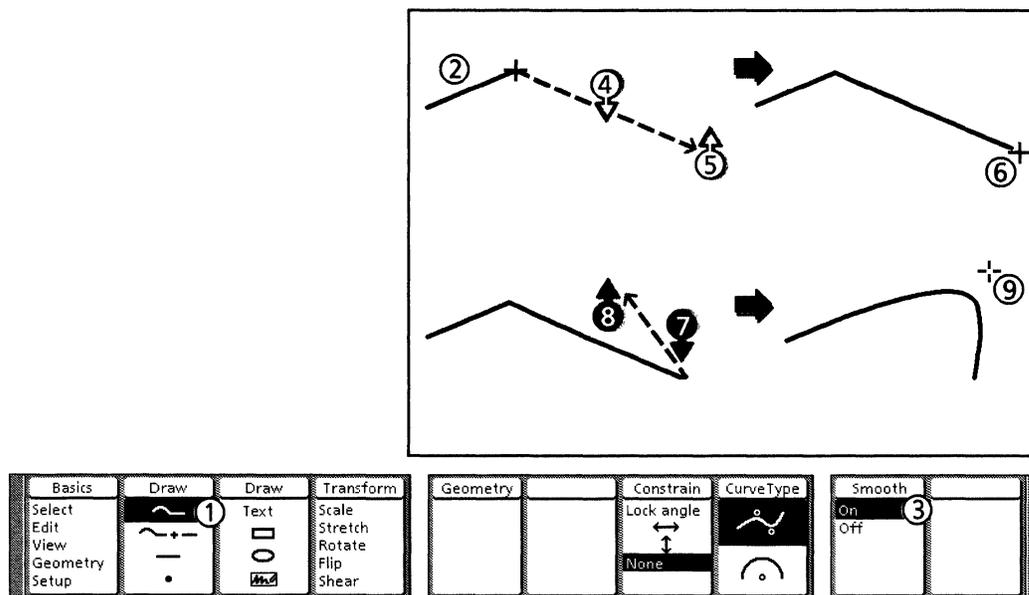


Follow these steps to draw an arc followed by an arc:

1. Select the Chain icon on the Draw softkey.
2. Select the Arc icon on the Curve Type softkey.
3. Draw an arc.
4. Select On on the Smooth softkey.
5. Press and hold down the right mouse button. Move the cursor to the desired location for the center of the second arc. As you move the cursor, the length of the first arc changes, and the position and size of the second arc change.
6. Release the right mouse button.
7. A temporary marker appears at the arc's center point.
8. Press and hold down the left mouse button. Move the cursor to the desired location for the second arc's second end point.
9. Release the left mouse button.
10. A chain containing two arcs is drawn. The joint between them is smooth.

## Drawing a line followed by a curve

Once you draw a line segment, its angle is not adjusted by drawing the next curved segment. Instead the curvature of the next segment is constrained to be smooth with the line.

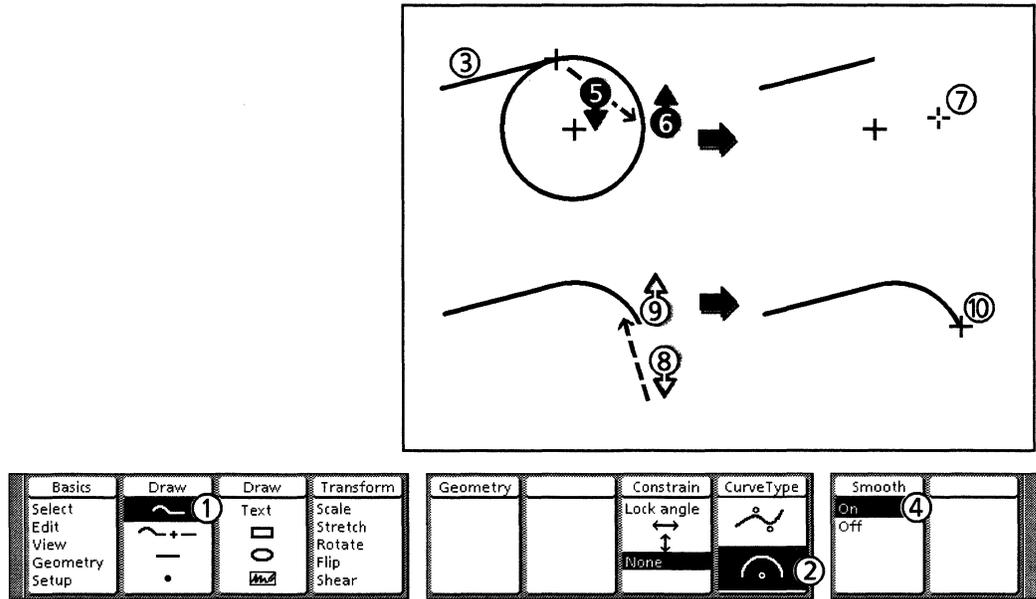


Follow these steps to draw a line followed by a curve:

1. Select the Chain icon on the Draw softkey.
2. Draw a line.
3. Select On on the Smooth softkey.
4. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the curve.
5. Release the left mouse button.
6. A chain containing two lines is drawn. The joint between them is sharp.
7. Press and hold down the right mouse button. Move the cursor to the desired location for the bend point of the curve. As you move the cursor, the bend point moves and is constrained to be tangent with the previous line segment.
8. Release the right mouse button.
9. A chain containing a line followed by a curve is drawn. The joint between them is smooth.

## Drawing a line followed by an arc

Once you draw a line segment, its angle is not adjusted by drawing the next curved segment. Instead the curvature of the next segment is constrained to be smooth with the line.



Follow these steps to draw a line followed by an arc:

1. Select the Chain icon on the Draw softkey.
2. Select the Arc icon on the Curve Type softkey.
3. Draw a line.
4. Select On on the Smooth softkey.
5. Press and hold down the right mouse button. Move the cursor to the desired location for the center point of the arc. As you move the cursor, the center point of the arc is constrained to be perpendicular to the previous line segment.
6. Release the right mouse button.
7. The center point of the arc is drawn perpendicular to the line. Notice that its position is different from that of the cursor.
8. Press and hold down the left mouse button. Move the cursor to the desired location for the second end point of the arc.
9. Release the left mouse button.
10. A chain containing a straight line followed by an arc is drawn. The joint between them is smooth.

## Drawing chains with the Directional constraints

This section contains procedures for drawing chains with the Directional constraints: Horizontal, Vertical, Lock angle. Directional constraints help you to draw chain segments constrained to be horizontal, vertical, or at any angle you specify.

When you draw chains, you can choose to activate directional constraints. These constraints cause lines and angles to be horizontal, vertical, or at an angle you specify, in either direction from the first end point or the previous control point (joint).

Xerox Pro Illustrator provides the following three directional constraints:

- Horizontal
- Vertical
- Lock angle.

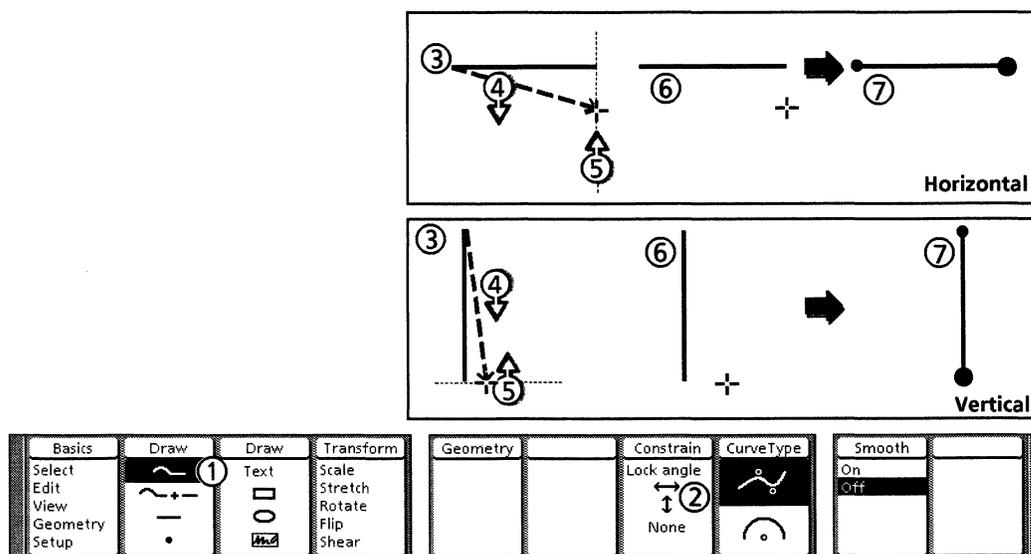
You may turn the directional constraints on or off at any time during chain drawing, even when the mouse button is down. Simply press the Constrain function key on the keyboard to change the softkey selection. You can also press the SAME key to turn the Lock angle constraint on or off.

When you select the Lock angle constraint while you are pressing the mouse button down, the cursor is constrained to the current angle between itself and the previous control point.

Refer to Chapter 14 for an explanation of the directional constraints when used with the Geometry feature.

## Drawing horizontally/vertically constrained line segments

The following illustration shows the effects of the Horizontal and Vertical constraints on line segments in chains.

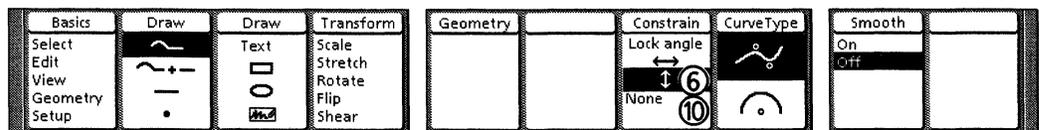
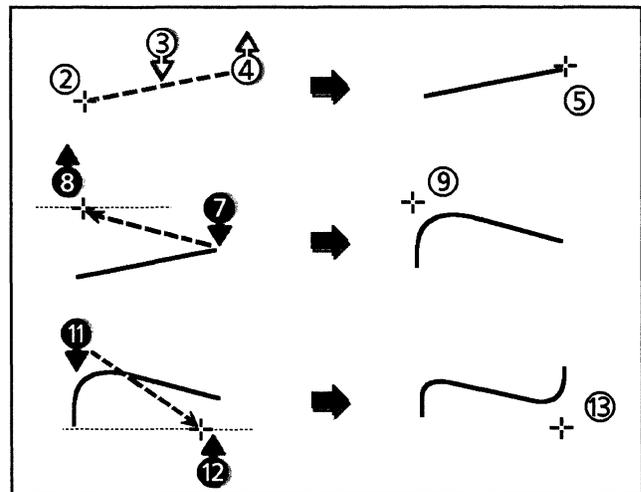


Follow these steps to draw horizontally and vertically constrained lines:

1. Select the Chain icon on the Draw softkey.
2. Select the Horizontal icon or the Vertical icon on the Constrain softkey.
3. Click the left mouse button to draw the first end point.
4. Press and hold down the left mouse button. Move the cursor in either direction from the first end point until the desired line length is reached.
5. Release the left mouse button.
6. A temporary marker appears at the cursor location, and a temporary line is drawn, constrained to be horizontal or vertical from the first end point.
7. If you do not add bend points to this line and press <Stop> as the next action, the marker disappears, and the straight line shown in the temporary image is drawn.

### Drawing horizontally/vertically constrained curves

The following illustration shows the effect of the Vertical constraint on curve segments. The Horizontal constraint works the same way to constrain in the horizontal direction. You can constrain end points and bend points. In this illustration and procedure, only the bend points are constrained.



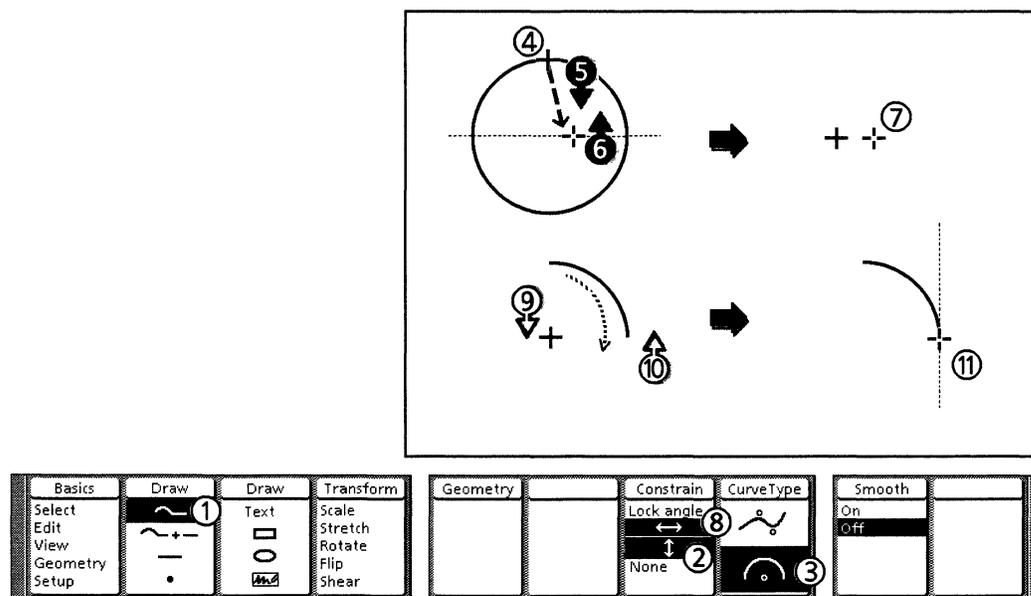
Follow these steps to draw vertically constrained curves:

1. Select the Chain icon on the Draw softkey.
2. Click the left mouse button to draw the first end point of the curve.

3. Press and hold down the left mouse button. Move the cursor in either direction from the first end point until the desired line length is reached.
4. Release the left mouse button.
5. A temporary marker appears at the cursor location, and a temporary line is drawn.
6. Select the Vertical icon on the Constrain softkey.
7. Press and hold down the right mouse button. The first bend point is constrained to be vertical from the first end point.
8. Release the right mouse button.
9. A curve with one bend point is drawn.
10. Select the Vertical icon on the Constrain softkey.
11. Press and hold down the right mouse button. The second bend point is constrained to be vertical from the second end point.
12. Release the right mouse button. A curve with two bend points is drawn.

## Drawing horizontally/vertically constrained arcs

The Horizontal and Vertical constraints affect where the center point and second end point of an arc are drawn. In the following illustration and procedure, the center point of the arc is constrained to be vertical from the arc's first end point and the arc's second end point is constrained to be horizontal from the arc's center.



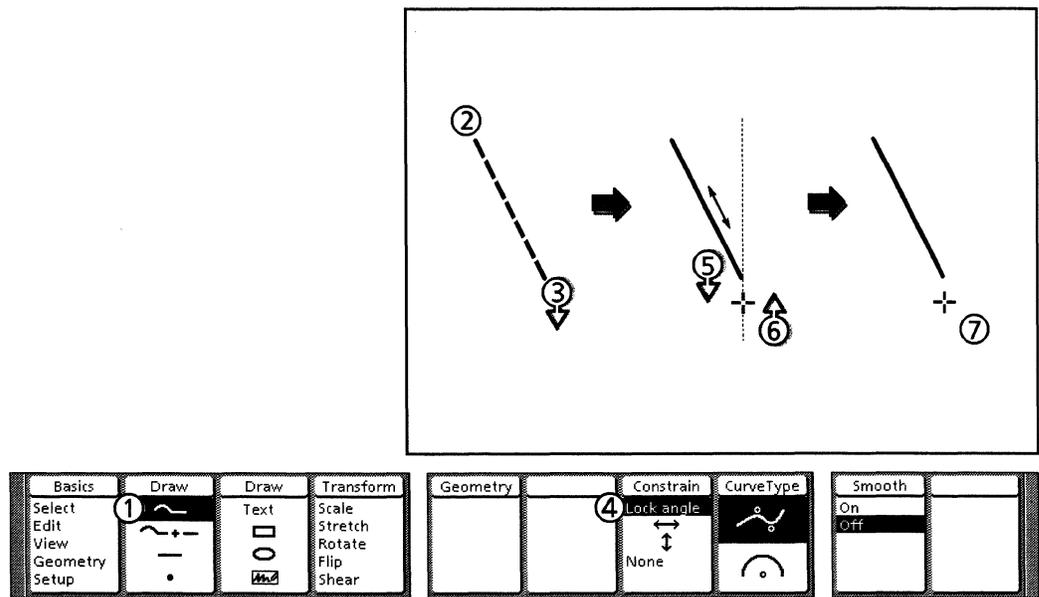
Follow these steps to draw vertically and horizontally constrained arcs:

1. Select the Chain icon on the Draw softkey.
2. Select the Vertical icon on the Constrain softkey.

3. Select the Arc icon on the Curve Type softkey.
4. Click the left mouse button to draw the first end point of the arc.
5. Press and hold the right mouse button. Move the cursor to the desired location for the center of the arc. As you move the cursor, the center point is constrained to be vertical from the arc's first end point, regardless of the cursor location.
6. Release the right mouse button.
7. A temporary marker is drawn at the arc's center point.
8. Select the Horizontal icon on the Constrain softkey.
9. Press and hold down the left mouse button. The direction in which the arc is drawn is determined by the location of the cursor when you press the left mouse button. As you move the cursor, notice that the second end point of the arc is constrained to be horizontal from the center of the arc.
10. Release the left mouse button.
11. An arc is drawn.

## Drawing line segments at a locked angle

The following illustration shows the effects of the Lock angle constraint on drawing line segments.



Follow these steps to draw line segments at a locked angle:

1. Select the Chain icon on the Draw softkey.
2. Click the left mouse button to draw the first endpoint.
3. Press and hold down the left mouse button. Move the cursor until the desired angle between the first and second end points is reached.

4. Press <Same> to activate the Lock angle constraint or press the Constrain function key to select Lock angle. The alignment cross hair appears, and the line is locked at the current angle.
5. Continue to move the cursor until the desired line length is reached. Notice that you can move the cursor in either direction from the first end point and that the angle remains locked.
6. Release the left mouse button.
7. A temporary line is drawn, constrained to be at the locked angle from the first end point. If you do not add bend points to this line and press <Stop> as the next action, the straight line shown in the temporary image is drawn.



To transform an object means to change its size, shape, or orientation. This chapter describes how to transform objects.

Topics covered include the following:

- An overview of the five types of transformations
- The general procedure for transforming objects
- The Pin At softkey (Pin Point transformations versus center-of-object transformations)
- Hints for placing the guide point and Pin Point
- Applying constraints to transformations
- Copying objects before transforming them
- Procedures for using the five transformations (scale, stretch, rotate, flip, and shear).

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## The five types of transformations

---

*Xerox Pro Illustrator* provides five different ways to transform objects: scale, stretch, rotate, flip, and shear.

Scale enlarges or reduces an object proportionally. The object becomes bigger or smaller by the same percentage both horizontally and vertically, so its shape does not change.

Stretch enlarges or reduces an object disproportionately. The object becomes bigger or smaller by different amounts horizontally and vertically, so its shape changes. For example, a stretched square becomes a rectangle.

Rotate turns or revolves an object. The object's shape remains the same, but its orientation changes.

Flip turns an object over so it ends up looking like a mirror image of its original self. You can flip objects horizontally, vertically, or both ways at once.

Shear causes parts of an object to slide relative to other parts. For example, picture how a strong wind might shear an old barn, causing the entire barn to slant to one side. You can shear objects either horizontally (like the barn) or vertically.

Each of these transformations is described in detail later in this chapter.

The following illustrations show the same object undergoing all five transformations.

Scale



manually or at exact percentages

Stretch



vertically

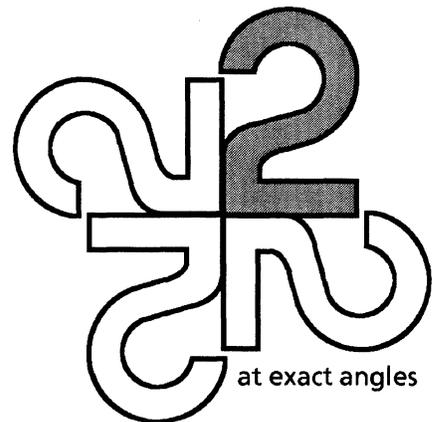


horizontally

Rotate

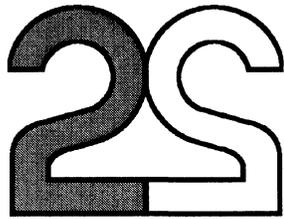


around object center or a specified point



at exact angles

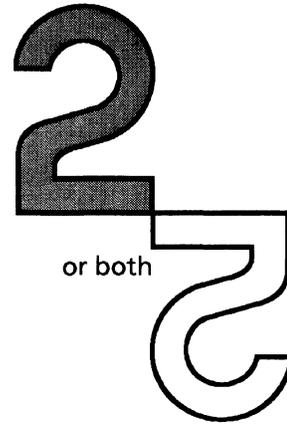
Flip



horizontally



vertically



or both

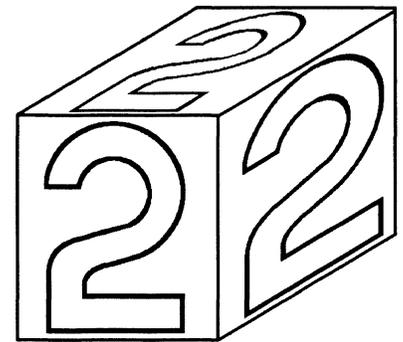
Shear



horizontally



vertically



at specified angles

---

## General procedure for transforming objects

---

Imagine that you could reach your hand into the computer screen, grab hold of objects, and manipulate them. To transform an object, you would first grab one of its control points to use as a handle. We call this the guide point.

Next, you would use the index finger of your other hand to pin down the object so it would not move as you transformed it. The place where you hold down the object is called the Pin At point. Obviously, you could not transform the object if you tried to place the guide point and the Pin At point at the same location.

Finally, you would transform the object by moving the guide point as you held down the Pin At point. The object would change shape and orientation as long as you moved the guide point; when you released the guide point, the object would freeze in its new, transformed shape or orientation.

In the real world of *Xerox Pro Illustrator*, the mouse acts as your hand. To transform an object, you use the mouse to select the guide point and to position the Pin At point. Then you press and hold the left mouse button and move the cursor. The guide point follows the cursor, thereby changing the object's shape or orientation.

Sometimes the system cannot perform the desired transformation with the guide point you have selected; it displays an error message telling you to select a different guide point (see the "Hints for placing the guide point and Pin At point" section in this chapter).

Follow these steps to transform objects:

1. Select the object at the desired guide point.
2. Select the desired transformation (scale, stretch, rotate, flip, or shear) on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. If you want to apply a constraint to your transformation:
  - Select the Horizontal or Vertical icon or Lock angle on the Constrain softkey.
  - or,
  - Select Set percent or Set angle on the Constrain softkey and then select a percentage or angle (depending upon the transformation).
5. If you want to copy the object before transforming it, select On on the Copy First softkey.
6. If you selected Pin Point in step 3, position the cursor where you want to place the Pin Point and click the *right* mouse button. The system moves the Pin Point to the cursor location.
7. Position the cursor on or near the guide point. Hold down the left mouse button and move the cursor. The system displays images of both the original object and the transforming object.
8. When the object is the desired shape and orientation, release the left mouse button. The system displays the new, transformed object. If you selected On in step 5 to copy the object before transforming it, the original object remains in place.
9. The system returns to Select on the Mode softkey with the transformed object selected.

If you want to stop a transformation in progress, press <Stop> before you release the mouse button. The system returns to Select on the Basics softkey with the object, in its original form, selected.

If you want to perform the same transformation again, press <Again>. All the softkey settings are retained.

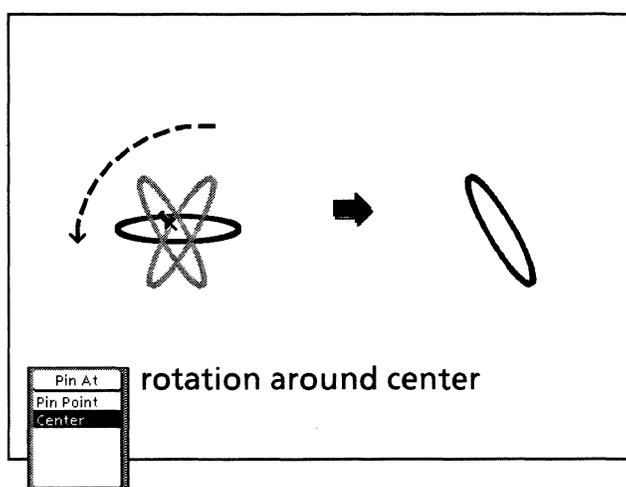
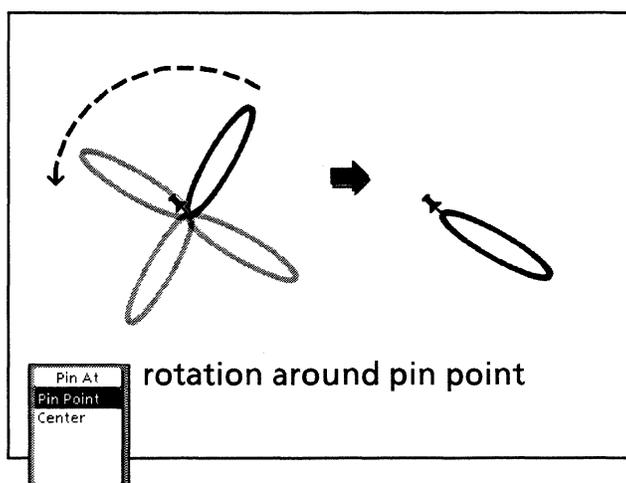
## The Pin At softkey

The Pin At point is where the system pins an object to the Pro Illustrator drawing pad while a transformation takes place (see “General procedure for transforming objects”). The Pin At softkey allows you to select the location of the Pin At point. You have two choices:

- Pin Point - the current location of the Pin Point
- Center - the geometric center of the object.

If you select Pin Point, the Pin Point must be located at the Pin At point (see the following section, “Positioning the Pin Point”).

The following illustration demonstrates the difference between a Pin Point and a Center transformation. In the top frame, an object is rotated around the Pin Point, which in this case is positioned at one end of the object. The object rotates like a propeller blade. In the bottom frame, the same object is rotated around its center; it rotates like a record on a turntable.



## Positioning the Pin Point

---

If you select Pin Point on the Pin At softkey, you must position the Pin Point at the desired location. You can do this in one of three ways: two methods occur before the transformation, and the other occurs after.

### **Using <Move> (before the transformation starts)**

---

1. Select the Pin Point.
2. Press <Move>.
3. Hold down the left mouse button and position the Pin Point at the desired location.
4. Release the mouse button.
5. Select the object you want to transform.
6. Select the desired transformation on the Transform softkey.
7. Select Pin Point on the Pin At softkey.
8. Follow the procedure to transform the object described in the appropriate section of this chapter.

### **Using <Find> (before the transformation starts)**

---

1. Select the location where you want to place the Pin Point.
2. Press <Find>. The system positions the Pin Point at the selected location.
3. Select the object you want to transform.
4. Select the desired transformation on the Transform softkey.
5. Select Pin Point on the Pin At softkey.
6. Follow the procedure to transform the object described in the appropriate section of this chapter.

### **Using right mouse button (after the transformation starts)**

---

1. Select the object you want to transform.
2. Select the desired transformation on the Transform softkey.
3. Position the cursor where you want the Pin Point and click the right mouse button. The system positions the Pin Point at the mouse location and selects Pin Point on the Pin At softkey. If desired, you can continue pressing the right mouse button to reposition the Pin Point.
4. Follow the procedure to transform the object described in the appropriate section of this chapter.

## Hints for placing the guide point and Pin At point

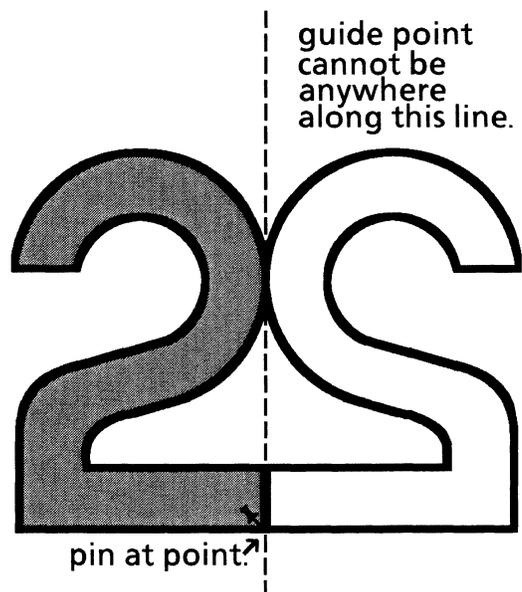
In order to transform an object, you must select a guide point and a Pin At point. The guide point is the handle with which you manipulate the object. The Pin At point is where the system pins the object to the drawing pad during the transformation. The Pin At point can be either the current location of the Pin Point or the geometric center of the object.

Sometimes the system is not able to transform an object using the combination of Pin At point and guide point that you have selected. In this case, an error message instructs you to select a different guide point.

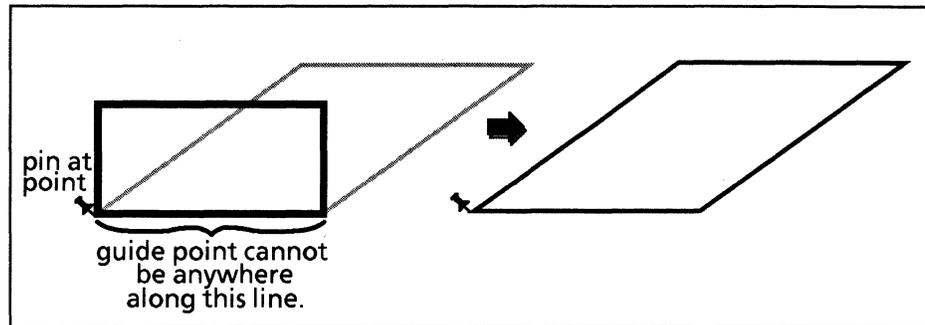
To avoid this situation, follow this general rule: Picture in your mind which part of the object will remain unchanged during the transformation. This will include the Pin At point and perhaps other points directly in line with the Pin At point (see the following examples). Do not place the guide point at the Pin At point or at any other point that will not move during the transformation.

Here is another way to think of it: Imagine that you could transform an object with your hands. The guide point is where you grasp the object; the Pin At point is where you hold the object down with one finger while you move the guide point. Obviously, you cannot put them both at the same point; nor can you put the guide point where you cannot get leverage to manipulate the object.

To illustrate, suppose you want to horizontally flip the numeral 72. As shown in the following illustration, a good place to position the Pin At point is at the lower right corner of the 2. This point does not move when you flip the 2, nor do any of the points in a vertical line with it. Therefore, you cannot place the guide point anywhere along the vertical line that includes the Pin At point.



Here is another example. Suppose you want to horizontally shear a rectangle with the Pin At point at the lower left corner (see the following illustration). When you shear the rectangle, its bottom side does not move. Therefore, you cannot place the guide point anywhere along the bottom side of the rectangle. (Note that if you shear the rectangle with the Pin At point at its center, the center is the only point where you cannot place the guide point because it is the only point that does not move.)




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## Applying constraints to transformations

---

The options on the Constrain softkey restrict transformations by causing the system to respond only to horizontal or vertical mouse movement, or to a specified angle and proportions; we say the transformation is constrained. You can also use grids and moving geometry set on the Geometry softkey to help you draw defined angles (isometric, military, and so on) or angles that you specify yourself (using the Geometry property sheet). Refer to Chapter 14 for more information about Geometry.

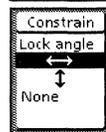
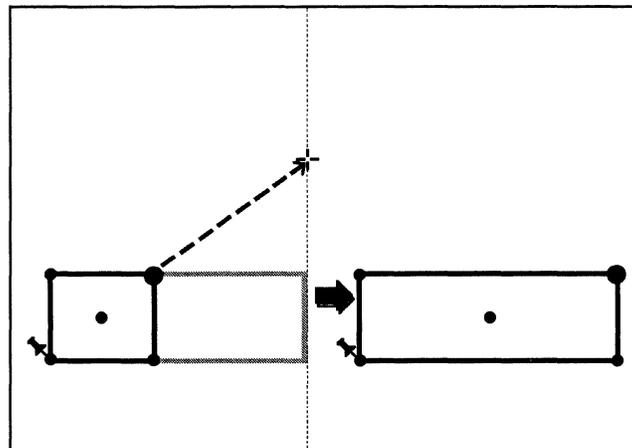
Constraints are available only on the softkeys, not on the object property sheet. They are active only while you are drawing or transforming an object. When you are finished, the system turns them off. You can automatically apply previously used constraints to another object by pressing <Again>.

Only one option on the Constrain softkey can be active at a time. If you select another constraint after selecting an angle or percentage through the Set angle or Set percent option, the angle or percentage values are overridden.

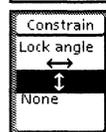
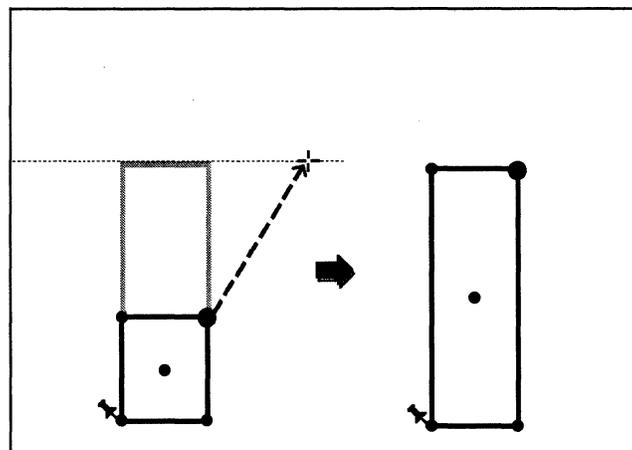
## How the horizontal and vertical constraints work

The following illustration demonstrates how the Horizontal and Vertical constraints work. It shows a rectangle being stretched with the Horizontal constraint (top frame) and with the Vertical constraint (bottom frame). Notice in the top frame that the rectangle stretches only horizontally even though the cursor moves vertically as well as horizontally. In the bottom frame, it stretches only vertically even though the cursor moves both horizontally and vertically.

In each case, the constraint causes the system to respond to only the horizontal or vertical portion of the mouse movement. Note also that the alignment cross hairs are in the opposite direction of the constraint, which is helpful for alignment.



stretch with horizontal constraint on

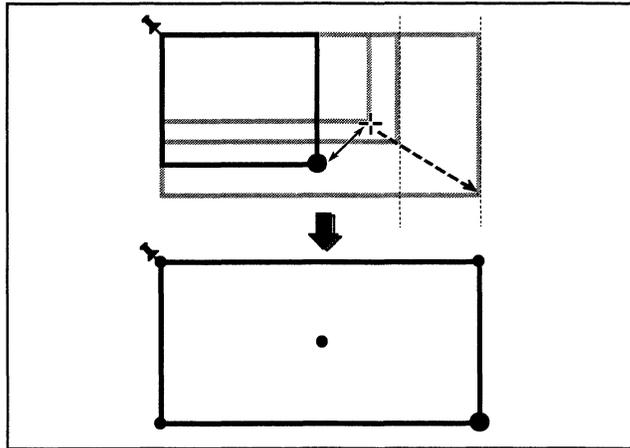


stretch with vertical constraint on

## How the Lock angle constraint works

---

After you have transformed an object to the angle and proportions you want, you can use the Lock angle constraint to lock the angle between the Pin Point and the guide point. The following illustration demonstrates how the Lock angle constraint works while you are stretching a rectangle. Notice that after Lock angle is selected, the alignment cross hair appears and the rectangle stretches proportionally from the Pin Point. The appearance of the plus cursor indicates that the angle has locked.



Sometimes the constraint selected combined with your choice of guide point and Pin At point makes the desired transformation impossible. If this happens, the system displays an error message telling you to select a different constraint. For more information, see the individual transformation descriptions later in this chapter.

The constraints are off until you turn one of them on. After the transformation is complete, the system turns off the constraints. You can use <Again> to apply previous constraints to another object.

## The Set percent and Set angle constraints

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The Set percent constraint is available for scaling and stretching by exact percentages, and the Set angle constraint is available for rotating and shearing at specific angles. Refer to the sections covering each transformation for more information about these constraints.

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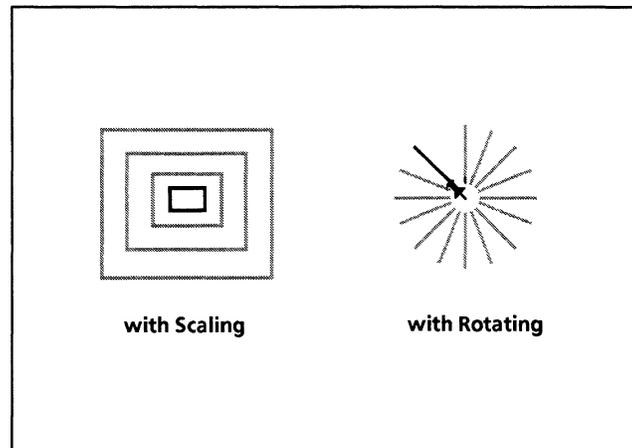
## Using the Copy First softkey

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The Copy First softkey gives you the option to copy an object before transforming it. It applies to all transformations. After the transformation, the original copy remains intact. Using this method to copy objects is easier than using <Copy> because it requires only one step instead of two.

When you do repeated transformations on the same object while using the Copy First function, use <Again> to save time. Otherwise, the Copy First function is turned off after each transformation.

The following illustration shows the Copy First function being used with scaling and rotating.




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## Scale

---

Scaling means reducing or enlarging an object's size proportionally; the object's size changes by the same percentage both horizontally and vertically, so its shape remains the same.

As you scale an object, the system displays images of both the original object and the transforming object. If these images happen to exactly overlap at any point, they both disappear. Just continue to move the cursor and both images will reappear.

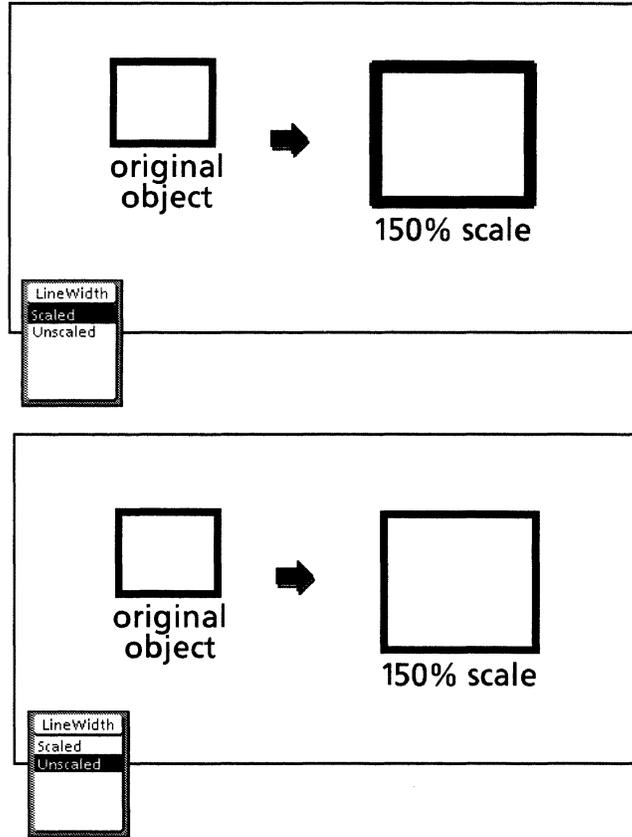
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## The Line Width softkey

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The Line Width softkey allows you to choose whether or not to keep the original line widths, line ending sizes, and point sizes as an object is scaled. If you select Unscaled, they stay exactly the same size. For example, a one-point line remains exactly one point wide no matter how big or small you make the object. If you select Scaled, the system changes these values proportionally so the overall appearance of the object (apart from size) stays the same. For example, if you double the size of an object, a one-point line is increased to two points to preserve the look of the object.

The following illustration shows a rectangle scaled at 150% with Line Width Scaled and Line Width Unscaled.



### How Pin At point and Constrain softkeys affect scaling

---

The system cannot scale an object if one of the following occurs:

- The guide point and the Pin At point are aligned horizontally and you turn on the Vertical constraint.
- The guide point and the Pin At point are aligned vertically and you turn on the Horizontal constraint.

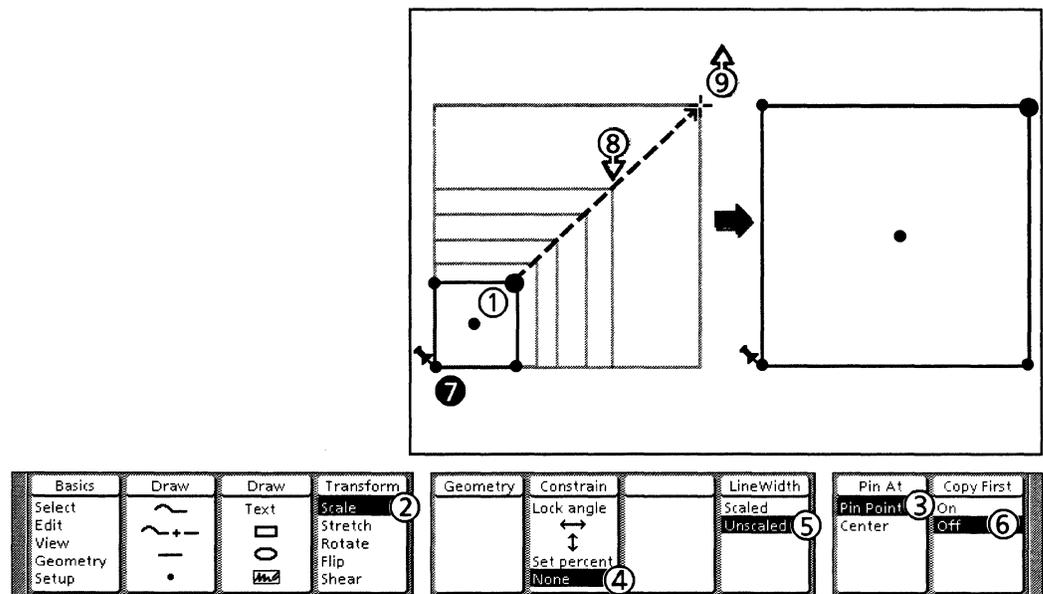
In either case, the system displays an error message telling you to select a different constraint.

The Horizontal and Vertical constraints are useful when you want to align the object you are scaling with another object, or scale the object to the same dimensions as another object. The section, "Scaling an object to the same width as another object" shows you how the Horizontal constraint is helpful in scaling an object to the same width as another object.

Using the Lock angle constraint while scaling does not offer any additional functionality because scaling already maintains an object's proportions.

The Set percent constraint allows you to scale an object by an exact percentage. For more information about this option, refer to the section, "Scaling by an exact percentage."

Only one constraint can be active at a time. Selecting another constraint after selecting the Set percent option cancels out the selected scaling percentage.



Follow these steps to scale objects:

1. Select the object at the desired guide point.
2. Select Scale on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. If you want to scale using the Horizontal or Vertical constraints, select the Horizontal or Vertical icon on the Constrain softkey.
5. Select either Unscaled or Scaled on the Line Width softkey.
6. If you want to copy the object before scaling it, select On on the Copy First softkey.
7. If you selected Pin Point at step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
8. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to scale the object. The system displays images of both the original object and the transforming object.
9. When the object is scaled the way you want it, release the left mouse button.

## Scaling by an exact percentage

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You can scale an object by an exact percentage. This section explains how the scaling percentages work in *Xerox Pro Illustrator*.

### Scaling percentages: what the numbers mean

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To scale an object by an exact percentage, you choose Set percent on the Constrain softkey. The Percent softkey appears giving you choices for scaling percentages. The numbers displayed on the Percent softkey are percentages of the object's original size, which is 100%. Numbers smaller than 100% are reductions, and numbers larger than 100% are enlargements.

You can think of the percentage numbers on the Percent softkey as ratios between the original size and the new size:

- The original size of an object is 100% (a ratio of 1:1).
- A percentage of 25% is one-fourth the original size (a ratio of 1:4).
- A percentage of 50% is one-half (a ratio of 1:2) the original size.
- A percentage of 200% is twice (a ratio of 2:1) the original size.

Imagine that each object just fits inside an invisible rectangle; scaling reduces or enlarges both the width and height of this rectangle by the same percentage. Thus, if you reduce by 50% an object that just fits within a 3 inch by 6 inch space, the resulting object has overall dimensions of 1.5 inches by 3 inches.

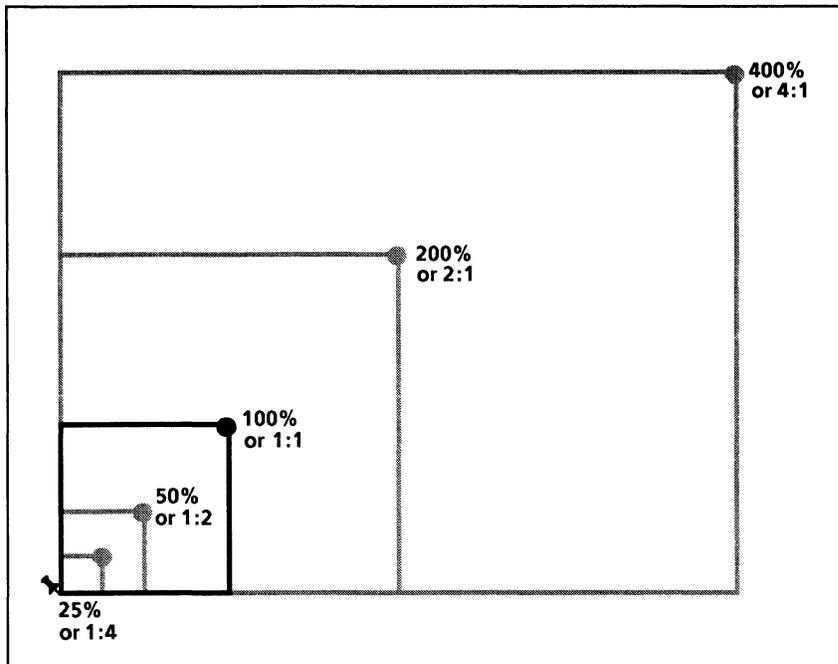
You can customize the percentages that appear on the Percent softkey. Refer to Chapter 5 for more information.

### Scaling detents

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When you choose a percentage from the Percent softkey, the system does not just scale the selection by that exact percentage. As you move the cursor away from or toward the Pin Point, the system scales the object larger or smaller at exact detents or stops. The detents are multiples of the percentage number on the Percent softkey. As you scale an object, it pops from one detent to the next. At each detent, the object's width and height are reduced or enlarged by the selected percentage.

The following illustration shows a how a rectangle is scaled larger and smaller when you select 200%.



When you move the cursor away from the Pin Point to enlarge the rectangle, the first detent is when the rectangle is twice its original size (200% or 2:1). As you move the cursor further away from the Pin Point, the system applies the scaling ratio to the 200% scaled size. So, the next detent is when the rectangle is four times its original size (400% or 4:1).

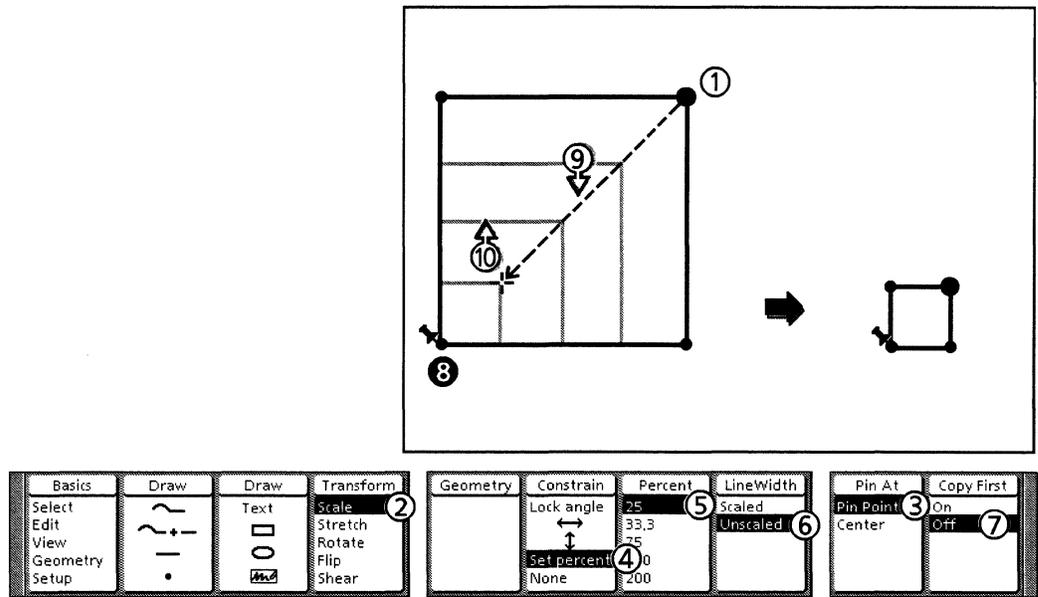
When you move the cursor toward the Pin Point to reduce the rectangle, the scaling ratio is inverted. In the illustration, the ratio changes from 2:1 to 1:2. The first detent is when the rectangle is one-half its original size (50% or 1:2). As you move the cursor closer to the Pin Point, the system applies the scaling ratio to the 50% scaled size. So, the next detent is when the rectangle is one-fourth its original size (25% or 1:4).

The following table lists some of the scaling multiples available for the default percentages appearing on the Percent softkey.

Percent	Ratio	Enlarge 1 time	Enlarge 2 times	Reduce 1 time	Reduce 2 times
25	1:4	400%	1600%	25%	6.25%
33.3	1:3	300%	900%	33.3%	11.08%
75	3:4	133.3%	177%	75%	56.25%
150	1:5:1	150%	225%	66.6%	44.3%
200	2:1	200%	400%	50%	25%

If you do not select the Set percent option, you can scale to any size. As you scale an object, you can use the Measures window to display its exact dimensions (see Chapter 15).

If you are reducing objects, you may want to use an enlarged View window.



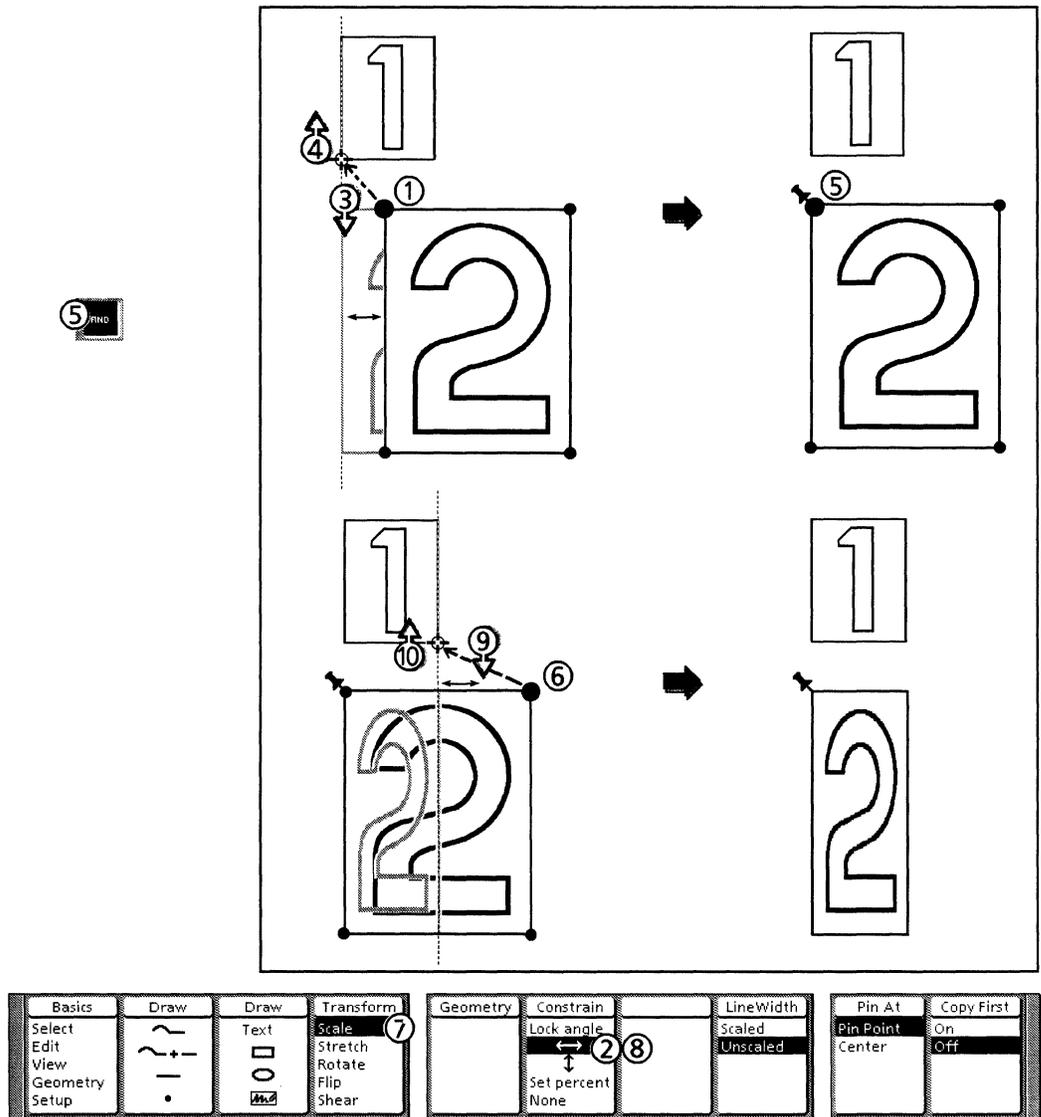
Follow these steps to scale by an exact percentage:

1. Select the object at the desired guide point.
2. Select Scale on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. Select Set percent on the Constrain softkey.
5. Select a percentage value on the Percent softkey.
 

To change the percentages on the Percent softkey, use the Percent softkey property sheet. Refer to Chapter 5 for more information.
6. Select either Unscaled or Scaled on the Line Width softkey.
7. If you want to copy the object before scaling it,select On on the Copy First softkey.
8. If you selected Pin Point in step 3, position the cursor where you want to place the Pin Point and click the *right* mouse button. The system moves the Pin Point to the selected location.
9. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to scale the object. The system displays images of both the original object and the transforming object.
10. When the object is scaled the way you want it, release the left mouse button.
11. The system returns to Select mode with the transformed object selected.

## Scaling an object to the same width as another object

This section shows you how to use the Horizontal constraint to scale an object to the same width as another object (note that using the Horizontal constraint causes the scale to look like a stretch). You can use the same procedure to scale objects to the same height using the Vertical constraint. Selecting the Horizontal or Vertical constraint causes the alignment cross hair to appear.



Follow these steps to scale an object to the same width as another object:

1. First you need to align the two objects vertically along one side. Select the object you want to align (object 2) along its left side and press <Move>.
2. Select the Horizontal icon on the Constrain softkey.

3. Press and hold down the left mouse button and move the cursor to a guide point on the left side of object 1 until the large open circle appears.
4. Release the mouse button.
5. Press <Find>. This places the Pin Point at the current guide point.
6. Select object 2 at the far right guide point.
7. Select Scale on the Transform softkey.
8. Select the Horizontal icon on the Constrain softkey.
9. Press and hold down the left mouse button and move the cursor to a control point on the right side of object 1 until the large open circle appears.
10. Release the mouse button. The objects should be the same width.

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## Stretch

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Stretching means reducing or enlarging an object's size disproportionately; the object's size changes by different amounts horizontally and vertically, so its shape changes.

As you stretch an object, the system displays images of both the original object and the transforming object. If these images happen to exactly overlap at any point, they both disappear. Just continue to move the cursor and both images will reappear.

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### How Pin At point and Constrain softkeys affect stretching

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If the Horizontal constraint is on, the object stretches only horizontally. If the Vertical constraint is on, the object stretches only vertically. If you select Lock angle before you begin stretching the object, the object stretches proportionally from the Pin Point, if you selected Scale. If you select Lock angle after you have already stretched the object to the desired shape (with the mouse button still down), the proportions of the newly stretched shape will be maintained during further stretching.

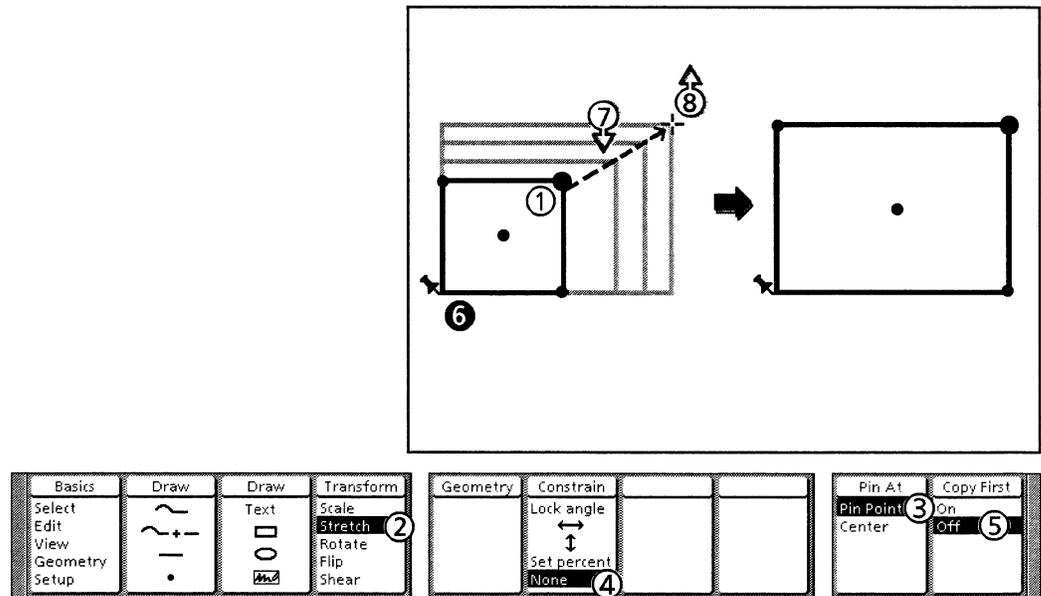
There is a separate procedure for stretching using the Lock angle constraint following the "Stretching objects" procedure.

The Set percent constraint allows you to stretch an object by separate horizontal and vertical percentages. For more information about this option, refer to "Stretching an object by exact percentages" in this chapter.

Only one constraint can be active at a time. For example, if you select another constraint after selecting stretching percentages, the stretching percentages are cancelled.

You can also flip an object while stretching it (see “Flip” in this chapter). Imagine the display screen is divided into four quadrants around the current location of the Pin At point. During a stretch, if you move the guide point into a different quadrant, the system flips the object horizontally, vertically, or both.

*VP Basic Graphics* users: There is another way to stretch objects that resembles the technique used in Basic Graphics: select and move an individual control point. This method is described in “Moving control points” under “Moving” in Chapter 7.

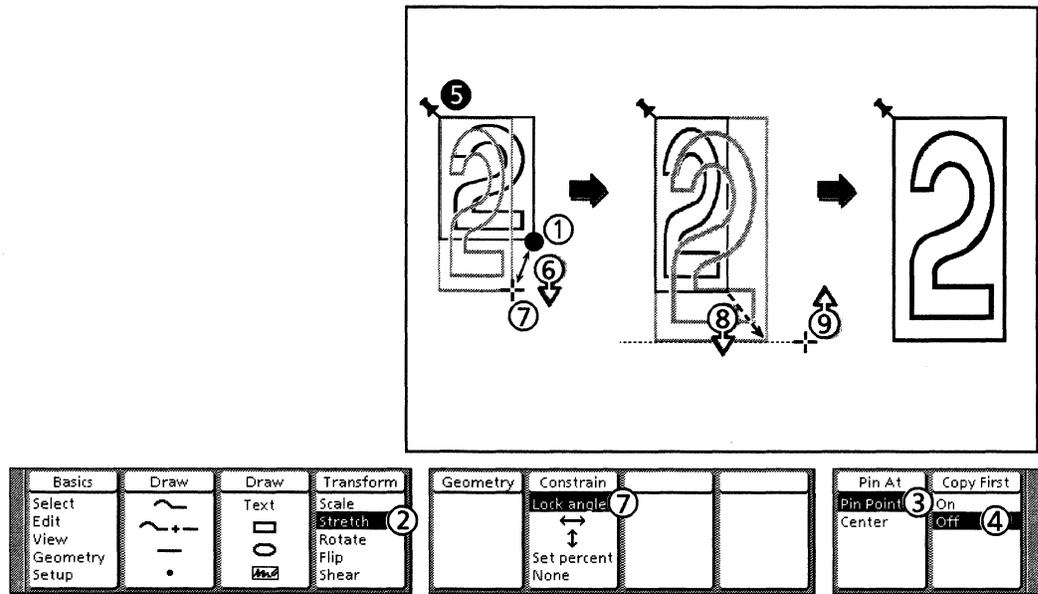


Follow these steps to stretch objects:

1. Select the object at the desired guide point.
2. Select Stretch on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. If you want to stretch using the Horizontal or Vertical constraint, select the Horizontal or Vertical icon on the Constrain softkey.
5. If you want to copy the object before stretching it, select On on the Copy First softkey.
6. If you selected Pin Point at step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
7. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to stretch the object. The system displays images of both the original object and the transforming object.
8. When the object is stretched the way you want it, release the left mouse button.

## Stretching with the Lock angle constraint

The following procedure shows you how to apply the Lock angle constraint while stretching objects. Selecting Lock angle after you have already stretched the object to the desired shape (with the mouse button still down) locks the angle between the guide point and the Pin Point, and maintains the angle during further stretching. Once you have selected the Lock angle constraint, the alignment cross hair appears.



Follow these steps to stretch with the Lock angle constraint:

1. Select the object at the desired guide point.
2. Select Stretch on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. If you want to copy the object before stretching it, select On on the Copy First softkey.
5. If you selected Pin Point in step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
6. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to stretch the object. The system displays images of both the original object and the transforming object. Do not release the left mouse button.

7. When the object has the proportions and angle you want, select Lock angle on the Constrain softkey by pressing <F6>. Or, press and release <Same> while keeping the mouse button down. Note that the object remains at the angle you specified regardless of where you position the cursor.
8. Note also that, while you are holding down the mouse button, you can select a different constraint, including None, by pressing <F6>. Selecting None or pressing <Same> allows you to unlock the angle and set it again if you are not satisfied with it.
9. Move the cursor to stretch the object.
10. When the object is stretched the way you want it, release the left mouse button.

### **Stretching by an exact percentage**

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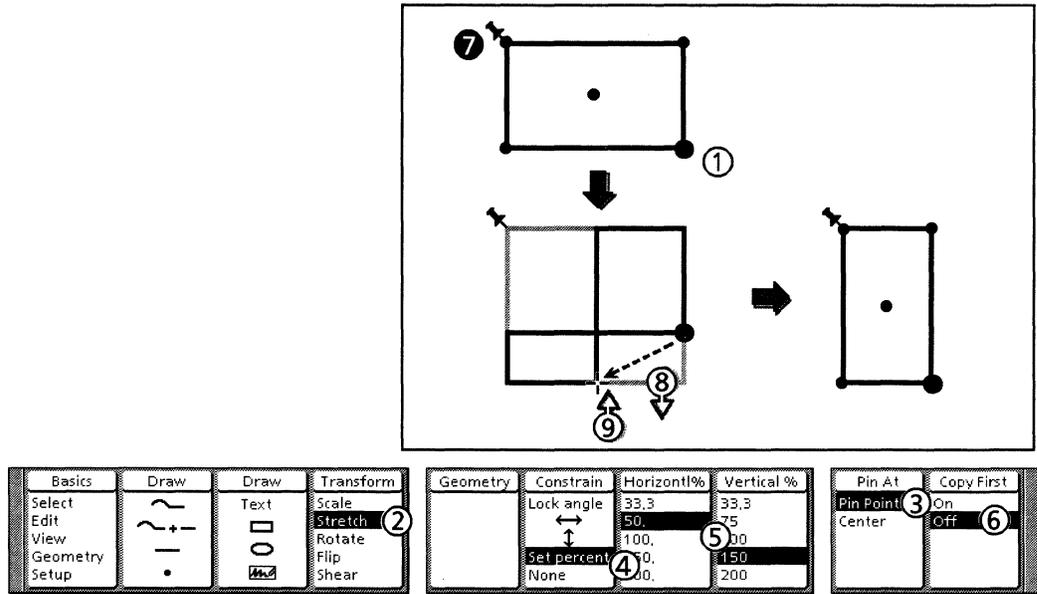
Selecting Set percent on the Constrain softkey before stretching an object allows you to specify separate horizontal (width) and vertical (height) scaling percentages. This is similar to setting a percentage when you are scaling an object except that scaling reduces or enlarges an object's width and height by the same percentage.

After you select the Set percent option, the system displays two softkeys for selecting the percentages: you select the width percentage on the Horizontal% softkey and the height percentage on the Vertical% softkey. Choosing a percentage for one direction only allows you to stretch freely in one direction while limiting the other.

When you choose percentages, the system does not just stretch the selection by those exact percentages. As you move the cursor away from or toward the Pin Point, the system stretches the object larger or smaller at exact detents or stops. The detents are multiples of the percentage numbers on the Horizontal% and Vertical% softkeys. As you stretch an object, it pops from one detent to the next. At each detent, the object's width and height are enlarged or reduced by the selected percentages. Refer back to the section, "Scaling by an exact percentage" for an explanation of how the percentages work.

You can customize the values displayed on the Horizontal% and Vertical% softkeys. Refer to Chapter 5 for more information.

The following illustration and procedure show how to stretch an object so that its width becomes 50% of its original size and its height becomes 150% of its original size.



Follow these steps to stretch by an exact percentage:

1. Select the object at the desired guide point.
2. Select Stretch on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. Select Set percent on the Constrain softkey.
5. Select percentage values on the Horizontal% and Vertical% softkeys.
6. If you want to copy the object before stretching it, select On on the Copy First softkey.
7. If you selected Pin Point in step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
8. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to stretch the object.
9. When the object is stretched the way you want it, release the left mouse button.

## Rotate

Rotate allows you to turn or revolve an object. The object's shape remains the same, but its orientation changes. You can rotate objects both clockwise and counter clockwise.

As you rotate an object, the system displays images of both the original object and the transforming object. If these images happen to exactly overlap at any point, they both disappear. Just continue to move the cursor and both images will reappear.

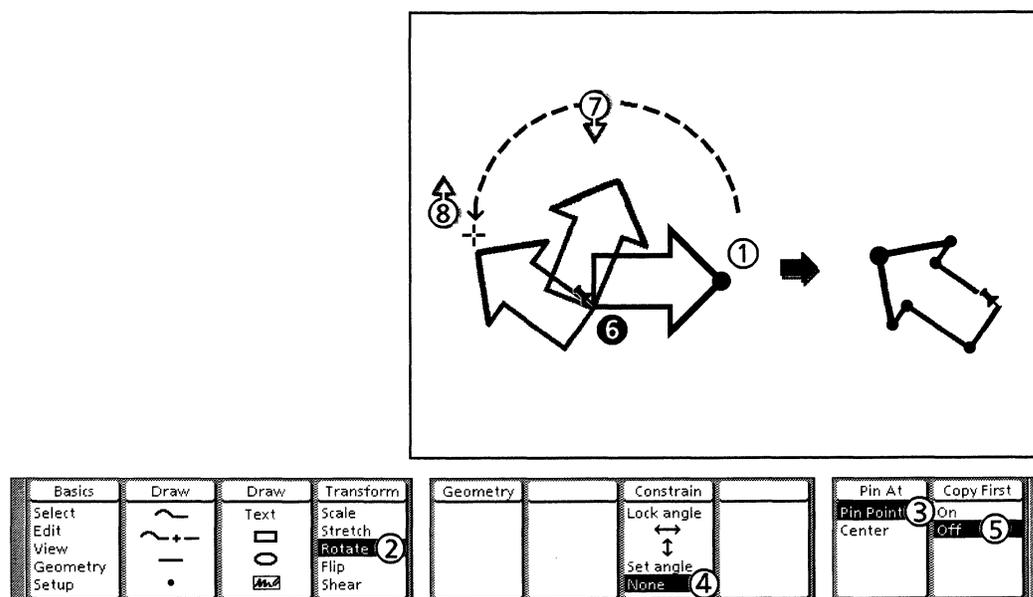
### How the Pin At and Constrain softkeys affect rotation

Using the Horizontal or Vertical constraints with rotation aligns the guide point either horizontally or vertically from the Pin Point so the object is rotated 180 degrees.

To rotate an object to a horizontal or vertical angle, align the Pin Point and guide point along the same axis, then select the Horizontal or Vertical constraint as you are rotating.

The Set angle constraint allows you to rotate an object to a specific angle. For more information about this option, refer to "Rotating to a specific angle" in this chapter.

Only one constraint can be active at a time. For example, if you select another constraint after selecting an angle, the angle is cancelled.



Follow these steps to rotate objects:

1. Select the object at the desired guide point.
2. Select Rotate on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. If you want to use the Horizontal or Vertical constraint, select

either the Horizontal or Vertical icon on the Constrain softkey.

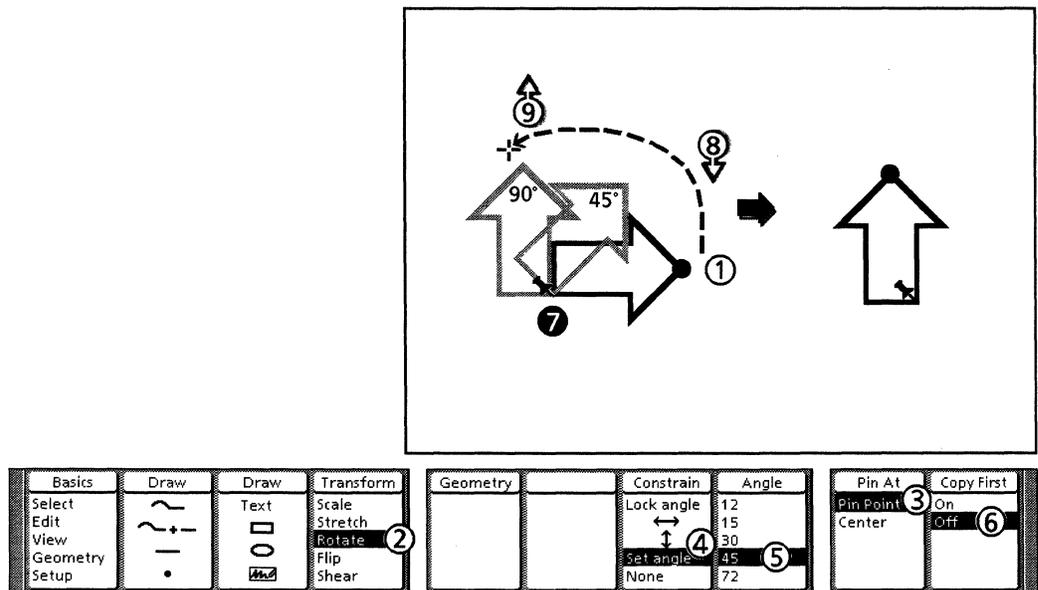
5. If you want to copy the object before rotating it, select On on the Copy First softkey.
6. If you selected Pin Point at step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
7. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to rotate the object. The system displays images of both the original object and the transforming object.
8. When the object is rotated the way you want it, release the left mouse button.

### Rotating to a specific angle

Selecting Set angle on the Constrain softkey lets you rotate an object to an exact angle. When you select an angle, the system restricts the rotation to a set of stops. The value you select is the angle between stops, measured clockwise and counter clockwise from the current selection. As you rotate an object, it pops from one stop to the next.

For example, suppose you select 15 degrees. As you rotate an object, it pops 15 degrees clockwise or counterclockwise (depending on which way you move the cursor) from its original position. If you continue to move the cursor, the object pops another 15 degrees (30 degrees from its original position), and so on.

You can use the Measures window to display an object's angle. See Chapter 15 for details.



Follow these steps to rotate to a specific angle:

1. Select the object at the desired guide point.
2. Select Rotate on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. Select Set angle on the Constrain softkey.
5. Select an angle value on the Angle softkey.
6. If you want to copy the object before rotating it, select On on the Copy First softkey.
7. If you selected Pin Point in step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
8. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to rotate the object. The system displays images of both the original object and the transforming object.
9. When the object is rotated the way you want it, release the left mouse button.

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## Flip

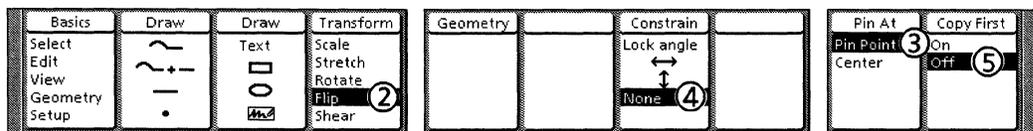
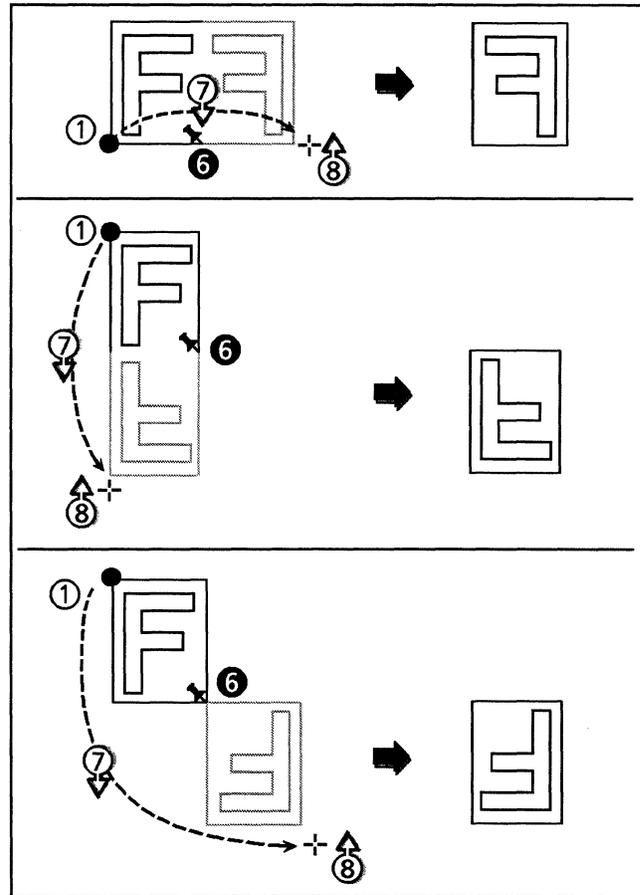
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Flip means to turn an object over so it looks like a mirror image of the original. You can flip objects horizontally, vertically, or both ways at once.

The way the system flips an object depends on how you move the mouse, and where the Pin At point is located. If the mouse movement is mostly horizontal relative to the Pin At point, the object flips horizontally. If the mouse movement is mostly vertical relative to the Pin At point, the object flips vertically. If the mouse movement is on a diagonal relative to the Pin At point, the object flips both horizontally and vertically.

You can use the Horizontal and Vertical constraints if you want to flip your object only horizontally or vertically. This way, only one result is possible. Flipping without constraints allows three possibilities: horizontal, vertical, or both.

As you flip an object, the system displays images of both the original object and the transforming object. If these images happen to exactly overlap at any point, they both disappear. Just continue to move the cursor and both images will reappear.



Follow these steps to flip objects:

1. Select the object at the desired guide point.
2. Select Flip on the Transform softkey.
3. Select either Pin Point or Center on the Pin At softkey.
4. If you want to flip the object only vertically or only horizontally, select the Horizontal or Vertical constraint.
5. If you want to copy the object before flipping it, select On on the Copy First softkey.
6. If you selected Pin Point in step 3, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
7. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to flip the object. The system displays images of both the original object and the transforming object.
8. When the object is the way you want it, release the left mouse button.

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## Shear

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Shear means to cause parts of an object to slide relative to other parts. For example, picture how a strong wind might shear an old barn, causing the entire barn to slant to one side; this would be a horizontal shear. *Xerox Pro Illustrator* allows you to shear objects either horizontally or vertically.

Shearing actually involves both shearing and stretching. In a horizontal shear, the system shears the object horizontally and stretches it vertically if there is any vertical mouse movement. In a vertical shear, the system shears the object vertically and stretches it horizontally if there is any horizontal mouse movement. You can limit the operation to shearing without stretching by using the Horizontal and Vertical constraints.

You select either horizontal or vertical shearing using the Shearing softkey. The icons on this softkey illustrate these shearing styles.

You can project linear objects onto parallel planes by shearing them in parallel geometry. Refer to Chapter 14 for more information.

As you shear an object, the system displays images of both the original object and the transforming object. If these images happen to exactly overlap at any point, they both disappear. Just continue to move the cursor and both images will reappear.

---

### How the constraints affect shearing

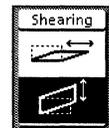
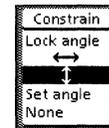
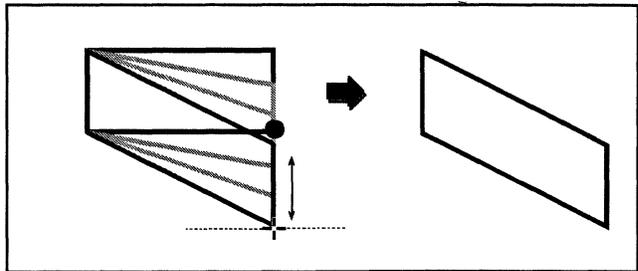
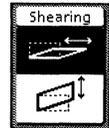
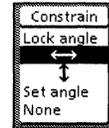
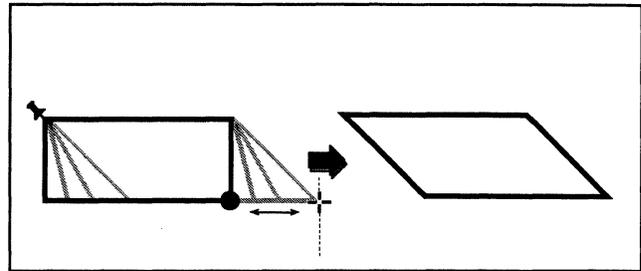
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For information about how to use the Constrain softkeys, see “Applying constraints to transformations” earlier in this chapter.

You can use the Horizontal and Vertical constraints to cause an object to shear without stretching. To do this, select the same constraint and shear styles (the alignment cross hair appears when you have selected the constraint).

After you have sheared an object to the angle and proportions you want, you can use the Lock angle constraint to lock the shear angle so it is maintained during further shearing. The “Shearing with the Lock angle constraint” procedure shows you how to apply the Lock angle constraint to shearing.

The Set angle constraint lets you shear an object to an exact angle. The following example illustrates shearing without stretching for both constraints. Refer to “Shearing with the Set angle constraint” for more information.



### How the Pin At point position affects shearing

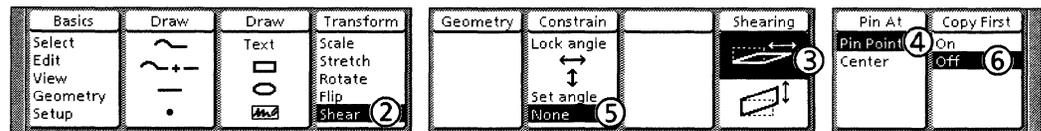
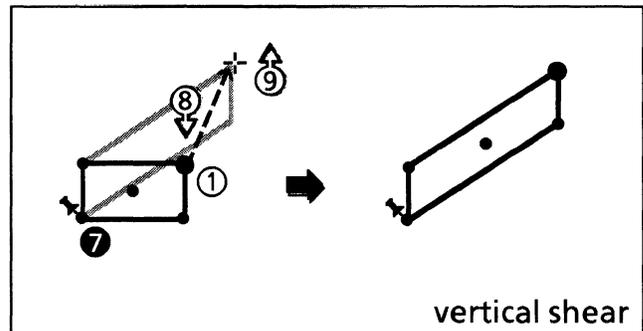
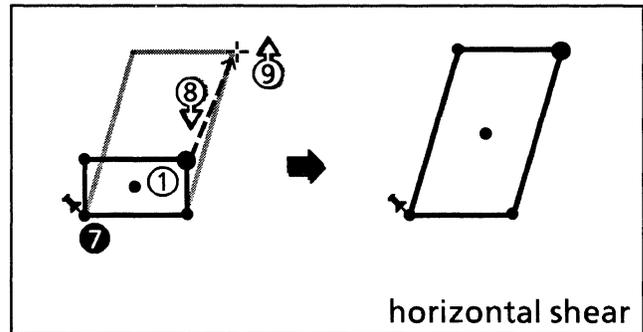
For information about how to use the Pin At softkey, see “The Pin At softkey” section in this chapter.

The system cannot shear an object if one of the following occurs:

- The guide point and the Pin At point are aligned horizontally and you turn on the Horizontal constraint while doing a horizontal shear.
- The guide point and the Pin At point are aligned vertically and you turn on the Vertical constraint while doing a vertical shear.

In either case, the system displays an error message telling you to select a different shear style or guide point.

The following illustration and procedure shows how to shear objects using the Horizontal or Vertical constraint.

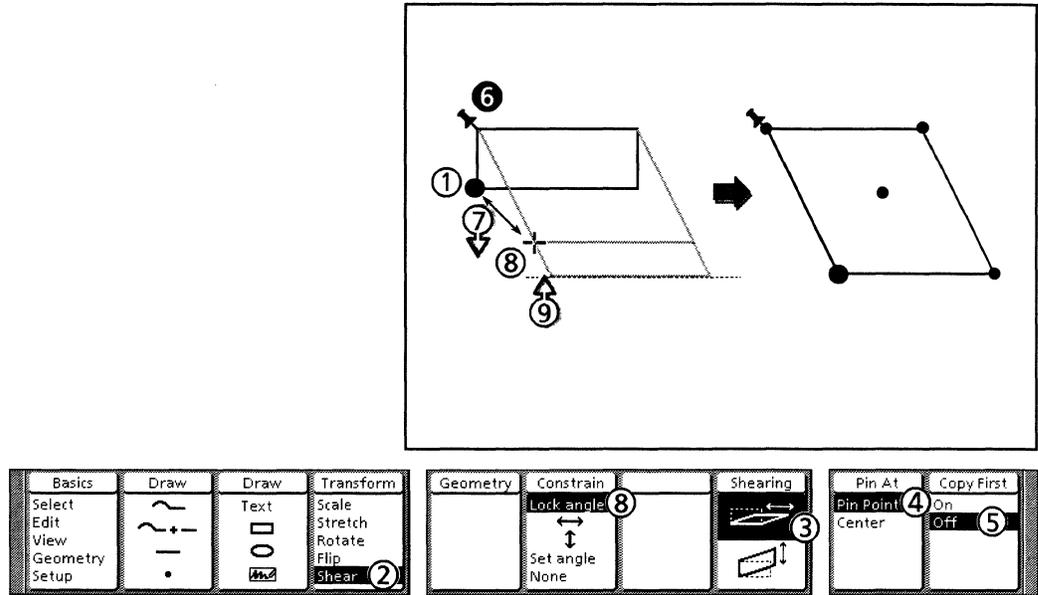


Follow these steps to shear objects:

1. Select the object at the desired guide point.
2. Select Shear on the Transform softkey.
3. Select either the Horizontal shear icon or the Vertical shear icon on the Shearing softkey.
4. Select either Pin Point or Center on the Pin At softkey.
5. If you want to shear using the Horizontal or Vertical constraint, select the Horizontal or Vertical icon on the Constrain softkey.
6. If you want to copy the object before shearing it, select On on the Copy First softkey.
7. If you selected Pin Point in step 4, position the cursor where you want the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
8. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to shear the object. The system displays images of both the original object and the transforming object.
9. When the object is sheared the way you want it, release the left mouse button.

## Shearing with the Lock angle constraint

The following procedure shows you how to apply the Lock angle constraint while shearing objects. Selecting Lock angle after you have already sheared the object to the desired shape (with the mouse button still down) locks the object's angle and proportions, and retains them during further shearing.



Follow these steps to shear with the Lock angle constraint:

1. Select the object at the desired guide point.
2. Select Shear on the Transform softkey.
3. Select either the Horizontal shear icon or the Vertical shear icon on the Shearing softkey.
4. Select either Pin Point or Center on the Pin At softkey.
5. If you want to copy the object before shearing it, select On on the Copy First softkey.
6. If you selected Pin Point in step 4, position the cursor where you want to place the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
7. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to shear the object. The system displays images of both the original object and the transforming object.
8. When the object is at the angle you want, select Lock angle on the Constrain softkey, or press and release <Same> while keeping the mouse button down. Note that the object remains at the angle you specified regardless of where you position the cursor.
9. Note also that, while you are holding down the mouse button, you can select a different constraint, including None, by pressing <F6>. Selecting None or pressing <Same>

again allows you to unlock the angle and set it again if you are not satisfied with it.

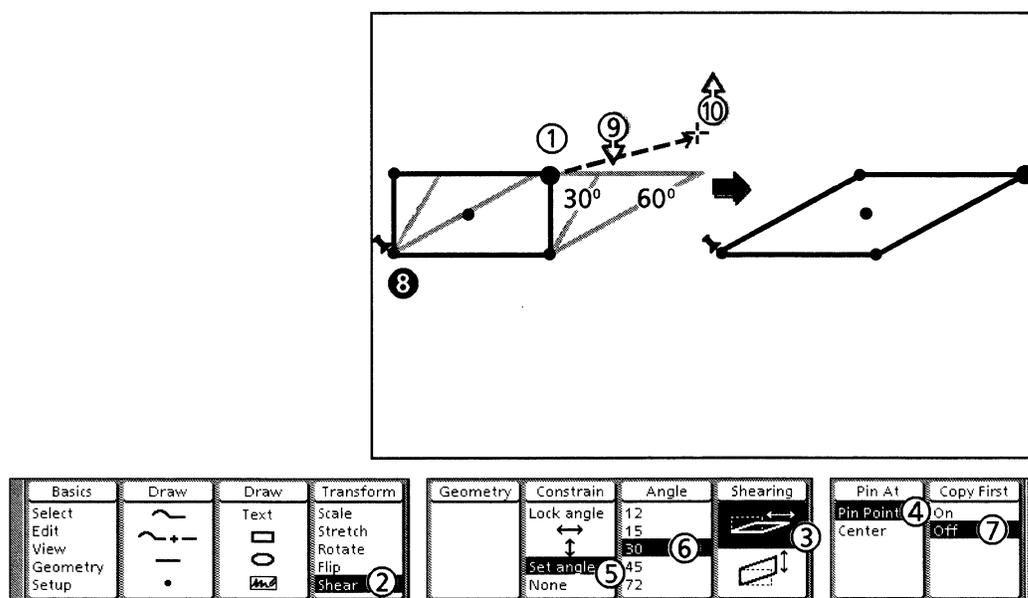
- When the object is sheared the way you want it, release the left mouse button.

## Shearing with the Set angle constraint

Selecting Set Angle on the Constrain softkey lets you shear an object to an exact angle. When you select an angle, the system restricts the rotation to a set of stops. The value you select is the angle between stops, measured clockwise and counter clockwise from the current selection. As you rotate an object, it pops from one stop to the next.

For example, suppose you select 15 degrees. As you shear an object, it pops 15 degrees clockwise or counter clockwise (depending on which way you move the cursor) from its original position. If you continue to move the cursor, the object pops another 15 degrees (30 degrees from its original position), and so on.

The following illustration and procedure show how to shear with the Set angle constraint.



Follow these steps to shear with the Set angle constraint:

- Select the object at the desired guide point.
- Select Shear on the Transform softkey.
- Select either the Horizontal shear icon or the Vertical shear icon on the Shearing softkey.
- Select either Pin Point or Center on the Pin At softkey.
- Select Set angle on the Constrain softkey.
- Select a value on the Angle softkey.
- If you want to copy the object before shearing it, select On on the Copy First softkey.

8. If you selected Pin Point in step 3, position the cursor where you want the Pin Point and click the right mouse button. The system moves the Pin Point to the selected location.
9. Position the cursor near the guide point. Hold down the left mouse button and move the mouse to shear the object. The system displays images of both the original object and the transforming object.
10. When the object is sheared the way you want it, release the left mouse button.

## **Part 3**

### **Using Xerox Pro Illustrator tools**



This chapter contains information on using the View window feature of *Xerox Pro Illustrator*. Using this feature, you can create multiple views of an illustration. These views allow you to work at varying locations and scales (zooming in for enlargements and zooming out for reductions) within an illustration.

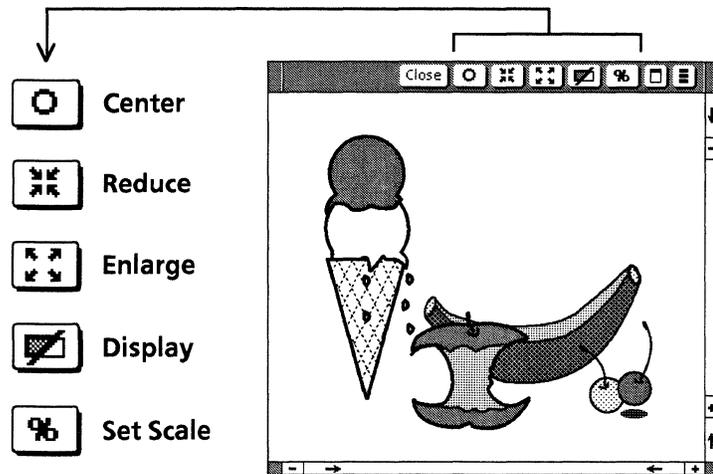
The portion of the illustration within a View window is not an enlargement or a reduction of the illustration contents. It is simply another view of the illustration. You can have any number of View windows open at a time, showing views of one or more Pro Illustrator frames. When you change the illustration in one View window, all of the View windows for that frame are updated to show the change.

Textures and the Pin Point are shown at the same scale in all View windows regardless of the actual scale of the view. Text in a text frame is visible in the main document view of a Pro Illustrator frame and in a 90% scale View window, but it can only be edited in the main document view. The raster images inside bitmap frames are visible in View windows; however, the images cannot be edited in either view.

This chapter does not include information on using the Geometry feature. To follow the procedures described in this chapter, the Geometry Type should be set to None.

## View window commands

The following illustration of a View window shows the special commands that are not available in the main document view of a Pro Illustrator frame. These commands allow you to change the scale, location, and display mode of the view.



The View window commands are summarized in the following list. Each command is discussed in more detail in later sections of this chapter.

- [Close] – Closes the View window and deletes it. To see the view again, you need to recreate it.
- Center – Places the location of any left mouse click including the guide point of an object in the center of the View window. This allows you to bring any location in the Pro Illustrator frame to the center of the View window.
- Reduce – Makes the scale of the view smaller (zooms out).
- Enlarge – Makes the scale of the view larger (zooms in).
- Display – Changes all objects in the View window to show as a thin black outline only (no dashed lines, line ends, tints, or fills) to speed up display time, or changes images in bitmap frames to a light gray shade for tracing purposes.
- Set Scale – Accesses a pull-down menu of view scales that you select to change the scale of the View window.

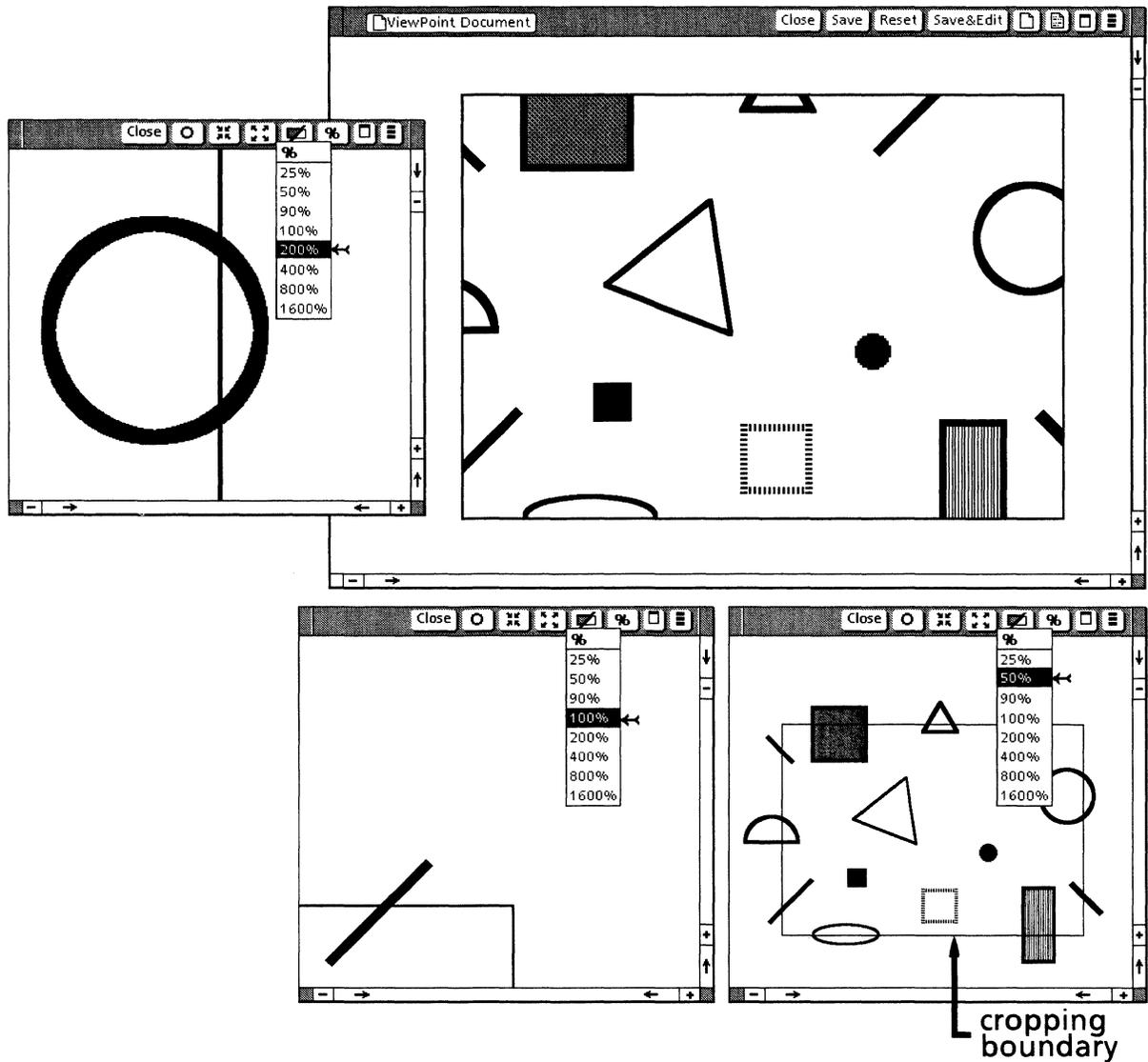
The View window also contains the following standard elements of a VP window:

- Floating item auxiliary menu
- Window management auxiliary menu
- Control points
- Scroll bars.

Except for the scroll bars, the elements work in the same way they do for any VP window. You can scroll up, down, right, and left. In a View window, the previous page (–), next page (+), left edge (–), and right edge (+) jump one view width or height in the specified direction.

## View windows and the infinite drawing pad

The following illustration shows how View windows provide access to parts of the illustration that are outside of the Pro Illustrator frame. It also shows the cropping boundary which indicates what is visible in the main document view.



---

## View window softkeys

---

When you select View on the Basics softkey, the following softkeys appear:

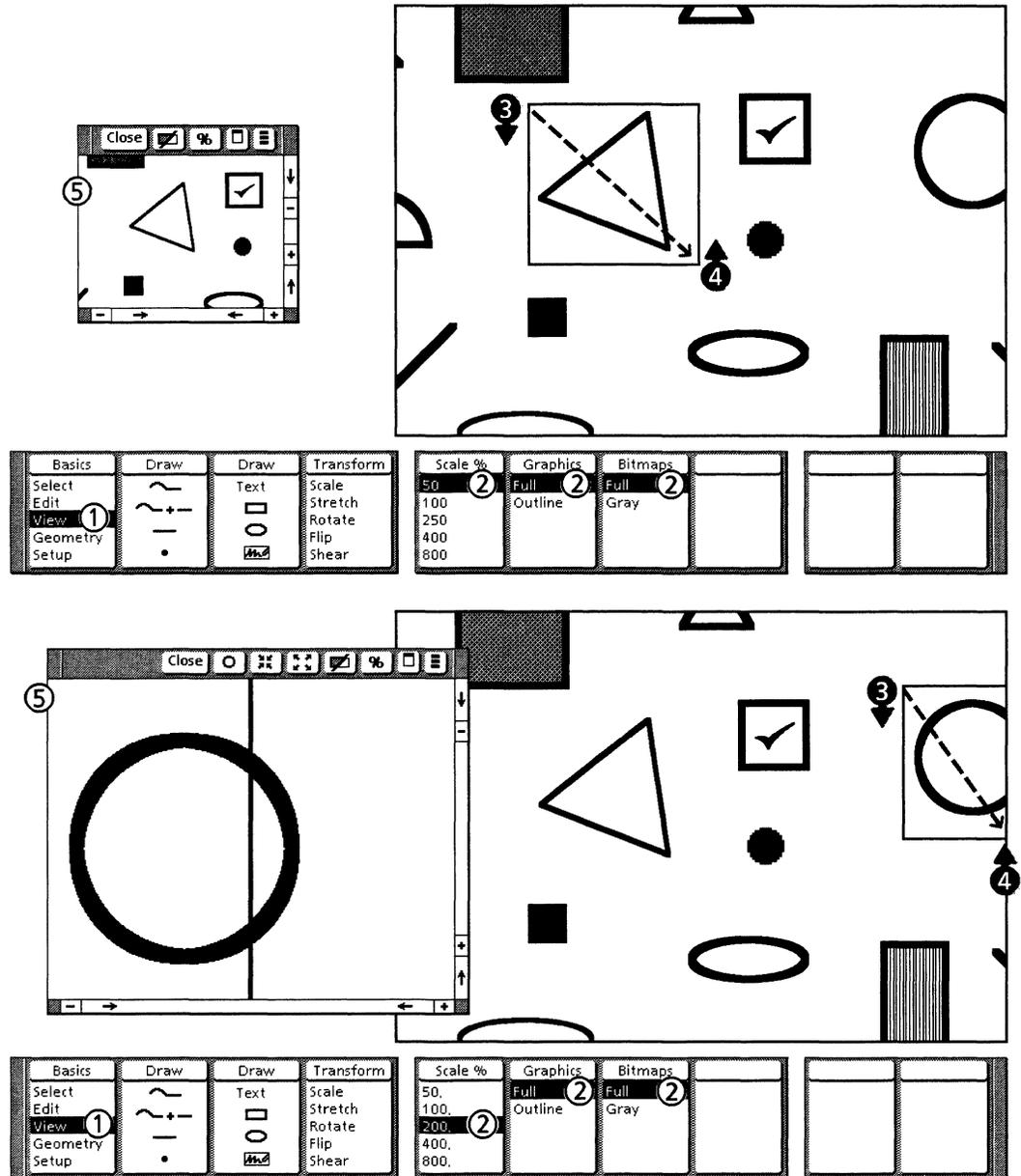
- Scale %
- Graphics
- Bitmaps.

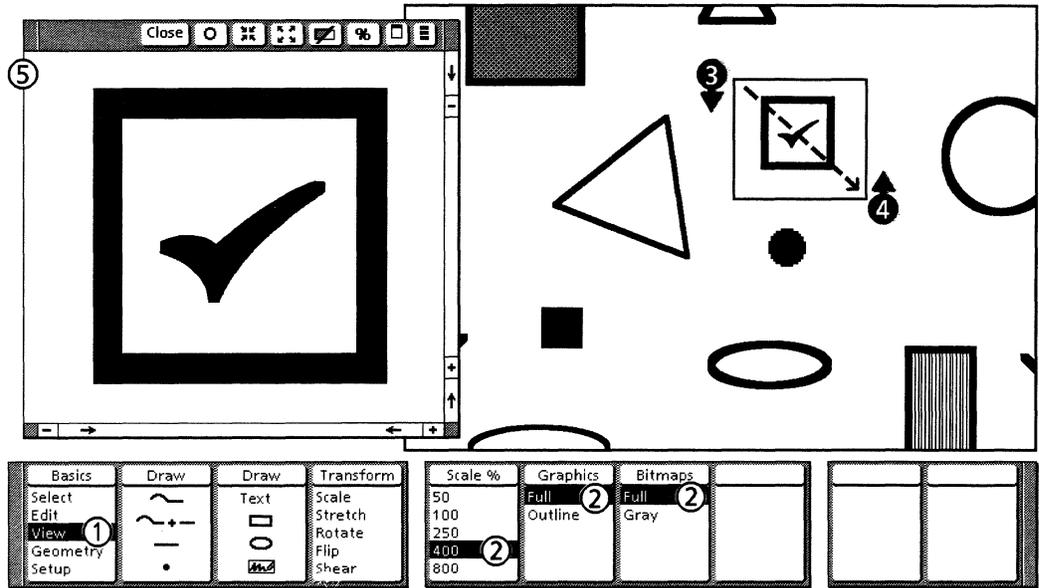
**Scale %:** You use the Scale % softkey to select the scale of a view before you create it. 100% is the actual size of the illustration on the printed page. If you select a scale less than 100%, the view is a reduction. If you select a scale greater than 100%, the view is an enlargement. The main document view shows the illustration at 90% scale so that the screen dot spacing is convenient for displaying text. By editing the choices on the Scale % softkey using that softkey's property sheet, you can scale to any percentage. There is no limitation to preset scale percentages. Refer the Softkeys chapter for more information on editing softkey choices.

**Graphics:** The Graphics softkey allows you to change the objects which appear in the View window so that only a thin black outline of the object displays. This feature speeds up the screen display time. The command Full shows the objects in the View window with all of their properties. The command Outline shows the objects in the View window with only an outline, no dashed lines, line ends, tints, or fills. Bitmap frames show as outlines, but retain their raster images. (This feature is also available in the main document view, but in that case the raster image does not show.)

**Bitmaps:** The Bitmaps softkey allows you to display raster images as light gray in the View window. This feature helps in tracing the outlines of the raster image. The command Full shows the raster images in the View window as black and white images. The command Gray shows the images as gray and white.

The following illustrations show three different View windows created at three different locations and scales. See the Displaying section in this chapter for more details on the outline objects and gray bitmaps features.






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## View windows

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This section describes how to create and close View windows.

### Creating a View window

---

Follow these steps to create a View window:

1. Select View on the Basics softkey.
2. Select the desired choices on the Scale%, Graphics, and Bitmaps softkeys.
3. Position the cursor near the area to be viewed. Press and hold down either the left or right mouse button. Move the cursor so that the draw-through box stretches to enclose the desired viewing area.
4. Release the mouse button.
5. Place the cursor where you want the upper left corner of the View window. Click the left mouse button.

### Closing a View window

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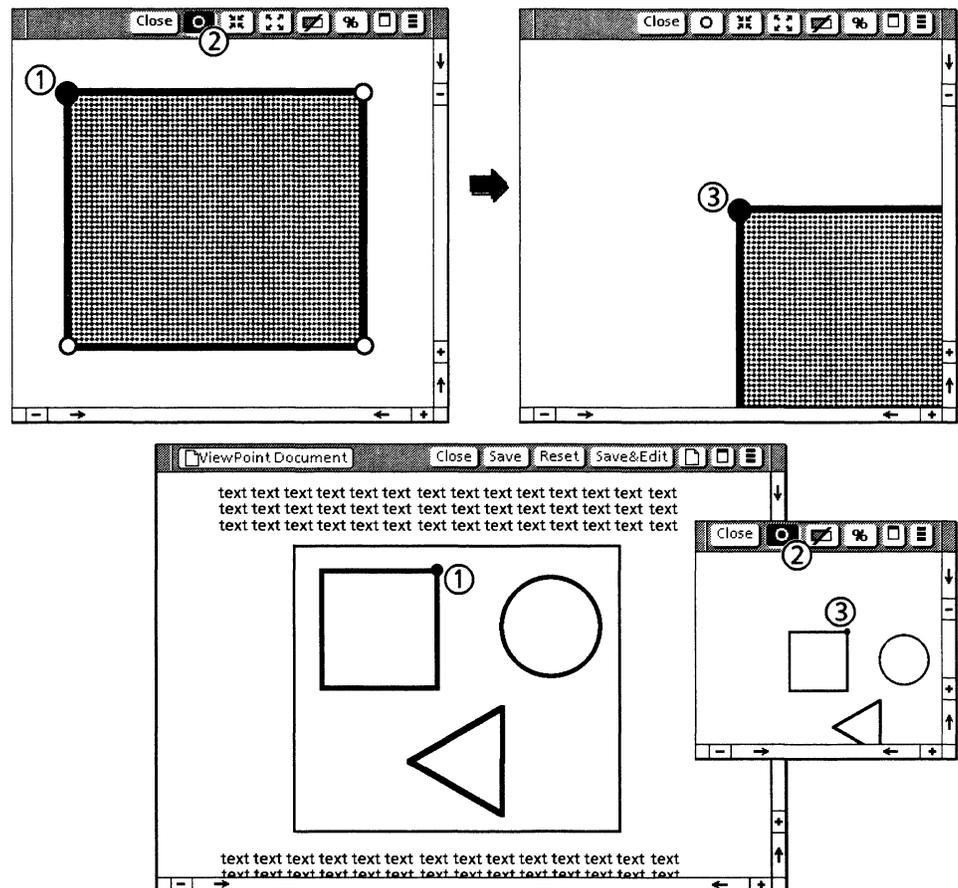
To close a View window, select [Close] in the View window header or in the main document header. When you close the main document, all View windows associated with the document close.

## Centering in a View window

The Center command places the location of any left mouse click or the guide point of an object in the center of the View window. There are three ways to center a location or object:

- Select any point to be centered in one View window and select the Center command in the same View window.
- Select any point to be centered in one View window and select the Center command in another View window, as long as both views are of the same Pro Illustrator frame.
- Select any point to be centered in the main document view and select the Center command in a View window of the same Pro Illustrator frame.

The second and third ways are useful if the point you want to center is not visible in one view but is visible in another.



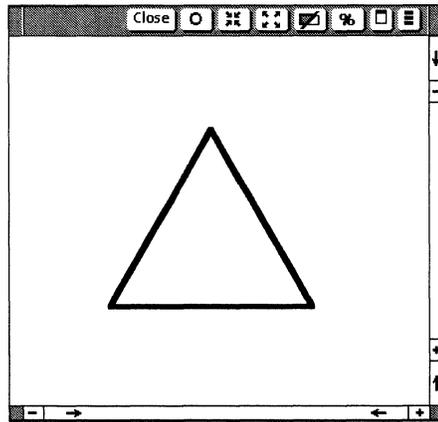
Follow these steps to center in a View window:

1. Select the point you want to center.
2. Select the Center icon.
3. The selected point is centered in the View window.

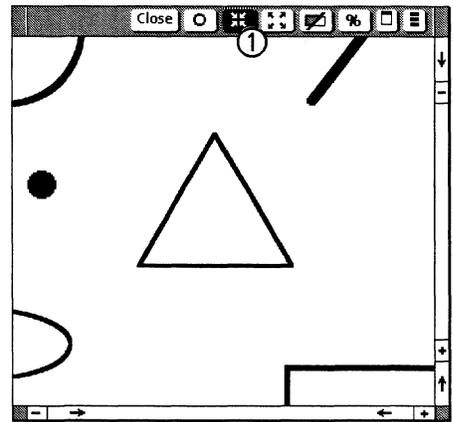
## Reducing

The Reduce command makes the scale of the view smaller. Each reduction is about 71% of the previous scale. Two successive reductions produce a reduction of exactly 50%. A reduction followed by an enlargement returns the view to its original scale.

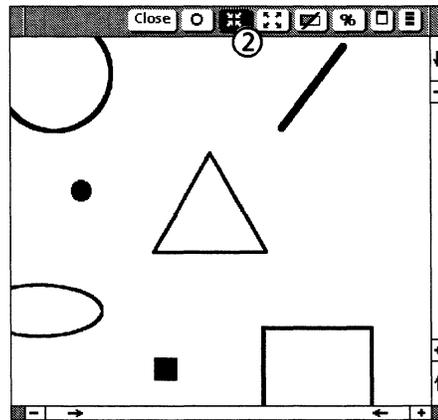
The following illustration shows four views. The second view is reduced once from the original view. The third is reduced twice from the second. The fourth is reduced three times from the third.



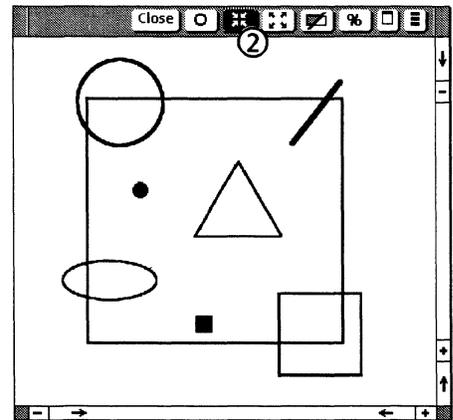
Original View



Second View



Third View



Fourth View

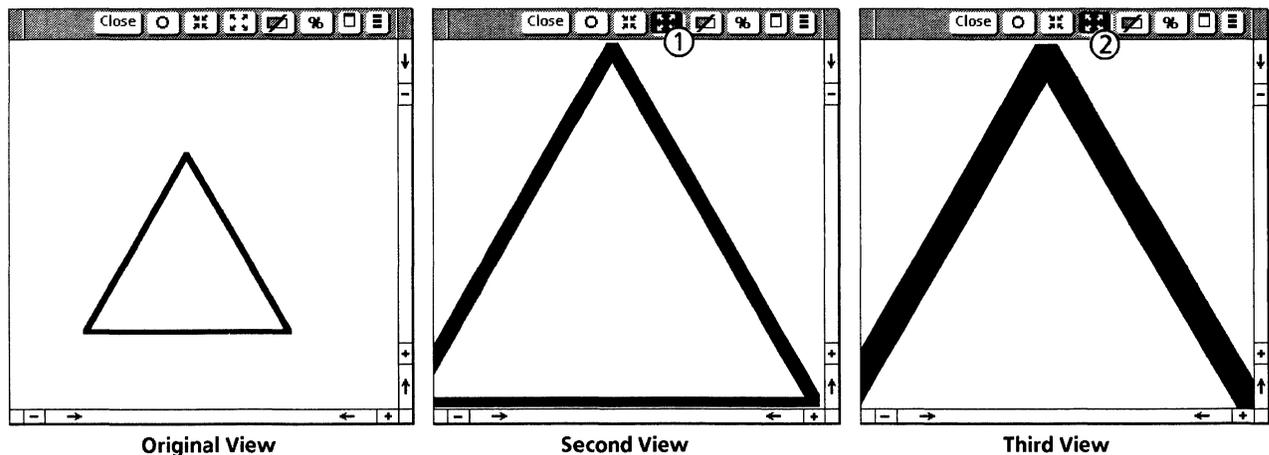
Follow these steps to reduce the view:

1. Select the Reduce icon.
2. Continue selecting the Reduce icon until you reach the desired scale.

## Enlarging

The Enlarge command makes the scale of the view larger. Each enlargement is about 141% of the previous scale. Two successive enlargements produce an enlargement of exactly 200%. An enlargement followed by a reduction returns the view to its original scale.

The following illustration shows three views. The second is enlarged once from the original view. The third is enlarged once from the second.



Follow these steps to enlarge the view:

1. Select the Enlarge icon.
2. Continue selecting the Enlarge icon until you reach the desired scale.

## Displaying graphics objects

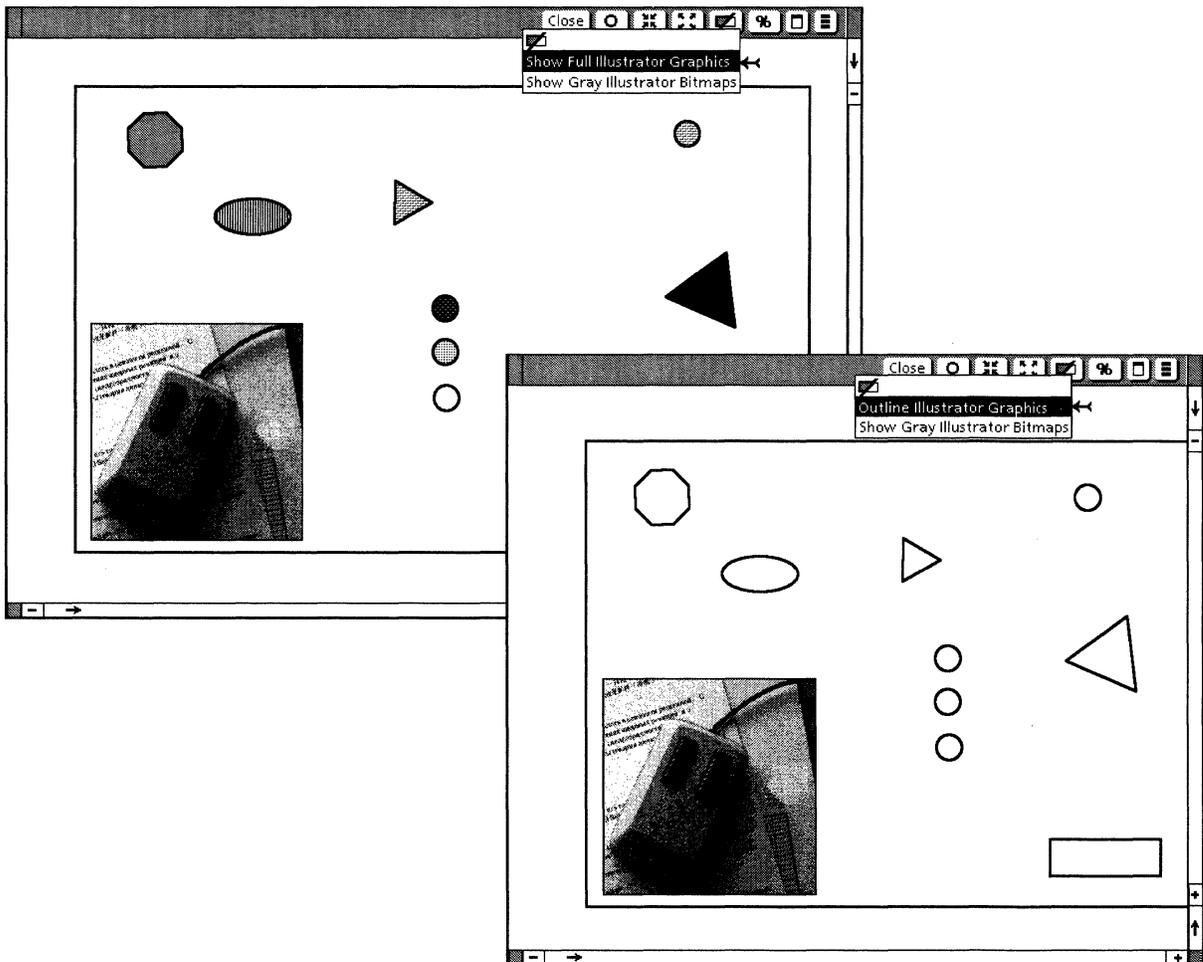
Display accesses a menu with two commands: [Outline Illustrator Graphics/Show Full Illustrator Graphics] and [Show Gray Illustrator Bitmaps/Show Full Illustrator Bitmaps]. These commands change the way objects appear in the View window.

### [Outline Illustrator Graphics] command

When you select [Outline Illustrator Graphics] on the Display menu, all the objects in the View window show as thin black outlines without dashed lines, line ends, tints, or fills. Points show as small dots regardless of actual point shape. In View windows, bitmap frames retain their raster images.

This feature speeds up the screen display time and can make editing easier. The object properties themselves are not changed; only the screen appearance is changed. To show all the object properties again, select [Show Full Illustrator Graphics] on the Display menu.

The following illustration shows objects in two View windows, one with [Show Full Illustrator Graphics] selected, and the other with [Outline Illustrator Graphics] selected. See the "Displaying" section Chapter 7 for more information on using the Display commands in the main document view.

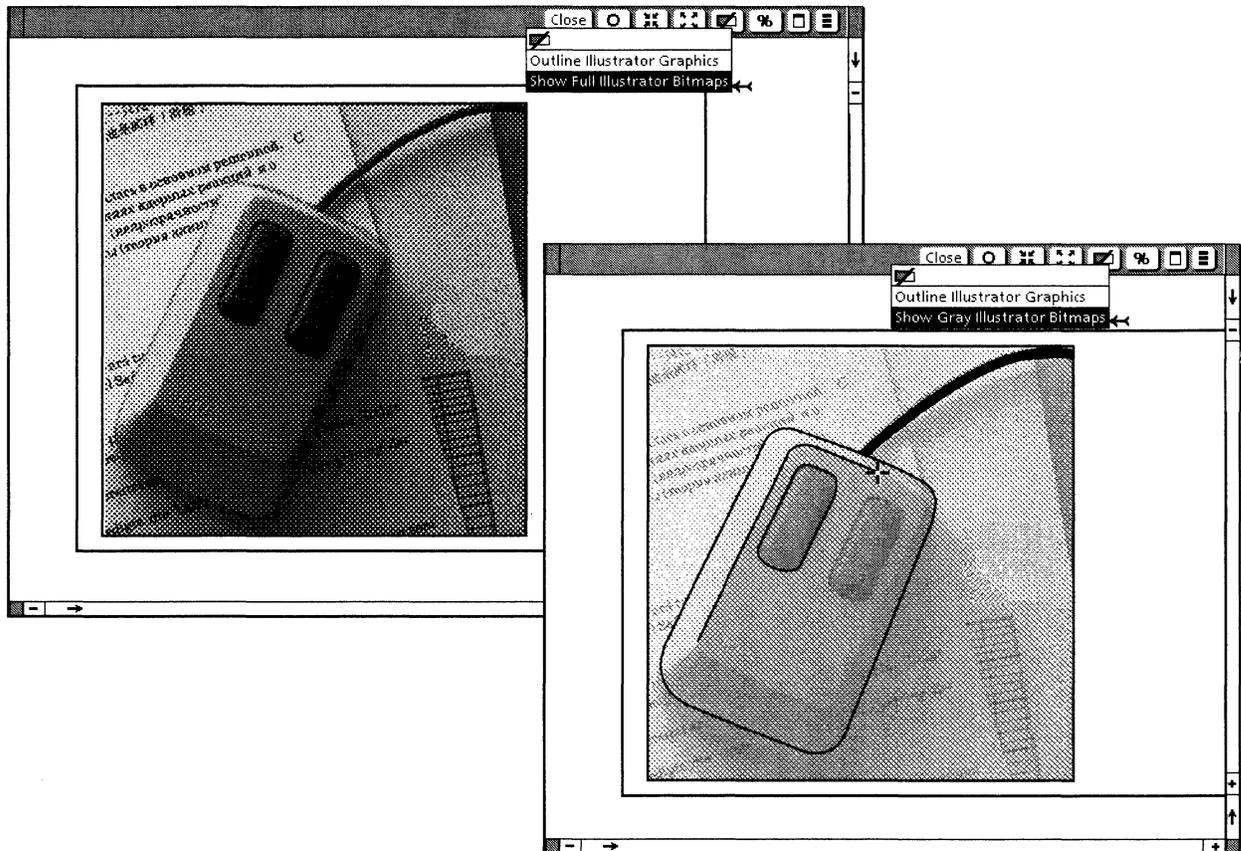


## [Show Gray Illustrator Bitmaps] command

When you select [Show Gray Illustrator Bitmaps] on the Display menu, the raster images inside bitmap frames which appear in the View window show as a light gray and white instead of black and white.

This feature is useful if you want to trace the outlines of the raster image. To show the raster image as black and white again, select [Show Full Illustrator Bitmaps] on the Display menu.

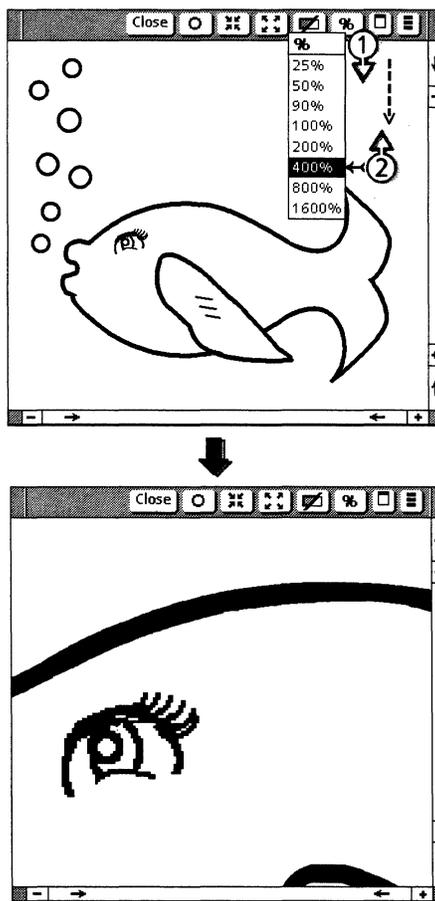
The following illustration shows objects in two View windows, one with [Show Full Illustrator Bitmap] selected, and the other with [Show Gray Illustrator Bitmap] selected.



## Setting scale

The Set scale command accesses a menu of view scales that you select to change the scale of the View window. The scale percentage is based on the actual scale when the object is printed, not on the view in the current View window.

The following illustration shows two views. The first is set at 200% of the original (not shown). The second is set at 800% of the original.



Follow these steps to set scale:

1. Place the cursor on the Set scale icon. Press and hold down the left mouse button. Move the cursor to the desired scale on the pull down menu.
2. Release the left mouse button.

*Xerox Pro Illustrator* provides a variety of electronic tools to help you position and align objects. These tools also help you to create technical illustrations requiring precise shapes and angles. This chapter describes these layout tools, which include the following:

- Gravity
  - Control point
  - Intersection
  - Object
- Directional constraints
  - Horizontal
  - Vertical
  - Lock angle
- Cross hairs
  - Linear
  - Angular
  - Plane (parallel and perspective)
  - Alignment
- Geometry
  - Linear
  - Angular
  - Parallel
  - Perspective.

---

## Gravity

---

Gravity allows you to control how objects are positioned with respect to one another. It helps you accurately draw, transform, copy, and move objects by providing snap or magnetism at the points where it is active. For example, gravity helps you join two line endings exactly, with no gap between them; or draw a line to the exact center of the side of a rectangle; or center a text frame within another object. Refer to Appendix B for tips on using gravity.

*Xerox Pro Illustrator* offers several levels of gravity. They are listed here, from the highest to the lowest level.

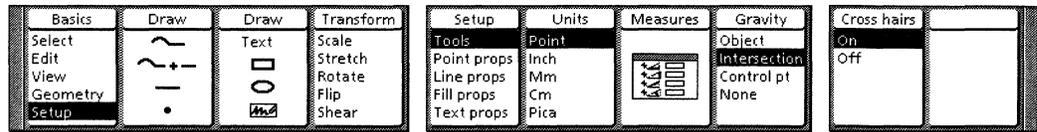
- Object
- Intersection ( automatic setting)
- Control point
- None (no gravity at all).

Each level of gravity contains the characteristics of the levels below it, as well as its own. Intersection gravity contains control point gravity; object gravity contains intersection and control point gravity.

The gravity level applies to all Pro Illustrator frames; you cannot have one gravity level in one frame and a different gravity level in another frame.

Object control points and intersections have a slightly stronger snap than the rest of an object (its outline or edge).

The following illustration shows the softkeys you use to select the gravity level.



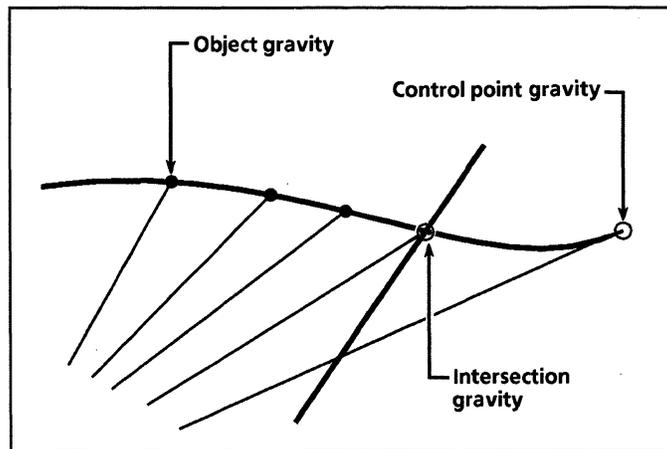
Follow these steps to select gravity level:

1. Select Setup on the Basics softkey.
2. Select the desired gravity level on the Gravity softkey or on the Tools property sheet (See Chapter 15).

## Gravity appearance

Xerox Pro Illustrator provides a visual indicator whenever you use gravity to align objects. Object control points, intersections, frame corners, and vanishing points display as a large open circle. Gravity along an object's outline displays as a small, solid round dot.

The following illustration shows the appearance of the different levels of gravity.



## Control point gravity

---

Control point gravity provides snap or magnetism at the following:

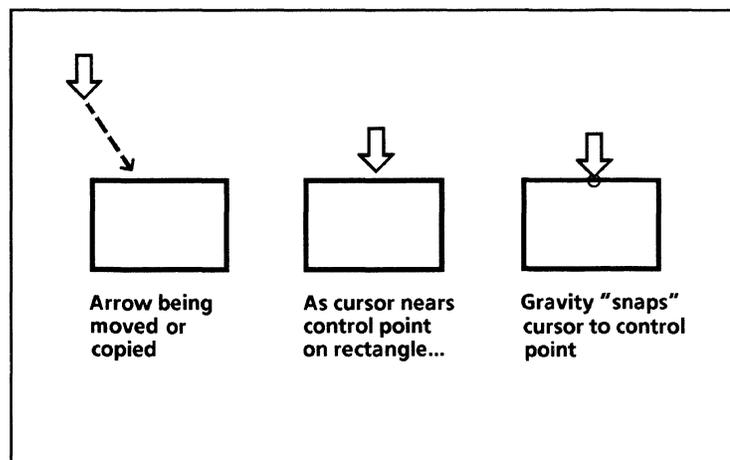
- Object control points
- Pro Illustrator frame corners, both in the main document view and in View windows
- Vanishing points in perspective geometry.

### Gravity at object control points

---

Gravity causes object control points to act like magnets; when you move the pointer close to a control point, gravity snaps the pointer to the control point. (Object control points are described in Chapter 7.)

As shown in the following illustration, control point gravity allows you to precisely align objects without having to make precise mouse movements. All you have to do is move the pointer close to the desired control point. The control point becomes visible as a large open circle when the pointer is close enough to be affected by its gravity, and the pointer snaps to the control point. In this example, the control point at the tip of the arrow is snapped to the control point at the top-center of the rectangle.



### Gravity at Pro Illustrator frame corners

---

Pro Illustrator frame corners have gravity, both in the main document view and in View windows. When you draw or move an object close to a frame corner, the frame corner becomes visible as a large open circle, and the pointer snaps to the frame corner.

### **Gravity at vanishing points**

---

Vanishing points in perspective geometry have gravity. When you draw or move an object close to the vanishing point, the vanishing point becomes visible as a large open circle, and the pointer snaps to the vanishing point. Vanishing control points are described in the Perspective geometry section in this chapter.

### **Intersection gravity**

---

Intersection gravity contains control point gravity in addition to its own characteristics. Intersection gravity provides snap or magnetism at intersections of the following:

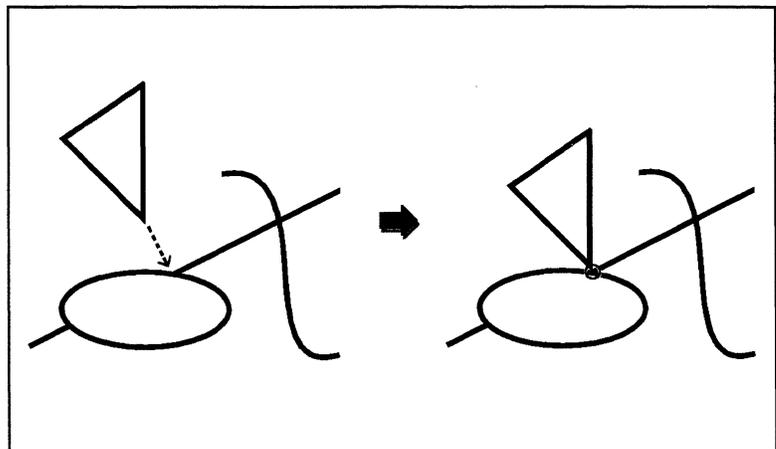
- Objects with other objects at their outlines
- Objects with grids and moving geometry
- Objects with directional constraints.

#### **Objects with other objects**

---

Intersection gravity is present at the intersection of straight lines with all other objects, at the intersection of circular arcs, and at the intersection of ellipses or arcs of the same shape.

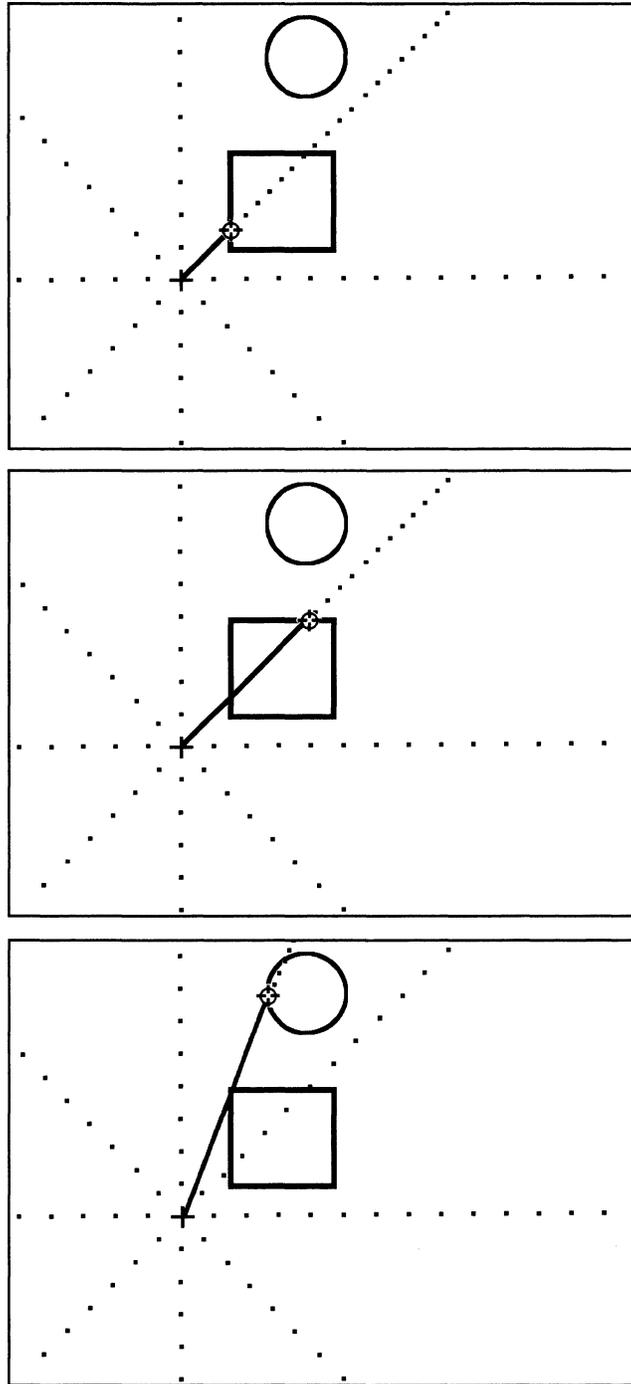
The following illustration shows intersection gravity at the intersection of two objects. When the triangle is moved near the intersection of the straight line and the ellipse, the pointer snaps to the intersection of the straight line and the ellipse, and the open circle appears, showing intersection gravity.



#### **Objects with grids and moving geometry**

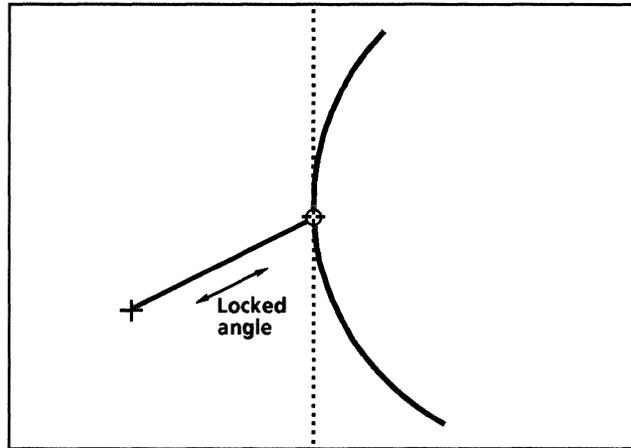
---

The following illustration shows both intersection gravity and control point gravity. Notice that, as the line is drawn, intersection gravity causes the pointer to snap to the points where the grid and rectangle intersect. This allows you to align the second end point of the line with the intersection gravity points. Intersection gravity works the same way between objects and moving geometry as it does between objects and grids. As the line is drawn beyond the rectangle, control point gravity causes the pointer to snap to the control point on the circle.



### Objects with directional constraints

The following illustration shows intersection gravity at the intersection of a line being drawn with the Lock angle directional constraint and an arc that lies in the direction of the locked angle. As the line nears the arc, the pointer snaps to the intersection of the arc and the Lock angle direction. Intersection gravity works the same way with the Horizontal and Vertical directional constraints as it does with the Lock angle constraint.



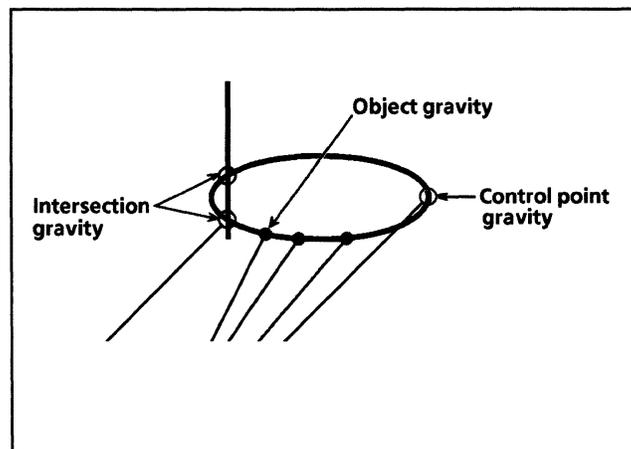
## Object gravity

Object gravity contains both control point gravity and intersection gravity in addition to its own characteristics.

Object gravity provides snap or magnetism along the outline or edges of an object. You need object gravity for drawing or placing an object at an arbitrary location along the edge of another object (not at a control point). You also need object gravity to place the Pin Point along an object's edge or outline in order to cut it.

The illustration shows the following:

- Object gravity at three points along the ellipse's edge
- Intersection gravity where the vertical line intersects the ellipse
- Control point gravity where the line's end point and the ellipse's control point touch.



Object gravity can slow system performance. Use it only when you need to.

## No gravity

---

When you select None on the Gravity softkey, *Xerox Pro Illustrator* turns off all gravity.

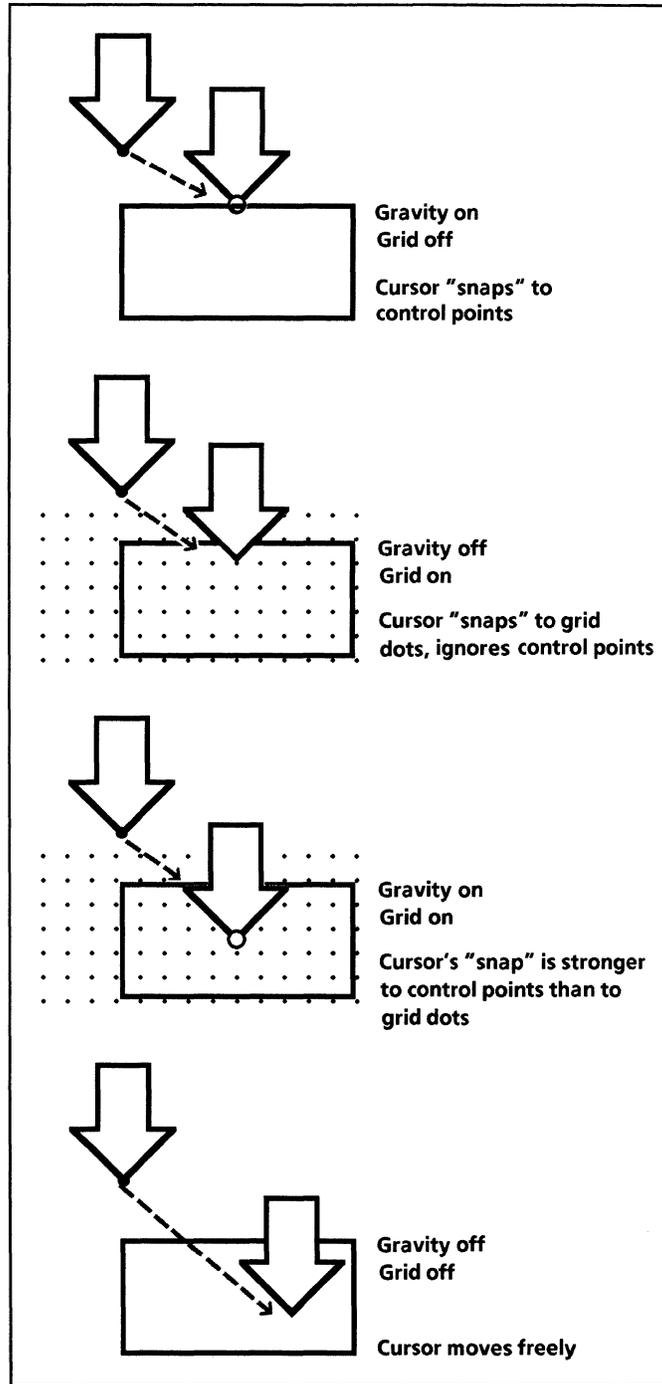
## Gravity, grids, and moving geometry

---

When you turn on geometry, the grids and moving geometry attract the pointer in a way similar to gravity. See the section, "Geometry" for more information.

The movement of the pointer is affected not only by gravity but also by the grid and moving geometry.

The following illustration shows how the pointer snaps to both object control points and linear grid dots.



If only gravity is on, the pointer snaps only to the locations specified by the level of gravity. If only the grid is on, the pointer snaps only to grid dots. If gravity and grid are both on, the pointer's snap is stronger to the locations specified by the level of gravity than it is to the grid dots. If both are off, the pointer moves freely.

## Turning gravity, grid, and moving geometry off

---

You can use <Shift> to temporarily turn off gravity, the grid, and moving geometry. As long as you hold down <Shift>, the pointer moves freely and does not snap to control points, grid dots, and moving geometry dots.

When you release <Shift>, gravity, the grid, and moving geometry are turned back on. You can use <Shift> even if you are already holding down a mouse button.

Pressing <Shift> does not turn off directional (Horizontal, Vertical, or Lock angle) constraints.

---

## Directional constraints

---

*Xerox Pro Illustrator* has three directional constraints:

- Horizontal
- Vertical
- Lock angle.

The directional constraints allow you to draw, copy, move, and transform objects exactly horizontally, vertically, or at any angle you specify. Directional constraints also provide alignment capability, either horizontal or vertical. The Horizontal and Vertical constraints are especially useful in creating drawings with objects arranged in rows or columns, such as organization charts. The Lock angle constraint provides you with precise control when drawing or manipulating objects at angles.

Directional constraints work with all types of geometry as well as with no geometry. In paraline and perspective geometries, directional constraints work in the specified plane; for example, horizontal is the angle of a horizontal line in the specified plane. Refer to the paraline and perspective geometry sections in this chapter for more information.

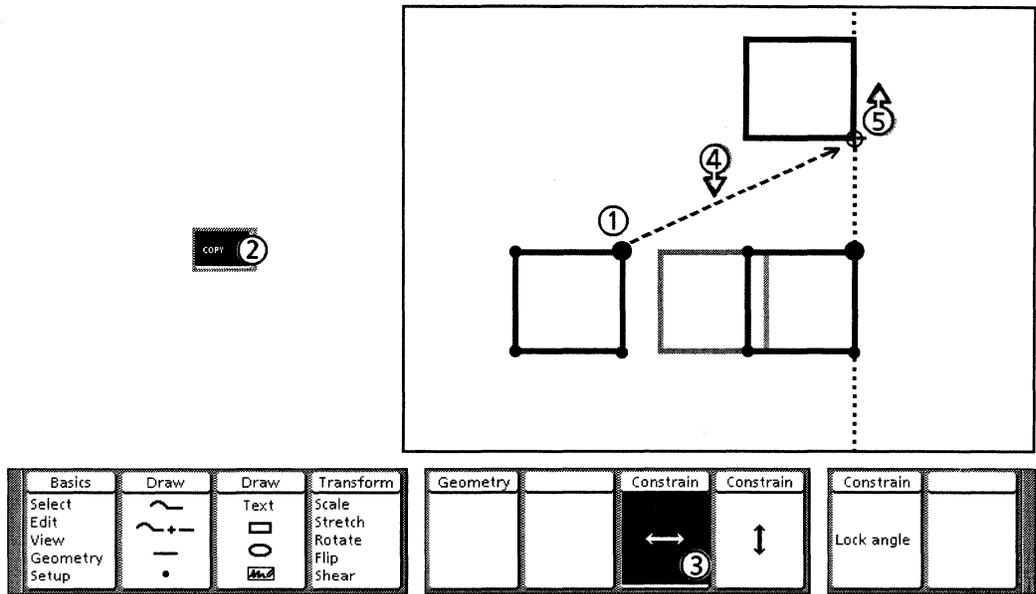
## Horizontal and Vertical

---

When the Horizontal constraint is on, the system responds only to horizontal mouse movement; it ignores any vertical mouse movement. As a result, the object is drawn, copied, moved, or transformed horizontally.

When the Vertical constraint is on, the system responds only to vertical mouse movement; it ignores any horizontal mouse movement. As a result, the object is drawn, copied, moved, or transformed vertically.

The following illustration shows the effect of the Horizontal constraint on the move and copy operations. Notice that the rectangle moves only horizontally even though the pointer moves both vertically and horizontally. Notice also that the Horizontal constraint allows you to vertically align the rectangle directly below another rectangle.



Follow these steps to use Horizontal or Vertical constraints:

1. Select the object to be copied or moved.
2. Press <Copy> or <Move>.
3. Select Horizontal icon or Vertical icon on the Constrain softkey.
4. Hold down the left mouse button. To align the rectangles vertically, move the pointer to the bottom right control point on the upper rectangle. The alignment cross hair appears.

You can change from Horizontal to Vertical constraint or vice versa and shut the constraints off while the mouse button is down.

5. When you see the open circle, release the left mouse button. The two rectangles are aligned vertically.

## Lock angle

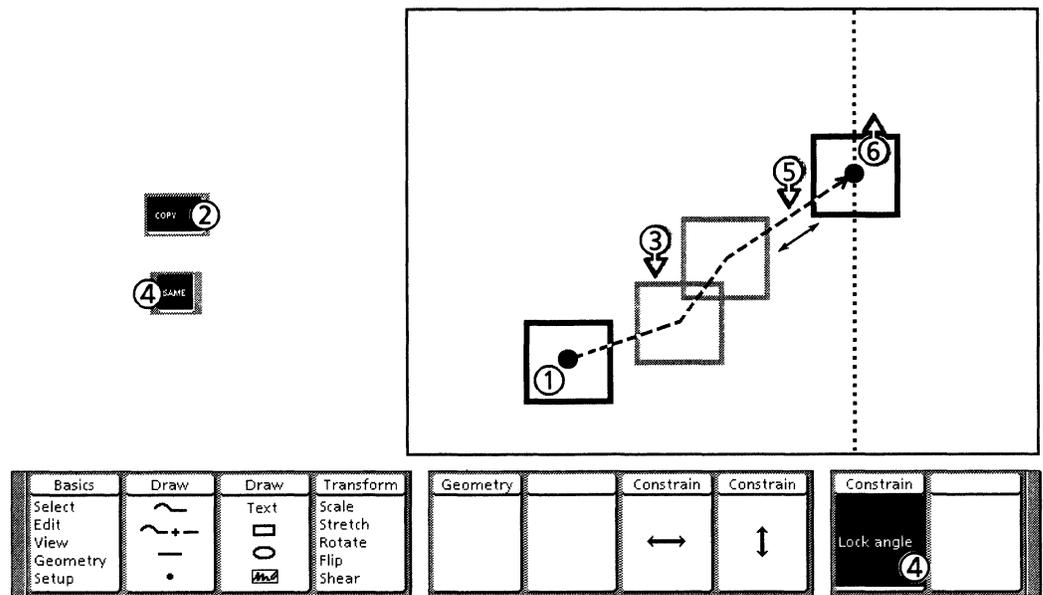
When the Lock angle constraint is on, the system responds only to mouse movement at the angle you specify; it ignores all other mouse movement. As a result, the object is drawn, copied, moved, or transformed at the specified angle.

You can also use Lock angle to extend the length of a line without changing its angle. All you do is control point select the end point and move it with the Lock angle constraint on. Refer to Appendix B for the procedure.

To select the Lock angle constraint, you press <Same> or select Lock angle on the Constrain softkey. <Same> toggles the Lock angle constraint on and off.

If you choose the Lock angle constraint while you are holding down the mouse button, the pointer's movement is constrained to the current angle.

The following illustration and procedure shows the effect of the Lock angle constraint when copying an object. Notice that the rectangle moves only along the specified angle even though the pointer moves elsewhere.



Follow these steps to use Lock angle constraint:

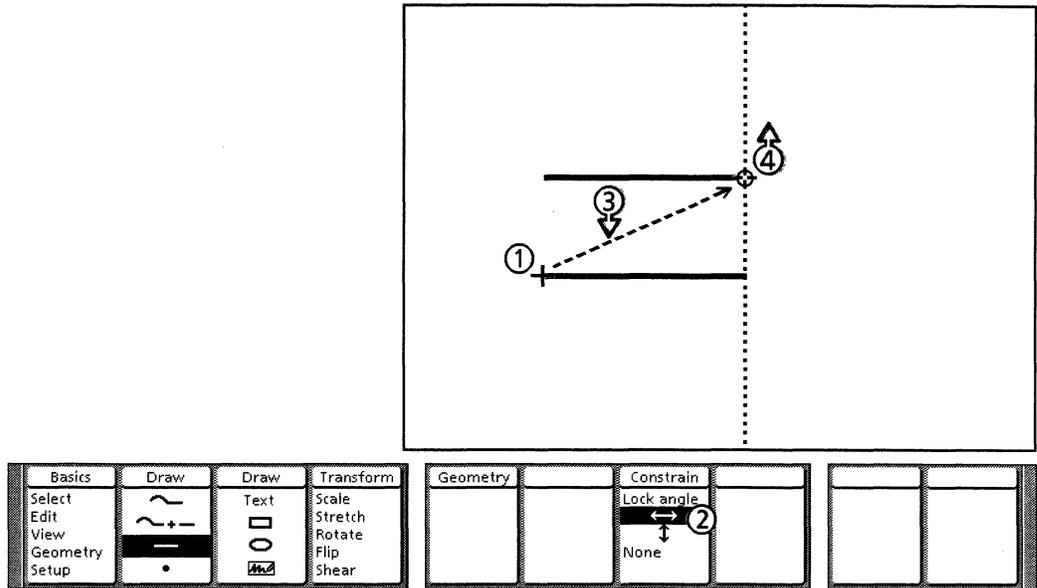
1. Select the object to be copied or moved.
2. Press <Copy> or <Move>.
3. Press and hold down the left mouse button. Move the object until it is at the desired angle.
4. While continuing to hold down the left mouse button, press <Same>, or press the function key to select Lock angle on the Constrain softkey.
5. Continue moving the object along the locked angle to the desired location.
6. Release the left mouse button.

## Alignment

Probably the most powerful feature of the directional constraints is alignment. While one direction is constrained, you can align objects in the opposite direction. When you select the Horizontal constraint, the alignment direction is vertical. When you select the Vertical constraint, the alignment direction is horizontal. The alignment cross hairs always show the direction of the alignment.

### Aligning end points of lines

The following illustration and procedure show how to align the end point of a line with the end point of an existing line. This capability is useful when creating forms, charts, and diagrams.



Follow these steps to align end points of lines:

1. Draw the first end point of the line.
2. Select the Horizontal icon on the Constrain softkey. Notice that the vertical alignment cross hair appears.
3. Hold down the left mouse button. Move the pointer to the second end point of the existing line.
4. When you see the open circle, release the mouse button. The two end points are exactly aligned.



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## Cross hairs

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*Xerox Pro Illustrator* has two categories of cross hairs that help you draw, align, and transform objects: geometry cross hairs and alignment cross hairs. The cross hairs snap to the grid, moving geometry dots, and gravity points, allowing precise alignment. In addition, they are a visual aid that helps you follow the movement of the pointer.

Geometry cross hairs – are active when you select a geometry type other than None on the Type softkey.

Alignment cross hairs – are active when you select a directional constraint (Horizontal, Vertical, or Lock angle) regardless of the type of geometry.

The following sections describe the cross hairs in more detail.

---

### Geometry cross hairs

---

The appearance of the geometry cross hairs depends on the type of geometry that is active. When you change the geometry type, the cross hairs change automatically. If the geometry type is None, there are no geometry cross hairs.

Pro Illustrator displays three types of geometry cross hairs:

- Linear
- Angular
- Plane.

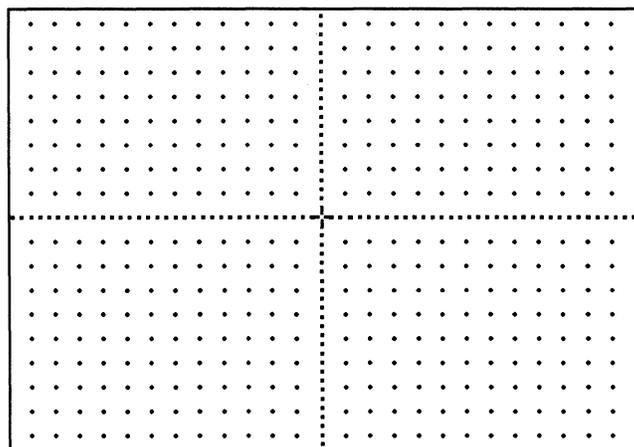
When you draw, copy, move, or transform objects, the cross hairs appear on the screen.

---

#### Linear cross hairs

---

When you select linear geometry, the linear cross hairs are available. The linear cross hairs are intersecting horizontal and vertical lines. They show horizontal and vertical positions from a point of origin.



Which cross hairs are visible depends on the selection on the Grid Active softkey (a changing softkey that appears when you select Geometry on the Basics softkey):

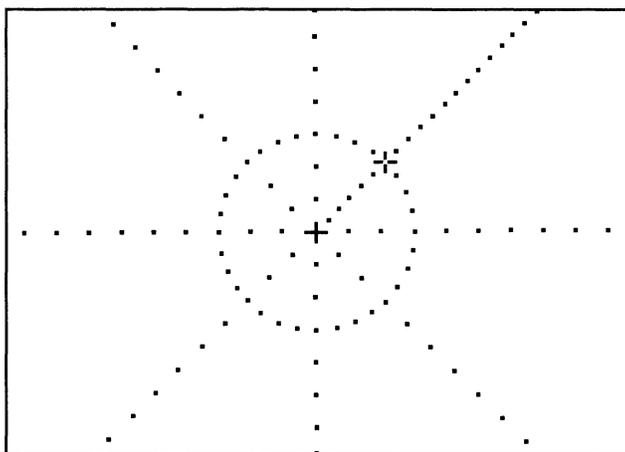
- When you select Horiz/Vert, both cross hairs are visible.
- When you select Horizontal, only the vertical cross hair is visible.
- When you select Vertical, only the horizontal cross hair is visible.
- When you select None, no cross hairs are visible.

Refer to section, "Linear geometry" for more information.

### Angular cross hairs

---

When you select angular geometry, the angular cross hairs are available. The angular cross hairs are represented by an angled line and a circle. They show distance and angle from a point of origin.



Which cross hairs are visible depends on the selection on the GridActive softkey (a changing softkey that appears when you select Geometry on the Basics softkey):

- Both the angle and the distance cross hairs are visible when you select Angle/Dist on the GridActive softkey.
- Only the angle cross hair is visible when you select Angle on the GridActive softkey.
- Only the distance cross hair is visible when you select Distance on the GridActive softkey.

Refer to the section, "Angular geometry" for more information.

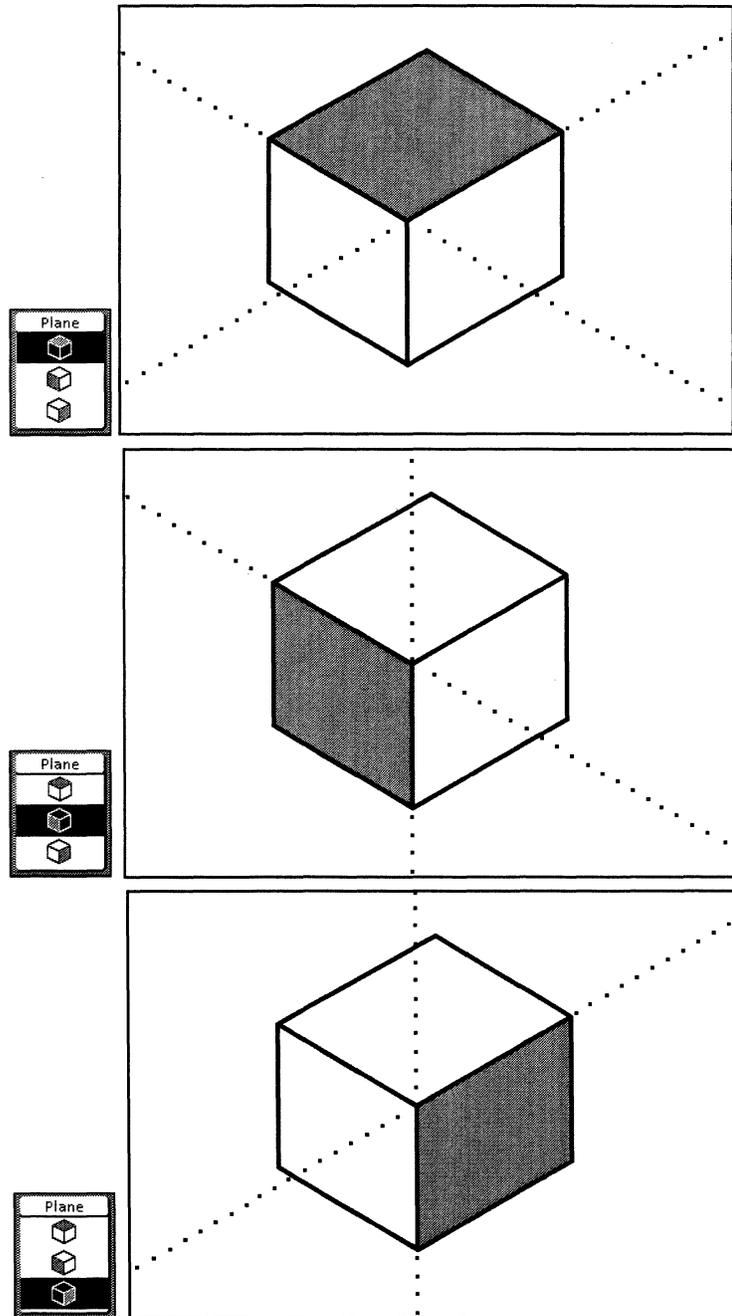
### Plane cross hairs

---

When you select paraline or perspective geometry, the plane cross hairs are visible. These cross hairs are two intersecting lines in the two directions corresponding to the current plane. The lines serve as a drawing guide, a reminder of which plane is currently selected, and they make it easier to visualize the plane.

**Paraline plane cross hairs**

The following illustration shows the appearance of the plane cross hairs with Isometric selected on the Style softkey. Notice that the cross hairs change depending on which plane you select on the Plane softkey. The shaded side of the box in the frame corresponds to the plane selected on the Plane softkey.



When you select Angle/Dist on the GridActive softkey, the cross hairs snap to the paraleine moving geometry dots, providing control over angles and the distance from the origin.

Refer to the Paraline geometry section in this chapter for more information on the GridActive softkey.

When you select Angle on the GridActive softkey, the pointer snaps to the angles but can be positioned at any distance from the origin.

### **Perspective plane cross hairs**

In addition to showing the current plane selected, perspective cross hairs change to always pass through the vanishing points at any location in the frame. As you move the pointer, the cross hairs and moving geometry angles change relative to the location of the vanishing points.

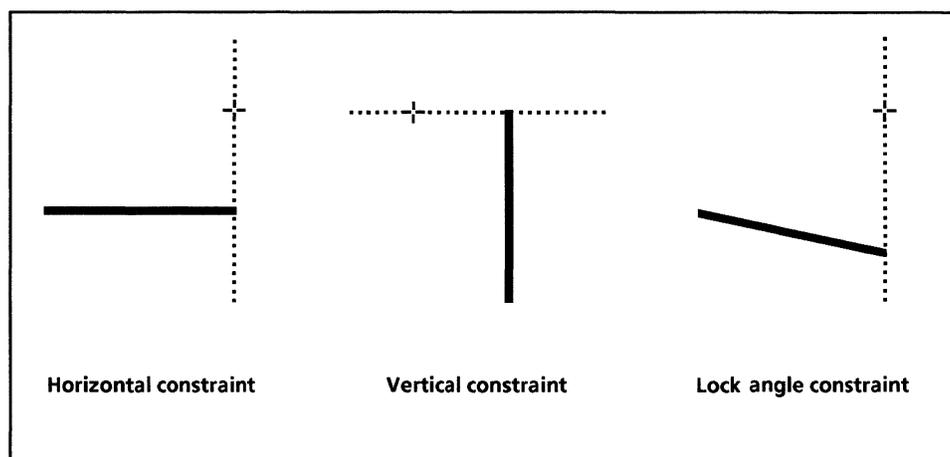
Refer to the Perspective geometry section in this chapter for more information.

## **Alignment cross hairs**

When you select a directional constraint: Horizontal, Vertical, or Lock angle, an alignment cross hair is visible in all types of geometry, including None. The alignment cross hair is a single line indicating the direction of alignment.

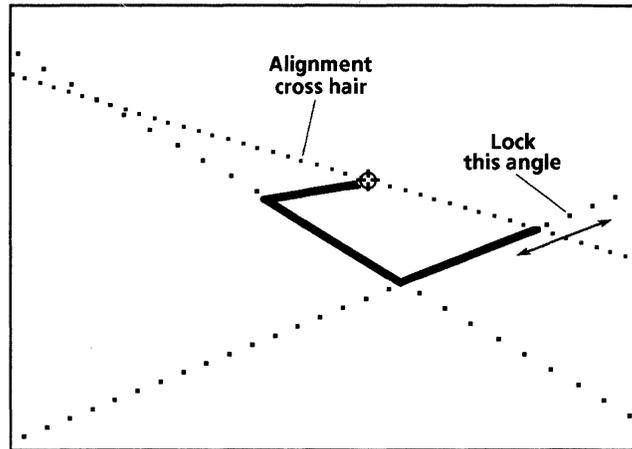
For the Horizontal constraint, a vertical cross hair displays. For the Vertical constraint, a horizontal cross hair displays. For the Lock angle constraint, either a horizontal or vertical cross hair displays, depending on which cross hair is the furthest from the locked angle. That is, for an angle closer to the Horizontal constraint, a vertical cross hair displays; for an angle closer to the Vertical constraint, a horizontal cross hair displays.

The following illustration shows the alignment cross hair in linear geometry for the three directional constraints.



In paraline and perspective geometries, alignment cross hairs appear in the specified plane. The following illustration shows the alignment cross hair while drawing a chain in perspective geometry, top plane. To align the third segment's end point with the first segment's end point, select the Lock angle constraint and move the pointer to the chain's first end point. When you see the open circle, release the mouse button. The first and third segments are correctly aligned.

Refer to the procedure Drawing an angular perspective box in the Working in perspective geometry section for more information.



## Turning cross hairs on and off

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You can turn the geometry and alignment cross hairs on and off. Use the following procedure.

Follow these steps to turn cross hairs on and off:

1. Select Setup on the Basics softkey.
2. Select On or Off on the Cross hairs softkey.

You can also use the Tools property sheet to turn cross hairs on and off. Refer to the Layout tools chapter for more information.

## Geometry

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Geometry is a system feature that provides a variety of useful geometric orientations while you are drawing and editing objects.

### Types of geometry

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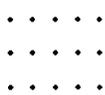
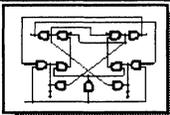
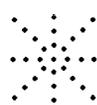
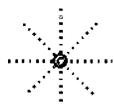
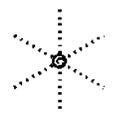
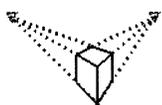
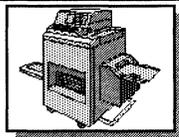
*Xerox Pro Illustrator* provides four types of geometry:

- Linear
- Angular
- Paraline
- Perspective.

In addition, you can select None as the geometry type, in order to work without grids or moving geometry. None is the automatic geometry type setting in *Xerox Pro Illustrator*.

Geometry, like Frame Units, is tied to each Pro Illustrator frame. You can have multiple frames in one or more documents that contain illustrations created with different geometries. Each time you click inside of a particular frame, the geometry you used to create the illustration in that frame is active.

The following illustration shows the four types of geometry available in *Xerox Pro Illustrator*.

	Grid	Moving geometry	Applications
<b>Linear</b>			
<b>Angular</b> Any angles			
<b>Paraline</b> 3 Angles for Isometric, Cabinet, Military and other views			
<b>Perspective</b> 1, 2 or 3 Vanishing points			

## Forms of geometry

---

Geometry can take two forms. It can appear as moving geometry and as a fixed grid, hereafter referred to as grid.

### Moving geometry

---

All geometries are available in the moving geometry form. Moving geometry provides correct angles and/or distances for the specified geometry in the form of a *moving* pattern of dots. When you draw and edit objects, the pattern of dots moves as you move the pointer so that the origin of the pattern is at the most recent mouse button-up location.

### Grid

---

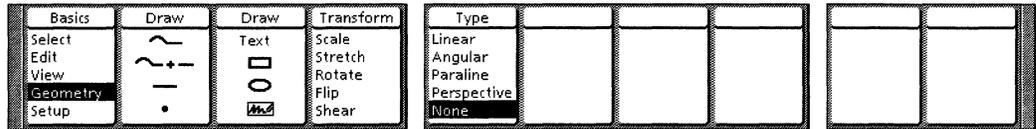
Linear and angular geometries are also available in the grid form. Grids provide correct angles and/or distances in the form of stationary patterns of dots—like having a piece of graph paper on the screen. Movement of the pointer does not affect the location of the pattern. The origin of the pattern stays fixed in its location.

## Selecting the type of geometry

You can select the type of geometry (linear, angular, paraline, perspective) and specify its properties using the Geometry mode softkeys or the Geometry property sheet.

### Geometry mode softkeys

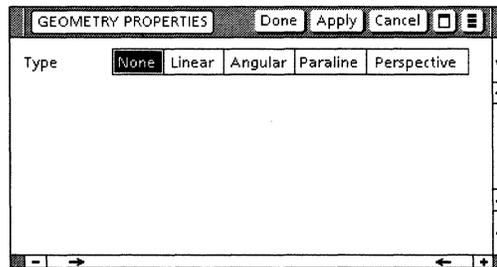
The following illustration shows the Geometry Type softkey that appears when you select Geometry on the Basics softkey. None is the geometry type automatically set by the system.



When you select the type of geometry on the Type softkey, the rest of the changing softkeys display the properties of that geometry type.

### Geometry property sheet

The following illustration shows the Geometry property sheet that appears when you select Geometry on the Basics softkey, and press <Props>. None is the geometry type automatically set by the system.



When you select the type of geometry on the Geometry property sheet, the property sheet changes to show the properties of that geometry type. Refer to the sections on each specific type of geometry for detailed information on the Geometry property sheet for each geometry type.

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## Linear geometry

---

Linear geometry is the Cartesian coordinate system. Its two angles are at 90 degrees (vertical and horizontal). Linear geometry has two forms in *Xerox Pro Illustrator*: The linear grid and linear moving geometry.

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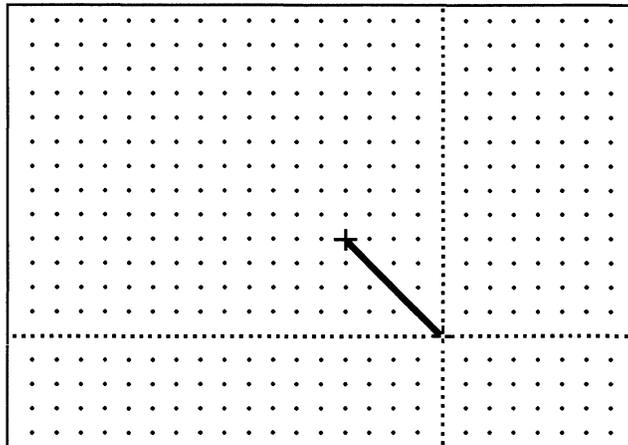
## Linear grid

---

The linear grid consists of a stationary dot pattern of horizontal and vertical lines. When you turn on the grid, the dots act like gravity, and objects can be drawn, copied, moved, and transformed only onto the grid dots.

Use the linear grid when you want the system to constrain linear distances. It is especially useful for making graphs and charts. Linear angles (90 degrees, horizontal, and vertical) are not constrained when you use the linear grid.

The following illustration shows a line being drawn using the linear grid and cross hairs.



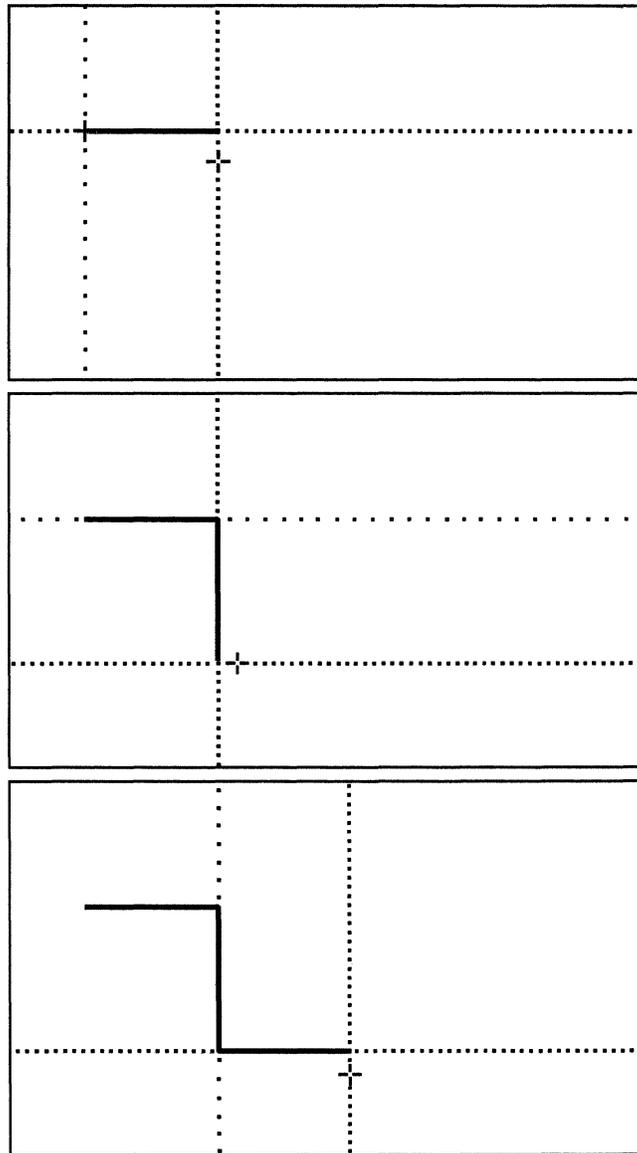

---

## Linear moving geometry

---

Linear moving geometry consists of a *moving* dot pattern of two intersecting lines, one horizontal and one vertical. Linear moving geometry provides distance and angular constraints. It is useful for drawing charts or diagrams where most of the elements are horizontal or vertical.

The following illustration shows a chain being drawn using linear moving geometry and cross hairs. Notice how the chain segments are constrained to be horizontal and vertical and how the origin of the moving geometry dots moves with the pointer. The moving geometry dots and cross hairs are shown as they appear while still holding down the mouse button after drawing each chain segment.



Refer to the procedure, "Drawing in linear moving geometry with Lock angle" in the "Drawing objects" section for steps to align linear objects.

### **Distance and angle constraints**

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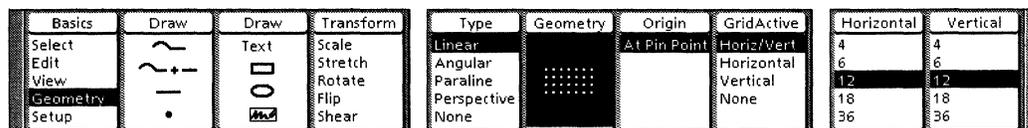
Linear moving geometry contains both distance and angle constraints. It allows you to precisely measure horizontal and vertical distances. It also constrains the drawing, editing, and transforming of objects to 90 degree angles (horizontal and vertical). The pointer snaps to the moving geometry dots.

## Angle constraints only

You can turn off the distance constraints so that the pointer snaps to the angles but can be any distance from the origin. To do this, you need to select None on the GridActive softkey.

## Selecting linear geometry on softkeys

This section describes the softkey choices for linear geometry. These choices remain set for a frame until you change them. The following illustration shows the softkeys used for selecting linear geometry and specifying its properties. These properties apply to both the linear grid and linear moving geometry.



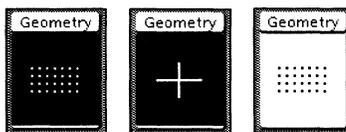
Follow these steps to select linear geometry on the softkeys:

1. Select Geometry on the Basics softkey.
2. Select Linear on the Type softkey.
3. Select the desired properties.
4. To turn off linear geometry, select None on the Type softkey.

## Geometry softkey

The Geometry softkey for linear geometry is a three-way toggle. Each time you select it, its setting changes. The following illustration show the three appearances for the Geometry softkey when linear geometry is active.

The first setting activates the linear grid. The second setting activates linear moving geometry. The third setting turns off linear geometry, both grid and moving geometry, totally.



The Geometry softkey also displays when you draw, copy, move, or transform objects. This allows you to easily change the form of geometry while you work, without having to return to the Geometry mode.

### **Horizontal and Vertical softkeys**

---

The Horizontal and Vertical softkeys allow you to control the spacing between the linear grid or linear moving geometry dots in the horizontal and vertical directions.

The first time you turn on the linear grid or linear moving geometry, the system uses a value of 12 points for both horizontal and vertical spacing. When you select a new value on either of these softkeys, the system uses the new value immediately and remembers it; the next time you open the frame, the system uses the most recently selected value.

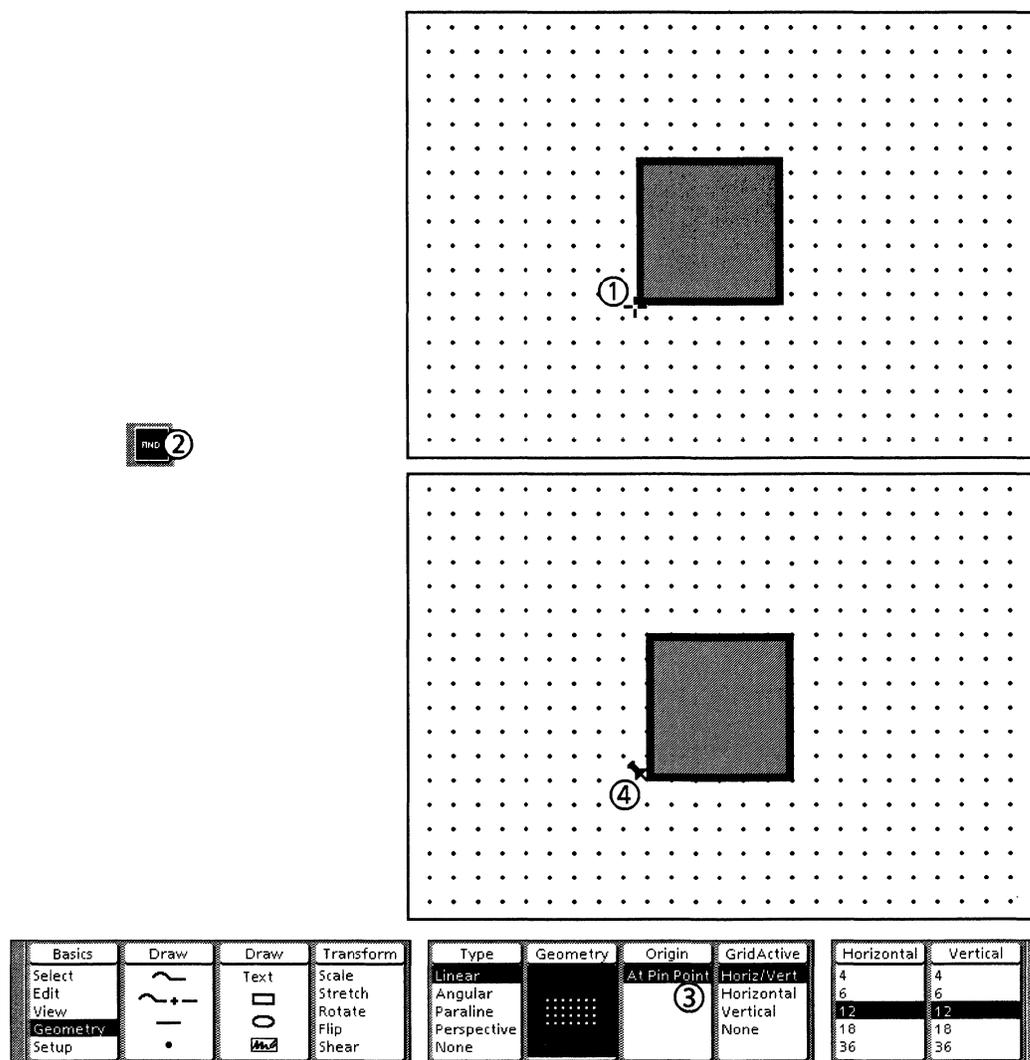
When you change the horizontal or vertical spacing, the linear grid or linear moving geometry origin does *not* change.

### **Origin softkey**

---

The Origin softkey allows you to change the location of the linear grid (like shifting grid paper beneath a drawing). When you change the grid's location, the system uses the new origin immediately and remembers it; the next time you open the document, the system uses the most recently selected location.

The following illustration demonstrates how to change the linear grid's location. In the top frame, a rectangle is positioned between grid dots; in the bottom frame, the grid is shifted so a grid dot is placed at the lower left corner of the rectangle.



Follow these steps to move the linear grid origin:

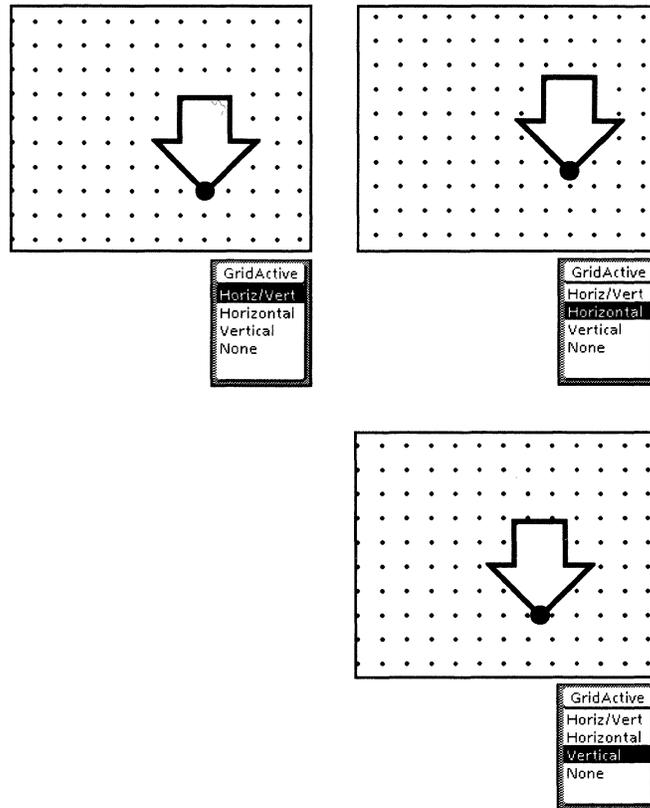
1. Position the pointer where you want a grid dot and click the left mouse button (at the lower left corner of the square).
2. Press <Find>. The system places the Pin Point at the selected location.
3. Select At Pin Point on the Origin softkey.
4. The system shifts the grid so a grid dot is located at the Pin Point.

#### GridActive softkey

The GridActive softkey offers the following four choices:

- Horiz/Vert
- Horizontal
- Vertical
- None.

The following illustration demonstrates the first three choices using the linear grid (notice the position of the control point at the tip of the arrow).



GridActive – means the grid is active (acts like gravity) in both the horizontal and vertical directions. The pointer snaps directly to grid dots.

Horizontal – means the grid is active only in the horizontal direction. The pointer snaps to grid dots in the horizontal direction, but can be positioned between grid dots in the vertical direction.

Vertical – means the grid is active only in the vertical direction. The pointer snaps to grid dots in the vertical direction, but can be positioned between grid dots in the horizontal direction.

The first three choices on the GridActive softkey have the same effect on the linear moving geometry that they have on the linear grid.

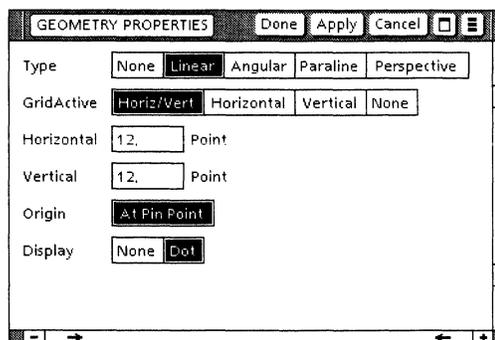
None – turns off the linear grid and the distance portion of the linear moving geometry. However, this choice does *not* turn off the angular portion of the linear moving geometry. The linear angles are still constrained, but the linear distance is not. With this choice selected, the pointer snaps to the angles but can be any distance from the origin.

## Selecting linear geometry on Geometry property sheet

---

You can also select linear geometry and specify its properties on the Geometry Property sheet. These choices remain set for a frame until you change them.

The following illustration shows the Geometry Property sheet for linear geometry. The properties apply to both the linear grid and the linear moving geometry.



## Selecting linear geometry on Geometry Property sheet

---

Follow these steps to select linear geometry on the Geometry Property sheet:

1. Select Geometry on the Basics softkey.
2. Press <Props>.
3. On the Geometry property sheet, select Linear in the Type box and select the desired properties.
4. Select Apply or Done.
5. To turn off linear geometry, select None in the Type box.

The properties are the same on the property sheet as they are on the softkeys except for Display.

## Display property

---

The Display property allows you to control the visibility of the linear grid and linear moving geometry.

When you select Dot, the linear grid and linear moving geometry are visible as patterns of dots. If you turn off the linear grid or linear moving geometry, they are not visible even if Dot is selected on the Geometry Property sheet.

When you select None, the linear grid and linear moving geometry are not visible but they are still functional. To turn off the linear grid and linear moving geometry, you need to select None on the Type softkey or toggle the Geometry softkey to the setting where the grid pattern is not highlighted.

## Working in linear geometry

---

This section explains how working in linear geometry affects Pro Illustrator operations. When you draw, move, copy, and transform objects, the Geometry softkey displays so that you can change the form of geometry without having to return to the Geometry mode.

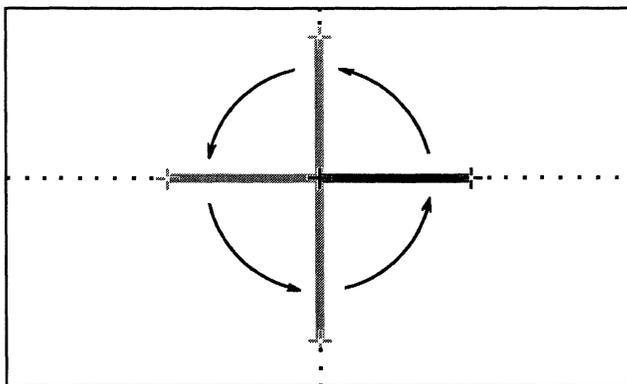
### Drawing objects

---

Drawing objects using linear geometry is the same as without geometry, in that the objects appear two-dimensional. The difference when drawing with linear geometry is that you have access to the linear grid and linear moving geometry.

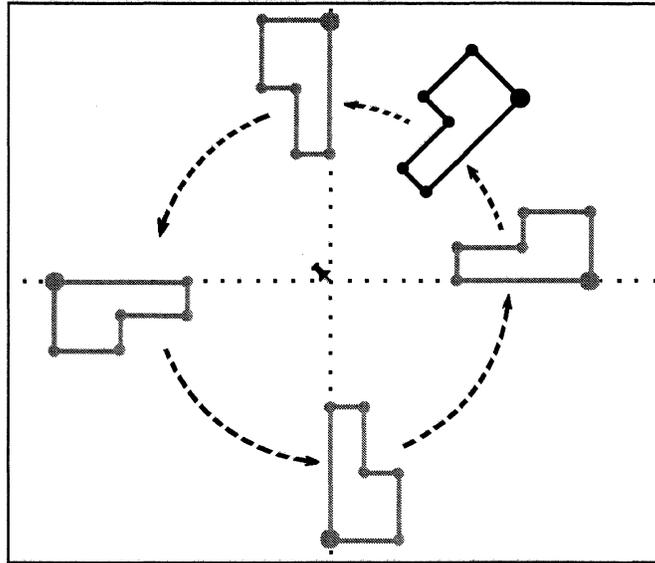
In draw mode, the linear moving geometry becomes active after the first mouse click. This allows you to start drawing anywhere. Once the first end point is drawn, the linear moving geometry origin is located at that point.

Linear moving geometry is very similar to the Horizontal and Vertical directional constraints. One difference is that when drawing in linear moving geometry, you can easily flop in all four directions, as shown in the following illustration. As you move the pointer while drawing the second end point of a line, the line flops in all four directions from the first end point. You can work quickly in the horizontal and vertical directions without having to select the Horizontal and Vertical constraints on the softkeys.



If you want to use gravity for alignment, you can use the Lock angle constraint to fix the direction.






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## Angular geometry

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Angular geometry is a polar coordinate system of equally spaced angles radiating from an origin. Angular geometry has two forms in *Xerox Pro Illustrator*, the angular grid and angular moving geometry. The appearance of the two forms is the same; that is, the grid dot pattern and the moving geometry dot pattern are identical. The difference is that the grid origin stays fixed in its location, while the moving geometry origin moves as you draw, copy, more, or transform objects.

---

## Angular grid

---

The angular grid consists of stationary dot patterns containing straight lines radiating from a point of origin. When you turn on the angular grid, the dots act like gravity; and objects can be drawn, copied, moved, and transformed only onto the grid dots. The origin remains stationary.

The angular grid allows you to precisely measure distance and angle from a point of origin. It is especially useful for drawing objects that require angular symmetry, such as gears, wheels, and clock faces.

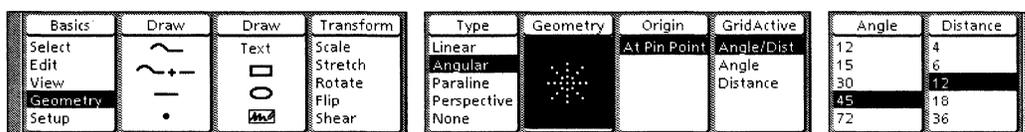
Refer to the Working in angular geometry section in this chapter for more information.

## Angular moving geometry

The angular moving geometry consist of *moving* dot patterns containing straight lines radiating from a point of origin. The origin moves with you as you draw, copy, move, or transform objects.

## Selecting angular geometry on softkeys

This section describes the softkey choices for angular geometry. These choices remain set for a frame until you change them. The following illustration shows the softkeys used for selecting angular geometry and specifying its properties. These properties apply to both the angular grid and angular moving geometry.



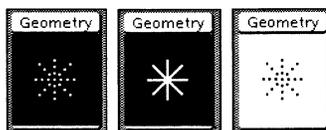
Follow these steps to select angular geometry on softkeys:

1. Select Geometry on the Basics softkey.
2. Select Angular on the Type softkey.
3. Select the desired properties.
4. To turn off angular geometry, select None on the Type softkey.

## Geometry softkey

The Geometry softkey for angular geometry is a three-way toggle. Each time you select it, its setting changes. The following illustration shows the three appearances for the Geometry softkey when angular geometry is active.

The first setting activates the angular grid. The second setting activates angular moving geometry. The third setting turns off angular geometry, both grid and moving geometry.



The Geometry softkey also displays when you draw, copy, move, or transform objects. This allows you to easily change the form of geometry while you work, without having to return to the Geometry mode.

## Angle and Distance softkeys

---

For the angular grid and angular moving geometry, distance is the spacing between the pattern dots outward from the origin. Angle is the spacing (in degrees) of the pattern dots that form angles about the origin, starting with zero degrees at the offset angle. The system sets the offset angle at the three o'clock position.

The first time you turn on the angular grid and angular moving geometry, the system uses 12 points for distance and 45 degrees for angle. The Distance and Angle softkeys allow you to change these values.

When you select a new value on either of these softkeys, the system uses the new value immediately and remembers it; the next time you open the frame, the system uses the most recently selected value.

The system displays the distance values in Frame Units. Refer to the Softkeys chapter for information on customizing the Distance and Angle softkeys to display the values you uses most.

## Origin softkey

---

The first time you turn on the angular grid or angular moving geometry, its origin is located in the upper right corner of the frame (the Pin Point location). The Origin softkey allows you to shift the angular grid (like shifting grid paper beneath a drawing) by moving the origin.

When you move the grid, the system uses the new origin immediately and remembers it; the next time you open the frame, the system uses the most recently selected location.

Follow these steps to move the angular grid origin:

1. Position the pointer where you want to place the grid origin and click the left mouse button.
2. Press <Find>. The system places the Pin Point at the selected location.
3. Select At Pin Point on the Origin softkey.
4. The system moves the angular grid so the origin is at the Pin Point.

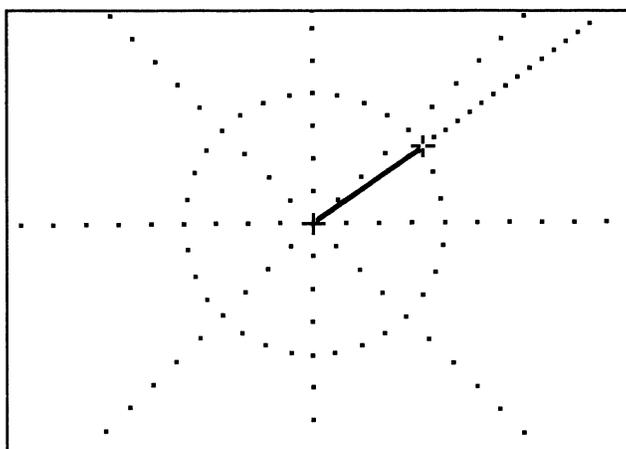
## GridActive softkey

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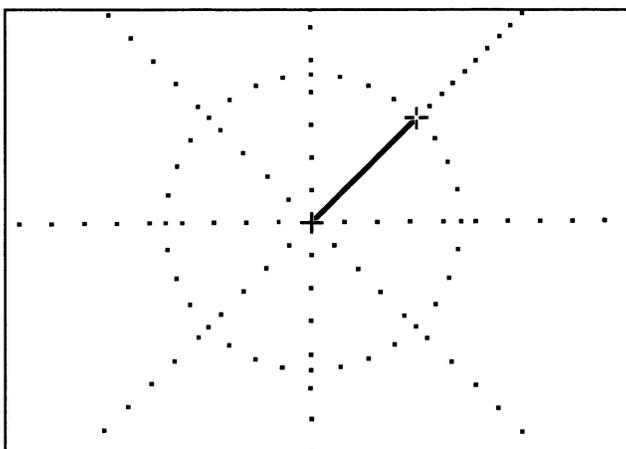
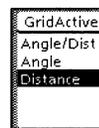
The GridActive softkey provides the following three choices:

- Angle/Dist
- Angle
- Distance.

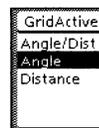
The following illustration demonstrates these choices (the illustration includes the angular cross hairs).



Line "snaps" to distance  
but can be drawn any angle



Line "snaps" to angle but  
can be drawn any distance



Angle/Dist – means the grid or moving geometry is active (acts like gravity) for both distance from the origin and angle. The pointer snaps directly to pattern dots.

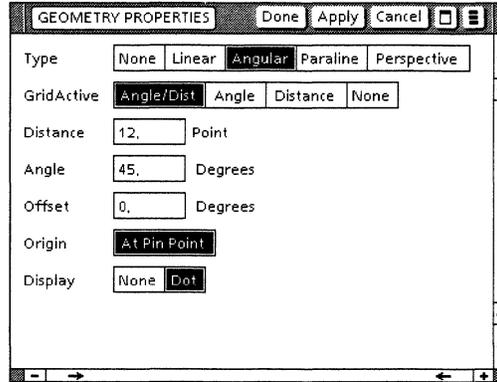
Angle – means the grid or moving geometry is active only for angle. The pointer snaps to angles, but can be positioned at any distance from the origin.

Distance – means the grid or moving geometry is active only for distance. The pointer snaps to distance pattern dots, but can be positioned at any angle.

## Selecting angular geometry on Geometry Property sheet

You can also select angular geometry and specify its properties on the Geometry Property sheet. These choices remain set for a frame until you change them.

The following illustration shows the Geometry Property sheet for angular geometry. The properties apply to both the angular grid and angular moving geometry.



Follow these steps to select angular geometry on the Geometry Property sheet:

1. Select Geometry on the Basics softkey.
2. Press <Props>.
3. On the Geometry Property sheet, select Angular in the Type box and select the desired properties.
4. Select [Apply] or [Done].
5. To turn off angular geometry, select None in the Type box.

The choices for the properties are the same on the property sheet as they are on the softkeys except for GridActive, Offset, and Display.

### GridActive property

On the property sheet, the GridActive property has the choice None which does not appear on the GridActive softkey. When you select this, you turn off the angular grid and angular moving geometry.

### Offset property

Offset is a property of the angular geometries that is available only on the property sheet, not on the softkeys. Offset allows you to change the alignment of the angular grid and angular moving geometry from their original default position of zero degrees at three o'clock.

If you enter a positive number, the grid and moving geometry shift counter clockwise by that number of degrees. If you enter a negative number, the grid and moving geometry shift clockwise.

Follow these steps to enter an Offset number:

1. Select Geometry on the Basics softkey.
2. Select Angular on the Type softkey.
3. Press <Props>. The system displays the Geometry property sheet.
4. In the Offset box, enter the number of degrees by which the grid is to be shifted (positive counterclockwise, negative clockwise).
5. Select [Apply] or [Done].

### **Display property**

---

The Display property allows you to control the visibility of the angular grid and angular moving geometry. When you select Dot, the angular grid and angular moving geometry are visible as patterns of dots. If you turn off the angular grid or angular moving geometry, they are not visible even if Dot is selected on the Geometry property sheet.

When you select None, the angular grid and angular moving geometry are not visible but they are still functional. To turn off the angular grid and angular moving geometry, you need to select None on the Type softkey or toggle the Geometry softkey to the setting where the grid pattern is not highlighted.

## **Working in angular geometry**

---

This section explains how working in angular geometry affects *Xerox Pro Illustrator* operations. When you draw, move, copy, and transform objects, the Geometry softkey displays so that you can change the form of geometry without having to return to the Geometry mode.

### **Drawing objects**

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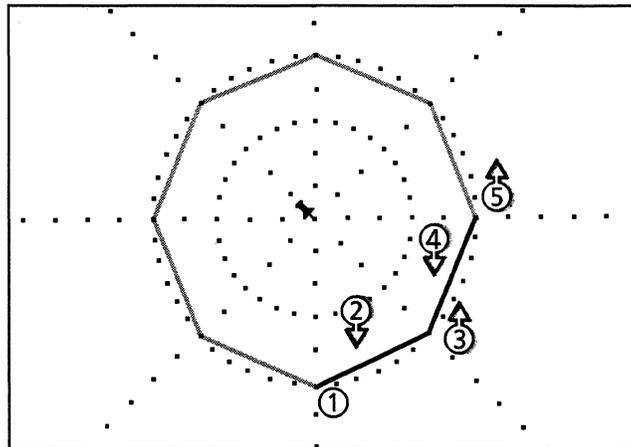
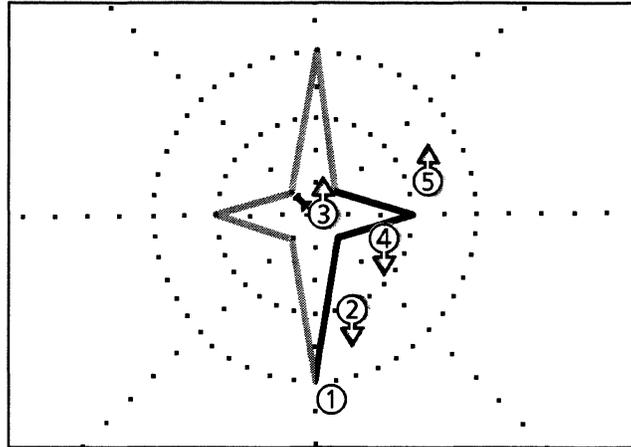
Drawing objects using angular geometry is the same as without geometry, in that the objects appear two-dimensional. The difference when drawing with angular geometry is that you have access to the angular grid and angular moving geometry.

### **Drawing with angular grid**

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The following illustrations demonstrate how to use the angular grid to draw chained shapes (a star and a polygon). Notice how the grid origin remains in the same location and how the distance cross hair (the circle) helps you position each chain segment.

The illustrations show the first five steps in the creation of each object. See Chapter 11 for more information on drawing chained shapes.

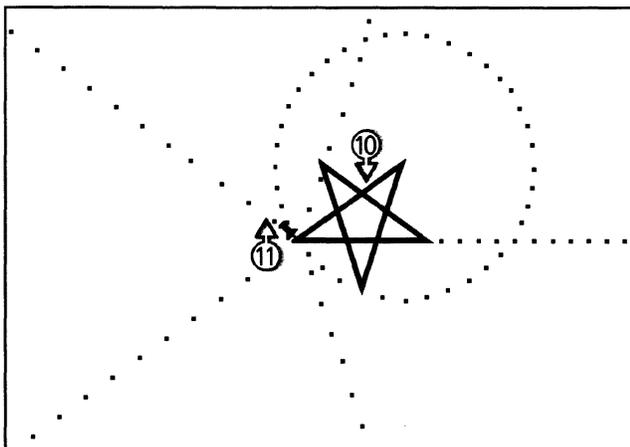
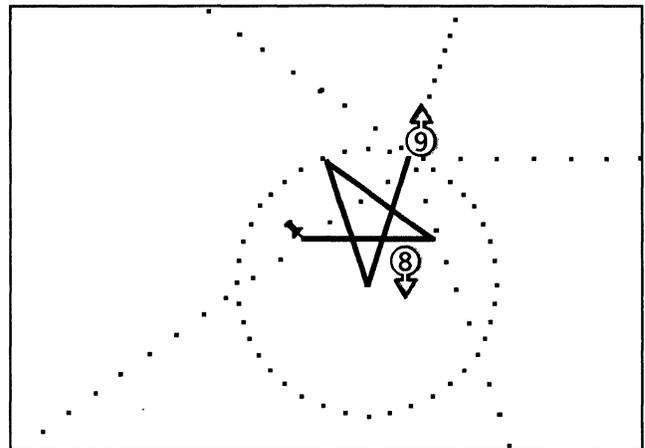
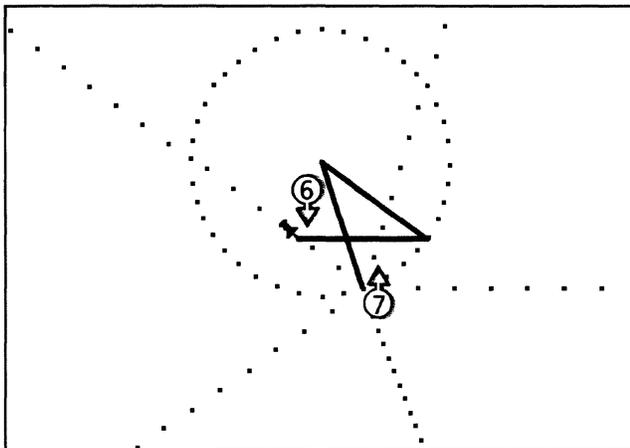
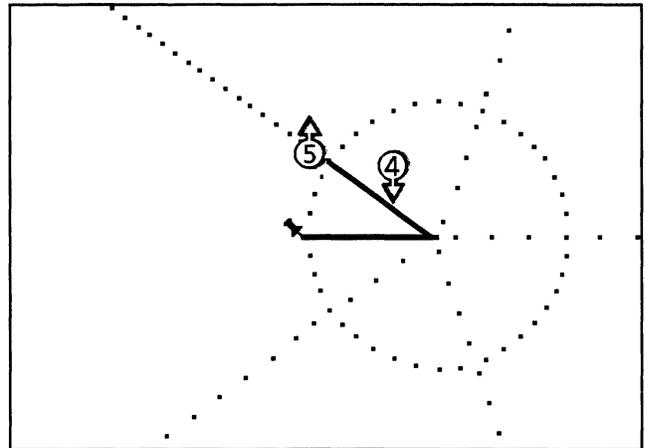
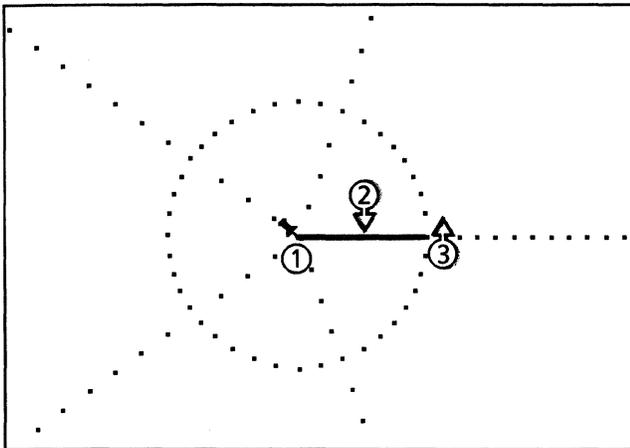


### Drawing with angular moving geometry

In draw mode, angular moving geometry becomes active after the first mouse click. This allows you to start drawing anywhere. Once the first end point is drawn, the moving geometry origin is located at that point.

The following illustrations show how to use angular moving geometry to draw a five-pointed star made up of five crossing line segments. Notice how the moving geometry origin moves, as each segment is completed, to help you draw the next segment at the correct angle.

To create this object, the grid angle is set at 72 degrees.



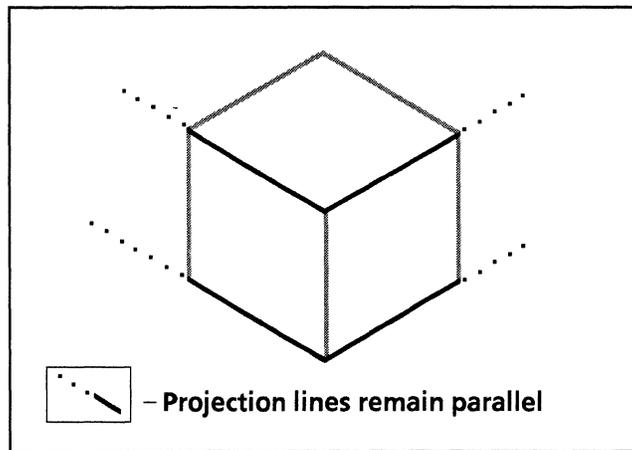
## Transforming objects

When you rotate an object when angular geometry is active, rotation angle detents are provided for the specified angles.

## Paraline geometry

Paraline geometry is a form of angular geometry which has three separately specified angles that define three projection planes (like the three sides of a cube: top, left, and right). The term paraline refers to projections in which the projection lines remain parallel.

A projection is a two-dimensional representation of a three-dimensional object. Projection lines are the lines in the projection which are drawn away from the picture plane (flat surface of the paper or computer screen) in a direction away from the viewer and into the drawing. The following illustration shows an isometric projection with the projection lines labeled as remaining parallel.

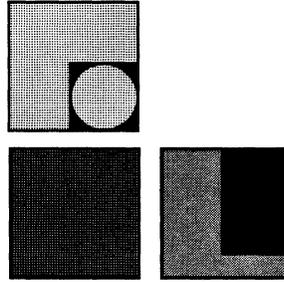


Paraline projections include the following:

- Axonometric
  - Isometric
  - Dimetric
  - Trimetric
- Oblique
  - Cavalier
  - Military
  - Cabinet.

The following illustration shows examples of paraline projections. Notice how the three sides of the cube shown as flat and straight-on in the orthographic projection appear when drawn on the three planes of the paraline projections. It is easier to visualize the whole object in space when you do not have to construct the object mentally from the flat views.

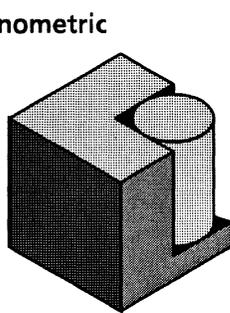
## Orthographic projection



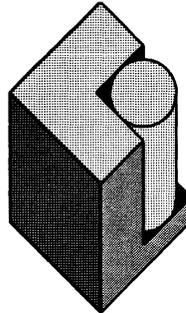
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## Paraline projections

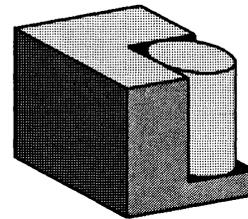
### Axonometric



Isometric



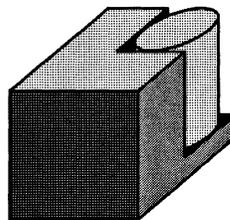
Dimetric (45°)



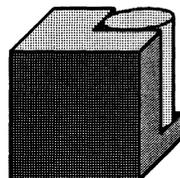
Trimetric (10° and -28°)

### Oblique

#### Elevation obliques

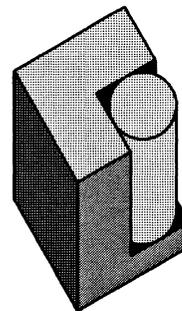


Cavalier

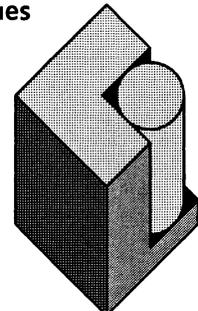


Cabinet

#### Plan obliques



Military



45° plan oblique

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## Axonometric projection

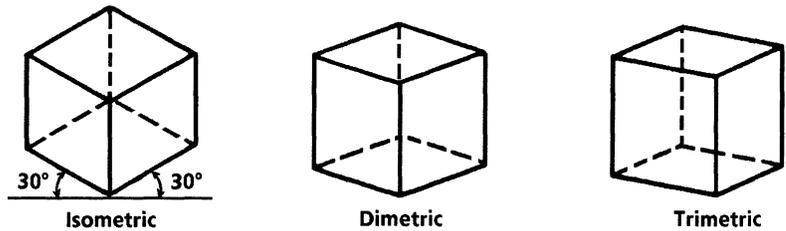
An axonometric projection represents a three-dimensional object on a single picture plane (sheet of paper or computer screen). The three planes (sides) of the object are oriented so that it looks three-dimensional. In axonometric drawing, the projection lines remain parallel and are perpendicular to the picture plane.

Isometric – is the most common style of axonometric projection. In an isometric view, all three sides of the object are equally exposed, and the angle between the two axes and the horizontal is 30 degrees.

Dimetric – is another style of axonometric projection. In a dimetric view, two sides of the object are equally exposed, but the top plane is more or less exposed than the sides.

Trimetric – is a third style of axonometric projection. In a trimetric view, the object is rotated so that all three sides are exposed differently.

The following illustration shows isometric, dimetric, and trimetric projections.



*Xerox Pro Illustrator* provides one preset style of axonometric projection, isometric. However, you can use the Geometry property sheet to create angles for other styles. Refer to the section, “Style and Angles properties” for more information.

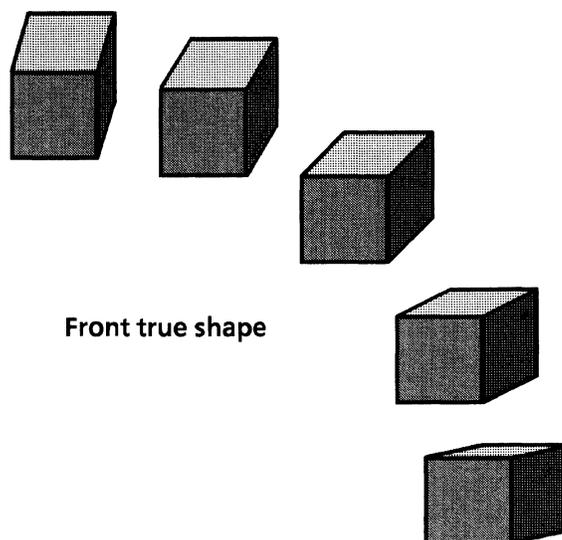
## Oblique projection

---

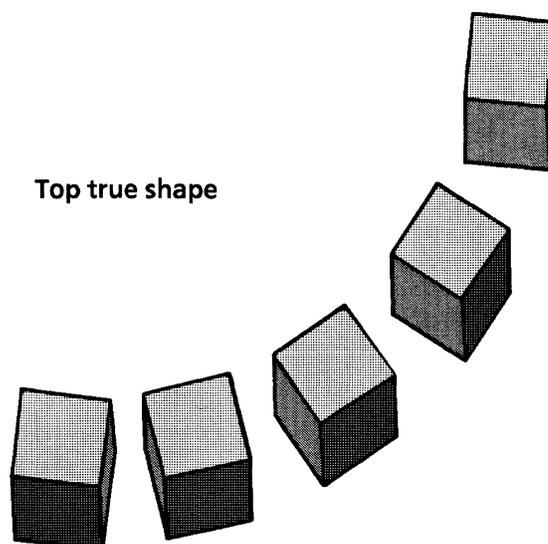
An oblique projection represents a three-dimensional object on a single picture plane (sheet of paper or computer screen). The three planes (sides) of the object are oriented so that it looks three-dimensional. In oblique drawing, the projection lines remain parallel and are oblique to the picture plane.

In an oblique projection, one side, or plane, is often presented in its true shape, that is, parallel to the plane of projection. This is true in both the Cavalier and Military styles. From the true shape, parallel projection lines are drawn at any angle to represent the perpendiculars to the true shape plane. The Cabinet style uses the same angles as the Cavalier style with projection lines that are half their true length.

The following illustration shows the front of the object as the true shape. Notice how the right side and the top side vary in shape and area as the angles of the projection lines vary. These are examples of elevation oblique drawings, drawings that present one set of the vertical planes in their true shape.



The following illustration shows the top of the object as the true shape. Notice how the front and sides vary in shape and area by turning the top of the object. The projection lines are vertical. These are examples of plan oblique drawings, drawings that present the horizontal planes in their true shape.



Because they can project one side in its true shape, oblique projections are preferable to axonometric projections in representing certain objects. For example, in axonometric projections, circles nearly always project as ellipses because the surfaces are inclined to the plane of projection. In oblique projections, the object may be positioned so that surfaces containing circles are parallel to the plane of projection, meaning that circles appear as circles.

Xerox Pro Illustrator provides two preset styles of oblique projections, Cavalier and Military. However, you can use the cavalier style to create cabinet projections, and the Geometry property sheet to create angles for other styles. Refer to the section, "Style and Angles properties" for more information.

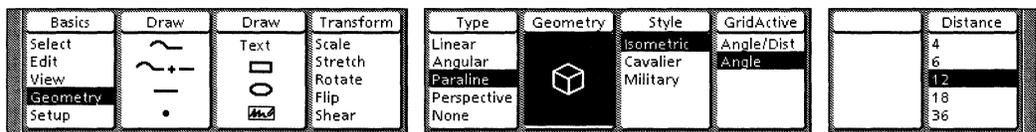
## Paraline moving geometry

Paraline moving geometry consists of *moving* dot patterns containing straight lines radiating from a point of origin. The origin moves as you draw, copy, move, or transform objects. There is no paraline fixed grid.

Refer to the procedure, "Drawing an isometric box" for more information.

## Selecting paraline geometry on softkeys

This section describes the softkey choices for paraline geometry. These choices remain set for a frame until you change them. The following illustration shows the softkeys used for selecting paraline geometry and specifying its properties.



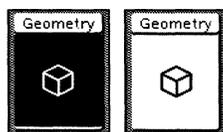
Follow these steps to select paraline geometry on the softkeys:

1. Select Geometry on the Basics softkey.
2. Select Paraline on the Type softkey.  
The system displays the paraline geometry softkeys.
3. Select the desired properties (described in the following sections).
4. To turn off paraline geometry, select None on the Type softkey.

### Geometry softkey

The Geometry softkey for paraline geometry is a two-way toggle. Each time you select it, its setting changes. The following illustrations show the two appearances for the Geometry softkey when paraline geometry is active.

The first setting activates the paraline moving geometry; the second turns it off.



The Geometry softkey also displays when you draw, copy, move, or transform objects. This allows you to easily change the form of geometry while you work, without having to return to the Geometry mode.

### Style softkey

---

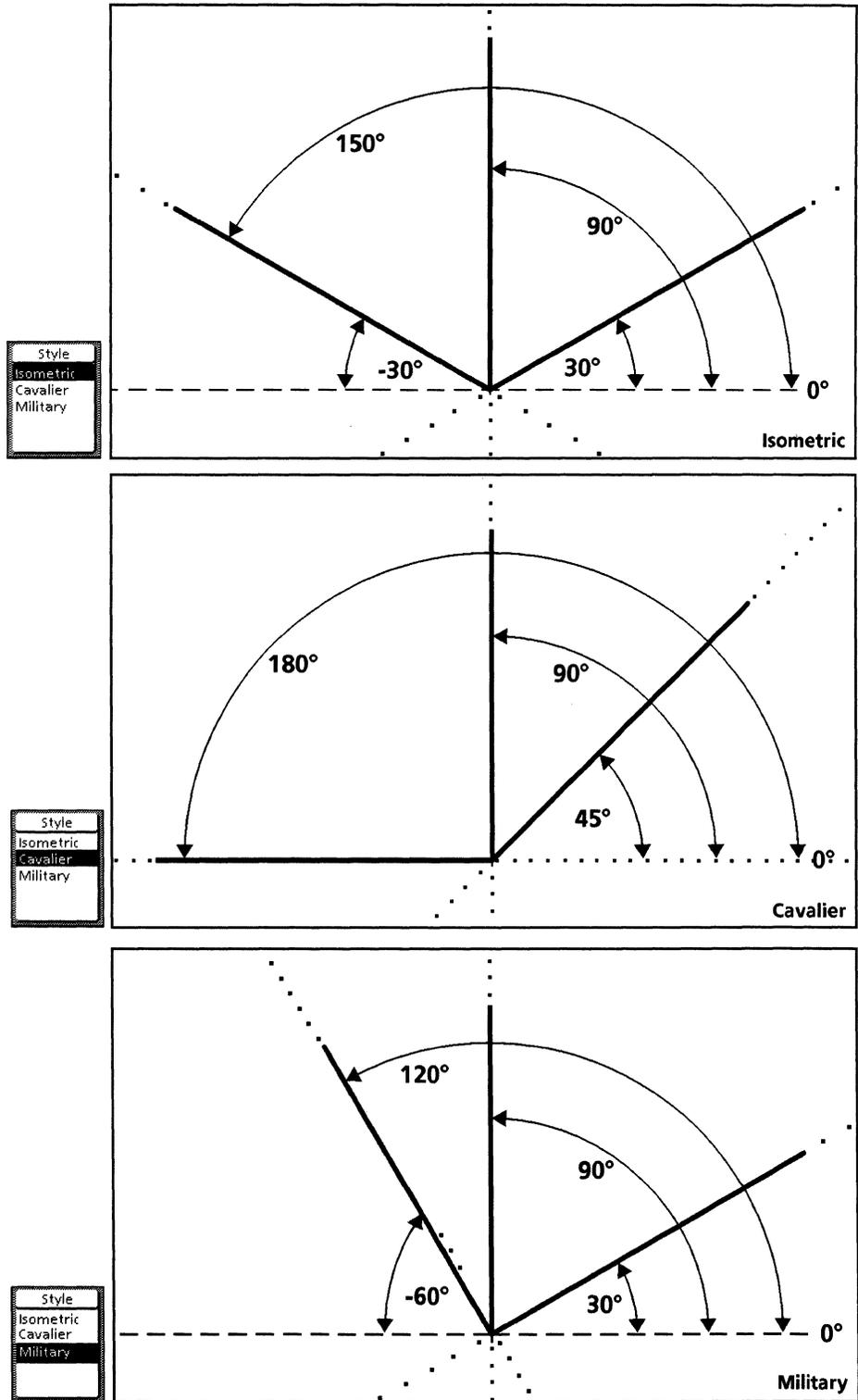
*Xerox Pro Illustrator* has three preset styles of paraline moving geometry:

- Isometric (default setting)
- Cavalier
- Military.

When you make a selection on the Style softkey, you are specifying the exact angles for these preset styles:

- Isometric (angles are 30, 90, and 150 degrees)
- Cavalier (angles are 45, 90, and 0 degrees)
- Military (angles are 30, 90, and 120 degrees).

The following illustration shows the three preset styles of paraline moving geometry.



You can specify other angles using the Geometry property sheet. Refer to the "Style and Angles properties" section in this chapter for more information.

### Distance softkey

---

For paraline moving geometry, distance is the spacing between the pattern dots outward from the origin. The value on the Distance softkey sets the distance along all three axes in order to support isometric, cavalier, and military projections, whose axes all have equal distances. The system displays the distance values in Frame Units.

### GridActive softkey

---

The GridActive softkey offers two choices: Dist/Angle and Angle (default setting).

Angle/Dist – means the moving geometry is active (acts like gravity) for both distance from the origin and the angles. The pointer snaps directly to the pattern dots.

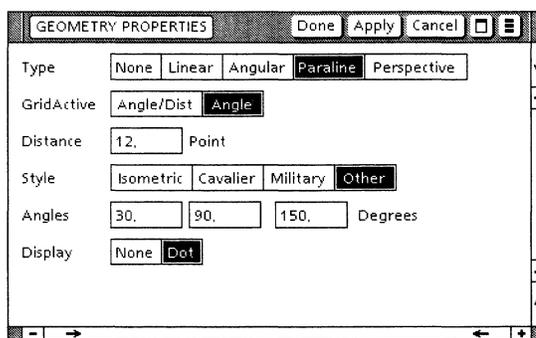
Angle – means the moving geometry is active only for the angles. The pointer snaps to angles, but can be positioned at any distance from the origin.

## Selecting paraline geometry on Geometry property sheet

---

You can also select paraline geometry and specify its properties on the Geometry property sheet. These choices remain set for a frame until you change them.

The following illustration shows the Geometry property sheet for paraline geometry.



Follow these steps to select paraline geometry on Geometry property sheet:

1. Select Geometry on the Basics softkey.
2. Press <Props>.
3. On the property sheet, select Paraline in the Type box and select the desired properties.
4. Select [Apply] or [Done].
5. To turn off paraline geometry, select None in the Type box.

The choices for the properties are the same on the property sheet as they are on the softkeys except for Style, Angles, and Display.

### **Style and Angles properties**

---

You can use the Geometry property sheet to specify other styles of paraline geometry, for example, dimetric and trimetric.

Follow these steps to different styles of paraline geometry:

1. Select Geometry on the Basics softkey.
2. Press <Props>.
3. On the property sheet, select Paraline in the Type box and select Other in the Style box.
4. Change the values in the Angles boxes and select Apply or Done. The moving geometry angles change to those you specify.
5. To return to one of the three preset styles, simply select the desired style on the Geometry property sheet or Style softkey.

### **Display property**

---

The Display property allows you to control the visibility of paraline moving geometry.

When you select Dot, the paraline moving geometry is visible as a pattern of dots. If you turn off paraline moving geometry, it is not visible even if Dot is selected on the Geometry property sheet.

When you select None, paraline moving geometry is not visible but it is still functional. To turn off paraline moving geometry, you need to select None on the Type softkey or toggle the Geometry softkey to the setting where softkey is not highlighted.

## **Working in paraline geometry**

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This section explains how working in paraline geometry affects *Xerox Pro Illustrator* operations.

### **Geometry softkey**

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When you draw, move, copy, and transform objects, the Geometry softkey displays so that you can change the form of geometry without having to return to the Geometry mode. Refer to the "Selecting paraline geometry on softkeys" section in this chapter for more information.

## Plane softkey

---

The Plane softkey allows you to select the desired parallel plane in which you draw, copy, move, and transform objects. It displays only while moving geometry is active. The first cube on the Plane softkey represents the top plane; the second, the left plane; the third, the right plane.

If you have chosen the incorrect plane, you can change it while the mouse button is down (except when you are drawing rectangles and ellipses – they are not constrained to the new plane).

Refer to the “Drawing an isometric box” procedure in this chapter for more information.

## Directional constraints

---

Directional constraints work in the parallel planes. The procedure in the next section shows how the Lock angle constraint works when you are drawing in the isometric planes specified on the Plane softkey.

Refer to the “Moving and copying objects” section in this chapter for more information.

## Drawing objects

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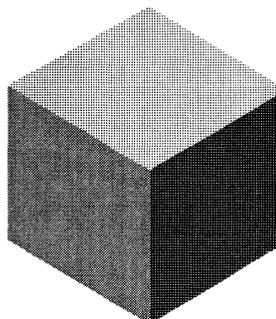
In draw mode, the parallel moving geometry becomes active after the first mouse click. This allows you to start drawing anywhere. Once the first end point is drawn, the parallel moving geometry origin is located at that point.

For all objects drawn using parallel geometry, except text and bitmap frames, the objects are constrained to the geometric angles, for example, isometric, cavalier, and military. When you specify the plane (top, right, or left) on the Plane softkey, the object is drawn at the correct angle for the specified plane.

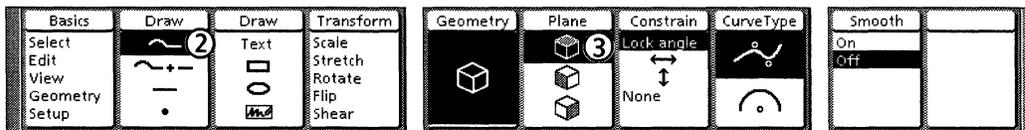
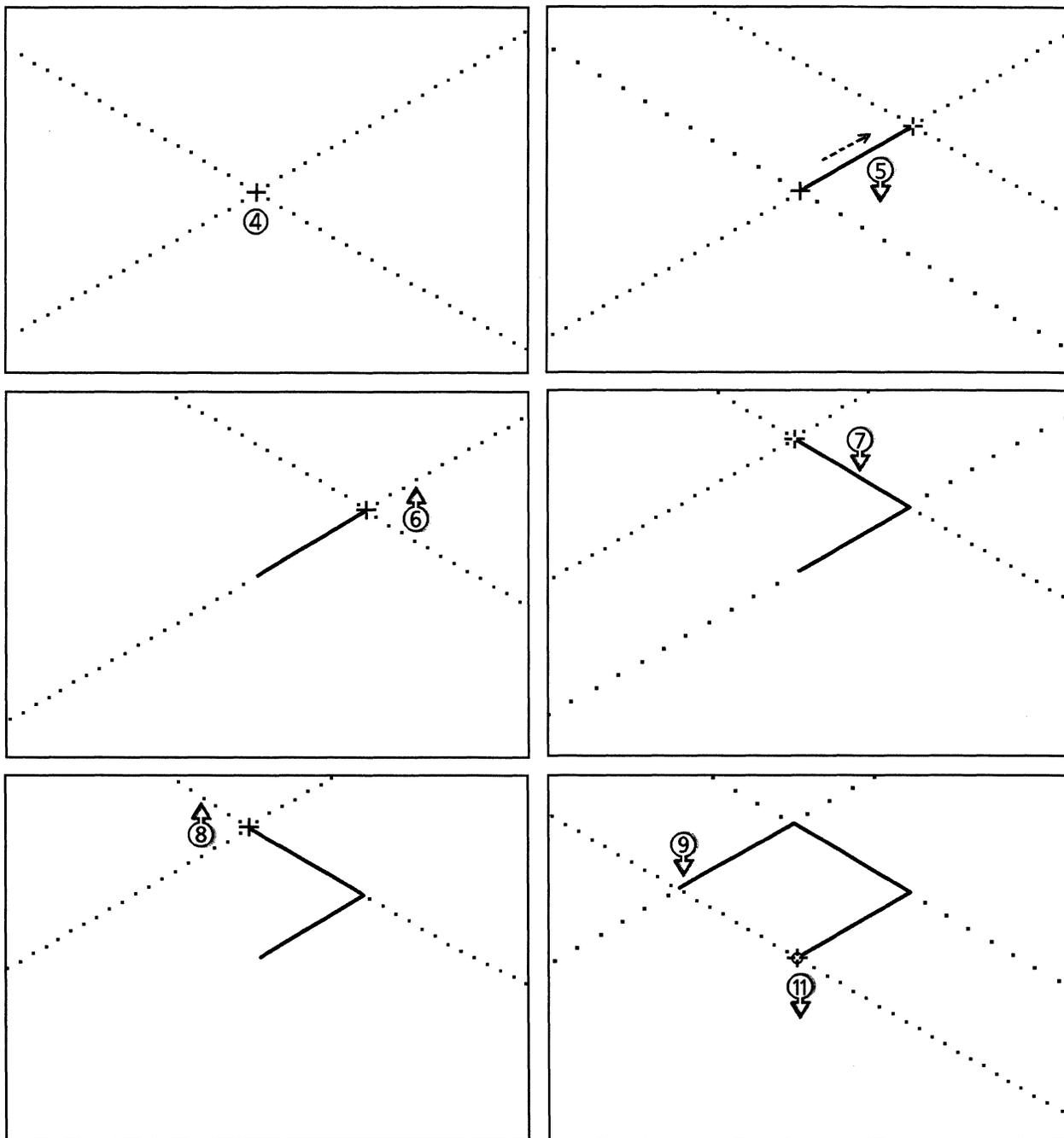
## Drawing an isometric box

---

The procedure in this section shows how to draw a simple isometric object: a box made up of three chained shapes, one shape for each side of the cube. The illustrations that go with the procedure also show the movement of the isometric moving geometry and cross hairs.



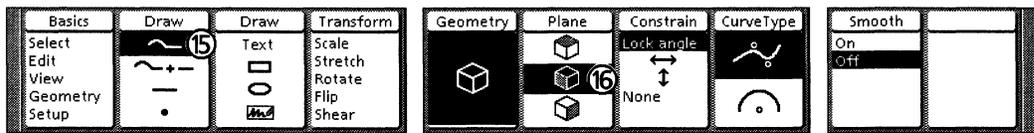
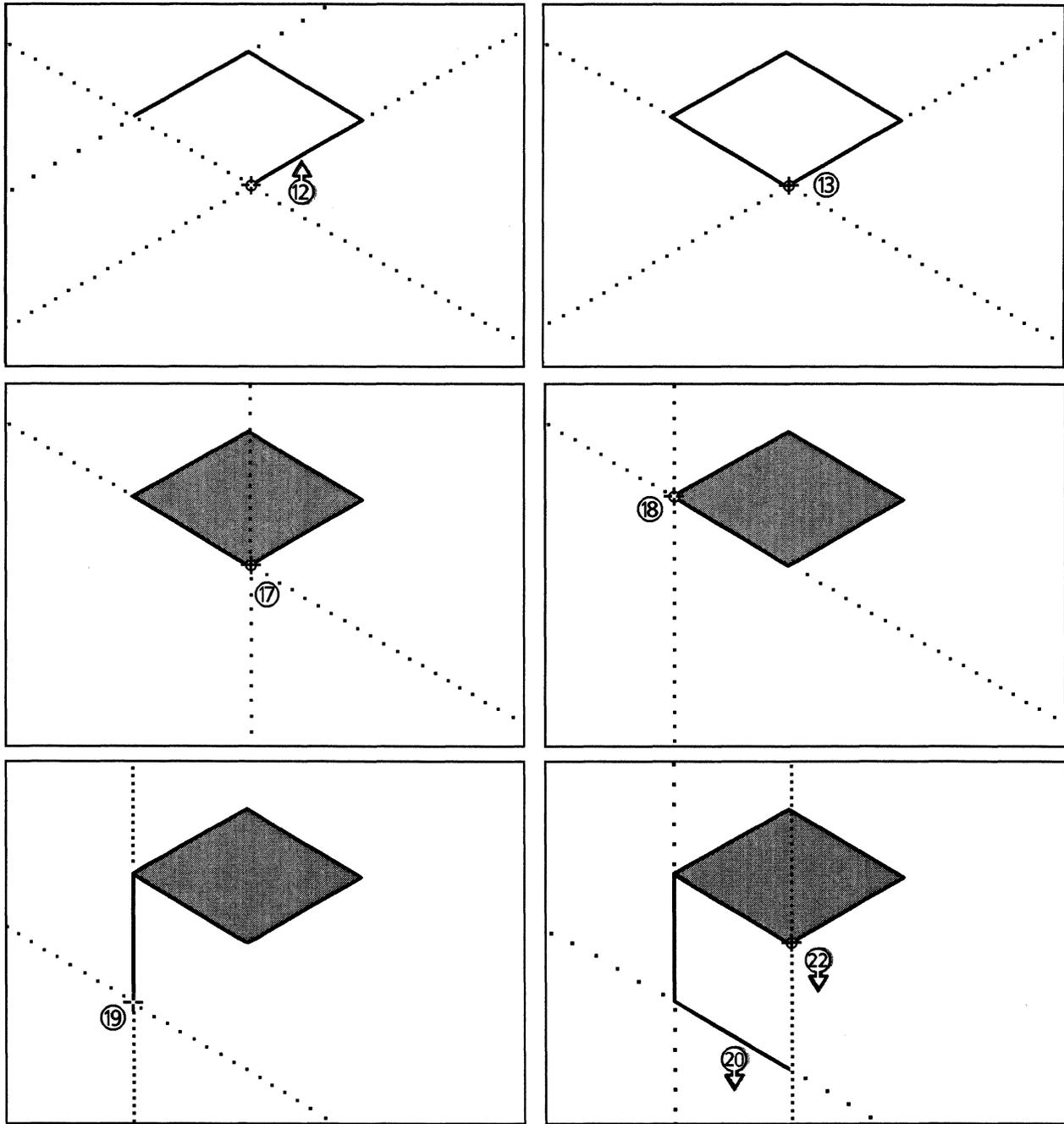
The following illustration shows steps 1 through 11.



Follow these steps to draw an isometric box:

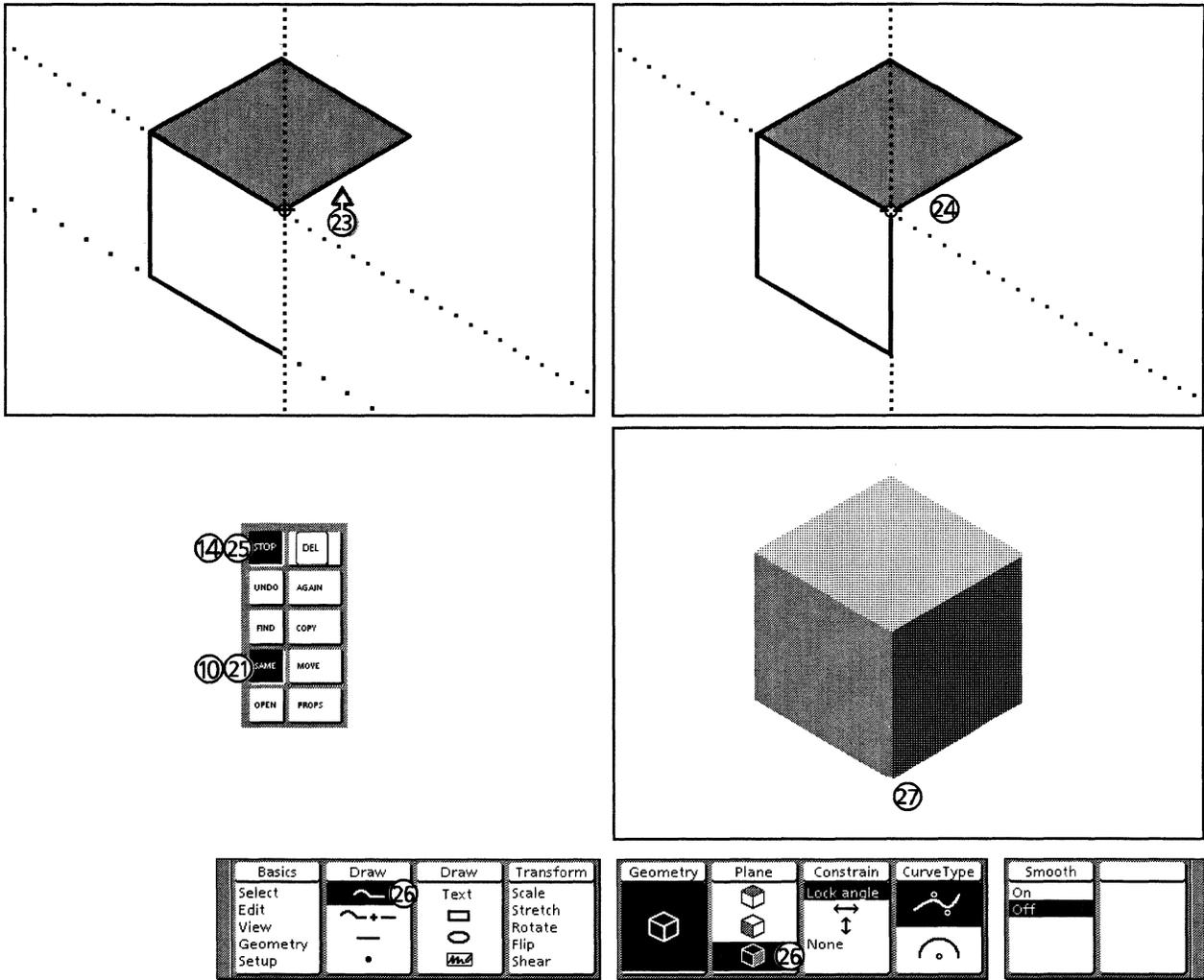
1. Be sure that parallel geometry is active. The isometric style is used in this procedure. Also be sure that gravity is on.
2. Select the Chain icon on the Draw softkey.
3. Select the Top plane icon on the Plane softkey.
4. Click the left mouse button to draw the first end point of the first segment.
5. Press and hold down the left mouse button. Move the pointer to the desired segment length. Notice how the plane cross hairs move with the pointer.
6. Release the left mouse button. The isometric moving geometry moves so that its origin is at the pointer location.
7. Press and hold down the left mouse button. Move the pointer to the desired segment length.
8. Release the left mouse button. The isometric moving geometry moves so that its origin is at the pointer location.
9. Press and hold down the left mouse button. Move the pointer in the direction of the next segment.
10. While continuing to hold down the left mouse button, press <Same> to turn on the Lock angle constraint. Notice that the plane cross hairs change to one alignment cross hair.
11. Move the pointer to the first end point of the first segment. Gravity causes the pointer to snap to the end point, allowing you to align the first and third segments exactly.

The following illustration shows steps 12 through 22.



12. When you see the open circle, release the left mouse button.
13. Click the left mouse button on the same end point as in step 12.
14. Press <Stop> to end the chain.
15. Select the Chain icon on the Draw softkey.
16. Select the Left plane icon on the Plane softkey.
17. To draw the first end point of the next chain, click the left mouse button on top of the existing control point.
18. Move the pointer to the location for the second control point. Using gravity to align the control points, click the left mouse button.
19. Move the pointer to the location for the third control point. Click the left mouse button.
20. Press and hold down the left mouse button. Move the pointer in the direction of the next segment.
21. While continuing to hold down the left mouse button, press <Same> to turn on the Lock angle constraint. Notice that the plane cross hairs change to one alignment cross hair.
22. Move the pointer to the first control point of the first segment. Gravity causes the pointer to snap to the end point, allowing you to align the first and third segments exactly.

The following illustration shows steps 23 through 27.



23. When you see the open circle, release the left mouse button.
24. Click the left mouse button on the same end point as in step 23.
25. Press <Stop> to end the chain.
26. Select the Chain icon on the Draw softkey and the Right plane icon on the Plane softkey.
27. Draw the right side of the box in the same way that you drew the top and left sides. The finished box is shown in the illustration, with different fill tints on the three sides and the line pattern property set to None.

## Chains

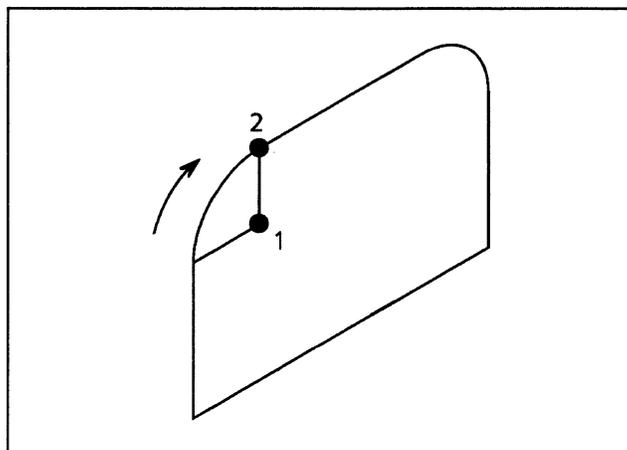
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In drawing line segments, the second end point is constrained to the geometry angles, as shown in the preceding procedure.

In drawing Bezier curve segments, the first bend point is constrained to the geometry angles from the first end point. The second bend point is constrained to these same angles from the second end point. This allows a smooth joint when drawing a straight line followed by a Bezier curve.

In drawing arc segments, the center point (1 in the following illustration) is constrained to the geometry angles from the first end point. The second end point (2 in the following illustration) is constrained to these same angles from the center point. The location of the mouse at button-down still determines the direction of the arc from the first end point. Arcs are elliptical; that is, they are drawn for the specified plane. This makes it possible to correctly draw "in plane" those elements which are circular arcs in an orthographic (straight on) view.

The following illustration shows an arc drawn in the right isometric plane to represent the rounded corner of a rectangle.

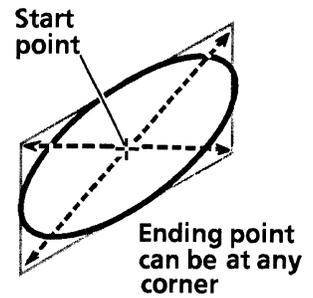
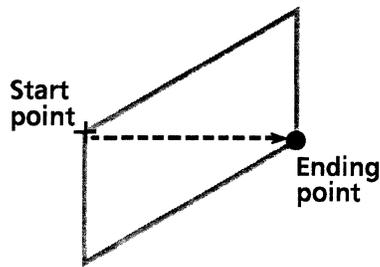
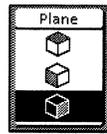


## Rectangles and ellipses

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Rectangles and ellipses are drawn in the paraline planes. When you draw a circle in paraline geometry, it appears as an ellipse.

The following illustration shows a rectangle and an ellipse drawn in the right isometric plane. Note that you can draw them from one corner to another or from the center outward. The starting point and ending point need to be diagonal from one another in the plane.



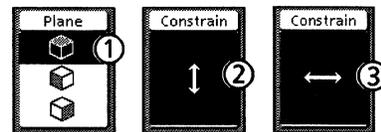
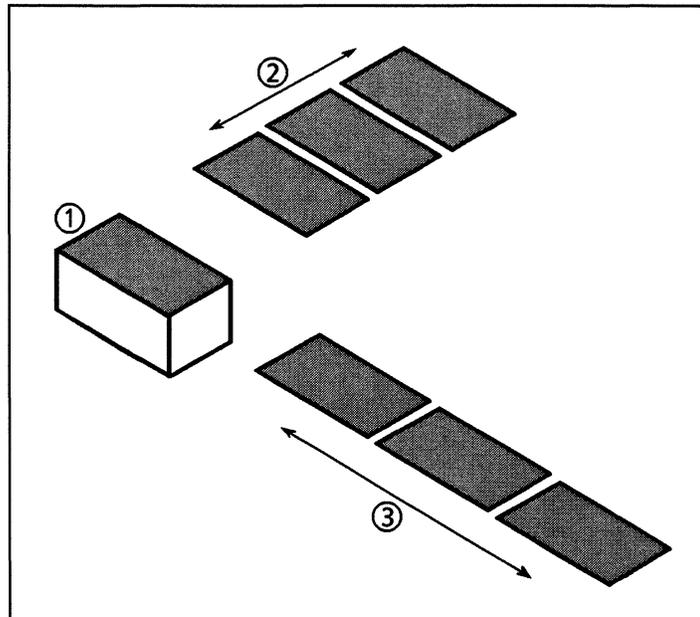
**Text frames and bitmap frames**

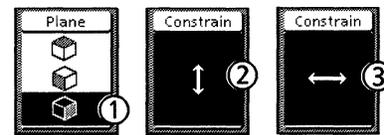
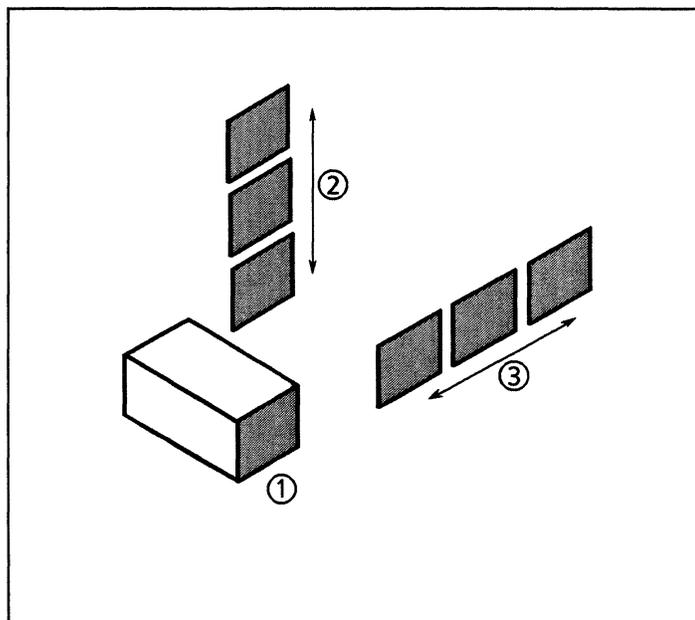
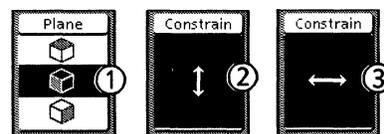
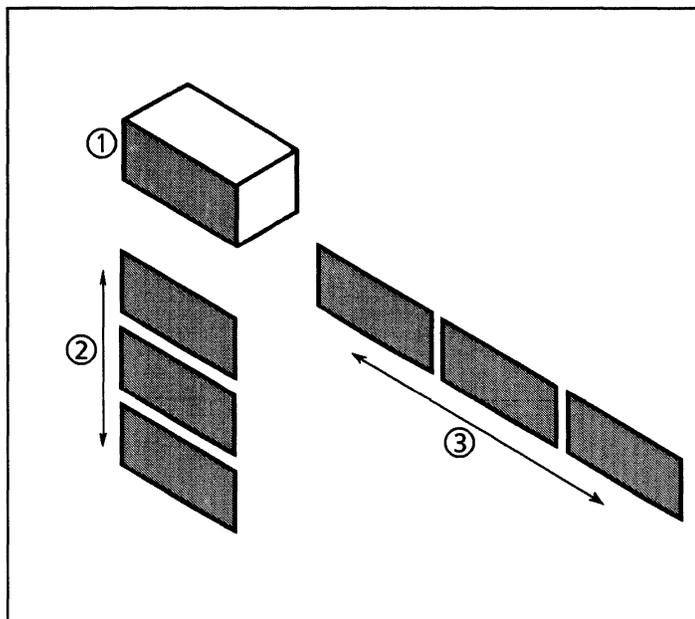
Text frames and bitmap frames are not drawn in the paraline planes.

**Moving and copying objects**

Move and copy operations work in each of the three planes. In these operations, the moving geometry origin is the guide point. You can use the directional constraints to align objects just as you can in other geometries. Refer to the "Directional constraints" section in this chapter for more information.

The following illustrations show copying isometric rectangles in the three planes using Horizontal and Vertical constraints.





### Transformations

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Transformations work in each of the three planes. The moving geometry origin is the Pin Point.

### Scale

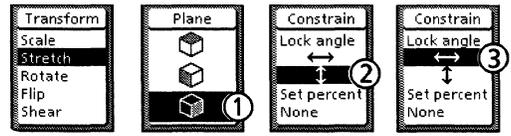
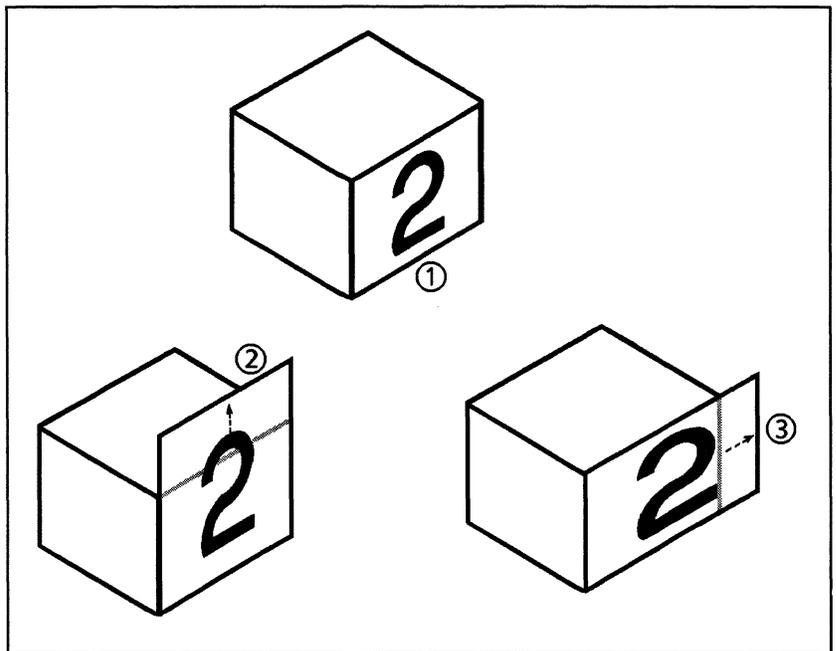
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You can use the Scale transformation to scale objects in the parallel planes.

### Stretch

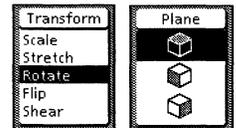
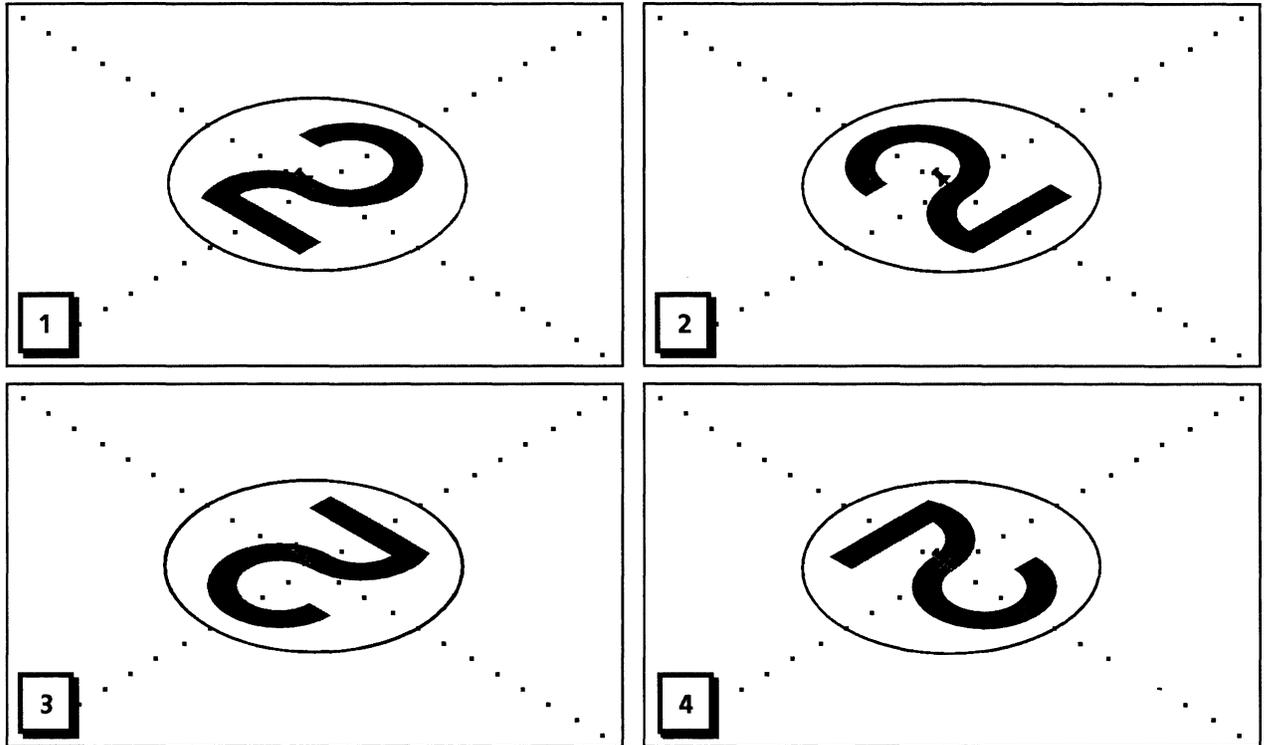
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The following illustration demonstrates stretching a right plane isometric projection using the Horizontal and Vertical constraints. Use the Plane softkey to specify the plane in which you want to stretch an object.



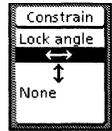
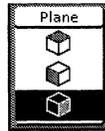
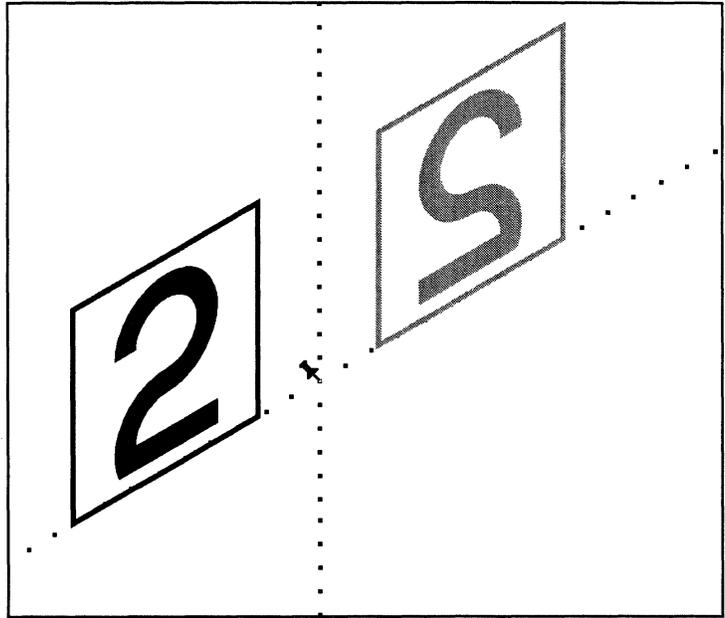
## Rotate

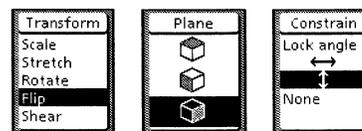
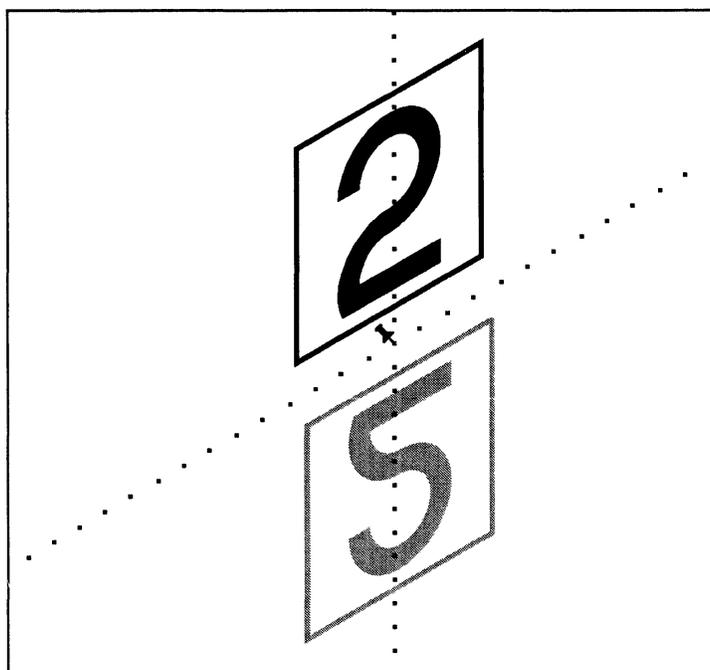
If paraline geometry is active, rotation angle detents are provided for the specified angles. The rotation occurs within the specified plane. The following illustration shows an object rotating in the top paraline plane.



## Flip

If paraline geometry is active, flipping occurs within the specified plane. Thus, a horizontal flip of an object flips about the vertical axis for the current plane; a vertical flip of an object flips about the horizontal axis for the current plane. See the following illustration.





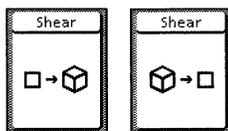
## Shear

The Shear transformation projects the selection from an orthographic (straight-on) view onto one of the three paraline planes. You specify the plane in which you are shearing on the Plane softkey. The system remains in paraline shear mode until you select another mode. In the paraline shear mode, the mouse pointer is always available for changing the selection. The directional constraints are not available for paraline shear.

Shear works in two directions; that is, you can shear the selection or unshear it using the Shear softkeys. By selecting the correct plane, you can return a sheared selection to its unsheared appearance so that you can work on it as a straight-on view and then shear it again.

The system does not prevent incorrect transformations. For example, it does not correctly unshear a selection whose plane is not the same as you specified on the Plane softkey.

To change the location of the Pin Point, you need to select the location where you want the Pin Point and press <Find>.

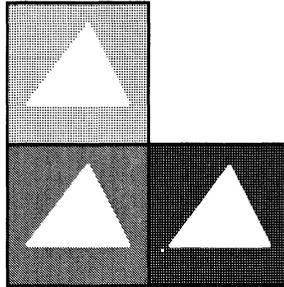


When you select the first Shear softkey, the selection in the orthographic view is sheared into the paraline plane.

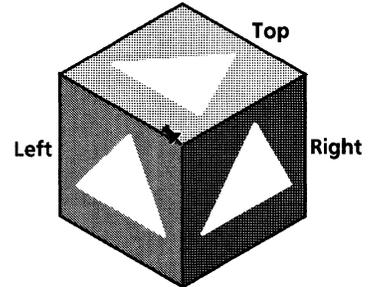
When you select the second Shear softkey, the selection in the paraline plane is unsheared back to the orthographic view.

The following illustration shows how the Shear transformation works in paraline geometry (isometric style). Notice how the three parts of the orthographic view are sheared into the isometric planes.

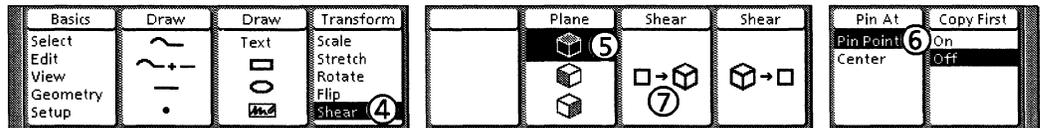
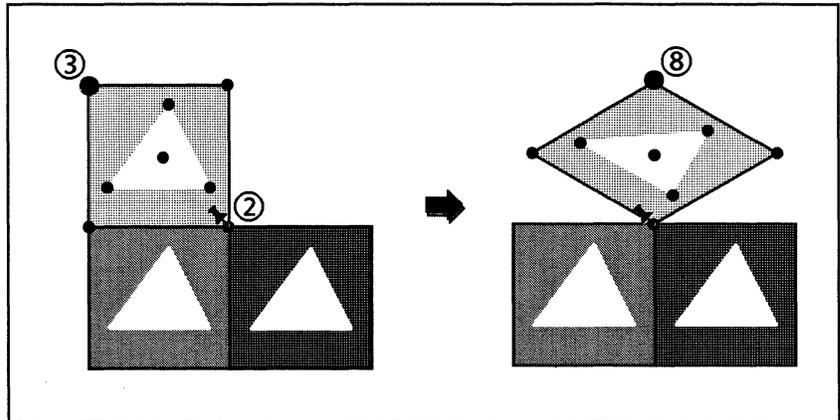
Orthographic (Straight-on) view



Sheared (Isometric) view



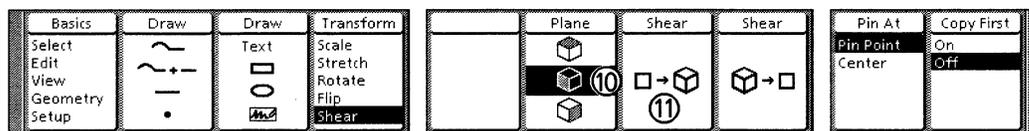
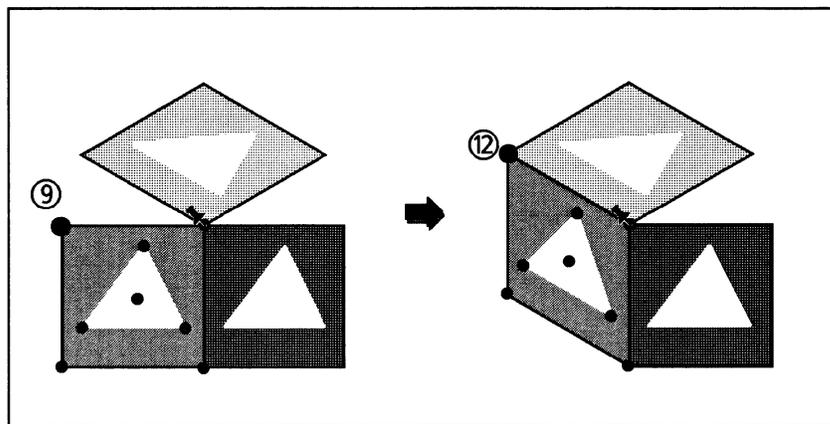
The following illustrations and procedure show how to use the Shear transformation in paraline geometry (isometric style).



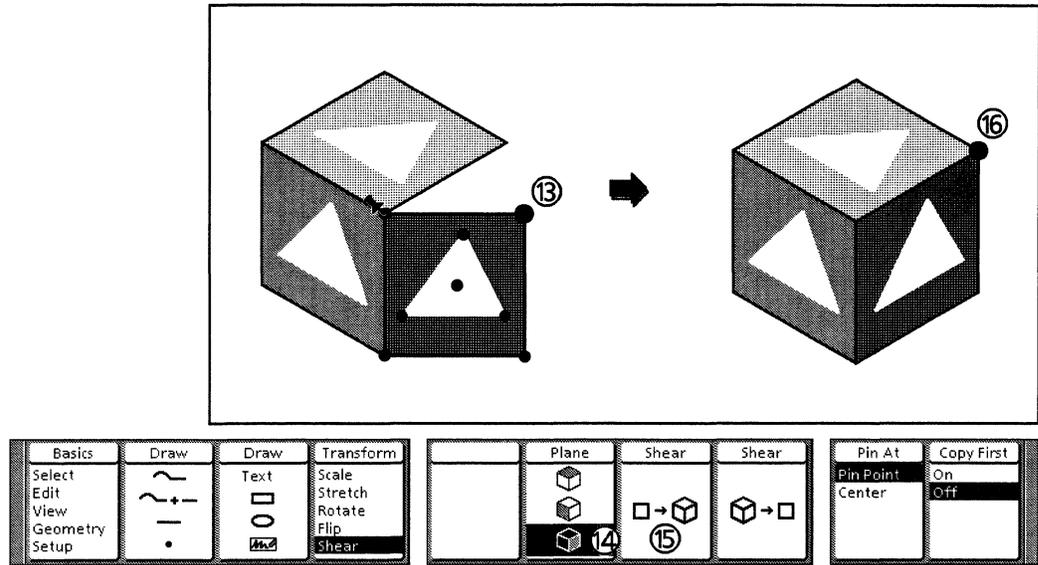
Follow these steps to use the Shear transformation in paraline geometry (isometric style):

1. Be sure that paraline geometry is active. In this procedure, the isometric style is used. Start with three sides, positioned (using gravity) so that their shared corner is in the same location.
2. Position the Pin Point at the intersection of the three sides by selecting that control point and pressing <Find>.
3. Select the side that will be in the top plane.

4. Select Shear on the Transform softkey.
5. Select the Top plane icon on the Plane softkey.
6. Select Pin Point on the Pin At softkey.
7. Select the icon on the first Shear softkey.
8. The top side is sheared into the top isometric plane.



9. Select the side that will be in the left plane.
10. Select the Left plane icon on the Plane softkey.
11. Select the icon on the left Shear softkey.
12. The left side is sheared into the left isometric plane. To unshear the left side, select the icon on the second Shear softkey.



13. Select the side that will be in the right plane.
14. Select the Right plane icon on the Plane softkey.
15. Select the icon on the left Shear softkey.
16. The right side is sheared into the right isometric plane. To unshear the right side, select the icon on the second Shear softkey.

## Perspective geometry

Perspective geometry allows you to draw objects so that they look even more realistic than objects drawn with paraline geometry. Using perspective geometry, you can draw an object to look much as the human eye or camera would see it at a particular point. Perspective shows an object as it appears rather than as its true shape and size. In perspective, objects closer to you appear larger; objects further away appear smaller.

Perspective geometry, like paraline geometry, uses three angles and has three planes. However, the difference between them is that one or more of the projection lines used in perspective illustrations converge at vanishing points, rather than remaining parallel as they do in paraline illustrations.

## Styles of perspective geometry

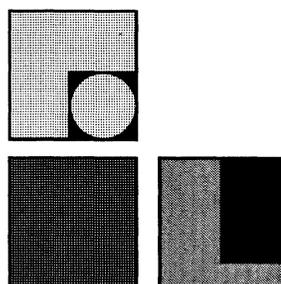
---

There are three styles of perspective geometry.

- Parallel (one vanishing point) – Illustrations that you see of railroad tracks and telephone poles are drawn in this style.
- Angular (two vanishing points) – Architects use this style to create building elevations.
- Oblique (three vanishing points) – Engineers use this style to create production illustrations.

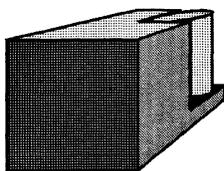
The following illustration shows the difference between the orthographic (straight-on) view of an object and the three styles of perspective views.

### Orthographic projection

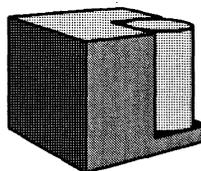


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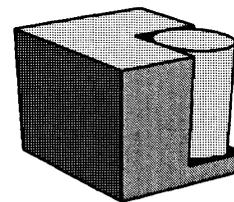
### Perspective



**Parallel** (1 vanishing point)

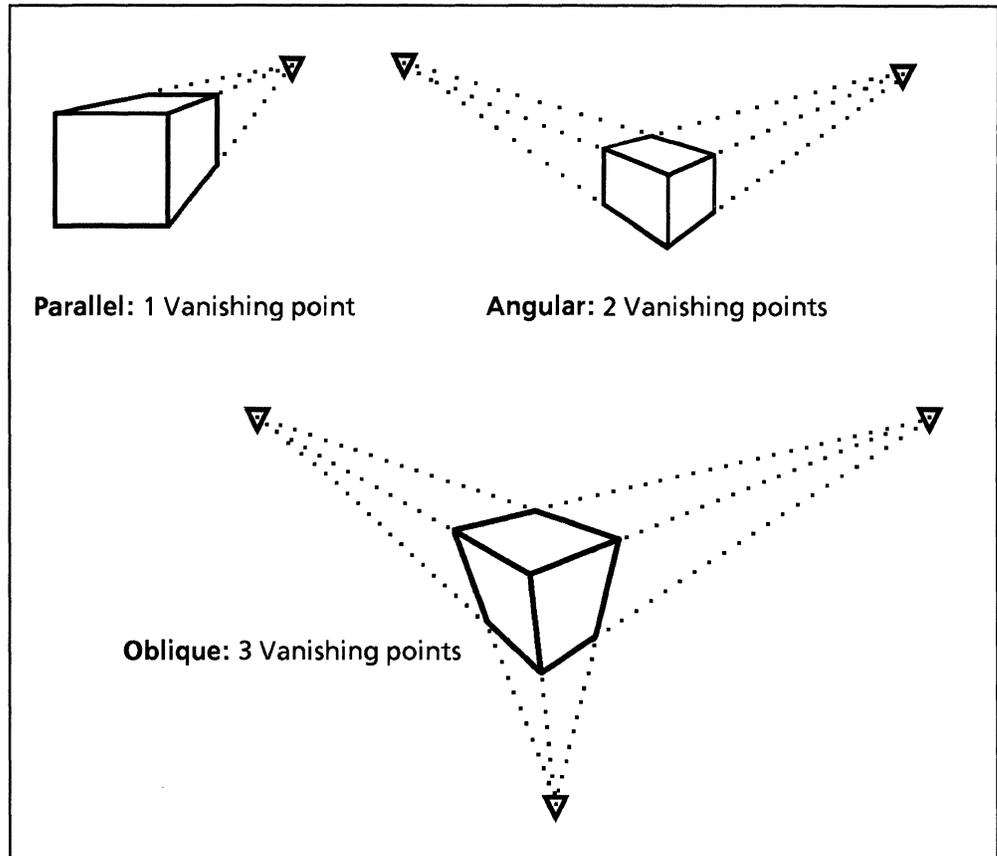


**Angular** (2 vanishing points)



**Oblique** (3 vanishing points)

The following illustration shows the differences among the three styles of perspective drawing. It demonstrates how the projection lines converge to one or more vanishing points.



### **Parallel style**

---

The parallel style has one fixed horizontal angle, one fixed vertical angle, and one changing angle that extends through one vanishing point. For the parallel style projection (see the preceding illustration), the vertical and horizontal lines that form the front of the object are parallel; the vertical lines that form the right side of the object are parallel. However, the horizontal lines that form the side and top of the object converge to a single vanishing point.

### **Angular style**

---

The angular style has one fixed vertical angle and two changing angles that extend through two vanishing points. For the angular style projection (see the preceding illustration), vertical lines stay parallel while horizontal lines converge to two vanishing points. Angular style is the default setting.

## Oblique style

---

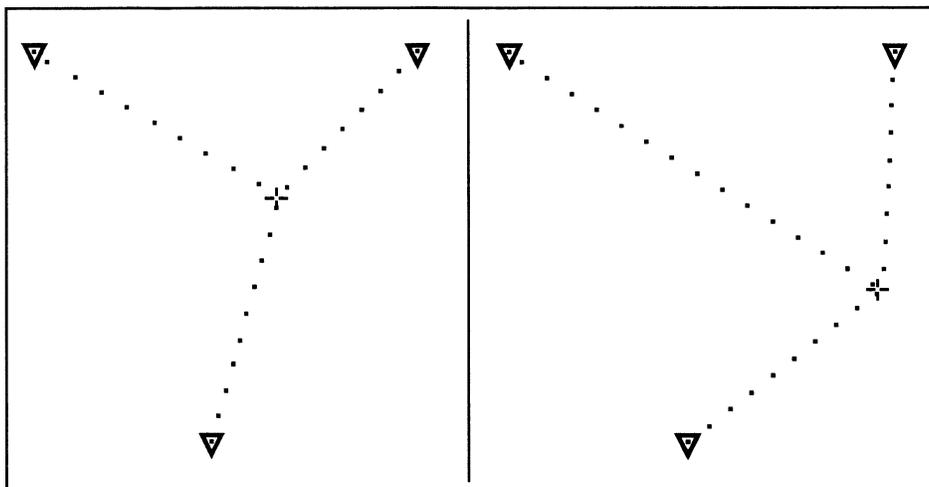
The oblique style has three changing angles which extend through three vanishing points. For the oblique style projection there are no parallel lines.

## Perspective moving geometry

---

Perspective moving geometry consists of *moving* dot patterns containing straight lines radiating from a point of origin. The origin moves as you draw, move, copy, or transform objects. There is no perspective fixed grid.

In perspective geometry, the angles of the moving geometry change depending on where the pointer is located with respect to the vanishing point(s). The following illustration shows how, in the oblique style, the three angles change depending on the location of the pointer.



Where *Xerox Pro Illustrator* positions vanishing points depends on the style you select on the Style softkey. The vanishing points are positioned approximately one frame width's distance outside of the frame boundary.

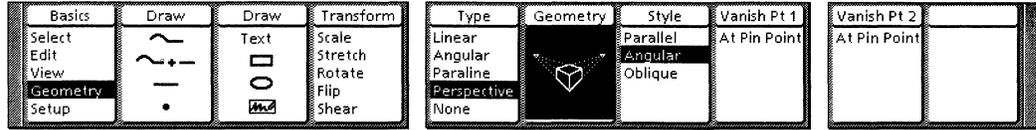
To see the vanishing points, you need to open a View window in a reduced size so you can view beyond the frame boundaries.

You can specify the location of vanishing points. Refer to the "Positioning vanishing points" procedure in this chapter for more information.

Refer to the Drawing an angular perspective box procedure in this chapter for more information.

## Selecting perspective geometry on softkeys

This section describes the softkey choices for perspective geometry. These choices remain set for a frame until you change them. The following illustration shows the softkeys used for selecting perspective geometry and specifying its properties.



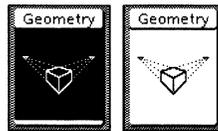
Follow these steps to select perspective geometry on the softkeys:

1. Select Geometry on the Basics softkey.
2. Select Perspective on the Type softkey. The system displays the perspective geometry softkeys.
3. Select the desired properties. To turn off perspective geometry, select None on the Type softkey.

### Geometry softkey

The Geometry softkey for perspective geometry is a two-way toggle. Each time you select it, its setting changes. The following illustrations show the two appearances for the Geometry softkey when perspective geometry is active.

The first setting activates the perspective moving geometry; the second turns it off.



### Style softkey

You use the Style softkey to select the following style of perspective geometry:

- Parallel (one vanishing point)
- Angular (two vanishing points)
- Oblique (three vanishing points).

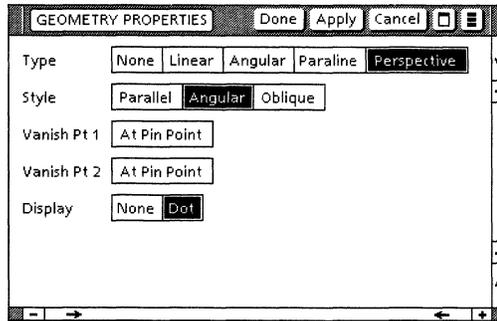


## Selecting perspective geometry on Geometry property sheet

---

You can also select perspective geometry and specify its properties on the Geometry property sheet. These choices remain set for a frame until you change them.

The following illustration shows the Geometry property sheet for perspective geometry.



Follow these steps to select perspective geometry on the Geometry property sheet:

1. Select Geometry on the Basics softkey.
2. Press <Props>.
3. On the property sheet, select Perspective in the Type box and select the desired properties.
4. Select Apply or Done. To turn off perspective geometry, select None in the Type box. The choices for the properties are the same on the property sheet as they are on the softkeys except for Display.

### Display property

---

The Display property allows you to control the visibility of perspective moving geometry.

When you select Dot, perspective moving geometry is visible as a pattern of dots. If you turn off perspective moving geometry, it is not visible even if Dot is selected on the Geometry property sheet.

When you select None, perspective moving geometry is not visible but it is still functional. To turn off perspective moving geometry, you need to select None on the Type softkey or toggle the Geometry softkey to the setting where the softkey is not highlighted.

## Working in perspective geometry

---

This section explains how working in perspective geometry affects *Xerox Pro Illustrator* operations.

### Geometry softkey

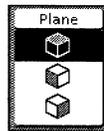
---

When you draw, move, copy, and transform objects, the Geometry softkey displays so that you can change the form of geometry without having to return to the Geometry mode.

### Plane softkey

---

The Plane softkey allows you to select the desired perspective plane in which you draw, copy, move, and transform objects. It displays only while moving geometry is active. The first cube on the Plane softkey represents the top plane; the second, the left plane; the third, the right plane. You can change the plane while the mouse button is down.



### Directional constraints

---

Directional constraints work in the perspective planes. The procedure in the next section shows how the Lock angle constraint works when you are drawing in the perspective planes (angular style).

Refer to the Moving and copying objects section in this chapter for more information.

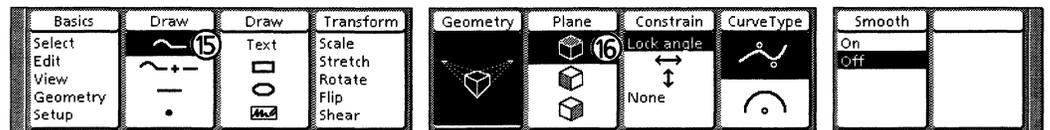
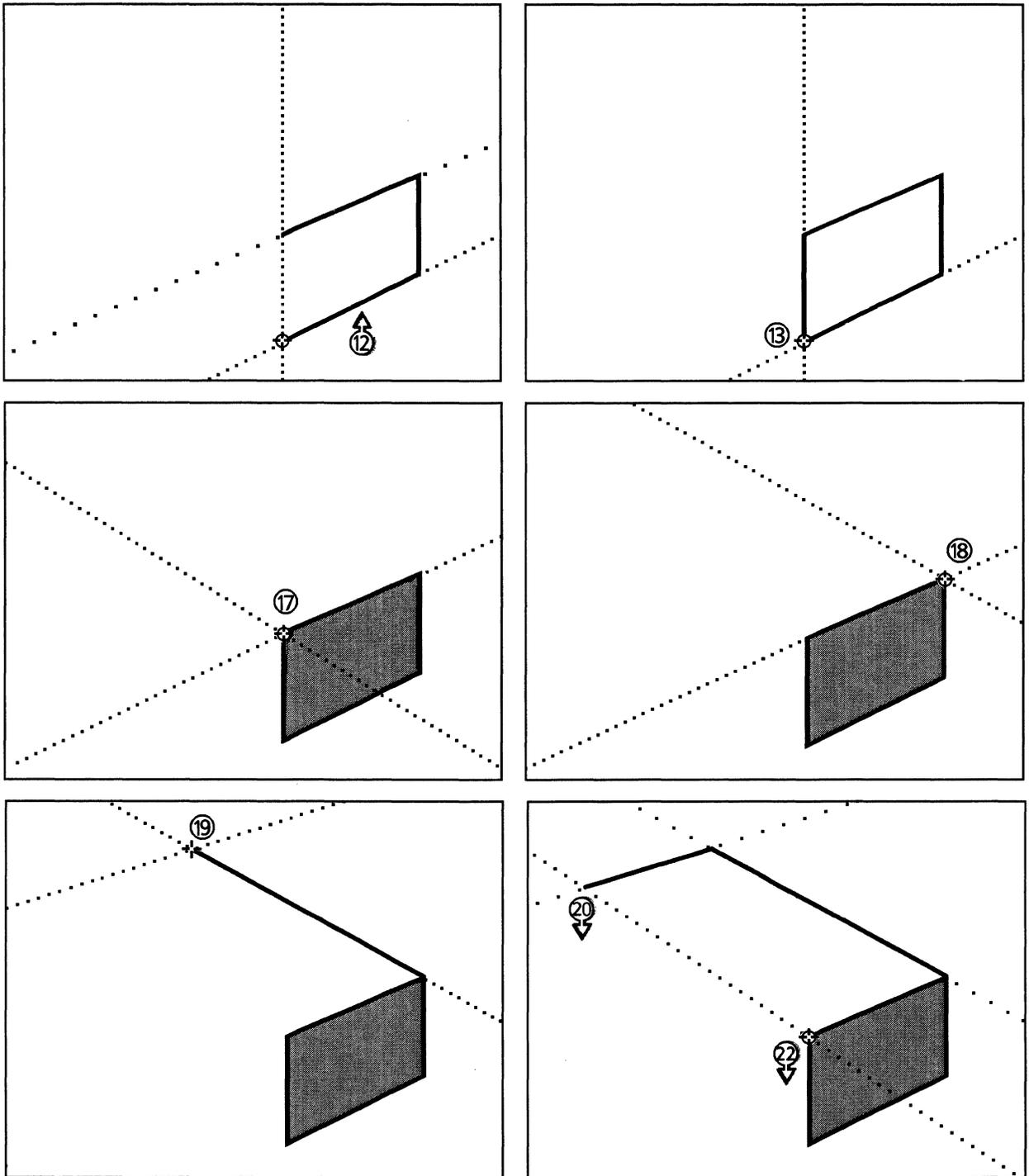




Follow these steps to draw an angular perspective object:

1. Be sure that perspective geometry is active. The angular style is used in this procedure. Be sure that either intersection or object gravity is on.
2. Select the Chain icon on the Draw softkey.
3. Select the Right plane icon on the Plane softkey.
4. Click the left mouse button to draw the first end point of the first segment.
5. Press and hold down the left mouse button. Move the pointer to the desired segment length.  
Notice how the plane cross hairs move with the pointer. The angle of the moving geometry also changes as the pointer moves toward the right vanishing point.
6. Release the left mouse button.  
The perspective moving geometry moves so that its origin is at the pointer location.
7. Press and hold down the left mouse button. Move the pointer to the desired segment length.
8. Release the left mouse button.
9. Press and hold down the left mouse button. Move the pointer in the direction of the next segment.
10. While continuing to hold down the left mouse button, press <Same> to turn on the Lock angle constraint.  
Notice that the plane cross hairs change to one alignment cross hair.
11. Move the pointer to the first end point of the first segment. Gravity causes the pointer to snap to the end point, allowing you to align the first and third segments exactly.

The following illustration shows steps 12 through 22.







## Chains

---

In drawing line segments, the second end point is constrained to the geometry angles, as shown in the preceding procedure.

In drawing Bezier curve segments, the first bend point is constrained to the geometry angles from the first end point. The second bend point is constrained to these same angles from the second end point. This allows a smooth joint when you are drawing a straight line followed by a Bezier curve.

## Other objects

---

Ellipses, elliptical arcs, text frames, rectangles, and bitmap frames are not drawn in the perspective planes. To draw a rectangle in plane, you need to draw it as a chained shape.

Refer to the Drawing an angular perspective box procedure in this chapter for more information.

To draw an ellipse in plane, first draw its surrounding rectangle (a chained shape), then fit an ellipse inside the box using the Stretch and Rotate transformations.

## Moving and copying objects

---

When you are moving and copying objects in perspective geometry, the moving geometry origin is the guide point. When you move or copy an object, it is not dynamically changed to remain accurate in size relative to the vanishing points. Directional constraints (Horizontal, Vertical, and Lock angle) work in the planes.

Refer to the Working in paraline geometry section in this chapter for more information. Refer to the Drawing an angular perspective box procedure in this chapter for steps on using the Lock angle constraint.

## Transforming objects

---

The Scale, Stretch, Rotate, Flip, and Shear transformations are available in perspective geometry, but they do not work in the perspective planes.

# 15.

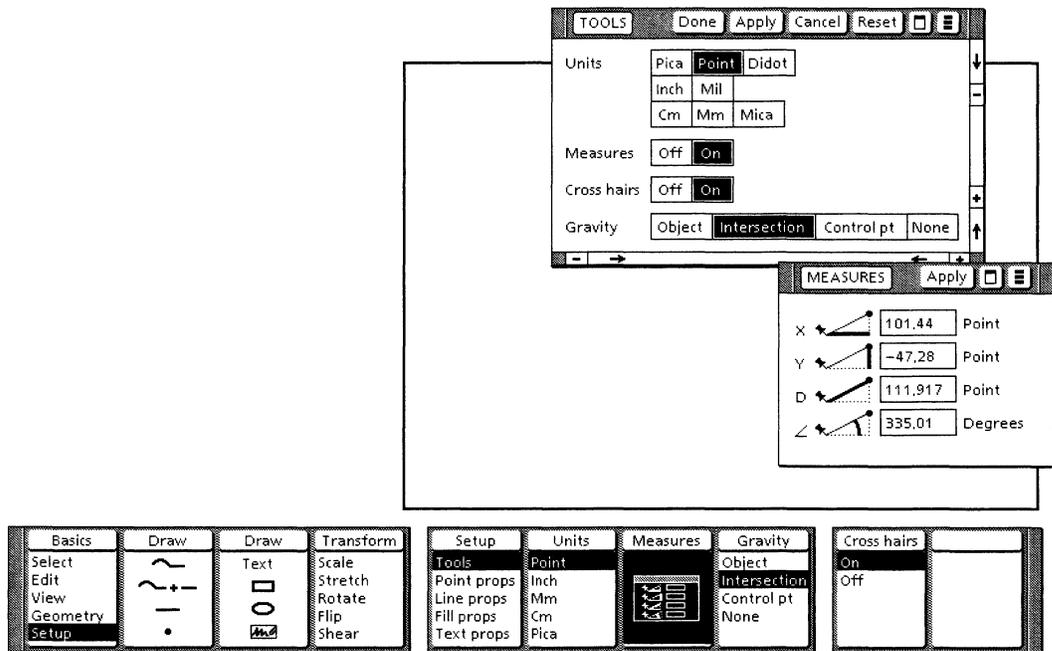
# Measuring tools

This chapter contains information about the measuring tools available in *Xerox Pro Illustrator*. These include the following:

- Frame Units
- Measures window
- Rulers.

## Selecting measurement tools

You select measurement tools through the Setup softkeys or through the Tools property sheet. Both are shown in the following illustration. The Tools property sheet displays when you press <Props> after selecting Setup on the Basics softkey.



The Setup softkeys and Tools property sheet display selections for Frame Units, turning the Measures window and Cross hairs on and off, and Gravity. This chapter covers Frame Units and the Measures window; cross hairs and gravity are discussed in Chapter 1.



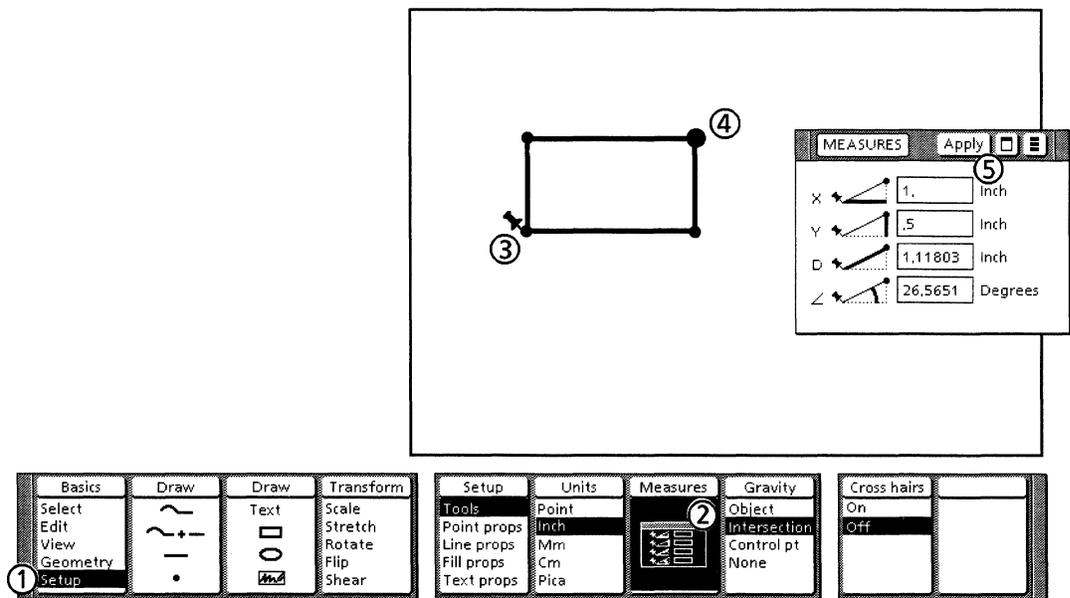


After a View window is drawn, the Measures window displays the position of the last mouse click or control point selected before the View window was drawn. After transforming or drawing an object, the Measures window displays the last point positioned before the mouse button is released.

When transforming an object, the pointer position can be different from the position of the object: when you release the mouse button, the Measures window adjusts from the pointer position measurements to those of the last guide point positioned before the mouse button is released.

**Measuring an existing object**

The illustration and procedure below shows you how to use the Measures window to measure an existing object.

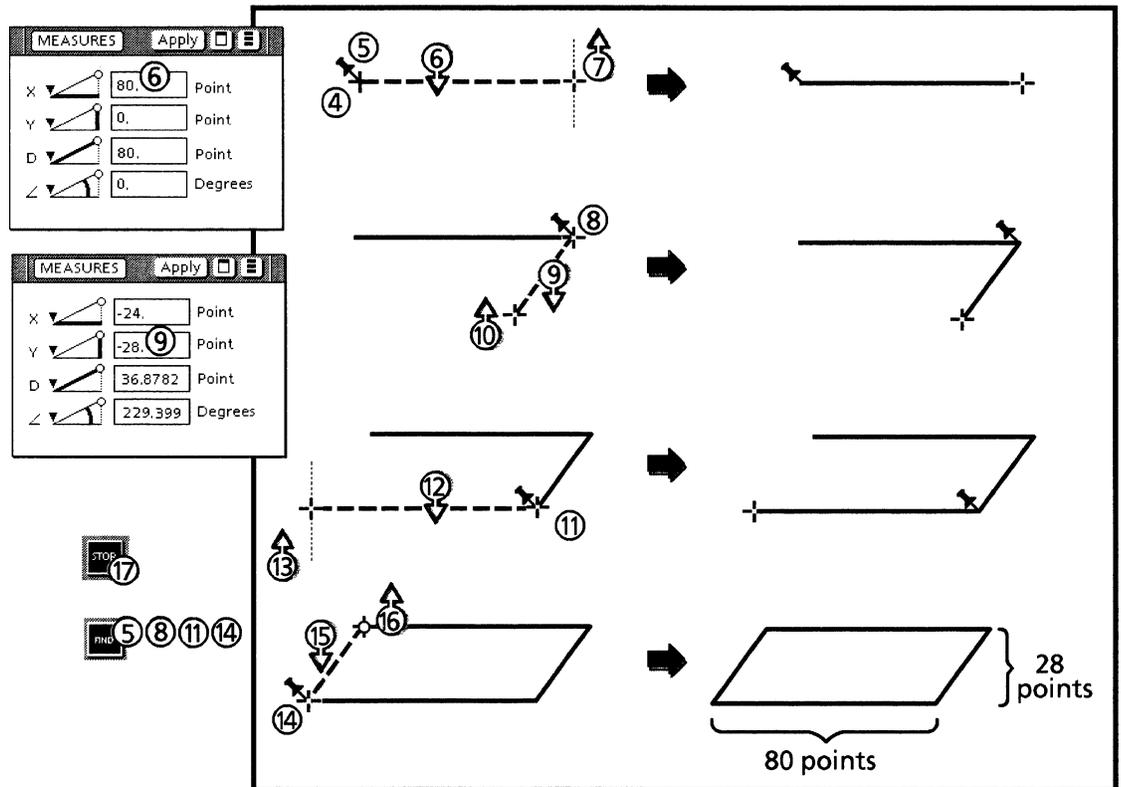


Follow these steps to measure an existing object:

1. Select Setup on the Basics softkey.
2. Select the Measures softkey. The Measures window displays.
3. Position the Pin Point where you want to start measuring.
4. Position the pointer on the desired control point and click the left mouse button. The position of the control point relative to the Pin Point location is displayed in the Measures window.

### Measuring while you draw

The illustration and procedure below shows you how to use the Measures window to measure while you draw. In this example, you draw a closed chain that is exactly 28 points high and 80 points wide. To display only whole numbers in the X and Y fields of the Measures window, turn on Linear geometry; be sure horizontal and vertical distances have been set to whole numbers.

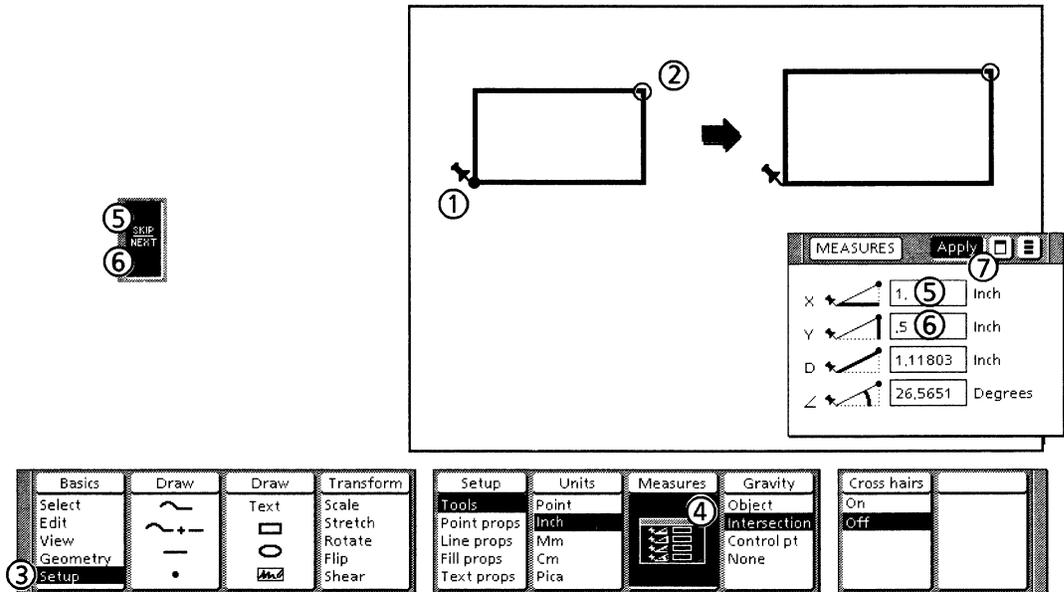


Basics Select Edit View Geometry Setup 1	Draw ~ + - • 3	Draw Text □ ○ H 4	Transform Scale Stretch Rotate Flip Shear	Setup Tools Point props Line props Fill props Text props	Units Point Inch Mm Cm Pica	Measures 2 3 4 5 6 7 8 9 10 11 12	Gravity Object Intersection Control pt None	Cross hairs On Off
Basics Select Edit View Geometry Setup	Draw ~ + - • 3	Draw Text □ ○ H 4	Transform Scale Stretch Rotate Flip Shear	Geometry •••••	Constrain Lock angle None 6 12	CurveType ~ •	Smooth On Off	



In this procedure, you press <Skip/Next> to select the measurements. The first time you press the <Skip/Next>, the first measurement is selected. The second time you press <Skip/Next>, the second measurement is selected, and so on for the third and fourth measurements. The measurements are applied after you cycle through each measurement and press <Skip/Next> for the fifth time.

The illustration and procedure below shows how to use the Measures window to change an object's size.



Follow these steps to use the Measures window to change the size of an object:

1. Position the Pin Point.
2. Select the control point you want to move (hold down the <Shift> and click the left mouse button).
3. Select Setup on the Basics softkey.
4. Select the Measures softkey so it is highlighted. The Measures window displays.
5. Press <Skip/Next> and change the first measurement.
6. Press <Skip/Next> and change the second measurement.
7. Select [Apply] or press <Skip/Next> three times. The control point is moved, the object is resized, and all of the measurements in the Measures window are updated.

---

## Rulers

---

Rulers are available as objects in the Quick Art. You can copy them into any frame. See Appendix A for information on how to copy the rulers into a frame.

Rulers operate like any other graphic object, that is, they can be rotated, flipped, and so on. You can make the rulers non-printing and leave them in your illustrations for reference.

For a pica typewriter scale, use the inch ruler with ten to the inch. For an elite typewriter scale, use the half-pica scale for twelve to the inch.

## **Part 4**

### **Using Xerox Pro Illustrator with your system**



*Xerox Illustrator Basics* supports *Xerox Pro Illustrator*, *Xerox Chemical Illustrator*, *Xerox Pro Illustrator Conversion of VP Basic Graphics*, *VP File Conversion of IGES Files*. It must be installed, enabled, and running on your Xerox workstation in order to use these Illustrator applications.

*Xerox Illustrator Basics* can also be used on its own to perform such functions as viewing, copying, and printing graphics frames that have been produced using an Illustrator application.

*Xerox Illustrator Basics*, a VP application, provides high-level software support for multiple vector graphics applications folders such as *Xerox Pro Illustrator* and *Xerox Chemical Illustrator*.

*Xerox Illustrator Basics* provides fundamental vector graphics and user interface functionality in one place, avoids duplication of code, and reduces code size. It features a modular software architecture that serves as a foundation for building Illustrator graphics applications. It also provides workstations running Illustrator Basics software with the ability to display and print frames produced by any Illustrator graphics package.

*Xerox Illustrator Basics*, a VP licensed application, is required to load and run *Xerox Pro Illustrator*, *Xerox Chemical Illustrator*, *Xerox Pro Illustrator Conversion of VP Basic Graphics*, *VP File Conversion of IGES Files*. It is compatible with other VP series applications.

For information on hardware and software requirements necessary to use the *Xerox Illustrator Basics* application, refer to Chapter 1 in this reference manual.

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## Features

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*Xerox Illustrator Basics* provides several features that enable you to work with documents containing Pro Illustrator graphics.

## Display graphics

---

*Xerox Illustrator Basics* enables you to display Pro Illustrator frames. Two display options are available:

- [Full display] shows graphics objects with their properties such as fill tints, line patterns, tints, and endings.
- [Outline display] ignores properties and allows you to view objects as thin lines. The outline view significantly improves display performance and is especially useful when you are editing or paging through a document.

The display commands, available in the document menu, toggle between [Outline Illustrator Graphics] and [Show Full Illustrator Graphics]. Illustrator graphics will print with their full object properties even though [Outline Illustrator Graphics] may be selected in the document.

## Work with frames

---

When *Xerox Illustrator Basics* running, you can perform the following operations on Pro Illustrator frames:

- Display graphics frames
- Copy graphics frames
- Move graphics frames
- Delete graphics frames
- Resize graphics frames
- Change graphics frame properties.

You cannot create an Illustrator application graphics frame unless the application is also running.

You cannot select, copy, or move objects within a frame, or between frames, unless the appropriate Illustrator graphics application is also running.

## Apply color

---

*Xerox Illustrator Basics* provides support for displaying and printing color graphics objects. It also enables you to apply color properties to the border and background color of a frame.

## Paginate documents

---

You can paginate documents with frames containing art produced by any Illustrator graphics application.

The graphics application that was used to produce the art does not have to be running.

## Print documents

---

Any workstation running *Xerox Illustrator Basics* can print frames produced by any Illustrator graphics application whether or not that application is loaded on the workstation.

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## System messages

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*Xerox Illustrator Basics* displays messages in the attention window at the top of the screen. Warning messages flash when they are displayed; informational or instructional messages do not.

The following table contains Illustrator system messages and indicates what actions to take, if any, when the corresponding message is displayed. Messages are arranged alphabetically by the first word in the message (Messages that begin with variable entries are listed first).

The first column of the table lists the message. The second column tells you what caused the message and/or what the message means. The third column gives a suggested response.

Message	Meaning	Action
{ } requires additional Processor Control Store.	({ } is application name.) The Illustrator application does not have or is not utilizing floating point microcode (8K control store).	Contact your System Administrator for more information.
{1} requires {2} disk pages minimum.	({1} is application name; {2} is application backing store requirement.) Backing store is required by Illustrator application. A message appears for each Illustrator application for which the backing store is insufficient. The workstation needs to have at least the number of disk pages required by the Illustrator application with the highest figure, but not the total disk pages required by all Illustrator applications.	Contact your System Administrator for more information.
{1} requires {2} megabytes minimum.	({1} is application name; {2} is application memory requirement.) Main memory is required by Illustrator application.	Contact your System Administrator for more information.
Additional Processor Control Store is recommended for faster Illustrator performance.	A system configuration check has determined that floating point microcode is not being utilized.	Contact your System Administrator for more information.
Contact your System Administrator to change workstation configuration. The system will work correctly but with slower performance. Choose Done to continue.	Confirmation following system configuration check. The system will work correctly, but with slower performance.	Contact your System Administrator if you want to modify your system for better performance.
Enable the Illustrator Performance Enhancement for additional backing store.	There is insufficient Virtual Memory backing store and the Illustrator Performance Enhancement Option is not enabled.	Contact your System Administrator for more information.
Workstation has insufficient Processor Control Store enabled.	System configuration check determined that floating point microcode is not being utilized.	Contact your System Administrator for more information.
Workstation has only { } megabytes of memory.	({ } represents value displayed for workstation main memory.) System configuration check indicates insufficient memory for Illustrator application. Lack of sufficient main memory may result in degraded performance.	Contact your System Administrator to obtain more main memory.

Message	Meaning	Action
Workstation only has {} disk pages backing store available.	({} is number of disk pages currently available.) There are insufficient free pages in the Virtual Memory backing file for Illustrator to have acceptable performance.	Contact your System Administrator for more information.
Xerox Illustrator Basics cannot proceed because required Software Option not enabled.	You have attempted to run Xerox Illustrator Basics before it has been product factored.	Enable the required software option.

---

## Notes and cautions

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This section explains how to identify and resolve problems that may occur when you work with *Xerox Illustrator Basics*. The notes and cautions are divided into the following areas:

- Limitations that can cause system failure
- Limitations relating to:
  - Frame operations
  - Display and printing
  - Text.

### Limitations that can cause system failure

---

- The system will fail if you run out of disk space while you are adding objects to an Illustrator frame, copying Illustrator frames, or paginating.

Workaround: Always maintain at least 300 free pages on the desktop, more if you are working with especially large documents or complex illustrations.

- If you attempt to paginate from the desktop auxiliary menu with a document open, your workstation will fail if a bitmap frame is selected that is either empty or referencing a bitmap canvas on the desktop.

Workaround: Paginate an open document from the document window header menu, not the desktop auxiliary menu.

Alternatively, you can select the Pro Illustrator bitmap frame and then paginate the document using [Paginate] or [Compress and Paginate] from the desktop auxiliary menu.

## Other limitations

---

These notes pertain to limitations of Illustrator Basics that do not result in system failure.

### Frame operations

---

- When you move an Illustrator frame within a document that contains the maximum of 100 frames, an error message is displayed indicating that no more frames are allowed. The message is erroneous in this situation since you are not adding a frame to exceed the maximum of 100.

Workaround: Move the frame to another document, then copy it to the new location in the original document.

- If you attempt in error to copy or move an illegal object (such as a desktop icon or a *VP Basic Graphics* object) into an Illustrator graphics frame, the operation does not abort. You can click again into a legal destination to correctly complete the copy or move.

### Displaying and printing documents

---

- If *Xerox Illustrator Basics* is not running in your loader, or if your workstation is not enabled for Xerox Illustrator Basics, any Illustrator frames occurring in a VP document will appear to be empty, both on the screen and in the printed copy. Do not delete a blank frame until you know what it is.

To identify if a frame is a Pro Illustrator frame, select it and press <Props>. If it is an Illustrator frame, a message mentioning *Xerox Pro Illustrator* or *Xerox Chemical Illustrator* displays in the desktop message area.

- Bitmap frames that lie partly outside the Illustrator frame will print outside the frame, even though they appear to be clipped on the screen.
- If you run Illustrator Basics after you log on, the Illustrator print level becomes "Print Service 11.0," regardless of what is specified in the User Profile. Change the print level from the desktop auxiliary menu, or log off and back on.
- Do not change the Illustrator print level in the desktop auxiliary menu during a printing operation (Since the change takes effect immediately, the last part of the document will be printed at the new print level).
- Certain text characters may not be visible when a document has been exchanged between VP 2.0 desktops with different font or hyphenation environments. To correct this, select the [Normalize Text] command in the content auxiliary menu in the document window header.
- If the *Xerox Chemical Illustrator* application is not running when you are working with related graphics frames, many of the control points in chemical rings and structures will not be highlighted when they are selected (This is because duplicate control points are canceling each other out).

### Selecting graphics objects

---

- To select an arc using the draw-through box, you need to make the draw-through box large enough to include the entire quarter circle of which the arc is a part.

### Work with text

---

- A fill-in order cannot be set for Illustrator text frames.
- Illustrator text frames cannot be linked.
- Characters are sometimes missing from the printed output for text frames with zero inner margins and varying width or height.

---

## 17. Xerox Illustrator Upgrader

*Xerox Illustrator Upgrader* enables you to upgrade VP documents containing graphics objects created with *Xerox Pro Illustrator 2.0* or *2.015* to *Xerox Pro Illustrator 3.1*.

For information on hardware and software requirements necessary to use the *Xerox Illustrator Upgrader* application, refer to Chapter 1 in this reference manual.

Two methods are available to upgrade graphics objects created with *Xerox Pro Illustrator 2.0* or *2.015*:

- Upgrade the documents with <Open>
- Upgrade the documents with [Upgrade].

---

### Upgrading documents with <Open>

---

Follow these steps to upgrade documents with <Open>:

1. Select a document icon.
2. Press <Open>. Alternatively, you can click the left mouse button twice to open the document.

---

### Upgrading documents with [Upgrade]

---

Follow these steps to upgrade documents with [Upgrade]:

1. Select a document or folder (containing documents).
2. Select [Upgrade] in the desktop auxiliary menu.



---

## 18.

# Conversion of VP Basic Graphics

*Xerox Pro Illustrator Conversion of VP Basic Graphics* enables you to convert a VP document containing *VP Basic Graphics* to a VP document with Pro Illustrator graphics. The conversion process works in one direction only.

For information on hardware and software requirements necessary to use the *Xerox Pro Illustrator Conversion of VP Basic Graphics* application, refer to Chapter 1 in this reference manual.

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### Converting VP Basic Graphics to Xerox Pro Illustrator

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When you convert a VP document containing *VP Basic Graphics*, the entire document is converted, not just graphics. Conversion operates in one direction only: from *VP Basic Graphics* to *Xerox Pro Illustrator*. The document will be paginated during the conversion process.

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#### Retrieving the Converter icon

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If you do not already have a converter icon on your desktop, you need to retrieve one from your Directory icon.

Follow these steps to retrieve the Converter icon.

1. Open the Directory icon, the Workstation divider, and the Office Accessories divider.
2. Copy the Converter icon to the desktop.

---

#### Converting the document

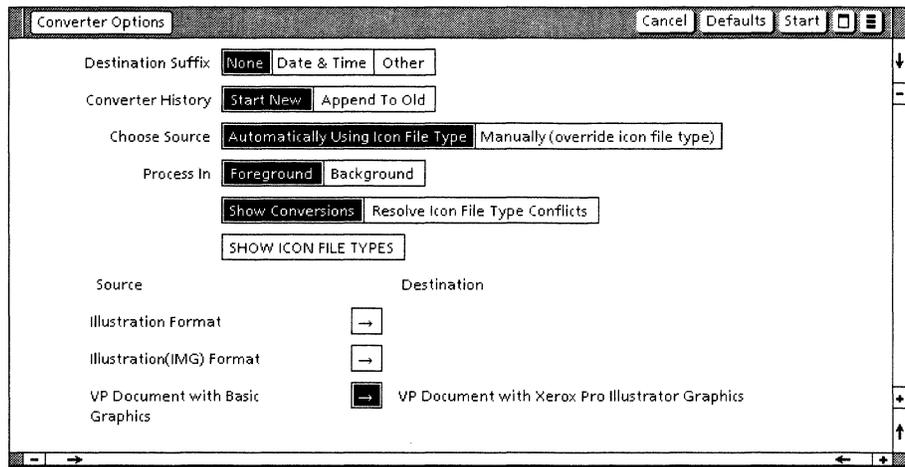
---

Follow these steps to convert a document containing *VP Basic Graphics* to *Xerox Pro Illustrator*:

1. Select the Converter icon, and press <Props>. The Converter Property sheet appears.
2. Select [Display Options].
3. Select [Done] in the property sheet header.
4. Select VP document icon to be converted, and press <Copy>.
5. Select the Converter icon. The Converter Property sheet appears.

6. Select the following properties:
  - [Foreground] or [Background] for the Process In.
  - [VP Document with Basic Graphics] for Source.
  - [VP Document with Xerox Pro Illustrator Graphics] for Destination.
7. Select [Start] in the Converter header.

The system converts the document and places it on your desktop.



Refer to the *File Conversion User Guide* in the *VP Series Reference Library* for a description of all options on the Converter Options sheet.

## Retrieving the conversion history log

Conversion may be run in either the foreground or the background. When the process is complete, a completion message indicates whether any data was lost during conversion. You will need to restore manually any data that is not converted.

If you selected [Foreground] for the Process In option on the Converter option sheet, a completion message indicates whether any data was lost during conversion. It lists each type of object converted and how many of each.

Click outside the message area to remove the message from the display.

If you selected [Background] for the Process In option on the Converter option sheet, open the Converter icon to view the conversion history. Information indicates whether any data was lost, and lists each type of object converted and how many of each.

## Effects of conversion on document components

Most components of a VP document are converted exactly. Within a graphics frame, line thicknesses, dashing, shading, textures, and opacity are converted exactly. Captions are retained on all frames.

The following table lists the conversion effects on other document features.

Document components	Effects of conversion
Auto-hyphenation	Converts.
Footnotes	Do not convert.
Headers/footers	Convert.
Index and Table of Contents markers	Index markers and Table of Contents markers are not converted.
Line and page endings	Hard page and column break characters are converted. Soft endings will be the same if the document was paginated immediately before conversion.
Linked text frames	The text in the frames will convert, but the linking path will not.
Redlining	Converts.
Style sheets	Do not convert. The appearance defined for characters and paragraphs will convert, but the Style sheet itself will not.

## Effects of conversion on graphics objects

The following table provides information about how objects within a *VP Basic Graphics* frame convert to *Xerox Pro Illustrator*.

Graphics objects	Illustrator object	Effects of conversion
Bitmap frame	Bitmap frame	Converts.
Cluster	Cluster	Converts.
Conic curve	Conic curve	Converts.
CUSP button	Rectangle	CUSP program is lost.
Data-Driven Graphics charts	Object equivalents	Objects are not data-driven.
Ellipse	Ellipse	Converts.
Form field	Text frame	Captions are retained. Other Form Field properties are lost.
Graphics frame	Border becomes a rectangle. Objects become a cluster.	Rectangle and cluster are not clustered together. Objects in frame are not clipped by border rectangle.
Image frame	Rectangle	Image frame is not converted. Rectangle holds position.
Line	Line	Double line becomes a cluster of a thin white line on a thicker black line. Line endings must be flush for an identical appearance. Arrowheads are converted to fixed sizes based on line width. Dashes may not convert exactly.
Point	Point	Converts.
Rectangle	Rectangle	Double-line border is created using the technique for double lines.
Tables	None	Does not convert.
Equation frames	None	Does not convert.
Text frame	Text frame	Converts.
Triangle	Chained shape consisting of three line segments	

---

## Restoring components not converted

---

You can use the following procedures to restore *VP Basic Graphics* components that do not convert to *Xerox Pro Illustrator*:

- Copy them from the original VP document into the converted document.
- In the original VP document, replace the Basic Graphics frames with the corresponding Pro Illustrator frames from the converted document. single.

---

## Turning on the grid

---

Grids are not converted. When conversion is complete, you need to turn on a grid or moving geometry in the Pro Illustrator frame.

---

## Chaining

---

*VP Basic Graphics* objects created as a series of contiguous lines and curves, which are not clustered, are not converted to chains. You need to link line and curve endpoints in Pro Illustrator before the object is recognized as a chain.

---

## Notes and cautions

---

The following notes and cautions apply to using *Xerox Pro Illustrator Conversion of VP Basic Graphics*.

- When a *VP Basic Graphics* frame on a landscape page has a frame width more than 6.5 inches and is immediately preceded by a portrait page, the frame will convert to a Pro Illustrator frame with a frame width of 6.5 inches. All the graphics will be converted, but they may extend beyond the frame.

Workaround: Open the frame properties sheet and change the size of the converted frame to the original size of the Basic Graphics frame.

- Embedded graphics frames whose contents extend beyond their boundaries will have a different appearance after conversion. Because Pro Illustrator does not support them, embedded graphics frames are converted to clusters. Any object or portion of an object extending outside an embedded graphics frame in *VP Basic Graphics* is hidden from view. These objects are completely visible in the resulting Pro Illustrator frame.



---

## 19. Printer requirements for Xerox Pro Illustrator

This chapter lists the printers supported by *Xerox Pro Illustrator*, and describes individual printer requirements and limitations.

---

### Supported printers

---

*Xerox Pro Illustrator* supports the following printers:

- Versatec 2700 Color Printer
- Xerox NS 3700 LPS Release 4.1
- Xerox 4045 Laser CP (combined with a 6085 Documenter workstation running VP Local Laser Printing)
- Xerox NS 8000 Laser CP Electronic Printer (4045 printer with an 8000-based server)
- Xerox 8040 Series Electronic Printer with NS 8000 Print Service software
- Xerox 4050 LPS
- Xerox 4090 LPS
- Xerox 4650 LPS
- Xerox 4085 HighLight Color Laser Printer System
- Xerox 8700/8790 LPS
- Xerox 9700/9790 LPS.

VP documents containing Pro Illustrator graphics are printed like any other VP documents, as long as the printers are configured correctly. The following sections describe configuration requirements for supported printers.

#### Versatec 2700 Color Printer requirements

---

Consult your System Administrator for information regarding the Versatec 2700 Color Printer configuration requirements.

#### NS 3700 configuration requirements

---

If you are printing Pro Illustrator output on the NS 3700 printer, it is strongly recommended that you use Complex Print Mode.

## **4045 Documenter configuration requirements**

---

In order to print Pro Illustrator graphics on a 4045 Documenter, XPI LPO Common Software, and XPI Local Laser Printing software must be loaded on the 6085.

## **NS 8000/8040 Series configuration requirements**

---

If you are printing Pro Illustrator output on the NS 8000 Laser CP or the 8040 Series printers, enable complex printing and slow page printing.

## **4085 HighLight Color Laser Printer System requirements**

---

Consult your System Administrator for information regarding the 4085 HighLight Color Laser Printer System configuration requirements.

## **4050, 4090, 4650, 8700/8790, and 9700/9790 requirements**

---

Pro Illustrator output sent to the 4050, 4090, 4650, 8700/8790, and 9700/9790 printers must first be formatted by a Formatting Print Service (FPS). If your printer is running Services 10.0 software, you can format documents automatically by copying them to a Network Formatting Print Service directly.

If your printer is running Services 11.0 software, you can format documents at your desktop using the Workstation Formatting Print Service, which is accessed through your Converter icon. You need the Filing and Printing Utilities application loaded and running in order to use the Workstation FPS.

---

## **Converting documents using the Formatting Print Service (FPS)**

---

Follow these steps to convert documents using the FPS:

1. Copy the VP document icon onto the Converter icon.
2. For Source, select VP Document. For Destination, select FPS Interpress Master.
3. Select Start in the Converter header.

The Converter produces an FPS Interpress master of the VP document and places the master icon on your desktop. Copy this icon to the desired printer icon (4050, 4090, 4650, 8700/8790, or 9700/9790).

---

## Setting the correct print level

---

*Xerox Pro Illustrator* supports three print levels which you can set through the desktop auxiliary menu: Services 10.0, Services 11.0, and Interpress 3.0.

The print quality increases from Services 10.0 to Interpress 3.0, so you should set the print level to the highest level your printer supports. The default print level is Services 11.0. The print level you set only affects printing of Pro Illustrator frames.

---

## Setting or changing print level

---

To set or change the print level, select Set Print Service 10.0, Set Print Service 11.0, or Set Interpress 3.0 in the desktop auxiliary menu. If the print level you want is not displayed as a menu option, you are already at that level.

If you do not know which print level your printer supports, contact your System Administrator,.

Alternatively, you can use the Print Level Test document in Quick Art to test for the level supported. The Print Level Test document contains instructions for determining the print level.

---

## [Xerox Illustrator Basics Printing] in the User Profile

---

You can also set the print level in the User Profile by adding the following entry:

[Xerox Illustrator Basics Printing]

Default Print Level: Print Service 11.0.

If you change the print level in your User Profile, you must log off and back on in order to apply the change.

Refer to the *General User Guide* in the *VP Series Reference Library* for information on editing your User Profile.

## Printing limitations

The following table describes the limitations that you might encounter when printing Pro Illustrator documents. Note that the printing complexity of a document is determined by all the objects in the Pro Illustrator infinite canvas, including any that are outside the frame (even though they would never appear in the printed document).

No.	Limitation
1	Gaps sometimes appear in printed curves. They are particularly noticeable in three-point wide curves. If you notice this, enlarge or reduce the line width until the gaps disappear.
2	Filled chains with intersecting lines do not print correctly. For example, a five-point, filled star drawn with five lines will not print correctly; to work around the problem, draw the star as an outline with ten lines, so the lines do not cross.
3	Printer error message, "Page Too Complex to Print." Simplify the illustration by reducing the number of objects in the illustration. Reprint the illustration.
4	White lines on black background occasionally disappear.
5	Black lines on white background occasionally disappear.
6	Filled chains with edges that are horizontal or vertical occasionally fill incorrectly.
7	Certain complex Pro Illustrator drawings print with image gaps. Image gaps are blank strips that run horizontally or vertically across the page. If these gaps occur, the Image Gap Reprinting option prints a second, correct copy of the page.
8	Font sizes are sometimes misinterpreted by the XPI converter (as very large fonts), and may not be printed.
9	Sometimes bitmap frames and image callouts are not scaled or rotated properly.

The following table indicates which limitations (as specified by their number in the preceding list) apply to each supported printer.

Printer	Print level	Limitations
VP Pro Print Service	IP 3.0	None
Versatec 2700 Color Printer	11.0	Consult your System Administrator
NS 3700	11.0	4
NS 8000 Laser CP	10.0	2, 3, 5, 6, 7, 8
NS 8000 Laser CP	11.0	1,9
8040 Series	11.0	1,4
Documenter (VP)	10.0	2, 3, 5, 6, 7, 8
Documenter (XPI)	11.0	1, 9
4050 4090 4650 8790 9790	10.0	2, 3, 5, 6, 7, 8
8700 9700	10.0	2, 3, 5, 6, 7, 8, 10
4050 4090 4650 8700 8790 9700 9790	11.0	1, 9, 10
Xerox 4085 HighLight Color Laser Printer System	11.0	Consult your System Administrator



This chapter explains how to solve or avoid known problems with *Xerox Pro Illustrator*. The notes and cautions are divided into the following areas:

- Limitations that cause system failure
- Limitations relating to:
  - Frame operations
  - Softkeys
  - Display and printing
  - Selection
  - Object creation
  - User Profile
  - Editing
  - View windows
  - Bitmaps
  - Text
  - Pro Illustrator HighLight Printer palettes
  - Fills
  - Running Xerox Pro Illustrator in the loader.

---

## Limitations that cause system failure

---

This system lists limitations that can cause system failure and provides workarounds to resolve them.

- The system will fail if you run out of disk space while you are adding objects to a Pro Illustrator frame, copying Pro Illustrator frames, or paginating.

Workaround: Always maintain at least 300 free pages on the desktop, more if you are working with especially large documents or complex illustrations.

- If you attempt to paginate from the desktop auxiliary menu with a document open, your workstation will fail if a bitmap frame is selected that is either empty or referencing a bitmap canvas on the desktop.

Workaround: Paginate an open document from the document window header menu, not the desktop auxiliary menu.

- Moving text from a Pro Illustrator text frame to a mail note will hang the system.

Workaround: Copy the text, then delete it from the Pro Illustrator frame.

- Attempting to use <Same> to get properties from a Basic Graphics object will cause your workstation to crash.

Workaround: Do not use <Same> between Pro Illustrator and *VP Basic Graphics*.

- Typing very large numbers in the Measures window and invoking Apply will sometimes cause the workstation to crash.

Workaround: Do not type very large numbers in the Measures window. Also, if asterisks appear in any Measures window field, delete them before invoking [Apply].

---

## Other limitations

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These notes pertain to limitations that do not produce fatal errors.

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## Frame operations

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- When you move a Pro Illustrator frame within a document that contains the maximum of 100 frames, an error message is displayed indicating that no more frames are allowed. The message is erroneous in this situation since you are not adding a frame to exceed the maximum of 100. To get around it, move the frame to another document, then copy it to the new location in the original document.
- If you attempt in error to copy or move an illegal object (such as a desktop icon or a *VP Basic Graphics* object) into a Pro Illustrator graphics frame, the operation does not abort. You can click again into a legal destination to correctly complete the copy or move.

---

## Softkeys

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- Changes you make to the Pro Illustrator softkeys using the softkey property sheet are not retained when the system is rebooted. They are, however, retained across logons, even when another user has logged on.

---

## Display and printing

---

- Bitmap frames that lie partly outside the Pro Illustrator frame will print outside the frame, even though they appear to be clipped on the screen.
- If you run Illustrator software after you log on, the Illustrator print level becomes "Print Service 11.0," regardless of what is specified in the User Profile. Change the print level from the desktop auxiliary menu, or log off and back on.
- Do not change the Illustrator print level in the desktop auxiliary menu during a printing operation (Since the change takes effect immediately, the last part of the document will be printed at the new print level).
- Certain text characters may not be visible when a document has been exchanged between ViewPoint 2.0 desktops with different font or hyphenation environments. To correct this, select the Normalize Text command in the content auxiliary menu in the document window header.

- In a printout of Pro Illustrator frames, arcs with dashed line style and extended line ends bend outward at the end. To avoid this, use flush line ends.

## Selection

---

- If you select Outline Illustrator Graphics for a View window that is zoomed very large, selection will behave strangely.
- To select an arc using the draw-through box, you need to make the draw-through box large enough to include the complete arc as though it were drawn to the nearest quarter circle. For example, for an arc that is a nearly a complete circle, you need to include the complete circle in the draw-through box.
- Some of the control points in rings and structures copied from Chemical Illustrator graphics frames will not be highlighted when they are selected (This is because duplicate control points are canceling each other out).

## Object creation

---

- When you are drawing a rectangle or ellipse in paraline cavalier geometry, the system will sometimes erroneously ask you to "Choose a different location for second corner." When this happens, place and hold down the mouse button for the second corner in a direction that works, and then move your cursor around to the desired location (This problem also occurs for user-specified paraline angles whenever one of the angles is 45 or 135 degrees).
- Adding an arrowhead line ending to a very short arc can cause the arc to reverse and become an almost full circle. Either make the arrow smaller or make the arc longer.
- Curves drawn with a single bend point really have two bend points, both at the same location. Normal control point selection selects only one of them (allowing the two bend points to be moved separately). To move the two bend points simultaneously, you need to select them both. Select the first bend point using control point selection. Then use draw-through box selection to select the second bend point at the same location.

## User Profile

---

- It is recommended that you specify the setting "Edit/Save: TRUE" in the [Documents] section of your User Profile. This setting disables the VP Document Editor's automatic checkpoint feature. If the setting is FALSE, automatic saves can be initiated by the system when you are in the middle of drawing or editing operations. If this occurs, you do not lose work, but the current operation is terminated as though you had pressed <Stop>. Generally, the object you were working with is still selected, and you can continue by pressing <Again>. If you were drawing a chain, select the Add to Chain icon to continue.

## Editing

---

- <Shift> is ignored if you click the mouse button while the system is still busy from the previous operation. Attempting a control point selection while the system is busy results in an object selection instead. Similarly, <Shift> does not disable grid and gravity while the system is busy.
- A control point move of a Chemical Illustrator bond in a Pro Illustrator frame moves the control point away from the bond (The bond itself does not move).
- The system will sometimes return to Select mode when you click into a different frame or view from the one in which you have been working. When this happens, choose the desired mode again.

## View windows

---

- If you are running the Extended Language Option, creating a View window will not work correctly. If you move the mouse outside the document window after you select the area to be viewed, the corner cursor shape changes to an arrow, and clicking the mouse has no effect. To create a view at a location outside the document window, hold the left mouse button down for about a second. The corner cursor symbol will reappear. Release the mouse button to create a View window.

## Bitmaps

---

- If a change is made in a referenced bitmap, it will not be updated in the bitmap frame unless you close the document or set the reference to a different bitmap canvas and then set it back to the altered canvas.
- If a bitmap canvas is copied to a bitmap frame when the Illustrator frame is in outline display, the properties of the bitmap are not shown on the object property sheet. The canvas resolution property, for example, is always zero. Change to Full display and choose Get Props in the object property sheet or open a new property sheet. Outline display will no longer affect bitmap frame properties.

## Text

---

- A fill-in order cannot be set for Pro Illustrator text frames.
- Pro Illustrator text frames cannot be linked.
- Characters are sometimes missing from the printed output for text frames with zero inner margins and varying width or height.

## Pro Illustrator HighLight Printer palettes

---

- The Pro Illustrator HighLight Printer palettes can be used to apply color to graphics objects, but they are not recommended for any use other than printing on a Xerox 4085 HighLight Color Laser Printer System.

To use the HighLight Color printing capability, special licensed software must be installed on your workstation. If your workstation is not equipped with this software, the HighLight Printer palettes will not display their true colors on the screen, nor will they print their true colors on a color printer. In addition, if an object is colorized using these palettes the Object Properties sheet will display "Unknown Color" for the color name.

## Fills

---

- A closed chain created by appending to a line has a tint of zero (white), and not the expected default tint. After completing the chain, use the softkeys to choose the desired tint.
- If you are working in a Pro Illustrator frame with a background fill and cannot see the image or the control points during editing, change the fill to a different color. Alternatively, you can select [White] for the Fill Color property or [Clear] for the Fill Opacity property during editing. When you have completed the edits, change the texture, opacity, and fill color to the desired choice.

## Running Xerox Pro Illustrator in the loader

---

- When the Illustrator applications are set to Auto Run [No] in the loader, and you run *Xerox Pro Illustrator* after running *Xerox Chemical Illustrator*, you may see the message "Cannot load application while any documents are open or in use." To run *Xerox Pro Illustrator*, select [Run] in the loader window header a second time.



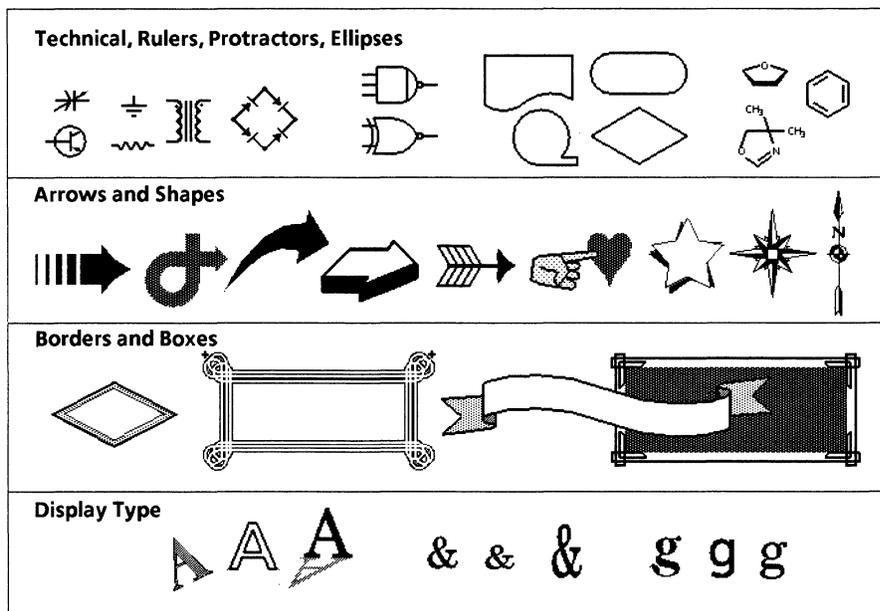
---

## A.

## Quick Art

*Xerox Pro Illustrator Quick Art* is a collection of ready-to-use symbols, objects, and shapes that you can copy into your *Pro Illustrator* drawings and edit. Quick Art is provided with the *Xerox Pro Illustrator* applications.

The following illustration is a sample of some of the Quick Art.



---

## Quick Art documents

---

The following documents are provided with Quick Art:

- Xerox Modern font
- Xerox Classic font
- Sausalito font
- Optima font
- Print Level Test
- Ellipses, linear and paraline
- Perspective grid
- Rulers
- Protractors
- Chemicals
- Flow chart
- Electronic
- Arrows and Compass points
- Brackets, Braces, and Numbers
- Forms Elements
- Office Layout

- Tint, Textures, Points, and Lines
- Banners, Boxes, and Flashes
- Borders
- Shapes, Stars, and Dingbats.

---

## Using Quick Art

---

Follow these steps to use Quick Art:



1. Copy Quick Art to your desktop.  
Be sure to copy not move objects from Quick Art documents to Pro Illustrator frames. If you move an object, it will no longer be available in the Quick Art document.
2. Make sure the VP document that contains the Pro Illustrator frame you want to work with is open on your desktop and in edit mode.
3. Open the Quick Art document. Select [Edit] in the document window header.
4. Select the desired object(s). Press <Copy> and move the cursor into the Pro Illustrator frame (you may have to move the windows so you can position the cursor in the frame). Click the left mouse button.
5. The system copies the object(s) into the Pro Illustrator frame. They are now part of the illustration and can be selected and edited.
6. Close the Quick Art document window.

---

## B. Tips and strategies for using Pro Illustrator

This appendix contains following tips and strategies for using *Xerox Pro Illustrator*. Topics covered include the following:

- Getting Pro Illustrator to work faster
- Correcting mistakes
- Using the Define/Expand Dictionary to quickly insert art
- Using non-printing layout lines and invisible notes in your illustrations
- Viewing illustrations on different pages at the same time
- Editing lines
- Aligning objects
- Moving objects with their connecting lines
- Finding the center of a Pro Illustrator frame
- Finding the center of a line
- Finding the center of an object
- Creating a symmetrical shape
- Drawing a hollow filled shape
- Drawing an isometric cylinder
- Drawing a round-cornered box
- Tracing smooth curves in sketches or scanned drawings
- Creating adjoining chained shapes with shared sides
- Using a gravity object to position objects in a layout.

---

### How to use the tips and strategies

---

You should familiarize yourself with *Xerox Pro Illustrator's* features and operations before you try to use the tips and strategies in this appendix.

The tips and strategies are written with the assumption that you are familiar with *Xerox Pro Illustrator* operations and features. As a result, the procedures contain steps which are not as detailed as those found in the rest of the manual. If you need more detailed information, refer to the appropriate section of this manual.

---

## Getting Pro Illustrator to work faster

---

This section contains some tips that can save you time while using *Xerox Pro Illustrator*.

---

### Using [Outline Illustrator Graphics] when drawing

---

When you select the [Outline Illustrator Graphics] option in the document auxiliary menu or View window Display command pull-down menu, Pro Illustrator drops the fill patterns, changes all line properties to 1 point solid, and displays bitmap frames as outlines (if you select the option in the View window, the raster image is also displayed). Using the [Outline Illustrator Graphics] option speeds up scrolling and repainting time in both the document and the View window. It is also helpful when you are using Quick Art. You can select the [Show Full Illustrator Graphics] option when you are ready to finalize properties or see your completed illustration.

---

### Limiting the number of View windows open at a time

---

When you edit a drawing and you have many View windows open, *Xerox Pro Illustrator* updates every View window, which slows down the system. To avoid this, have only the number of View windows open that you need, or place View windows you are not using behind View windows that you are using.

This saves time because *Xerox Pro Illustrator* does not update View windows behind other View windows. *Xerox Pro Illustrator* does update View windows behind property sheets.

---

### Making your main document small when using View

---

Another time saver you can use when working with View windows is to make your main document view small (so that the part you are working on is not visible) or cover the main document view with the View window while you work. As you make changes, *Xerox Pro Illustrator* only has to update one view, and you can scroll the View window more quickly.

---

### Creating a View window of Quick Art symbols

---

To save processing time in repainting the Quick Art symbols every time you reposition documents on your desktop, make a small (25%) view window of the quick art symbols you need. You select [Outline Illustrator Graphics], then size the Quick Art document down and place the view window on top of it. You can then copy the quick art from the View window into your illustration.

## Drawing shapes with chains instead of lines

---

Using chains instead of line clusters to draw shapes with many connecting lines saves disk space and repainting time, and provides faster access time when you are formatting, paginating, and opening Pro Illustrator frames. This is because each line has its own set of properties which *Xerox Pro Illustrator* must process. Chained shapes have one set of properties, and therefore do not require as much processing time.

## Dragging the cursor

---

If you know exactly where to place your cursor while moving, copying, or transforming an object, just click the mouse button at that location instead of dragging the cursor. If you drag the cursor to the final location, *Xerox Pro Illustrator* updates the object's appearance one or more times as you move the cursor, which slows down the system.

## Turning off object gravity

---

When you transform, copy, move, or draw objects with object gravity on, the temporary image moves more slowly while you have the cursor down. Do not use object gravity unless you need it.

---

## Correcting mistakes

---

This section contains alternative ways of correcting mistakes in *Xerox Pro Illustrator*.

### Using <Stop>

---

While transforming an object, you can return it to its original position and/or shape by pressing <Stop> while you are still holding down the mouse button. Pressing <Stop> also aborts a drawing action while the mouse button is still down.

### Save&Edit and [Reset]

---

If you have Edit/Save set to True in your User Profile, you can use Save&Edit in the document window header to undo an operation. For example, if you are not sure if an edit is going to be correct, such as deleting or transforming an object, you can select Save&Edit in the main document window header first, make the edit, then select [Reset] to undo the operation if you need to.

---

## Using the Define/Expand Dictionary to quickly insert art

---

If you have a set of art symbols, bitmap frames, signatures, or any graphics that you use often, you can load them into the VP Expansion Dictionary so you can quickly insert them as you are composing your documents.

If you do not already have an active dictionary, you can create one during the procedure.

Follow these steps to place art in a Define/Expand Dictionary:

1. Select the anchor representing the Pro Illustrator frame that you want in the Expansion Dictionary.
2. Press <Shift> and <Define/Expand> at the same time.
3. If an active dictionary already exists, the Define options window appears. If not, you are prompted to create a dictionary. If you need to create a dictionary, select Yes in the desktop auxiliary window header.
4. Enter an abbreviation for the frame in the Define Options window, and select Start.
5. Before you log off, make sure to select Store Expansion Dictionary in the desktop auxiliary menu in order to save the dictionary contents.

When you are ready to place the art in a document, type the abbreviation you previously defined and press <Define/Expand> (Note that you cannot use <Define/Expand> to insert art inside an existing Pro Illustrator frame). The frame containing the object(s) will automatically appear in your document.

If the frame contains other objects you do not need, create another Pro Illustrator frame where you want to place the symbol, and copy the art you want into it. Delete the original Pro Illustrator frame containing all of the symbols from your document.

For more information about the Define/Expand option, refer to *Document Editor: Formatting Tools User Guide* in the VP Series Reference Library.

---

## Creating non-printing layout lines and invisible notes

---

If you want to leave layout guide lines, shapes, templates, or notes (in text frames) inside your illustrations, you can set their properties to non-printing in the object property sheet. This causes them to remain visible on the screen, but not to print. This is helpful for retaining perspective drawing lines, providing information about an illustration such as its frame units and grid settings, and referencing any other object properties.

## Simultaneously viewing illustrations on many pages

To simultaneously view and edit illustrations on many different pages of your document, make a View window of each of the Pro Illustrator frames you want to view. Use 90% scale if you want to see the text frame contents.

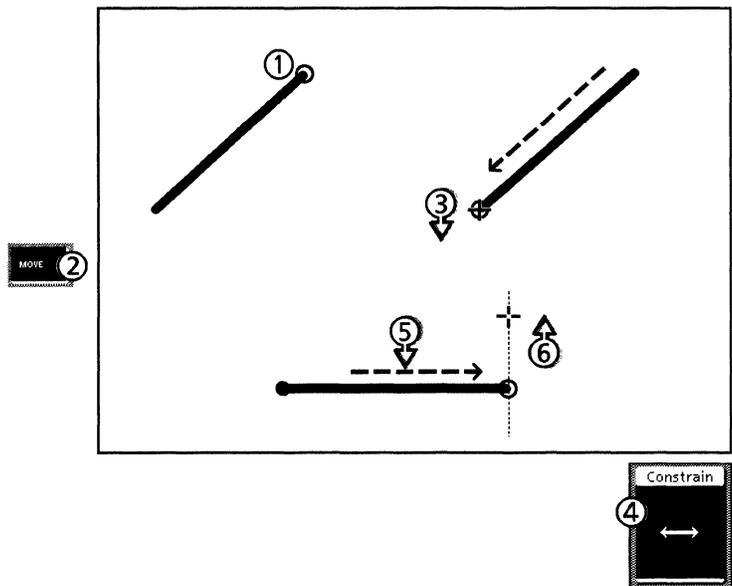
## Editing lines

This section contains the following procedures:

- Changing a line's angle
- Changing a line's length without altering its angle
- Quickly deleting line segments at object intersections.

### Changing a line's angle

The procedure in this section shows you how to change a line's angle to be horizontal or vertical. To change a line to an angle other than horizontal or vertical, just control point select one of the end points, then move it in the direction of the angle you want.

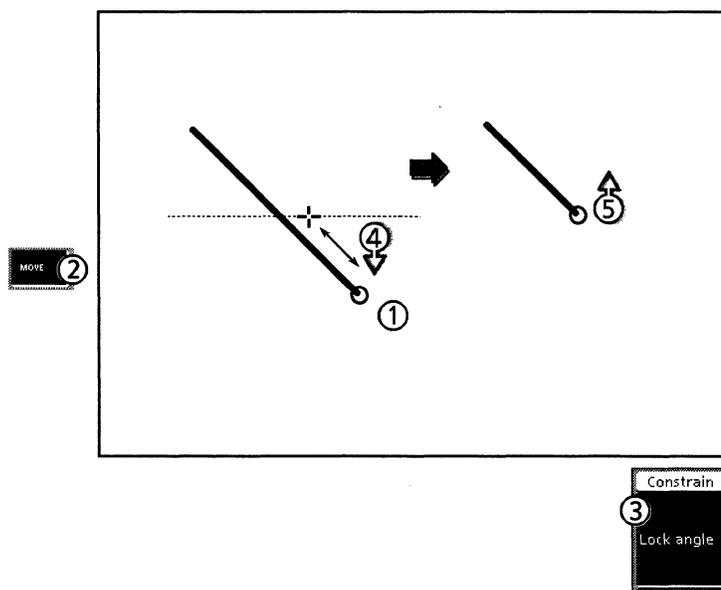


Follow these steps to change a line's angle to horizontal or vertical:

1. With gravity on, control point select one of the line's end points.
2. Press <Move>.
3. Press and hold down the left mouse button. Move the cursor to the line's other end point until you see an open circle. Do not release the mouse button.
4. Select the Horizontal or Vertical constraint.
5. Move the cursor to the desired location for the end point.
6. Release the mouse button.

## Changing a line's length while keeping its angle

You use the Lock angle constraint to change the length of a line while maintaining the angle.

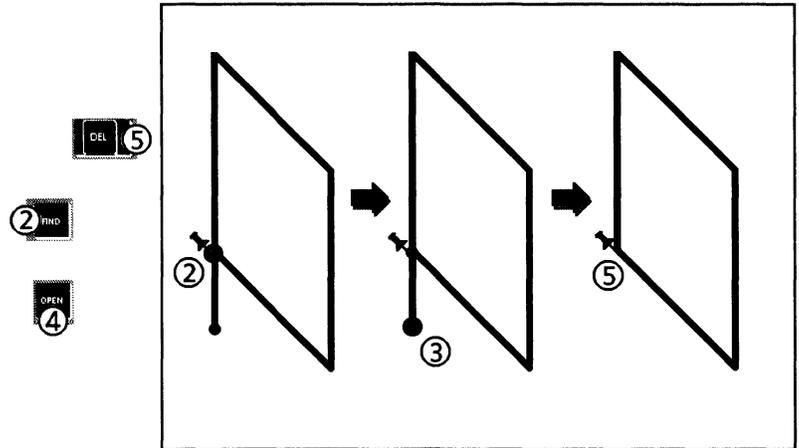


Follow these steps to change a line's length while keeping its angle:

1. Control point select one of the line's end points.
2. Press <Move>.
3. Select the Lock angle constraint.
4. Press and hold down the left mouse button and move the cursor until the line is the desired length.
5. Release the mouse button.

## Quickly deleting line segments

This section contains a quick procedure for deleting unwanted line segments at object intersections. You can apply this procedure to chain segments, or regular lines.



Follow these steps to quickly delete line segments:

1. Select a control point at an intersection where you want to cut the line.
2. Press <Find>. This places the Pin Point at the intersection.
3. Select the end of the line segment you want to delete.
4. Press <Open>. This is a quick way to cut a line segment at the Pin Point without using the Cut At and Link/Cut softkeys.
5. Press to delete the unwanted segment.

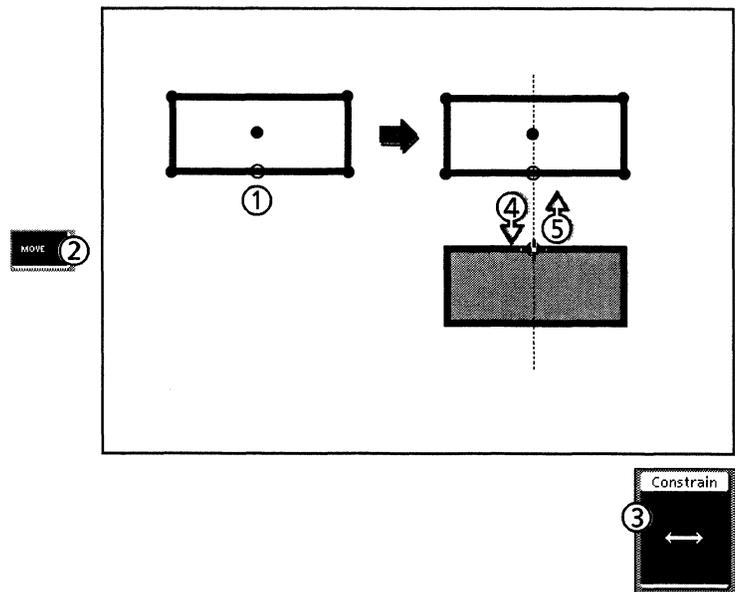
## Aligning objects

This section contains two strategies for aligning objects. The first shows you how to use the Horizontal and Vertical constraints to align objects. The second procedure shows you how to use linear moving geometry to aid in alignment.

### Using the Horizontal and Vertical constraints for alignment

Use this tip to align objects with one another. The key is in aligning objects at their respective control points. Before you start, you need to determine the alignment point: that is, whether you want to align the objects by their top or bottom control points, center control points, or side control points.

If you are aligning the objects horizontally, use the Vertical constraint so you can maintain horizontal spacing while moving the cursor. If you are aligning the objects vertically, use the Horizontal constraint so you can maintain vertical spacing.



Follow these steps to align objects horizontally or vertically:

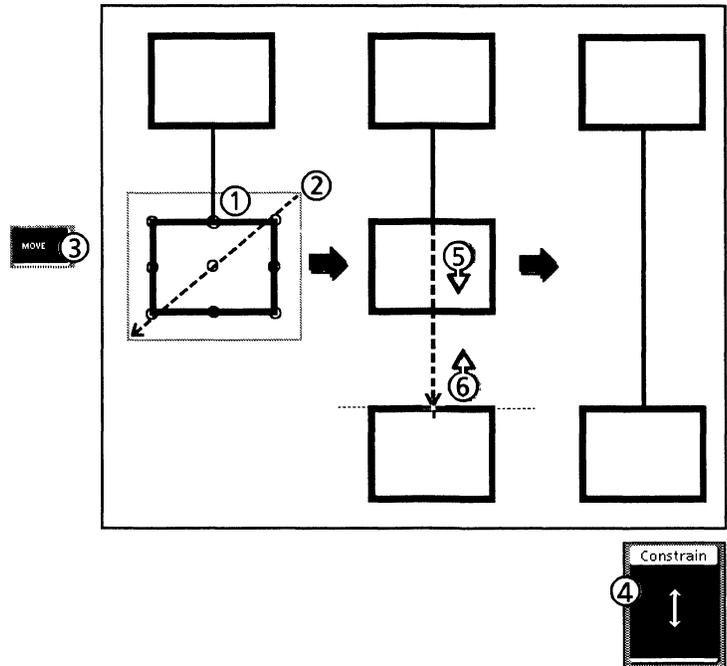
1. Select the object you want to align at the control point you want to align with the other object.
2. Press <Move>.
3. Select the Horizontal or Vertical constraint, depending upon the direction in which you are aligning the objects (Horizontal for vertical alignment; Vertical for horizontal alignment).
4. Press and hold down the mouse button and move the cursor to the corresponding control point on the other object.
5. Release the mouse button when you see the open circle. The objects should be aligned correctly.



6. Place the copy below the original by moving the cursor down. Notice how the box is constrained to move vertically without your having to select the Vertical constraint.
7. Select the box you just positioned and press <Move>.
8. Move the box to the left. Notice how the box is constrained to move horizontally without your having to select the Horizontal constraint.
9. Select the box you just positioned and press <Copy>.
10. Copy the box to the right.
11. Continue copying, moving, and positioning boxes until you have enough. You use the same process to add connecting lines.
12. Select the Chain icon on the Draw softkey.
13. Select the top box by the bottom center control point.
14. Draw a vertical line.
15. Press and hold down the left mouse button, and move the cursor horizontally towards the lower left box.
16. With the mouse button still down, press <Same> to lock the line's angle.
17. Move the cursor to the top center control point of the lower left box until the open circle appears. Release the mouse button.
18. Click again on the top center control point to draw the last segment.
19. Press <Stop>.
20. Continue this process to draw the rest of the lines in the chart.

## Moving objects with their connecting lines

If you want to move an object that has lines connecting it to another object, you can stretch the connecting lines as you move the object using the procedure below.



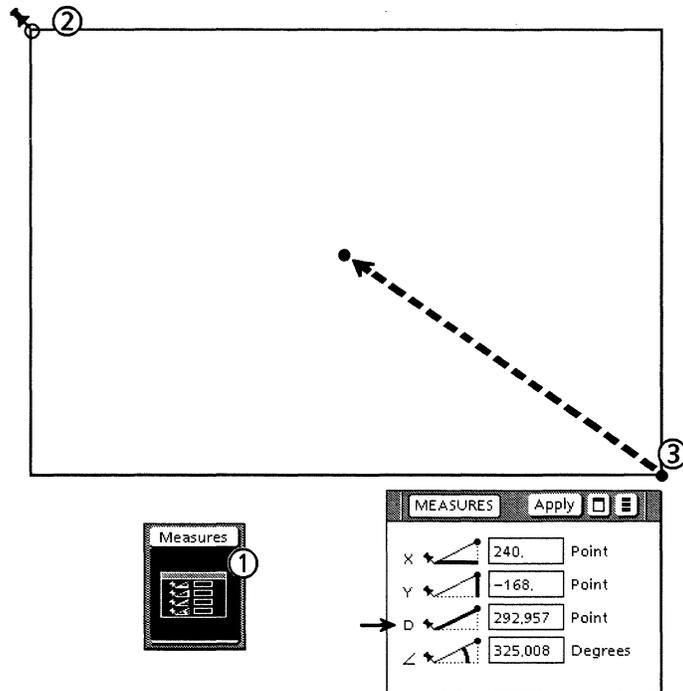
Follow these steps to move objects with their connecting lines:

1. Control point select the end of the connecting line on the object you want to move.
2. Extend select the object with the draw-through box.
3. Press <Move>.
4. If you want to move the object horizontally or vertically, select the Horizontal or Vertical constraint.
5. Press and hold the left mouse button and move the object and the connecting line.
6. Release the mouse button. The connecting line stretches with the object to the new location.

## Finding the center of a Pro Illustrator frame

This section shows you how to find the center of a Pro Illustrator frame using the Measures window.

Before you start, make sure that intersection or object gravity is active.

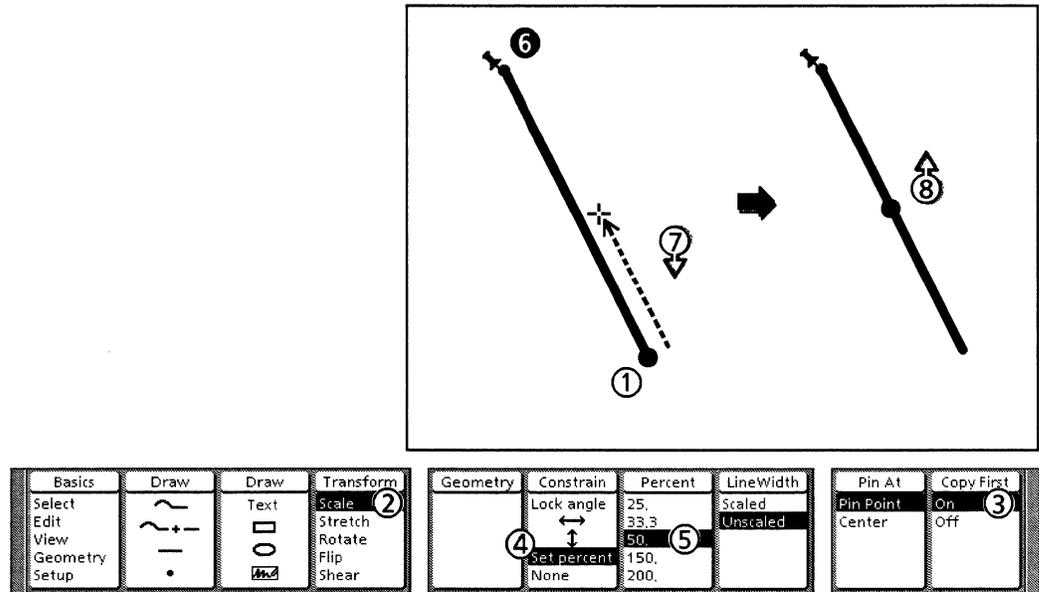


Follow these steps to find the center of a Pro Illustrator frame:

1. Activate the Measures window by selecting the Setup option and then selecting the Measures softkey.
2. Select the Pin Point and move it to the top left edge of the Pro Illustrator frame. Release the mouse button when you see the open circle.
3. Draw a point shape at the bottom right corner of the frame. Make sure that the point shape remains selected. The value in the D (Distance) field of the Measures window is the distance between the two points.
4. Divide the value by 2 and type the result in the D field.
5. Select [Apply]. The point shape moves to the center of the frame.

## Finding the center of a line

This tip shows you a quick and easy way to find the center of a line using the Set percent option instead of measuring the line and dividing the length in half. This is useful for aligning the center of a line with other objects. You can also use this procedure to find different percentages of a line, such as 33.3% (1/3), 25% (1/4), and so on.

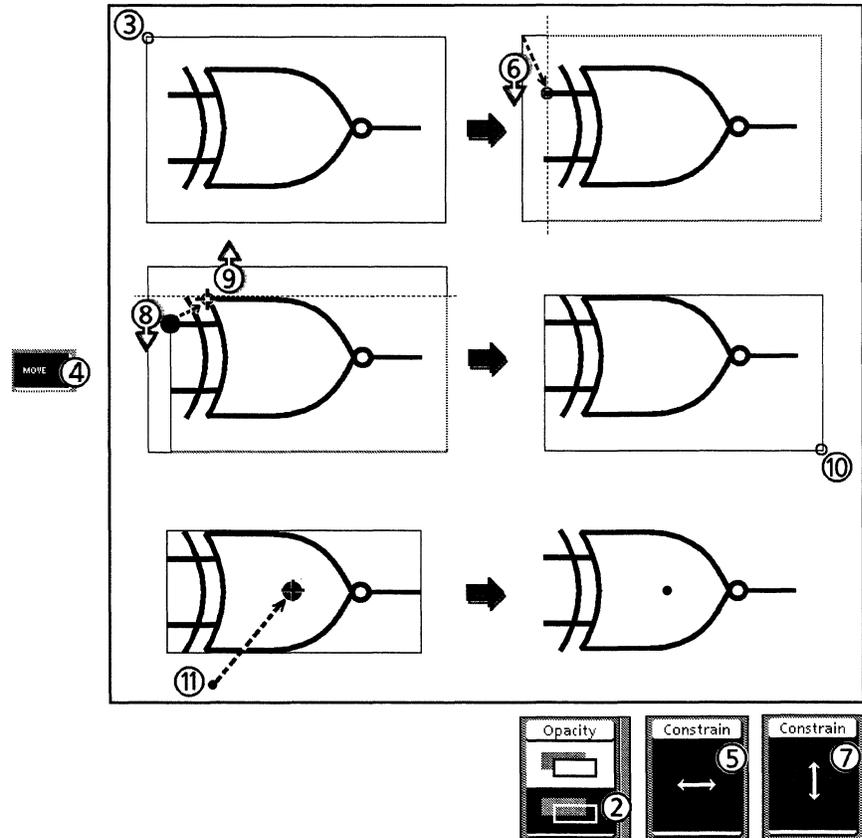


Follow these steps to find the center of a line:

1. Select the line.
2. Select Scale on the Transform softkey.
3. Select On on the Copy First softkey.
4. Select Set percent on the Constrain softkey.
5. Select 50 on the Percent softkey.
6. Click the right mouse button to position the Pin Point on the opposite end point of the line.
7. Press and hold the left mouse button and move the cursor toward the Pin Point until the cursor snaps to half of the line length.
8. Release the mouse button. The guide point for the new line is at the center of the original line.
9. If you want to cluster the new line and the original line, select both lines, then select Edit on the Basics softkey, then Joined on the Cluster softkey.

## Finding the center of an object

You may need to find the center of an object in order to create a control point for alignment purposes, or to center additional objects within another object. This procedure shows you how to position a rectangle around an object so you can use the rectangle's center control point for the object's center.



Follow these steps to find the center of an object:

1. Draw a rectangle around the object.
2. Set Opacity to Clear and change the fill tint to zero if the rectangle is filled.
3. Control point select the upper left corner of the rectangle.
4. Press <Move>.
5. Select the Horizontal constraint.
6. Press and hold the left mouse button. Move the cursor to the leftmost control point on the object. Do not release the mouse button.
7. Select the Vertical constraint. Move the cursor to the top control point on the object.
8. Release the mouse button.
9. Control point select the bottom right corner of the rectangle. Repeat steps 4 through 9 to position the corner.

10. To place a control point in the center: Draw a small point shape and make it non-printing so it will not appear on the printed copy. Move the point shape to the same position as the rectangle's center control point, using gravity to snap the point to the rectangle's center. Cluster the point shape with your object.
11. Delete the rectangle.

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## Tips for creating a symmetrical shape

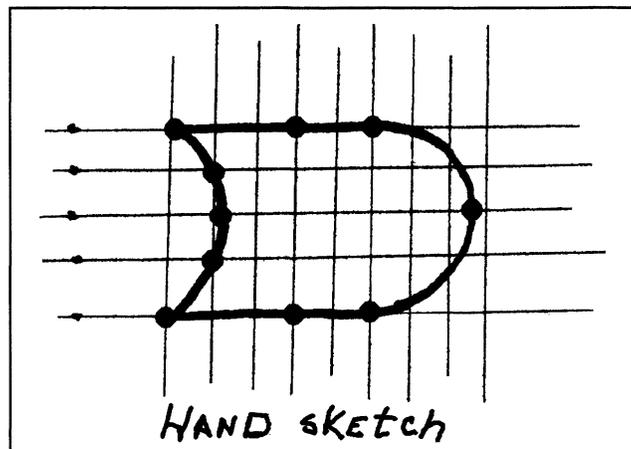
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This section contains tips for planning and drawing a symmetrical shape. You can follow along and draw the shape shown in this section, or you can modify the procedure to draw your own shape.

### Planning the symbol or shape

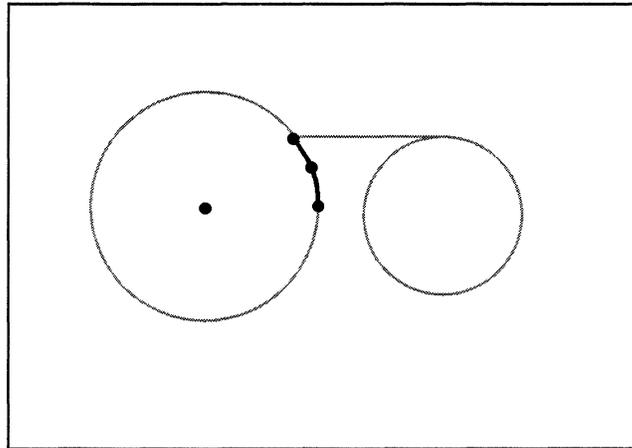
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Before you begin, sketch the shape you want to draw on graph paper, or measure an existing shape. Keep in mind while you are drawing where you want control points for alignment or for connecting the shape to other objects. For example, the left curve in the following figure consists of four curves with five control points instead of one curve with only two end points. This makes it easier to intersect the curve at a specific number of evenly spaced points.



It may be helpful to draw objects that you can use to trace over, especially if you are drawing curves. You can use their control points as guidelines for your symbol's control points, and, if you have object gravity selected, you can trace along the edge of the object using gravity. Make these gravity objects thin gray lines so they appear differently from the final symbol. You can make them non-printing if you want to leave them in the illustration.

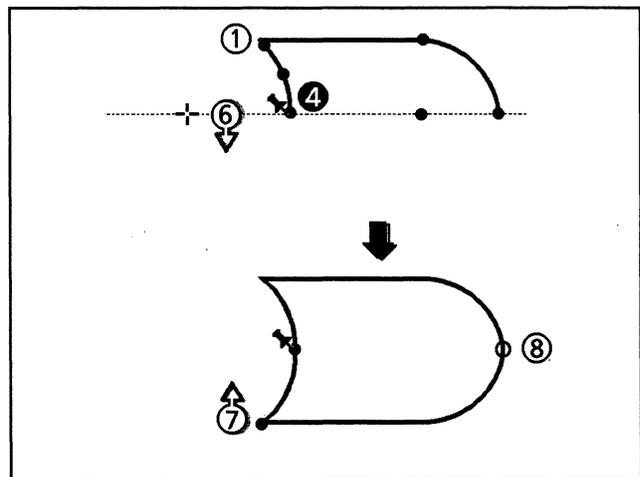
The following illustration shows a curve being traced over an object.



### Quick steps for drawing a symmetrical object

When the object you are creating is symmetrical, you can draw half of it, flip and copy it, then link the two chains together. This section contains the procedure for creating a symmetrical shape using this method.

Start with half of the object already created, then determine the direction in which you want to flip the object. You want to place the guide point opposite the flip axis.



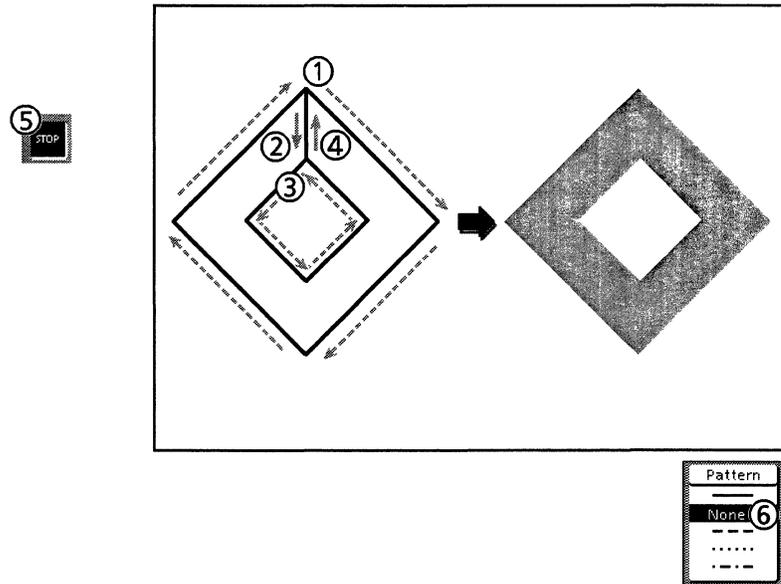
Basics Select Edit View Geometry Setup	Draw ~ ~+ -   •	Draw Text □ ○ ▭	Transform Scale Stretch Rotate Flip Shear
Geometry		Constrain Lock angle ↔ ↕ None	Pin At Pin Point Center Copy First On Off
Basics Select Edit View Geometry Setup	Draw ~ ~+ -   •	Draw Text □ ○ ▭	Transform Scale Stretch Rotate Flip Shear
Cluster Joined Split		Cut at Cut Link/Cut Linked	Layer Top Bottom Layer Above Below

Follow these steps to draw a symmetrical shape:

1. Select the chain by a control point away from the flip axis.
2. Select Flip on the Transform softkey.
3. Select On on the Copy First softkey.
4. Use the right mouse button to place the Pin Point.
5. If you are flipping the object horizontally, select the Horizontal constraint. If you are flipping it vertically, select the Vertical constraint.
6. Press the left mouse button and move the cursor across the flip axis.
7. Release the left mouse button when the object is flipped.
8. To link the chains, select end points from each chain using control point selection and the draw-through box.
9. Select Edit on the Basics softkey.
10. Select Linked on the Link/Cut softkey.
11. Repeat steps 8 through 10 for the other pair of end points.

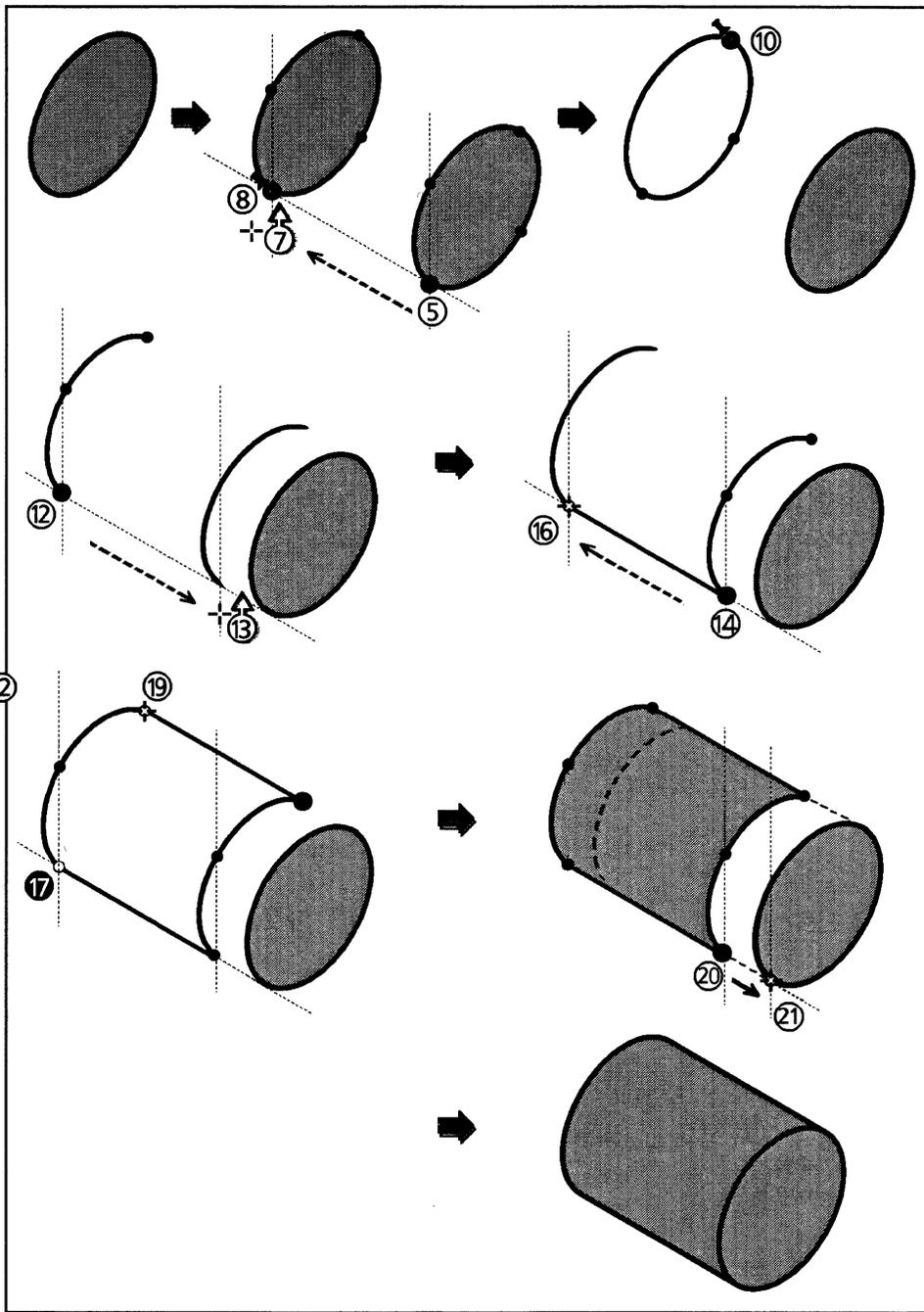
## Drawing a hollow filled shape

The following procedure shows you how to draw a hollow filled shape.



Follow these steps to draw a hollow filled shape:

1. Chain around the outside of the shape and return to the starting point just as you would to make any chained shape, but do not press <Stop>.
2. Make a bridge to the inside of the hollow shape by drawing a segment to a point on the inside of the shape.
3. Chain around the inside of the shape in the opposite direction from the outside chain, returning to the first point on the inside of the shape.
4. Draw the last segment on top of the bridge back to the starting point.
5. Press <Stop>.
6. Select None on the Pattern softkey so the bridge does not show. Select a full tint and/or texture, if desired.



STOP 16

RMB COPY 8 5 12

OPEN 9

Basics Select Edit View Geometry Setup	Draw ? ? ? + -     •	Draw Text □ ○ ■	Transform Scale Stretch Rotate Flip Shear	Type Linear Angular Paragraph Perspective None	Geometry [3D Icon]	Style Isometric Cavalier Military	GridActive Angle/Dist Angle	Distance 4 6 12 18 36
Basics Select Edit View Geometry Setup	Draw ? ? ? + -     •	Draw Text □ ○ ■	Transform Scale Stretch Rotate Flip Shear	Geometry [3D Icon]	Plane [3D Icon]	Constrain Lock angle None	CurveType [Curve Icon]	Smooth On Off
Basics Select Edit View Geometry Setup	Draw ? ? ? + -     •	Draw Text □ ○ ■	Transform Scale Stretch Rotate Flip Shear	Cluster Joined Split	Cut at [Cut Icon]	Link/Cut Cut Linked	Layer Top Bottom	Layer Above Below

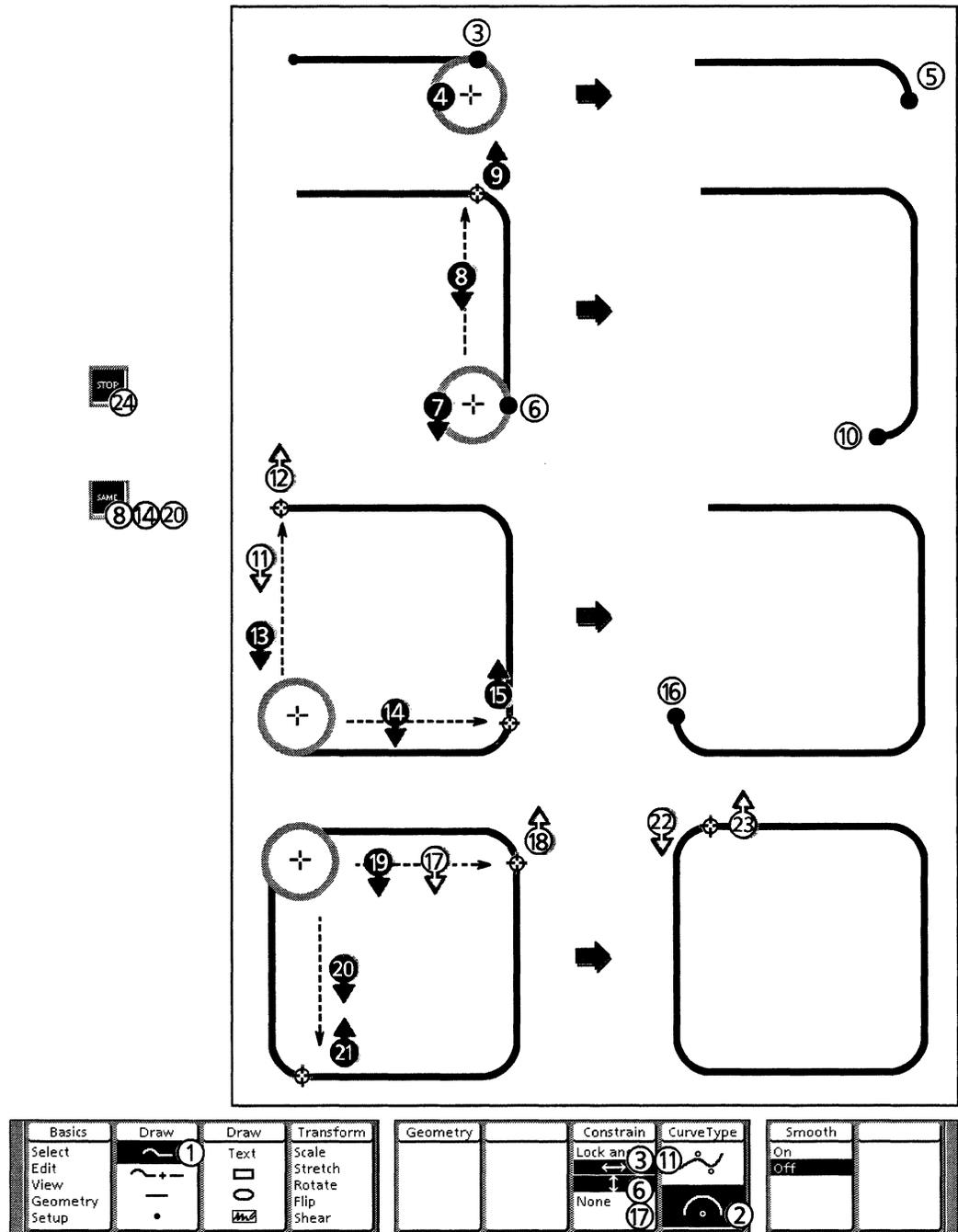
Follow these steps to draw a cylinder in paraline plane:

1. Copy an ellipse from the desired plane into your frame.
2. Select **Geometry** on the **Basics** softkey, then select **Paraline** on the **Type** softkey.
3. Select the **Paraline Style** corresponding to the ellipse you copied in step 1.
4. Select **Angle/Dist** or **Angle** on the **GridActive** softkey.
5. Select the ellipse at either end of the major axis, and press **<Copy>**.
6. Select a plane on the **Plane** softkey which corresponds to the plane in which you are constructing the cylinder. Note that this is not the same as the plane from which you copied the original ellipse.
7. Move the cursor in the direction you want to make the cylinder body and release the mouse button.
8. Press **<Find>**. This places the **Pin Point** at the selected control point.
9. Press **<Open>**. This cuts the ellipse at the **Pin Point** location.
10. Select the control point on the other end of the major axis and repeat steps 8 and 9.
11. Delete the lower half of the ellipse.
12. Select the half ellipse and press **<Copy>**.
13. Move the cursor in the direction you want to make the cylinder body and release the mouse button.
14. Select an end of one of the half ellipses.
15. Select the **Add to Chain** icon on the **Draw** softkey.
16. Move the cursor to the corresponding endpoint on the other half ellipse until the open circle appears, and press **<Stop>**.
17. With the object you just drew still selected, select the endpoint on the half ellipse with the right mouse button. (You can also control point select the endpoint on the line and use the draw-through box to select the endpoint on the half ellipse.)
18. Select **Edit** on the **Basics** softkey, and then select **Linked** on the **Link/Cut** softkey.
19. Repeat steps 14 through 16 with the other end of the half ellipse to close the cylinder. The system will automatically close the chain so it can be filled.
20. To connect the cylinder body to the end, select the cylinder at a major axis control point and press **<Move>**.
21. Move the cursor to a corresponding control point on the ellipse and release the mouse button when the open circle appears.

## Drawing a round-cornered box

The procedure shows you how to make the round-cornered box in the following illustration. You can modify the procedure by drawing it in a geometric mode such as paraline, drawing larger or smaller arcs for the corners, or drawing the box from a different starting point or in a different direction.

The procedure is meant not only to show you how to draw a round-cornered box, but how to use the directional constraints to draw even line sides and align the box corners with each other.



Follow these steps to draw a round-cornered box:

1. Select the Chain icon on the Draw softkey.
2. Select the Arc icon on the CurveType softkey.
3. Select the Horizontal constraint and draw a horizontal line.
4. Click the right mouse button directly below the end of the horizontal line. This draws the arc's center point.
5. Move the cursor to the right of the arc's center and click the left mouse button to draw the arc to be a quarter of a circle.
6. Select the Vertical constraint and draw a vertical line.
7. Press and hold down the right mouse button directly to the left of the end of the vertical line.
8. With the mouse button still down, press <Same> and move the cursor up to the joint between the horizontal line and the first arc.
9. Release the right mouse button when the open circle appears. This aligns the center point of the arc you are drawing with the center point of the previous arc.
10. Move the cursor directly below the arc's center point and click the left mouse button to draw the arc to be a quarter of a circle.
11. Select the Horizontal constraint and draw a horizontal line. With the mouse button still down, move the cursor up to the start of the first horizontal line.
12. Release the left mouse button when the open circle appears. This makes the line the same length as the horizontal line above it.
13. Press and hold down the right mouse button directly above the end of the second horizontal line.
14. With the mouse button still down, press <Same> and move the cursor over to the bottom of the vertical line.
15. Release the right mouse button when the open circle appears. This aligns the center point of the arc you are drawing with the center point of the previous arc.
16. Move the cursor to the left of the arc's center point and click the left mouse button to draw the arc to be a quarter of a circle.
17. Select the Vertical constraint and draw a vertical line. With the mouse button still down, move the cursor over to the top of the first vertical line.
18. Release the left mouse button when the open circle appears. This makes the line the same length as the first vertical line.
19. Press and hold down the right mouse button directly to the right of the end of the second vertical line.
20. With the mouse button still down, press <Same> and move the cursor down to the left end of the bottom horizontal line.
21. Release the right mouse button when the open circle appears.

22. Press and hold the left mouse button and move the cursor to the beginning of the top line.
23. Release the mouse button when the open circle appears.
24. Press <Stop>.

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## Tips for tracing smooth curves in sketches or scanned drawings

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When tracing a sketch or scanned drawing, you want to make sure that the curves are as smooth as those in the original. One trick is learning how long to make the chain segments. For example, broad, flat curves need fewer segments than short, tight curves do.

Another trick is using double curves (curves with two bend points) and the Smooth constraint as you are drawing to make the curves and the joints between the curve segments as smooth as possible. The procedure in this section shows you how to draw double curves and use the Smooth constraint as you are tracing.

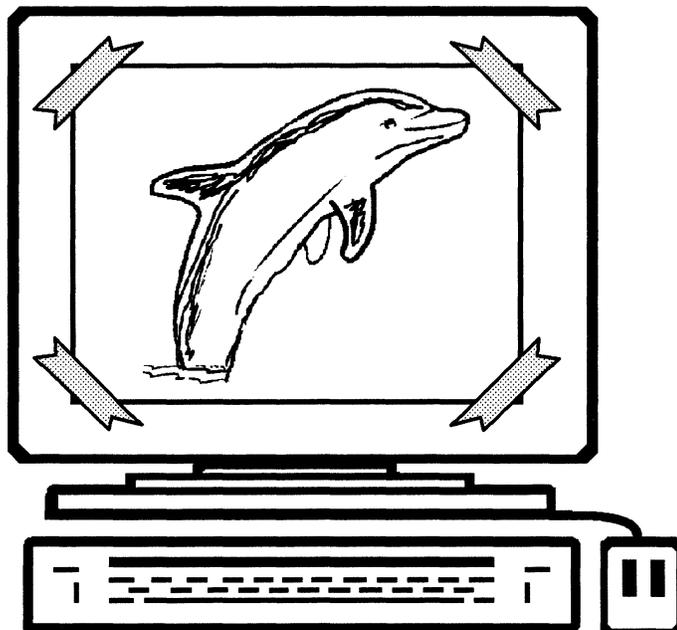
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## Preparing the hand sketch or scanned image

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If your drawing or scanned image has many curved shapes, make the transparency or image as large as you can. The larger it is, the easier it is to draw. You can always scale it down later.

If you are tracing a hand sketch, draw it on a transparency, or draw the sketch then photocopy it onto tracing paper or a transparency. Then tape the tracing paper or transparency to your screen, as shown in the following figure. Also select [Outline Illustrator Graphics] in the document auxiliary menu if you are creating many chained shapes. This eliminates fills and tints from chained shapes so you can see the chain outlines more clearly, and speeds up scrolling and repainting time.

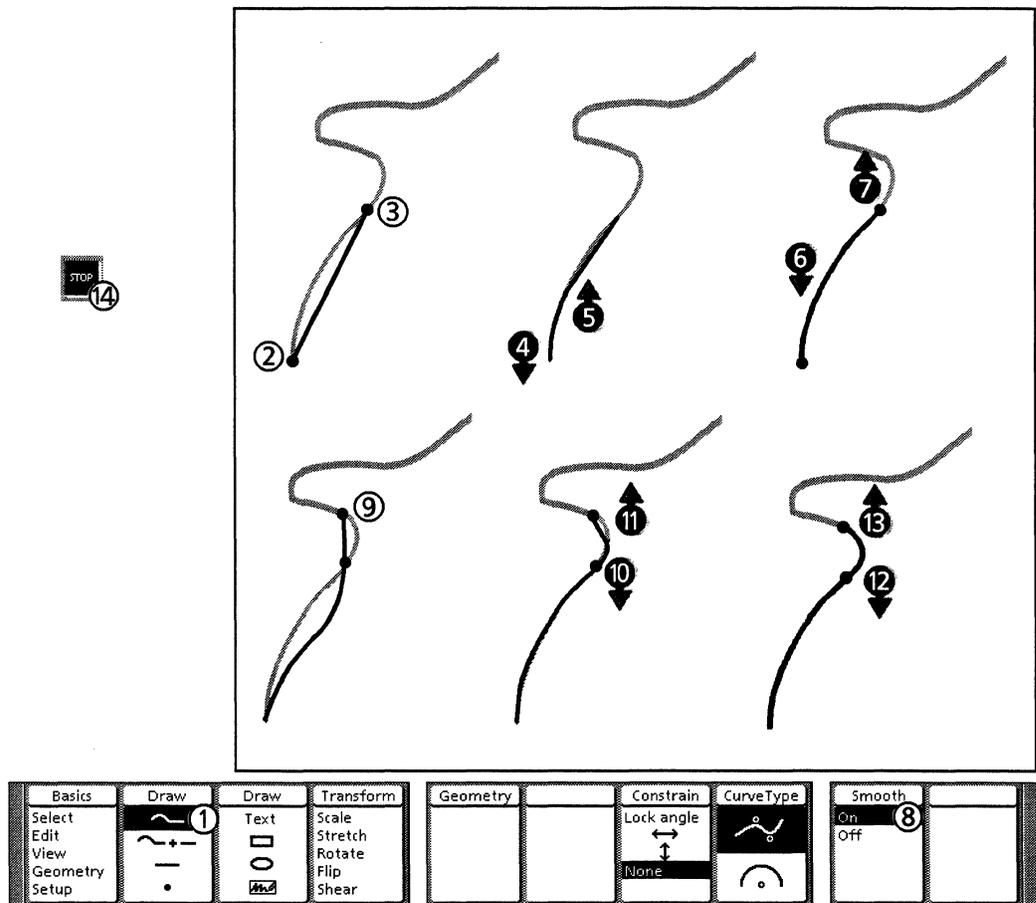


If you are tracing a scanned image, place a bitmap frame in your frame, and copy the image into the frame. Make a View window of the image. If you want to see the bitmap images more clearly without fills and tints, and speed up scrolling and repainting time, select [Show Gray Illustrator Bitmaps] and [Outline Illustrator Graphics] in the Display command menu.

## Tracing curves

This section contains the procedure for using double curves and the Smooth constraint to trace smooth curves.

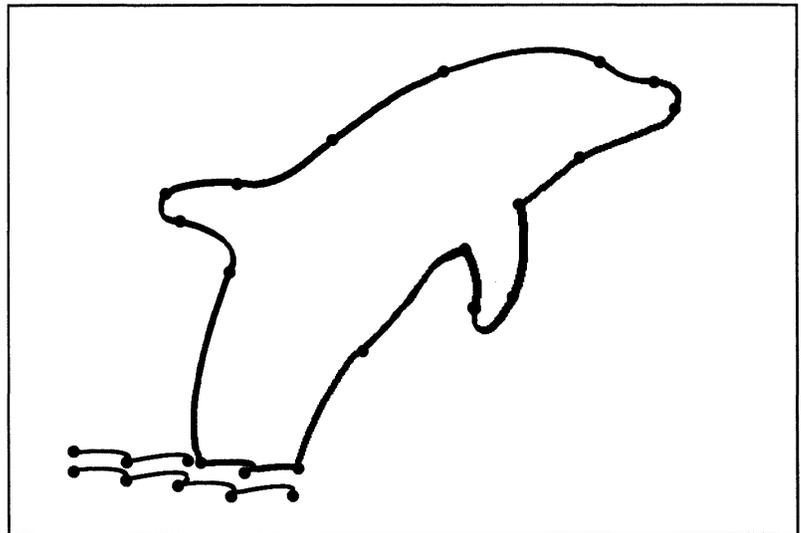
As you draw, you can press <Undo> to delete any incorrectly curved segments.



Follow these steps to use double curves and the Smooth constraint to trace curves:

1. Select the Chain icon on the Draw softkey.
2. Click the left mouse button to draw the first end point.
3. Click the left mouse button to draw the second end point.
4. Press and hold down the right mouse button. Move the cursor along the original curve until the chain segment you are drawing pulls away from it.
5. Release the right mouse button.

6. Press and hold down the right mouse button. Move the cursor to adjust the chain to fit the curve you are tracing. (Different curves require variations on how close to the curve you draw the bend points.)
7. Release the right mouse button.
8. Select On on the Smooth softkey.
9. Click the left mouse button to draw the next segment. Because the Smooth constraint is on, the curve of the previous segment changes. You can return it to its original shape when you draw the bend points for the current curve (the next two steps).
10. Press and hold down the right mouse button. Move the cursor to adjust the previous curve to its original shape.
11. Release the right mouse button.
12. Press and hold down the right mouse button. Move the cursor to adjust the current curve's shape.
13. Release the right mouse button.
14. Continue drawing the shape and press <Stop> when you are done. The following figure shows the completed chain for his example.




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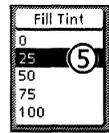
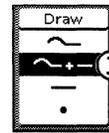
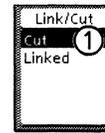
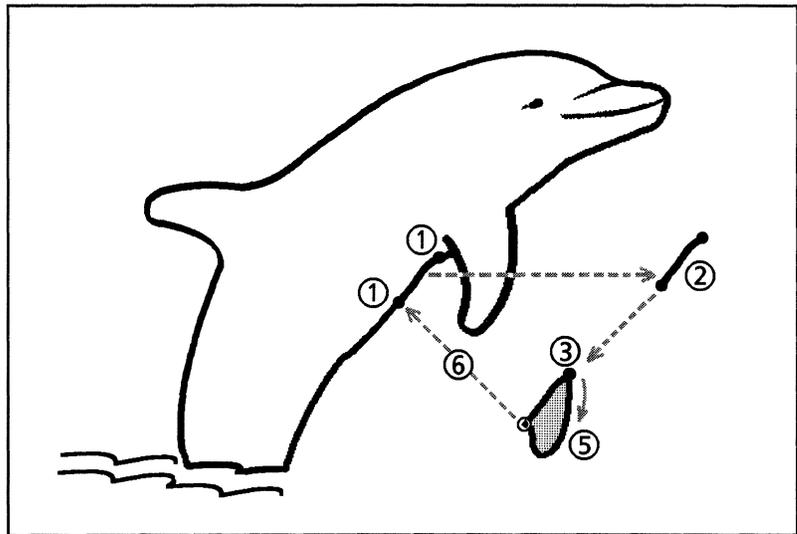
## Creating adjoining chained shapes with shared sides

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This section shows you how to create adjoining chained shapes out of segments from an original chain. This makes it easy to add to a shape without overlapping lines, and to add different textures and fills to an existing shape.

You can cut chains at their control points, or at any place on the chain by moving the Pin Point to the place you want to cut. After a chain segment is separated, it has its own control points.

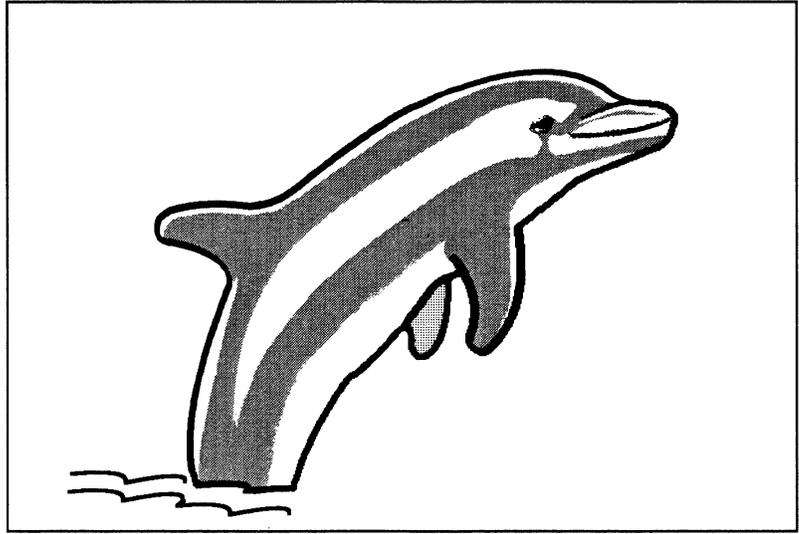
This procedure starts with an existing chain. You can apply it to creating adjoining shapes for your own chained shape. Before you begin, determine which edge will be used as the shared edge for both shapes.



Follow these steps to create adjoining chained shapes with shared sides:

1. Cut each end of the chain portion that will become the shared edge. You can cut the chain at control points, or at any location on the chain using object level gravity to place the Pin Point.
2. Copy the separated chain portion to one side.
3. Select an endpoint on the separated chain. Then select the Add to Chain icon on the Draw softkey and add segments to the separated segment. If you are drawing a closed chain, make sure to use gravity to highlight the last connection point.
4. Press <Stop> when you are finished drawing.
5. If the new chain is closed, select a fill tint and/or texture if you want.
6. Move the new chain next to the original chain, using gravity to place the shared edges on top of each other.
7. Repeat the above steps to create more filled shapes from the copy of the chain. After you have drawn all of the shapes you want, layer them using the options on the Layer softkeys.

The following figure shows the finished example drawing. Each filled area was created from original chain segments, or from segments from newly added chains.



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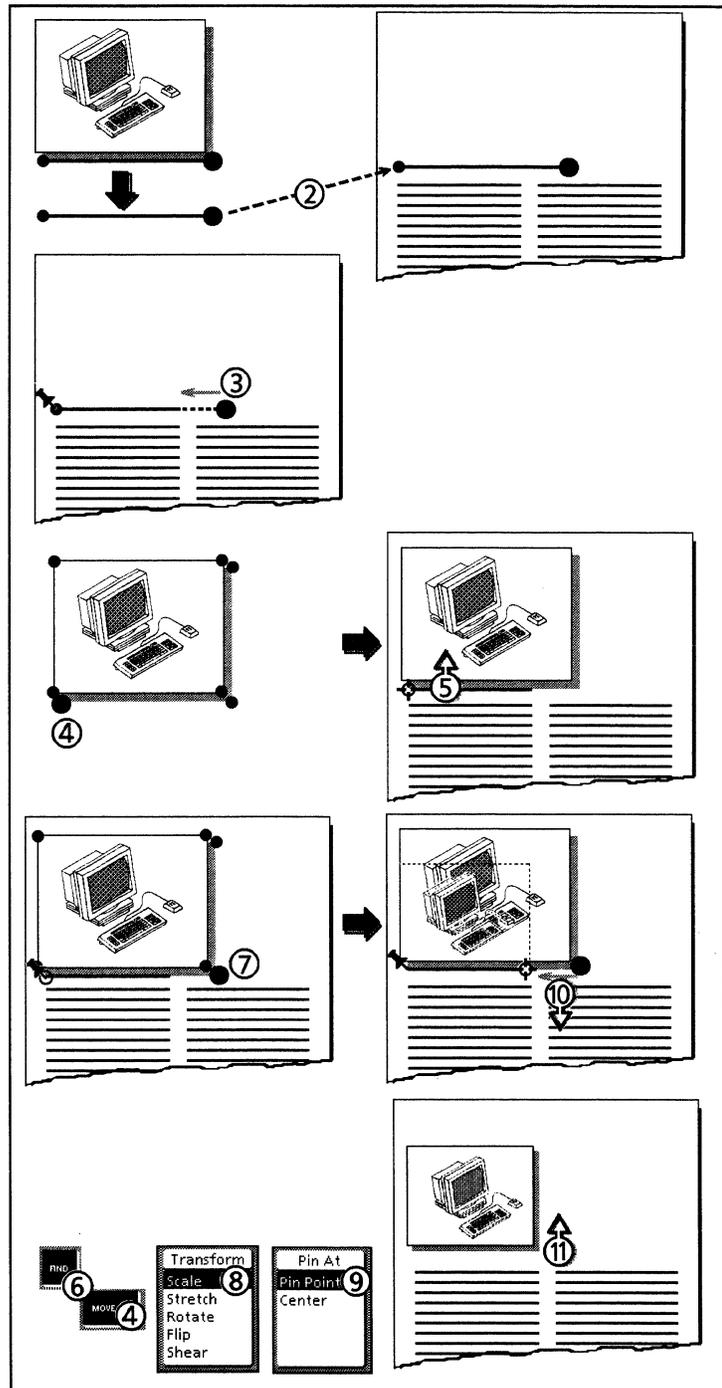
## Using a gravity object to position objects in a layout

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If you need to experiment with an object's position, angle, size, and so on, before you place it in a layout, you can create a gravity object to save time in repainting, and experiment without distorting the original.

A gravity object can be a portion of the object, or an outline that you position and/or resize instead of the original object. It is a gravity object because you use gravity to align the original object with the gravity object once you have positioned and/or transformed it in the layout.

This section contains a procedure for creating a gravity object, then scaling it before it is positioned in the layout. It also shows you an easy way to align and scale the original object to the gravity object. You can apply any of the transformations to the gravity object.



Follow these steps to use a gravity object to position objects in a layout:

1. Trace a portion of your shape, or trace or copy an outline of it. In this example, we are tracing the bottom edge of the object. This is your gravity object.
2. Move the gravity object to the layout and position it.
3. Transform the gravity object, if desired. In this example, the object is scaled.

4. Now you want to align the original object and the gravity object along one side. Select your original object by a control point that you want to align with the gravity object and press <Move>.
5. Press and hold down the left mouse button and move the cursor towards the control point on the gravity object that you want to align the original object with. When the open circle appears, release the mouse button. The objects should be aligned on one side.
6. Press <Find>. This places the Pin Point at the guide point that was highlighted.
7. Select the original object at a control point opposite the Pin Point.
8. Select the same transformation for the original object as you did for the gravity object in step 3.
9. Select Pin Point on the Pin At softkey.
10. Press and hold down the left mouse key and move the cursor to the corresponding control point on the gravity object until the open circle appears.
11. Release the mouse button. The original object should be exactly sized and positioned with the gravity object.
12. Delete the gravity object.



This glossary defines special terms used in this manual. Most of the terms are specific to *Xerox Pro Illustrator*. Some apply to VP in general, and others come from the worlds of graphic arts, technical drawing, and typography. The field from which a term is taken is shown in brackets (for example, [Typography]). If no field is listed, the term applies specifically to *Xerox Pro Illustrator*.

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**A**


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<b>Accelerator</b>	A key used instead of a softkey command to perform an action. For example, you can hold down <Shift> to select control points instead of selecting the Control point icon on the Select softkey.
<b>Alignment Cross Hairs</b>	Aids for aligning when you draw and edit objects. They are a single line, indicating the direction of alignment, (for example, vertical alignment for the Horizontal constraint). Alignment cross hairs are visible regardless of the geometry type.
<b>Anchored Frame</b>	[VP] A frame that you can position or anchor within a document by pressing a special key sequence. An anchor symbol (visible when Show Structure is on) indicates where the frame is inserted. frames are anchored frames. Compare with Embedded Frame.
<b>Angular Cross Hairs</b>	See Geometry Cross Hairs.
<b>Angular Geometry</b>	A polar coordinate system of equally spaced angles radiating from an origin. See Polar Coordinate System.
<b>Angular Moving Geometry</b>	The form of angular geometry that acts like a moving grid to help you draw and edit objects.
<b>Angular Grid</b>	A polar grid available in angular geometry. See Grid.
<b>Angular Perspective</b>	[Technical drawing] A particular style of perspective projections containing two vanishing points. See Perspective Moving Geometry.
<b>Attachment Point</b>	The control point on a text frame where the system pins the text frame to the frame during a transformation.
<b>Axonometric</b>	[Technical drawing] A way of representing a three-dimensional object on a single picture plane that orients the three faces of an object so that it looks three-dimensional. In axonometric drawing, the projection lines remain parallel and are perpendicular to the picture plane. Compare with Orthographic and Oblique.

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**B**


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<b>Baseline</b>	[Typography] An imaginary horizontal line on which the characters in a line of type are set. Character descenders (for example, the lower part of a g or p) extend below the baseline. Subscripted and superscripted characters are offset from the baseline.
<b>Baseline Control Points</b>	The three control points on a text frame that are aligned horizontally along the baseline of the first line of text. They are located where the baseline meets the left and right edges of the text frame and at the horizontal center of the baseline. Compare with Center Control Points. You can use either the Baseline control points or the Center control points, but not both.
<b>Bend Point</b>	A component of a curve chain segment. A curve starts as a straight line. To bend it, you select a point above or below the line. The line bends in the direction of the bend point, creating a curve. The final shape of the curve depends on the final position of the bend point. A single curve has one bend point; a double curve has two.
<b>Bitmap Frame</b>	A rectangular area within a frame that contains a raster image. Bitmap frames can be created only within frames; they cannot be anchored in VP document text, embedded in other VP frames, or copied directly from a VP Basic Graphics frame. Other types of frames cannot be embedded in bitmap frames.

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**C**


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<b>Cartesian Coordinate System</b>	[Technical drawing] A two-dimensional coordinate system in which the coordinates of a point are its distances from two intersecting perpendicular straight lines, the distance from each being measured along a straight line parallel to the other.
<b>Cabinet</b>	[Technical drawing] A particular style of parallel plane (paraline) projections whose angles are 45, 90, and 0 degrees. The length of the projection lines is equal to one-half the length of the two axis lines of the true shape side.
<b>Cavalier</b>	[Technical drawing] A particular style of parallel plane (paraline) projections whose angles are 45, 90, and 0 degrees. The length of the projection lines is equal to that of the two axis lines of the true shape side.
<b>Center Control Points</b>	The three control points on a text frame that are aligned horizontally at the vertical center of the text frame. They are located at the midpoints of the left and right sides and at the center of the frame. Compare with Baseline Control Points. You can use either the Baseline control points or the Center control points, but not both.
<b>Chain</b>	An object made up of two or more segments linked together. Each chain segment can be a straight line, a single curve, a double curve, or an arc. Chains allow you to draw curves, polygons, and complex shapes. See Open Chain and Closed Chain.

<b>Changing Softkeys</b>	The six rightmost softkeys. They display the options, properties, and constraints for each command or mode that you select on the Command Softkeys. They are called changing because the information they display is different for each command you select. See Command Softkeys.
<b>Click</b>	To press and immediately release a mouse button. Compare with Drag.
<b>Closed Chain</b>	A chain that has joints but no end points. It forms an enclosed shape (such as a polygon) that you can fill with tints and textures. Contrast with Open Chain.
<b>Cluster</b>	Two or more objects joined together so they function as a single object. When you select any one object in a cluster, all the objects are selected. You can join clusters (called subclusters) to make bigger clusters, and split clusters into subclusters or into individual objects.
<b>Command Softkeys</b>	The Basics softkey, the two Draw softkeys, and Transform softkeys. They contain the commands that allow you to operate. See Changing Softkeys.
<b>Constraint</b>	A limitation of direction, angle, or shape used while drawing and editing.
<b>Control Point</b>	Each object has one or more control points that allow you to manipulate the object. For example, a rectangle has nine control points: four at the corners, four at the midpoints of the sides, and one at the center. The control points are visible only when the object is selected. You can select and manipulate individual control points. See Guide Point.
<b>Control Point Gravity</b>	Causes the cursor to snap to object control points, frame corners, and vanishing points. See Gravity.
<b>Cropping Boundary</b>	[Printing] A border that separates out the unwanted portions of an illustration. The frame is cropping boundary that surrounds a portion of the drawing pad. See Infinite Drawing Pad.
<b>Cross Hairs</b>	Aids for drawing and editing objects. Cross hairs snap to the grid, moving geometry, and gravity points.
<b>Cycle-Through Selection</b>	A method for selecting a particular object when several objects are layered or very close together. If you keep the cursor in place and repeatedly click the mouse button, the system selects first the top object, then the object just below it, and so on. After you reach the bottom object, selection begins again with the top object.

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**D**


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<b>Define/Expand Option</b>	[VP] An option which allows you to create a dictionary of words, tables, frames, and so on. that you can quickly insert into your document by pressing <Define/Expand>.
<b>Detent</b>	Automatic stops at angles around a fixed point. For example, as you rotate an object around the angular grid's origin, the object's guide point stops at these angles.
<b>Didot</b>	[Typography] A typographical unit of measure used in Europe. The didot is slightly larger than the point (67.568 didots per inch versus 72.289 printer's points per inch). In <i>Xerox Pro Illustrator</i> , didot is one of the choices for Frame Units.

<b>Dimetric</b>	[Technical drawing] A way of representing a three-dimensional object on a single picture plane. In a dimetric view, two of the spatial axes of the object are represented as equally inclined to the drawing surface. The result is that two sides of the object are equally exposed, but the top side is more or less exposed than the sides.
<b>Directional Constraints</b>	Softkey choices that limit the angle or direction relative to the cursor position when drawing or editing an object. The directional constraints are Horizontal, Vertical, and Lock angle. Compare with Property.
<b>Drag</b>	To move the mouse while you are holding down a mouse button. Compare with Click.
<b>Drawing Pad</b>	See Infinite Drawing Pad.

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**E**


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<b>Embedded Frame</b>	[VP] A frame that you can place inside an anchored frame. Text frames and bitmap frames are the only types of frames that can be embedded in a frame. Compare with Anchored Frame.
<b>End Point</b>	The control point at either end of a line or of a chain segment. As you draw a chain, the second end point of one segment becomes the first end point of the next segment, and so on. See Joint.
<b>Expansion Dictionary</b>	[VP] A feature of the Define/Expand option. It is the document containing the entries and abbreviations that you define. See Define/Expand Option.
<b>Extended Selection</b>	[VP] Having two or more objects selected at the same time. There are two methods of extended selection: object-by-object and draw-through box.

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**F**


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<b>Fixed Side</b>	A side of a text frame that does not move as text is added or modified. If Show Structure is on, fixed sides appear as solid lines. Compare with Free Side.
<b>Flip To</b>	To turn an object over so it ends up looking like a mirror image of its original self. <i>Xerox Pro Illustrator</i> allows you to flip objects horizontally, vertically, or both ways at once. See Transformation.
<b>Frame</b>	[VP] A rectangular area in a document reserved for graphics, text, tables, or equations. See Anchored Frame and Embedded Frame.
<b>Frame Units</b>	The units of measure for everything inside the frame. When you change Frame Units, the numerical choices on the softkeys, object property sheet, and Measures window change to reflect the new units.
<b>Free Side</b>	A side of a text frame that moves to hug the text as text is added, deleted, or changes size. If [Show Structure] is on, free sides appear as dotted lines. Compare with Fixed Side.

---

**G**


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<b>Geometry</b>	Geometry is a mode which provides consistent geometric orientations while you draw and edit objects. The four geometries in are: linear, angular, paraline, and perspective.
<b>Geometry Cross Hairs</b>	Aids for drawing and editing objects. Geometry cross hairs snap to the grid, moving geometry, and gravity points. The types of geometry cross hairs are: linear (intersecting horizontal and vertical lines), angular (a circle and an angled line), and plane (two lines intersecting in the directions of the current plane).
<b>Gravity</b>	When you place the cursor near an item possessing gravity, gravity snaps the cursor directly to it. Objects, intersections of objects, frame corners, and vanishing points have gravity. Grids and moving geometry act like gravity (the cursor snaps to them).
<b>Grid</b>	Like traditional grid paper beneath a drawing, the grid is a stationary pattern of dots. When the grid is on, the grid dots act like gravity. Also called fixed grid. Grids are available in linear and angular geometry. Compare with Moving Geometry.
<b>Guide Point</b>	When you select an object, the control point nearest the cursor when you release the mouse button becomes the guide point. The guide point, which appears as a larger circle than the other control points, acts as a handle that you manipulate to copy, move, or transform the object. See Control Point.

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**H**


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<b>Horizontal Constraint</b>	See Directional Constraints.
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**I**


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<b>Icon</b>	[VP] A pictorial representation of a document, folder, file drawer, printer, or other desktop object. Icon A graphic symbol on the softkeys that represents a type of object, a property, or a constraint.
<b>Infinite Drawing Pad</b>	When you create a frame, you create a drawing pad that extends without limit in all directions. You can draw, copy, and move objects anywhere on the drawing pad, but only those objects within the frame appear on the printed document. You can use View Windows to work on areas of the drawing pad outside the frame. See Cropping Boundary.
<b>Intersection Gravity</b>	Causes the cursor to snap to the intersections of objects with other objects, objects with grids and moving geometry, and objects with directional constraints. See Gravity.
<b>Isometric</b>	[Technical drawing] A way of representing a three-dimensional object on a single picture plane. The three spatial axes of the object are represented as equally inclined to the drawing surface. Dimensions of the object parallel to the axes are drawn at their true lengths, that is, there is no foreshortening to create perspective.

**Isometric** A particular style of parallel plane (paraline) projections, whose angles are 30, 90, and 150 degrees, used to create isometric drawings. See Paraline Moving Geometry.

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## J

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**Join** To combine two or more objects into a cluster. See Cluster and Split.

**Joint** In a chain, the shared control point between two chain segments. See Smooth Joint and Sharp Joint.

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## L

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**Layer** To position two or more objects so that one object is on top of another, which is on top of another, and so on. *Xerox Pro Illustrator* allows you to select an object and place it on top of or below another object or on top of or below all the other objects in the frame.

**Linear Geometry** A Cartesian coordinate system with 90-degree angles (horizontal and vertical). See Cartesian Coordinate System.

**Linear Moving Geometry** The form of linear geometry that acts like a moving grid to help you draw and edit objects.

**Linear Cross Hairs** See Geometry Cross Hairs.

**Linear Grid** A Cartesian grid available in linear geometry. See Grid.

**Lock Angle Constraint** See Directional Constraints.

---

## M

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**Margin** The amount of space between the text within a text frame and the text frame itself. Technically, the margin is the distance between the text boundary and the text frame.(see Text Boundary).

**Measures Window** A feature of that helps you to determine positions and sizes and to move objects. The Measures window displays four measures: horizontal distance (X), vertical distance (Y), direct distance in any direction (D), and angle. All measures are relative to the current location of the Pin Point.

**Mica** 1/1,000 of a centimeter. In *Xerox Pro Illustrator*, mica is one of the choices for Frame Units.

**Mil** 1/1,000 of an inch. In *Xerox Pro Illustrator*, mil is one of the choices for Frame Units.

**Military** [Technical drawing] A particular style of parallel plane (paraline) projections, whose angles are 30, 90, and 120 degrees, used to create military drawings. See Paraline Moving Geometry.

**Moving Geometry** Sets of angles that act like moving grids to help you draw, align, and transform objects. These angles constrain operations to the directions for the type of geometry. All geometries are available as moving geometry. Compare with Grid.

---

**N**


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**Neutral Property** If you open the object property sheet with more than one object selected, the property sheet displays only those properties common to all the selected objects. Other properties are neutral; they appear shaded with diagonal gray lines. See Object Property Sheet.

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**O**


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**Object Gravity** Causes the cursor to snap along the edges or outlines of objects. See Gravity.

**Object Property Sheet** Rather than having a separate property sheet for each type of object, uses a single property sheet for all objects. The properties are organized into groups. To set the properties for a particular object, you select the groups appropriate for that object, then select the desired properties within each group.

**Oblique** [Technical drawing] A way of representing a three-dimensional object on a single picture plane that orients the three faces of the object so that it looks three-dimensional. In parallel plane (paraline) projections, oblique means that the projection lines remain parallel and are oblique to the picture plane. In perspective geometry, oblique means that all projection lines converge at vanishing points. Compare with Orthographic and Axonometric.

**Oblique Perspective** A style of perspective moving geometry used to create oblique perspective drawings. Set Perspective Moving Geometry.

**Offset** An option for angular geometry which establishes the zero degree angle. The system's automatic setting is at the three o'clock position. See Geometry and Angular Geometry.

**Open Chain** A chain with one or more segments that has two end points. Contrast with Closed Chain.

**Origin** Applies to grids and moving geometry. The origin of the linear grid is arbitrary; any grid dot can serve as the origin. The origin of the angular grid is the center from which the angles radiate. The origin of moving geometry for all geometry types moves to the starting location when you draw or transform objects. allows you to relocate the origin of the linear and angular grids. See Grid and Moving Geometry.

**Orthographic** [Technical drawing] A way of representing a three-dimensional object in two or more views of the object, with each view showing only two dimensions so that the drawing appears flat, without spatial quality. Compare with Axonometric, Oblique, and Perspective.

---

**P**


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<b>Paraline</b>	[Technical drawing] A way of representing a three-dimensional object in one picture plane with all of the projection lines remaining parallel. In paraline (parallel plane) drawings, objects appear to be three-dimensional but not in perspective. Types of paraline drawing are axonometric (including isometric) and oblique.
<b>Paraline Moving Geometry</b>	The form of paraline geometry that acts like a moving grid to help you draw and edit objects. See Moving Geometry.
<b>Paraline Shear</b>	A transformation which causes objects to be projected in and out of the specified parallel (paraline) plane. Actually a projection transformation.
<b>Parallel Perspective</b>	[Technical drawing] A style of perspective projection containing one vanishing point. See Perspective Moving Geometry.
<b>Parallel Plane Projection</b>	See Paraline.
<b>Perspective</b>	[Technical drawing] A way of representing a three-dimensional object in one picture plane with some or all of the projection lines converging at vanishing points. In perspective drawings, objects appear much as the human eye or a camera would see them.
<b>Perspective Moving Geometry</b>	The form of perspective geometry that acts like a moving grid to help you draw and edit objects. See Moving Geometry.
<b>Pica</b>	[Typography] 0.166 inch (about 1/6 of an inch). There are 12 points in a pica. In <i>Xerox Pro Illustrator</i> , pica is one of the choices for Frame Units.
<b>Pin At Point</b>	During a transformation, the point where an object is pinned to the drawing pad. The Pin At point can be either at the current location of the Pin Point or at the exact geometric center of the object.
<b>Pin Point</b>	A special object (shaped like a push pin) that you use to transform objects, to relocate the grid origin, and to measure distances with the Measures window. You can select and move the Pin Point, but you cannot delete, copy, or transform it. The Pin Point is not printed as part of the illustration.
<b>Plane Cross Hairs</b>	See Geometry Cross Hairs.
<b>Point</b>	[Typography] The traditional printer's point equals 0.0138 inch (72.289 points to the inch).
<b>Point</b>	The <i>Xerox Pro Illustrator</i> point is 1/72 of an inch (exactly 72 points per inch). The point is one of the choices for Frame Units.
<b>Polar Coordinate System</b>	[Technical drawing] A two-dimensional coordinate system in which the coordinates of a point are its distances from a fixed point on a line (the origin) and the angle this line makes with a fixed line (the offset position).
<b>Projection</b>	[Technical drawing] The process or technique of reproducing a spatial object upon a plane by projecting its points.

**Property** A quality or attribute of an object (for example, width of a line or shape of an end point). Each type of object has a set of properties that you can control. Properties are available on both the softkeys and the object property sheet. The system remembers the properties you assign to each object; you do not have to reassign the properties each time you work with an object. Compare with Constraint.

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## Q

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**Quick Art** A collection of ready-to-use symbols, objects, and shapes that you copy into your drawings. Quick Art documents are made of frames containing objects which can be edited.

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## R

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**Rotate** To turn or revolve an object around a fixed point. *Xerox Pro Illustrator* allows you to rotate an object freely (to any angle) or to an exact angle (and its multiples). See Transformation.

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## S

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**Scale** To enlarge or reduce an object proportionally (by the same amount both horizontally and vertically). The object's shape does not change. *Xerox Pro Illustrator* allows you to scale freely (to any size) or by an exact percentage (and its multiples). Compare with Stretch. See Transformation.

**Sharp Joint** A joint between two chain segments that is not constrained to be smooth or tangential. The joint between two adjacent straight line segments is always sharp. Contrast with Smooth Joint.

**Shear** To slant an object. *Xerox Pro Illustrator* allows you to shear objects either horizontally or vertically. You can shear freely (to any angle) or to an exact angle (and its multiples). See Transformation.

**Smooth Joint** The Smooth constraint or property works by adjusting two adjacent chain segments as you draw or edit. The two segments blend together smoothly at the joint between them. If you draw a straight line segment followed by a curved segment, the angle of the line does not change; rather, the curved segment is adjusted so it blends smoothly with the line. Contrast with Sharp Joint.

**Softkeys** The control panel for using *Xerox Pro Illustrator*; they contain the commands and options that allow you to operate the system. The 10 softkeys displayed on the screen correspond to the function keys at the top of the keyboard. The softkeys appear when you select inside a frame and disappear if you select outside the frame. See Changing Softkeys and Command Softkeys.

- Split** To separate a cluster into its component parts, either subclusters or individual objects. See Cluster and Join.
- Stretch** To enlarge or reduce an object disproportionately (by different amounts horizontally and vertically). The object's shape changes. Compare with Scale. See Transformation.

---

**T**


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- Text Boundary** An imaginary rectangle that surrounds the text within a text frame. It extends from the top of the highest character in the first line of text to the bottom of the lowest character in the last line, and from the left edge of the leftmost character to the right edge of the rightmost character. If there is no margin, the text boundary is the text frame. See Margin.
- Text Frame** A rectangular area within a frame that contains text. Text frames can be created only within frames; they cannot be anchored in VP document text or embedded in other VP frames. Other types of frames cannot be embedded in text frames.
- Transformation** To change an object's size, shape, or orientation. *Xerox Pro Illustrator* provides five object transformations: flip, scale, shear, stretch, and rotate (see their individual definitions).
- Trimetric** [Technical drawing] A way of representing a three-dimensional object on a single picture plane. In a trimetric view, none of the spatial axes of the object are represented as equally inclined to the drawing surface. The result is that all three sides of the object are exposed differently.

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**V**


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- Vanishing Point** [Technical drawing] The location at which perspective projection lines converge.
- Vertical Constraint** See Directional Constraints.
- View Window** A feature of that allows you to create different views of an illustration. You can view part or all of the illustration, enlarge or reduce the view, select an exact scale for the view, and change the center point of the view. You can open multiple View Windows; a change made in one is reflected in the others. View Windows allow you to work with the infinite drawing pad outside the frame.

---

## D.

# Working with XPS 700 documents

During document composition on the XPS 700 system, you can merge documents from other systems into an XPS document. Using this technique, you can integrate a graphic into an XPS document by merging the VP document containing the graphic.

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## General procedure

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The following procedure describes the overall steps for integrating graphics in XPS documents. The steps are described in detail in subsequent sections of this appendix.

Follow these steps to integrate graphics in XPS documents:

1. Open a VP blank document and create a graphic. You can also copy an existing graphic from another VP document into the blank document.
2. Set the margins to zero in the VP document and Pro Illustrator frame.
3. Convert the VP document containing the Pro Illustrator graphic into an FPS IP (Formatting Print Service Interpress) master.
4. Transfer the FPS IP master to the XPS 700 system.
5. Determine the copy mark to call the FPS IP master into the XPS document and place it into an XPS Style or Design.
6. Compose and print the XPS document.

---

## Preparing the VP document

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Because the merge operation merges an entire document, the VP document must contain nothing but a frame (that is, no text, headers, or footers outside the graphics frame) in order for the graphic to be merged correctly. The document must be a one page document containing no margins. The page should be taller than it is wide if your document is portrait, otherwise VP turns the graphic into a landscape document. The frame must also have no margins and must be aligned flush left and flush bottom in the VP document.

Follow these steps to prepare the VP document:

1. In a blank VP document, create a graphic. If you use a graphic that already exists in a VP document, make sure that you either delete surrounding text, or copy the graphic into a blank VP document.
2. Select [Show Structure] from the pull-down menu in the VP document window header.
3. Select the Page Format Character and press <Props> to open the Page Format Properties Sheet.
4. Set all of the Page Margins to 0. Select [Done].
5. Select the Pro Illustrator frame and press <Props> to open the Xerox Pro Illustrator properties sheet.
6. Set all of the Margins 0 to and set the Alignment to [Flush Left] and [Flush Bottom]. Select [Done].
7. Paginate the document by selecting [Paginate] from the desktop menu in the VP document window header.
8. Measure the frame height in points using the Measures window. Move the Pin Point to one of the frame corners, and place the cursor in the opposite corner. Record the number in the Y field. You will need it for the copy mark that merges the graphic into the XPS document.
9. Close the document.

## Converting the VP document

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After you have prepared the VP document, you need to convert it into an FPS IP master. Refer to Chapter 16 for information about software requirements for using the Formatting Print Service.

Follow these steps to convert the VP document:

1. Copy the VP document icon onto the Converter icon.
2. Indicate VP Document as the Source, and FPS Interpress Master as the Destination.
3. Select Start in the Converter window header. The converter produces an FPS IP master of the graphics document, and places the icon next to (or close to) the original document.

## Transferring the FPS IP master to the XPS 700 system

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After you have converted the VP document into an FPS IP master, you can transfer it to the XPS 700 system.

Follow these steps to transfer the FPS IP master to XPS:

1. At the 6085 workstation, move or copy the FPS IP master to a file server (via a file drawer).
2. At the XPS 700 terminal using the Ship and Receive function group, retrieve the FPS IP master from the server to the XPS 700 Held File area. Move the master as a Merge part to the appropriate Merge Library. The FPS IP master becomes an INT part.

Refer to the *XPS 700 System Management Guide* and the *XPS 700 Reference Manual* for detailed procedures on transferring VP files from the 6085 to the XPS via a file server.

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## Determining the copy mark

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Once the FPS IP master containing the graphic is in the Merge Library, you can merge and manipulate the graphic in an XPS document using the XICS IMG command.

Shown below is the generic copy mark used to place the graphic. The copy mark you use may be different depending on your job requirements.

```
{#lLaa={IFNE,^^32,0,71/T,0/PT,,bb/NL}
{IMG,p1,p2,p3,p4,p5,p6,p7}Art name
{PT,,11}}
```

Where:

- aa is the unique indicator for the art copy mark.
- bb is the line feed value, which is the total number of points between the baseline of the line of text preceding the graphic and the top of the line of text following the graphic. This equals the height of the art as printed, plus 24 points.

First, you need to set the line feed to equal the number of points in the height of the graphic plus 24 points (bb in the above generic copy mark). The fourth parameter (p4, the reference point) is always set at the lower left corner of the graphic regardless of how you position it in the IMG command. This is caused by the flush bottom, flush left alignment of the frame in the VP document. The horizontal and vertical offsets (p1 and p2) do not control the position of the art. You control the position of the art by modifying the value of bb (art size).

Refer to the *XICS Reference Manual* for more information on the XICS commands used in the generic copy mark (IFNE, T, PT, NL, IMG).

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## Composing and printing

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Once you have defined the copy mark in an XPS 700 Design or Style, you can use Interactive Composition to compose and view the document. Make the master in Interpress format. Edit the copy mark until the position of the graphic is correct.

You cannot control the position of the art with the horizontal and vertical offsets (p1 and p2). You can control the placement by modifying the value of bb (the art size).

Refer to the *XPS 700 User Guide* for information on composing and printing documents.



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## E. Recovering from problems

*Xerox Pro Illustrator* displays messages in the attention window at the top of the screen. The messages include the following:

- Confirmation of commands (for example, relationships like top/bottom)
- Information when something cannot be done
- Errors
- Prompts (suggested user actions).

Warning messages flash when they are displayed; informational or instructional messages do not.

This appendix explains the messages and what actions to take, if any, when the messages are displayed. Some messages are not listed because their meaning is obvious or no action is required.

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### Illegal entries in number fields

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*Xerox Pro Illustrator* does not display messages when you enter illegal entries in numbers fields. The system converts the entries to acceptable values. The following list explains the entries:

- Where negative values are illegal, the system converts them to their positive equivalents (for example, -5 becomes 5).
- Tint values greater than 100 are converted to 100. Negative tint values become their positive equivalent.
- Letters used (where numbers should be used) are replaced with 0.

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### Reading the table

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The following table contains the messages which require further explanation or action on your part. They are arranged alphabetically by the first word in the message.

The first column of the table lists the message. The second column tells you what caused the message and/or what the message means. The third column gives a suggested response to the message. Sometimes no response is needed, so none is listed.

Message	Meaning	Action
{1} requires {2} disk pages minimum.	({1} is application name, {2} is application backing store requirement.) Backing store required by Illustrator application. A message appears for each Illustrator application for which the backing store is insufficient. The workstation needs to have at least the number of disk pages required by the Illustrator application with the highest figure, but not the total disk pages required by all Illustrator applications.	Contact your System Administrator for more information.
{1} requires {2} megabytes minimum.	({1} is application name, {2} is application main memory requirement.) Main memory required by Illustrator application.	Contact your System Administrator for more information.
{ } requires additional Processor Control Store.	({ } is application name.) The Illustrator application does not have or is not utilizing floating point microcode (8K control store).	Contact your System Administrator for more information.
Action must be completed in the same frame.	You clicked the mouse button in a <i>Xerox Pro Illustrator</i> frame other than the one where you selected multiple objects, or a Draw, Transform, or View command. Or, you selected Center in a View window when the selected object was in a different frame than the one in which you chose the Center command. Or, you selected Above or Below when the destination or source object is in a different frame. The selection is deselected.	Repeat the operation and make all mouse actions in the same Pro Illustrator frame as the selection.
Additional Processor Control Store is recommended for faster Pro Illustrator performance.	A system configuration check determines that floating point microcode is not being utilized.	Contact your System Administrator if you want to modify your system for better performance.
Contact your System Administrator to change workstation configuration. The system will work correctly, but with slower performance. Choose Done to continue.	Confirmation following System configuration check. The system will work correctly, but with slower performance.	Contact your System Administrator if you want to modify your system for better performance.
Enable the Pro Illustrator Performance Enhancement for additional backing store.	There is insufficient Virtual Memory backing store and the Pro Illustrator Performance Enhancement is not enabled.	Contact your System Administrator for more information.
Frame contents cannot be retrieved. Please delete frame.	You opened a document page in which the objects in a <i>Xerox Pro Illustrator</i> frame have been deleted by the system (your disk may have crashed on the last open or the frame is a version mismatch).	Delete the frame to clean up the document.

Message	Meaning	Action
Illustrator frames in this document have been upgraded.	You opened a document containing Illustrator applications frames from an older software version than is currently running. After frames are upgraded, you cannot use the earlier software version to open the document.	Check the frame contents for accuracy. Some editing may be required.
Illustrator objects including bitmap frames are now displayed as outlines in this document.	The document opened in Outline display mode or you have selected Outline display mode in the document view. All Illustrator objects are shown only as outlines.	Use a View window to see raster images inside bitmap frames while document is in Outline display mode.
Insufficient space on desktop has caused some <i>Xerox Pro Illustrator</i> objects to be deleted.	You selected Save when there was insufficient space to save all objects in the <i>Xerox Pro Illustrator</i> frame.	Free up some space on the desktop, and invoke Save again.
Insufficient space on desktop has caused some <i>Xerox Pro Illustrator</i> objects to be deleted.	You selected Close when there was insufficient space to save all objects in the <i>Xerox Pro Illustrator</i> frame. Some objects were lost.	
Insufficient system resources to complete this operation. Close extra documents or delete icons from desktop. Then try again.	You copied an Illustrator graphics application frame, created objects, displayed bitmap frame contents, created gray bitmap display, or performed other actions for which the system does not have sufficient resources to complete. The action is aborted.	Close all unnecessary documents containing Illustrator graphics application frames. If disk space is low, clean up desktop space. If you have plenty of disk space, run fewer applications by setting unneeded applications to Idle. Attempt the aborted action again.
No more than 100 Illustrator frames are allowed in a document.	You attempted to create more than 100 Illustrator frames in a document.	Delete other <i>Xerox Pro Illustrator</i> frames in the document, combine contents of several frames, or split into separate documents.
Only two chain endpoints in same location can be linked.	You tried to link anything which cannot be linked, or the endpoints were not exactly in the same location and you selected Linked on the Link/Cut softkey.	Be sure the two chain endpoints are in the same location (gravity must be active). Control point select one chain at the control point to be linked, and use a draw-through box to select the second endpoint. Then select Linked on the Link/Cut softkey.
Properties just set will apply to new objects	You changed object properties either on the softkeys in Setup mode, or by applying in the object property sheet before drawing an object in a Draw Mode. These become the object creation default properties.	

Message	Meaning	Action
Set no more than two values: x and y OR distance and angle.	You attempted to change more than two measures and selected Apply or a final Next in the Measure Window. You attempted to change both a linear (horizontal or vertical) and angular (distance or angle) measure and selected Apply or a final Next in the Measures Window.	Change no more than two linear or two angular values at a time.
The Measures Window cannot respond to this command.	You selected a command not supported by the Measures window and then attempted to enter a Measures window field.	
The selection cannot be copied to that destination.	You attempted to copy non-Illustrator objects (icons, basic graphics objects, text) into a <i>Xerox Pro Illustrator</i> frame.	
The selection cannot be moved to that destination.	You attempted to move non-Illustrator objects (icons, basic graphics objects, text) into a <i>Xerox Pro Illustrator</i> frame.	
The selection contains objects with locked properties which cannot be changed.	You attempted to change an object property which is locked. For example, a bracket might have locked line endings to prevent it from having arrowheads. Pro Illustrator currently does not support locking or unlocking of properties. Objects with locked properties may have originated from other Illustrator applications.	
This document was created with a newer version of <i>Xerox Illustrator Basics</i> .	Open with new <i>Xerox Illustrator Basics</i> version. You opened a document containing Illustrator application frames from a newer Illustrator Basics software version than is currently running.	Close the document and run the newer <i>Xerox Illustrator Basics</i> .
This operation is not possible. You can only copy out of this frame, and only into a frame which has its Illustrator application running.	You selected an object and pressed a command key other than <Copy> or <Stop>. Or, you attempted to copy a selected object into an Illustrator application frame in which the application is not running. Or, you attempted to use <Same> to apply properties to or from an object in an Illustrator application frame in which the application is not running.	
Workstation has insufficient Processor Control Store enabled.	System configuration check determined that floating point microcode is not being utilized.	Contact your System Administrator for more information.
Workstation has only { } megabytes of memory. ( { } is workstation main memory.)	System configuration check indicates insufficient memory for Illustrator application. Lack of sufficient main memory may result in degraded performance.	Contact your System Administrator to obtain more main memory.

Message	Meaning	Action
Workstation only has { } disk pages backing store available.	({ } is number of disk pages currently available.) There are insufficient free pages in the Virtual Memory backing file for Illustrator to have acceptable performance.	Contact your System Administrator for more information.
<i>Xerox Illustrator Basics</i> cannot proceed because required Software Option not enabled.	You attempted to run <i>Xerox Illustrator Basics</i> before it has been product factored.	Enable the required software option.
<i>Xerox Pro Illustrator</i> cannot proceed because required Software Option not enabled.	You attempted to run <i>Xerox Pro Illustrator</i> before it has been product factored.	Enable the required software option.



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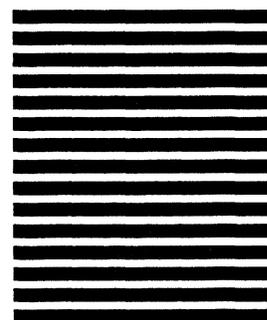
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